

# **Pressure ulcers: the management of pressure ulcers in primary and secondary care**

**NICE guideline**

**First draft for consultation, January 2005**

If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.

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## Introduction

This guideline should be read in conjunction with the NICE guideline for the use of pressure relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care) NICE 2003 and is a further addition to clinical guidelines forming the Wound Care Suite.

### What are pressure ulcers?

Pressure ulcers (also commonly referred to as pressure ulcers, bed ulcers, pressure damage, pressure injuries and decubitus ulcers) are areas of localised damage to the skin, which can extend to underlying structures such as muscle and bone. Damage is believed to be caused by a combination of factors including: pressure, shear forces, friction and moisture. Pressure ulcers can develop in any area of the body. In adults damage usually occurs over bony prominences, such as the sacrum, whilst presentation in infants and children is more likely to occur on, for example, the occipital area or ears.

### Definitions and classifications

Definition and classification of pressure ulcers were agreed with the Guideline Development Group at the 2<sup>nd</sup> group meeting and will serve to update definitions and classifications used in related published NICE and RCN guidance (*Pressure ulcer prevention: Pressure ulcer risk assessment and prevention, including the use of pressure-relieving support surfaces (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care*, NICE, 2003) available at [www.nice.nhs.org.uk](http://www.nice.nhs.org.uk) and [www.rcn.org.uk](http://www.rcn.org.uk).

**A pressure ulcer is defined as:** *an area of localised damage to the skin and underlying tissue caused by pressure, shear, friction and or a combination of these. EPUAP (2003)*

European Pressure Ulcer Advisory Panel [www.epuap.org.uk](http://www.epuap.org.uk)

Pressure ulcer severity for the purpose of this guideline is using the EPUAP Classification Tool on the basis of current thinking and expert GDG opinion.

Grade 1: non-blanchable erythema of intact skin. Discolouration of the skin, warmth, oedema, induration or hardness may also be used as indicators, particularly on individuals with darker skin.

Grade 2: partial thickness skin loss involving epidermis, dermis, or both. The ulcer is superficial and presents clinically as an abrasion or blister.

Grade 3: full thickness skin loss involving damage to or necrosis of subcutaneous tissue that may extend down to, but not through underlying fascia.

Grade 4: extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures with or without full thickness skin loss.

EPUAP (2003) classification system<sup>†</sup>. [www.epuap.org.uk](http://www.epuap.org.uk)

### **Groups at risk**

- Those who are seriously ill, neurologically compromised, i.e. individuals with spinal cord injuries, have impaired mobility or who are immobile (including those wearing a prostheses, body brace or plaster cast), suffer from impaired nutrition, obesity, poor posture or use equipment such as seating or beds which do not provide appropriate pressure relief.
- Sub-groups in society including those with spinal cord injury, the elderly and those pregnant are also reported to be at risk.

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<sup>†</sup> A range of classification systems are used throughout the literature. The one described above is generally accepted.

## **Patient-centred care**

This guideline offers best practice advice on the care of people with pressure ulcers.

Treatment and care should take into account patients' individual needs and preferences. People with pressure ulcers should have the opportunity to make informed decisions about their care and treatment. Where patients do not have the capacity to make decisions, healthcare professionals should follow the Department of Health guidelines – *Reference guide to consent for examination or treatment* (2001) (available from [www.dh.gov.uk](http://www.dh.gov.uk)).

Good communication between healthcare professionals and patients is essential. It should be supported by the provision of evidence-based information offered in a form that is tailored to the needs of the individual patient. The treatment, care and information provided should be culturally appropriate and in a form that is accessible to people who have additional needs, such as people with physical, cognitive or sensory disabilities, and people who do not speak or read English.

Unless specifically excluded by the patient, carers and relatives should have the opportunity to be involved in decisions about the patient's care and treatment.

Carers and relatives should also be provided with the information and support they need.

## **Key priorities for implementation**

The following recommendations have been identified as priorities for implementation.

### General recommendations

- Patients with identified grade I pressure ulcers are at a significant risk of developing more severe ulcers and should receive interventions to prevent deterioration. **[B]**

- The most benefit for patients with pressure ulcers is likely to be achieved by adopting a multi-interventional inter-disciplinary approach which includes: **[B]**
  - local wound management using modern or advanced wound dressings and other technologies
  - pressure relieving support surfaces such as beds, mattresses, overlays or cushions
  - treatment of concurrent conditions which may delay healing
  - repositioning of the individual **[D]**

### **Holistic assessment**

- Patients with pressure ulcers should receive an initial and on-going holistic assessment. Both intrinsic and extrinsic factors have been identified as important factors for assessment. This assessment should include: **[D]**
  - health status
    - ◇ acute, chronic illness and terminal illness
    - ◇ co-morbidity
  - mobility status
  - posture (pelvic obliquity and posterior pelvic tilt)
  - sensory impairment
  - level of consciousness
  - systemic signs of infection
  - nutritional status
  - previous pressure damage
  - pain status
  - psychological factors
  - social factors
  - continence status
  - medication
  - cognition

- tissue perfusion.
- Holistic assessment is the responsibility of the inter-disciplinary team and should be carried out by registered health professionals who have undergone appropriate training and have demonstrated competence.

