

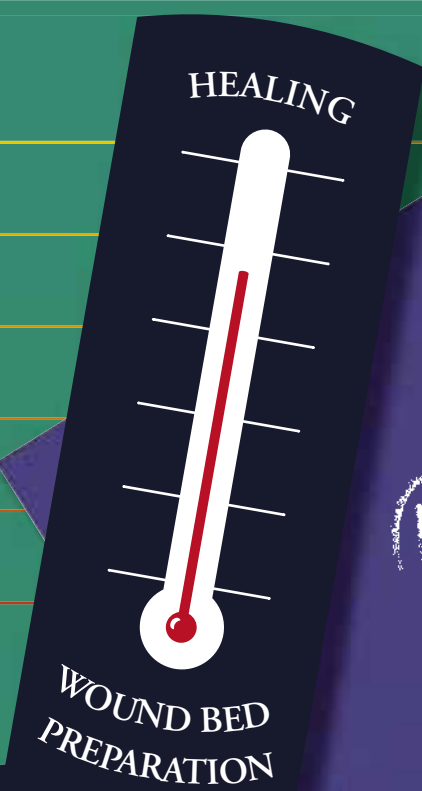
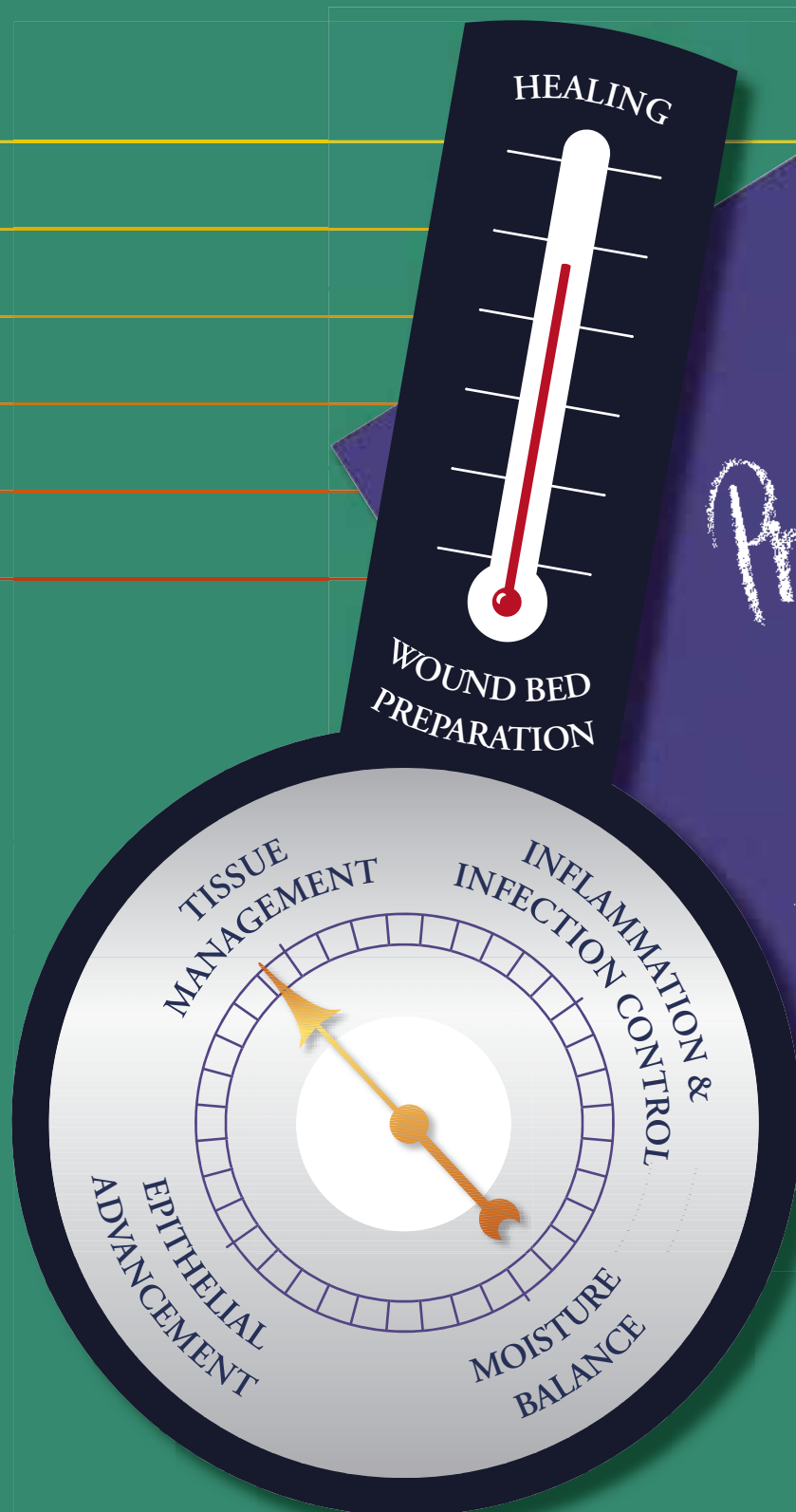


EWMA

Journal

Volume 4
Number 2
Fall 2004

Published by
European
Wound Management
Association



*Prepare
for
Healing*

EWMA Council

The EWMA Journal
ISSN number: 1609-2759
Volume 4, No. 2, Fall, 2004

The Journal of the European
Wound Management Association
Published twice a year

Editorial Board

Carol Dealey, *Editor*
Michelle Briggs, *Advisor*
Finn Gottrup
Sylvie Meaume, *Advisor*
E. Andrea Nelson
Sue Bale
Peter Vowden, *Legal Responsible*

EWMA Homepage
www.ewma.org

For membership application,
correspondence,
prospective publications contact:

EWMA Secretariat
PO Box 864, London SE1 8TT
United Kingdom
Tel: +44 207 848 3496
ewma@kcl.ac.uk

Enquiries concerning advertising
should be addressed to:
Congress Consultants
Martensens Allé 8
DK-1828 Frederiksberg C · Denmark.
Tel: (+45) 7020 0305
Fax: (+45) 7020 0315
ewma@ewma.org

Layout:
Birgitte Clematide

Printed by:
Kailow Graphic A/S, Denmark
Copies printed: 10,000

Prices:
Distributed free of charge to members
of the European Wound Management
Association and members of
co-operating associations.
Individual subscription per issue: 7,50€
Libraries and institutions per issue: 25€

The next issue will be published
in Spring 2005. Prospective material for
the publication must be with the editors
as soon as possible and in no case
later than 1st March.

The contents of articles and letters in
the EWMA Journal do not necessarily
reflect the opinions of
the Editors or the European
Wound Management Association.

The copyright of all published material
and illustrations is the property of
the European Wound Management
Association. However, provided prior
written consent for their reproduction
is obtained from both the Author and
EWMA via the Editorial Board of the
Journal, and proper acknowledgement
made and printed, such permission will
normally be readily granted. Requests to
reproduce material should state where
the material is to be published, and, if it
is abstracted, summarised, or abbreviated
then the proposed new text should
be sent to the EWMA Journal Editor for
final approval.



Christine Moffatt
Immediate Past President



Peter Vowden
President



Peter Franks
President Elect



Finn Gottrup
Recorder



Brian Gilchrist
Secretary



Marco Romanelli
Treasurer



Sue Bale



Carol Dealey
EWMA Journal Editor



Madeleine Flanagan



Katia Furtado



Luc Gryson



Deborah Hofman



Zena Moore



E. Andrea Nelson



Javier Soldevilla



Carolyn Wyndham-White

For
contact information,
see www.ewma.org

Panel Members (not on council)

Co-operating Organisations' Board

Leif Aanderud
Andrea Bellingeri
Katia Furtado
Finn Gottrup
Aníbal Justiniano
Bernadette Kerry
Iveta Lankovska
Marie Melicharová
Helen Orchard
Helena Peric
Ralf-Uwe Peter
Zbigniew Rybak
Javier Soldevilla
Luc Tèot
Rosine Van Den Buck
Carolyn Wyndham-White
Gerald Zöch

Educational Panel

Christina Lindholm
Hugo Partsch

Cost-effectiveness Panel

Elia Ricci
John Posnett
Nick Bosanquet
Patricia Price

Editorial Board

Michelle Briggs
Sylvie Meaume

EWMA Journal

3 Word from the president Peter Vowden

Scientific Articles

4 Advanced treatments for non-healing chronic wound Vincent Falanga

8 Watch the pressure – It drops! Anne Marie Larsen, Inger Futtrup

15 Cost Effectiveness of Dressing Materials Peter J. Franks

Background Article

21 Wound healing: Historical Aspects Finn Gottrup, David Leaper

29 Wound healing and fine art: What is possible to learn? Massimo Papi

EBWM

34 Abstracts of Recent Cochrane Reviews Sally Bell-Syer

36 Selected abstracts from 2nd World Union of Wound Healing Societies meeting

EWMA

41 Update from the Treasurer: Overview of EWMA finances Marco Romanelli

42 Did You See?

44 EWMA Journal Previous Issues

44 International Journals

46 EWMA Activity Report

46 EWMA Representatives

46 EWMA Council

48 EWMA Corporate Sponsor Contact Data

Conferences

49 Conference Calendar

Organisations

50 SAFW Swiss Association for Wound Care

52 WMAT Wound Management Association Turkey

54 Co-operating Organisations

Word from the president

Six days full of informative presentations, workshops, symposiums and panels can be hard work! Particularly in a meeting as interesting as the recent World Union meeting in Paris turned out to be. I am sure that I, like most of the delegates and speakers, found more than enough to keep me stimulated and interested not to mention enjoying the many and varied dinners and entertainments that Paris had to offer!

On behalf of EWMA and, I am sure, the other societies involved, I would like to thank Luc Téot and the organising committee for all the efforts they made over the preceding four years on our behalf. They are to be congratulated. They set very ambitious goals for this meeting and I believe they were able to achieve most if not all of them. The World Union has made much progress since its inaugural meeting in Sydney in 2000.

The World Union shares many of the same aims and goals as EWMA and it was excellent to see those common aims being realised in the consensus meetings that occurred throughout the conference agenda. Discussions resulting in strong, united statements of intent took place on a range of subjects from re-imburement to education and from larval therapy to the management of diabetic foot and pressure ulcers. I know these initiatives will be continued and developed over the next four years. I look forward to seeing the progress that has been made when the World Union next meets in Toronto in 2008.

What were the high points of the meeting? Well, with over 750 papers, presentations and keynote speeches it would be wrong to single out any one individual for mention. There were enthusiastic and, at times, heated debates over infection and silver; DNA transfer; stem cell treatment and tantalising looks into the future where the wound bed could be manipulated by the introduction of gene therapy.

There was also a realisation that, for some, there was a need to develop basic wound care standards, a process recently started by the ETRS. The World Union has to address the inequality that exists in terms of facilities, resources and need. This is, I suspect, the greatest challenge facing us all over the next few years. Both EWMA and the World Union are based on an inclusive principle of co-operation and this should allow us to support and develop common basic minimum standards of care whilst establishing the goal of "best practice".

What of EWMA's role as a co-organising society? Certainly it was a major step to forgo the annual EWMA conference, however we were strongly represented in Paris in terms of members present both as delegates and speakers. The latest EWMA Position Paper on "Wound bed preparation in practice", which expands on and develops the concept of T.I.M.E., was launched at the conference and was well received, as was the work of the Educational and Re-imburement Panels.

Meetings such as those hosted by the World Union and EWMA would not take place if it were not for the sponsorship and patronage of industry. Such meetings are, however, expensive and, over the next four years, we have to find a way to manage wound care meetings in a way that does not drain the funding source. Certainly EWMA intends to keep working with, and listening to, industry as we start the planning for our next meeting in Stuttgart in 2005. This conference, which will be the first jointly hosted by EWMA, ETRS and the German wound care society DGfW, will, I hope, offer an excellent opportunity for clinicians, managers and scientists to exchange ideas and develop further understanding of wound healing so that we can all benefit the patients in our care. I look forward to meeting you in Germany next September.

Peter Vowden

Advanced treatments for non-healing chronic wound



Vincent Falanga
MD FACP

Professor of Dermatology and Biochemistry
School of Medicine,
Boston University
Chairman and Training
Program Director,
Roger Williams
Medical Centre,
Providence,
Rhode Island,
USA
vfallanga@aol.com

CONTENTS

Abstract

The science of wound healing is advancing rapidly, particularly as a result of new therapeutic approaches such as growth factors, skin substitutes, and gene and stem cell therapy. This article reviews the latest developments in wound healing products and their progress through clinical trials, and suggests way to maximise their clinical effectiveness and hasten their integration into wider clinical practice.

Keywords: Wound healing; chronic wounds; non-healing wounds; biological products; growth factors; skin substitutes; gene therapy; stem cell therapy.

INTRODUCTION

Clinicians' understanding of and ability to achieve wound healing has increased significantly over the past few years, particularly as a result of advances in molecular biology such as the use of growth factors, the ability to grow cells *in vitro* and the development of bioengineered tissue¹⁻³. Knowledge of scarring has also increased fundamentally⁴⁻⁷, and the science behind wound healing and the identification of the critical components of the healing process have benefited from technical advances such as transgenic and knock-out animal models⁸. This paper describes the clinical experiences to date of the advanced products being developed as a result of this dynamic process.

GROWTH FACTORS

Over the past two decades several recombinant growth factors have been tested for their ability to accelerate the healing of chronic wounds. Among others, some promising results have been obtained using epidermal growth factor⁹ and keratinocyte growth factor-2¹⁰ for venous ulcers, and fibroblast growth factor¹¹ and platelet-derived growth factor (PDGF) for pressure ulcers^{12, 13}.

However, the only topically applied growth factor widely approved for use is PDGF, which randomised controlled clinical trials have shown accelerates the healing of neuropathic diabetic foot ulcers by about 15 percent¹⁴⁻¹⁶. Why, then, has a wider range of growth factors not been approved for clinical use and why have the results of clinical trials not lived up to the expectations created by preclinical data?

A number of explanations have been put forward, all of which may apply. It has been suggested that the dosage and mode of delivery for topically applied growth factors may have been incorrect and that growth factors need to be used in combination to achieve a better response¹⁷⁻¹⁹. It is also possible that closer attention should have been paid to appropriately preparing the chronic wound before treatment with the growth factor being tested²⁰. Notably, there is evidence that the aggressive approach to surgical debridement taken in the initial PDGF trial for diabetic neuropathic ulcers seems to have worked synergistically with the application of the growth factor¹⁵.

BIOENGINEERED SKIN

A number of bioengineered skin products or skin equivalents have become available for the treatment of acute and chronic wounds as well as burns. Since the initial use of keratinocyte sheets²¹⁻²³, several more complex constructs have been developed and tested in human wounds. Skin equivalents may contain living cells, such as fibroblasts or keratinocytes, or both^{2, 24-26}, while others are made of acellular materials or extracts of living cells²⁷⁻³⁰. The clinical effect of these constructs is 15-20 percent better than conventional 'control' therapy, but there is debate over what constitutes an appropriate control.

In US trials, saline-soaked gauze and off-loading have been accepted by the Food and Drug Administration as the control. However, methods for off-loading differ between countries and the wound dressings to be used are also subject to controversy. As a result, in spite of notable successes with the use of bioengineered skin to treat diabetic neuropathic foot ulcers, acceptance of this type of therapy by clinicians is not likely to become as widespread as desired.

Bioengineered skin may work by delivering living cells which are known as a 'smart material' because they are capable of adapting to their environment. There is evidence that some of these living constructs are able to release growth factors and cytokines^{31, 32}, but this cannot yet be interpreted as their mechanism of action. It should be noted that some of these allogeneic constructs do not survive for more than a few weeks when placed in a chronic wound³³.

GENE THERAPY

The technology to introduce certain genes into wounds by a variety of physical means or biological vectors, including viruses, has existed for some time. These range from *ex vivo* approaches, where cells are manipulated before being re-introduced into the wound, to more direct *in vivo* techniques that may rely on a simple injection or the use of a gene gun³⁴⁻³⁶. Gene therapy as a whole is a very active area of research, with 320 clinical protocols submitted to regulatory bodies around the world since 1999³⁷.

An inability to achieve stable and prolonged expression of a gene product, which has been a problem in the gene therapy treatment of systemic conditions, could be an advantage in the context of non-healing wounds, where only transient expression may be required³⁵.

Most work with gene therapy in relation to wounds has been done in experimental animal models³⁸, but there are promising indications that certain approaches may work in humans. For example, the introduction of naked plasmid DNA encoding the gene for vascular endothelial growth factor (VEGF) has been reported to enhance healing and angiogenesis in selected patients with ulcers resulting from arterial insufficiency³⁹.

The introduction of the gene rather than its product, for example a growth factor, is seen as a less expensive and potentially more efficient delivery method so there is no doubt that research into gene therapy for chronic wounds will increase over the next few years.

STEM CELL THERAPY

Extending the hypothesis that cell therapy may be required to recondition chronic wounds and accelerate their healing leads to the conclusion that stem cells may offer even greater advantages. Pluripotent stem cells (PSCs), the precursors to all more specialised stem cells, are capable of differentiating into a variety of cell types, including fibroblasts, endothelial cells and keratinocytes, all of which are critical cellular components for healing. Although most PSCs are derived from human embryonic research, which is the subject of some controversy, pluripotent mesenchymal stem cells, which are the source of new connective tissue, may be present in bone marrow⁴⁰.

A recent report on an uncontrolled clinical trial suggests that direct application of autologous bone marrow and its cultured cells may accelerate the healing of non-healing chronic wounds⁴¹. This needs to be confirmed in a larger controlled trial, but when considering the pathophysiological abnormalities present in chronic wounds there is the potential that stem cells may reconstitute dermal, vascular and other components required for optimal healing.

CONCLUSION

Considerable progress has been made on advanced products in the field of wound healing and a number of new therapeutic approaches are now available. It is hoped that continued advances will come about which, when combined with basic medical and surgical approaches, will accelerate the healing of chronic wounds to an extent that is still not possible with current therapeutic agents.

It is important to note that the treatment of chronic wounds has evolved rapidly over the past few years and it could be argued that the increased number of randomised clinical trials for chronic wounds has improved standard wound care. If this is so, in the future new products will be required to perform much better than the controls to show efficacy.

In addition, to make the best use of advanced products clinical trials will have to include more complex wound types. For example, existing advanced therapeutic products tested on diabetic foot ulcers, such as growth factors and skin equivalents, have focused entirely on neuropathic ulcers of the metatarsal heads. Arterial insufficiency and more complex heel ulcers have been exclusion criteria in these trials. Purely neuropathic ulcers are relatively straightforward and many clinicians believe they can be effectively treated with sound surgical debridement and off-loading. While it might be argued that accelerating the



healing of these relatively simple ulcers may prevent complications arising from infection, more needs to be done to show cost-effectiveness to our society as a whole.

A rational strategy for the effective use of advanced products in chronic wound healing is likely to require greater understanding of the clinical factors involved as well as the pathophysiological components that underlie impaired healing. ■

Key points:

1. A renaissance in the biology of wound care has resulted in the development of a range of advanced therapeutic products: growth factors, skin substitutes, gene therapy and stem cell therapy.
2. To make the best use of these advanced products and speed their introduction to standard practice, a more co-ordinated international approach to clinical trials is required and researchers need to broaden their remit to include more complex wound types.
3. Further research is necessary to increase understanding of the clinical factors that impair healing and develop a rational strategy for the effective use of advanced therapeutic products.

