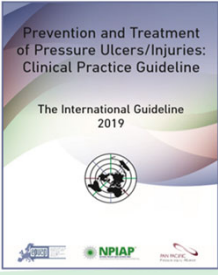


**2019
NPIAP-EPUAP-PPIA
Pressure Injury
Guidelines—
What's New?**

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**Nebraska Medicine &
University of Nebraska Medical Center
Omaha, NE**

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Conflict of Interest

- ◊ I have no conflicts of interest to disclose.

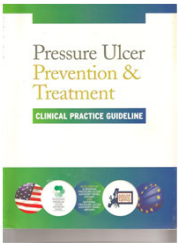
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2009 EPUAP–NPUAP International Guideline

- Publications
 - Clinical Practice Guideline
 - Quick Reference Guide
- Developed by:
 - 12 GGG members
 - 99 SWG members
- Peer reviewed by:
 - 903 individuals
 - 146 organizations
 - In 63 countries on 6 continents



The image shows the cover of the 2009 Clinical Practice Guideline for Pressure Ulcer Prevention & Treatment. The cover is white with a green header and footer. The title "Pressure Ulcer Prevention & Treatment" is in a large, blue font, with "CLINICAL PRACTICE GUIDELINE" in a smaller, black font below it. There are several small icons at the bottom of the cover, including a globe, a person, and a computer monitor.

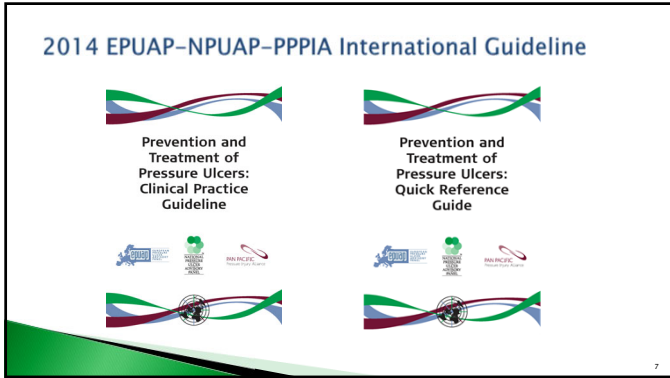
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2009: The FIRST International Guideline on Pressure Ulcer Prevention and Treatment

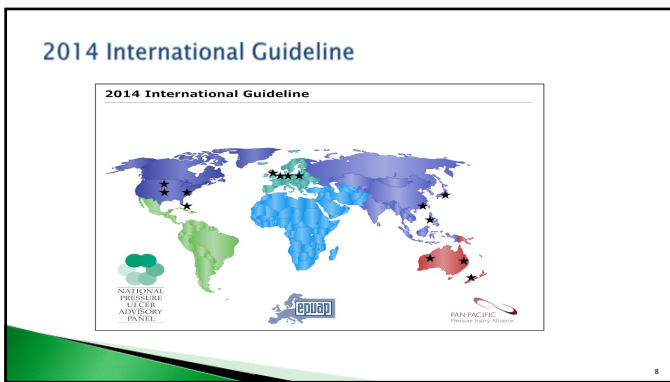


The image shows a world map with a green border. The map is titled "2009 International Guideline" and shows the distribution of the guideline across the world. The map is color-coded by continent: North America is blue, South America is green, Europe is blue, Africa is blue, Asia is blue, and Australia is red. There are several red dots on the map, indicating the locations of the guideline's development or implementation.

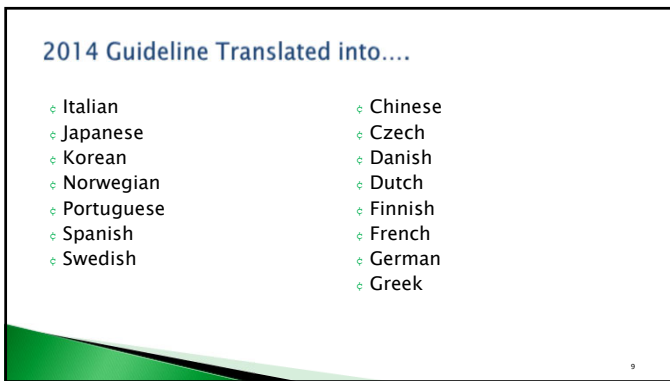
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World-wide Dissemination of English Versions