**[D]**

### **Ulcer assessment**

- Patients with pressure ulcers should receive an initial and on-going pressure ulcer assessment. Ulcer assessment should include: **[D]**
  - cause of ulcer
  - site/location
  - dimensions of ulcer
  - stage or grade
  - exudate amount and type
  - local signs of infection
  - pain
  - wound appearance
  - surrounding skin
  - undermining/tracking (sinus or fistula)
  - odour.

This should be supported by photography (calibrated with a ruler) and tracings.

- Record the pressure ulcer grade using the European Pressure Ulcer Advisory Panel Classification System (page 12). **[D]**

### **Mobility and positioning**

- All patients with pressure ulcers should actively mobilise, change their position or be re-positioned frequently. **[D]**

### **Pressure relieving support surfaces**

- Patients with pressure ulcers should have access to appropriate pressure relieving support surfaces (for example, mattresses and cushions) 24 hours a day and this applies to all support surfaces. **[D]**



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- Decisions about choice of dressing or topical agent for those with pressure ulcers should be made by registered health professionals that have undergone appropriate training and have demonstrated competence. **[D]**
- Choice of dressings or topical agents for the treatment of pressure ulcers should be based on: **[D]**
  - ulcer assessment (condition of wound)
  - general skin assessment
  - treatment objective
  - dressing characteristics
  - previous positive effect of particular dressing
  - manufacturer's indications for use and contra indications
  - risk of adverse events
  - patient preference (lifestyle, abilities and comfort).
- There is no conclusive research evidence to guide clinicians decision making about which dressings are most effective in pressure ulcer management. However professional consensus recommends that:
  - Create the optimum wound healing environment by using advanced dressings (for example, hydrocolloids, hydrogels, foams, films, alginates, soft silicones) in preference to basic dressing types (for example, gauze, paraffin gauze and simple dressing pads). **[D]**

### **Debridement**

- Clinicians should recognise the positive potential benefit of debridement in the management of pressure ulcers. Decisions about the method of debridement should be based on: **[D]**
  - ulcer assessment (condition of wound)
  - general skin assessment
  - previous positive effect of debridement techniques
  - manufacture's indications for use and contra indications

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- risk of adverse events
- patient preference (lifestyle, abilities and comfort)
- characteristic of dressing/technique
- treatment objective.

### **Nutritional support**

- Nutritional support should be given to patients with an identified nutritional deficiency<sup>†</sup>. **[A]**

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<sup>†</sup> The link between correcting this deficiency and its causal relationship with pressure ulcer healing has not been clearly established.

## 1 Guidance

The following guidance is evidence based. Appendix A shows the grading scheme used for the recommendations: A, B, C, D or good practice point – D(GPP). A summary of the evidence on which the guidance is based is provided in the full guideline (see Section 5).

### 1.1 *General recommendations*

- 1.1.1 Patients with identified grade I pressure ulcers are at a significant risk of developing more severe ulcers and should receive interventions to prevent deterioration. **[B]**
- 1.1.2 The most benefit for patients with pressure ulcers is likely to be achieved by adopting a multi-interventional inter-disciplinary approach which includes: **[B]**
- local wound management using modern or advanced wound dressings and other technologies
  - pressure relieving support surfaces such as beds, mattresses, overlays or cushions
  - treatment of concurrent conditions which may delay healing
  - repositioning of the individual **[D]**

- 1.1.3 All pressure ulcers should be documented as a clinical incident and the circumstances thoroughly investigated. **[GPP]**

## **1.2 Holistic assessment**

- 1.2.1 Patients with pressure ulcers should receive an initial and on-going holistic assessment. Both intrinsic and extrinsic factors have been identified as important factors for assessment. This assessment should include: **[D]**

- health status
  - acute, chronic illness and terminal illness
  - co-morbidity
- mobility status
- posture (pelvic obliquity and posterior pelvic tilt)
- sensory impairment
- level of consciousness
- systemic signs of infection
- nutritional status
- previous pressure damage
- pain status
- psychological factors
- social factors
- continence status
- medication
- cognition
- tissue perfusion.

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- 1.2.2 Assessment of mobility should include all aspects of independent movement including walking, ability to reposition (for example, in bed or chair) or transfer (for example, from bed to chair). **[D]**
- 1.2.3 Presence of any sensory impairment in an individual with a pressure ulcer should be recorded. **[GPP]**
- 1.2.4 Level and duration of impaired consciousness should be recorded. **[GPP]**
- 1.2.5 Presence of acute, chronic or terminal illness and its potential impact on ulcer healing should be recorded. **[GPP]**
- 1.2.6 Previous pressure damage (site/location, stage or grade of previous ulcer and previous interventions) should be recorded. **[D]**
- 1.2.7 Pain assessment should include: whether the individual is experiencing pain; the causes of pain; level of pain (using an appropriate tool); location and management interventions. **[D]**
- 1.2.8 In the presence of systemic and clinical signs of infection in the patient with a pressure ulcer, systemic anti-microbial therapy should be considered. **[GPP]**
- 1.2.9 Psychological assessment should include concordance and abilities of the individual to self-care (mood, motivation and aptitude). **[D]**
- 1.2.10 Assessment of social factors should include suitable home environment, level of supportive provision and the involvement of local support services. **[D]**
- 1.2.11 Continence assessment should include whether the individual is continent of urine, faeces and continence interventions which may affect ulcer healing and impair the function of pressure relieving support surfaces (for example, pads or bedding). **[GPP]**
- 1.2.12 Holistic assessment is the responsibility of the inter-disciplinary team and should be carried out by registered health professionals

who have undergone appropriate training and have demonstrated competence. **[D]**

