# NATIONAL GUIDELINE CLEARINGHOUSE™ (NGC)
# GUIDELINE SYNTHESIS

## PRESSURE ULCER PREVENTION

### Guidelines

1. The John A. Hartford Foundation Institute for Geriatric Nursing (JHF). Preventing pressure ulcers and skin tears. In: Mezey M, Fulmer T, Abraham I, Zwicker DA, editor(s). Geriatric nursing protocols for best practice. 2nd ed. New York (NY): Springer Publishing Company, Inc.; 2003. p. 165-84. [45 references]
2. National Collaborating Centre for Nursing and Supportive Care, National Institute for Clinical Excellence (NCCNSC/NICE). The use of pressure-relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care. London (UK): National Institute for Clinical Excellence (NICE); 2003 Oct. 167 p.
3. Registered Nurses Association of Ontario (RNAO). Risk assessment & prevention of pressure ulcers. Toronto (ON): Registered Nurses Association of Ontario (RNAO); 2005 Mar. 80 p. [70 references]
4. Wound, Ostomy, and Continence Nurses Society (WOCN). Guideline for prevention and management of pressure ulcers. Glenview (IL): Wound, Ostomy, and Continence Nurses Society (WOCN); 2003. 52 p. (WOCN clinical practice guideline; no. 2). [141 references]

### TABLE OF CONTENTS:



### INTRODUCTION:

A direct comparison of the John A. Hartford Foundation (JHF); National Collaborating Centre for Nursing and Supportive Care, National Institute for Clinical Excellence (NCCNSC/NICE); Registered Nurses Association of Ontario (RNAO); and Wound, Ostomy, and Continence Nurses Society (WOCN) recommendations for prevention of pressure ulcers is provided in the tables below. Two topics, skin tears (addressed by JHF) and treatment of pressure ulcers (addressed by WOCN), are not included in this synthesis.

Table 1 compares the scope of each of the guidelines. Table 2 compares recommendations for risk assessment and interventions to prevent pressure ulcers. Prevention interventions compared in the tables include skin care and protection, positioning, pressure-reducing devices, nutrition, education, and other interventions. Table 3 compares the potential benefits and harms associated with the implementation of each guideline.

The level of evidence supporting the major recommendations is also identified, with the definitions of the rating schemes used by NCCNSC/NICE, RNAO, and WOCN included in Table 4. The JHF guideline does not identify the level of evidence supporting its recommendations, but provides rationale in narrative format. References supporting selected recommendations of the JHF guideline are also provided in Table 4.

Following the content comparison tables, the areas of agreement and differences among the guidelines are identified.

**Abbreviations:**

- JHF, The John A. Hartford Foundation Institute for Geriatric Nursing
- NCCNSC/NICE, National Collaborating Centre for Nursing and Supportive Care, National Institute for Clinical Excellence
- RNAO, Registered Nurses Association of Ontario
- WOCN, Wound, Ostomy, and Continence Nurses Society

| **TABLE 1: COMPARISON OF SCOPE AND CONTENT** | |
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| **Objective And Scope** | |
| **JHF (2003)** | • To provide instruction regarding pressure ulcer risk assessment<br>• To identify risk factors associated with pressure ulcer development<br>• To explain the meaning of an individual's risk assessment score<br>• To present a comprehensive, holistic plan to prevent pressure ulcers in individuals at risk |
| **NCCNSC/NICE** | • To evaluate and summarize the clinical and cost evidence |

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| **(2003)** | for the use of pressure-relieving devices in preventing pressure ulcers<br>• To highlight gaps in the research evidence<br>• To formulate evidence-based and, where possible, cost effective clinical practice recommendations on the prevention of pressure ulcers using pressure-relieving devices based on the best evidence available to the Guideline Development Group (GDG)<br>• To consider the resource implications of using pressure-relieving devices to prevent pressure ulcers |
| **RNAO (2005)** | • To present nursing best practice guidelines for risk assessment and prevention of pressure ulcers<br>• To assist nurses who work in diverse practice settings to identify adults who are at risk of pressure ulcers and provide direction to nurses in defining early interventions for pressure ulcer prevention, and to manage Stage I pressure ulcers |
| **WOCN (2003)** | • To present an evidence-based guideline for pressure ulcer prevention and management<br>• To improve cost-effective patient outcomes as well as increase wound research in the areas where there are gaps between research and practice |
| **Target Population** | |
| **JHF (2003)** | • United States<br>• Older adults with identified intrinsic and/or extrinsic risk factors for pressure ulcers |
| **NCCNSC/NICE (2003)** | • England and Wales<br>• Individuals of all ages who are vulnerable to or at elevated risk of developing pressure ulcers (including those undergoing surgery and post-operative care)<br><br>**Note**: The guideline does not include recommendations on the treatment of existing pressure ulcers. |
| **RNAO (2005)** | • Canada<br>• Adults from diverse practice settings who are at risk of developing pressure ulcers |
| **WOCN (2003)** | • United States |

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| | • Patients with or at risk for developing pressure ulcers |
| **Intended Users** | |
| **JHF (2003)** | Advanced Practice Nurses<br>Allied Health Personnel<br>Health Care Providers<br>Health Plans<br>Hospitals<br>Managed Care Organizations<br>Nurses<br>Patients<br>Students |
| **NCCNSC/NICE (2003)** | Allied Health Personnel<br>Health Care Providers<br>Hospitals<br>Patients<br>Physicians |
| **RNAO (2005)** | Advanced Practice Nurses<br>Nurses |
| **WOCN (2003)** | Advanced Practice Nurses<br>Allied Health Personnel<br>Health Care Providers<br>Nurses<br>Physical Therapists<br>Physician Assistants<br>Physicians |
| **Interventions And Practices Considered** | |
| **JHF (2003)** | **Risk Assessment**<br>• Assessment for risk factors using tools such as Braden scale<br>• Reassessment when conditions change or based on care setting<br>• Documentation of findings<br>**Prevention**<br>• Skin care, including daily skin assessment, cleansing, moisturizing, protecting incontinent from moisture, and using lubricants and proper lifting techniques to avoid injury<br>• Positioning to avoid excess pressure (raise heels, 30 degree side-lying, head raised to lowest height possible) |

