



Best Practice

Evidence Based Practice Information Sheets for Health Professionals

Pressure Sores - Part II: Management of Pressure Related Tissue Damage

This practice information sheet is the second of a two part release. Part 1 relates to the prevention of pressure related tissue damage & Part 2 deals with management of existing pressure damage.

Pressure sores remain a significant problem in both the acute and community health settings despite being largely preventable. The cost of treating an established pressure sore can be enormous. There are not only emotional and physical consequences to the individual but also a significant drain on health system resources.

Considerable research has been devoted to this problem and yet many clinicians and administrators are faced with findings that are often ambiguous and lacking validation.

The aim of this information sheet is to provide clinicians with evidence based recommendations related to the treatment of pressure sores. To this end the recommendations are derived in particular from three publications derived via a systematic review and analysis of the available literature and listed on page 6.

This Practice Information Sheet Covers The Following Concepts:

1. Definition And Scope
2. Risk Assessment
3. Managing Tissue Loads
4. Pressure Sore Wound Care
5. Infection
6. Operative Repair
7. Continuous Quality Improvement
8. Summary Of Evidence

1. Definition And Scope

Pressure sores are areas of localised damage to the skin and underlying tissue, caused by pressure, shear or friction. This type of damage can also be known as; pressure ulcers, bedsores, decubiti or decubitus ulcers. (NHS 1995)

As discussed in Best Practice Information Sheet I Part I of this series it has been difficult to benchmark the prevalence/incidence of pressure sores due to the

Evidence Rating (ER)

Recommendations in this publication are rated on the level of evidence used to derive them. The following criteria is derived from the AHCPR (1992) No. 3 Quick reference guidelines.

ER = G. Good research based evidence to support the recommendation

ER = F. Fair research based evidence to support the recommendation

ER = Op. Recommendation based on expert opinion and panel consensus

lack of uniformity in classification. Differing inclusion criteria results in wide variation in prevalence/incidence rates. Studies based on dissimilar grading systems make comparisons difficult.

Table 1. Pressure Sore Grading System

Grade I	Discolouration of intact skin, including non-blanchable erythema, blue/purple and black discolouration
Grade II	Partial-thickness skin loss or damage involving epidermis and/or dermis
Grade III	Full thickness skin loss involving damage or necrosis of subcutaneous tissues; but not through the underlying fascia and not extending to the underlying structures
Grade IV	Full thickness skin loss with extensive destruction, and tissue necrosis extending to the underlying bone, tendon or joint capsule

2. Risk Assessment

To allow for appropriate planning of care and to determine progress, the patient with the pressure sore should receive assessment and reassessment in a comprehensive and holistic manner. (AHCPR 1994)

Pressure Sore Assessment & Grading

As with any wounds it is important to determine the dimensions of the wound, the type of tissue present and the level and type of exudate. Many pressure sore grading or staging systems have been devised. Ideally pressure sore grading systems should provide cross discipline uniform understanding of diagnosis and progress of pressure sores. They should also allow for auditing of performance relating to prevention and treatment of pressure sores and finally to compare clinical trials relating to interventions and devices. (Reid and Morrison, 1994)

An example of a pressure sore grading scale is given in Table 1. These simple grading systems are often modified to provide more detail within each stage/grade. This makes them more clinically useful but less practical for audit and comparison of trial results.

Assessing Complications

Pressure sores are often associated with significant complications that the clinician should be wary of.

They can be divided into local complications such as *sinus tract or abscess, fistula, maggot infestation, squamous cell carcinoma in the ulcer*, general complications including *sepsi-caemia, septic arthritis, meningitis, and complications of topical treatment (eg., iodine toxicity and hearing loss after topical neomycin and systemic gentamicin)* (AHCPR 1994 P.5).

Nutritional Assessment & Management

The link between pressure sores and malnutrition is well documented. Baseline and ongoing assessment of nutritional status and needs are required to ensure adequate nutrients to prevent further deterioration and provide support for healing (AHCPR 1994).