### **1.3 Ulcer assessment**

1.3.1 Patients with pressure ulcers should receive an initial and on-going pressure ulcer assessment. Ulcer assessment should include: **[D]**

- cause of ulcer
- site/location
- dimensions of ulcer
- stage or grade
- exudate amount and type
- local signs of infection
- pain
- wound appearance
- surrounding skin
- undermining/tracking (sinus or fistula)
- odour.

This should be supported by photography (calibrated with a ruler) and tracings..

- 1.3.2 Record the pressure ulcer grade using the European Pressure Ulcer Advisory Panel Classification System (page 12 of the Full version). **[D]**
- 1.3.3 Measure the dimensions of the pressure ulcer, recording the longest length/longest width as an estimate of surface area (use of tracings); the deepest part of the wound should also be measured. **[D]**
- 1.3.4 Initial and on-going ulcer assessment is the responsibility of the inter-disciplinary team and should be carried out by registered health professionals that have undergone appropriate training and have demonstrated competence. **[D]**
- 1.3.5 Reassessment of the ulcer should be performed at least weekly but may be required more frequently, depending on the condition of the wound and the result of holistic assessment of the patient. **[D]**

#### ***1.4 Mobility and positioning***

- 1.4.1 Mobilising, positioning and repositioning interventions should be considered for all individuals with pressure ulcers (including those in beds, chairs and wheelchairs). **[D]**
- 1.4.2 All patients with pressure ulcers should actively mobilise, change their position or be re-positioned frequently. **[D]**
- 1.4.3 Avoid positioning individuals directly on pressure ulcers or bony prominences (commonly the sites of pressure ulcer development). **[D]**
- 1.4.4 Mobilising, positioning and re-positioning interventions should be determined by: **[D]**
- general health status
  - location of ulcer
  - general skin assessment
  - acceptability (including comfort) to the patient

- needs of the carer.

1.4.5 Frequency of re-positioning should be determined by the patient's individual needs and recorded (for example, a turning chart.) **[D]**

1.4.6 Passive movements should be considered for patients with pressure ulcers who have compromised mobility. **[D]**

### **1.5 Pressure relieving support surfaces**

1.5.1 Patients with pressure ulcers should have access to appropriate pressure relieving support surfaces (for example, mattresses and cushions) 24 hours a day and this applies to all support surfaces. **[D]**

1.5.2 Decisions about choice of pressure relieving support surfaces for patients with pressure ulcers should be made by registered health professionals that have undergone appropriate training and have demonstrated competence. **[D]**

1.5.3 Initial choice and subsequent decisions, following re-assessments, related to the provision of pressure relieving support surfaces for patients with pressure ulcers should be based on: **[D]**

- ulcer assessment (severity)
- level of risk: from holistic assessment
- location and cause of the pressure ulcer
- general skin assessment
- general health status
- acceptability and comfort for the patient
- lifestyle of the patient
- ability of the patient to reposition themselves
- availability of carer/health professional to reposition the patient.



## **1.6 Pressure relieving support technologies**

There is no conclusive research evidence that any one pressure relieving support technology is superior to another. However professional consensus recommends that:

- 1.6.1 All individuals assessed as having a Grade 1-2 pressure ulcer should, as a minimum provision, be placed on a high specification foam mattress with pressure-reducing properties combined with very close observation of skin changes and a documented positioning and repositioning regime. **[D]**
- AP (replacement or overlay) or sophisticated CLP system (for example, low air loss, air fluidized, viscous fluid) if there is any perceived or actual deterioration of affected areas or further pressure ulcer development. **[D]**
- 1.6.2 All individuals assessed as having Grade 3-4 pressure ulcer (including intact eschar where depth - and therefore grade - cannot be assessed) should, as a minimum provision be placed on an alternating pressure mattress (replacement or overlay) or sophisticated continuous low pressure system (for example, low air loss, air fluidised, viscous fluid). **[D]**
- 1.6.3 Alternating pressure equipment should, be allocated according to a patient's weight not level of risk or grade of ulcer. Patients within the weight range of alternating pressure overlays should be supplied AP overlays not replacement systems. Replacement systems should be allocated to patients who exceed the weight limit of the overlay used. (N.B. In order to ensure maximum effect the inflated cells of the overlay must support the body weight of the patient in all bed positions (during use of backrest, knee break, etc) and all patient positions (sitting up, side lying, etc)). **[D]**

**Pressure relieving devices for young children**

When selecting pressure relieving devices for young children consider the following factors:

1. Ensure that the mattress does not elevate the child to an unsafe height in relation to cot sides on the bed.
2. Ensure that the child is within the recommended weight range for the mattress
3. Alternating pressure
  - a. Minimum weight limit of equipment
  - b. Cell size of mattress (small children can sink into gaps created by deflated cells causing discomfort and reducing efficacy)
  - c. Position of pressure sensors within the mattress in relation to the child (small children positioned at the top of the mattress may not register as the weight sensor is positioned in the middle of the mattress, thus producing inappropriate cell calibration)
  - d. Many alternating pressure mattresses have a permanently inflated head end which may place the occiput at risk in young children.