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| | • Repositioning every 2 hours according to a written schedule<br>• Management of friction and shear<br>• Pressure-reducing devices and lifting devices<br>• Nutrition management via increased protein, caloric intake and A, C, and E vitamin supplements and proper hydration<br>• Education for patients, caregivers, and staff<br><br>**Note**: This guideline also addresses prevention and treatment of skin tears. |
| **NCCNSC/NICE (2003)** | **Risk Assessment**<br><br>• Formal and informal assessment of risk factors<br>• Assessment tools to aid memory, not as replacement for clinical judgment<br>• Reassessment when conditions change<br><br>**Prevention**<br><br>• Regular skin inspection<br>• Positioning to avoid prolonged pressure<br>• Scheduled repositioning<br>• Management of shear and friction through use of manual handling devices<br>• Pressure-relieving devices, including high-specification foam mattresses and other pressure-relieving surfaces<br>• Techniques to reduce pressure for chair-bound patients<br>• Education for patients, caregivers, and staff<br><br>**Note**: This guideline also includes organizational and policy recommendations. |
| **RNAO (2005)** | **Risk Assessment**<br><br>• Risk assessment based on clinical judgment and reliable, valid risk-assessment tool (e.g., Braden scale)<br>• Identification and staging of pressure ulcers<br>• Documentation of all findings<br><br>**Prevention**<br><br>• Skin care and protection, including daily assessment; protection, hydration; avoidance of massage, hot water, and friction; and incontinence management (cleansing, moisturizers, protective barriers)<br>• Position to avoid pressure (30 degree side turn, head at lowest elevation [30 degrees])<br>• Consult occupational therapist/physical therapist (OT/PT) regarding proper positioning, turning, and transferring techniques<br>• Use of positioning schedule (every 2 hours for high-risk |

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| | patients)<br>• Pressure-reducing surfaces, such as mattresses with low interface pressure (e.g., high-density foam)<br>• Lifting devices to transfer and change position<br>• Techniques to reduce pressure for chair-bound patients<br>• Nutritional assessment and appropriate interventions<br>• Education for patient, caregivers, and staff<br>• Other interventions, including plan of care, pain assessment and pain control measures, rehabilitation program, and transfer planning<br><br>**Note**: This guideline also includes organizational and policy recommendations. |
| **WOCN (2003)** | **Risk Assessment**<br><br>• Risk assessment on entry to healthcare setting and on regular schedule based on setting, or when condition changes<br>• Assessment for other contributing factors, including cognition, friction, history of ulcer<br><br>**Prevention**<br><br>• Skin care and protection, including daily inspection, documentation of changes, and incontinence management<br>• Positioning to avoid pressure, including maintaining head of bed at or below 30 degrees<br>• Repositioning every 2 to 4 hours (for patients on pressure-reducing mattress) or every 2 hours (for patients on regular mattress)<br>• Pressure-reducing surfaces for at-risk patients<br>• Techniques to reduce pressure for chair-bound patients<br>• Nutritional assessment and maintenance of adequate nutrition<br>• Education for patients and caregivers<br><br>**Note**: This guideline also addresses treatment of pressure ulcers. See the NGC guideline synthesis, Management and Treatment of Pressure Ulcers. |

| **TABLE 2: COMPARISON OF RECOMMENDATIONS FOR THE ASSESSMENT AND PREVENTION OF PRESSURE ULCERS** | |
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| **Assessment** | |
| **JHF (2003)** | **Parameters of Assessment**<br><br>• Assess for intrinsic and extrinsic risk factors |

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| | • Braden Scale-cutscore (at risk)<br>  • 18 or below for elderly and persons with darkly pigmented skin<br>  • 16 or below for other adults<br><br>**Nursing Care Strategies/Interventions**<br><br>*Risk Assessment Documentation*<br><br>• Complete on admission to a facility.<br>• Reassess whenever the client's condition changes and based on patient care setting:<br>  • Acute care: every 48 hrs<br>  • Long-term care: weekly for first 4 weeks, then monthly to quarterly<br>  • Home care: every visit<br>  • Use a reliable and standardized tool for doing a risk assessment such as the Braden Scale which is available at: www.bradenscale.com/braden.PDF.<br>• Document risk assessment scores and implement prevention protocols based on cutscore.<br><br>*General Care Issues and Interventions*<br><br>• Culturally sensitive early assessment for stage I pressure ulcers in clients with darkly pigmented skin<br>  • Use a halogen light to look for skin color changes--may be purple hues.<br>  • Compare skin over bony prominences to surrounding skin--may be boggy or stiff, warm or cooler. |
| **NCCNSC/NICE (2003)** | **Identifying Individuals Vulnerable to or at Elevated Risk of Pressure Ulcers**<br><br>**3** - Assessing an individual's risk of developing pressure ulcers should involve both informal and formal assessment procedures.<br><br>**3** - Risk assessment should be carried out by personnel who have undergone appropriate training to recognise the risk factors that contribute to the development of pressure ulcers and know how to initiate and maintain correct and suitable preventative measures.<br><br>**3** - The timing of risk assessment should be based on each individual case. However, it should take place within 6 hours of the start of admission to the episode of care. |

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| | **3** - If an individual is considered not to be vulnerable to or at elevated risk of pressure ulcers on initial assessment, reassessment should occur if there is a change in an individual's condition that increases risk (see recommendations under "Risk Factors" below).<br><br>**3** - All formal assessments of risk should be documented/recorded and made accessible to all members of the interdisciplinary team.<br><br>**Use of Risk Assessment Tools**<br><br>**1** - Risk assessment tools should only be used as an aide memoire and should not replace clinical judgment.<br><br>If use of a risk assessment tool is preferred (to assist clinical judgment), it is recommended that a scale that has been tested for use in the same specialty is chosen.<br><br>**Risk Factors**<br><br>**2** - An individual's potential to develop pressure ulcers may be influenced by the following intrinsic risk factors, which therefore should be considered when performing a risk assessment:<br><br>• Reduced mobility or immobility<br>• Sensory impairment<br>• Acute illness<br>• Level of consciousness<br>• Extremes of age<br>• Vascular disease<br>• Severe chronic or terminal illness<br>• Previous history of pressure damage<br>• Malnutrition and dehydration<br><br>**2** - The following extrinsic risk factors are involved in tissue damage and should be removed or diminished to prevent injury: pressure, shearing, and friction.<br><br>**2** - The potential of an individual to develop pressure ulcers may be exacerbated by the following factors, which therefore should be considered when performing a risk assessment: medication and moisture to the skin. |
| **RNAO (2005)** | **Assessment**<br><br>A head-to-toe skin assessment should be carried out with all clients at admission, and daily thereafter for those identified at risk for skin breakdown. Particular attention should be paid to |