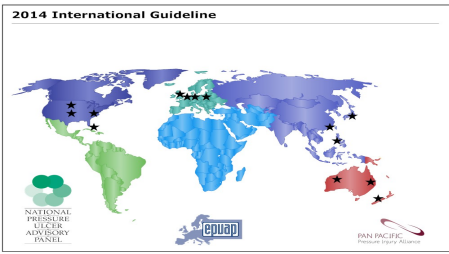


- Over 200,000 QRGs downloaded for free
- 2,272 hard copies of QRG purchased
- 4,398 electronic & hard copies of the CPG purchased.
- Electronic copies made available starting in 2016
- Evidence tables available for free on the guideline website
- Cited 155 times (Web of Science)

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2019 International Guideline



2014 International Guideline

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2019 Associate Organization Partners



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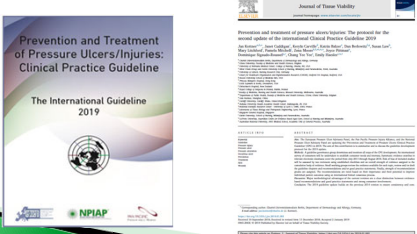
Quick Reference Guide

- Free e-download at NPIAP website.
- Complete the pages and check out of the store (will be free).
- <https://guidelinesales.com/page/NPIAP>

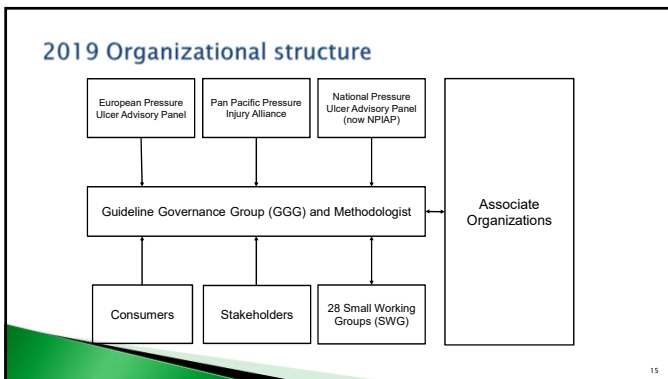
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Overview of the 2019 Guideline Methodology

- Built on the methods used for the 2014 guideline
- Improvements (e.g., consumer involvement, strength of evidence ratings)



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Sources of Data

- Published material
 - Literature published from July 1, 2013 to August 31, 2018
 - Inclusion criteria:
 - ... Primarily focused on Pressure Injury (PI) prevention, risk assessment, or PI treatment in human subjects
 - ... Published in a peer reviewed journal.
 - ... Primary research using empirical research designs (e.g. RCTs, observational...)
 - ... Every language
- Consumer input and engagement
 - N = 1233 participants (n = 383 patients, n = 850 caregivers)

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Levels of Evidence (LoE) (for intervention studies)

Level 1	Experimental designs <ul style="list-style-type: none"> • Randomized trial
Level 2	Quasi-experimental designs <ul style="list-style-type: none"> • Prospectively controlled study design • Pre-test post-test or historic/retrospective control group study
Level 3	Observational-analytical designs <ul style="list-style-type: none"> • Cohort study with or without control group • Case-controlled study
Level 4	Observational-descriptive studies (no control) <ul style="list-style-type: none"> • Observational study with no control group • Cross-sectional study • Case series (n=10+)
Level 5	Indirect evidence: studies in normal human subjects, human subjects with other types of chronic wounds, laboratory studies using animals, or computational models

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Strength of Evidence (SoE) rating for Recommendations


A	<ul style="list-style-type: none"> • More than one high quality Level 1 study providing direct evidence • Consistent body of evidence
B1	<ul style="list-style-type: none"> • Level 1 studies of moderate or low quality providing direct evidence • Level 2 studies of high or moderate quality providing direct evidence • Most studies have consistent outcomes and inconsistencies can be explained
B2	<ul style="list-style-type: none"> • Level 2 studies of low quality providing direct evidence • Level 3 or 4 studies (regardless of quality) providing direct evidence • Most studies have consistent outcomes and inconsistencies can be explained
C	<ul style="list-style-type: none"> • Level 5 studies (indirect evidence) e.g., studies in healthy human subjects, humans with other types of chronic wounds, animal models • A body of evidence with inconsistencies that cannot be explained, reflecting genuine uncertainty surrounding the topic

C ≠ Expert Opinion

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Good Practice Statements (GPS)

- Not supported by a body of evidence
- Considered significant for clinical practice
- Helps practitioners to take appropriate actions in area(s) of uncertainty
- No strength of evidence assignment
- Common Sense (!?)