## **1.7 Dressings and topical agents**

- 1.7.1 Decisions about choice of dressing or topical agent for those with pressure ulcers should be made by registered health professionals that have undergone appropriate training and have demonstrated competence. **[D]**
- 1.7.2 Choice of dressings or topical agents for the treatment of pressure ulcers should be based on: **[D]**
- ulcer assessment (condition of wound)
  - general skin assessment
  - treatment objective
  - dressing characteristics
  - previous positive effect of particular dressing
  - manufacturer's indications for use and contra indications
  - risk of adverse events
  - patient preference (lifestyle, abilities and comfort).

1.7.3 There is no conclusive research evidence to guide clinicians decision making about which dressings are most effective in pressure ulcer management. However professional consensus recommends that:

- Create the optimum wound healing environment by using advanced dressings (for example, hydrocolloids, hydrogels, foams, films, alginates, soft silicones) in preference to basic dressing types for example, gauze, paraffin gauze and simple dressing pads). **[D]**

## **1.8 Debridement**

1.8.1 Clinicians should recognise the positive potential benefit of debridement in the management of pressure ulcers. Decisions about the method of debridement should be based on: **[D]**

- ulcer assessment (condition of wound)
- general skin assessment
- previous positive effect of debridement techniques
- manufacturer's indications for use and contra indications
- risk of adverse events
- patient preference (lifestyle, abilities and comfort)
- characteristic of dressing/technique
- treatment objective.

- 1.8.2 Decisions about debridement methods for patients with pressure ulcers should be made by registered health professionals that have undergone appropriate training and have demonstrated competence. **[D]**

## **1.9 Nutritional support**

- 1.9.1 Nutritional support should be given to patients with an identified nutritional deficiency<sup>†</sup>. **[A]**
- 1.9.2 Nutritional support/supplementation for the treatment of patients with pressure ulcers should be based on: **[D]**
- nutritional assessment (using a recognised tool)
  - general health status
  - patient preference
  - expert input supporting decision making (dietician or specialists).

## **1.10 Adjunct therapies**

- 1.10.1 The use of adjunct therapies (electro-therapy technologies and topical negative pressure therapy) for the treatment of pressure ulcers should be based on: **[D]**
- ulcer assessment
  - level of risk from holistic assessment
  - general skin assessment
  - general health status
  - previous positive effects of the technology/therapy
  - patient preference (lifestyle, abilities and comfort)
  - practitioner's competence.

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<sup>†</sup> The link between correcting this deficiency and its causal relationship with pressure ulcer healing has not been clearly established.

## **1.11 Surgery**

1.11.1 Referral for surgical interventions for patients with pressure ulcers should be based on: **[D]**

- level of risk (anaesthetic and surgical intervention; recurrence)
- patient preference (lifestyle, abilities and comfort)
- ulcer assessment
- general skin assessment
- general health status
- competing care needs
- assessment of psycho-social factors regarding the risk of recurrence
- practitioner's experience
- previous positive effect of surgical techniques
- failure of previous conservative management interventions.

## **2 Notes on the scope of the guidance**

All NICE guidelines are developed in accordance with a scope document that defines what the guideline will and will not cover. The scope of this guideline was established, after a period of consultation, at the start of the guideline development process; it is available from [www.nice.org.uk/page.aspx?o=93321](http://www.nice.org.uk/page.aspx?o=93321).

The scope of the guideline is the management of pressure ulcers in primary and secondary care. The guideline covers all aspects relating to the scope. The guideline covers both holistic and ulcer assessment, and the following interventions: debridement, surgical referral, antimicrobial therapy, dressing selection, nutritional support, pain relief and adjunct therapies (see PUM algorithm in appendix).

## **3 Implementation in the NHS**

### ***3.1 In general***

Local health communities should review their existing practice for the management of pressure ulcers against this guideline as they develop their Local Delivery Plans. The review should consider the resources required to implement the recommendations set out in Section 1, the people and processes involved and the timeline over which full implementation is envisaged. It is in the interests of patients that the implementation timeline is as rapid as possible.

Relevant local clinical guidelines, care pathways and protocols should be reviewed in the light of this guidance and revised accordingly.

This guideline should be used in conjunction with the NICE guideline on *The use of pressure relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care* and the audit material created by the GDG.

### ***3.2 Audit***

Suggested audit criteria are listed in Appendix D. The intention is that these can be used for both national and local clinical audit.

## **4 Research recommendations**

The following research recommendations have been identified for this NICE guideline, and represent areas within the evidence where there is a paucity of high quality research. The Guideline Development Group's full set of research recommendations will be detailed in the full guideline produced by the Quality Improvement Programme supported by National Collaborating Centre for Nursing and Supportive Care (NCC-NSC).