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| | vulnerable areas, especially over bony prominences.<br><br>*(Level of Evidence = IV)*<br><br>The client's risk for pressure ulcer development is determined by the combination of clinical judgment and the use of a reliable risk assessment tool. The use of a tool that has been tested for validity and reliability, such as the *Braden Scale for Predicting Pressure Sore Risk*, is recommended. Interventions should be based on identified intrinsic and extrinsic risk factors and those identified by a risk assessment tool, such as Braden's categories of sensory perception, mobility, activity, moisture, nutrition, friction, and shear. Risk assessment tools are useful as an aid to structure assessment.<br><br>*(Level of Evidence = IV)*<br><br>Clients who are restricted to bed and/or chair, or those experiencing surgical intervention, should be assessed for pressure, friction, and shear in all positions and during lifting, turning, and repositioning.<br><br>*(Level of Evidence = IV)*<br><br>All pressure ulcers are identified and staged using the National Pressure Ulcer Advisory Panel (NPUAP) criteria.<br><br>*(Level of Evidence = IV)*<br><br>If pressure ulcers are identified, utilization of the Registered Nurses Association of Ontario (RNAO) best practice guideline Assessment and Management of Stage I to IV Pressure Ulcers is recommended.<br><br>*(Level of Evidence = IV)*<br><br>All data should be documented at the time of assessment and reassessment.<br><br>*(Level of Evidence = IV)* |
| **WOCN (2003)** | **Assessment**<br><br>Several risk assessment tools are available that consist of subscales for determining risk score. The Braden and the Norton scales have been the most extensively studied. The Braden Scale has six subscales: sensory perception, moisture, activity, mobility, nutrition, friction, and shear. The Norton Scale consists of five subscales: physical condition, mental |

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| | state, activity, mobility, and incontinence. (See Appendices B-D in the original guideline document for risk assessment scales.<br><br>1. Perform risk assessment on entry to a healthcare setting and repeat on a regularly scheduled basis or when there is a significant change in the individual's condition. ***Level of evidence = C***.<br>a. **Acute care**: Perform initial assessment at admission and reassess at least every 48 hours or whenever the patient's condition changes or deteriorates.<br>b. **Long-term care**: Perform initial assessment at admission. Reassess weekly for the first 4 weeks, then quarterly after that, and whenever the resident's condition changes or deteriorates.<br>c. **Home-health care**: Perform initial assessment at admission and reassess every visit.<br>2. Identify high-risk settings and groups to target prevention efforts to minimize risk. ***Level of evidence = C***.<br>3. Assess for cognition, sensation, immobility, friction, shear, and incontinence. ***Level of evidence = C***.<br>4. Assess for history of prior ulcer and presence of current ulcer, previous treatments, or surgical interventions that increase risk for additional pressure ulcers. ***Level of evidence = C***. |
| **PREVENTION** | |
| **Skin Care and Protection** | |
| **JHF (2003)** | Agency for Health Care Policy and Research (now known as the Agency for Healthcare Research and Quality, AHRQ) (AHCPR, 1992) prevention recommendations:<br><br>• Assess skin daily<br>• Clean skin at time of soiling--avoid hot water and irritating cleaning agents<br>• Use moisturizers on dry skin<br>• Do not massage bony prominences<br>• Protect skin of incontinent clients from exposure to moisture<br>• Use lubricants, protective dressings, and proper lifting techniques to avoid skin injury from friction/shear during transferring and turning of clients<br><br>Other care issues and interventions<br><br>• Don't massage reddened bony prominences<br>• Avoid drying out the patient's skin, use lotion after bathing |

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| | • Avoid hot water and soaps that are drying when bathing elderly<br>• Manage moisture<br>  • Manage moisture by determining the cause, use absorbent pad that wicks moisture<br>  • Offer a bedpan or urinal in conjunction with turning schedules |
| **NCCNSC/NICE (2003)** | **Skin Inspection**<br><br>**3** - Skin inspection should occur regularly and the frequency determined in response to changes in the individual's condition in relation to either deterioration or recovery.<br><br>**3** - Skin inspection should be based on an assessment of the most vulnerable areas of risk for each patient. These are typically: heels; sacrum; ischial tuberosities; parts of the body affected by anti-embolic stockings; femoral trochanters; parts of the body where pressure, friction, or shear is exerted in the course of an individual's daily living activities; parts of the body where there are external forces exerted by equipment and/or clothing; elbows; temporal region of the skull; shoulders; back of head; and toes.<br><br>Other areas should be inspected as necessitated by the patient's condition.<br><br>**3** - Individuals who are willing and able should be encouraged, following education, to inspect their own skin.<br><br>**3** - Individuals who are wheelchair users should use a mirror to inspect the areas that they cannot see easily or get others to inspect them.<br><br>**3** - Healthcare professionals should be aware of the following signs, which may indicate incipient pressure ulcer development: persistent erythema; non-blanching hyperaemia previously identified as non-blanching erythema; blisters; discolouration; localised heat; localised oedema; and localised induration. In those with darkly pigmented skin: purplish/bluish localised areas of skin; localised heat that, if tissue becomes damaged, is replaced by coolness; localised oedema; and localised induration.<br><br>**3** - Skin changes should be documented/recorded immediately. |
| **RNAO (2005)** | A head-to-toe skin assessment should be carried out with all clients at admission, and daily thereafter for those identified at risk for skin breakdown. Particular attention should be paid to |

