Nuts & Bolts of Pressure Injuries: 2019 International Nutrition Clinical Guidelines

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Disclosures

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- Executive Board of Director, National Pressure Injury Advisory Panel
- Assistant Chief, NFS, Southern Nevada Healthcare System, Las Vegas
- Lecturer, UMass, Amherst
- Co-chair of nutrition work group for international guidelines 2019
- Member of nutrition work group for international guidelines 2014
- None pose a conflict of interest for this presentation

Mary Ellen Posthauer, RDN, LDN, FAND

- President, MEP Healthcare Dietary Services, In.
- Past President NPIAP
- Member of nutrition work group for international guidelines 2009, 2014 and 2019
- Author: 2014 NPUAP/EPUAP/PPPIA white paper
- No conflict of interest for this presentation
Learning Objectives

Review the nutrition guidelines within the 2019 International EPUAP/NPIAP/PPPIA Prevention and Treatment of Pressure Ulcers/Injuries Clinical Practice Guideline

Highlight the key changes and updates from the 2014 guidelines (2nd edition), including a brief review of the evidence used to develop the 2019 international guidelines

Discuss how malnutrition impacts the risk of developing a Pressure Injury and decreases the rate of wound healing

Demonstrate the Guidelines in action through a case report based on the nutrition care process that includes a review of nutrition assessment and relevant interventions
The National Pressure Ulcer Advisory Panel (NPUAP) is now the National Pressure Injury Advisory Panel (NPIAP)

- The patient is the center (green core)
- The sunrays emanating from the core represent NPIAP's work in reaching out to improve outcomes for patients with education, research, and public policy
Healthcare institutions must
- Identify and quantify the risk for PI
Prevalence of PI

- International Prevalence Survey:
  Long term acute care 25.2%, acute care 9.7%, LTC-nursing home 11.8%, rehab centers 12%,

- 10 year prevalence study in the US
  - PI declined from 13.5% in 2006 to 9.3% in 2015

- 60,000 people die yearly

The Clinical Practice Guideline presents recommendations and summarizes the supporting evidence for pressure ulcer prevention and treatment.

Printed copies of both the Quick Reference Guide and full 2019 International EPUAP/NPIAP/PPPIA Pressure Injury Prevention and Treatment Clinical Practice Guidelines can be obtained at https://guidelinesales.com/
### Strength of Evidence

<table>
<thead>
<tr>
<th></th>
<th>Strength of Evidence</th>
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<tbody>
<tr>
<td>A</td>
<td>• More than one high quality Level I study providing direct evidence</td>
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<tr>
<td></td>
<td>• Consistent body of evidence</td>
</tr>
<tr>
<td>B1</td>
<td>• Level 1 studies of moderate or low quality providing direct evidence</td>
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<tr>
<td></td>
<td>• Level 2 studies of high or moderate quality providing direct evidence</td>
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<td>• Most studies have consistent outcomes and inconsistencies can be explained</td>
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<tr>
<td>B2</td>
<td>• Level 2 studies of low quality providing direct evidence</td>
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<tr>
<td></td>
<td>• Level 3 or 4 studies (regardless of quality) providing direct evidence</td>
</tr>
<tr>
<td></td>
<td>• Most studies have consistent outcomes and inconsistencies can be explained</td>
</tr>
<tr>
<td>C</td>
<td>• Level 5 studies (indirect evidence) e.g., studies in normal human subjects, humans with other types of chronic wounds, animal models</td>
</tr>
<tr>
<td></td>
<td>• A body of evidence with inconsistencies that cannot be explained, reflecting genuine uncertainty surrounding the topic</td>
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<tr>
<td>GPS</td>
<td><strong>Good Practice Statement</strong></td>
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<tr>
<td></td>
<td>• Statements that are <strong>not supported by a body of evidence</strong> as listed above but considered by the GGG to be significant for clinical practice.</td>
</tr>
</tbody>
</table>

Reference: EXTRACT FROM INTERNATIONAL GUIDELINE 2019 EDITION
<table>
<thead>
<tr>
<th>Strength of Recommendations</th>
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<tbody>
<tr>
<td>↑↑</td>
<td>Strong positive recommendation: Definitely do it</td>
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<tr>
<td>↑</td>
<td>Weak positive recommendation: Probably do it</td>
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<tr>
<td>↔</td>
<td>No specific recommendation</td>
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<tr>
<td>↓</td>
<td>Weak negative recommendation: Probably don’t do it</td>
</tr>
<tr>
<td>↓↓</td>
<td>Strong negative recommendation: Definitely don’t it</td>
</tr>
</tbody>
</table>