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Strength of Recommendation (SoR)

- Rating based on potential to improve individual patient outcomes
- Degree to which professionals can be confident to do more good than harm
- Formal web based consensus process included all SWG and GGG members
- Facilitated by "evidence-to-decision" frameworks presenting pros and cons per intervention
- Assignment of 'Strength of Recommendation'

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Strength of Recommendation

Recommendation	Symbol	Description
Do it: Strong recommendation for an intervention	↑↑	Indicates a judgment that most well informed people would make.
Don't do it: Strong recommendation against an intervention	↓↓	
Probably do it: Conditional recommendation for using an intervention	↑	Indicates a judgment that a majority of well informed people would make, but a substantial minority would not.
Probably don't do it: Conditional recommendation against using an intervention	↓	
No specific recommendation: Conditional recommendation for either the intervention or the comparison	↔	Trade-offs between risk and benefit unclear or lack of agreement between voting participants.

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Methodological improvements

- Reduction of overall numbers of recommendations
- Clear distinction between evidence-based guideline recommendations and good practice statements and implementation considerations
- Recommendations for special populations, only if they are unique
- Evidence-to-decision frameworks
- Consumer engagement



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Guideline Layout

5 main sections:

1. Background material (purpose/scope, basic science and etiology, specific risks to special populations)
2. Prevention of PI (PI risk & assessment, skin assessment & tissue, preventive skin care)
3. Prevention and treatment of PI (nutrition, repositioning & early mobilization, heel PI, support surfaces & device related PI)
4. Treatment of PI – once a PI has occurred (accurate diagnosis, classification & assessment, monitoring of healing, development of ongoing comprehensive treatment plan)
5. Implementing the guideline – organization and professional level strategies for effective implementation [implementation strategies (facilitators and barriers), health professional education, support for the patient consumer & caregivers, measurement for monitoring PI within a facility/organization, & QI for monitoring guideline implementation]

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New Guideline Format (beginning with "Risk Factors" section)

1. Introduction
2. Clinical Questions
3. Recommendation
 1. Good Practice Statement (GPS) – *white boxes*
 2. Evidence-based Recommendations with SoE & SoR – *grey boxes*
4. Evidence Summary
5. Implementation Considerations
6. Evidence Discussion
7. References

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Clinical Questions: Medical Devices (MDRPI)

1. What factors should be considered when selecting and fitting a medical device?
2. What local management strategies are effective in preventing MDRPI?
3. Is a prophylactic dressing effective for preventing MDRPI? If so, what factors should be considered when selecting a prophylactic dressing?



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Good Practice Statement

8.3: Assess the skin under and around medical devices for signs of pressure related injury as part of routine skin assessment.
(Good Practice Statement)

- 8.4: Reduce and/or redistribute pressure at the skin device interface by:
- Regularly rotating or repositioning the medical device and/or the individual
 - Providing physical support for medical devices in order to minimize pressure and shear
 - Removing medical devices as soon as medically feasible.
- (Good Practice Statement)

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Evidence-based Recommendations

8.5: Use a prophylactic dressing beneath a medical device to reduce the risk of medical device related pressure injuries.
(Strength of Evidence = B1; Strength of Recommendation = 1)

8.6: If appropriate and safe, alternate the oxygen delivery device between correctly fitting mask and nasal prongs to reduce the severity of nasal and facial pressure injuries for neonates receiving oxygen therapy. (Strength of Evidence = B1; Strength of Recommendation = 1)

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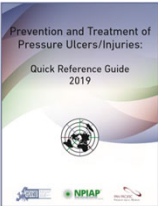
Implementation Considerations

- Avoid excessive layering of prophylactic dressings under a medical device because layering may increase pressure at the skin-device interface. (Expert opinion).
- Ensure the functionality of the medical device is not compromised by the prophylactic dressing (Expert opinion).
- Consider the following factors when selecting a prophylactic dressing:
 - Ability of the prophylactic dressing to manage moisture and microclimate (1) especially when used with a medical device that may be in contact with bodily fluids/drainage (e.g., percutaneous endoscopic gastrostomy tube)
 - Ease of application and removal (1)
 - Ability to regularly assess the condition of the skin (1)....