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| | vulnerable areas, especially over bony prominences.<br><br>*(Level of Evidence = IV)*<br><br>Avoid massage over bony prominences.<br><br>*(Level of Evidence = IIb)*<br><br>Protect and promote skin integrity:<br><br>• Ensure hydration through adequate fluid intake.<br>• Individualize the bathing schedule.<br>• Avoid hot water and use a pH balanced, non-sensitizing skin cleanser.<br>• Minimize force and friction on the skin during cleansing.<br>• Maintain skin hydration by applying non-sensitizing, pH balanced, lubricating moisturizers and creams with minimal alcohol content.<br>• Use protective barriers (e.g., liquid barrier films, transparent films, hydrocolloids) or protective padding to reduce friction injuries.<br><br>*(Level of Evidence = IV)*<br><br>Protect skin from excessive moisture and incontinence:<br><br>• Assess and manage excessive moisture related to body fluids (e.g., urine, feces, perspiration, wound exudates, saliva)<br>• Gently cleanse skin at time of soiling. Avoid friction during care with the use of a spray perineal cleaner or soft wipe.<br>• Minimize skin exposure to excess moisture. When moisture cannot be controlled, use absorbent pads, dressings, or briefs that wick moisture away from the skin. Replace pads and linens when damp.<br>• Use topical agents that provide protective barriers to moisture.<br>• If unresolved skin irritation exists in a moist area, consult with the physician for evaluation and topical treatment.<br>• Establish a bowel and bladder program.<br><br>*(Level of Evidence = IV)* |
| **WOCN (2003)** | • Inspect skin and bony prominences at least daily. Any skin changes should be documented including a description of the skin changes as well as any action taken. ***Level of evidence = C***<br>• Clean and dry skin after each incontinent episode. ***Level of evidence = C***.<br>• Avoid vigorous massage over bony prominences. ***Level of*** |

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| | ***evidence = C***.<br>• Establish a bowel and bladder program for patients with incontinence. ***Level of evidence = C***.<br>• Use incontinence skin barriers as needed to protect and maintain skin integrity. ***Level of evidence = C***.<br>• Consider a pouching system or collection device to contain urine or stool to protect the skin from the effluent. In situations where the severity of urinary incontinence has contributed to or may contaminate the pressure ulcer, an indwelling catheter may be indicated for a short period of time. ***Level of evidence = C***. |
| **Positioning and Pressure-Relieving Devices** | |
| **JHF (2003)** | Agency for Health Care Policy and Research (now known as the Agency for Healthcare Research and Quality, AHRQ) (AHCPR, 1992) prevention recommendations:<br><br>• Turn and position bed-bound clients every 2 hours if consistent with overall care goals.<br>• Use a written schedule for turning and repositioning clients.<br>• Use pillows or other devices to keep bony prominences from direct contact with each other.<br>• Raise heels of bed-bound clients off the bed; do not use donut-type devices.<br>• Use a 30 degree lateral side lying position; do not place client directly on their trochanter.<br>• Keep head of the bed at lowest height possible.<br>• Use lifting devices (Trapeze, bed linen) to move clients rather than dragging them in bed during transfers and position changes.<br>• Use pressure-reducing devices (static air, alternating air, gel, water mattresses).<br>• Reposition chair or wheelchair bound clients every hour. In addition, if client is capable, have them do small weight shifts every 15 minutes.<br>• Use a pressure-reducing device (not a donut) for chair-bound clients.<br><br>Other care issues and interventions<br><br>• Avoid positioning the patient directly on their trochanter.<br>• Avoid use of doughnut-shaped devices.<br>• Manage friction and shear:<br>  • Elevate the head of the bed no more than 30 degrees.<br>  • Have the patient use a trapeze to lift self up in bed. |

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| | Staff should use a lift sheet or mechanical lifting device to move patient.<br><br>• Protect high-risk areas such as elbows, heels, sacrum, back of head from friction injury.<br><br>*Interventions Linked to Braden Cutscores (Adapted from Ayello & Braden, 2001)*<br><br>Prevention protocols linked to Braden cutscores are as follows:<br><br>At risk: score of 15 to 18<br><br>• Frequent turning, consider every 2 hour schedule, use a written schedule<br>• Maximize patient's mobility.<br>• Protect patient's heels.<br>• Use a pressure-reducing support surface if patient is bed- or chairfast.<br><br>Moderate risk: score of 13 to 14<br><br>• Same as above but provide foam wedges for 30 degree lateral position<br><br>High risk: score of 10 to 12<br><br>• Same as above but add the following:<br>  • Increase the turning frequency.<br>  • Do small shifts of position.<br><br>Very high risk: score of 9 or below<br><br>• Same as above but use a pressure relieving surface<br>• Manage moisture, nutrition, and friction/shear. |
| **NCCNSC/NICE (2003)** | **Positioning**<br><br>**3** - Individuals who are vulnerable to or at elevated risk of pressure ulcer development should be repositioned and the frequency of repositioning determined by the results of skin inspection and individual needs, not by a ritualistic schedule.<br><br>**3** - Repositioning should take into consideration other relevant matters, including the patient's medical condition, their comfort, the overall plan of care, and the support surface.<br><br>**3** - Positioning of patients should ensure that prolonged |

pressure on bony prominences is minimised, bony prominences are kept from direct contact with one another, and friction and shear damage is minimised.

**3** - A repositioning schedule, agreed with the individual, should be recorded and established for each person vulnerable to pressure ulcers.

**3** - Individuals or carers, who are willing and able, should be taught how to redistribute weight.

**3** - Manual handling devices should be used correctly in order to minimise shear and friction damage. After manoeuvring, slings, sleeves, or other parts of the handling equipment should not be left underneath individuals.

**Seating**

**3** - Seating assessments for aids and equipment (otherwise known as assistive technologies) should be carried out by trained assessors who have the acquired specific knowledge and expertise (for example, physiotherapists or occupational therapists).

**3** - Advice from trained assessors with acquired specific knowledge and expertise should be sought about correct seating positions.

**3** - Positioning of individuals who spend substantial periods of time in a chair or wheelchair should take into account distribution of weight, postural alignment, and support of feet.

**D** - The management of a patient in a sitting position is important. Even with appropriate pressure relief, it may be necessary to restrict sitting time to less than 2 hours until the condition of an individual with an elevated risk changes.

**3** - No seat cushion has been shown to perform better than another, so this guideline makes no recommendation about which type to use for pressure redistribution.

**Use of Aids**

**3** - The following should not be used as pressure-relieving aids: water-filled gloves, synthetic sheepskins, doughnut-type devices.

