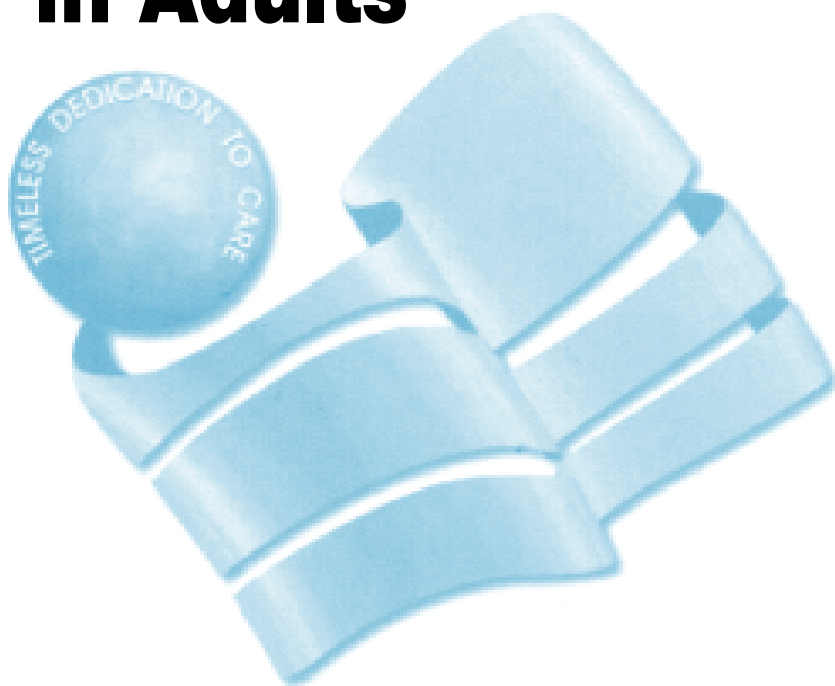


Nursing Management of Pressure Ulcers in Adults



Ministry
of Health

NMRC

National Medical
Research Council



SingHealth



National
Healthcare
Group

NYP Nanyang
Polytechnic



Institute of Technical Education

Dec 2001

MOH NURSING CLINICAL PRACTICE GUIDELINES 2/2001

Nursing Management of Pressure Ulcers in Adults

Dec 2001

STATEMENT OF INTENT

This set of guidelines serves as a guide for caregivers of adults with pressure ulcers. It should be used in conjunction with ***MOH Nursing Clinical Practice Guidelines 1/2001 Prediction and Prevention of Pressure Ulcers in Adults.***

Recommendations are based on best available evidences at the time of guideline development. New research studies are ongoing thus the contents are subject to updates as scientific knowledge unfolds. Due to the unique variations in each individual circumstance, adopting this set of guidelines does not guarantee effective client outcomes in every instance.

Every practitioner must exercise clinical judgement in the nursing management of patients with pressure ulcers. Practitioners must assess the appropriateness of the recommendations in the light of individual client's condition, overall treatment goal, resource availability, institutional policies and viable treatment options before adopting any of them for their own practice.

FOREWORD

The prevention and treatment of pressure ulcers is a challenge in the care of patients with compromised mobility. Prediction through accurate assessment and prevention of pressure ulcers using appropriate measures are of primary importance. However, for patients who have already developed pressure ulcers, timely intervention can reduce morbidity and mortality rates. The concerted effort of patients, caregivers, nurses, doctors, dietitians and other paramedical personnel is necessary for optimal outcomes.

I am pleased to present these clinical practice guidelines as a follow up to the Nursing Clinical Practice Guidelines on the Prediction and Prevention of Pressure Ulcers in Adults. The main aims of these guidelines are to enhance appropriateness, effectiveness and efficiency of care, and to reduce unacceptable variation in clinical practice. I hope that these guidelines will be incorporated into the routine nursing practice in our institutions, for the benefit of our patients.

PROFESSOR TAN CHORH CHUAN
DIRECTOR OF MEDICAL SERVICES

CONTENTS

1	Introduction	6
1.1	Background	6
1.2	Definition of Pressure Ulcers	6
1.3	Staging of Pressure Ulcers	6
1.4	Highlights of Patient Management	9
1.5	Scope of the Guidelines	9
2	Development of Guidelines	10
2.1	Training and Guidance	10
2.2	Strategy and Literature Review	10
2.3	Evaluation of Evidence and Grading of Recommendations	10
2.4	Guidelines Review and Revision	14
2.5	Limitations	14
3	Algorithm for the Nursing Management of Pressure Ulcers in Adults.	15
4	Clinical Guidelines/ Recommendations	16
4.1	Assessment	16
4.2	Wound Cleansing	18
4.3	Debridement	19
4.4	Dressings	20
4.5	Nutrition	22
4.6	Psychosocial Assessment	23
4.7	Pain	24
5	Clinical Audit	25
5.1	Outcome Indicators	25
5.2	Management Role	25
6	Implementation of Guidelines	26
	References	27
	Glossary	29
	Workgroup Members	32

1 INTRODUCTION

1.1 Background

Pressure ulcers remain a serious problem in the care of vulnerable patients. According to a local study by the Ministry of Health (MOH Nursing Department 1998), the incidence ranges from 5% – 16% among in-patients. Prevention is better than cure. However, if patients have pressure ulcers, accurate assessment followed by prompt and effective management can minimise pain and other complications.