Pain Assessment & Management

Pain relief should always have an high priority. In the case of patients with pressure sores dressing types and frequency, support surfaces and repositioning can both contribute to and provide relief from pain. (AHCPR 1994)

Psychosocial Assessment & Management

The success of any treatment program relies on the ability and motivation of the patient and carers to adhere to the plan of care. The psychosocial assessment is important to tailor

the plan to the needs and wishes of the patient and so maximise the effect of the program. (AHCPR 1994)

Recommendations Relating To Assessment:

- Any patient presenting with a pressure sore should have a complete history and physical and psychosocial examination. (AHCPR 1994) ER = Op
- The damaged area should be graded with a uniform grading system (as in Table 1). A baseline of the location, size and shape, tissue type, and exudate (amount and type) should be assessed and documented (AHCPR 1994) ER = Op
- Reassessment should occur following, a significant clinical event or change in condition, and/or at least weekly. (AHCPR 1994) ER = Op
- Clinicians should be wary of complications related to pressure sores as listed above. (AHCPR 1994) ER = Op
- Nutritional assessment should occur on admission and at least three monthly for patients at risk of malnutrition (AHCPR 1994) ER = Op
- Monitoring of dietary intake in the at risk patient should be undertaken to 'ensure adequate dietary intake to prevent malnutrition' (AHCPR 1994). ER =F.
- Nutritional support (eg. tube feeding) should be considered if intake continues to be inadequate (AHCPR 1994). ER = Op
- Pain management should include

adequate analgesia but must also attempt to eliminate or control the source of pain eg; wound care, inappropriate or prolonged positioning. (AHCPR 1994)

ER = Op

- Psychosocial assessment should determine the patients ability and motivation to adhere to the treatment program. Assessment should include mental status, cognitive ability, social support, alcohol and/or drug abuse, lifestyle, sexuality; culture and ethnicity; and stressors. (AHCPR 1994) ER = Op

- Assessment of resources and support is crucial in planning for continuing care. (AHCPR 1994)

ER = Op

- Above all, the values, needs and lifestyle of the patient and care givers must be considered when establishing treatment goals. (AHCPR 1994) ER = Op

3. Managing Tissue Loads

Managing tissue loads is directed at relieving pressure to already damaged tissue and preventing further tissue damage to other areas. Any patient with existing pressure damage should be considered 'at risk' of further damage and recommendations in Practice Information Sheet I Part I should be followed with regard to; Skin care, hygiene, moisture management, pressure relieving interventions, devices and support surfaces. In addition it should be considered that the greater the existing damage the less tolerant will that tissue be to further pressure (AHCPR 1994).

Recommendations Relating To Managing Tissue Loads For Patients With Existing Pressure Sores:

- Positioning and devices such as pillows and foams should be used

to avoid direct pressure on already damaged tissue. (AHCPR 1994)

ER = Op

- In patients with existing pressure sores a static support surface should be used if the patient can be positioned without weight bearing on the pressure sore and without 'bottoming out' (A hand placed beneath the support surface checks to determine that the compression of the surface is no less than 2cm). (AHCPR 1994)

ER = F

- Patients should be placed on a dynamic support surface such as a large cell alternating pressure mattress, low-air loss or air fluidised bed if positioning options are limited or if the patient bottoms out on a static surface. (AHCPR 1994) (NHS 1995) ER = F

- In the least, patients with large grade III or IV pressure sores should be considered for a dynamic support surface. (AHCPR 1994) ER = Op

4. Pressure Sore Wound Care

Management of the pressure sore is directed to: promoting an optimum environment for healing by second intention, preparation for surgical management as indicated or maintenance and comfort when healing is not a priority.

Debridement

Devitalised tissue provides an ideal environment for infection, prolongs inflammation and retards healing (AHCPR 1994). Sharp debridement is the most rapid method of removing necrotic tissue but is restricted to those with the necessary clinical skills (AHCPR 1994). Modern moist wound healing products if used appropriately support autolytic debridement. This takes longer and is useful for

patients that are unable to tolerate other methods but should not be used if there is a high risk of infection. (AHCPR 1994)

Recommendations Relating To The Debridement Of Pressure Sores:

- Devitalised/necrotic tissue should be removed using one of the following methods: Sharp, mechanical, and/or autolytic debridement techniques. (AHCPR 1994) ER = Op

- Choice of method is based on patient's condition and goals, and on available clinical expertise. Sharp debridement should be considered particularly in urgent cases such as the presence of infection. (AHCPR 1994) ER = Op