References

1. Bell E, Ehrlich HP, Buttle DJ, Nakatsuji T. Living tissue formed in vitro and accepted as skin-equivalent tissue of full thickness. *Science* 1981; **211**(4486): 1052-1054.
2. Boyce ST. Design principles for composition and performance of cultured skin substitutes. *Burns* 2001; **27**(5): 523-533.
3. European Wound Management Association. *Position Document: Wound Bed Preparation in Practice*. London: MEP Ltd, 2004. Available from www.ewma.org
4. Longaker MT, Chiu ES, Adzick NS et al. Studies in fetal wound healing. V. A prolonged presence of hyaluronic acid characterizes fetal wound fluid. *Ann Surg* 1991; **213**(4): 292-296.
5. Longaker MT, Whitby DJ, Ferguson MW et al. Adult skin wounds in the fetal environment heal with scar formation. *Ann Surg* 1994; **219**(1): 65-72.
6. Mackool RJ, Gittes GK, Longaker MT. Scarless healing. The fetal wound. *Clin Plast Surg* 1998; **25**(3): 357-365.
7. Mast BA, Diegelmann RF, Krummel TM, Cohen IK. Scarless wound healing in the mammalian fetus. *Surg Gynecol Obstet* 1992; **174**(5): 441-451.
8. Martin P. Wound healing—aiming for perfect skin regeneration. *Science* 1997; **276**(5309): 75-81.
9. Falanga V, Eaglstein WH, Bucalo B et al. Topical use of human recombinant epidermal growth factor (h-EGF) in venous ulcers. *J Dermatol Surg Oncol* 1992; **18**(7): 604-606.
10. Robson MC, Phillips TJ, Falanga V et al. Randomized trial of topically applied repifermin (recombinant human keratinocyte growth factor-2) to accelerate wound healing in venous ulcers. *Wound Repair Regen* 2001; **9**(5): 347-352.
11. Robson MC, Phillips LG, Lawrence WT et al. The safety and effect of topically applied recombinant basic fibroblast growth factor on the healing of chronic pressure sores. *Ann Surg* 1992; **216**(4): 401-406.
12. Robson MC, Phillips LG, Thomason A et al. Platelet-derived growth factor BB for the treatment of chronic pressure ulcers. *Lancet* 1992; **339**(8784): 23-25.
13. Pierce GF, Tarpley JE, Allman RM et al. Tissue repair processes in healing chronic pressure ulcers treated with recombinant platelet-derived growth factor BB. *Am J Pathol* 1994; **145**(6): 1399-1410.
14. Steed DL. Clinical evaluation of recombinant human platelet-derived growth factor for the treatment of lower extremity diabetic ulcers. Diabetic Ulcer Study Group. *J Vasc Surg* 1995; **21**(1): 71-78.
15. Steed DL, Donohoe D, Webster MW, Lindsley L. Effect of extensive debridement and treatment on the healing of diabetic foot ulcers. Diabetic Ulcer Study Group. *J Am Coll Surg* 1996; **183**(1): 61-64.
16. Smiell JM, Wieman TJ, Steed DL et al. Efficacy and safety of becaplermin (recombinant human platelet-derived growth factor-BB) in patients with nonhealing, lower extremity diabetic ulcers: a combined analysis of four randomized studies. *Wound Repair Regen* 1999; **7**(5): 335-346.
17. Robson MC. Growth factors as wound healing agents. *Curr Opin Biotechnol* 1991; **2**(6): 863-867.
18. Cross SE, Roberts MS. Defining a model to predict the distribution of topically applied growth factors and other solutes in excisional full-thickness wounds. *J Invest Dermatol* 1999; **112**(1): 36-41.
19. Robson MC, Hill DP, Smith PD et al. Sequential cytokine therapy for pressure ulcers: clinical and mechanistic response. *Ann Surg* 2000; **231**(4): 600-611.
20. Falanga V. Classifications for wound bed preparation and stimulation of chronic wounds. *Wound Repair Regen* 2000; **8**(5): 347-352.
21. Leigh IM, Navsaria H, Purkis PE, McKay I. Clinical practice and biological effects of keratinocyte grafting. *Ann Acad Med Singapore* 1991; **20**(4): 549-555.
22. Gallico GG 3rd. Biologic skin substitutes. *Clin Plast Surg* 1990; **17**(3): 519-526.
23. Phillips TJ, Gilchrist BA. Clinical applications of cultured epithelium. *Epithelial Cell Biol* 1992; **1**(1): 39-46.
24. Sabolinski ML, Alvarez O, Auletta M et al. Cultured skin as a 'smart material' for healing wounds: experience in venous ulcers. *Biomaterials* 1996; **17**(3): 311-320.
25. Hansbrough JF, Dore C, Hansbrough WB. Clinical trials of a living dermal tissue replacement placed beneath meshed, split-thickness skin grafts on excised burn wounds. *J Burn Care Rehabil* 1992; **13**(5): 519-529.
26. Hansbrough JF, Mazingo DW, Kealey GP et al. Clinical trials of a biosynthetic temporary skin replacement, Dermagraft-Transitional Covering, compared with cryopreserved human cadaver skin for temporary coverage of excised burn wounds. *J Burn Care Rehabil* 1997; **18**(1 Pt 1): 43-51.
27. Margolis DJ, Lewis VL. A literature assessment of the use of miscellaneous topical agents, growth factors, and skin equivalents for the treatment of pressure ulcers. *Dermatol Surg* 1995; **21**(2): 145-148.
28. Phillips TJ. Biologic skin substitutes. *J Dermatol Surg Oncol* 1993; **19**(8): 794-800.
29. Gentzkow GD, Iwasaki SD, Hershorn KS et al. Use of dermagraft, a cultured human dermis, to treat diabetic foot ulcers. *Diabetes Care* 1996; **19**(4): 350-354.
30. Veves A, Falanga V, Armstrong DG et al. Graftskin, a human skin equivalent, is effective in the management of noninfected neuropathic diabetic foot ulcers: a prospective randomized multicenter clinical trial. *Diabetes Care* 2001; **24**(2): 290-295.
31. Mansbridge J, Liu K, Patch R et al. Three-dimensional fibroblast culture implant for the treatment of diabetic foot ulcers: metabolic activity and therapeutic range. *Tissue Eng* 1998; **4**(4): 403-414.
32. Falanga V, Isaacs C, Paquette D et al. Wounding of bioengineered skin: cellular and molecular aspects after injury. *J Invest Dermatol* 2002; **119**(3): 653-660.
33. Phillips TJ, Manzoor J, Rojas A et al. The longevity of a bilayered skin substitute after application to venous ulcers. *Arch Dermatol* 2002; **138**(8): 1079-1081.
34. Slama J, Davidson JM, Eriksson E. Gene therapy of wounds. In: Falanga V (Ed). *Cutaneous Wound Healing*. London: Martin Dunitz 2001; 123-140.
35. Badiavas EV, Falanga V. Gene therapy. *J Dermatol* 2001; **28**(4): 175-192.
36. Eming SA, Medallie DA, Tompkins RG et al. Genetically modified human keratinocytes overexpressing PDGF-A enhance the performance of a composite skin graft. *Hum Gene Ther* 1998; **9**(4): 529-539.
37. Human gene marker/therapy clinical protocols. *Hum Gene Ther* 1999; **10**(12): 2037-2088.
38. Yao F, Eriksson E. Gene therapy in wound repair and regeneration. *Wound Repair Regen* 2000; **8**(6): 443-451.
39. Isner JM, Baumgartner I, Rauh G et al. Treatment of thromboangiitis obliterans (Buerger's disease) by intramuscular gene transfer of vascular endothelial growth factor: preliminary clinical results. *J Vasc Surg* 1998; **28**(6): 964-973.
40. Quesenberry PJ, Colvin GA, Lambert JF et al. The new stem cell biology. *Trans Am Clin Climatol Assoc* 2002; **113**: 182-206.
41. Badiavas EV, Falanga V. Treatment of chronic wounds with bone marrow-derived cells. *Arch Dermatol* 2003; **139**(4): 510-16.

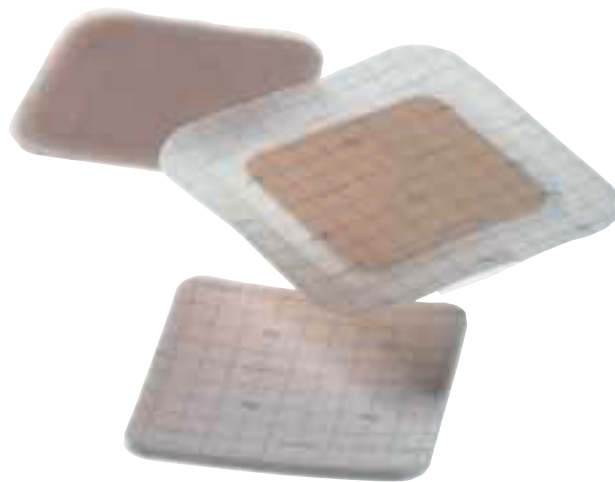
The original related article *Wound Bed Preparation: science applied to practice* by Vincent Falanga was first printed in the EWMA Position Document: *Wound Bed Preparation in Practice*. London: MEP Ltd, 2004, pp. 2-5.

Contreet



Contreet Foam

- ✓ Significantly faster healing progress^{1,2}
- ✓ Up to 60% more cost-effective³
- ✓ Smart,⁶ sustained silver release
- ✓ Clinically proven¹⁻⁵



1. Sibbald R.G. and the **Contreet** Study Group, Wound Bed Preparation properties of a foam dressing and a silver-containing foam dressing. Poster presented at the 2nd WUWHS meeting in Paris, July 2004.

2. Price P. and the **Contreet** Study Group, Health-related quality of life aspects after treatment with a foam dressing and a silver-containing foam dressing in chronic leg ulcers. Poster presented at the 2nd WUWHS meeting in Paris, July 2004.

3. Scanlon, E, Münter, K.C., Hart-Hansen, K. Cost-Effectiveness of a Silver Containing Hydro-Activated Foam Dressing in Germany and the UK. Poster presented at the 2nd WUWHS meeting in Paris, July 2004.

4. Lansdown, A.B.G., Jensen, K., Jensen, M.Q. **Contreet** Foam and **Contreet** Hydrocolloid: An insight into two new silver-containing dressings. Journal of Wound Care 2003. Vol. 12 (6) p. 205-210.

5. Karlsmark, T., et al. Clinical performance of a new silver dressing, **Contreet** Foam, for chronic exuding venous leg ulcers, Journal of Wound Care 2003. Vol. 12 (9) p. 351-354

6. Falanga, v. Topical antimicrobials: Can they affect outcomes? The use of a new dressing. ETRS Conference 2001. www.etrts.org/abstracts 02.06.04.

Watch the pressure – It drops!



Anne Marie Larsen

Coordinating wound nurse, the University Centre for Wound Healing at the Department of Plastic Surgery Z, Odense University Hospital Denmark
anne.marie.larsen@ouh.fyns-amt.dk



Inger Futtrup

Coordinating wound nurse, the University Centre for Wound Healing at the Department of Plastic Surgery Z, Odense University Hospital Denmark
inger.futtrup@ouh.fyns-amt.dk



Figure 1



Figure 2

INTRODUCTION

This study refers to the previous experiences reported in the Danish wound journal SÅR¹, from work presented at Jysk Sårforum discussing sub-bandage pressure measuring devices; the authors have expanded on the work with the described technique at Odense University Hospital.

A literature study primarily provided information about the initial bandage pressure and very little about the pressure over time. However, pressure drops were found to occur in other studies particularly in connection with short stretch bandages².

Previous experience led the authors to believe that pressure in the compression bandages tends to fall over time. The patients often reported that the bandages were quite tight immediately after they were applied, but did not feel so tight several hours later. This is particularly the case for short stretch bandages. The authors also found from experience that a compression bandage must be applied relatively firmly in order to remain in place and not loosen; in the worst cases the bandage would become loose and trail behind the patient. This situation often applies to bandages worn by outpatients when visiting the clinic for a check-up and to the bandages applied by nurses at the clinic. However, the authors had never had the opportunity to measure the pressure under the bandages, and thus had no idea of what pressure value the bandages were exerting initially and after time.

This research assumed that the desired working pressures are 40mm Hg at ankle level and 20mm Hg at calf level.² A literature search primarily found information regarding the initial bandage pressure and little about the pressure over time. However, sub-bandage pressure reduction had been found before in Bispebjerg Department of Dermatology, particularly in connection with short stretch bandages.

The authors were most interested to find out how bandages, applied as normal, worked in practice over time and the question was:

At what initial pressure should a compression bandage be applied on a person with an ABI of ≥ 0.8 with her/his leg resting horizontally in order to maintain the recommended working pressure of 40mm Hg at ankle level and 20mm Hg at calf level for up to 10-12 hours?

A small study was conducted in which the sub-bandage pressure of two types of compression bandages and two types of elastic stockings was measured.

The authors used:

- Two Kikuhime sub-bandage pressure-measuring apparatuses with large pads. These work using a pressure system comprising a balloon, with a layer of polyurethane foam, connected via a thin tube to a measuring unit³ (see Figure 1).

- Two compression bandages, applied following normal practices:
- A short stretch bandage with a Comprilan bandage.
Two bandages, 10cm each, each applied according to the shape of the leg.
- A long stretch bandage with a Dauer bandage K
One bandage, 10cm, applied spirally
- One elastic stocking, Sigvaris 222 Class II (with cotton)
- One elastic stocking, Sigvaris 503 Class II (with natural rubber)
- One elastic stocking, Sigvaris 504 Class III (with natural rubber)

The bandages were applied on the same left leg, by the same person and a new bandage was used for each application.

The elastic stockings had been acquired for the “test leg” according to measurement.

The pressure measuring apparatuses were the same and the two pads were placed in the same place on the leg for each measurement (figure 1).

Three different measurements were taken each time:

- sitting, leg in horizontal position = “application position” and resting pressure (figure 2)
- standing = load pressure
- walking = working pressure

The highest value was noted.

The results were entered in a table as shown in figure 3.

Figure 3

Time Hours	Sitting, leg stretched = resting pressure		Standing = load pressure		Walking = working pressure	
	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg
0						
1						
2 etc.						

Readings were made every hour for the first three hours, then every other hour for the rest of the day if the situation permitted.

Some of the bandages were not removed at night.

The measurements were repeated for three days for each bandage and stocking type.

The pressure reduction was then stated as a percentage reduction compared with the initial pressure, which is 100%; i.e. if the initial pressure (the pressure upon application) was 100mm Hg and the pressure dropped to

85mm Hg, the pressure was recorded as having decreased to 85% of the initial value. It could also be stated that the pressure fell by 15%.

The short stretch bandages lost resting pressure at the ankle, down to 60 → 55% of the initial pressure during the first three hours. During the 11 hours until the bandage was removed, the resting pressure at ankle level reduced to approximately 50% of the initial resting pressure.

The working pressure, measured at ankle level, reduced during walking to 75 → 60% of the initial pressure within the first three hours. After a wearing time of 11 hours, the working pressure reduced to approximately 55% at ankle level.

A short stretch bandage applied with an initial resting pressure of 52mm Hg at ankle level and 27mm Hg at calf level shows an initial working pressure of 69mm Hg at ankle level and 29mm Hg at calf level. After three hours the working pressure fell to 41mm Hg at ankle level and 12mm Hg at calf level (see Table 1).

Subsequent pressure reductions are very modest. In one case the bandage was not removed at night (i.e. it stayed on for 22 hours) and there were no further significant pressure changes. In the daytime, variations with brief increases of pressure and subsequent reductions were seen. We attributed such increases and falls to activity and therefore increased muscular tone.

In addition, in this case there was oedema when the bandage was applied and it must be assumed that the pressure would fall further if oedema was initially present and then reduced.

Table 1

Short stretch bandage						
Time Hours	Sitting, leg stretched = resting pressure		Standing = load pressure		Walking = working pressure	
	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg
0 application	52	27	66	28	69	29
1	42 (80%)	18 (67%)	49	20	51 (74%)	18 (62%)
2	34	15	47	17	47	17
3	29 (56%)	13 (48%)	44	16	41 (59%)	12 (41%)
7	27	11	34	11	38	10
11	26 (50%)	10 (37%)	34	11	37 (54%)	10 (35%)

The parentheses state the percentage of the initial pressure upon application.

The long stretch bandages generally lost resting pressure at ankle level, down to approximately 90 → 85% of the initial pressure during the first three hours. During the 11 hours until the bandage was removed, the resting pressure at ankle level reduced to approximately 70%.

The working pressure measured at ankle level reduced to approximately 90% of the initial pressure within the first three hours. After 11 hours' wearing time, the working pressure reduced to approximately 85% at ankle level. The larger the initial pressure at which the bandage was applied, the greater the percentage of pressure lost.

A long stretch bandage applied with an initial resting pressure of 42mm Hg at ankle level and 23mm Hg at calf level showed an initial working pressure of 47mm Hg at ankle level and 24mm Hg at calf level. After three hours the working pressure fell to 42mm Hg at ankle level and 21mm Hg at calf level (see Table 2).

Again, there was no oedema to affect pressure levels. However, the bandage did not appear to lose any appreciable resting pressure after approximately five hours and in the one case where the bandage was not removed at night (i.e. stayed on for 24 hours), the pressure was more or less maintained.

Table 2

Long stretch bandage						
Time	Sitting, leg stretched = resting pressure		Standing = load pressure		Walking = working pressure	
Hours	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg
0 application	42	23	45	25	47	24
1	35 (83%)	22 (96%)	42	25	45 (95%)	23 (96%)
2	37	21	42	23	45	22
3	36 (86%)	21 (91%)	40	23	42 (89%)	21 (88%)
7	33	20	41	22	40	21
11	30 (71%)	20 (87%)	39	21	40 (85%)	21 (88%)

The elastic stocking with natural rubber both Class II and III were very stable in terms of pressure.

Elastic stocking, Sigvaris 503 Class II: The resting pressure reduced to approximately 80% of the initial pressure at the ankle level and approximately 88% at the calf level during the first five hours. Further loss of pressure, measured after 11 hours wearing time was moderate.

Working pressure is very stable. After five hours, pressure reduced to approximately 90% at the ankle level, and to approximately 95% at the calf level of the initial pressure. (See table 3)

Elastic stocking, Sigvaris 504 Class III: The resting pressure reduced to 85% of the initial pressure at ankle level and 90% at calf level over the first five hours. Subsequent pressure drops after 11 hours were rather modest.

The working pressure was very stable. At ankle level there was a drop to approximately 95% of the initial pressure after five hours, while the pressure at calf level was maintained (see Table 3).

Table 3

The elastic stocking, Sigvaris 503 Class ii						
Time	Sitting, leg stretched = resting pressure		Standing = load pressure		Walking = working pressure	
Hours	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg
0 putting on	32	17	28	17	32	17
1	29 (91%)	17 (100%)	28	17	29 (91%)	16 (94%)
2	26	17	28	16	29	16
3	26 (81%)	15 (88%)	26	16	29 (91%)	16 (94%)
7	26	15	26	15	29	16
11	24 (75%)	13 (76%)	25	14	28 (88%)	16 (94%)

Table 4

The elastic stocking, Sigvaris 504 Class III						
Time	Sitting, leg stretched = resting pressure		Standing = load pressure		Walking = working pressure	
Hours	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg
0 putting on	38	28	37	29	41	27
1	34 (90%)	29 (104%)	36	27	39 (95%)	28 (104%)
2	33	25	37	28	40	28
3	32 (84%)	25 (89%)	36	28	38 (93%)	27 (100%)
7	32	24	35	28	37	27
11	32 (84%)	24 (86%)	35	27	37 (90%)	27 (100%)

The elastic stocking with cotton lost a little more pressure over time than the stocking with natural rubber. After six hours the resting pressure reduced to approximately 90% of the initial pressure at ankle level. After a wearing time of 11 hours, the pressure fell to approximately 80%.

The working pressure reduced to approximately 95% of the initial pressure at ankle level over six hours, and after 11 hours' wearing time it fell to approximately 85% (see Table 5).

Table 5

The elastic stocking, Sigvaris 222 Class ii						
Time	Sitting, leg stretched = resting pressure		Standing = load pressure		Walking = working pressure	
Hours	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg	Ankle mm Hg	Calf mm Hg
0 putting on	27	16	29	17	30	17
1	26 (96%)	16 (100%)	29	17	30 (100%)	17 (100%)
2	25	15	28	17	29	17
3	24 (89%)	13 (81%)	28	16	28 (93%)	16 (94%)
7	23	13	28	15	27	16
11	22 (82%)	12 (75%)	27	15	26 (87%)	16 (94%)

DISCUSSION

Short stretch bandages

In general, it is difficult to say how the short stretch bandages "behave" because that depends on how the bandage is applied and how many layers are used, and the fact that the bandage is applied according to the shape of the leg and not according to a particular model.

What was interesting was to identify the perfect initial resting pressure at ankle level when applying the bandage that would ensure an optimum working pressure at ankle level during the greatest part of the wearing time.

The measurements showed that the working pressure at ankle level after 7-8 hours dropped to approximately 75% of the initial resting pressure. If it is desirable for the bandage to exert a working pressure of approximately 40mm Hg at ankle level and approximately 20mm Hg at calf level most of the wearing time, then it means that the bandage should be applied with a resting pressure of 50-50mm Hg at ankle level and approximately 30-35mm Hg at calf level (see Table 1).

This means that a short stretch bandage should be applied with an initial resting pressure at ankle level corresponding to 40mm Hg + approximately 25%. The bandage will attain (drop to) the right pressure after approximately three hours and will subsequently, according to the measurements taken, remain fairly stable in terms of pressure on a non-oedematous leg.

The pressure must be assumed to drop somewhat further if any oedema is reduced and therefore it will be necessary to apply the bandages with a higher initial pressure and/or more frequent reapplications than is presently the practice. Currently the bandages typically stay on for two to three days depending on any need for changing wound dressings.

The consequence of applying the bandage with a higher pressure is unknown and needs to be carefully evaluated. One should, in any case, make sure that the patient has an adequately high arterial pressure verified by means of a Doppler ultrasound.

According to LaPlaces Law⁴, the factors to be considered when applying a bandage are:

$$P = \frac{T \times N}{C \times W}$$

P = sub-bandage pressure in mm Hg

T = bandage tension in Kg

N = number of bandage layers

C = leg circumference in cm

W = bandage width in cm

The tension of the bandage may be the same upon application, as the above factors will ensure a graduation of the pressure up the leg.

Our small study has enabled the authors to pinpoint the following important elements in connection with compression treatment using a short stretch bandage:

- Frequent reapplication of the bandage must be recommended; minimum once a day as long as oedema is present.
- In order for the bandage to remain effective during the entire wearing time, the bandage must be applied in a way that allows for the pressure reduction that was found to take place.

Long stretch bandages

Again, the authors wanted to identify the perfect initial resting pressure at ankle level when the bandage was applied that would ensure the recommended working pressure of approximately 40mm Hg at ankle level during the entire wearing time.

The measurements showed that the long stretch bandage is very stable in terms of pressure. The working pressure at ankle level after 7-8 hours only dropped to approximately 95% of the initial resting pressure.