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Broad Areas of Prevention Unchanged

- Risk Factors and Risk Assessment
- Skin and Soft Tissue Assessment
- Preventive Skin Care
- Nutrition Assessment and Treatment
- Repositioning & Early Mobilization
- Heel Pressure Injury Prevention
- Support Surfaces for Prevention
- Device Related Pressure Injury Prevention



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Risk Factors and Risk Assessment

- Risk assessment on admission, routinely and with change in condition.
 - Structured approach
 - Include comprehensive skin assessment
 - Supplement risk tools with additional factors
 - Use clinical judgment
- Develop & implement a risk-based prevention plan.



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Risk Factors and Risk Assessment

1.1 Consider individuals with **limited mobility, limited activity and a high potential for friction and shear** to be at risk of pressure injuries. (A, ↑↑)

Comprehensive review of new epidemiological risk literature with *changes in Strength of Evidence*. See 1.2 through 1.9.

- ◊ A: Stage 1, diabetes mellitus.
- ◊ B1: Perfusion & circulation deficits, increased body temperature.
- ◊ C: Existing pressure injury (if risk remains), oxygenation deficits, nutritional status, moist skin, older age, impaired sensory perception, blood tests.
- ◊ GPS: previous pressure injury, other skin alterations, pain at pressure points, general and mental health status

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Additional Risk Factors for Special Populations

- 1.17 - Perioperative Experience: time immobilized before, during & after surgery, ASA scores (B2, ↑).
- 1.18 - Critical Care: duration of ICU stay, mechanical ventilation, use of vasopressors, APACHE II scores (GPS).
- 1.19 - Neonates & Children: skin maturity, perfusion & oxygenation and medical device (B1, ↑↑).
- 1.20 - Neonates & Children: illness severity and duration of critical care stay (B2, ↑)

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For your consideration.....


- ◊ 1.21 - Screening: Conduct a pressure injury risk screening as soon as possible after admission to the care service and periodically thereafter to identify individuals at risk of developing pressure injuries. (GPS)
- ◊ 1.22 - Full Risk Assessment: Conduct a full pressure injury risk assessment as guided by the screening outcome after admission and after any change in status. (GPS)
- ◊ See CPG (pages 61+) for discussions of clinical judgement & risk assessment tools.



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Skin and Soft Tissue Assessment

- Conduct a comprehensive skin and tissue assessment for all individuals at risk of pressure injuries:
 - ASAP after admission/transfer
 - Part of every risk assessment
 - Repeat based on risk
 - Prior to discharge.
- Assessment should include:
 - Erythema (blanchable or non)
 - Temperature differences
 - Tissue consistency differences (edema)
 - Pain at pressure points
- Special Assessment of Darkly Pigmented Skin



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Skin and Soft Tissue Assessment

2.4 Assess the temperature of skin and soft tissue (e.g., thermography). (B1, ↑↑)

2.6 Consider using a sub-epidermal moisture/edema measurement device as an adjunct to routine clinical skin assessment. (B2, ↔)

2.7 When assessing darkly pigmented skin, consider assessment of skin temperature and sub-epidermal moisture as important adjunct assessment strategies. (B2, ↑)

2.8 Evaluate the relevance of performing an objective assessment of skin tone using a color chart when conducting a skin assessment. (B2, ↔)

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Preventive Skin Care

3.1 Implement a skin care regimen that includes:

- Keeping the skin clean and appropriately hydrated
- Cleansing the skin promptly after episodes of incontinence
- Avoiding use of alkaline soaps and cleansers
- Protecting the skin from moisture with a barrier product. (B2, ↑↑)