1.2 Definition of Pressure Ulcers

A pressure ulcer is defined as ‘an area of localised damage to the skin, muscle and/or underlying tissue, caused by shear, friction or unrelieved pressure, usually over bony prominences’.

1.3 Staging of Pressure Ulcers

The staging of pressure ulcers uses the National Pressure Ulcers Advisory Panel four-level staging system (NPUAP 1989; NPUAP 1998).

Stage I: An observable pressure related alteration of intact skin whose indicators as compared to the adjacent or opposite area on the body may include changes in one or more of the following:

- skin temperature (warmth or coolness)
- tissue consistency (firm or boggy feel) and/or
- sensation (pain, itching).

The ulcer appears as a defined area of persistent redness in lightly pigmented skin, whereas in darker skin tones, the ulcer may appear with persistent red, blue, or purple hues.

Stage II: Partial thickness skin loss involving epidermis, dermis, or both. The ulcer is superficial and presents clinically as an abrasion, blister, or shallow crater.

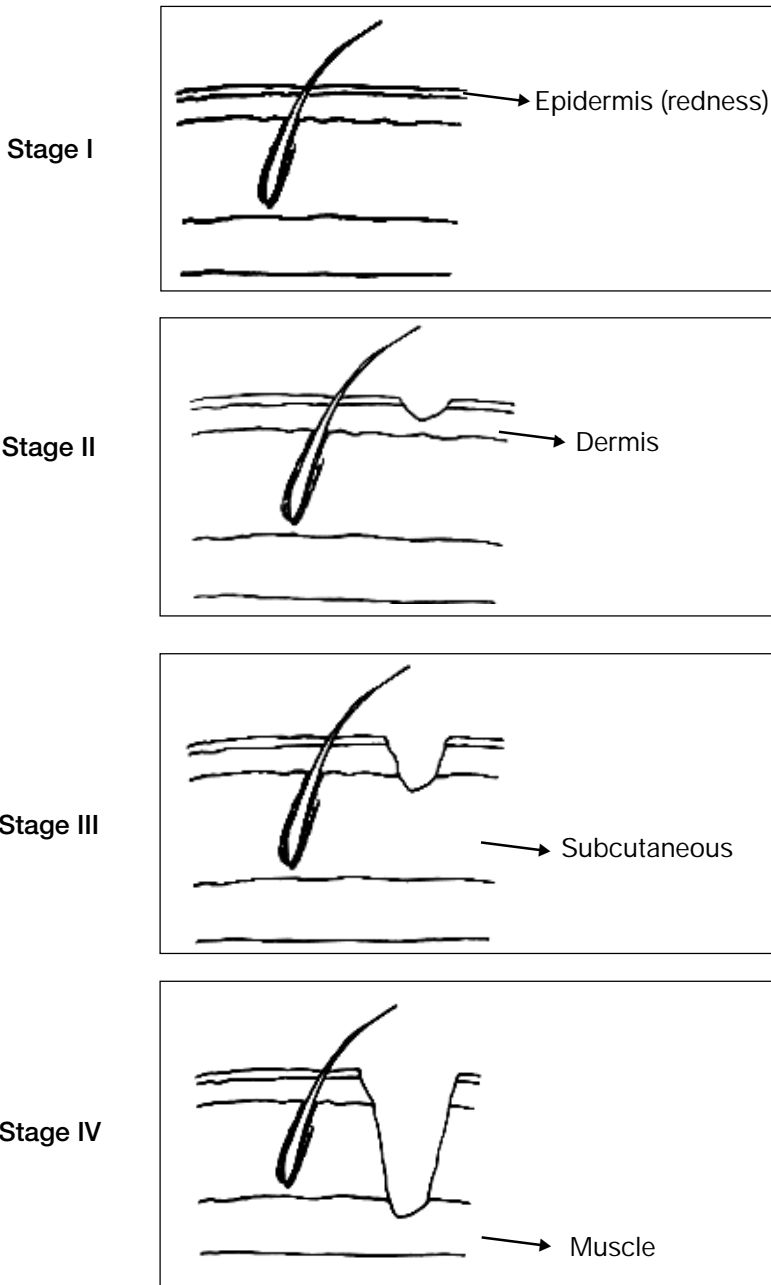
Stage III: Full thickness skin loss involving damage to or necrosis of subcutaneous tissue that may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without sinus tracts extending into adjacent tissue.