Provided that it is desired for the bandage to exert a working pressure of approximately 40mm Hg at ankle level and approximately 20mm Hg at calf level, the band-

age should consequently be applied with a resting pressure of 42-45mm Hg at ankle level and approximately 22mm Hg at calf level (see Table 2). This means that a long stretch bandage should be applied with an initial resting pressure at ankle level corresponding to 40mm Hg + approximately 5-10%. The working pressure will stabilise at the desired pressure level after approximately three hours. Subsequently the bandage was found to be stable in terms of pressure over a period of 12 hours – and after 22 hours.

Again, oedema should be taken into consideration in the same way as described under short stretch bandages.

According to LaPlace's Law, the tension of the bandage upon application must again be the same, as the increasing circumference of the leg will automatically graduate the pressure of the bandage up the leg, if the application method used by the authors is followed (spiral with approximately 50% overlap all the way up the leg).

Elastic stockings

– *with natural rubber*: The pressure also reduces under both the class II and class III stockings with natural rubber. After five hours, the working pressure is approximately 85% of the initial value. The elastic stockings proved to be exceptionally stable in terms of pressure and after 11 hours' wearing time, a working pressure of 90%/ 91% of the initial value is still maintained.

These types of stockings must be said to be pressure efficient provided that it is adjusted to a non-oedematous leg.

– *with cotton*: From the start, this stocking exerts a smaller pressure than the stockings with natural rubber (Sigvaris 503) even though the classification of the two stockings is the same. However, its reduction in pressure over time is not significantly larger than for the stockings with natural rubber.

Over 11 hours' wearing time, the working pressure reduces to approximately 85% at ankle level.

WHICH TYPE OF BANDAGE DO WE RECOMMEND TO WHOM AND WHY?

Do clinicians choose bandage type based on the change frequency and economy? Is this the basis on which to make a decision?

Measurements have indicated that the long stretch bandages, on the basis of their ability to maintain a uniform pressure over time, are the most effective. However, in practice, using them in co-operation with the home care

service may be rather difficult considering the alternatives available. Long stretch bandages should preferably be applied in the morning before the patient rises. Often the patient will then remove the bandage him/herself at bedtime but sometimes the bandage is removed several hours before the patient goes to bed because the carer (often the home care service) is visiting the patient at that time.

In practice, therefore, short stretch bandages are often used, usually based on the argument that they can stay on for several days, depending on whether there is any need to change the dressing of a wound. When compared with long stretch bandages and the limitations of availability of assistance, this provides a good argument in favour of the use of short stretch bandages if the patient has no oedema and the bandage is applied in such a way that it allows for a pressure reduction.

Using elastic stockings often requires assistance from the home care service, due to the difficulties of application and removal, they are rather tight and many users are too weak or have physical disabilities that make it difficult for them to handle this task themselves. For some this situation may be alleviated by using an Easy Slide; a special aid for putting on elastic stockings.

Elastic stockings are classified, but there are no standardised requirements for pressure in mm Hg within the various classes, also, the stockings are made from different materials but the classification does not take the properties of the different materials into consideration. Elastic stockings are more generally used when the ulcer is healed, or nearly healed, and there is little or no oedema in the leg.


In order to optimise the compression treatment, it is expedient to try to involve and instruct the patients so that they share the responsibility for their own treatment. In the same way, the staff should be given further training in the understanding and handling of the tasks. ■

References

- 1 Rolf Jernes. Conference report: *Erfaringer med KIKUHIME subbandage trykmåler*. (Experiences with the KIKUHIME subbandage pressure monitor) SÅR no. 2, 2002, p 104. Published by the Danish Wound Healing Society. ISSN 0907-9513
- 2 Haid, H., Hinger, KJ., *Messungen des andruckes von Verbaenden und Gummi-strümpfen*. In: Hrsg. Von R. May. *Messmethoden in der Venenchirurgie*. Bern: Huber, 1971.
- 3 Takahashi M. Poster presented at WCET conference, Florence 8-11 July 2002.
- 4 Danielsen L. *Sår relateret til karforandringer – venøse sår*. (wounds related to vascular changes – venous ulcers.) Ed. Gottrup F. and Olsen L. Publ. in SÅR: Baggrund, diagnose og behandling. (Wounds: Background, diagnosis and treatment) Munksgaard 1. udgave, 3. oplag 1999. ISBN:87-16-11645-3
- 5 Lis Danielsen, *Sub-bandage Pressure Measurements Comparing a long stretch with a short-stretch Compression Bandage*. Acta Derm. Venerol. (stockh) 1998; 78: 201-204.
- 6 SÅR årgang 11. No. 2. 2003.

KIKUHIME

Subbandage Pressure Measuring Device



The diagram shows the KIKUHIME device, a small blue rectangular unit with a digital display showing '002'. It is connected by a yellow tube to a yellow circular pressure-sensing pad. A blue carrying case is also shown. A syringe and valve are used for calibration. The device is described as having a handy size (9x6x2 cm), extended battery life (approx. 5 years), and being a low-priced device. It includes a power button with a hold function and an attachment clip with a drop-preventing strap.

- POWER button. HOLD function displays steady measurement value.
- Syringe and valve for calibration.
- Handy size, 9×6×2 cm. Fits easily into the breast pocket. Light-weight, only 90 g.
- Extended battery life. (Approx. 5 years for measurements of 20 times/day).
- Attachment clip with drop-preventing strap.
- A low priced device.

This device has been produced with the advice of scholars at Graduate School of Hokkaido University, Biomedical Systems Engineering, System- and information Engineering.



The **KIKUHIME** subbandage pressure measuring device enables the nurse to ensure that a compression bandage with the correct subbandage pressure measured in mmHg is applied.

The pressure-sensing pad is placed inside the double sliding cloth at ankle level. Then the compression bandage is applied in the usual way. Now the subbandage pressure at ankle level will be displayed on the display screen. Once the pressure has been read, the pressure-sensing pad can be removed easily and without disturbing the bandage by pulling the outer part of the double sliding cloth. A reading of the pressure right below the knee may also be made in order to ensure graduated compression.

See the demonstration
video at our website
www.TTMediTrade.dk

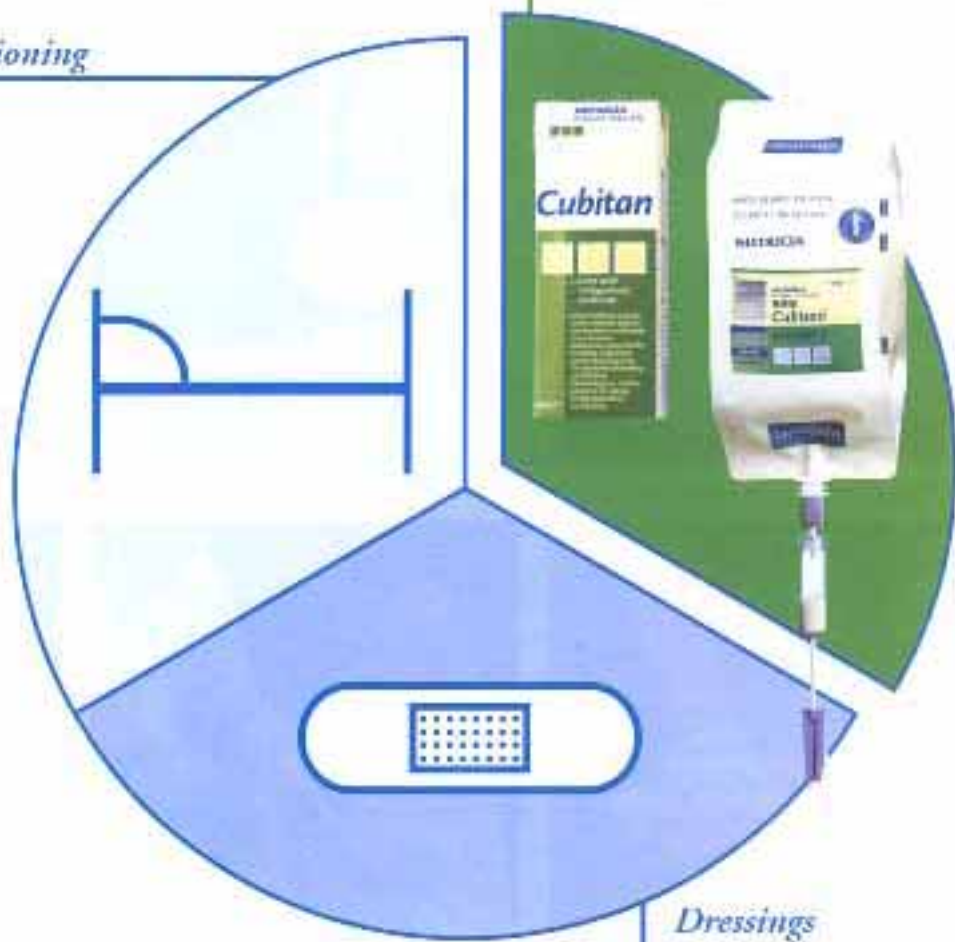
TT MediTrade

Successful wound healing requires a multi-disciplinary approach

Nutritional intervention¹⁻¹⁷

- Improves nutritional status
- Helps regulate the inflammatory process
- Aids tissue regeneration
- Improves wound healing
- Helps support immune function

Positioning



Cubitan[®] and **Cubison[®]** are specially formulated to meet optimal nutritional requirements to aid successful wound healing.

1) Messing RO, Deodhar 1997, 2) Linsen 83 et al, J Am Geriatr Assoc. 1999, 3) Thomas R, Manual of dietary practice, Blackwell 2001, 4) Breslow RA et al, J Am Geriatr Soc. 1993, 5) Uhler R, Ostomy Wound Manage 1992, 6) Wallace L, B, J of Nursing 1994, 7) Borish A et al, Surgery 1990, 8) Kyk S et al, Surgery 1993, 9) Wu C et al, Current opinion in Clin Nutr Met Care 2000, 10) Kleyer HA et al, New Horizons 1992, 11) Dorr JM et al, Clin Nutr Med 1990, 12) Benati L et al, Arch. General. Circul. 2001, 13) Malone AM, Nutr Clin Practice 2000, 14) Andrews M et al, Adv Wound Care 1999, 15) Rojas A et al, Dermat Surgery 1999, 16) Nocklet SC et al, J Am Acad Dermatol 1993, 17) Howesgrill et al, J of Wound Care 2000.

If you need more information please contact us at woundcare@nutricia.com

NUTRICIA

www.nutricia.com

Cost Effectiveness of Dressing Materials

INTRODUCTION

The term 'Cost effectiveness' has become part of health services' language to justify the use of particular products and health care systems. Despite its frequent use there is often little objective evidence of true 'cost effectiveness' of different products and procedures in wound management. In this article I will describe studies which have evaluated cost effectiveness using different dressing.

METHOD

The review of articles of cost effectiveness was undertaken following a literature search. For this article the medical databases of Medline and Embase were combined with the nursing database Cinahl. Searching was undertaken using the terms "cost effectiveness" and "cost utility" and combined with the terms "leg ulcer" and "venous ulcer". Articles were included provided they gave comparative evidence of both outcomes and costs of treatment in at least two groups. Individual case studies, non comparative series and descriptions of disease burden without outcome measures were not included. These leg ulcer/ venous ulcer papers were then evaluated for cost effectiveness studies of dressing materials.

RESULTS

In total, eight studies were identified which fitted this criterion. Of these, four were from the UK, and one each from the US, France, Sweden and Canada. Four presented data from original randomised controlled trials (RCTs), with the remainder pooling information from previously published literature to develop cost models.

The first identified study was published in Sweden (Ohlsson et al 1994), and was a randomised trial to compare the cost effectiveness of a hydrocolloid (DuoDerm) with saline gauze (SG) soaks. A total of thirty patients with venous or mixed arterial/venous ulcers were randomised, with the nurse in charge of the patient recording all treatments given over a six week period. All patients

were treated using Comprilan short stretch compression bandaging. Dressing changes occurred twice daily in patients randomised to SG and weekly (more frequently if clinically indicated) in the HCD group. Nine patients healed over the study (seven on HCD, two on SG). The mean cost of dressings, cleansers and bandages was 608 Swedish Krone (SEK) on SG compared with 653 SEK with HCD. However, cost of nursing time and travel more than cancelled this difference out. Mean costs of this were 3518 SEK with SG and 912 SEK with HCD. The mean direct cost of care was therefore 4125 SEK with SG compared with 1565 SEK with HCD. It is worthy of note that the trial protocol dictated the frequency of dressing changes, and such may have influenced the final cost effectiveness analysis. However, this study did indicate that whilst the cost of the dressing could be cheaper using saline gauze the total cost of care may be substantially higher using this product due to the increased frequency of dressing changes required. Later studies using published clinical data have since found similar results. Harding et al (2001) used published literature to compare the cost effectiveness of saline gauze with Granuflex (UK name for DuoDerm), and tissue engineered skin-TES (Apligraf) over a twelve week follow up. They identified 12 studies involving 843 ulcers, of which 205 were treated with SG, 509 with HCD and 278 with TES. A multinational panel of four wound care was used to supplement the clinical information where areas of doubt existed. Cost effectiveness was evaluated as the total cost of care of the cohort divided by the number of healed ulcers to give a cost per healed ulcer of £342 for HCD, £541 for SG and £6741 for TES. Few details were given in the paper about how these costs were calculated and the precise composition of these costs. The results of this study were also adapted to give a French perspective on the relative costs effectiveness of these three treatment regimens (Meaume & Gemmen 2002). The expert panel in this study consisted of five French wound care experts. While the system of care is different between the UK and France



Prof. Peter J. Franks

Co-director of the Centre for Research & Implementation of Clinical Practice, Thames Valley University, UK. EWMA president elect

Correspondence to:
Prof. Peter J Franks
Thames Valley University
Centre For Research
and Implementation of
Clinical Practice
Faculty of Health &
Human Sciences
32-38 Uxbridge Road
GB-W5 2B London
United Kingdom
Tel: +44 20 8280 5020
Fax: +44 20 8280 5285
peter.franks@tvu.ac.uk

the pattern of cost effectiveness was consistent, with HCD being most cost effective at £2763 per healed ulcer, £1436 with SG and £11,396 with TES.

A similar study was undertaken in the US by Kerstein et al (2001). They undertook a broader literature review which included the Cinahl database to evaluate the cost effectiveness of SG, HCD and TES in patients with venous ulceration from a US perspective. They identified 18 studies which fitted their search criteria and identified 223 patients on SG, 530 on HCD and 130 on TES. This paper used a similar methodology to that adopted by Harding et al (2000), but gave more details of how the model was developed and analysed. The average cost of dressings was lowest with SG (\$112), followed by HCD (\$223) and then TES (\$6130) over 12 weeks. However, the difference in SG and HCD was reversed when considering nursing costs (\$559 versus \$227). The cost per healed patient was estimated at \$2939 for SG, \$1873 for HCD and \$15,053 for TES.

Other studies have concentrated similar efforts in evaluating the relative cost effectiveness of other dressing types. Bale et al (1998) evaluated a relative performance of a hydrocellular dressing –HCE (Allevyn) with a HCD (Granuflex) in a trial of 100 patients (32 pressure ulcers, 30 leg ulcers, 34 others) over eight weeks. Dressing changes were made according to need, particularly leakage, imminent leakage or other clinical reason such as wound pain. There was no indication in this trial of the protocol adopted for compression therapy in the two groups though Tensopress compression bandage was clearly used in some instances. Cost analysis was undertaken for dressing and other material costs only. The total material costs of treatment were £1290 in the 16 leg ulcer patients randomised to HCE compared with £932 in the 14 patients randomised to HCD, with 2/16 (12.5%) healing on HCE and 1/14 (7.1%) healing on HCD. In this limited analysis the mean dressing costs were higher in the HCE group (£81 versus £67), but a cost effectiveness analysis (per healed ulcer) would favour HCE due to its greater effectiveness (£645 versus £932). Clearly a more detailed analysis would be required to investigate the wear time, nursing and medical costs associated with these two dressing types. Whilst the results from this trial must be treated with caution because of the limited data collected, this study does have a major advantage in that patients underwent dressing changes according to need, not according to the trial protocol. As such this may better reflect the real clinical situation than other studies of this type.

Armstrong and Ruckley (1997) compared the clinical and cost effectiveness of a hydrofibre dressing –HFD (Aquacel) with and alginate-AGD (Kaltostat) in a randomised controlled trial. Forty four patients with moderately or heavily exuding leg ulcers were randomised to one of the two dressings in combination with a secondary dressing (DuoDerm Extra Thin), orthopaedic padding and a class 3c compression bandage (Tensopress). Changes of dressing were dictated by clinical need (leakage or pain) to a maximum of seven days for up to six weeks. The wound types included in this trial were venous (36), mixed arterial/venous (6) and two others. In this trial direct costs of care were evaluated which included costs of dressing materials and nurse time. Over the six weeks 6/21 (29%) healed on HFD compared with 2/23 (9%) on AGD. There were similar total costs of treatment at £1424 and £1375 in the two groups. The cost per healed ulcer as given by the data in the paper was £237 for HFD compared with £688 with AGD. Here the overall costs of care were similar, but with greater effectiveness the HFD was shown to be more cost effective.

A similar study was undertaken by Harding et al (2001) using the same HFD, but a different HCD (Sorbsan replacing Kaltostat). This was an open RCT undertaken in four centres in the UK. A total of 131 patients (103 venous, 15 mixed, 11 arterial and two diabetic) were randomised to one of the two dressings. An absorbent pad was used as a secondary dressing, with orthopaedic wool and class 3c compression bandage used in those in whom it was clinically indicated, for up to twelve weeks. Again dressing changes were undertaken according to clinical need to a maximum of seven days. Costs were calculated according to information collected on materials used at dressing change, with a notional cost of £15 added for the cost of nursing time per visit. After 12 weeks 17 patients had healed in both groups. Cost effectiveness was determined in three ways, as the cost per healed ulcer, the cost per 1 cm² reduction in ulcer area and the cost per 10% reduction in area. While the cost per healed ulcer was similar between groups (£1184 in HFD versus £1201 with AGD), there was greater cost effectiveness when examining cost per 1 cm² reduction (£59 versus £92) and per 10% reduction in area (£80 versus £105). The authors stated in their conclusions that this showed that the HFD was more cost effective than AGD. While reductions in area may have clinical importance, this is unlikely to have a major impact in cost effectiveness studies since the patient still has an ulcer and therefore still requires a similar level of care. The difference in healing rate (i.e. reductions in area) might be ►



The innovative treatment concept for chronic stagnating wounds

The treatment of chronic stagnating wounds requires an innovative treatment concept:

The **combined** application of Suprasorb® G Amorphous Gel, Suprasorb® C Collagen Dressing and Suprasorb® P PU Foam Dressing presents an effective concept for managing necroses, exudate and wound environment.

One treatment concept – triple action

Within two weeks of the combined treatment with Suprasorb® products, the wound begins to come out of the stagnation phase and enters the healing process again.

Suprasorb® G: cleans and moistens the wound

Suprasorb® C: binds pro-inflammatory proteases and radicals

Suprasorb® P: absorbs excess exudate and allows undisturbed wound healing

explained by different median areas between the groups, but these data were not presented in the paper.

Finally, two papers have evaluated the potential cost-effectiveness of the use of tissue engineered skin –TES (Apligraf) in the management of patients with venous ulceration. The first of these used data derived from the randomised controlled trial of Apligraf to develop a semi-Markov model of care (Schonfeld et al 2000). Clinical trial data were supplemented with a information provided by a panel of physicians. The patients for the trial had an ulcer present for a minimum of one month and had failed to respond to standard treatments. Direct costs were estimated from the cost of products, physician visits, in-patient stays, home visits, over a one year period. Overall healing rates were 48.1% with TES compared with 25.2% after one year, with mean ulcer free period of 4.6 months with TES and 1.75 months without. The total annual cost of care was \$20,041 with TES compared with \$27,493 without.

While the results do show a cost advantage in using TES there was little information in the paper about how many applications were assumed to be used in the model. Sibbald et al (2001) explored the use of TES as an adjunct to high compression therapy using a similar decision model approach. They used information derived from the literature supplemented with expert opinion. In addition to the direct costs of care this study also attempted to evaluate the indirect costs of care through the impact of the ulceration and its treatment time lost from work. Costs were assessed using two models one at three months and one for a six month follow up. The results showed that the mean cost of care was higher for patients treated with TES at \$1,758 compared with \$1,454 using high compression alone. However, the mean number of ulcer days per patient was considered to be lower with Apligraf at 45 days compared with 67, giving an average number of ulcer days averted at 22. The cost per ulcer day averted was estimated at \$14. In this analysis \$14 is the cost per day of having a healed ulcer. With the six month model this cost per day healed was greater at less than \$5 per day. While this was an interesting take on the method of cost effectiveness analysis, a number of caveats must be considered. The cost models are highly dependent on the assumptions made about costs and outcomes. In this model, with no clinical evidence of the use of Apligraf under four layer compression, the panel decided on their best guess estimate of healing based on the only RCT available. They decided that 4LB alone would provide a 60% healing rate compared with 67.5%

when combined with TES. Related to this, the mean days to heal was lower at 26.1 with Apligraf compared with 56 with 4LB alone. A further assumption was that one piece of Apligraf was required per patient at a cost of \$950. While this may be the case in most situations, any smaller difference in healing or additional use of Apligraf would have a huge impact on the relative cost of providing care within this group.