- Autolytic debridement should not be used if the wound is infected. (AHCPR 1994) ER = Op

Pressure Sore Cleansing

The object of wound cleansing is to remove non viable tissue, excess exudate, metabolic wastes and residue from topical therapy without further traumatising the area. (AHCPR 1994)

Skin cleansers and antiseptic agents (eg., povidone iodine, iodophor, sodium hypochlorite solution [Dakin's solution], hydrogen peroxide, acetic acid), are non selective and are cytotoxic to healthy tissue. (AHCPR 1994)

Recommendations Relating To Wound Cleansing Of Pressure Sores:

- Initially pressure sores should be cleansed at each dressing change. (AHCPR 1994) ER = Op

- Minimal mechanical force and less coarse materials should be used when cleansing the pressure sores with gauze or sponges etc. (AHCPR 1994) ER = Op

- When cleaning pressure sores, skin cleansers or antiseptic agents should be avoided. (AHCPR 1994) ER = F

- Normal saline at room temperature is the preferred cleanser. (AHCPR 1994) ER = Op

Dressings

Dressing therapy is aimed at protecting pressure sores from further deterioration and providing an environment that is optimal for healing whilst being cost effective. It is crucial to keep pressure sores moist and the surrounding skin dry and intact. (AHCPR 1994) See Figure 1. Studies of different types of moist wound dressings showed no differences in healing but they must be matched with the requirements of the wound. (AHCPR 1994) In cavity wounds dead space results in a greater risk of infection. (AHCPR 1994)

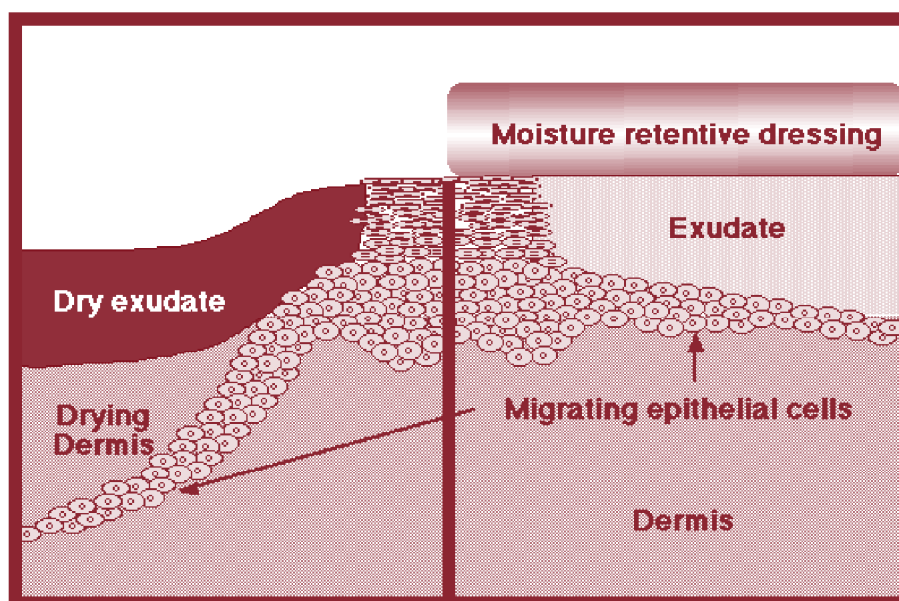


Figure 1: Moist wound healing assists to create the optimal environment for autolysis and tissue repair.

Recommendations For Dressing Of Pressure Sores:

- A dressing should be chosen that manages exudate to keep the wound bed moist (AHCPR 1994) ER =F
- The dressing should also prevent maceration of surrounding skin, and avoids desiccation of the wound bed (AHCPR 1994) ER = Op
- Dressings that are able to maintain an optimum environment and require less care over time can be very cost effective (AHCPR 1994) ER =F
- Dead space is eliminated by loosely filling all cavities with moist wound healing materials. (AHCPR 1994) ER = Op

5. Infection

All open pressure sores are likely to be colonised with bacteria. However, adequate cleansing and debridement will usually prevent the wound from progressing to the point of clinical infection where healing is impaired. (AHCPR 1994). Puru-

lence and foul odour are positive signs of infection but infection must also be suspected in wounds that appear clean but do not respond after 2-4 weeks of appropriate care (AHCPR 1994).