Stage IV: Full thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures (e.g. tendon, joint capsule). Sinus tracts also may be associated with Stage IV pressure ulcers.

These staging definitions recognise the following limitations:

- Stage I pressure ulcers may be superficial, or they may be a sign of deeper tissue damage;
- Stage I pressure ulcers are not always accurately assessed, especially in patients with darkly pigmented skin;
- When an eschar is present, a pressure ulcer cannot be accurately staged until it is removed;
- It may be difficult to assess pressure ulcers in patients with casts, other orthopaedic devices, or support stockings. Extra vigilance is required to assess ulcers under these circumstances.

Figure 1 Diagrammatic presentation of pressure ulcer at various stages.



1.4 Highlights of Patient Management

Patients and their families are important team players in the effective management of pressure ulcer treatment. The clinician should:

- Discuss treatment options with patients and their families
- Encourage patients to be active participants in their care
- Develop an effective plan of care that is consistent with the patient's goals

The recommended treatment programme should focus on:

- Assessment of the patient and the pressure ulcer(s)
- Managing tissue loads
- Ulcer care
- Managing bacterial colonisation and infection
- Operative repair of the pressure ulcer(s)
- Education and quality improvement

1.5 Scope of the Guidelines

These clinical practice guidelines are tools for assisting clinical decision making about the nursing care given to patients with pressure ulcers. They are the result of systematic identification and synthesis of published research findings and expert opinion. They should be adapted locally to suit a particular situation and patient. It is the intention of the workgroup not to be encyclopaedic in coverage but to produce a concise, readable and practical format that addresses key topics which can be used as a reference and training tool.

This set of guidelines is intended as a simple and readable reference for caregivers of adults with pressure ulcers.

2 DEVELOPMENT OF GUIDELINES

2.1 Training and Guidance

Members of the workgroup attended a two-day interactive training workshop to learn about and discuss the theory and practical issues of developing evidence-based guidelines under the guidance of Dr Edwin Chan and Dr Miny Samuel of the MOH Clinical Trials & Epidemiology Research Unit. The practical training revolved around topic selection and the development of “mock” evidence-based guidelines which developed into this present guidelines.

2.2 Strategy and Literature Review

Two highly regarded evidence-based guidelines were reviewed:

- The Agency of Healthcare Research and Quality (AHRQ) Practice Guideline on Pressure Ulcer Treatment: Technical Report Number 15 **Treating Pressure Ulcers** Volume 1 (Bergstrom and Cuddigan 1994); and
- The **Pressure Sores – Part II: Management of Pressure Related Tissue Damage** from The Joanna Briggs Institute for Evidence Based Nursing & Midwifery (JBI 1997).

The members felt that an updated literature search on the specific topics addressed would suffice. The electronic databases (MEDLINE, EMBASE, Cochrane Library, SPRINGNET and CINAHL) and hard copies of relevant journals (Journal of Wound Care, Advances in Wound Care, Current Problems in Surgery, Resources in Wound Care Management Directory) were searched.

2.3 Evaluation of Evidence and Grading of Recommendations

We adopted the revised Scottish Intercollegiate Guidelines Network (SIGN 2001) procedure which gives clear guidance on evaluating the design of individual studies, grading each study’s level of evidence (see 2.3.1 and 2.3.2); and assigning a grade to the recommendation after taking into account external validity, result consistency, local constraints and expert opinion (see 2.3.3). The extensive reliance on the AHRQ and JBI guidelines is acknowledged and treated as a very special case of published expert opinion.

The guideline statement with the accompanying rationale was modelled after the simple declarative style of the Dialysis Outcomes Quality Initiative guidelines (NKF-K/DOQI 2001) in order to provide a clear link between the recommendation and its justification. The word “should” is not to be taken to mean “must”.

2.3.1 Individual Study Validity Rating

All primary studies and reviews addressing a particular topic e.g. measurement of wound size, were appraised using a SIGN checklist appropriate to the study’s design. This resulted in an individual study rating for internal validity according to the criteria described below:

Rating	Description
++	All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought <u>very unlikely</u> to alter.
+	Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought <u>unlikely</u> to alter the conclusions.
-	Few or no criteria fulfilled. The conclusions of the study are thought <u>likely or very likely</u> to alter.