### **Risk of delayed healing/complications to healing**

Well design prospective cohorts studies including those with pressure ulcers and including relevant identified risk factors to show how the identifies risk factors lead to more sever ulcers or delayed healing or complications.

### **Pressure ulcer assessment**

Pressure ulcer assessment is a fundamental activity for both evaluating treatment interventions and communicating that information. Research needs to focus on what methods of measurement and which parameters are of use to clinicians to allow accurate wound evaluation.

### **Support surfaces for pressure support**

Independent, well-designed, multi-centre, randomised, controlled trials are needed to compare the clinical and cost-effectiveness of different types of pressure-relieving support surfaces to treat existing pressure ulcers for patients in a variety of settings. In particular, this research should aim to compare:

- alternating pressure support surfaces with continuous low pressure supports.

Future research must address the methodological deficiencies associated with much of the research described in this review: particular attention should be paid to:

- description of inclusion and exclusion criteria used to derive the sample from the target population
- evidence of an a priori sample size calculation
- evidence of allocation concealment at randomisation
- description of baseline comparability of treatment groups
- evidence of blinded outcome assessment
- clear description of main interventions
- adequate description of associated care
- withdrawals reported by treatment group with reasons.

Patients should be:

- truly randomised (with concealed allocation)

- should be of sufficient size to detect clinically important differences have clear criteria for measuring outcomes
- blinded interventions and assessment
- adequate follow-up
- appropriate statistical analysis
- measure patient experiences of pressure-relieving equipment
- comfort
- pain
- ease of use
- appropriateness for users and settings
- durability of equipment.

The studies should also have evaluations of the cost-benefit trade off of pressure ulcer treatment alternatives should also be undertaken.

### **Antimicrobials/nutrition**

The results summarised in this review are based on findings from small trials with methodological problems. Therefore, much of the required research requires replication in larger, well-designed studies using contemporary interventions for antimicrobial activity/nutritional support.

## **5 Other versions of this guideline**

The National Institute for Clinical Excellence commissioned the development of this guidance from the Quality Improvement Programme within the Royal College of Nursing, who work closely with the National Collaborating Centre for Nursing and Supportive Care (NCC-NSC). A Guideline Development Group was established, which reviewed the evidence and developed recommendations. The members of the Guideline Development Group are listed in Appendix B. Information about the independent Guideline Review Panel is given in Appendix C.

The booklet *The guideline development process – an overview for stakeholders, the public and the NHS* has more information about the Institute's guideline development process. It is available from the Institute's



website and copies can also be ordered by telephoning 0870 1555 455 (quote reference N0472).

### **5.1 Full guideline**

The full guideline *The Management of Pressure Ulcers in Primary and Secondary Care* will be published by the National Collaborating Centre for Nursing and Supportive Care; it will be available from its website ([www.rcn.org.uk/XXX](http://www.rcn.org.uk/XXX)), the NICE website ([www.nice.org.uk/CGXXXfullguideline](http://www.nice.org.uk/CGXXXfullguideline)) and on the website of the National Library for Health ([www.nlh.nhs.uk](http://www.nlh.nhs.uk)).

### **5.2 Quick reference guide**

A quick reference guide for health professionals will also be available from the NICE website ([www.nice.org/CGXXXquickrefguide](http://www.nice.org/CGXXXquickrefguide)) or from the NHS Response Line (telephone 0870 1555 455; quote reference number **N0XXX**).

### **5.3 Information for the public**

A version of this guideline for people with pressure ulcers and their carers, and for the public, is available from the NICE website ([www.nice.org.uk/CGXXXpublicinfo](http://www.nice.org.uk/CGXXXpublicinfo)) or from the NHS Response Line (0870 1555 455); quote reference number **N0xxx** for an English version and **N0XXX** for an English and Welsh version).

## **6 Related NICE guidance**

The Institute has issued the following related guidance:

National Institute for Clinical Excellence (2003) Pressure ulcer prevention - Pressure ulcer risk assessment and prevention, including the use of pressure relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care.

## **7 Review date**

The process of reviewing the evidence is expected to begin 4 years after the date of issue of this guideline. Reviewing may begin earlier than 4 years if

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significant evidence that affects the guideline recommendations is identified sooner. The updated guideline will be available within 2 years of the start of the review process.

## Appendix A: Grading scheme

The classification of recommendations and the levels of evidence for intervention studies used in this guideline are adapted from the Scottish Intercollegiate Guidelines Network (*SIGN 50. A Guideline Developers' Handbook*), and summarised in the tables below.