**Patient Factors to Consider in Selecting a Pressure-Relieving Device**

**D** - Decisions about which pressure-relieving device to use should be based on cost considerations and an overall assessment of the individual. Holistic assessment should include all of the following and should not be based solely on scores from risk assessment tools:

- Identified levels of risk
- Skin assessment
- Comfort
- General health state
- Lifestyle and abilities
- Critical care needs
- Acceptability of the proposed pressure-relieving equipment to the patient and/or carer

**Provision for All Individuals Vulnerable to Pressure Ulcers**

**B** - All individuals assessed as being vulnerable to pressure ulcers should, as a minimum provision, be placed on a high-specification foam mattress with pressure-relieving properties

**Patients at Elevated Risk of Developing Pressure Ulcers**

**D** - Although there is no research evidence that high-tech pressure relieving mattresses and overlays are more effective than high-specification (low-tech) foam mattresses and overlays, professional consensus recommends that consideration should be given to the use of alternating pressure or other high-tech pressure-relieving systems:

- As a first-line preventative strategy for people at elevated risk as identified by holistic assessment
- When the individual's previous history of pressure ulcer prevention and/or clinical condition indicates that he or she is best cared for on a high-tech device
- When a low-tech device has failed

**Patients Undergoing Surgery**

**D** - All individuals undergoing surgery and assessed as being vulnerable to pressure ulcers should, as a minimum provision, be placed on either a high-specification foam theatre mattress or other pressure-redistributing surface.

**Repositioning and 24-hour Approach to Provision of Pressure-Relieving Devices**

**D** - The provision of pressure-relieving devices needs a 24-hour approach. It should include consideration of all surfaces used

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| | by the patient.<br><br>**D** - Support surface and positioning needs should be assessed and reviewed regularly and determined by results of skin inspection, patient comfort, ability, and general state. Thus repositioning should occur when individuals are on pressure relieving devices.<br><br>**Coordinated Time Specified Approach**<br><br>**D** - A pressure ulcer reduction strategy should incorporate a coordinated approach to the acquisition, allocation, and management of pressure-relieving equipment. The time elapsing between assessment and use of the device should be specified in this strategy. |
| **RNAO (2005)** | For clients with an identified risk for pressure ulcer development, minimize pressure through the immediate use of a positioning schedule.<br><br>*(Level of Evidence = IV)*<br><br>Use proper positioning, transferring, and turning techniques. Consult Occupational Therapy/Physiotherapy (OT/PT) regarding transfer and positioning techniques and devices to reduce friction and shear and to optimize client independence.<br><br>*(Level of Evidence = IV)*<br><br>Clients at risk of developing a pressure ulcer should not remain on a standard mattress. A replacement mattress with low interface pressure, such as high-density foam, should be used.<br><br>*(Level of Evidence = Ia)*<br><br>For high risk clients experiencing surgical intervention, the use of pressure-relieving surfaces intraoperatively should be considered.<br><br>*(Level of Evidence = Ia)*<br><br>For individuals restricted to bed:<br><br>• Utilize an interdisciplinary approach to plan care.<br>• Use devices to enable independent positioning, lifting, and transfers (e.g., trapeze, transfer board, bed rails).<br>• Reposition at least every 2 hours or sooner if at high risk.<br>• Use pillows or foam wedges to avoid contact between bony prominences. |

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| | • Use devices to totally relieve pressure on the heels and bony prominences of the feet.<br>• A 30 degree turn to either side is recommended to avoid positioning directly on the trochanter.<br>• Reduce shearing forces by maintaining the head of the bed at the lowest elevation consistent with medical conditions and restrictions. A 30 degree elevation or lower is recommended.<br>• Use lifting devices to avoid dragging clients during transfer and position changes.<br>• Do not use donut type devices or products that localize pressure to other areas.<br><br>*(Level of Evidence = IV)*<br><br>For individuals restricted to chair:<br><br>• Use an interdisciplinary approach to plan care.<br>• Have the client shift weight every 15 minutes, if able.<br>• Reposition at least every hour if unable to shift weight.<br>• Use pressure-reducing devices for seating surfaces.<br>• Do not use donut type devices or products that localize pressure to other areas.<br>• Consider postural alignment, distribution of weight, balance, stability, support of feet, and pressure reduction when positioning individuals in chairs or wheelchairs.<br>• Refer to OT/PT for seating assessment and adaptations for special needs.<br><br>*(Level of Evidence = IV)* |
| **WOCN (2003)** | • Use turning or lift sheets or devices to turn or transfer patients. ***Level of evidence = C***.<br>• Maintain head of bed at, or below, 30 degrees or at the lowest degree of elevation consistent with the patient's medical condition. ***Level of evidence = C***.<br>• Schedule regular and frequent turning and repositioning for bed and chair-bound individuals. Turn at least every 2 to 4 hours on a pressure-reducing mattress or at least every 2 hours on a nonpressure-reducing mattress. ***Level of evidence = B***.<br>• Place "at-risk" individuals on a pressure-reduction surface and not on an ordinary hospital mattress. ***Level of evidence = A***.<br>• Avoid using foam rings, donuts, and sheepskin for pressure reduction. ***Level of evidence = C***.<br>• Use pressure-relief devices in the operating room for individuals assessed to be at high risk for pressure ulcer development. ***Level of evidence = A***.<br>• Position chair-bound patients when seated with attention to anatomy, postural alignment, distribution of weight, and |