Although widely used to diagnose infection, swab cultures may not truly reflect the organism(s) causing the infection. (AHCPR 1994) When the wound fails to respond to topical antibiotics, quantitative bacterial cultures provide more precise information about soft tissue infection and osteomyelitis.

Recommendations Relating To Infection And Pressure Sores:

- Wound cleansing and debridement is performed to minimise bacterial colonisation (AHCPR 1994) ER = G
- In clean pressure sores that are not healing and those that continue to produce exudate after 2 to 4 weeks a 2-week trial of topical antibiotics may be considered **but with caution and only after appropriate**

management has failed to provide any improvement. (AHCPR 1994)

ER = G

- When pressure sores do not respond to topical antibiotic therapy quantitative bacterial cultures of soft tissue and evaluation for osteomyelitis should be performed. (AHCPR 1994) ER = Op
- Topical antiseptic agents should be avoided. (AHCPR 1994) ER =F
- Patients with systemic infections must be treated with appropriate systemic antibiotics. (AHCPR 1994) ER = G

6. Operative Repair

Wounds can be closed by direct closure, or with the use of various reconstructive techniques such as skin grafting, local and free flaps. Choice of technique is based on individual patient's needs, overall goals, the specific site and extent of the tissue damage. Extrinsic factors that might impair healing include; smoking, spasticity, and the ability to maintain pressure relief post-operatively. Intrinsic factors include levels of bacterial colonisation, incontinence and urinary tract infection. (AHCPR 1994)

Table 2. Summary Of Recommendations: Treatment Of Pressure Sores

Assessment:

- There should be a complete history and physical and psychosocial examination.
- The damaged area should be graded with a uniform grading system.
- The location, size and shape, tissue type, and exudate should be assessed and documented.
- Reassessment should occur following; a significant clinical event or change in condition, and/or at least weekly.
- Clinicians should be wary of complications related to pressure sores as listed in text.
- Nutritional assessment should occur on admission and at least three monthly for patients at risk of malnutrition.
- Monitoring of dietary intake in the at risk patient should be undertaken to 'ensure adequate dietary intake.
- Nutritional support should be considered if intake continues to be inadequate.
- Pain management should include adequate analgesia but must also attempt to eliminate or control the source of pain.
- Psychosocial assessment should determine the patients ability and motivation to adhere to the treatment program.
- Assessment should include mental status, cognitive ability, social support, alcohol and/or drug abuse, lifestyle, sexuality, culture, ethnicity and stressors.
- Assessment of resources and support is required to plan for continuing care.
- The values and lifestyle of the patient, and care givers must be considered when establishing treatment goals.

Managing Tissue Loads:

- Positioning and devices should be used to avoid direct pressure on already damaged tissue.
- A static support surface should be used if the patient can be positioned without weight bearing on the pressure sore and without 'bottoming out'.
- Patients should be placed on a dynamic support surface if positioning options are limited or if the patient bottoms out on a static surface.
- In the least, patients with large grade III or IV pressure sores should be considered for a dynamic support surface.

Pressure Sore Wound Care:

- Devitalised/necrotic tissue should be debrided. Choice of method is based on patient's condition/goals and available clinical expertise. Sharp debridement is considered in urgent cases. Autolytic debridement is inappropriate if the pressure sore is infected.
- Initially pressure sores should be cleansed at each dressing change with minimal mechanical force. Skin cleansers or antiseptic agents should be avoided. Normal saline at room temperature is preferred.
- A dressing should be chosen that manages exudate to keep the pressure sore bed moist, prevent maceration of surrounding skin and avoid desiccation of the wound bed. Dead space is eliminated by loosely filling all cavities with dressing materials.

Infection And Pressure Sores:

- Wound cleansing and debridement is performed to minimise bacterial colonisation. Clean pressure sores that are not healing and those that continue to produce exudate after 2 to 4 weeks of appropriate management should be considered for a 2-week trial of topical antibiotics.
- When there is no response to topical antibiotic therapy quantitative bacterial cultures of soft tissue and evaluation for osteomyelitis should be performed.
- Topical antiseptic agents should be avoided. Patients with systemic infections must be treated with appropriate systemic antibiotics.