2.3.2 Levels of Evidence

The study design is designated by a numerical prefix

- “1” for systematic reviews or meta-analyses or randomised controlled trials (RCTs)
- “2” for cohort and case-control studies
- “3” for case reports/series
- “4” for expert opinion/ logical arguments/ “common” sense

Each study is assigned a level of evidence by combining the design designation (1, 2, 3 or 4) and its validity rating (++, + or -). The meaning of the various 'levels of evidence' are given below:

Level	Type of Evidence
1 ⁺⁺	High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias.
1 ⁺	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias.
1 ⁻	Meta-analyses, systematic reviews, or RCTs with a high risk of bias.
2 ⁺⁺	High quality systematic reviews of case-control or cohort studies. High quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal.
2 ⁺	Well-conducted case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal.
2 ⁻	Case-control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal.
3	Non-analytic studies e.g. case reports, case series.
4	Expert opinion.

2.3.3 Grade of Recommendation

The detailed results of each study and mitigating local circumstances were considered in the formulation of each guideline which was then assigned a 'grade of recommendation' according to the criteria listed below:

Grade	Recommendation
A	At least one meta-analysis, systematic review, or RCT rated as 1 ⁺⁺ , and directly applicable to the target population; or A body of evidence, consisting principally of studies rated as 1 ⁺ , directly applicable to the target population, and demonstrating overall consistency of results.
B	A body of evidence, including studies rated as 2 ⁺⁺ , directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1 ⁺⁺ or 1 ⁺ .
C	A body of evidence including studies rated as 2 ⁺ , directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2 ⁺⁺ .
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2 ⁺ .

2.3.4 Interpretation of the D/4 Grading

The grading system emphasises the quality of the experimental support underpinning each recommendation. The grading D/4 was assigned in cases where

- it would be unreasonable to conduct a RCT because the correct practice is logically obvious
- recommendations derived from existing high quality evidence-based guidelines. We alert the user to this special case by appending the initials of the source e.g. (D/4; Bergstrom et al 1994; JBI 1997)

2.4 Guidelines Review and Revision

A set of the draft guidelines was circulated to selected health-related institutions for peer review and evaluation of the validity, reliability and practicality of the recommendations.

This set of guidelines will be reviewed and revised periodically to incorporate the latest relevant evidence and expert clinical opinion.

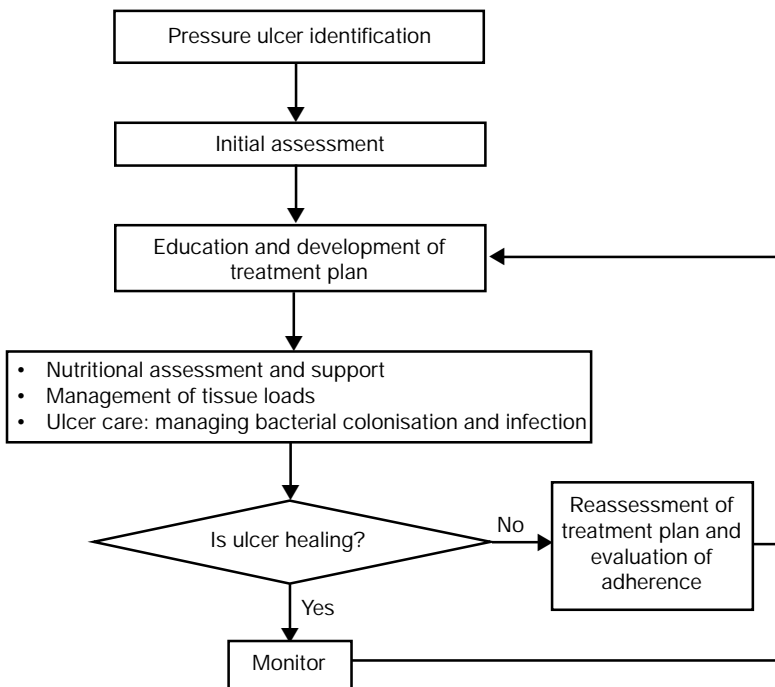
2.5 Limitations

This set of guidelines offers recommendations based on current scientific evidence and professional judgement. It is not intended as legal standard of care and does not guarantee or ensure safe and effective patient care.

Users of this set of guidelines should determine what are safe and appropriate patient care practices, based on assessment of the circumstances of the particular patient, their own clinical experiences and the knowledge of the most recent research findings.

3 ALGORITHM FOR THE NURSING MANAGEMENT OF PRESSURE ULCERS IN ADULTS

Figure 2 Algorithm for the nursing management of pressure ulcers.



4 CLINICAL GUIDELINES/ RECOMMENDATIONS

4.1 Assessment

Guideline 1: Initial Assessment

The initial assessment of a pressure ulcer should include its location, size, stage, condition, odour, amount and type of exudate. The presence, location and extent of sinus tracts, pain and signs of infection, condition of surrounding skin, general condition and diagnosis of patient should also be assessed and documented.