DISCUSSION

This review has evaluated the relative cost effectiveness of dressing materials in the management of patients with chronic venous leg ulceration. While there is a general paucity of information on this subject, those articles that have been published have demonstrated overwhelmingly that modern wound dressings, particularly hydrocolloid dressings are more cost effective when compared with saline gauze. Thus, although the dressing material may be more expensive, when evaluated with nursing costs, the modern wound dressings offer considerably greater clinical and cost effectiveness. The evidence on the relative performance of other modern wound dressings is less clear. Studies to evaluate these products, either as adjuncts to clinical trials, or through economic modelling will help in our understanding of which dressings provide the best value for money in different systems of care. ■

References

- Armstrong SH, Ruckley CV. 1997. Use of a fibrous dressing in exuding leg ulcers. *J Wound care* 6(7): 322-324.
- Bale S, Hagelstein S, Banks V, Harding KG. 1998. Costs of dressings in the community. *J Wound Care* 7(7) 327-330.
- Harding K, Cutting K, Price P. 2000. The cost effectiveness of wound management protocols. *Br J Nursing (Suppl.)* 9 (19) S6-S24.
- Harding KG, Price P, Robinson B, Thomas S, Hofman D. 2001. Cost and dressing evaluation of hydrofiber and alginate dressings in the management of community based patients with chronic leg ulceration. *Wounds* 13(6): 229-236.
- Kerstein MD, Gemmen E, van Rijswijk L et al. 2001. Cost and cost effectiveness of venous and pressure ulcer protocols of care. *Dis. Manage. Health Outcomes* 9 (11): 651-663.
- Meaume S, Gemmen E. 2002. Cost-effectiveness of wound management in France: pressure ulcers and venous leg ulcers. *J Wound Care* 11(6): 219-224.
- Ohlsson P, Larsson K, Lindholm C, Moller M. 1994. A cost-effectiveness study of leg ulcer treatment in primary care. Comparison of saline-gauze and hydrocolloid treatment in a prospective, randomised study. *Scand. J. Health Care* 12 (4): 295-299.
- Schonfeld WH, Villa KF, fastenau JM Mazonson PD, Falanga V. 2000. An economic assessment of Apligraf (Graftskin) for the treatment of hard-to-heal venous leg ulcers. *Wound Repair Regen.* 8: 251-257
- Sibbald RG, Torrance GW, Walker V, Attard C, MacNeil P. 2001. Cost-effectiveness of Apligraf in the treatment of venous leg ulcers. *Ostomy / Wound Manage.* 47(8): 36-46.



Do you really have time to perform surgery on heel dressings?



3M™ Foam Adhesive Heel Dressing

New fast one-handed application

- No cutting, no shaping
- Saves you time and materials
- Exceptional Patient Comfort
- Designed for long wear time
- Also available in many other shapes and sizes



3M is a trademark of the 3M company. © 3M Health Care 2004

3M Health Care

For more information or to obtain samples, please contact your local 3M office or return this coupon to:

3M Deutschland GmbH, Health Care Europe, Hammfeldamm 11,
41453 Neuss, Germany, Fax: +49 (0)2131 144397,
email: healthcareEurope@mmn.com

Name: _____

Address: _____

Country: _____

Tel: _____



TELFA™ AMD™

Non-adherent dressing



- Preventative protection against nosocomial wound infections.
- AMD provides broad spectrum effectiveness whilst being gentle to healthy cells.
- Helps to provide a Low Cost Solution to Infection Control.

TELFA AMD is
the first product to be launched
within the AMD range-
more will follow!



Wound healing: Historical Aspects



Fig. 1.
A cave drawing in Spain dating back some 20-30,000 years. This is one of the first recordings of wounds from the Stone Age.



Fig. 2.
a human sternum that is pierced by an arrowhead

The earliest recording of a 'wound healing man' is in a cave drawing in Spain dating back some 20-30,000 years (Figure 1). This is one of the first recordings of wounds from the Stone Age. There is also fossilized evidence of wounds from the same period and a human sternum that is pierced by an arrowhead (Figure 2). From the earliest recorded history it is clear that the Assyrians knew about healing, not just from an observational point of view but also in

terms of practical management. From them we have a description of surgical management: Figure 3 shows the cuneiform script for surgeon, which includes a hand. This represents the first concept of 'barber-surgeons': using hands and undertaking surgical operations. The barber's pole is of course related to surgery: white for the bandages and red for the blood.

The Egyptians also had experience in wound healing and several treatises on healing have been recorded. Figure 4 shows part of The Edwin Smith Surgical Papyrus in which the 'awy' and the 'ydr' are mentioned: the 'awy' being a type of suture, a piece of thread, maybe on a thorn; and the 'ydr' a type of steristrip, where strips of linen were laid across a wound to hold it together. The tools obviously worked in practice, and it is clear that the Egyptians understood the concept of primary wound healing.

The Egyptians also used antiseptics. They used the copper pigment malachite as both an eye adornment and an antiseptic. The Egyptians also knew of the value of sugar and honey. A mould can

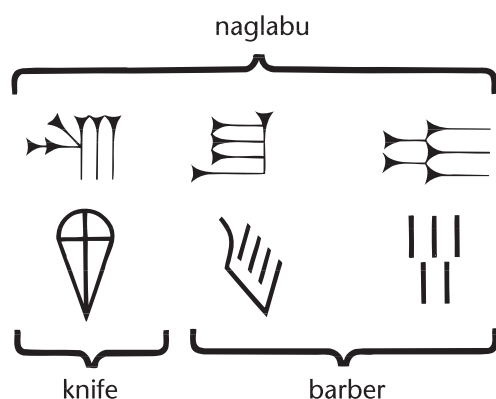


Fig. 3: Assyrian cuneiform script for 'surgeon'. Note the hand symbol.



Prof. Finn Gottrup
MD, DMSci

Professor of Surgery at the University of Southern Denmark. Specialist in General Surgery and Surgical Gastroenterology. Denmark
finn.gottrup@ouh.fyns-amt.dk



Prof. David Leaper

Wound Healing Research Unit University of Wales College of Medicine Cardiff Wales
profdavidleaper@doctors.org.uk



Fig. 4. Egyptian text which contains the hieroglyphs for 'awy' (thread) and 'ydr' (strip) from the Edwin Smith papyrus.

grow on sugar but no organism grows in a concentrated solution. A honey or sugary salve can improve healing and reduce surface contamination, possibly as a topical nutrient, possibly just because it is hyperosmolar. Antiseptics used in open wounds are probably not always necessary and some antiseptics are actually quite toxic.

Soon after the Egyptians came the Indian knowledge professed by Sushruta Samhita. This document contains methods of skin suture and the details of techniques to incise an abscess. For practice, a bag of warm butter was used to simulate the feel of the knife going in and the pus coming out.

The Sushruta scripts also include a description of how insects have been applied in the healing of wounds. The earliest type of clip was based on the mandibles of certain ants. It describes how wounds in connection with the bowels caused so much juice that they were difficult to close. The mandibles from a certain 'soldier ant' were used to

close these types of wounds. This technique is also found in Asia, Africa and South America. The mandibles from the *Eciton burchell* are particularly large (Figure 5). Its mandibles would close on the wound and the body would then be pinched off (Figure 6). Contemporary clips work according to the same principles but the 'ant-method' is still practised by some South American tribes.

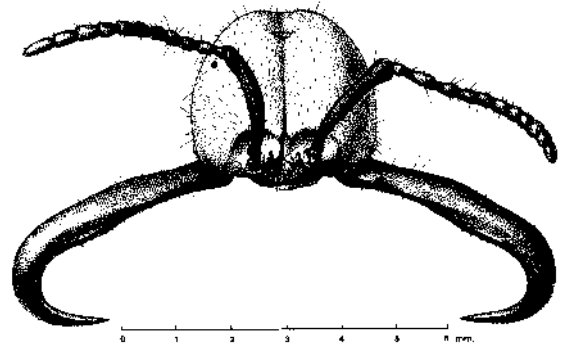


Fig. 5. The mandibles from the *Eciton burchell* are particularly large.



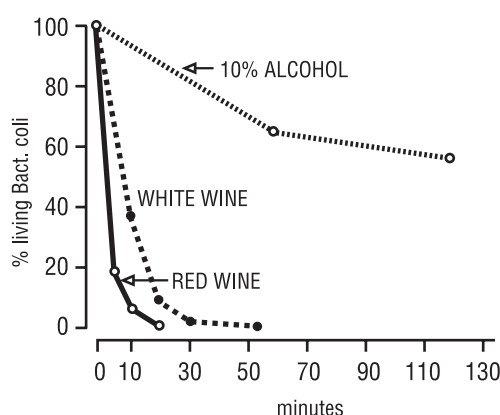
Fig. 6. The mandibles would close on the wound and the body would then be pinched off.



Fig. 7. Listening to the 'vayu'. It was believed that if you listened to a venous ulcer and the winds were blowing the right way, it might heal.

We also know of a Hindu practice which involved listening to the winds of the body, the 'vayu'. It was believed that if you listened to a venous ulcer and the winds were blowing the right way, it might heal (Figure 7).

The father of medicine, Hippocrates, who lived nearly 2500 years ago, wrote several accounts on wound healing and was aware of the importance of infection in relation to wound healing. He understood the concepts of primary and secondary wound healing, using antiseptics such as wine. Figure 8 shows the purpose of using wine for a different reason other than as a stimulant. In only a few hours, wine can eliminate certain types of bacteria such as cholera vibrios, *E. typhi*, *S. Aureus* and, as shown, in the figure *E.*



coli. The effect has been much disputed but cannot be due only to the alcohol in the wine. When taking the same concentration of alcohol the effect has been shown to be limited. Hippocrates pointed to the significant role of compression in the treatment of patients with leg ulcers, but even today this knowledge is not widely accepted.

For centuries only limited information existed on wound healing. During the 15th century the anatomy was described in greater detail by the surgeon Andreas Vesalius. As a result surgical expertise became more acknowledged, although it was still carried out by barber surgeons. In England the Company of Barber Surgeons was constituted which laid the grounds for a surgical specialty. As the well-known wound-man shows, wound healing around this time was primarily associated with barber surgeons and acute traumatic wounds (Figure 9).

From the early history of wound healing it is apparent that Celsus in *De Medicina*, recognized the cardinal signs of inflammation. John Hunter, considered one of the fathers of surgery, recognized that we would not be able to operate without inflammation. Actually it was thought that the pus had to be present in order for the wound to heal. ►

Fig. 8. The purpose of using wine for a different reason other than as a stimulant.

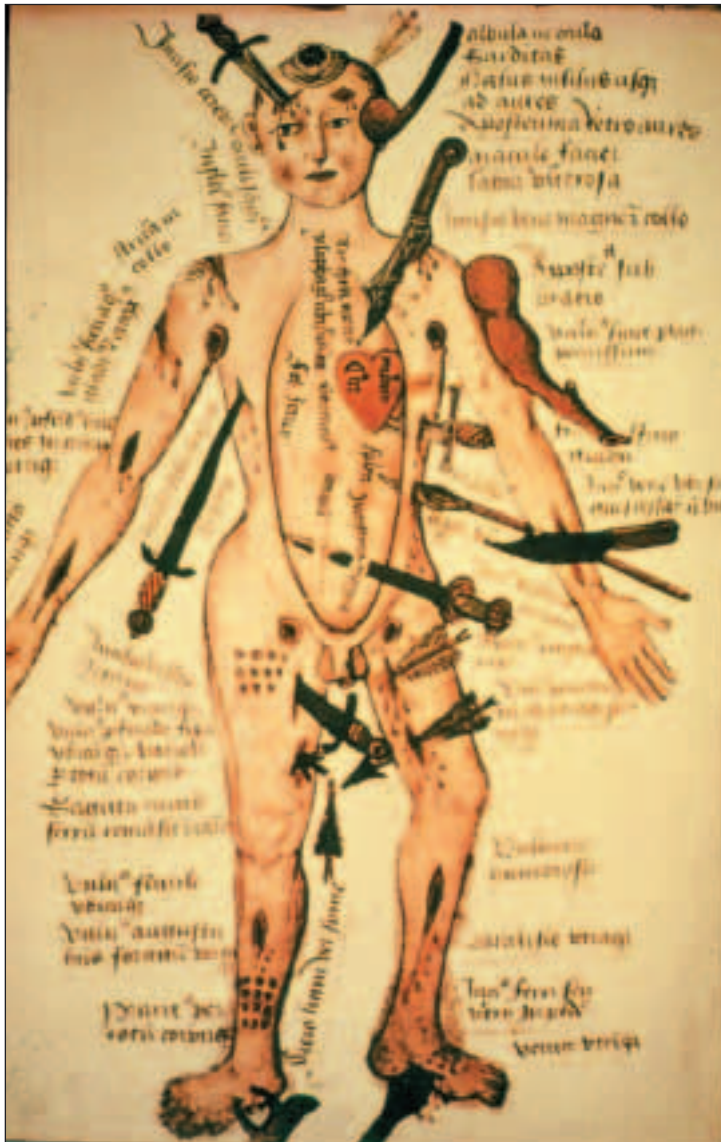


Fig. 9. In the 15th century wound healing was primarily associated with barber surgeons and acute traumatic wounds.

One of the largest advances we owe to Ignaz Semmelweis, a Hungarian obstetrician who lived in Vienna. The obstetrician discovered that if you went from the post-mortem room to the delivery room, but washed your hands in between using chloride of lime, the maternal mortality was reduced. He did not know what the washed-off particles consisted of, only that they had a significant and appalling smell. By introducing obligatory hand washing the mortality rate fell from over 10% to 1% in two years. Sadly Semmelweis published his work too late and it did not receive the attention it deserved.

Lord Lister introduced antiseptics containing carbolic acid and realized that by using antiseptics compound fractures could heal and amputation be avoided. The idea of cleansing wounds was further developed by Alexander Fleming who was one of a group of scientists who discovered that penicillin could treat infections. The first patient treated



Fig. 10. The first patient treated with penicillin was police constable Alexander, who had already lost one eye with staphylococcal cellulitis.

with penicillin was police constable Alexander, who had already lost one eye with staphylococcal cellulitis (Figure 10). He responded to the treatment, but although the penicillin was recovered from his urine the supply ran out and Alexander died. The year was 1940.

Certain antiseptics can cause a negative effect on new as well as old tissue, and today antiseptics are rarely used in the treatment of open wounds. Alexander Fleming suggested in 1920 that the value of the antiseptic (antimicrobial) effect of antiseptics should be weighed against their toxicity in tissues. Although he did not perform any studies in this specific area there is good evidence that antiseptics are toxic and their value should be carefully judged.

Contemporary surgery is based on the results from these surgeons. In the early 1800s Ephraim McDowell performed the first elective abdominal operation on a large ovarian cyst. Had he failed he would have been lynched, but the patient, who sang hymns during the procedure



Fig. 11. By the 1920s major elective surgery was commonplace with general anaesthesia and the surgeons using gloves but no masks. Surgery in Baltimore.

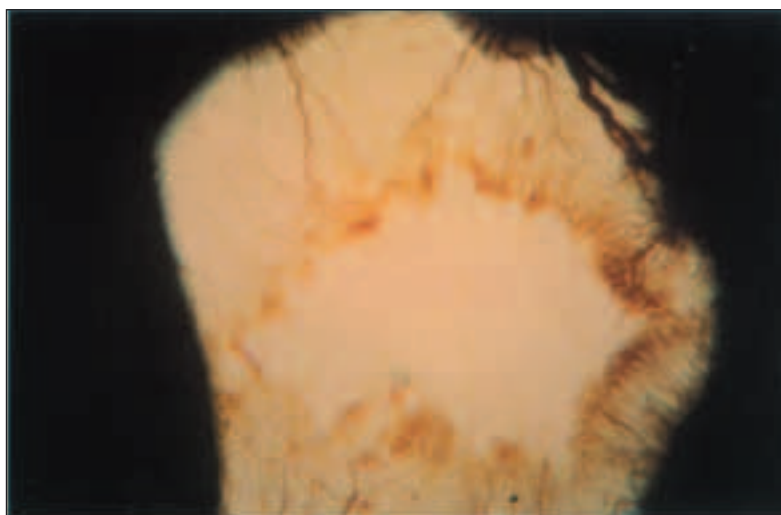


Fig. 12. The rabbit ear chamber allows direct visualization of the healing process and the formation of granulation tissue.

after taking wine, recovered uneventfully. By the 1920s major elective surgery was commonplace (Figure 11) with general anaesthesia and the surgeons using gloves but no masks. From these artisans came the aphorism of ‘cut well, sew well, get well’.

Since then, research has produced many results and significant improvements have been made. Several experimental methods can be used for wound healing research, some are crude and others relatively sophisticated. We can grow fibroblasts or other cells involved in wound healing in culture and with supravital stains easily ascertain whether these cells are alive or dead.

From these experimental models, new knowledge is gained on the healing process and on factors or substances that can have an impact on the healing. Alexander Fleming suggested that the toxic nature of antiseptics on the treated tissue should be examined according to the above findings/models. The viability of fibroblasts from a baby hamster kidney has been examined in cultures containing dilute antiseptics. Even at a dilution of 1:100 or 1:1000 most of the commonly used antiseptics are highly toxic. We have also looked at the level of collagen acquisition in experimental wounds, by measuring hydroxyproline (a principal amino acid in collagen). Wounds dressed once with a saline dressing, compared with a dressing containing a standard clinical-use hypochlorite antiseptic, gain hydroxyproline significantly more quickly, suggesting that there is some delay in the healing process influenced by hypochlorite. The DNA in these wounds, which is a

reflection of the acute inflammatory response, is increased in the wounds treated with hypochlorite and this is histologically confirmed. The rabbit ear chamber allows direct visualization of the healing process and the formation of granulation tissue. The ear chamber allows direct measurement, for example, of pO₂, lactate and glucose. We have used it for measuring the effect of antiseptics and their effects on granulation tissue. With one application of a hypochlorite, within seconds the vessels constrict with a marked exudate. The flow of blood in those capillaries can be measured using a laser Doppler velocimeter. After hypochlorite it is reduced to zero and does not recover. Within a few weeks the granulation tissue grows back into the ear chamber periphery but the ghosts of the old blood vessels remain until granulation tissue is complete (Figure 12.).

In order to understand the wound healing process, it is necessary to understand the medical patho-physiology. The ability to heal by regeneration or tissue formation is significant. Microorganisms can completely regenerate and amphibians can regrow a damaged tail. However, while humans can regenerate liver cells and grow new skin and other epithelia, we cannot replace connective tissue. Once the spinal cord is transected, for example, it remains so for ever as healing is affected by scar tissue repair. The sequence of healing and the module of acute inflammation (macrophages, fibroblasts, myofibroblasts and angiogenesis) are well known. The macrophage interrelates with all the processes of healing and clearly is the key player. ►

Open wounds do epithelialize, but the main contribution to the closure of epithelia is the contraction effected by myofibroblasts, which produce fibrils that pull the wound together. This can be visualized on a collagen lattice and is not an electron microscopic hypothesis. Angiogenesis in the healing wound edge brings nutrients and oxygen necessary to healing. The rich vasculature of granulation tissue in a healing wound causes its red appearance. When it involutes a white scar is left, with scar protein, collagen, forming when healing is complete. It has been recognized that epithelial cells cover a defect much quicker if a scab is not allowed to form. If the wound is kept moist then contraction and epithelialization can be enhanced. A moist environment also enhances granulation tissue formation.

The best dressing of all is skin. When large venous ulcers are clean they can take a skin graft and heal. The new dressings clean up venous ulcers for example and make them ideal for grafting. However, if adequate compression is not given then a healed grafted venous ulcer will revert to square one. If microbiological swabs are taken from ulcers healing by secondary intention, many commensal, and occasionally pathogenic, organisms are commonly harvested. If the wound is not clinically infected with invasive cellulites then antibiotics are not indicated except, if beta-haemolytic streptococci or *Pseudomonas* are grown from the swab. Conditions with a larger probability for infections, e.g. patients with diabetic foot ulcers, will require the use of antibiotics. When acute cellulitis occurs then appropriate systemic antibiotics should be used but there is rarely a need for topical antibiotics.

Some healing wounds are difficult to manage. Should we spend 6-8 weeks using a hydrocolloid dressing to soften necrotic tissue and debride the wound? Or should we simply take the patient to theatre and remove it surgically? Several methods have been applied through time and some, e.g. larvae, have re-emerged from oblivion. Today we know a lot more, but the basic questions such as what and when have not yet been clarified.


Ischaemic ulcers can be equally difficult to treat, but new operational methods mean that patients can have their peripheral perfusion restored and there are increased possibilities of treatment. The significance of ischaemia and diabetes in the healing process, particularly that of foot ulcers, has also become clearer within the last couple of years.

Ambroise Pare, who lived in the 15th century, exclaimed that he could dress a wound, but only God could heal it. During military service Pare managed to abolish the use of boiling oil to stop bleeding and there is no doubt that this was an important contribution to medical science. We have come much further since then and modern dressings no longer rely on divine intervention for success in healing.