### Classification of recommendations on interventions

Recommendation grade	Evidence
A	<ul style="list-style-type: none"> <li>At least one meta-analysis, systematic review or RCT rated as 1++, directly applicable to the target population, <b>or</b></li> <li>A systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results</li> <li>Evidence drawn from a NICE technology appraisal</li> </ul>
B	<ul style="list-style-type: none"> <li>A body of evidence including studies rated as 2++, directly applicable to the target population and demonstrating overall consistency of results, <b>or</b></li> <li>Extrapolated evidence from studies rated as 1++ or 1+</li> </ul>
C	<ul style="list-style-type: none"> <li>A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results, <b>or</b></li> <li>Extrapolated evidence from studies rated as 2++</li> </ul>
D	<ul style="list-style-type: none"> <li>Evidence level 3 or 4, <b>or</b></li> <li>Extrapolated evidence from studies rated as 2+, <b>or</b></li> <li>Formal consensus</li> </ul>
D (GPP)	<ul style="list-style-type: none"> <li>A good practice point (GPP) is a recommendation for best practice based on the experience of the Guideline Development Group</li> </ul>

### Levels of evidence for intervention studies

Level of evidence	Type of evidence
1 <sup>++</sup>	<ul style="list-style-type: none"> <li>High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</li> </ul>
1 <sup>+</sup>	<ul style="list-style-type: none"> <li>Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias</li> </ul>
1 <sup>-</sup>	<ul style="list-style-type: none"> <li>Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias*</li> </ul>
2 <sup>++</sup>	<ul style="list-style-type: none"> <li>High-quality systematic reviews of case-control or cohort studies</li> </ul>

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	<ul style="list-style-type: none"> <li>High-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal</li> </ul>
2 <sup>+</sup>	<ul style="list-style-type: none"> <li>Well-conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal</li> </ul>
2 <sup>-</sup>	<ul style="list-style-type: none"> <li>Case-control or cohort studies with a high risk of confounding bias, or chance and a significant risk that the relationship is not causal*</li> </ul>
3	<ul style="list-style-type: none"> <li>Non-analytic studies (for example, case reports, case series)</li> </ul>
4	<ul style="list-style-type: none"> <li>Expert opinion, formal consensus</li> </ul>
*Studies with a level of evidence '-' should not be used as a basis for making a recommendation	

## **Appendix B: The Guideline Development Group**

Sarah Bazin	Chartered Society of Physiotherapy
Malcolm Blanch	Patient Representative, Carers UK
Jane Hampton	Professional Development Nurse, Westminster Primary Care Trust
Hugh Henderson	Royal College of Surgeons
Jacqueline Morris	British Geriatric Society
Mark O'Brien	Paediatric Tissue Viability Nurse, Great Ormond Street NHS Trust. Tissue Viability Nurses Association.
Alison Porter-Armstrong	College of Occupational Therapists
Julie Stevens	Consultant Tissue Viability Nurse, Hounslow Primary Care Trust and West Middlesex University Hospital NHS Trust. Tissue Viability Nurses Forum.
Adam Thomas	Patient Representative, Royal Association of Disability and Rehabilitation
Steve Thomas	Royal Pharmaceutical Society
Tracy Vernon	Tissue Viability Lead Nurse, Doncaster and Bassetlaw NHS Trust
<b>Paul Yerrell (GDG Lead)</b>	Senior Research Fellow, Oxford Brookes University

### **Royal College of Nursing Institute Staff leading the project.**

Ian Bullock	Acting Director, National Collaborating Centre Nursing and Supporting Care (NCC-NSC) and Senior Research and Development Fellow Quality Improvement Programme RCN Institute
Debra Bick	Professor and Chair Midwifery and Women's Health, Thames Valley University formally Senior Research and Development Fellow Quality Improvement Programme RCN Institute

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Will Gray (Project Lead)	Research and Development Fellow	Quality Improvement Programme	RCN Institute
Helen Weatherly	Health Economist	University of York	
Kate Misso	Information Scientist	University of York	
Rayhan Rashid	Guidelines Administrator,	Quality Improvement Programme,	RCN Institute

## **Appendix C: The Guideline Review Panel**

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring its quality. The Panel includes experts on guideline methodology, health professionals and people with experience of the issues affecting patients and carers. The members of the Guideline Review Panel were as follows.