(D/4; Bergstrom et al 1994; JBI 1997)

Rationale:

- Adequate baseline assessment is needed for planning of treatment and for monitoring the progress of wound healing.
- A uniform description of wound parameters facilitates communication among healthcare providers.
- Assessing the general condition of the patient provides holistic care by considering all factors that affect wound healing.

(Bergstrom et al 1994; JBI 1997)

Guideline 2: Wound Size

The initial and subsequent outlines of the wound should be traced and dated on a clean transparent plastic material.

(D/4; Bergstrom et al 1994)

Rationale:

- This is a simple, inexpensive and adequately accurate method of monitoring the progress of wound healing.

(Bergstrom et al 1994; Harding 1995)

Guideline 3: Wound Depth/ Length of Sinus Tract

The depth of the pressure ulcer and the length of sinus tract should be estimated by placing a sterile applicator/ catheter to the deepest point.
(D/4; Lagemo et al 1998)

Rationale:

- This is a simple, inexpensive and adequately accurate method of measurement.

(Bergstrom et al 1994)

Guideline 4: Staging of Pressure Ulcer

Staging of pressure ulcers using National Pressure Ulcers Advisory Panel four-level staging system should only be performed during the initial assessment.

(D/3; Bergstrom et al 1994; Xakellis and Frantz 1997)

Rationale:

- The healing process is not a simple reversal of wound development process. Therefore, staging should not be used as a tool for re-assessment.

(Maklebust 1997)

Guideline 5: Re-assessment

A pressure ulcer should be re-assessed at least once a week or when the condition of the patient or wound deteriorates.

(D/4; Bergstrom et al 1994; JBI 1997)

Rationale:

- This is to evaluate adequacy and suitability of the treatment plan.

(Bergstrom et al 1994, JBI 1997)

4.2 Wound Cleansing

Guideline 1: Cleansing Medium

The wound should be cleansed with solutions that are non-toxic to granulating tissue e.g. normal saline.

(D/4; Bergstrom et al 1994; JBI 1997)

Rationale:

- Cleansing agents should not harm the wound. Normal saline is physiological unlike antiseptic agents (e.g. povidone iodine, sodium hypochlorite, hydrogen peroxide) which are non-selective and cytotoxic to healthy tissue.

(Bergstrom et al 1994; JBI 1997)

Guideline 2: Mechanical Cleansing

Appropriate mechanical pressure/ force should be used to remove non-viable tissue, excess exudate and metabolic wastes, without causing trauma to the wound bed.

(D/4; Bergstrom et al 1994; JBI 1997)

Rationale:

- Traumatized wounds are more susceptible to infection and are slower to heal.

(Bergstrom et al 1994; JBI 1997)

4.3 Debridement

Guideline 1: Choice of Debridement Method

Necrotic tissues should be debrided. The choice of debridement method should be based on the patient's condition, treatment goal and type and amount of necrotic tissue in the wound.

(D/4; Bergstrom et al 1994; JBI 1997; Bradley et al 1999)

Rationale:

- Removal of necrotic tissue promotes an aerobic environment that enhances wound healing.
- Consequences of not debriding include protein loss through large open wounds, risk of osteomyelitis, general infection, septicaemia, limb amputation and death.
- Inappropriate choice of debridement method will cause unnecessary distress to the patient or delay wound healing.

(Bergstrom et al 1994; JBI 1997;
Sieggreen & Maklebust 1997; Bradley et al 1999)

Guideline 2: Sharp Debridement

Sharp debridement is the preferred choice when debridement is urgently indicated, e.g. advancing cellulitis or sepsis. Sharp debridement is not recommended for patients with low platelet counts or taking anti-coagulant medication or when there is a lack of clinical expertise to perform the debridement.

(D/4; Bergstrom et al 1994; JBI 1997)

Rationale:

- Sharp debridement is the most rapid method of removing necrotic tissue and promotes an aerobic environment in the wound bed.
- Complications of sharp debridement include bleeding, possible nerve damage and transient bacteraemia during debridement.

(Bergstrom et al 1994; JBI 1997)

Guideline 3: Autolytic Debridement

Autolytic debridement techniques should be used when there is no urgent clinical need for drainage or removal of devitalised tissue. It is contraindicated in infected ulcers.

(D/4; Bergstrom et al 1994)

Rationale:

- Autolytic debridement requires minimal clinical skill and is non-traumatic. Infected necrotic tissue requires a more rapid method of debridement.

(Bergstrom et al 1994)

4.4 Dressings

Guideline 1: Moist Wound Healing

The dressing should keep the ulcer bed moist and the surrounding tissue (periulcer) skin dry.

(D/3; Bergstrom et al 1994; Thomas et al 1998)

Rationale:

- A moist wound environment is important for healing as it provides optimal conditions for cell migration and mitosis.