However there are still many unanswered questions that need to be answered before the historical part of wound treatment can be integrated into modern wound healing and treatment. What dressings should be used, how should they be applied and for how long? Are we just putting off the inevitable need for an amputation? Can we avoid pressure ulcers, which are still a major problem, by compensating for age with prophylaxis? All of us are capable of making evaluations and it is crucial that our minds remain open to new concepts and do not close in the mists of tradition. The history of wound management is rich in examples of miraculous healing methods that have been adopted as recommended treatment methods without recognising that these were all individual actions. In modern wound treatment we should not forget these examples, but it is necessary to recognise that scientific documentation must be the main principal in wound management now as well as in the future. ■

References

1. Bhishagratna KK, ed. *Susruta Samhita*. 2nd edition. Varanasi: Chow-khamba Sanskrit Series Office, 1963.
2. Breasted JH. *The Edwin Smith Surgical Papyrus*. Chicago, IL: University of Chicago Press, 1930.
3. Brennan SS, Leaper DJ. The effect of antiseptics on the healing wound: a study using the rabbit ear chamber. *Br J Surg* 1985; 72: 780-2.
4. Cameron S, Leaper DJ. History of wound healing and infection. *Update* 1988; 36: 2498-506.
5. Deas J, Billings P, Brennan S et al. The toxicity of commonly used antiseptics on fibroblasts in tissue culture. *Phlebology* 1986; 1: 205-9.
6. Ellis H. *Famous operations*. Pennsylvania, P A: Harwac, 1984.
7. Forrest RD. Early history of wound treatment. Development of wound therapy from the Dark Ages to the present. *J R Soc Med* 1982; 75: 198-205, 268-73.
8. Haeger K. *The illustrated history of surgery*. London: Harold Starke (Medical), 1989.
9. Lucarotti ME, Morgan AP, Leaper DJ. The effect of antiseptics and the moist environment on ulcer healing: an experimental and biochemical study. *Phlebology* 1990; 5: 173-9.
10. Majno G. *The healing band: man and wound in the ancient world*. London: Harvard University Press, 1975.
11. Schreiber W, Mathys FK. *Infection. Les maladies infectieuses dans l'histoire de la médecine*. Basel: Hoffman-La Roche, 1987.



It's about minimising trauma and pain

Good wound management requires an holistic approach

According to the recently published World Union Best Practice Document¹ the following dressing criteria should be considered in order to minimise trauma and pain at dressing-related procedures:

- Moist wound healing
- Fluid handling capacity
- Atraumatic on removal
- Low allergy potential

We provide the **solutions**
mepitel • mepilex • mepilex lite • mepilex border • mepilex transfer
you make the **difference**



GENTLE CARE™

1) Principles of best practice: Minimising pain at wound dressing-related procedures.
A consensus document. London: MEP Ltd, 2004. Downloadable on www.tendra.com



 **smith&nephew**
ACTICOAT[®]
ABSORBENT
SILCRYST[™]

Together at last, a super powered partnership dynamic silver and absorbency

New to the ACTICOAT range, ACTICOAT Absorbent with SILCRYST[™] Nanocrystals has the added benefit of absorbency to provide:

- Antimicrobial power of silver delivered within the dressing and to the wound bed¹
 - Moist wound environment
 - Highly absorbent alginate.
- Boosted with a hydrophilic gelling core, this silver absorbent antimicrobial dressing is:
- Very soft and conformable.
 - Can be moulded, folded or cut to meet a wide range of wound shapes and sizes.
 - Assists faster healing.



Wound Management
Smith's Nephew
Medical Ltd
101 Inceville Road
Hull HU3 2NS
England

www.smith-nephew.com
www.acticoat.com

Citations:

- ¹ Smith H, et al. *Wound Care* (2000) 19(6)
 - ² Wright JH et al. *Wounds* 1998; 10(1): 17-20
 - ³ SILCRYST is a Trade Mark of SILCRYST Pharmaceuticals Corp. used under license
 - ⁴ Trademark of Smith & Nephew
- www.acticoatinternational.com/1704/05

Wound healing and fine art:

What is possible to learn?



Fig. 1.
Pier Antonio Magatti.
St Pellegrino Laziosi,
Patron of the
wounded people.
Church of Codogno
(Italy).



Fig. 2.
The physician Iapige debrides
Enea's wound.
Mural painting,
Pompei (Italy).



Massimo Papi

Istituto Dermopatico
Immacolata,
IRCCS,
Rome
Italy
m.papi@idi.it

INTRODUCTION

The challenge to heal cutaneous wounds started with the development of this pathology in the human race. An excellent chronological review on “Wounds in art” has been recently published by Christina Lindholm¹. A number of modalities of cure have been proposed by single physicians or entire communities based on religious doctrine, mystic view or empiric experience. Most of them were credited for many years and then substituted by others. The battle between medical/religious dogmas (fig. 1), scientific knowledge and empiric approach, characterized the last part of the 2nd millenium and some aspects of modern wound care are still influenced by it. The Hippocratic (460-377 b.C) medical theory based on cardinal humours, conditioned all the medical views until the Middle Ages. Throughout the history of Medicine it was repeatedly supported by other famous physicians such as the Roman Gallen and the Arabian Avicenna (~1000 A.D.). Avicenna, in his “De ulceribus”, reaffirmed the concept that curing an ulcer is at great risk, above all for the elderly, being the ulcer acts as an exit from the body for “malignant humours”, disease substances which are stored and built up in the skin. The concept that an ulcer is a self-purifying mechanism influenced the medical practice for many centuries².

Despite some domineering theories of Official Medicine concerning wound healing and ulcer biological value, I believe that, throughout the years, the practical approach and the techniques of wound care have been greatly conditioned by the real necessity of obtaining complete healing. In fact, we can hypothesize that “past” ulcers were as painful as “present” ones, and that chronicity prevented the patients to be active. And this might have been a great handicap before the industrial revolution!

Historical wound management has been documented by a number of paintings, drawings and sculptures³. They may represent a proof of the evolution of the art of healing throughout history. At the same time, surprisingly, they reveal medications that are still in use, debated or recently re-evaluated. A tour in the world of fine arts and wound care, reminds us of the difficulty of this “art”, despite huge advances in technological and biological knowledge.

The aim of the article is to speculate on the direct representation of the common ways of treating ulcers in the past, in the light of the modern concepts of wound care.

DEBRIDEMENT

For many centuries Gallen's (130-200 A.D.) theory of “pus bonum et laudabile” dominated the way of curing wounds. Suppuration was considered a prerequisite to wound healing. If not spontaneous,



Fig. 3. David Rijkaert (1612-1661). *The village surgeon*. Galerie Dahlem, Berlin (Germany).



Fig. 4. Nicolò Rosselli. *St. Lazzaro*. Schifanoia Palace, Ferrara (Italy).

it had to be induced. However, cleansing of wound and removal of debris is a technique adopted very early in the history, even before the Roman civility as confirmed by the mural paintings of Pompei (fig. 2). Gallen's point of view was slowly abandoned along with the foundation of the University Medical School of Salerno and Bologna (11th-13th Century) and the innovative experience of surgeons active in these cities (Ruggiero of Salerno, Teodorico Borgognoni)⁴. In particular, Teodorico taught the sistematic cleansing of wounds and removal of necrotic tissue and debris. Surgical debridement as a concept of wound care became a common empiric practice during the 18th century⁵ and was fully accepted in the 20th Century, when the research and the developments in microbiology were widely disseminated.¹

At present times, debridement is a critical phase of "wound bed preparation", which is considered the preliminary and fundamental process of any modern approach to the treatment of ulcers. It is increasingly required by the development of new products specifically dedicated to enhancing the healing of chronic ulcers^{6,7}.

ENZYMES AND GROWTH FACTORS

One of the main problems in the field of research into wound healing is the absence of a proper animal model for chronic wounds. However, animals offer an interesting model of self-treatment. In fact they perform instinctive medications when they lick acutely injured areas of their body⁸. It implies both cleansing the wound and delivering enzymes and other promoting healing substances to the wound bed. It has been demonstrated that wounds accessible to licking healed faster than those inaccessible (dorsal) in individually caged mice⁹.

The use of enzymes for wound cleansing has been variously supported by clinical practice evidence. The dogs in Nicolò Rosselli's painting (fig. 4) may be helping the healing of St. Lazzaro's ulcerative lesions due to the pest, with their saliva enzymes. This is another example of the diffuse empirism of the "historical wound care" founded on recently developed scientific basis. As a matter of fact, saliva has been reported to contain not only enzymes, but also several growth factors. In the last decade, these latter molecules have been widely investigated and successfully used to stimulate the healing of chronic lesions¹⁰. The practical approach of the monk in the painting by Zapatta (fig. 5) seems unacceptable as "routine therapy", but is a sign that we always receive precious information from nature.

ANTISEPSIS AND INFECTION

Honey was one of the most cited ingredients in several topic wound preparations in Egyptian and Roman culture (fig. 6). The Edwin Smith papyrus (1500 b.C.) suggests to protect the wounds with fresh meat (hemostatic property) and application of butter and honey.

The empiric use of honey was probably due to its antibacterial activity. In fact there is much evidence that it produces an osmotic dehydration of bacteria and diminishes the superficial oedema. In addition, it contains several chemical constituents that may reduce the quantity of germs. The most intriguing is glucose oxidase which, as honey is diluted with exudate, produces a consistent quantity of hydrogen peroxide (H₂O₂). The antibacterial property of H₂O₂ is one of the most used in nature, above all from neutrophils. Moreover, the greasy structure of honey may prevent secondary dressing from adhering to



Fig. 5. Zapatta (18th Century). Religious curing the patients in the Hospital of St Andrea of Cuzco. National Institute of Culture, Cuzco (Perù).



Fig. 6. The infusion of wine and honey improves the wound healing. Painting from a manuscript. 4th Century AD (Italy).

the wound bed. For the same reason, it acts as a barrier from the environmental risk of contamination.

One of the emerging problems of modern wound care is the control of bacterial presence in the wound and to prevent the risk of infection without damaging the newly formed epithelium. Therefore the rediscover of honey as antibacterial medication¹¹ and the large use made in the past is not surprising.

TRAUMA AND PAIN

The drawing by Cornelius Dusart (fig. 6) could be the symbol of the anguish of a patient during medication. In many other paintings and drawings various painful techniques of management have been represented. One of the most cruel ones was cauterization. It means applying heat with a red-hot iron device. The main indication was hemostasis, contaminated and inflamed wounds.

One of the main goals of modern wound care is to reduce spontaneous pain and to preserve the patients from painful injuries caused by medication. Approaches to minimise pain and trauma in chronic wound management are increasingly claimed. The details emerging from evidence-based understandings stimulated the study of a new generation of interactive products that assure a pain-free removal¹².

In the daily practice, the attention to the patients' quality of life can be furtherly improved if we keep in mind that pain is avoidable in most cases. ►



Fig. 7. Cornelius Dusart (1660-1704). Das Schropfwieb Dresden (Germany).



Fig. 8. David Teniers (1610-1690). *The cure of ulcers in a village*. Museum of Fine Arts, Budapest (Hungary).



Fig. 9. School of painting from Ferrara (1500 AD). *A middle ages hospital*. Laurenziana Library, Florence (Italy).

WHO CURES THE ULCERS?

This question was raised in my mind by figure 8 in which wound treatment is provided by a single caregiver in comparison to figure 9 illustrating a scene of hospital care (we would call it: “a wound clinic”).

Although in the past the care of ulcers has been left to the sensibility and clinical ability of single practitioners (in Italy, after the Renaissance, many of them were barbers) who often had the idea that wounds would either easily heal, or not heal at all no matter what you did, the modern day wound management obliges to choose a multidisciplinary approach. In the recent years, a lot of major advances have occurred in the world of wound care. They have been in part supported by industry, but also by the consciousness of each single medical discipline and nurse specialists, in that the treatment of the ulcers is an “art” and requires “teamwork”. Undoubtedly, most of the chronic wounds are due to pressure or primary vascular diseases. However, an increasing percentage of them may be the symptom of an inflammatory disorder. It implies the necessity to make an accurate diagnosis before addressing a therapeutic strategy. Consequently, the involvement of different medical expertise is required. In addition the techniques of medication have become different and very sophisticated. They need specific training in nurses. Finally, in the last decade the social impact of wound care has been repeatedly stressed¹³. The direct costs of hospitalization and the indirect costs of the loss of millions of working-days set forth the problem of “home-care” and that of the measures for primary prevention.

THE FUTURE

Therapeutically, advanced technologies widened the options of cure and highly improved the outcome of chronic ulcer treatments. The miracle of the substitution of a wounded limb with one of a black donor (fig. 10), reminds us of the chance to use these modern technologies:



Fig. 10. Beato Angelico (1440 AD). *The miracle of St Cosma and Damiano*. Museum of St Marco, Florence (Italy).

tissue engineering, living skin equivalents, gene therapy or grafts and, hopefully, in the future, an entire limb might be changed. ■

Bibliography

- 1 Lindholm C (2003) Wounds in art. *EWMA Journal*, 3: 25-31
- 2 Bonadeo P In: Guarnera G, Papi M (2000) *L'ulcera cutanea degli arti inferiori*. Ed Monti, Saronno, Italy
- 3 Sholz A (1993) Historical aspects. In: Westerhof W. *Leg ulcers*. Elsevier
- 4 Dealey C (2003) Wound healing in Medieval and Renaissance Italy. Was it art or science? *EWMA Journal*, 3: 33-35
- 5 Koeveker GB (2001) Surgical debridements of wounds. In: Falanga V. *Cutaneous wound healing*. Martin Dunitz
- 6 Falanga V (2000) Classification for wound-bed preparation and stimulation on chronic wounds. *Wound Repair Regen*, 8: 347
- 7 Romanelli M (2002) The role of wound-bed preparation in managing chronic pressure ulcers. *J Wound Care*, 11: 305
- 8 Sheretz E (1988) Why Sadie likes her wounds *Arch Dermatol*, 24: 1499-1500
- 9 Hutson J (1979) The effect of salivary glands on wound contraction in mice *Nature*, 279: 793-5
- 10 Papi M et al (2002) The use of granulocyte-monocyte colony stimulating factor in the therapy of chronic wounds *J Eur Acad Dermatol*, 16 (suppl 1): 336
- 11 Molan PC (2001) Potential of honey in the treatment of wounds and burns. *Am J Clin Dermatol*, 2:13-19
- 12 EWMA Position Document (2002). Pain at wound dressing changes
- 13 Philips T et al (1994) A study of the impact of leg ulcers on quality of life: financial, social and psychologic implications. *J Am Acad Dermatol*, 31: 49-53

ABSTRACTS OF RECENT COCHRANE REVIEWS



Sally Bell-Syer, MSc

Review Group Co-ordinator
Cochrane Wounds Group

Department of
Health Sciences
Area 4
Seeborn Rowntree
Building
University of York
York,
United Kingdom
sembs1@york.ac.uk

Preoperative skin antiseptics for preventing surgical wound infections after clean surgery

Edwards PS, Lipp A, Holmes A.

This review should be cited as Edwards PS, Lipp A, Holmes A, Preoperative skin antiseptics for preventing surgical wound infections after clean surgery. (Cochrane Review) In: *The Cochrane Library*, Issue 3, 2004. Chichester, UK: John Wiley & Sons, Ltd.

SYNOPSIS

There is insufficient evidence on whether cleaning patients' skin with antiseptic before "clean" surgery reduces wound infections after surgery.

Patients skin at the operation site is routinely cleaned with antiseptic solutions before surgery. Antiseptic skin cleansing before surgery is thought to reduce the risk of postoperative wound infections.

ABSTRACT

Background: Approximately 15% of elective surgery patients and 30% of patients receiving contaminated or dirty surgery are estimated to develop post-operative wound infections. The costs of surgical wound infection can be considerable in financial as well as social terms. Preoperative skin antiseptics is performed to reduce the risk of post-operative wound infections by removing soil and transient organisms from the skin. Antiseptics are thought to be both toxic to bacteria and aid their mechanical removal. The effectiveness of preoperative skin preparation is thought to be dependent on both the antiseptic used and the method of application, however it is unclear whether preoperative skin antiseptics actually reduces post-operative wound infection and if so which antiseptic is most effective.

Objectives: To determine whether preoperative skin antiseptics reduces post-operative surgical wound infection.

Search strategy: We searched the Cochrane Wounds Group Specialised Trials Register and the Cochrane Central Register of Controlled Trials in April 2004. In addition we handsearched journals, conference proceedings and bibliographies.

Selection criteria: Randomised controlled trials evaluating the use of preoperative skin antiseptics applied immediately prior to incision in clean surgery. There were no restrictions based on language, date or publication status.

Data collection & analysis: Three reviewers independently undertook data extraction and assessment of study quality. Pooling was inappropriate and trials are discussed in a narrative review.

Main results: We identified six eligible RCTs evaluating preoperative antiseptics. There was significant heterogeneity in the comparisons and the results could not be pooled. In one study, infection rates were significantly lower when skin was prepared using chlorhexidine compared with iodine. There was no evidence of a benefit in four trials associated with the use of iodophor impregnated drapes.

Reviewers' conclusions: There is insufficient research examining the effects of preoperative skin antiseptics to allow conclusions to be drawn regarding their effects on post-operative surgical wound infections. Further research is needed.

Support surfaces for pressure ulcer prevention

Cullum N, McInnes E, Bell-Syer SEM, Legood R

This review should be cited as Cullum N, McInnes E, Bell-Syer SEM, Legood R. Support surfaces for pressure ulcer prevention. (Cochrane Review) In: *The Cochrane Library*, Issue 3, 2004. Chichester, UK: John Wiley & Sons, Ltd.

SYNOPSIS

Special foam mattresses prevent pressure ulcers more effectively than standard hospital foam mattresses.

Pressure ulcers (also called bed sores) are ulcers on the skin caused by pressure or rubbing at the weight-bearing, bony points of immobilised people (such as hips, heels and elbows). Different pressure relieving surfaces (e.g. beds, mattresses, mattress overlays and cushions) are used to cushion vulnerable parts of the body and distribute the surface pressure more evenly. The review found that people lying on ordinary foam mattresses are more likely to get pressure ulcers than those on higher specification foam mattresses. More research comparing different support surfaces is needed.

ABSTRACT

Background: Pressure ulcers (also known as bedsores, pressure sores, decubitus ulcers) are areas of localised damage to the skin and underlying tissue due to pressure, shear or friction. They are common in the elderly and immobile and costly in financial and human terms.

Pressure-relieving beds, mattresses and seat cushions are widely used as aids to prevention in both institutional and non-institutional settings.

Objectives: This systematic review seeks to answer the following questions: to what extent do pressure-relieving cushions, beds, mattress overlays and mattress replacements reduce the incidence of pressure ulcers compared with standard support surfaces? how effective are different pressure-relieving surfaces in preventing pressure ulcers, compared to one another?

Search strategy: The Specialised Trials Register of the Cochrane Wounds Group (compiled from regular searches of many electronic databases including MEDLINE, CINAHL and EMBASE plus handsearching of specialist journals and conference proceedings) was searched up to January 2004, Issue 3, 2004 of the Cochrane Central Register of Controlled Trials was also searched. The reference sections of included studies were searched for further trials.

Selection criteria: Randomised controlled trials (RCTs), published or unpublished, which assessed the effectiveness of beds, mattresses, mattress overlays, and seating cushions for the prevention of pressure ulcers, in any patient group, in any setting. RCTs were eligible for inclusion if they reported an objective, clinical outcome measure such as incidence and severity of new of pressure ulcers developed. Studies which only reported proxy outcome measures such as interface pressure were excluded.

Data collection & analysis: Trial data were extracted by one researcher and checked by a second. The results from each study are presented as relative risk for dichotomous variables. Where deemed appropriate, similar studies were pooled in a meta analysis.

Main results: 41 RCTs were included in the review.

Foam alternatives to the standard hospital foam mattress can reduce the incidence of pressure ulcers in people at risk. The relative merits of alternating and constant low pressure devices, and of the different alternating pressure devices for pressure ulcer prevention are unclear.

Pressure-relieving overlays on the operating table have been shown to reduce postoperative pressure ulcer incidence, although one study indicated that an overlay resulted in adverse skin changes. One trial indicated that Australian standard medical sheepskins prevented pressure ulcers. There is insufficient evidence to draw conclusions on the value of seat cushions, limb protectors and various constant low pressure devices as pressure ulcer prevention strategies.

A study of Accident & Emergency trolley overlays did not identify a reduction in pressure ulcer incidence. There are tentative indications that foot waffle heel elevators, a particular low air loss hydrotherapy mattress and an operating theatre overlay are harmful.

Reviewers' conclusions: In people at high risk of pressure ulcer development, consideration should be given to the use of higher specification foam mattresses rather than standard hospital foam mattresses. The relative merits of higher-tech constant low pressure and alternating pressure for prevention are unclear. Organisations might consider the use of pressure relief for high risk patients in the operating theatre, as this is associated with a reduction in post-operative incidence of pressure ulcers. Seat cushions and overlays designed for use in Accident & Emergency settings have not been adequately evaluated.



Access to The Cochrane Library is free of charge in many countries:

Australia – see www.nicsl.com.au/cochrane/index.asp
All residents of Australia with access to the Internet can access The Cochrane Library for free, thanks to funding provided by the Commonwealth Government of Australia and administered by the National Institute of Clinical Studies.

Denmark – Several Danish Web sites offer open access to The Cochrane Library. For access, go to www.cochrane.dk, www.deff.dk, www.sundhed.dk, or www.vifab.dk.

England – see www.nelh.nhs.uk/cochrane.asp or go directly to www.update-software.com/clibng/cliblogon.htm.
All residents of England with access to the Internet can access The Cochrane Library for free, thanks to funding provided by the National Electronic Library for Health. NHS Libraries requiring copies on CD-ROM can apply by contacting NELH on 0121-333-0229.