3.2 Avoid vigorously rubbing skin that is at risk of pressure injuries. (GPS)

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Preventive Skin Care

3.3 Use **high absorbency incontinence products** to protect the skin in individuals with or at risk of pressure injuries who have urinary incontinence. (B1, ↑)

3.4 Consider using **textiles with low friction coefficients** for individuals with or at risk of pressure injuries. (B1, ↑)

3.5 Use a **soft silicone multi-layered foam dressing** to protect the skin for individuals at risk of pressure injuries. (B1, ↑)

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Nutritional Prevention- Changes

4.4 Optimize energy intake for individuals at risk of pressure injuries who are malnourished or at risk of malnutrition. (B2/1)

- Adjust protein intake for individuals at risk of pressure injuries who are malnourished or at risk of malnutrition. (GPS)
- Conduct age appropriate nutritional screening and assessment for neonates and children at risk of pressure injuries. (GPS)
- For neonates and children with or at risk of pressure injuries who have inadequate oral intake, consider fortified foods, age appropriate nutritional supplements, or enteral or parenteral nutritional support. (GPS)

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Repositioning & Early Mobilization

5.1 Reposition all individuals with or at risk of pressure injuries on an **individualized schedule**, unless contraindicated. (B1, ↑↑)

5.2 Determine repositioning frequency with **consideration to the individual's** level of activity, mobility and ability to independently reposition. (B2, ↑↑)

5.3 Determine **repositioning frequency** with consideration to the individual's:

- ... Skin and tissue tolerance
- ... General medical condition
- ... Overall treatment objectives
- ... Comfort and pain (GPS)

5.9 Keep the head of bed **as flat as possible**. (B1, ↔)

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Repositioning & Early Mobilization

5.4 Implement **repositioning reminder strategies** to promote adherence to repositioning regimens. (B1, ↑)

- ...Wearable Sternal Sensors (Pickham, et al., 2018)
- ...Musical cues (Yap, et al., 2013)
- ...Turning clocks & prompts.

5.6 Reposition the individual to relieve or redistribute pressure using manual handling techniques and equipment that **reduce friction and shear**. (B2, ↑)

5.7 Consider using **continuous bedside pressure mapping** as a visual cue to guide repositioning. (C, ↔)

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Seating & Early Mobilization

5.11 Promote **sitting out of bed** in an appropriate chair or wheelchair for limited periods of time. (B1, ↑)

5.14 Teach and encourage individuals who spend prolonged durations in a seated position to perform **pressure relieving maneuvers**. (C, ↑)

5.15 Implement an **early mobilization program** that increases activity and mobility as rapidly as tolerated. (C, ↑)

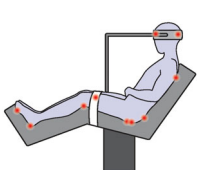
See Support Surface chapter for seating cushions and Surgery chapter for progressive seating.

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Positioning in OR and Post Op - 9 New Diagrams

Sitting/modified sitting

- ◊ Scapula
- ◊ Buttocks
- ◊ Coccyx
- ◊ Sacrum
- ◊ Ischium
- ◊ Back knees
- ◊ Heels
- ◊ Devices & securement straps



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Heel Pressure Injury Prevention

6.1 Assess the [vascular/perfusion status](#) of the lower limbs, heels and feet when performing a skin and tissue assessment, and as part of a risk assessment. (B2, ↑↑)

6.2 [Offload the heel completely](#) in such a way as to distribute the weight of the leg along the calf without placing pressure on the Achilles tendon and the popliteal vein. (B1, ↑↑)

6.4 Use a [prophylactic dressing as an adjunct](#) to heel offloading and other strategies to prevent heel pressure injuries. (B1, ↑)

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Support Surfaces for Prevention

7.1 Select a support surface that meets the individual's need for pressure redistribution based on the following factors:

- Level of immobility and inactivity
- Need to influence microclimate control and shear reduction
- Size and weight of the individual
- Number, severity and location of existing pressure injuries
- Risk for developing new pressure injuries. (GPS)

7.1.1 Select seat and seating support:

- Body size and configuration
- Effects of posture & deformities
- Mobility & lifestyle needs (GPS)



© Can Stock Photo

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Support Surfaces for Prevention

7.4 [High specification](#) reactive single layer foam mattress over foam mattress without high specification (B1, ↑)