Reference: EXTRACT FROM INTERNATIONAL GUIDELINE 2019 EDITION
EPUAP/NPIAP/PPPIA Clinical Practice Guideline
Nutrition Recommendations

Nutrition Small Work Group

Mary Ellen Posthauer, USA
Nancy Munoz, USA - Work Group Co-chair
Emanuele Cerdea, Italy, Work Group Co-chair
Jos Schols, Netherlands
Hajer Alsabaa, Saudi Arabia
Siriluck Siripanyawat, Thailand
Angela (Yi Jia) Liew, Singapore
Merrilyn Banks, Australia
Emily Haesler, Australia
Nutrition Risk for Developing Pressure Injuries

What has been reaffirmed?

What is new?
Nutrition Risk for Developing Pressure Injuries
Increased Nutrient Needs

Factors that may increase needs:

- Underweight
- History of significant weight loss
- Prevention of further weight loss or regain of lost weight
- Presence of multiple wounds
- Pre-existing malnutrition
- COPD
- Cancer
- Acute spinal cord injury
- Traumatic brain injury
- Hemodialysis
- Suspected hyper-metabolism and other comorbidities
## Nutrition Risk for Developing Pressure Injuries: Malnutrition

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>ASPEN/ Academy of Nutrition and Dietetics</th>
<th>GLIM</th>
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</thead>
<tbody>
<tr>
<td>Unintended weight loss</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low BMI</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Loss of muscle mass</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Loss of subcutaneous fat</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Localized or generalized fluid accumulation</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Decreased functional status.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Reduced Food Intake or Assimilation</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Disease burden/Inflammation</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Two of the six characteristics must be present. One phenotype and one etiologic characteristics must be present.

White, J.et al., *J Acad Nutr Diet* 2012, 112.5. 730-738
Nutrition Risk for Developing Pressure Injuries
Malnutrition

“Insufficient calories, protein, or other nutrients needed for tissue maintenance and repair”
Cycle of Declining Nutritional Status

Reduced Appetite
- ↓ Sense of taste & smell
- Isolation
- ↑ Inflammation due to disease

Declining Functional Status
- ↓ Hearing & vision
- ↓ Ability to shop & cook
- Impaired chewing
- Poor oral health
- Sarcopenia

Impaired Nutrient Utilization
- Poor diet
- Food-medication interactions
- ↓ Organ function

Financial
- Limited access to grocery store
- Food insecurity
- ↑ Medical costs
Nutrition Risk for Developing Pressure Injuries

Sarcopenia - loss of muscle mass & loss of function

Consequences:
- Impaired Functional Status
- Disabilities
- Increased risk for falls and fractures
- Increased risk for infections
- Loss of independence
- Increased risk for extended hospital LOS & institutionalization
- Death

Cruz-Jentoft, 2010; Pichard, 2004; Reisinger, 2014; Wakabayshi, 2014.
Relationship Between Malnutrition & Sarcopenia

Sarcopenia: loss of muscle mass & loss of function

Consequences of Loss of LBM

- Impaired immunity, increased risk for infection: 10%
- Decreased healing, weakness, infection: 20%
- Not able to sit up, increased risk for PI, Pneumonia: 30%
- Death: 40%
Sarcopenic Obesity
- Presence of both sarcopenia and obesity
  - Low muscle mass, decreased muscular strength, decreased physical performance
  - Combined with high fat mass
- Prevalence
  - As high as 20% in older adults

Increased risk
- Disability
- Institutionalization
- Mortality

Greater risk for poor health related outcomes
- Than either obesity or sarcopenia alone
2019 EPUAP, NPIAP, PPPIA
International Guideline

Nutrition Recommendation
Nutrition Screening 2019
Screening

The Academy of Nutrition and Dietetics

- The process of identifying patients, clients, or groups who may have a nutrition diagnosis and benefit from nutrition assessment and intervention by a registered dietitian nutritionist (RDN)

Time to Get Involved!