HE & FE Institutions in the United Kingdom

Higher Education and Further Education Institutions can access The Cochrane Library through JISC (Joint Information Systems Committee). Access for HE & FE Institutions is controlled by Athens authentication. To log onto The Cochrane

Library with your Athens details see www.update-software.com/cochrane/athenslogon/

Finland – see www.update-software.com/clibng/cliblogon.htm
All residents of Finland can access The Cochrane Library for free, thanks to funding for a national provision from Duodecim.
Ireland – see www.update-software.com/clibng/cliblogon.htm
All residents within the Island of Ireland can access The Cochrane Library for free, thanks to funding for a national provision by The Health Research Board in Dublin and The Research and Development Office in Belfast.

Norway – see www.update-software.com/clibng/cliblogon.htm
All residents of Norway can access The Cochrane Library for free, thanks to funding for a national provision from The Norwegian Agency for Health and Social Welfare.

South Africa – Access to The Cochrane Library is available in South Africa for registered members of SA HealthInfo please go to www.sahealthinfo.org/evidence/evidence.htm for further details on how to register for access.

Wales – see www.update-software.com/clibng/cliblogon.htm
All residents of Wales with access to the Internet can access The Cochrane Library for free, thanks to funding provided by The National Assembly for Wales. NHS members can access it via their internal Internet system.

Selected abstracts from 2nd World Union of Wound Healing Societies meeting



More abstracts from WUWHS
in the next issue of the
EWMA Journal

Efficacy of Leukichtan A prospective controlled study

S. Coerper MD, M. Witte MD, H.D. Becker MD

Introduction: Sodiumbituminsulfate suspended in hydrogel (Leukichtan®) has antibacterial and proliferative properties and presents an ideal substance to enhance the healing of contaminated chronic wounds. We present the preliminary data of a prospective, randomized and controlled multi-center study on patients with venous ulcers.

Methods: Patients with leg ulcers caused by venous insufficiency were included in the study. Patients received either Leukichtan® Gel or vehicle only. Local treatment was performed for 16 weeks, with the wound area being determined by tracings.

Results: At the time of the interim analysis a total of 59 patients were enrolled (30 Leukichtan® / 29 vehicle). Patient age, weight and wound size were not significantly different in both groups. In ulcers smaller than 20 cm², (n=46), treatment with Leukichtan® resulted in the area under baseline still being reduced 16 weeks after treatment compared to the vehicle (-566.5+627.3 cm² vs. -201.3+738.4 cm²; p=0.064). There was no severe adverse event in the Leukichtan® group.

Weeks	2	4	6	8	10	12	14	16
Leukichtan	-17.8	-32.6	-45.3	-45.5	-58.1	-63.9	-62.9	-68.6
Vehicle	-13.5	-21.1	-29.5	-35.0	-21.9	-31.0	-23.7	-18.8

Tab.: Relative (%) Volume reduction during treatment

Conclusion: After inclusion of 50% of the patients we have already seen a tendency to good healing response after treatment with Leukichtan. The study will be finished within the next few weeks and we will report the final results.

Understanding wound care in Ireland: lessons for europe

S. Cowman, PhD, MSc, FFNMRC SI, PGCEA, RNT, Dip N (London), RGN, RPN. Professor and Head of Nursing;

Z. Moore, RGN, MSc, FFNMRC SI, Lecturer, Faculty of Nursing & Midwifery, Royal College of Surgeons in Ireland, 123 St Stephens Green, Dublin 2, Ireland. zmoore@rcsi.ie

Introduction: There are currently no standardised policies or strategies for the provision of wound care in Ireland. The costs associated with wound care are considerable and the lack of standardised education approaches and policies compound this cost and contribute to increased morbidity and mortality of patients. In order to deliver effective wound care services in Ireland, knowledge must be gained of how wound care is currently being provided.

Aims and objectives: The specific aims of the study were:

1. To identify the nature of wounds managed
2. To establish who is providing wound care advice
3. To establish if there are policies/guidelines pertaining to wound care
4. To examine costing issues associated with wound care

Methods: A cross-sectional survey was conducted using a pre-piloted questionnaire as the data collection tool. Data were collected from directors of Nursing/Public Health Nursing in all community care areas and hospitals, with a capacity of greater than 40 beds, in Ireland. Anonymity of the study participants and the institutions was guaranteed. One hundred and twenty one questionnaires were circulated. Data analysis was carried out using SPSS version 11.

Results: 116 questionnaires were returned (response rate 96%). Leg ulcers, diabetic foot ulcers and pressure ulcers were the most commonly encountered wound types.

Kerraboot®

A giant stride in ulcer management

Up to **82%** reduction in nursing time¹

Up to **60%** reduction in diabetic
neuropathic ulcer size¹

85% of patients rated the
Kerraboot® as "better" or
"much better" than their
previous dressing¹

To find out more about Kerraboot®

Freephone: 0800 1077 107 or email: info@arktherapeutics.com

¹ Leigh R, Barker S, Murray N, Hurrel SJ. The Kerraboot: A novel wound dressing device for the management of leg and foot ulcers. *Practical Diabetes Int* 2004;21(1):27-30

Ark
Therapeutics

Advice was primarily sought from the doctor or ward manager pertaining to wound care, however a company representative was also used as a source of advice by 43% of respondents. Of respondents, 46% had no pressure ulcer policy, despite 95% identifying their involvement in the management of pressure ulcers. Also, 60% of respondents did not know how much was spent on pressure ulcer prevention or wound management annually, despite nursing professionals being identified as the decision makers regarding the availability of wound management products in over 70% of responses.

Discussion: This study provides an insight into the provision of wound care and will form the basis for the development of best practice guidelines in Ireland. The study also prompts questions about wound management practices across the EU member states. There is an urgent need for the development of a national strategy for the prevention and management of wound related problems, in order to ensure equity and accessibility of services for all users of the Irish health care system.

Acknowledgements: This study was a joint project between The Faculty of Nursing & Midwifery and the School of Pharmacy, Royal College of Surgeons in Ireland. The study was funded by a research grant from the RCSI and an unrestricted research grant from ConvaTec, Ireland.

Asepsis in wound management – an observation study

Salla Seppänen, RGN, MNSc & Maija Alahuhta, RGN, MNSc,
Oulu Polytechnic, Oulainen School of Nursing

The aim of this study was to describe asepsis in the management of chronic open and complicated surgical wounds. The data was collected in the spring of 2003 on structural observation forms by nurses and practical nurses in different care units across Finland. Before data collection the nurses and practical nurses were familiarised with asepsis as a part of their continuing education in wound management. They were also trained on the structural observation forms.

In 43 cases the local treatment of wounds was observed in entirety, of these 43 cases, half took place in the ward, one-fifth in the patients' homes and one-fifth in nursing homes for the elderly. The remaining treatments were implemented in first aid, service home or rehabilitation centers. In the main the wounds were treated either by a registered nurse (42%) or a practical nurse (51%). In two cases the wounds were treated by home-helpers. In most cases the wound management was usually (41 cases) implemented on the morning shift.

In 60% of cases the person who cared for the wounds (e.g. a nurse) washed their hands before the wound treatment and disinfected their hands in 72% of cases. All nurses put

The **EWMA** website features many useful listings and other information.

For instance you can find information on all Council members, sponsors, publications and future meetings.

We invite you to visit the website at

www.ewma.org



on the gloves before treating a wound, with sterile gloves being worn in 7% of cases. The gloves were removed following debridement of the wound in 80% of cases. Only in 28% of cases did a nurse disinfect their hands after removing the gloves. In 22% of cases, the nurses neither washed nor disinfected their hands after removing the gloves. While setting new dressings on a wound, 93% of nurses wore gloves. After the wound treatment was finished 61% of nurses washed and 77.5% disinfected their hands.

In 83% of cases the wounds were mechanically debrided. In hospital mechanical debridement was carried out at the bedside. In the patients' homes it was done in various places, such as the bathroom, kitchen, bedroom etc. The wounds were washed with tap water in 46% of cases and with sterile saline in 32% of cases. In some cases sterile water was used.

According to the study, in wound management special attention must be paid to asepsis, especially in hand hygiene, as it is known that disinfecting the hands is one of the most important issues in the prevention of cross-infections among wound patients.

A 3-d technique for the investigation of skin deformation with application to wound dressing fixation.

W.B. Gardner MSc, **R.G. Cameron** PhD, CEng., **P. Grocott** PhD
P. Vowden MD FRCS; **A. Lovatt** RN; **R.E. Dugdale** PhD.
Bradford Teaching Hospitals NHS Trust, Bradford, U.K. BD9 6RJ. Wayne.Gardner@bradfordhospitals.nhs.uk

The research was funded by EPSRC project GR/R39023/01.

The performance of dressings significantly affects the time to healing of wounds and the quality of life of patients. Despite extensive collective experience in nursing care, there still remains uncertainty about the optimum choice of many parameters that affect performance, such as shape, extensibility and fixing position. This work was a pilot study to investigate the influence of skin deformation on the fixing of dressings for leg ulcers, pressure sores and post-operative wounds in the upper torso, neck and legs.

Digital surface photogrammetry techniques were developed to obtain shape information for various sites on the neck and legs of young, middle-aged and elderly subjects. First, the subjects were marked, using adhesive labels or marker pens, to identify a grid of points on the skin around the neck, knee or ankle. Images were cap-

tured using a DSP400 3D-imaging system manufactured by 3dMD. The positional differences of the grid points were computed when the subjects were relaxed and as they made typical movements to articulate the joint. Studies were made both with and without dressings affixed. The analysis and display of the data used purpose-written software developed by the authors.

The results were displayed by colour-coding the grid to show regions of skin that compressed or stretched. Absolute and relative changes were tabulated alongside the display. Individual arcs in the grid can be selected for closer study.

Preliminary studies have highlighted the complex and sometimes counter-intuitive response of skin to joint articulation. It was observed in the neck study that while skin in the central part of the neck was stretching, there was a region of compression in the skin over the adjacent shoulder in a direction orthogonal to the direction of stretch. In the ankle study, it was observed that while skin deformed uniformly without a dressing, there was significant wrinkling of the skin with a dressing. These observations suggest some possible reasons why the fixation of dressings may fail in practice. ■

Stuttgart 2005

FROM THE LABORATORY
TO THE PATIENT:

FUTURE ORGANISATION AND
CARE OF PROBLEM WOUNDS

STUTT GART · GERMANY
SEPTEMBER 15-17 · 2005



www.stuttgart2005.org



Excellence in Education

EUROPEAN WOUND INSTITUTE



The European Wound Institute is Europe's first accredited centre for wound therapy, embedded in the ESI, one of the world most modern centres for continuing medical education.



In Cooperation with



Update from the Treasurer:

Overview of EWMA finances



Once a year, at the Annual Meeting, the Treasurer presents the annual economic report to the EWMA members. I am pleased to announce that in June the accountants were able to provide the auditors with the accounts for the year ending 31 December 2003; these 2003 accounts are now fully audited.

The Economic strategy for 2003 had been to secure the investment made in 2001- 2002 – this investment created the financial basis for an enlargement of EWMA's activities.

The balances for both 2002 and 2003 have been separated into the activities of the Charity and of the "Business Office" (BO) represented by Congress Consultants (CC).

The balance for the Charity shows that the reserve has increased to €62.000 (£40.000), which was the target set by the Council in order to secure the financial obligations of at least six months of a budget year.

The membership subscriptions have been increased by 25% as many new members joined from Italy following the Pisa Conference.

One research award of 10,500 was awarded in 2003 to *Georgina Gethin*. This has been allocated in 2004, as the amount will be paid this year.

EWMA's economic activities are now reported in Euros except for the EWMA Charity finances; these continue to be handled in GBP (£) due to the reporting requirements of the UK Charity Commission.

The separation of the activities and the reporting allows EWMA to follow the regulations set by the UK Charity Commission and the EWMA statutes in relation to the Charity.

The Business Office does not have to be reported to the UK Charity Commission as the activities are taking place in many different European countries. There are presently no regulations on the reporting, but the activities are carried out following the instructions from the EWMA Executive and EWMA Council.

INCOME 2003

Conference: The result from the Pisa conference was positive giving a good contribution to the organising associations as well as EWMA. The final amount is still awaiting the settlement of the Italian tax authorities, but the meeting already shows a noticeable surplus that will be shared between the organising associations and EWMA.

Journal advertising: Advertising in the EWMA Journal represents an income with significant potential for growth. Many companies look to advertise in the journal to support and reinforce their conference exhibitions. This results in a high advertising income for EWMA.

EWMA Organisation: The aim for 2003 was to keep EWMA's expenses at a level that allowed EWMA to maintain and strengthen the profile achieved in enlarging its activities especially with regard to the EWMA Journal and the Co-operating Organisation, e.g. expansion of the Council with the addition of two members from the Co-operating Organisations' Board.

Council: Two Council Meetings took place in 2003. The expenses covered: meeting rooms, catering, equipment, travel and accommodation, material preparation and organisational planning prior to the meeting. All Council members do as a principle travel apex (economy) and expenses are kept at a minimum. In 2003 the expenses were relatively lower than in 2002 due to one less meeting.

Executive: Three Executive Committee meetings were held in 2003. The cost principles are the same as for Council meetings

Journal: The spring issue of EWMA Journal was 72 pages, which explains the high production expenses. The autumn issue is down to the budgeted 56 pages. More and more people/organisations are now familiar with the journal, which requires more attention. The journal is still not self-financing, but, as EWMA's voice to the national organisations, it is an important means of communication and disseminating information. ►



Marco Romanelli
EWMA Treasurer

Web: The website was modernised in 2002. Web expenses in 2003 primarily covered maintenance and minor updates. The translation of *www.ewma.org* into four other languages was initiated with French as the first language.

Education: Education expenses cover project meetings and organisational support. Six education modules were initiated in 2002. In 2003 emphasis was placed on piloting the accreditation process, and by the end of the year three of the six modules were completed and three were in progress.

As education is a primary objective of EWMA, the costs are seen as an investment. From a financial point the objective is that, once up and running, the accredited courses should bear the costs of the accrediting process.

Cost Effectiveness: The Cost Effectiveness Panel has been working towards assisting the Slovenian clinicians. This covers: Data collection, economic calculations, baseline definitions, and articles.

Co-operating Organisations: Expenses for 2003 covered meetings and official visits in some of the key areas (Poland, Slovenia and the Czech Republic); contact to current and potential national organisations; organisational assistance and support. The Co-operating Organisations Board had an eventful year with the first Co-operating Organisations Board meeting taking place during the EWMA conference in Pisa.

Sponsors: In 2003 EWMA had eight Corporate A Sponsors and four Corporate B Sponsors.

The seniority discount of 5% per year of membership was initiated in 2003. In addition to researching and developing contacts with potential sponsors, expenses cover meetings, contact and service to existing sponsors. Two Corporate Sponsors Meetings took place in 2003.

This year sponsors received a special discount, due to the World Meeting.

CONCLUSIONS

The result for 2003 shows EWMA's increasing growth and success and illustrates that, despite the increased activities, we have generated a surplus of income. This is similar to the result of 2002.

The surplus will be used to diminish the deficit on the EWMA funds generated in the expansion period 2000/2001.

As Treasurer I would like to take this opportunity to thank *Mr. Henrik Nielsen* and the *Congress Consultants staff* for their hard work in assisting the EWMA business activities.

EWMA is still investing large funds in developing Wound Care and its work is generating increased interest in the topic. The growth and success of 2003 indicates that EWMA's economic future looks solid even if 2004, due to the World Meeting, has been difficult. ■

Did You See?

Reference List covering effectiveness studies published in 2003 of concerning diabetic foot ulcers, burns and pressure ulcers.

Diabetic foot ulcers

- Abidia A, Laden G, Kuhan G, Johnson B F, Wilkinson A R, Renwick P M, Masson E A, and McCollum PT. The role of hyperbaric oxygen therapy in ischaemic diabetic lower extremity ulcers: a double-blind randomised-controlled trial. *European Journal of Vascular and Endovascular Surgery* 25(6), 513-8. 2003.
- Agrawal PR, Agrawal S, Beniwal S, Joshi CP, and Kochar DK. Granulocyte-macrophage colony-stimulating factor in foot ulcers.(Experimental). *The Diabetic Foot* 6(2), 93-7. 2003.
- Alvarez OM, Rogers RS, Booker JG, and Patel M. Effect of noncontact normothermic wound therapy on the healing of neuropathic (diabetic) foot ulcers: an interim analysis of 20 patients. *Journal of Foot and Ankle Surgery* 42(1), 30-5. 2003.
- Bann CM, Fehnel SE, and Gagnon DD. Development and validation of the Diabetic Foot Ulcer Scale-short form (DFS-SF). *Pharmacoeconomics* 21(17), 1277-90. 2003.
- Chin G A, Thigpin T G, Perrin K J, Moldawer L L, and Schultz G S . Biochemistry of wound healing. Treatment of chronic ulcers in diabetic patients with a topical metalloproteinase inhibitor, doxycycline. *Wounds: A Compendium of Clinical Research and Practice* 15(10), 315-23. 2003.
- Eginton M T, Brown K R, Seabrook G R, Towne J B, and Cambria R A . A prospective randomized evaluation of negative-pressure wound dressings for diabetic foot wounds. *Annals of Vascular Surgery* 17(6), 645-9. 2003.
- Gimbel J S, Richards P, and Portenoy R K . Controlled-release oxycodone for pain in diabetic neuropathy: a randomized controlled trial. *Neurology* 60(6), 927-34. 2003.
- Joshi S, Maroli S, Moulick ND, Badhane S, Joshi S, Sthalekar N, Ambavane V, Patil R, Abhyankar M, and Dilip P. Efficacy and tolerability of a combination of ofloxacin and tinidazole in the management of infectious diabetic foot ulcer. *Journal of the Indian Medical Association* 101(5), 329-32. 2003.
- Kalani M, Apelqvist J, Blomback M, Brismar K, Eliasson B, Eriksson J W, Fagrell B, Hamsten A, Torffvit O, and Jorneskog G . Effect of dalteparin on healing of chronic foot ulcers in diabetic patients with peripheral arterial occlusive disease: a prospective, randomized, double-blind, placebo-controlled study. *Diabetes Care* 26(9), 2575-80. 2003.
- Kastenbauer T, Hornlein B, Sokol G, and Irsigler K. Evaluation of granulocyte-colony stimulating factor (Filgrastim) in infected diabetic foot ulcers. *Diabetologia* 46(1), 27-30. 2003.
- Kessler L, Bilbault P, Ortega F, Grasso C, Passemard R, Stephan D, Pinget M, and Schneider F. Hyperbaric oxygenation accelerates the healing rate of nonischemic chronic diabetic foot ulcers: a prospective randomized study. *Diabetes Care* 26(8), 2378-82. 2003.
- Lipkin S, Chaikof E, Isseroff Z, and Silverstein P . Effectiveness of bilayered cellular matrix in healing of neuropathic diabetic foot ulcers: results of a multicenter pilot trial. *Wounds-A Compendium of Clinical Research & Practice* 15(7), 230-6. 2003.
- Lu W and Zhong G L . [Clinical observation on treatment of diabetic foot by integrative Chinese and Western Medicine]. [Chinese]. *Zhongguo Zhong Xi Yi Jie He Za Zhi Zhongguo Zhongxiyi Jiehe Zazhi/Chinese Journal of Integrated Traditional & Western Medicine/Zhongguo Zhong Xi Yi Jie He Xue Hui, Zhongguo Zhong Yi Yan Jiu Yuan Zhu Ban* 23(12), 911-3. 2003.
- Marston WA, Hanft J, Norwood P, and Pollak R. The efficacy and safety of dermagraft in improving the healing of chronic diabetic foot ulcers: results of a prospective randomized trial. *Diabetes Care* 26(6), 1701-1705. 2003.
- Marston WA, Hanft J, Norwood P, Pollak R, and Dermagraft Diabetic Foot Ulcer Study Group. The efficacy and safety of Dermagraft in improving the healing of chronic diabetic foot ulcers: results of a prospective randomized trial. *Diabetes Care* 26(6), 1701-5. 2003.
- McMurray SD and McDougall K. Improving diabetes foot care in the dialysis facility. *Nephrology News & Issues* 17(10), 57, 60-1, 65-6. 2003.
- Mueller MJ, Sinacore DR, Hastings MK, Strube MJ, and Johnson JE. Effect of Achilles tendon lengthening on neuropathic plantar ulcers. A randomized clinical trial. *Journal of Bone & Joint Surgery - American Volume* 85-A(8), 1436-45. 2003.
- Plank J, Haas W, Rakovac I, Gorzer E, Sommer R, Siebenhofer A, and Pieber TR. Evaluation of the impact of chiropodist care in the secondary prevention of foot ulcerations in diabetic subjects. *Diabetes Care* 26(6), 1691-5. 2003.

Redekop W K, McDonnell J, Verboom P, Lovas K, and Kalo Z. The cost effectiveness of Apligraf treatment of diabetic foot ulcers. *Pharmacoeconomics* 21(16), 1171-83. 2003.

Rullan M, Cerda L, Frontera G, Llobera J, Masmiquel L, and Olea JL. [Triple-blind clinical trial with placebo control to evaluate the efficacy of a heparin of low molecular weight (bemiparin) for treating slow-responding ulcers in diabetic foot in primary care]. [Spanish]. *Atencion Primaria* 31(8), 539-44. 2003.