Operative Repair Of Pressure Sores:

- Pre-operative planning and counselling should include factors that might impair healing or lead to recurrence. Post-operative care must ensure pressure relief to the operative site for a minimum of 2 weeks. Tolerance of the operative site to pressure must be gradually developed and monitored closely. Preventing recurrence of pressure sores relies on education and encouragement to adhere to daily skin examination, pressure reduction, and intermittent relief techniques.

Continuous Quality Improvement:

- See Practice Information Sheet I Part I with regard to prevention.
- Education programs should be directed at all levels of clinicians, patients, and other carers and include: Aetiology, pathology & risk factors. Uniform staging/grading of tissue damage. Principles of wound healing. Principles of nutritional support.
- individualised program of skin care. Principles of cleansing and infection control.
- Principles of post-operative care, Principles of prevention, Product selection, Effects or influence of the physical and mechanical environment on the pressure sore, and strategies for management. Mechanisms for accurate documentation and monitoring of pertinent data, including treatment interventions and healing progress.
- Educational programs should be updated on an ongoing and regular.
- The effect of these programs, variability in practice, and clinical outcomes should be subject to ongoing monitoring.

Recommendations Relating To Operative Repair Of Pressure Sores:

- Pre-operative planning and counselling should include factors that might impair healing or lead to recurrence. (AHCPR 1994) ER=OP
- Post-operative care must ensure pressure relief to the operative site for a minimum of 2 weeks. (AHCPR 1994) ER=OP
- Tolerance of the operative site to pressure must be gradually developed and monitored closely. (AHCPR 1994) ER=OP
- Preventing recurrence of pressure sores relies on education and encouragement to adhere to daily skin examination, pressure reduction and intermittent relief techniques. (AHCPR 1994) ER=G

7. Continuous Quality Improvement

Continuous quality improvement should be focused on reducing the incidence of pressure sores and reducing variability in treatment of existing pressure sores. This should be achieved by providing instruction/guidelines that are current, evidence based and delivered via appropriate education programs. (AHCPR 1992), (AHCPR 1994)

Patient management systems should be modified to reflect these instructions. Incidence of pressure sore development should be accurately documented and monitored (NHS 1995). In addition tissue damage should be accurately assessed and documented and both practice and outcomes should be monitored to determine performance levels. (AHCPR 1994)

Recommendations For Achieving Continuous Quality Improvement:

See Practice Information Sheet I, Part I with regard to prevention. Education programs for the treatment of pressure sores should

be directed at all levels of clinicians, patients, and other carers.

These programs should include:

- Aetiology, pathology & risk factors.
- Uniform staging/grading of tissue damage.
- Principles of wound healing.
- Principles of nutritional support
- Individualised program of skin care.
- Principles of cleansing and infection control.
- Principles of post-operative care
- Principles of prevention
- Product selection (ie., categories and uses of support surfaces, dressings, topical medications, or other agents).
- Effects or influence of the physical and mechanical environment on the pressure sore, and strategies for management.
- Mechanisms for accurate documentation and monitoring of pertinent data, including treatment interventions and healing progress. (AHCPR 1994) ER = Op

Program revision. Update educational programs on an ongoing and regular basis to integrate new knowledge,

techniques, or technologies. (AHCPR 1994)

The effect of these programs, variability in practice, and clinical outcomes should be subject to ongoing monitoring.

This Practice Information Sheet has been compiled by Rick Wiechula and is based principally on the following publications which the Joanna Briggs Institute for Evidence Based Nursing gratefully acknowledges.

1. Panel for the Prediction and Prevention of Pressure Ulcers in Adults. *Pressure Ulcers in Adults: Prediction and Prevention*. Clinical Practice Guideline, Number 3. AHCPR Publication No. 92-Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services, May 1992.
2. Bergstrom N, Bennett MA, Carlson CE, et al. *Treatment of Pressure Ulcers*. Clinical Practice Guideline, Number 15. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service, Agency for Health Care Policy and Research, AHCPR Publication No. 95-0652 December 1994.
3. NHS Center for Reviews and Dissemination. *The prevention and treatment of pressure sores (effective health care bulletin)* York: University Of York; 1995.

Other references include:

Reid, J., Morison, M. (1994). Towards a consensus: Classification of Pressure Sores. *Journal of Wound Care*. 3 (3), 157-160.

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