7.5 Reactive [air](#) mattress or overlay (C, ↑)

7.6 Relative benefits of [medical grade sheepskin](#) (B1, ↔)

7.8 Pressure redistribution support surface on [OR tables](#) (B1, ↑)

7.12 Pressure redistribution [cushion for high risk in chair](#) (B1, ↑)

7.13 Relative benefits of [alternating pressure cushion](#) (B1, ↑)

7.14 [Bariatric](#) pressure redistribution cushion (B1, ↑)

7.15 Pressure redistributing support surface during [transit](#).(GPS)

7.16 Transfer [off spinal hardboard](#) as soon as safely possible. (C, ↑)

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Treatment: Guided by Assessment

- Conduct a comprehensive initial assessment of the individual with a pressure injury.
- Set treatment goals consistent with the value and goals of the individual, with input from the individual's informal caregivers, and develop a treatment plan that supports these values and goals.
- Monitor the progress of the pressure injury towards healing.

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Treatment- Basic Treatment Changes

- 4.10 Provide high-calorie, high-protein, arginine, zinc and antioxidant oral nutritional supplements or enteral formula for adults with a Category/Stage II or greater pressure injury who are malnourished or at risk of malnutrition. (B1/1)
- 12.1 Cleanse the pressure injury. (B1/1)
- 14.5 Use polymeric dressings for non-infected Category/Stage II pressure injuries. (B1/1)
- 14. 9 Use super-absorbent wound dressings with a high capacity for absorption to manage heavily exuding pressure injuries. (B2/1)
- 14.10 Use moist gauze dressings to maintain an appropriately moist wound environment when advanced wound dressings are not an option. (B1/ --)
- 14.11 Use moist gauze dressings to maintain an appropriately moist wound environment when advanced wound dressings are not an option. (B1/ --)

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Treatment- Debridement- Infection

- 12.5 Debride the pressure injury of devitalized tissue and suspected or confirmed biofilm and perform maintenance debridement until the wound bed is free of devitalized tissue and covered with granulation tissue. B1/11
- 13.6 Evaluate the pressure injury for presence of osteomyelitis in the presence of exposed bone and/or if the bone feels rough or soft, or if the pressure injury has failed to heal with appropriate treatment. (B2/1)
- 13.8 Use topical antiseptics in *tissue-appropriate strengths* to control microbial burden and to promote healing in pressure injuries that have delayed healing. (B1/1)

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Treatment- Advanced Treatments Changes

15.1 Consider applying collagen dressings to nonhealing pressure injuries to improve rate of healing and decrease signs and symptoms of wound inflammation. (B1 / 1)

16.1 Consider applying platelet-rich plasma for promoting healing in pressure injuries. (B1 / ---)

17.2 Consider using non-contact low frequency ultrasound therapy as an adjunct therapy to facilitate healing in Category/Stage III and IV pressure injuries and suspected deep tissue injuries. (B2 / ---)

17.3 Consider using high frequency ultrasound therapy at 1MHz as an adjunct therapy to facilitate healing in Category III and IV pressure injuries. (B1 / ---)

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Treatment- Reconstructive Surgery

18.3 Evaluate and mitigate physical and psychosocial factors that may impair surgical wound healing or influence recurrence of a pressure injury. (B2 / 1)

18.4 Fully excise the pressure injury, including abnormal skin, granulation and necrotic tissue, sinus tracts, bursa and involved bone to the extent possible. (B2 / 1)
excise

18.9 When the surgical site is sufficiently healed commence a progressive sitting protocol. (B2 / 1)

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Clinical Question: Are parachutes effective in preventing injury when jumping from a plane at high altitudes?

Wear a parachute when jumping from a plane at high altitudes. (Good Practice Statement)



"Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomized controlled trials."

Smith GC, Pell JP. Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials. *BMJ (Clinical research ed)*. 2003;327(7429):1459-1461.

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Implementation Considerations: How to Implement

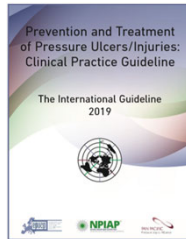
- Suggestion on how to implement a recommendation.
- Provide further guidance on clinical questions.
- Describes how, when, where, who or how often to implement a recommended practice.
- May identify core principles to consider when implementing the recommendation.
- Supplemental information pertinent to practice.
- May be supported by Level 1 to 5 evidence or consensus of SWG/GGG.