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| | support of feet. ***Level of evidence = C***.<br>• Reposition chair-bound individuals every hour if they cannot perform pressure-relief exercises every 15 minutes. ***Level of evidence = C***.<br>• Refer to trained healthcare professionals to select appropriate pressure reduction/relief devices for chairs, wheelchairs, and beds. ***Level of evidence = C***.<br>• Relieve pressure under heels by using pillows or other devices. ***Level of evidence = B***. |
| **Nutrition** | |
| **JHF (2003)** | Manage nutrition:<br><br>• Consult a dietician and correct nutritional deficiencies by increasing protein and calorie intake and A, C, or E vitamin supplements as needed.<br>• Offer a glass of water with turning schedules to keep patient hydrated. |
| **NCCNSC/NICE (2003)** | No recommendations provided. |
| **RNAO (2005)** | A nutritional assessment with appropriate interventions should be implemented on entry to any new health care environment and when the client's condition changes. If a nutritional deficit is suspected:<br><br>• Consult with a registered dietitian. *(Level of Evidence = IV)*<br>• Investigate factors that compromise an apparently well nourished individual's dietary intake (especially protein or calories) and offer him or her support with eating. *(Level of Evidence = IV)*<br>• Plan and implement a nutritional support and/or supplementation program for nutritionally compromised individuals. *(Level of Evidence = IV)*<br>• If dietary intake remains inadequate, consider alternative nutritional interventions. *(Level of Evidence = IV)*<br>• Nutritional supplementation for critically ill older clients should be considered. *(Level of Evidence = Ib)* |
| **WOCN (2003)** | Perform nutritional assessment on entry into a new healthcare setting and whenever there is a change in the individual's condition that may increase the risk of malnutrition. ***Level of evidence = C***.<br><br>Assess laboratory parameters to determine nutritional status, |

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| | which may include albumin or pre-albumin, transferring, and total lymphocyte count. ***Level of evidence = C***.<br><br>Assess nutrition to measure effectiveness of nutritional interventions. ***Level of evidence = C***.<br><br>Maintain adequate nutrition that is compatible with the patient's wishes or condition to maximize the potential for healing. ***Level of evidence = C***. |
| **Patient, Caregiver and Professional Education** | |
| **JHF (2003)** | Other care issues and interventions<br><br>Teach patient, caregivers, and staff the prevention protocols |
| **NCCNSC/NICE (2003)** | **Education and Information-giving**<br><br>**D** - All healthcare professionals should be educated about:<br><br>• Pressure ulcer risk assessment and prevention<br>• Selection, use, and maintenance of pressure-relieving devices<br>• Patient education and information giving<br><br>**D** - Individuals vulnerable to or at elevated risk of developing pressure ulcers and their carers should be informed verbally and in writing about:<br><br>• The prevention of pressure ulcers using pressure-relieving strategies<br>• The use and maintenance of pressure-relieving devices<br>• Where they can seek further advice and assistance |
| **RNAO (2005)** | **Education Recommendations**<br><br>Educational programs for the prevention of pressure ulcers should be structured, organized, and comprehensive and should be updated on a regular basis to incorporate new evidence and technologies. Programs should be directed at all levels of health care providers including clients, family or caregivers. *(Level of Evidence = III)*<br><br>The educational program for prevention of pressure ulcers should be based on the principles of adult learning, the level of information provided and the mode of delivery. Programs must be evaluated for their effectiveness in preventing pressure ulcers through such mechanisms as quality assurance |

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| | standards and audits. Information on the following should be included:<br><br>• The etiology and risk factors predisposing to pressure ulcer development.<br>• The use of risk assessment tools, such as the *Braden Scale for Predicting Pressure Score Risk.* Categories of the risk assessment should also be utilized to identify specific risks and ensure effective care planning.<br>• Skin assessment.<br>• Staging of pressure ulcers.<br>• Selection and/or use of support surfaces.<br>• Development and implementation of an individualized skin care program.<br>• Demonstration of positioning/transferring techniques to decrease risk of tissue breakdown.<br>• Instruction on accurate documentation of pertinent data.<br>• Roles and responsibilities of team members in relation to pressure ulcer risk assessment and prevention.<br><br>*(Level of Evidence = III)* |
| **WOCN (2003)** | **Patient/Caregiver Education**<br><br>Educate patients and caregivers about the causes and risk factors for pressure ulcer development and ways to minimize risk. ***Level of Evidence = C***.<br><br>The patient or caregiver, or both, should understand the importance of the following:<br><br>• Conduct a regular inspection of skin over bony prominences. (Individuals can use a mirror if necessary to inspect their own skin.)<br>• Follow appropriate skin-care regimens.<br>• Use measures to avoid friction/shearing.<br>• Avoid vigorous massage of bony prominences or reddened areas.<br>• Include routine turning, repositioning, and the use of pressure-reducing devices if patient is confined to bed and/or chair.<br>• Avoid use of donut-type devices.<br>• Maintain adequate nutrition and fluid intake and monitoring for weight loss, poor appetite, or gastrointestinal changes that interfere with eating.<br>• Promptly report healthcare changes and nutritional problems to healthcare providers. |
| **Other Prevention Activities** | |

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| **JHF (2003)** | No recommendations provided. |
| **NCCNSC/NICE (2003)** | No recommendations provided. |
| **RNAO (2005)** | An individualized plan of care is based on assessment data, identified risk factors, and the client's goals. The plan is developed in collaboration with the client, significant others, and health care professionals.<br><br>*(Level of Evidence = IV)*<br><br>The nurse uses clinical judgment to interpret risk in the context of the entire client profile, including the client's goals.<br><br>*(Level of Evidence = IV)*<br><br>Consider the impact of pain. Pain may decrease mobility and activity. Pain control measures may include effective medication, therapeutic positioning, support surfaces, and other non-pharmacological interventions. Monitor level of pain on an on-going basis, using a valid pain assessment tool.<br><br>*(Level of Evidence = IV)*<br><br>Consider the client's risk for skin breakdown related to the loss of protective sensation or the ability to perceive pain and to respond in an effective manner (e.g., impact of analgesics, sedatives, neuropathy, etc.)<br><br>*(Level of Evidence = IV)*<br><br>Consider the impact of pain on local tissue perfusion<br><br>*(Level of Evidence = IV)*<br><br>Institute a rehabilitation program, if consistent with the overall goals of care and the potential exists for improving the individual's mobility and activity status. Consult the care team regarding a rehabilitation program.<br><br>*(Level of Evidence = IV)*<br><br>Advance notice should be given when transferring a client between setting (e.g., hospital to home/long-term care facility/hospice/residential care) if pressure reducing/relieving equipment is required to be in place at time of transfer (e.g., pressure relieving mattresses, seating, special transfer |