**Mrs Judy Mead (Chair)**

Head of Clinical Effectiveness, Chartered Society of Physiotherapy

**Mrs Joyce Cormie**

Consumer Representative

**Mrs Gill Hek**

Reader in Nursing Research, University of the West of England, Bristol

**Ms Karen Cowley**

Practice Development Nurse, York Health Services NHS Trust

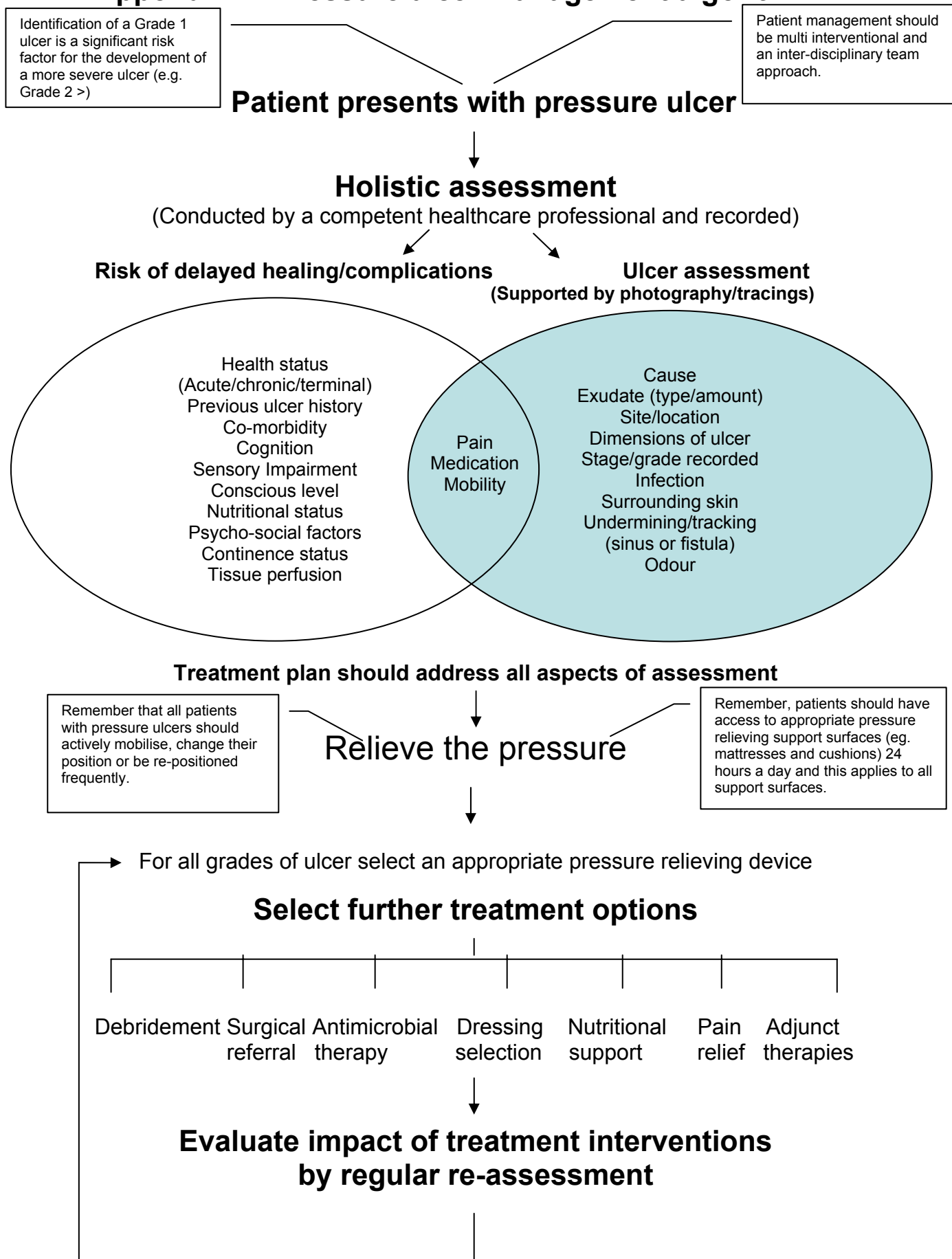
**Mrs Jill Freer**

Head of Clinical Governance and Quality Development, Leicestershire, Northamptonshire and Rutland Strategic Health Authority

**Miss Amanda Wilde**

Reimbursement & Outcomes Manager, ConvaTec Ltd

## Appendix D: Pressure ulcer management algorithm





## **Appendix E: Technical detail on the criteria for audit**

### ***Possible objectives for an audit***

- To ensure that the management of pressure ulcers follows evidence reviewed guideline recommendations.

### ***People who could be included in an audit and time period for selection***

- All staff and carers who work or have close associations with patients who have a pressure ulcer.

### ***Measures that could be used as a basis for an audit***

Essential questions that form the basis of the audit criteria were developed by the Guideline Development Group. Plans for a national web based audit tool are in place, creating emphasis on the importance of implementation of this guidance. This builds on the innovative work currently being tested by the Quality Improvement Programme, Royal College of Nursing Institute in the area of venous leg ulcers, supported by the Healthcare Commission.

### ***Audit criteria should be read alongside the algorithm***

The GDG have listed essential questions that form the basis of broad audit criteria in relation to the algorithm.

### **Patient presents with pressure ulcer**

- Family, medical, personal and domestic activities of daily living, social history?
- Cognitive ability?
- Features of the care environment that they have come from (including current resources)?
- Level of family and social support?
- Carer involvement and ability of unpaid carer/s

**Holistic assessment**

- Who conducted the assessment?
- When was it conducted?
- Did it incorporate all aspects of risk and ulcer assessment?
- Is the treatment plan triggered by the findings of the holistic assessment?
- Is the period of re-assessment clearly stated and evidence that it has taken place?

**For all grades of ulcer, use a pressure support surface**

- What pressure support device was requested (time and date recorded)?
- Type of device supplied (time and date recorded)?
- Recorded first use by patient (time and date recorded)?
- Is there an equivalent pressure support from bed to chair?
- Has an assessment of patient mobility, ability to reposition or be repositioned been undertaken?

**Consider treatment options**

- What treatments or interventions used in the management plan?
- Have identified treatment options been addressed?

**Evaluate impact of treatment interventions by regular re-assessment**

- Effect of treatments or interventions used in the management plan?
- Is there evidence of re-assessment?
- Has this influenced the ongoing management plan?