(Bergstrom et al 1994; Thomas et al 1998)

Guideline 2: Choice of Dressings

The choice of wound dressings should depend on the treatment goal and the size, shape, depth, location and condition of the wound.

(D/4; Bergstrom et al 1994)

Rationale:

- There is no single dressing suitable for the management of every wound.
- Each wound care product has unique properties suited for different wound management goals.

(Bergstrom et al 1994)

Guideline 3: Granulating Wound

Granulating wounds should be dressed with hydrocolloid or other non-adherent dressing.

(D/4; Bergstrom et al 1994)

Rationale:

- The dressing should be easy to remove without traumatising the wound.

(Thomas 1997; Bergstrom et al 1994)

Guideline 4: Exudative Wound

Exudative wounds should be dressed with highly absorbent material e.g. alginate, foam/ hydrofibre or hydropolymer.

(D/3; Bergstrom et al 1994; Hess 2000)

Rationale:

- Excessive exudate should be removed to minimise excoriation and maceration of the surrounding skin.
- The highly absorbent nature of the dressing also reduces the frequency of dressing changes.

(Bergstrom et al 1994)

Guideline 5: Eschar

Wounds with eschar should be dressed with hydrocolloid or hydrogel used together with an occlusive dressing e.g. polyurethane film.

(D/4; JBI 1997)

Rationale:

- Hydration of the wound promotes autolytic debridement, and hence facilitates eschar removal.
- The occlusive dressing prevents moisture loss.

(JBI 1997; Thomas 1997; Hess 1999)

Guideline 6: Sloughy Wound

Wounds with slough should be dressed with a hydrocolloid, hydrogel or alginate dressing.

(D/4; Bergstrom et al 1994; JBI 1997)

Rationale:

- The autolytic property of the dressing facilitates removal of slough.
(Thomas 1997; Hess 2000)

Guideline 7: Granulating Cavity Wound

Cavity wounds should be loosely packed with non-adherent dressings.

(D/4; Bergstrom et al 1994)

Rationale:

- Dead space should be eliminated to minimise abscess formation. Wound packing prevents closure of the sinus entrance before the wound heals.

(Bergstrom et al 1994; Hess 2000)

4.5 Nutrition

Guideline 1: Nutritional Assessment

Healthcare providers should do baseline and ongoing assessment of nutritional status, appropriate interventions, and evaluation of the effectiveness of medical nutritional therapy.

(D/4; Bergstrom et al 1994)

Rationale:

- Nutritional deficits should be detected and rectified promptly as malnutrition (e.g. deficit in Body Mass Index measurement) predisposes a patient to pressure ulcers.
- Adequate nutrients will help to prevent deterioration and promote healing.

(Bergstrom et al 1994; Strauss and Margolis 1996;
JBI 1997; Carlson 1999)

4.6 Psychosocial Assessment

Guideline 1: Initial Psychosocial Assessment

The nurse should perform a psychosocial assessment which includes the following areas:

- mental status
- social support
- medications
- values and lifestyle
- stressors

(D/4; Bergstrom et al 1994)

Rationale:

- This information helps the nurse to determine the ability and motivation of the patient and the caregiver.
- An accurate assessment helps the nurse to formulate a plan of care consistent with the patient and caregiver's needs and goals, and their ability to adhere to the treatment programme.

(Bergstrom et al 1994)

Guideline 2: Re-assessment

Periodic psychosocial re-assessment should be included when the wound management is reviewed.

(D/4; Bergstrom et al 1994)

Rationale:

- Psychosocial factors may change over the course of the treatment programme which may adversely affect wound healing.

(Bergstrom et al 1994)

Guideline 3: Patient Education

The nurse should involve the patient and caregiver in the treatment programme.

(D/4; Bergstrom et al 1994)

Rationale:

- Compliance is greater when the patient and caregiver participate in the treatment process.

(Bergstrom et al 1994)

4.7 Pain

Guideline 1: Pain Management

Pain assessment and pain relief should be a high priority.

(D/4; JBI 1997)

Rationale:

- Patients experience pain during turning, change of dressing and wound debridement.
- The type of dressing, frequency of change, support surfaces and repositioning can contribute to and/or provide relief from pain.
- Effective steps to relieve pain will promote comfort for the patient and promote compliance with treatment plans.

(JBI 1997)

5 CLINICAL AUDIT

Hospital and institution administrators should incorporate these guidelines in their in-house quality assurance programmes. Nurses should critically review the implications of these guidelines on their routine care, patient teaching and education needs.

5.1 Indicators

In pressure ulcer management, the indicators should include:

- frequency and quality of assessment of pressure ulcers
- assessment of pain, psychosocial and nutritional status
- use of non-toxic cleansing agents and appropriate debridement methods and dressings that are consistent with the moist wound healing paradigm.