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| | equipment). Transfer to another setting may require a site visit, client/family conference, and/or assessment for funding of resources to prevent the development of pressure ulcers.<br><br>*(Level of Evidence = IV)*<br><br>Clients moving between care settings should have the following information provided:<br><br>• Risk factors identified<br>• Details of pressure points and skin condition prior to discharge<br>• Type of bed/mattress the client requires<br>• Type of seating the client requires<br>• Details of healed ulcers<br>• Stage, site, and size of existing ulcers<br>• History of ulcers, previous treatments, and products used<br>• Type of dressing currently used and frequency of change<br>• Adverse reactions to wound care products<br>• Summary of relevant laboratory results<br>• Need for on-going nutritional support<br><br>*(Level of Evidence = IV)* |
| **WOCN (2003)** | No recommendations provided. |

| **TABLE 3: BENEFITS AND HARMS** | |
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| **Benefits** | |
| **JHF (2003)** | **Patient**:<br><br>• Client's skin will remain intact.<br>• Pressure ulcer(s) will heal.<br><br>**Provider/Nurse**:<br><br>• Nurses will accurately perform pressure ulcer risk assessment using standardized tool.<br>• Nurses will implement pressure ulcer prevention protocols for clients interpreted as at risk for pressure ulcers.<br>• Nurses will perform a skin assessment for early detection of pressure ulcers. |

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| | **Institutional**:<br><br>• Reduction in development of new pressure ulcers.<br>• Increased number of risk assessments performed.<br>• Cost-effective prevention protocols developed. |
| **NCCNSC/NICE (2003)** | • Although the guideline does not cover treatment of existing pressure ulcers, its recommendations will be useful in preventing pressure ulcers on other areas of the patient's body and further pressure damage to existing pressure ulcers.<br>• Prevention of pressure ulcers has benefits for both the health-related quality of life of the patient/carer and the health services.<br><br>**Subgroups Most Likely to Benefit**<br><br>Groups at high risk of developing a pressure ulcer generally include those with the following intrinsic risk factors:<br><br>• Reduced mobility or immobility<br>• Sensory impairment<br>• Acute illness<br>• Level of consciousness<br>• Extremes of age<br>• Previous history of pressure damage<br>• Vascular disease<br>• Severe chronic or terminal illness<br>• Malnutrition |
| **RNAO (2005)** | • Accurate identification of at-risk individuals who need preventive interventions and of the specific factors that place them at risk<br>• Protection and promotion of skin integrity<br>• Protection against the forces of pressure, friction, and shear<br>• Reduction of the incidence of pressure ulcers through educational programs for health professionals and clients<br>• Nurses, other health care professionals, and administrators who are leading and facilitating practice changes will find this document valuable for the development of policies, procedures, protocols, educational programs, assessment, and documentation tools, etc. |
| **WOCN (2003)** | • Early identification of individuals at risk for developing pressure ulcers and early prevention measures.<br>• Appropriate strategies/plans to: |

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| | • attain/maintain intact skin<br>• prevent complications<br>• promptly identify or manage complications<br>• involve patient and caregiver in self-management<br>• Cost-effective strategies/plans that prevent and treat pressure ulcers |
| **Harms** | |
| **JHF (2003)** | Not stated |
| **NCCNSC/NICE (2003)** | Equipment safety is an important issue in relation to the use of pressure-relieving devices. In particular, cross-infection can happen if equipment is inadequately decontaminated between patients and injury is possible if users of such equipment (patients, carers, and healthcare professionals) have not been educated about appropriate use. |
| **RNAO (2005)** | Not stated |
| **WOCN (2003)** | Not stated |

| **TABLE 4: EVIDENCE RATING SCHEMES AND REFERENCES** | |
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| **JHF (2003)** | **REFERENCES SUPPORTING THE RECOMMENDATIONS**<br><br>• Agency for Health Care Policy and Research (AHCPR). Pressure ulcers in adults: prediction and prevention. Rockville (MD): U.S. Department of Health and Human Services, Public Health Service, AHCPR; 1992 May. 63 p. (Clinical practice guideline; no. 3). [127 references]<br>• Ayello EA, Braden B. Why is pressure ulcer risk assessment so important. Nursing 2001 Nov;31(11):74-9. |
| **NCCNSC/NICE (2003)** | **Levels of Evidence**<br><br>**I**: Evidence from meta-analysis of randomised controlled trials or at least one randomised controlled trial<br><br>**II**: Evidence from at least one controlled trial without randomisation or at least one other type of quasi-experimental |

study

**III**: Evidence from non-experimental descriptive studies, such as comparative studies, correlation studies, and case-control studies

**IV**: Evidence from expert committee reports or opinions and/or clinical experience of respected authorities

***Recommendation Grades**

**A**: Directly based on category I evidence

**B**: Directly based on:

- category II evidence, or
- extrapolated recommendation from category I evidence

**C**: Directly based on:

- category III evidence, or
- extrapolated recommendation from category I or II evidence

**D**: Directly based on:

- category IV evidence
- extrapolated recommendation from category I, II, or III evidence

****Grading Scheme**

***Evidence***

**1**: Generally consistent finding in a majority of multiple acceptable studies

**2**: Either based on a single acceptable study, or a weak or inconsistent finding in multiple acceptable studies

**3**: Limited scientific evidence that does not meet all the criteria of acceptable studies or absence of directly applicable studies of good quality. This includes expert opinion.

*From Eccles M, Mason J. (2001) How to develop cost conscious guidelines. *Health Technology Assessment* 5(16).

**Adapted from Waddell G, Feder G, McIntosh A, et al (1996) *Low Back Pain Evidence Review*. London: Royal College of

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| | General Practitioners. |
| **RNAO (2005)** | **Levels of Evidence**<br><br>**Ia** Evidence obtained from meta-analysis or systematic review of randomized controlled trials<br><br>**Ib** Evidence obtained from at least one randomized controlled trial<br><br>**IIa** Evidence obtained from at least one well-designed controlled study without randomization<br><br>**IIb** Evidence obtained from at least one other type of well-designed quasi-experimental study without randomization<br><br>**III** Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, and case studies<br><br>**IV** Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities |
| **WOCN (2003)** | The type of evidence is identified for selected recommendations (see "Major Recommendations" field) and defined as follows:<br><br>**Level A**: Two or more supporting randomized controlled trials (RCTs) on lower extremity arterial disease (LEAD) in humans (at Levels I or II), meta-analysis of RCTs, or Cochrane Systematic Review of RCTs<br><br>**Level B**: One or more supporting controlled trials on lower extremity arterial disease in humans or two or more supporting trials in an animal model (at Level III)<br><br>**Level C**: One supporting controlled trial, at least two supporting case series that were descriptive studies on humans, or expert opinion<br><br>Where a level of evidence rating is not included, the information presented represents a consensus of the panel members |