Sheehan P, Jones P, Caselli A, Giurini JM, and Veves A. Percent change in wound area of diabetic foot ulcers over a 4-week period is a robust predictor of complete healing in a 12-week prospective trial. *Diabetes Care* 26(6), 1879-1882. 2003.

Sherman RA. Maggot therapy for treating diabetic foot ulcers unresponsive to conventional therapy. *Diabetes Care* 26(2), 446-51. 2003.

Sibbald R G, Torrance G, Hux M, Attard C, and Milkovich N. Cost-effectiveness of becaplermin for nonhealing neuropathic diabetic foot ulcers. *Ostomy Wound Management*. 49(11), 76-84, 2003 Nov. 2003.

Tsang MW, Wong WK, Hung CS, Lai KM, Tang W, Cheung EY, Kam G, Leung L, Chan CW, Chu CM, and Lam EK. Human epidermal growth factor enhances healing of diabetic foot ulcers. *Diabetes Care* 26(6), 1856-61. 2003.

Wu H N and Sun H. [Study on clinical therapeutic effect of composite Salvia injection matched with Western medicine in treating diabetic foot]. [Chinese]. *Zhongguo Zhong Xi Yi Jie He Za Zhi Zhongguo Zhongxiyi Jiehe Zazhi/Chinese Journal of Integrated Traditional & Western Medicine/Zhongguo Zhong Xi Yi Jie He Xue Hui, Zhongguo Zhong Yi Yan Jiu Yuan Zhu Ban*. 23(10), 727-9. 2003.

Zimny S, Schatz H, and Pföhl U. The effects of applied felted foam on wound healing and healing times in the therapy of neuropathic diabetic foot ulcers. *Diabetic Medicine* 20(8), 622-5. 2003.

Burns

Ang E, Lee S T, Gan C S, Chan Y H, Cheung Y B, and Machin D. Pain control in a randomized, controlled, clinical trial comparing moist exposed burn ointment and conventional methods in patients with partial-thickness burns. *Journal of Burn Care & Rehabilitation*. 24(5), 289-96. 2003.

Brychta P, Adler J, Rihova H, Suchanek I, Kaloudova Y, and Koupil J. Cultured epidermal allografts: Quantitative evaluation of their healing effect in deep dermal burns. *Cell and Tissue Banking* 3(1), 15-23. 2003.

Connolly CM, Barrow RE, Chinkes DL, Martinez JA, and Herndon DN. Recombinant human growth hormone increases thyroid hormone-binding sites in recovering severely burned children. *Shock* 19(5), 399-403. 2003.

Demling R H and DeSanti L. The potential benefits of a temporary bioactive skin substitute to treat partial-thickness burns of the feet. *Wounds-A Compendium of Clinical Research & Practice* 15(1), 10-5. 2003.

Demling R H and DeSanti L. Topical doxepin significantly decreases itching and erythema in the chronically pruritic burn scar. *Wounds-A Compendium of Clinical Research & Practice* 15(6), 195-200. 2003.

Garrel D, Patenaude J, Nedelec B, Samson L, Dorais J, Champoux J, D'Elia M, and Bernier J. Decreased mortality and infectious morbidity in adult burn patients given enteral glutamine supplements: a prospective, controlled, randomized clinical trial.[comment]. *Critical Care Medicine* 31(10), 2444-9. 2003.

Gore MA and Akolekar D. Banana leaf dressing for skin graft donor areas. *Burns* 29(5), 483-6. 2003.

Herndon DN, Dasu MR, Wolfe RR, and Barrow RE. Gene expression profiles and protein balance in skeletal muscle of burned children after beta-adrenergic blockade. *American Journal of Physiology - Endocrinology & Metabolism* 285(4), E783-9. 2003.

Lai W, Chen H D, Zheng S Y, Gao H, and Xiong B. [Change of protein catabolism and immunocompetence in severely burned patients after operations and the therapeutic effect of recombinant human growth hormone]. [Chinese]. *Di Yi Junyi Daxue Xuebao* 23(10), 1112-4. 2003. Full. Growth factors.

Liao Y, Guo L, and Ding E Y. [A comparative study on burn wound healing treated by different methods of recombinant human epidermal growth factor]. [Chinese]. *Chung-Kuo Hsiu Fu Chung Chien Wai Ko Tsa Chih/Chinese Journal of Reparative & Reconstructive Surgery*. 17(4), 301-2. 2003.

Marin B V, Rodriguez-Osias C, Castillo-Duran C, Schlesinger L, Villegas J, Lopez M, and Iniguez G. Controlled study of arginine-supplemented diet in burn pediatric patients: immunological and metabolic effect. *Pediatric Research* 53(5), 872. 2003.

Mileski WJ, Burkhart D, Hunt JL, Kagan RJ, Saffle JR, Herndon DN, Heimbach DM, Lutermaier A, Yurt RW, Goodwin CW, and Hansborough J. Clinical effects of inhibiting leukocyte adhesion with monoclonal antibody to intercellular adhesion molecule-1 (enlimomab) in the treatment of partial-thickness burn injury. *Journal of Trauma-Injury Infection & Critical Care* 54(5), 950-8. 2003.

So K, Umraw N, Scott J, Campbell K, Musgrave M, and Cartotto R. Effects of enhanced patient education on compliance with silicone gel sheeting and burn scar outcome: a randomized prospective study. *Journal of Burn Care & Rehabilitation* 24(6), 411-7; discussion 410. 2003.

Still J, Glat P, Silverstein P, Griswold J, and Mazingo D. The use of a collagen sponge/living cell composite material to treat donor sites in burn patients. *Burns* 29(8), 837-41. 2003.

Suman OE, Thomas SJ, Wilkins JP, Mcack RP, and Herndon DN. Effect of exogenous growth hormone and exercise on lean mass and muscle function in children with burns. *Journal of Applied Physiology* 94(6), 2273-81. 2003.

Vloemans A F P, Soesman A M, Suijker M, Kreis R W, and Middelkoop E. A randomised clinical trial comparing a hydrocolloid-derived dressing and glycerol preserved allograft skin in the management of partial thickness burns. *Burns* 29(7), 702-10. 2003.

Wilkins JP, Suman OE, Benjamin DA, and Herndon DN. Comparison of self-reported and monitored compliance of daily injection of human growth hormone in burned children. *Burns* 29(7), 697-701. 2003.

Wolf SE, Thomas SJ, Dasu MR, Ferrando AA, Chinkes DL, Wolfe RR, and Herndon DN. Improved net protein balance, lean mass, and gene expression changes with oxandrolone treatment in the severely burned. *Annals of Surgery* 237(6), 801-10; discussion 810-1. 2003.

Zhou Y, Jiang Z, Sun Y, Wang X, Ma E, and Wilmore D. The effect of supplemental enteral glutamine on plasma levels, gut function, and outcome in severe burns: a randomized, double-blind, controlled clinical trial. *JPEN: Journal of Parenteral and Enteral Nutrition*. 27(4), 241-5, 304. 2003.

Pressure ulceration

Bates-Jensen B M, Alessi C A, Al-Samarrai N R, and Schnelle J F. The effects of an exercise and incontinence intervention on skin health outcomes in nursing home residents. *Journal of the American Geriatrics Society* 51(3), 348-55. 2003.

Graumlich JF, Blough LS, McLaughlin RG, Milbrandt JC, Calderon CL, Agha SA, and Scheibel WL. Healing pressure ulcers with collagen or hydrocolloid: A randomized, controlled trial. *Journal of the American Geriatrics Society* 51(2), 147-54. 2003.

Kennedy P, Berry C, Coggrave M, Rose L, and Hamilton L. The effect of a specialist seating assessment clinic on the skin management of individuals with spinal cord injury. *Journal of Tissue Viability*. 13(3), 122-5. 2003.

Maas-Irslinger R, Hensby C N, and Farley K L. Efficacy and safety of XENADERM ointment: a novel formulation for treatment of injured skin due to pressure ulcers. *Wounds-A Compendium of Clinical Research & Practice* 15(3), 2. 2003.

Meaume S, Van De Looverbosch D, Heyman H, Romanelli M, Ciangherotti A, and Charpin S. A study to compare a new self-adherent soft silicone dressing with a self-adherent polymer dressing in stage II pressure ulcers. *Ostomy Wound Management*. 49(9), 44-6, 48-51, 2003 Sep. 2003.

Russell L, Reynolds TM, Towns a, Worth W, Greenman, and Turner R. Randomized comparison trial of the RIK and the Nimbus 3 mattresses. *British Journal of Nursing* 12(4), 254-259. 2003.

Russell LJ, Reynolds TM, Park C, Rithalia S, Gonsalkorale M, Birch J, Torgerson D, and Iglesias C. Randomised clinical trial comparing CONFOR-Med and standard hospital mattresses: results of the prevention of pressure ulcers study (PPUS-1). *Advances in Skin and Wound Care Nov*, 317-27. 2003.

5th Scientific Meeting



Diabetic Foot Study Group

Diabetic Foot Study Group of the European Association for the Study of Diabetes

7-10 September 2005, Greece

The theme of the conference is
"Advancement of Knowledge on
all aspects of Diabetic Foot Care"

Abstract submission deadline
15 March 2005

Please visit www.dfsg.org
for further information.

www.dfsg.org

EWMA Journal

Previous Issues



Volume 2, no 2, Fall 2002

The Management of Pain Associated with Dressings Changes in Patients with Burns
Jacques Latarjet

Evaluating Australian Clinical Practice Guidelines for Pressure Ulcer Prevention
J. L. Prentice

Growth Factors and Interactive Dressings in Wound Repair
David Leaper et al

Contemporary Research in Pressure Ulcer Prevention and Treatment from the meta Register of Clinical Trials (mRCT)
E. Andrea Nelson



Volume 3, no 1, Spring 2003

Multidisciplinary Wound Healing Concepts
Finn Gottrup

Smoking and Wound Healing
Lars Tue Sørensen

Wound Healing, Bacteria and Topical Therapies
Keith F. Cutting

The Use of the Laplace Equation in the Calculation of Sub-bandage Pressure
Steve Thomas

Wounds in Art
Christina Lindholm

Was it Art or Science?
Carol Dealey



Volume 3, no 2, Fall 2003

Diabetic foot ulcer metabolism
Lars B Stolle, Per Reigels Nielsen

Clinical evaluation of L-Mesitran® – a honey-based wound ointment
Jan Vandeputte, P.H. Van Waeyenberge

Research on wound healing: The integration of a basic research laboratory into a clinical wound care unit
Stephan Coerper, M. Witte, M. Schäffer, C. Wicke, S. Wagner, G. Köveker, H.D. Becke

The prevalence of leg ulceration: a review of the literature
Michelle Briggs, S José Closs

Experiences of two (first-time) Cochrane reviewers
Gabriele Schlömer, Gero Langer



Volume 4, no 1, Spring 2004

Prevalence Investigation of Pressure Ulcers
Susan Bermark, Vonnice Zimmerdahl, Kirsten Müller

Histological examination of the distribution change of myofibroblasts in wound contraction
Ai Tanaka

Problematic recurrent ulcers: A case of calciphylaxis in a dialyzed patient
Massimo Bulckaen, A. Capitanini, I. Petrone, N. Petrini, Del Corso, F. Giuntoli, A. Rossi

The TELER System in Wound Care Research and Post Market Surveillance
Natasha Browne et al.

The Contribution of French Surgeons to Wound Healing in Medieval and Renaissance Europe
Carol Dealey

Previous issues can be acquired for €7,50 per copy. Please contact:
Congress Consultants, Martensens Allé 8, DK-1828 Frederiksberg C, Denmark
Tel: + 45 7020 0305, Fax: + 45 7020 0315, ewma@ewma.org

The EWMA Journals can also be downloaded free of charge from www.ewma.org

International Journals

The section on International Journals is part of EWMA's attempt to exchange information on wound healing in a broad perspective.

English



Advances In Skin & Wound Care. October 2004 Issue
www.woundcarejournal.com

CLINICAL MANAGEMENT EXTRA
Bariatric Skin and Wound Care

• **Obesity: Impediment to Postsurgical Wound Healing**
Joyce A. Wilson, Jan J. Clark

• **Preplanning with Protocols for Skin and Wound Care in Obese Patients**

Susan Gallagher, Charlotte Langlois, David Spacht, Annie Blackett, Therese Henns

This continuing education activity addresses the effects of obesity on postoperative wound healing and how preplanning protocols can minimize skin and wound care problems in this patient population.

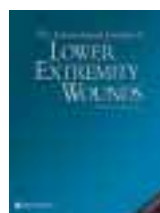
CLINICAL REVIEW

The Epidermal Skin Barrier:

Implications for the Wound Care Practitioner, Part I
Jane Fore-Pfliger

This first article in a 2-part series on the epidermal skin barrier examines the anatomy and development of the epidermis and stratum corneum, as well as homeostasis and physical stressors that affect the epidermis.

English



International Journal of Lower Extremity Wounds
– September 2004. <http://ijl.sagepub.com>

Wound Outcomes: The Utility of Surface Measures
Thomas Gilman

A Review of the Principles and Use of Lasers in Lower Limb Problems
A. M. Cotton

Wound Healing Potential of Pterocarpus Santalinus Linn: A Pharmacological Evaluation

Tuhin Kanti Biswas, Lakshmi Narayan Maity, Biswapati Mukherjee

Analysis of Skin Wound Images Using Digital Color Image Processing: A Preliminary Communication
Hakan Oduncu, Andreas Hoppe, Michael Clark, Robert J. Williams, Keith G. Harding

An Audit of Foot Infections in Patients with Diabetes Mellitus Following Renal Transplantation

Robbie K. George, Ashok K. Verma, Amit Agarwal, Gaurav Agarwal, Saroj K. Mishra

An Audit of Lower Extremity Complications in Octogenarian Patients with Diabetes Mellitus

James F. Reed, III

Sciatic Nerve Schwannoma

A. Rekha, A. Ravi

Buried Chip Skin Grafting in Neuropathic Diabetic Foot Ulcers Following Vacuum-Assisted Wound Bed Preparation:

Enhancing a Classic Surgical Tool with Novel Technologies
Jürgen Kopp, Ulrich Kneser, Alexander D. Bach, Raymund E. Horch

Finnish



HAAVA 2, 2004

Wound patient in home care

Wound management in integrated home help and nursing care unit – example from a rural town in the Middle-Finland

Outpatient treatment of wound patients in Satakunta Central Hospital

Pain management in wound care – Finnish translation of the World Union Healing Societies consensus document 2004

Pressure ulcer risk assessment and implementation of prevention in Salo Health Care Center

Ultrasound debridement of wounds

Learning by doing – applying system of apprenticeship in wound management education for practitioners

English



International Wound Journal, June 2004
www.blackwellpublishing.com

Early diagnosis is vital in the management of squamous cell carcinomas associated with chronic non healing ulcers: a case series and review of the literature
S. Enoch, D. R. Miller, P. E. Price, K. G. Harding

Comparison of bacteria-retaining ability of absorbent wound dressings
M. Tachi, S. Hirabayashi, Y. Yonehara, Y. Suzuki, P. Bowler

Necrotising fasciitis: a new management algorithm based on clinical classification
P. S. Carter, P. E. Banwell

Gamma-irradiated human skin allograft: a potential treatment modality for lower extremity ulcers
M. A. Rosales, M. Bruntz, D. G. Armstrong

Pyoderma gangrenosum: a challenging complication of bilateral mastopexy
S. V. Poucke, P. G. Jorens, R. Peeters, W. Jacobs, B. O. de Beeck, J. L. Beaucour

English



Journal of Tissue Viability, Vol 14, no 4, October 2004
www.tvs.org.uk

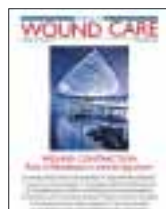
A clinical study and the National Service Framework for Diabetes
Angela Barry, Isabel Wilkinson, Victoria Halford, Kate Springett, Alistair McInnes

The role of outcome measures in assessing change in the at-risk rheumatoid foot
Simon Otter, Kate Springett, Kevin Lucas, Ann Moore, Rob Horne, Kevin Davies, Adam Young

The use of qualitative research methodologies to explore leg ulceration
Alison Hopkins

Policy implementation in practice: the case of national service frameworks in general practice
Kath Checkland, Stephen Harrison

English



Journal of Wound Care, October issue, Vol 13, No 9
www.journalofwoundcare.com / jwc@emap.com

Comparing the contractile properties of human fibroblasts in leg ulcers with normal fibroblasts
C. Viennet, V. Armbruster, A. C. Gabiot et al.

Psychological needs of patients when dressing a fungating wound: a literature review
M. L. Goode

Infection prophylaxis of gunshot wounds using probiotics
V. I. Nikitenko

An evaluation of non-adherent wound-contact layers for acute traumatic and surgical wounds
F. Burton

Clinical usage of honey as a wound dressing: an update
P. C. Molan, J. A. Betts

The release of zinc ions from and cytocompatibility of two zinc oxide dressings
M. S. Ågren, U. Mirastschijski

The prevention of heel pressure ulcers using a hydro-polymer dressing in surgical patients
Th. C. M. Bots, B. F. G. Apotheker

Is this leg ulcer venous? Unusual aetiologies of lower leg ulcers
B. King

Comparing cost per use of 3M Cavilon No Sting Barrier Film with zinc oxide oil in incontinent patients
H. Baatenburg de Jong, H. Admiraal

Evaluation of SurePress Comfort: a new compression system for the management of venous leg ulcers
R. Polignano, S. Guarnera, P. Bonadeo

Influence of dressing changes on wound temperature
W. McGuinness, E. Vella, D. Harrison

German



If existing
English abstracts are
available from
www.mhp-verlag.de

Zeitschrift für Wundheilung, Issue 05/2004
www.dgfw.de

Painless Woundmanagement in Children
Th. Meyer

Aspects of Health Economics in Vacuum Sealing of wounds
D. Nord

Extended Abstracts of the DGfW annual meeting, Weimar, 23/24th of September 2004)

Colonisation or infection: Relevance and Consequences for the Treatment of Chronic Wounds
A. Ambrosch

Remuneration in Surgery for Cases with Critical Ischemia: Which Possibilities exist in the German DRG-System
A. Billing, M. Thalhammer, H. Hornung, K.-W. Jauch

Transverse Collagenisation in Sclerous skin diseases
J. Brinckmann

Integrated Care in the Event of Arterial Ulcers
H. Daum, A. Bültemann, H. Diener, W. Gross-Fengels, B. Schulenburg, E.S. Debus

Aspects of Nursing in the concomitant Therapy of Ulcus cruris
G. Deutschle, C. Halm-Nill, S. Coerper

The Impact of the pH Value on Wound Healing
J. Dissemmond

Cytokines and Protease Activity – New Developments in the Treatment of chronic wounds
S. A. Eming

The change of Life after Infragenual Bypass Insertion
M. Engelhardt, H. Bruijnen, N. Jedzinsky, K. D. Wölfe

Cooperation Between Resident Doctor and Hospital in the Integrated Care
K. Chr. Mürter

IRA – At any Price?
G. Riepe

The Surgical Spectrum for the Treatment of Ulcus cruris venosum – From Endoscopic Perforans Dissection the Crural Fasciotomy
A. B. Schmidt, H.-W. Nestle, G. Salzmann

Polyarteriitis nodosa
IA. Kößler, J. Dissemmond

Scandinavian



Wounds (SÅR) Vol 12, no 3, 2004
www.saar.dk

Pressure ulcer preventing cushions – a possibility to prevent and treat ulcers on sitting surfaces
Helle Dreier

How to minimize pain connected to a wound bandage change – Principles for best practice... An initiative from the World Union of Wound Healing Societies

Unfortunate patient
Karl-Otto Hande

Experiences with Curapulse high pressure measure apparatus
Anna Nordmann og Ida Maria Agger

Resume: Pressure damages with hospitalised patients: Classification and screening
Anne-Birgitte Vogelsang

Resume: Treatment of Ulcus Cruris Venosum based on evidence. Development of clinical quality indicators
Monica L. Kjær

Danish Surgical Symposium: Clinical research – clinical experiences with wound treatment
Lisa Aalbæk

EWMA Activity Report

Recent Activities

- **EWMA Council Meetings:** The Council had two meetings this year – a meeting in Paris on July 12th 2004 and in London on October 13th 2004.
- **EWMA Executive Meetings:** The Executive Board has met twice in Paris this year – on July 11th and on October 12th 2004.
- **EWMA Co-operating Organisations Meetings:** The Board held its meeting in Paris in July of this year. The Co-operating Organisations Board holds two seats in the EWMA Council and as *Stephan Coerper*, DGfW and *Salla Seppänen*, FWCS, had ended their election period, the seats were up for election. The two new members of the EWMA Council are *Katia Furtado*, GAIF, and *Caroline Wyndham-White*, SafW.
- **Germany:** Meetings were held in July, September, October and December of this year to coordinate the preparation for the DGfW, ERTS and EWMA joint conference “Stuttgart 2005”, which takes place next year on the 15th-17th of September 2005.
- **Iceland:** In August and October 2004 EWMA participated in the establishment of The Icelandic Wound Healing Organisation. The organisation is now a member of EWMA.
- **Slovenia:** EWMA met in October 2004 with WMAS to plan epidemiology, education and implementation projects.
- **Poland:** EWMA met in October 2004 with PWMA to plan epidemiology, education and implementation projects.
- **Czech Republic:** In October and November EWMA met with CSLR to discuss the EWMA Conference in Prague in 2006 and the planning of epidemiology, education and implementation projects.
- **Spain, Portugal:** In August and October 2004 EWMA met with GNEAUPP, GAIF and APTF to discuss the possibilities of a conference in Portugal in 2008 and begin the planning of a Pan-Iberian development and implementation project on education in Wound Healing and Management.
- **EWMA Educational Panel:** The panel has met in June, July and October. Emphasis has been on the completion of the EWMA Curriculum and establishing accreditation procedures. Furthermore the Educational Panel has initiated several educational projects, most of which are in cooperation with members of EWMA Cooperating Organisations.
- **EWMA Corporate Sponsor Meetings:** EWMA hosted a meeting with the corporate sponsors on the October 13th 2004 in London.
- **Position Document:** In July 2004 the position paper on Wound Bed Preparation was published.