- Which screening tool is used in your facility?
4.1: Conduct nutritional screening for individuals at risk for pressure ulcer/injury

- Strength of Evidence = B1
- Strength of Recommendation = ↑↑

Not as prescriptive

- At admission to a health care setting;
- With each significant change of clinical condition; and/or
- When progress toward pressure ulcer closure is not observed

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Validated Screens

- Validated for use with individuals with/at risk for PI
  - The Mini Nutritional Assessment full version (MNA®)
  - the Malnutrition Universal Screening Tool (MUST) screening

- Older Adults
  - The Nutrition Risk Screening (NRS) 2002
  - Rapid Screen
  - Short Nutrition Assessment Questionnaire (SNAQ)
Nutrition Assessment
2019
Nutrition Assessment

The Academy of Nutrition and Dietetics

- identifying and evaluating data needed to make decisions about a nutrition-related problem/diagnosis

Includes
- food/nutrition-related history
- biochemical data
- medical tests and procedures
- anthropometric measurements
- nutrition-focused physical findings
- client history

4.2: Conduct a comprehensive nutrition assessment for adults at risk of a pressure ulcer/injury who are screened to be at risk of malnutrition and for all adults with a pressure ulcer/injury.

- Strength of Evidence = B2
- Strength of Recommendation = ↑↑

Not as prescriptive

- Assess the weight status of each individual to determine weight history. Then identify significant weight loss (= 5% in 30 days or 10% in 180 days). (Strength of Evidence = C; Strength of Recommendation = ★)
- Assess the individual’s ability to eat independently. (Strength of Evidence = C; Strength of Recommendation= ★ ★)
- Assess the adequacy of total nutrient intake (i.e., food, fluid, oral supplements, and enteral/parenteral feeds). (Strength of Evidence = C; Strength of Recommendation= ★ ★)
Nutrition Assessment

- Assessment conducted by RDN
- Weight Hx
- Ability to feed self
- Laboratory results in context of diagnosis and prognosis
Care plan developed to meet the patient’s desired outcomes

Care plan should:
- Individualized
- Interdisciplinary
- Revolve around the patient’s goals and preferences
- Include due date
- Reviewed and updated frequently
4.3: Develop and implement an individualized nutrition care plan for individuals with, or at risk of, a pressure ulcer/injury who are malnourished or who are at risk of malnutrition.
- Strength of Evidence = B2
- Strength of Recommendation = ↑↑

Not as prescriptive
- Develop an individualized nutrition care plan for individuals with or at risk of a pressure ulcer. (Strength of Evidence = C; Strength of Recommendation = ↑)
- Follow relevant and evidence-based guidelines on nutrition and hydration for individuals who exhibit nutritional risk and who are at risk of pressure ulcers or have an existing pressure ulcer. (Strength of Evidence = C; Strength of Recommendation = ↑)

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RDN with interprofessional team
- Individualized interventions
- Based on the individual’s nutritional needs
- Feeding route
- Clinical goals of care

Research 2013
- Care plan for older adults with stage 2 PI associated with improved wound healing
Energy and Protein Intake for Individuals at Risk of Pressure Injuries

2019
Energy and Protein- At Risk for PI

- Indirect evidence suggests
  - Risk of pressure injuries and with malnutrition
  - Nutritional supplementation
  - Improved energy intake
4.4: Optimize energy intake for individuals at risk of pressure injuries who are malnourished or at risk of malnutrition.
- Strength of Evidence = B2; Strength of Recommendation =↑

4.5: Adjust protein intake for individuals at risk of pressure injuries who are malnourished or at risk of malnutrition
- (Good Practice Statement)

New Recommendation: 2019

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Research examining the benefits of providing increased energy and protein for individuals at risk for PI or at risk for malnutrition has produced mixed results.

No high quality research evidence to indicate if a higher protein and higher energy intakes reduces the incidence of pressure injuries in people at risk.
Energy and Protein for Individuals with Pressure Injuries 2019
4.6: Provide 30 to 35 kcalories/kg body weight/day for adults with a pressure injury who are malnourished or at risk of malnutrition
   - Strength of Evidence = B2
   - Strength of Recommendation = ↑

4.7: Provide 1.25 to 1.5 g/kg body weight/day for adults with a pressure ulcer/injury who are malnourished or at risk of malnutrition
   - Strength of Evidence = B1
   - Strength of Recommendation = ↑↑
Research in the past three decades

- Demonstrate the interrelationship between meeting energy and protein requirements
  - Breslow-1993-individuals receiving higher protein, higher energy diets achieved statistically significantly greater reductions in pressure injury surface area compared to baseline than did individuals receiving a standard diet (p < 0.02)
  - Lizaka-2014-Energy and protein intake was associated with wound healing for deep pressure injuries
  - Lee- 2006- Providing 1.5 g/kg body weight/day (total protein 45 g) compared to placebo resulted in a 60% reduction in PUSH scores after eight weeks of treatment compared to a 48% reduction in the control group (p < 0.05)
Oral nutritional supplements (ONS) and fortified food can be used to reverse unintended weight loss and malnutrition