**GUIDELINE CONTENT COMPARISON**

The John A. Hartford Foundation (JHF), National Collaborating Centre for Nursing and Supportive Care, National Institute for Clinical Excellence (NCCNSC/NICE),

Registered Nurses Association of Ontario (RNAO), and Wound, Ostomy, and Continence Nurses Society (WOCN) present recommendations for prevention of pressure ulcers. NCCNSC/NICE, RNAO, and WOCN rank the level of evidence for each major recommendation, and JHF offers literature citations to support their major recommendations. In addition, JHF, RNAO, and WOCN provide explicit reasoning behind their judgments in narrative form.

The guidelines differ somewhat in scope. In addition to addressing pressure ulcer prevention, JHF provides recommendations for skin tear risk assessment and prevention, NCCNSC/NICE and RNAO consider organizational and policy issues, and WOCN discusses treatment of pressure ulcers. Additionally, the RNAO guideline states that their recommendations apply to management of Stage I pressure ulcers.

Three guidelines (JHF, RNAO, and WOCN) either reviewed or explicitly adapted recommendations from a guideline developed by the U.S. Agency for Healthcare Policy and Research (now the U.S. Agency for Healthcare Research and Quality), *Pressure Ulcers in Adults: Prediction and Prevention* (1992). (NGC note: The AHCPR guideline does not meet criteria for inclusion in the National Guidelines Clearinghouse because it is more than five years old).

**Areas of Agreement**

*Assessment of Pressure Ulcer Risk*

All the guidelines agree on the need for timely assessment of pressure ulcer risk and most explicitly recommend a combination of informal (i.e., clinical judgment) and formal (i.e., use of a risk assessment tool) methods. As a formal risk assessment method, use of a standardized tool is recommended by all the guidelines. The Braden Scale and the Norton Scale are mentioned as appropriate instruments by JHF, RNAO, and WOCN. Some differences between the guidelines concerning use of such tools are discussed below. All guidelines also agree on the need for reassessment when a patient's clinical condition changes, or on a regular basis for high-risk patients.

*Skin Care and Protection*

All four guidelines address skin care as a prevention intervention and recommend regular assessment, with JHF, RNAO, and WOCN recommending daily assessment of skin. NCCNSC/NICE does not address specific skin protection interventions, but otherwise there is overall agreement that keeping the skin dry and moisturized is an important prevention step. All three guidelines that address skin protection stress the need to avoid vigorous massage, especially over bony prominences. All four guidelines address the need to protect the skin from friction and shear, particularly during transfer and repositioning, as well as the need to manage moisture from incontinence. RNAO and WOCN specifically recommend establishing a bowel and bladder program for incontinent patients.

*Positioning and Pressure-Relieving Devices*

Recommendations concerning positioning and pressure-relieving devices are similar across the guidelines, with all noting the need for frequent repositioning of bed-bound and chair-bound patients and the need to use pressure-reducing mattresses and positioning devices such as wedges and pillows. Of note are that JHF, NCCNSC/NICE, and RNAO recommend use of a written repositioning schedule; NCCNSC/NICE, RNAO, and WOCN specifically cite the need for use of a pressure-relieving mattress during surgery for at-risk patients; and all four guidelines caution against the use of doughnut-type devices, which can cause venous congestion and edema.

*Nutrition*

JHF, RNAO, and WOCN consider the need for adequate nutrition as a part of pressure ulcer prevention. JHF cites the need for adequate hydration, protein, calories, and vitamins A, C, and E. Two guidelines, JHF and RNAO, recommend consultation with a dietitian to assess nutritional needs and develop a nutritional support plan.

*Patient, Carer, and Professional Education*

JHF, NCCNSC/NICE, and RNAO consider the need for education aimed at patients, carers, and professional staff, while WOCN includes recommendations concerning patient and carer education. JHF and RNAO state that educational programs should be structured, organized, comprehensive, and directed at all levels of healthcare providers, patients, and families or caregivers. RNAO stresses the importance of incorporating updated information and new technologies into educational programs.

*Other Interventions*

RNAO notes that pain has an impact on the risk for developing pressure ulcer by limiting a patient's mobility and, therefore, needs to be assessed and managed. RNAO also includes recommendations for creating a plan of care and a plan for transferring patients to another location. RNAO recommends implementing a rehabilitation program, when feasible, to improve patient mobility.

**Areas of Differences**

*Assessment of Pressure Ulcer Risk*

While all the guidelines include use of a standardized tool as a component of risk assessment, the guidelines differ concerning how much these tools should be relied on to guide interventions. JHF recommends that prevention protocols should be implemented based on scoring of the risk assessment tool. RNAO notes that the Braden and Norton scales have been tested sufficiently for reliability and validity and are useful adjuncts to nursing assessments and care planning, but nonetheless recommends that interventions be based on both a standardized instrument and clinical judgment, including identification of extrinsic and intrinsic risk factors. NCCNSC/NICE is the most cautious concerning use of risk assessment instruments, citing research that indicates routine use of these scales leads to inefficient use of preventive measures. The NCCNSC/NICE guideline therefore

explicitly recommends that risk assessment scales be used only as an aide memoire and not as a replacement for clinical judgment.

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This Synthesis was prepared by ECRI on October 31, 2006. The information was verified by UIGN on November 21, 2006, by AMDA and WOCN on December 5, 2006, and by RNAO on December 11, 2006. This summary was updated by ECRI Institute on July 30, 2007 following the withdrawal of the Singapore Ministry of Health guideline from the NGC Web site. This synthesis was updated on December 12, 2007 to remove UIGN recommendations.

Internet citation: National Guideline Clearinghouse (NGC). Guideline synthesis: Pressure Ulcer Prevention. In: National Guideline Clearinghouse (NGC) [website]. Rockville (MD): 2006 Dec (revised 2007 Dec). [cited YYYY Mon DD]. Available: http://www.guideline.gov.

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Date Modified: 6/2/2008