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Chapters on Implementing the Guideline

- Measuring Pressure Injury Prevalence & Incidence
- Implementing Best Practice in Clinical Settings
- Health Professional Education
- Quality of life, Self-care and Education
- **Quality Indicators for this Guideline**



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The research was rigorously analyzed, but.....

..... how do I make it work in the real world?



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Evidence-to-Decision (E2D)

Are low friction or m Recommendation 3.4	CRITERIA	JUDGEMENTS					RESE • I1 • I2 • I3 • I4 • I5 • I6 • I7 • I8 • I9 • I10 • I11 • I12 • I13 • I14 • I15 • I16 • I17 • I18 • I19 • I20
		Very low	Low	Moderate	High	No account undisable performance	
Option: Low friction shoe Recommendation 3.4	What is the overall certainty of the evidence?	No included studies <input type="checkbox"/>	Very low <input type="checkbox"/>	Low <input type="checkbox"/>	Moderate <input type="checkbox"/>	High <input type="checkbox"/>	<p>Evide</p> <p>• I1 • I2 • I3 • I4 • I5 • I6 • I7 • I8 • I9 • I10 • I11 • I12 • I13 • I14 • I15 • I16 • I17 • I18 • I19 • I20</p>
	Is there important uncertainty about how much people value the main outcomes?	Probably important uncertainty of variability <input type="checkbox"/>	Probably important uncertainty of variability <input type="checkbox"/>	Probably not important uncertainty of variability <input type="checkbox"/>	Probably important uncertainty of variability <input type="checkbox"/>	No account undisable performance <input type="checkbox"/>	
	How substantial are the desirable anticipated effects?	Unclear <input type="checkbox"/>	Probably not substantial <input type="checkbox"/>	Probably substantial <input type="checkbox"/>	Probably substantial <input type="checkbox"/>	Substantial <input type="checkbox"/>	
	How substantial are the undesirable anticipated effects?	Unclear <input type="checkbox"/>	Probably not substantial <input type="checkbox"/>	Probably substantial <input type="checkbox"/>	Probably substantial <input type="checkbox"/>	Substantial <input type="checkbox"/>	
	Do the desirable effects outweigh the undesirable effects?	No <input type="checkbox"/>	Probably not <input type="checkbox"/>	Unclear <input type="checkbox"/>	Probably Yes <input type="checkbox"/>	Yes <input type="checkbox"/>	Varies <input type="checkbox"/>

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Evidence-to-Decision (E2D) Frameworks

- ◊ Structured and transparent summary of evidence
- ◊ **Clearly indicates missing evidence**
- ◊ Informs about pros and cons based on predefined criteria
- ◊ Helps to develop appropriate recommendations
- ◊ Enables guideline users to understand judgments

Schunemann HJ, Mustafa R, Brozek J, et al. GRADE Guidelines: 16. GRADE evidence to decision frameworks for tests in clinical practice and public health. *Journal of Clinical Epidemiology*. 2016;76:89-98.

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Best Bedside Evidence Available

- ◊ Consider immobility, limited activity and exposure to friction and shear as risk factors
- ◊ Consider a stage 1 as a risk factor
- ◊ Consider the impact of diabetes on risk
 - ◊ Discussion centers on decreased perfusion and neuropathy
- ◊ Inspect the skin for erythema
- ◊ Administer pulsed electrical stimulation for recalcitrant PI
 - ◊ This statement does not begin with the word "Consider"

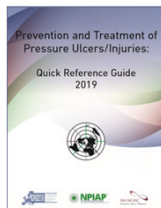
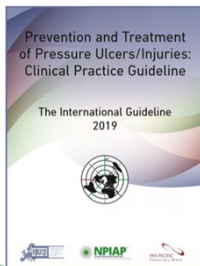
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Best System Evidence Available

- Develop and implement structured, tailored and multi-faceted QI programs
- Provide professional education on prevention and treatment
- QI indicators on structure, process and outcomes are included in the guideline

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2019 EPUAP-NPUAP-PPPIA International Guideline



<https://guidelinesales.com/page/Guidelines>

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