- Unable to consume estimated requirements by PO food intake

- ONS
  - Products that supply nutrients including protein, carbohydrates, fat, vitamins, minerals, and/or amino acids
  - Read labels!
4.8: Offer high calorie, high protein fortified foods and/or nutritional supplements in addition to the usual diet for adults who are at risk of developing a pressure ulcer/injury and who are also malnourished or at risk of malnutrition, if nutritional requirements cannot be achieved by normal dietary intake

- Strength of Evidence = C
- Strength of Recommendation = ↑
4.9: Offer high calorie, high protein nutritional supplements in addition to the usual diet for adults with a pressure ulcer/injury who are malnourished or at risk for malnutrition, if nutritional requirements cannot be achieved by normal dietary intake

- Strength of Evidence = B1
- Strength of Recommendation = ↑↑

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4.10: Provide high-calorie, high-protein, arginine, zinc and antioxidant oral nutritional supplements or enteral formula for adults with a Category/Stage 2 or greater pressure ulcer/injury who are malnourished or at risk for malnutrition

- Strength of Evidence = B1
- Strength of Recommendation = ↑

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ONS for adults at risk for developing PI

- PI risk reduction is multifactorial in nature
  - Linking ONS to PI risk reduction is challenging
- Research in this area has mixed findings
  - There is uncertainty about the efficacy of supplementation in the prevention of PI
ONSM for adults with PI

- Evidence on the efficacy of extra protein and energy provision in the healing of pressure injuries is substantial.
- Research conducted in hospitals, long term care and community care settings have consistently demonstrated significant improvement in healing of pressure injuries in individuals receiving high energy, high protein ONS in addition to a usual diet compared to control groups.
- The research supporting the use of arginine and micronutrients (zinc and antioxidants) to high calorie, high protein nutritional supplementation via either ONS or tube-feeding is growing.
Artificial Nutrition: Enteral and Parenteral Feeding

2019
4.11: Discuss the benefits and harms of enteral or parenteral feeding to support overall health in light of preferences and goals of care with individuals at risk of pressure ulcer/injury who cannot meet their nutritional requirements through oral intake despite nutritional intervention

- Good Practice Statement

4.12: Discuss the benefits and harms of enteral or parenteral feeding to support pressure injury treatment in light of preferences and goals of care for individuals with pressure ulcer/injury who cannot meet their nutritional requirements through oral intake despite nutritional interventions

- Strength of Evidence = B1
- Strength of Recommendation = ↑

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If oral intake is inadequate, enteral or parenteral nutrition may be recommended if consistent with the individual’s wishes.

Enteral (tube) feeding is the preferred route if the gastrointestinal tract is functioning.

The risks and benefits of nutrition support should be discussed with the individual and informal caregivers early on and should reflect the individual’s preferences and goals for care.
Hydration

2019
Water serves as the solvent for vitamins, minerals, glucose and other nutrients

- Water is also needed to transport nutrients through the body, and to eliminate waste products
- In healthy individuals who are adequately hydrated, water released from food and metabolism accounts for 20% or more of total water intake
- Total water needs include the water content of food
- ONS and enteral feedings normally contain 75% water from its total volume

- Review labels
Hydration Recommendations

4.13: Provide and encourage adequate water intake for hydration for an individual with or at risk of a pressure ulcer/injury, when compatible with goals of care and clinical condition

- Good Practice Statement

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Nutrition Management in Neonates and Children

2019
4.14: Conduct age appropriate nutritional screening and assessment for neonates and children at risk of pressure injuries

Good Practice Statement
4.15: 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.

**Good Practice Statement**
Let’s Put It All Together
Case Study

- Jane admitted to LTC following hip fx
- Fell at home, & on floor for hrs
- Additional dx, arthritis, DM
- Admission wt. 150 lbs., ht. 5 ft.2
- 8 lbs. decline in 3 wk due to poor intake
- Regular diet
- Meds: hypoglycemic, NSAID
- Poor endurance in therapy, poor hand grip strength
- Wheel chair most of day
- Stage 3 hip measuring 2.5 cm X 3.0 cm
- Braden sub-score = 2

- MNA Score = 5
- RDN interviews Jane & learns she ate microwave meals and snakes at home
- Labs: Hgb A1C 8%, FBS 195 mg/dl
- Meal intake records indicate 50% average eaten
- Current weight is 5% decline since admission
- No edema or meds to cause wt. decline
- Slow PI healing noted on medical record
Based on guidelines, protein needs are 81-97 grams/day.