A baseline of these measures should be established for future comparison. Institutions should set their own measurable target for each indicator. These can be included as items in the routine clinical audits. Audits can be performed on randomly selected individual episodes of care and retrospective review of recent cases.

5.2 Management Role

Hospital and institution administrators, together with quality assurance teams, should ensure that these indicators are met. Results should be documented and available for benchmarking.

6 IMPLEMENTATION OF GUIDELINES

It is expected that these guidelines should be adopted after discussion involving clinical staff and hospital and institution management. They may review how these guidelines may complement or be incorporated into their existing institutional protocols.

Feedback may be directed to the Ministry of Health for consideration in future reviews.

REFERENCES

- Bergstrom N, Bennett MA, Carlson CE, et al. 1994. *Treatment of Pressure Ulcers. Clinical practice guideline, No. 15*. Rockville, MD: US Department of Health and Human Services, Public Health Service, Agency for Healthcare Research and Quality. AHRQ Publication No. 95-0652.
- Bergstrom N, Cuddigan J, editors. 1994. *Treating Pressure Ulcers. Guideline Technical Report, No. 15. Vol. I*. Rockville, MD: US Department of Health and Human Services, Public Health Service, Agency for Healthcare Research and Quality. AHRQ Publication No. 96-N014.
- Bradley M, Cullum N, Nelson EA, Petticrew M, Sheldon T, Torgerson D. 1999. *Systematic reviews of wound care management: (2) Dressings and topical agents used in the healing of chronic wounds*. Health Technology Assessment: NHS R&D HTA Programme.
- Carlson GL. 1999 The influence of nutrition and sepsis upon wound healing. *Journal of Wound Care*, Oct 8(9):471-474.
- Harding KG. 1995. Methods for assessing change in ulcer status. *Advances in Wound Care*, 8(4):37S-42S.
- Hess CT. 1999. When to use alginate dressings. *Nursing 2000*, 30(2):26.
- Hess CT. 2000. When to use hydrogel dressings. *Advances in Skin & Wound Care*, 13(1):42.
- Joanna Briggs Institute for Evidence Based Nursing and Midwifery. 1997. *Pressure sores Part II: Management of pressure related tissue damage*. Best Practice, 1(2):1-6.
- Lagemo DK, Melland H, Hanson D, Olson B, Hunter S & Henly SJ. 1998. Two-dimensional wound measurement: comparison of 4 techniques. *Advances in Wound Care*, 11(7):337-343.
- Maklebust J. 1997. Policy Implications using reverse staging to monitor pressure ulcer status. NPUAP Proceedings. *Advances in Wound Care*, 10(5):32-35.

Ministry of Health Nursing Department. 1998. *Nursing research report on the prevalence & incidence of pressure sores among patients in Alexandra Hospital, Changi Hospital & Tan Tock Seng Hospital*. Ministry of Health, Nursing Department.

National Pressure Ulcer Advisory Panel. 1989. Pressure ulcers - incidence, economics and risk assessment. Consensus development conference statement. *Decubitus*, 2(2):24-28.

National Pressure Ulcer Advisory Panel. 1998. *Stage I assessment in darkly pigmented skins*. <http://www.npuap.org/positn4.htm>.

NKF-K/DOQI. 2001. Clinical practice guidelines for haemodialysis adequacy: Update 2000. *Am J Kidney Dis*, Jan; 37 (1 Suppl 1): S7-S64.

Sieggreen MY & Maklebust J. 1997. Debridement: Choices and challenges. *Advances in Wound Care*, 10(2):32-37.

SIGN. 2001. *Scottish Intercollegiate Guidelines Network*. <http://www.nhsis.co.uk/sign/index>.

Strauss EA & Margolis DJ. 1996. Malnutrition in patients with pressure ulcers: Mobility, mortality, and clinically practical assessments. *Advances in Wound Care*, 9(5):37-40.

Thomas DR, Goode PS, LaMaster K & Tennyson T. 1998. Acemannan hydrogel dressing versus saline dressing for pressure ulcers. *Advances in Wound Care*, 11(6):273-276.

Thomas S. 1997. A guide to dressing selection. *Journal of Wound Care*, 6(10):479-482.

Xakellis GC & Frantz RA. 1997. Pressure ulcer healing: What is it? What influences it? How is it measured? NPUAP Proceedings. *Advances in Wound Care*, 10(5):20-26.

GLOSSARY

Abscess. A circumscribed collection of pus that forms in tissue as a result of acute or chronic localised infection. It is associated with tissue destruction and frequently swelling.

Antiseptic. Product with anti-microbial activity.

Cellulitis. Inflammation of cellular or connective tissue. Inflammation may be diminished or absent in immuno-suppressed individuals.