Forthcoming Activities

- EWMA Council Meeting: 15.03.2005 in London
- EWMA Executive Meeting: 14.03.2005 in London
- EWMA Co-operating Organisations Meeting: 15-17 September 2005 in Stuttgart
- EWMA Educational Panel: 14.03.2005 in London
- EWMA Corporate Sponsor Meeting: 15.03.2005 in London

EWMA Representatives

At the AGM in Paris in July this year two new representatives were elected to EWMA Council.



Katia Furtado



Carolyn Wyndham-White

As representatives of the Co-operating Organisations Board for the following year we welcome *Katia Furtado* from the Portuguese Wound Care Organisation (GaIF) and *Carolyn Wyndham-White* from the Swiss Association for Wound Care (SAfW).



Salla Seppänen



Stephan Coerper

At the same time we would like to express our warmest wishes to *Salla Seppänen* and *Stephan Coerper* and thank

them for all their efforts as co-operating representatives. We hope they will continue to share their valuable input with the Council.

EWMA Council



Javier Soldevilla

Javier Soldevilla has been elected to EWMA Council. Javier has been a co-opted member of Council since Joan Enric Torra Bou stepped down but has now been properly elected at the AGM.



Joan-Enric Torra I Bou

Joan-Enric Torra I Bou, has since he graduated with a Diploma in nursing at the Nursing College of the Universitat Central de Barcelona worked in different areas of Nursing, and since 1996 worked in a management post at the “Consorci Sanitari de Terrassa” (Terrassa’s Health Consortium), a Catalan Health Service. Joan-Enric Torra I Bou is the founding member of GNEAUPP, a large and very active wound management organisation in Spain.

Today he is working for a wound management company. Joan-Enric Torra I Bou has taught community nursing, nursing research and wound care in many universities in Spain as well as in health care institutions in Spain. He has contributed significantly to EWMA as a EWMA Council member, and the EWMA Council would like to take this opportunity to show its appreciation.

Dedicated to Healing Wounds

V.A.C.[®] Therapy™

Decreases wound volume

Removes excess fluid

Assists granulation*

acute/traumatic wounds

dehiscent wounds

flaps and grafts

subacute wounds

pressure ulcers

chronic wounds

diabetic ulcers

The new V.A.C.[®] Granufoam™ heel dressing is one of a range of dedicated dressings for challenging wounds. Designed to fit the contours of the heel for easier, faster and more comfortable dressing application.

It can be used in combination with proven, cost-effective and safe V.A.C.[®] therapy to help promote wound healing.

To find out more about V.A.C.[®] Therapy visit

www.kci1.com

THE V.A.C.
VACUUM ASSISTED CLOSURE™

KCI
The Clinical Advantage

For use with V.A.C.[®] ATS and V.A.C.[®] Freedom Therapy systems

©2007 KCI Medical Inc. All rights reserved. V.A.C. and Granufoam are trademarks of KCI Medical Inc. All other trademarks are the property of their respective owners. KCI Medical Inc. is not responsible for any misuse of the V.A.C. system. The V.A.C. system is a registered trademark of KCI Medical Inc. All other trademarks are the property of their respective owners.



EWMA Corporate Sponsor Contact Data

Corporate A



Coloplast
Holtedam 1-3
DK-3050 Humlebæk
Denmark
Tel: +45 49 11 15 88
Fax: +45 49 11 15 80
www.coloplast.com



ConvaTec Europe
Harrington House
Milton Road
Ickenham, Uxbridge
UB10 8PU
United Kingdom
Tel: +44 (0) 1895 62 8300
Fax: +44 (0) 1895 62 8362
www.convatec.com



Ethicon GmbH
Johnson & Johnson Wound Management
Oststraße 1
22844 Norderstedt
Germany
Tel: +49 40 52207 230
Fax: +49 40 52207 823
www.jnjgateway.com



KCI Europe Holding B.V.
Parktoeren, 6th floor
van Heuven Goedhartlaan 11
1181 LE Amstelveen
The Netherlands
Tel: +31 - (0) 20 - 426 0000
Fax: +31 (0)20 426 0097
www.kcimedical.com



Lohmann & Rauscher
P.O. BOX 23 43 Neuwied
D-56513
Germany
Tel: +49 (0) 2634 99-6205
Fax: +49 (0) 2634 99-1205
www.lohmann-rauscher.com



Mölnlycke Health Care Ab
Box 13080
402 52 Göteborg,
Sweden
Tel: +46 31 722 30 00
Fax: +46 31 722 34 08
www.tendra.com



Smith & Nephew
Po Box 81, Hessle Road
HU3 2BN Hull,
United Kingdom
Tel: +44 (0) 1482 225 181
Fax: +44 (0) 1482 328 326
www.smith-nephew.com



Tyco Healthcare
Tyco Healthcare
154, Fareham Road
PO13 0AS Gosport
United Kingdom
Tel: +44 1329 224479
Fax: +44 1329 224107
www.tycohealthcare.com

Corporate B



3M Health Care
Morley Street, Loughborough
LE11 1EP Leicestershire
United Kingdom
Tel: +44 1509 260 869
Fax: +44 1 509 613326
www.mmm.com



PAUL HARTMAN AG
Paul-Hartmann Strasse
D-89522 Heidenheim
Germany
Tel: +49 (0) 7321 / 36-0
Fax +49 (0) 7321 / 36-3636
www.hartmann.info



Nutricia
1e. Stationsstraat 18b
2700 MAZoetermeer
The Netherlands
Tel: +31 (0) 79-3539600
Fax: +31 (0) 79-3539650
www.nutricia.com

**Use the
EWMA Journal
to
profile your
company**

*Deadline for advertising in the
next issue is 1. March 2005.*

Conference Calendar

Conference	Theme	Month	Date	Place	Country
Current Concepts in Wound Healing		Jan	15	Florida	US
9th National Conference on Wounds and Scarring		Jan	16-18	Paris	France
Norwegian Wound Healing Association annual meeting		Feb	3-4	Kristiansand	Norway
Finnish Wound Healing Association annual Conference		Feb	3-4	Helsinki	Finland
17th Annual Burn and Wound Care Today	Assessment and appropriate management of patients with complex wounds and burn injuries	Feb	16-18	Minnesota	US
Institut Pasteur: Tissue repair and ulcer/wound healing	Molecular mechanisms, therapeutic targets and future directions	Mar	17-18	Paris	France
Diabetic Foot Global Conference 2005		Mar	3	California	US
North American Burn Society (NABS) 23rd Annual Meeting		Mar	19-24	Montana	US
ETRS Focus meeting	Diabetic vascular disease & wound complications	Mar	22-23	Southampton	UK
18th Annual Symposium on Advanced Wound Care		Apr	21-24	California	US
Tissue Viability Society Meeting		May	4	Aberdeen	Scotland
EPUAP 8th European Pressure Ulcer Advisory Panel Open Meeting		May	5-7	Aberdeen	Scotland
Wound Healing Society 2005	Marketing Opportunities	May	18	Chicago/Illinois	US
CAWC 11th annual		sum	tba	tba	Canada
European Wound Healing Summer School		July	22-25	Oxford	UK
DFSG - 5th Scientific Meeting		Sep	7-10	tba	Greece
Stuttgart 2005	From the laboratory to the patient: future organization and care of problem wounds	Sep	15-17	Stuttgart	Germany
Wound Care Consultant Society		Nov	4-5	Utrecht	The Netherlands



EWMA

Position Document 2004

Editor: Christine Moffatt.

Languages: English, French, German, Italian and Spanish.

See www.ewma.org

Wound bed preparation in practice

The third EWMA position document arose out of the need to focus on the factors that influence healing and why a significant proportion of chronic wounds fail to heal even with the highest standards of care.

The document, entitled 'Wound bed preparation in practice' seeks to advance understanding of the concept of wound bed preparation by examining how the four components of the 'T.I.M.E.' model (Tissue management; Inflammation and infection control; Moisture balance and Epithelial (edge) advancement) are translated into the practical management of different wound types, each presenting with unique clinical challenges.

The document has been made possible by a educational grant from Smith & Nephew. It has been published in English, French, German, Italian and Spanish and is available to download from the EWMA website (www.ewma.org) as a pdf.



Previous Position Documents:





SAfW Swiss Association for Wound Care

Dr. Hubert Vuagnat
President

Contacts:

Carolyn Wyndham-White,
Vice-president SAfW
– French-speaking section
carolyn.wyndham-
white@bluewin.ch

Laurent Chabal,
Vice-president SAfW
– French-speaking section
l.chabal@luewin.ch

Severin Laeuchli,
Vice-president SAfW
– German-speaking section
slaeuchli@safw.ch

Thomas Hunziker,
President SAfW
– German-speaking section
thomas.hunziker@insel.ch

Hubert Vuagnat,
President SAfW
– French-speaking section
hubert.vuagnat@hcuge.ch

*EWMA welcomes the Swiss wound organisation
and look forward to a mutually beneficial co-operation.*

History and creation of the Swiss Association for Wound care

The organisation of Swiss health professionals working in the field of wound care was made separately by Cantons: each one answering to specific structural and organizational realities as well as its cultural and linguistic sensibilities. In spite of these differences, the proposed objectives and implementation strategies in each Canton were very similar. It was logical, therefore, that sooner or later, these individual groups would join and evolve into the creation of a national association – the Swiss Association for Wound Care (SAfW).

However, as the linguistic barrier presents a real difficulty to overcome in Switzerland, this association has two entities: a Germanic section for the representatives of the German-speaking Cantons and a French section for the French-speaking members.

Furthermore, a postgraduate course in wound care and healing is proposed in these two entities, thus answering the identified need for education and development of quality practice.

The Swiss medical, sanitary, political and organizational issues depend on the competence of Cantons (regions). Hence while they re-

spond to general directives edicted by the Federal State, each Canton establishes its own laws, organizations and public health structures.

The field of health insurance remains within federal competence. Basic insurance is compulsory and covered by health insurances on a common and minimal basis. Complementary insurance is optional and covers a variety of listed acts. Both forms of insurances are subscribed to on a private basis.

Interest in wound care and healing arose in both the German and French parts of Switzerland. It first became formalized in the German part of the country with the creation of an association (SAfW) in 1997. Set up by Professor Urs Brunner, a surgeon interested in wound care and healing, it aimed to develop medical and nursing skills in this field and promote national and inter-regional communication in this matter. An annual congress was organized covering different wound care and healing themes, the need having being highlighted by the organization comity. An internet site was initiated as well as a yearly journal on different topics in wound care. The French parts of the country were invited to actively participate but ultimately, owing to the language and cultural difficulties, the society was dominated by German speakers. In response to this, local wound care groups emerged in the French-speaking parts of Switzerland. Most of these groups were created through the initiative of motivated nurses working in wound care, a few of them having followed a specialised training outside the country (e.g. in wound care and/or in stomatherapy). Representing a variety of medical institutes, by means of a survey, these groups highlighted the lack of education in the field of wound care as well as a variety of different practices specifically concerning prevention and the treatment of pressure ulcers. In order to bridge this gap these groups identified the same overall following goals:



From left to right:
S. Laeuchli – Vice-President – SAfW – German Switzerland
C. Wyndham-White – Vice-president – SAfW – French Switzerland
L. Chabal – Vice-president – SAfW – French Switzerland
Prof. T. Hunziker – President – SAfW – German Switzerland
Dr. H. Vuagnat – President – SAfW – French Switzerland

- Education in prevention of pressure ulcers in medical/social homes for elderly patients
- Creation of reference documents for pressure ulcer prevention and practical education by means of courses given by the members of the group
- On-line, specialized advice to be made available
- Organization of an annual training day

Year after year, the different groups joined forces to organize an annual congress. The number of participants steadily rose year after year to reach, in 2004, 350 participants.

In turn, the union around the yearly congress and the growing interest in wound care allowed the establishment, this year, of a distinct association in the French-speaking part of Switzerland, the SAfW French-speaking section. A collaboration is being developed to share our practice and reference documents within our regions as well as to develop standards in daily practice across both French and German-speaking Switzerland. A recognized network was also established with the help of the health industry to promote education; organize annual congresses and promote education issues. An active participation in international congresses was noted. However it became evident to the two main linguistic regions in the country that, in order to work more efficiently, two separate sections under one common umbrella association were necessary.

Two distinct and separated societies do not mean lack of union on national matters, each association works independently in its region but remains strongly linked for strategic actions, for example, coping with national, political and regulatory issues. A close link is ensured through a national bureau and through the internet. A yearly congress organized for the French region in spring and the German region in autumn enables participants to attend either one or both.

Postgraduate courses have recently been organized in both regions, thus enabling better specialization.

The common objectives are to:

- gather together professionals (doctors and paramedics) with experience and interest in wound care to promote their knowledge in this field; develop education issues; share reference documents and experiences, while developing contacts and research projects
- establish international contacts to promote educational and research projects in order to increase our level of expertise in this field and develop collaboration and exchange of experiences with our international colleagues. This will be facilitated by the participation of one of our vice-presidents in the EWMA comity this year.

Diabetic Vascular Disease & Wound Complications



The aim of this meeting is to update our knowledge base but with a focus on measurements. There will be keynote lectures, scintillating scientific sessions featuring, oral and poster presentations and workshops.

Selected abstracts will be published in International Journal of Lower Extremity Wounds.

For further information and abstract submission please visit:

http://vmrg.som.soton.ac.uk/southampton_2005.html

ETRS FOCUS MEETING

South Hampton UK

March 22-23 · 2005



WMAT Wound Management Association Turkey



Prof. Dr. Ali Barutçu
General Secretary

The chair of Plastic, Reconstructive and Aesthetic Surgery Dept. of Dokuz Eylül University Medical School, Izmir, Turkey

General Secretary of the Turkish Society of Plastic, Reconstructive and Aesthetic Surgery

Correspondence to:
Dr. Mediha Eldem sok. 60/2
Kızılay Ankara – Turkey
abarutcu@ipras.net

Wound Management Association Turkey

After the first Wound Management Congress, we (Prof. Dr. Semih Baksan, general surgeon, Prof. Dr. Ali Barutçu, plastic surgeon, and Ass. Prof. Dr. Bülent Erdoğan, plastic surgeon) were inspired and believed that "wound Healing is a team work. As soon as we returned to Turkey, we organised this association in order to educate every member of this great team of wound care professionals.

Now our Society has 200 active members strongly supported by other medical societies. The Turkish Plastic, Reconstructive and Aesthetic Surgery Society, the Turkish Society of Aesthetic, Plastic and Reconstructive Surgery and the Turkish Society of General Surgeons are our main supporters. We are actively seeking to gain the support of other societies such as the dermatological, physiotherapy, and nursing societies. We are working hard to expand the field of wound care knowledge and experience in Turkey.

Prof. Dr. Semih Baksan, President

Ass. Prof. Dr. Gökhan Adanali
Treasurer

Ass. Prof. Dr. Bülent Erdoğan
Dr. Orgun Deren
Dr. Asuman Serin



The 1st National Wound Healing Symposium 2002 Denizli/Turkey.



International Attendance in the first meeting (Prof. Dr. Cherry, and other invited speakers).



8th European Pressure Ulcer Advisory Panel Open Meeting

Aberdeen, Scotland

Theme:

**Pressure ulcers; back to basics
– the fundamental principles**

May 5-7 2005

For further registration and abstract submission please visit www.epuap.org or contact EPAUP by telephone: +44 (0)1865 714358



Stuttgart 2005

FROM THE LABORATORY TO THE PATIENT: FUTURE ORGANISATION AND CARE OF PROBLEM WOUNDS

STUTT GART · GERMANY · SEPTEMBER 15-17 · 2005



Important Deadlines

2nd Announcement
Call for Abstracts
January 2005

Abstract Submission
15 May 2005

Early Registration before
15 June 2005

Late registration before
15 August 2005

Conference Dates
15-17 September 2005

Conference Venue

Liederhalle Cultural and
Congress Centre
Stuttgart, Germany

Official Languages

The conference will be fully bilingual
German/English – English/German

Information

Registration Secretariat

Congress Partner
registration@stuttgart2005.org
Tel +49-30-204 59 0
Fax +49-30-204 59 50

Scientific Secretariat

Frau Jutta Schnabel
science@stuttgart2005.org
+49 (0) 7071 298 0336

Commercial Secretariat

Congress Consultants
commercial@stuttgart2005.org
Tel +45 7020 0305
Fax +45 7020 0315

For further information,
please fill out the form at
www.stuttgart2005.org

www.stuttgart2005.org



Co-operating Organisations



AISLeC

Associazione Infermieristica per lo Studio Lesioni Cutanee
Italian Nurse Association for the Study of Cutaneous Wounds
www.aislec.it



AIUC

Associazione Italiana Ulcere Cutanee
Italian Association for Cutaneous Ulcers
www.aiuc.it



APTF

Portuguese Wound Management Association
www.aptferridas.no.sapo.pt



AWA

Austrian Wound Association
www.a-w-a.at



CNC/BFW

Wound Management Organisation
www.befewo.org
www.wondzorg.be



Česká společnost
pro léčbu ran

CSLR

Czech Wound Management Society
www.cslr.cz



DGfW

Deutsche Gesellschaft für Wundheilung
www.dgfw.de



DWHS

Danish Wound Healing Society
www.dgfw.de



Suomen Haavanhoitoyhdistys ry

FWCS

Finnish Wound Care Society
www.suomenhaavanhoitoyhdistys.fi



Grupo Associativo de Investigação em Feridas

GAIF

Grupo Associativo de Investigação em Feridas
www.gaif.net



GNEAUPP

Grupo Nacional para el Estudio y Asesoramiento en Ulceras por Presión y Heridas Crónicas
www.gneaupp.org



IWHS

Iceland Wound Healing Society



LBAA

Latvian Wound Treating Organisation
sergejs.kolesnikovs@molnlycke.net



SUPPORT NETWORK

LSN

The Lymphoedema Support Network
www.lymphoedema.org/lsn



LUF
The Leg Ulcer Forum
www.legulcerforum.org



NIFS
Norwegian Wound Healing Association
www.nifs-saar.no



**POLISH WOUND
MANAGEMENT ASSOCIATION**

PWMA
Polish Wound Management Association



SAfW
Swiss Association for Wound Care
www.safw.ch



SFFPC
La Société Française et Francophone de Plaies et Cicatrisations
www.sffpc.org



SWHS
Svenskt Sårhäkningsällskap
www.sarlakning.com



**Tissue
Viability
Society**

TVS
Tissue Viability Society
www.tvs.org.uk



WMAOI
Wound Management Association of Ireland
www.wmaoi.org



WMAS
Slovenian Wound Management Association



WMAT
Wound Management Association Turkey



EWMA *Membership application*

Surname: _____

First name(s): _____

Profession: ☐ Physician ☐ Surgeon ☐ Dietician ☐ Nurse ☐ Pharmacist ☐ Other

Work Address: _____

Address for Correspondence (if different from above): _____

Tel: _____

Fax: _____

E-mail: _____

Payment accepted in pound sterling only, drawn on UK bank.
I enclose a cheque of £15. Please indicate cheque no.:

Please make cheques payable to:
European Wound Management Association

Or:

Please debit my account by £15:
Credit Card type: (Delta, Master Card or Visa)
Credit card no:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Expiry Date:

--	--	--	--

Exact name and initials on the credit card:

Please return form and enclose cheque to:
EWMA Secretariat, PO Box 864,
London SE1 8TT, United Kingdom
Tel: +44 207 848 3496, ewma@kcl.ac.uk



EWMA Journal



NUTRICIA

3M Health Care

- 3 Word from the president**
Peter Vowden

Scientific Articles

- 4 Advanced treatments for non-healing chronic wound**
Vincent Falanga
- 8 Watch the pressure – It drops!**
Anne Marie Larsen, Inger Futtrup
- 15 Cost Effectiveness of Dressing Materials**
Peter J. Franks

Background Article

- 21 Wound healing: Historical Aspects**
Finn Gottrup, David Leaper
- 29 Wound healing and fine art: What is possible to learn?**
Massimo Papi

EBWM

- 34 Abstracts of Recent Cochrane Reviews**
Sally Bell-Syer
- 36 Selected abstracts from 2nd World Union of Wound Healing Societies meeting**

EWMA

- 41 Update from the Treasurer: Overview of EWMA finances**
Marco Romanelli
- 42 Did You See?**
- 44 EWMA Journal Previous Issues**
- 44 International Journals**
- 46 EWMA Activity Report**
- 46 EWMA Representatives**
- 46 EWMA Council**
- 48 EWMA Corporate Sponsor Contact Data**

Conferences

- 49 Conference Calendar**

Organisations

- 50 SAfW Swiss Association for Wound Care**
- 52 WMAT**
Wound Management Association Turkey
- 54 Co-operating Organisations**