Is Jane consuming adequate protein?

How would you define Jane’s nutritional status?

Eats 50% of meals = 39 gr.
Implement PI Protocol/POC

- Calories: 30-35 kcalories/kg/body weight (adjust per clinical condition)
- Protein: 1.2-1.5 gms/kg/body weight (adjust per clinical condition)
- Fluid: Provide & encourage good hydration & monitor status
- Provide high calorie, high protein ONS or high calorie, high protein ONS fortified with arginine, zinc & anti-oxidants between meals
- Liberalize restrictive diets
- Offer vitamin/mineral supplement with 100% of RDI’s if intake is poor

Monitor per Facility Policy

- Skin condition and/or wound status per facility policy
- Acceptance and tolerance of ONS
- Caloric, protein, fluid adequacy compared to estimated requirement
- Weight status
- Laboratory values, if applicable
- Ability to meet estimated needs orally
- Oral intake and if inadequate, consider enteral feeding consistent with individual’s wishes
Desired Outcome

- Intact skin or progress toward healing
- Improved and/or stable nutritional status
- Intake meets estimated caloric, protein and fluid requirements

Effectiveness of intervention in collaboration with interdisciplinary team and adjust, if condition changes, improves or declines

Document and re-assess per policy
<table>
<thead>
<tr>
<th>Practice Pearls</th>
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<tbody>
<tr>
<td><strong>Use</strong></td>
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<tr>
<td>Use a validated nutrition screening tool to identify nutritional status of individuals at risk of PI or with PIs</td>
</tr>
<tr>
<td><strong>Refer</strong></td>
</tr>
<tr>
<td>Refer individuals at risk of PI or with PIs to the RDN for a nutrition assessment</td>
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<tr>
<td><strong>Collaborate</strong></td>
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<tr>
<td>Collaborate with the RDN and interdisciplinary team to determine a patient-centered nutrition plan</td>
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<tr>
<td><strong>Encourage</strong></td>
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<tr>
<td>Encourage consumption of a balanced diet based on the individuals’ assessed caloric, protein and hydration requirements</td>
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<tr>
<td><strong>Practice Pearls</strong></td>
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<td>---------------------</td>
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<tr>
<td><strong>Provide</strong></td>
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<tr>
<td>Provide enriched foods and/or high calorie, high protein ONS between meals if needed to achieve assessed requirements.</td>
</tr>
<tr>
<td><strong>Consider</strong></td>
</tr>
<tr>
<td>Consider ONS enriched with arginine, zinc, and antioxidant for individuals with PIs who are at risk for or malnourished as needed to meet their assessed nutritional requirements.</td>
</tr>
<tr>
<td><strong>Offer</strong></td>
</tr>
<tr>
<td>Offer nutrition support (EN or PN) for individuals who are unable to consume adequate intake. Note, this must be compatible with individual’s goals.</td>
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<tr>
<td><strong>Provide</strong></td>
</tr>
<tr>
<td>Provide palliative/hospice care based on individual’s wishes.</td>
</tr>
</tbody>
</table>
Resources

- NPIAP [https://npuap.org/](https://npuap.org/)
- 2019 International EPUAP/NPIAP/PPPIA Pressure Injury Prevention and Treatment Clinical Practice Guidelines
  - [http://internationalguideline.com/](http://internationalguideline.com/)
- Printed copies of the full 2019 International EPUAP/NPIAP/PPPIA Pressure Injury Prevention and Treatment Clinical Practice Guidelines
  - [https://guidelinesales.com/](https://guidelinesales.com/)
- Guidelines Quick Reference Guide
  - [https://guidelinesales.com/](https://guidelinesales.com/)

Printed copies of both the Quick Reference Guide and full 2019 International EPUAP/NPIAP/PPPIA Pressure Injury Prevention and Treatment Clinical Practice Guidelines can be obtained at [https://guidelinesales.com/](https://guidelinesales.com/).
Resources

- NPIAP [https://npuap.org/](https://npuap.org/)
- NPUAP Pressure Injury Stages
  - Updated 2016
  - [https://npuap.org/page/resources](https://npuap.org/page/resources)
- Pressure Injury Staging Illustrations
  - [https://npuap.org/page/resources](https://npuap.org/page/resources)


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