Cellulitis (advancing). Cellulitis that is visibly spreading in the area of the wound. Advancement can be monitored by marking the outer edge of the cellulitis and assessing the area for advancement or spread 24 hours later.

Clean dressing. Dressing that is not sterile but is free of environmental contaminants such as water damage, dust, pest and rodent contaminants, and gross soiling.

Colonised. The presence of bacteria on the surface or in the tissue of a wound without indications of infection such as purulent exudate, foul odour, or surrounding inflammation. All Stage II, III or IV pressure ulcers are colonised.

Dead space. A cavity remaining in a wound.

Debridement. Removal of devitalised tissue and foreign matter from a wound. Various methods can be used for this purpose.

Autolytic debridement. The use of synthetic dressings to cover a wound and allow eschar to self-digest by the action of enzymes present in wound fluids.

Sharp debridement. Removal of foreign material or devitalised tissue by a sharp instrument such as a scalpel. Laser debridement is also considered a type of sharp debridement.

Dressing. The material applied to a wound for the protection of the wound and absorbance of drainage.

Alginate dressing. A non-woven absorptive dressing manufactured from seaweed.

Film dressing. A clear, adherent, non-absorptive, polymer-based dressing that is permeable to oxygen and water vapour but not to water.

Foam dressing. A sponge-like polymer dressing that may or may not be adherent; it may be impregnated or coated with other materials and has some absorptive properties.

Hydrocolloid dressing. An adhesive, mouldable wafer made of a carbohydrate-based material, usually with a waterproof backing. This dressing usually is impermeable to oxygen, water, water vapour and has some absorptive properties.

Hydrogel dressing. A water-based, non-adherent, polymer-based dressing that has some absorptive properties.

Eschar. Thick, leathery, necrotic, devitalised tissue.

Exudate. Any fluid that has been extruded from a tissue or its capillaries, more specifically because of injury or inflammation. It is characteristically high in protein and white blood cells,

Granulation tissue. The pink/red, moist tissue that contains new blood vessels, collagen, fibroblasts and inflammatory cells, which fills an open, previously deep wound when it starts to heal.

Infection. The presence of bacteria or other micro-organisms in sufficient quantity to damage tissue or impair healing. Clinical experience has indicated that wounds can be classified as infected when the wound tissue contains 10^5 or greater micro-organisms per gram of tissue. Clinical signs of infection may be present, especially in the immuno-compromised patient or the patient with a chronic wound.

Macerate. To soften by wetting or soaking. In this context, it refers to degenerative changes and disintegration of skin when it has been kept too moist.

Malnutrition. State of nutritional insufficiency due to either inadequate dietary intake or defective assimilation or utilisation of food ingested.

Necrosis. Death of tissue.

Necrotic tissue. Tissue that has died and has therefore lost its usual physical properties and biological activity. Also called "devitalised tissue".

Purulent discharge/ drainage. A product of inflammation that contains pus - i.e. cells (leukocytes, bacteria) and liquefied necrotic debris.

Sepsis. The presence of various pus-forming and other pathogenic organisms or their toxins, in the blood or tissues. Clinical signs of blood-borne sepsis include fever, tachycardia, hypotension, leukocytosis, and a deterioration in mental status. The same organism is often isolated in both the blood and the pressure ulcer.

Sinus tract. A cavity or channel underlying a wound that involves an area larger than the visible surface of the wound.

Slough. Necrotic (dead) tissue in the process of separating from viable portions of the body.

Underlying tissue. Tissue that lies beneath the surface of the skin such as fatty tissue, supporting structures, muscles and bones.

WORKGROUP MEMBERS

Chairperson:

Tan Wee King

RN, MPC, BN, Grad Dip (Nurse Teaching), MSc (Training)

Secretary:

Chen Yee Chui

RN, Cert DN, BNursing (Hons)

Members:

Azizah Yunos

RN, Oncology Nursing Cert, Enterostoma Nursing Cert

Chong Irene

RN, BSc (Nursing), MHSM

Koh Serena

RN, RM, Adv Dip (Midwifery), BSc (Hons) Nursing Studies

Lim Hui Li

RN, BN, MSc (Health Policy and Management)

Ng Toon Mae

RN, BN

Tan Gim Wah

RN, RM, Dip (Personnel Management)

Tan Kwee Yuen

RN, Oncology Nursing Cert

Tang Siew Yeng

RN, RM, Dip (Management Studies), BBBA,
MSc (Nursing & Education)

Tay Ai Choo

RN, BHSN, Oncology Nursing Cert, Stoma Care Cert,
Wound Management Cert

Yeo Soo Gim

RN, RMN, BHSN

External Consultant:

Edwin Chan Shih-Yen

BSc, BVMS, PhD

Deputy Director/ Head of Evidence-based Medicine

MOH Clinical Trials & Epidemiology Research Unit