## **How this guideline was funded**

This work was undertaken by the Royal College of Nursing (RCN) Quality Improvement Programme (QIP) and the Guideline Development Group (GDG) convened to develop this Guideline. Funding for the Health Economics analysis for this Guideline was received from the National Institute for Clinical Excellence (NICE) and this work was undertaken by the Centre for Health Economic (CHE) at the University of York. The RCN is host to the National collaborating Centre for Nursing and Supportive Care (NCC-NSC) which receives partnership support from the: Centre for Evidence-Based Nursing; Centre for Statistics in Medicine; Clinical Effectiveness Forum for Allied Health Professionals, College of Health; Health Care Libraries (University of Oxford); Health Economics Research Centre, and UK Cochrane Centre.

## **Principles of practice**

The principles outlined below, describe the ideal context in which to implement the recommendations contained in this Guideline. They reflect original research and development work previously produced by the RCN, and enable clinicians using evidence based guidance to contextualise and understand the importance of preparation and planning prior to utilising this evidence-based tool.

### ***Person-centred care***

- Patients and carers should be made aware of the Guideline and its recommendations and be referred to the version 'Information for the public.'
- Patients and carers should be involved in shared decision-making about the management of pressure ulcers.
- Health professionals are advised to respect and incorporate the knowledge and experience of people who have had, or have a pressure ulcer.

- Patients and carers should be informed about any potential risks and or complications of having a pressure ulcer.

### ***A collaborative inter-disciplinary approach to care***

- All members of the inter-disciplinary team should be aware of the Guidelines and all care should be documented in the patient's healthcare records.
- The approach to care should be an inter-disciplinary approach involving all necessary in the management of pressure ulcers.

### ***Organisational issues***

- There should be an integrated approach to the management of pressure ulcers with a clear strategy and policy supported by management.
- Care should be delivered in a context of continuous quality improvement where improvements to care following guideline implementation are the subject of regular feedback and audit.
- Commitment to and availability of education and training are needed to ensure that all staff, regardless of profession, are given the opportunity to update their knowledge and are able to implement the guideline recommendations.
- The healthcare team should have undergone appropriate training and who have demonstrated competence in pressure ulcer management.
- Staffing levels and skill mix should reflect the needs of patients and is paramount to providing high quality services for individuals with pressure ulcers.

Priority should be given to the provision and allocation of resources in the management of patients with pressure ulcers.

## Appendix F: Glossary

This adapted glossary is consistent with the full version.

<b>Carer</b>	An individual who provides unpaid care as opposed to paid carers (for example, care workers)
<b>Cohort</b>	A group of people sharing some common characteristics (for example, patients with the same disease or condition), followed up in a research study for a specified period of time
<b>Clinical effectiveness</b>	The extent to which an intervention (for example, a support surface or treatment) produces health benefits (that is, more good than harm)
<b>Cochrane collaboration</b>	An international organisation in which people retrieve, appraise and review available evidence of the effect of interventions in health care. The Cochrane Database of Systematic Reviews contains regularly updated reviews on a variety of issues. The Cochrane library contains the Central Register of Controlled Trials (CENTRAL) and a number of other databases which are regularly updated and is available as CD-Rom or on the internet ( <a href="http://www.cochranelibrary.com">www.cochranelibrary.com</a> )
<b>Co-interventions</b>	Interventions/treatments etc other than the treatment under study that are applied differently to the treatment and control groups
<b>Co-morbidity</b>	Co-existence of a disease or diseases in a study population in addition to the condition that is the subject of study
<b>Debridement</b>	The removal of dead (devitalised) tissue, cell debris or foreign material from the wound

<b>Dead tissue</b>	Dead tissue can present in a variety of forms. Dead (necrotic) tissue varies in appearance according to moisture content. When dry it presents as black eschar (hard leather like material). If moisture content rises the eschar becomes brown, then yellow before breaking down to slough (yellow/grey fibrous tissue with a gelatinous surface attached to the wound bed)
<b>Effectiveness</b>	The extent to which interventions achieves health improvements in real practice settings
<b>Evidence based</b>	The process of systematically finding, appraising and using research findings as the basis for clinical decisions
<b>Evidence-based clinical practice</b>	Evidence-based clinical practice involves making decisions about the care of individual patients based on the best available research evidence rather than on personal opinion or common practice (which may not always be evidence based). Evidence-based clinical practice involves integrating individual clinical expertise and patient preferences with the best available evidence from research
<b>Extrinsic</b>	Factors which are external to the individual
<b>Health professional</b>	Includes nurses, allied health professionals and doctors
<b>Health economics</b>	A field of economics that examines the benefits of healthcare interventions (for example, medicines) compared with their financial costs
<b>Incidence</b>	The number of new cases of illness commencing, or of persons falling ill during a specified time period in a given population

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<b>Intervention</b>	Healthcare action intended to benefit the patient, for example, drug treatment, dressings, physiological therapy
<b>Intrinsic</b>	Factors which present within the individual
<b>Prevalence</b>	The proportion of persons with a particular disease within a given population at a given time
<b>Systematic review</b>	A way of finding, assessing and using evidence from studies (usually RCTs) to obtain a reliable overview
<b>User</b>	Any one using the guideline
<b>Wound bed preparation</b>	Management of the wound to promote endogenous healing or to facilitate the effectiveness of therapeutic interventions