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OPERATIONAL DEFINITION

MEASUREMENT: Pressure Injury (PI)

I. Description and Rationale

This measure answers the question: How often is a patient harmed due to pressure injury?

The National Pressure Injury Advisory Panel (NPIAP) will serve as the guide for defining and staging pressure injuries. The Solutions for Patient Safety (SPS) operational definition (this document) will serve as the official guide for reporting all hospital acquired pressure injuries detected during hospitalization. SPS recommends that all pressure injuries are staged by a certified wound ostomy nurse or specialty trained clinician.

II. Population Definition

The patient population for this measure is defined per the patient population operational definition. Inpatient and observational stay patients will be included in the measure.

Inclusion criteria
All patients are included who are defined as inpatient or under observation at the hospital.

Exclusion criteria
Any patient who has a PI documented upon admission to the hospital, would be excluded because this would be considered a non-facility acquired PI (unless the PI progresses to a stage 3, 4, or unstageable during their hospital stay).

III. Data Source(s)

Each hospital will report data using their own collection methods unless specific high detection methods are prescribed by the network in the future.

IV. Sampling and Data Collection Plan

Pressure injuries are assigned to the month the event occurred. One pressure injury is only recorded once at its "highest" stage.

V. Calculation

A pressure injury is localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or as an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, comorbidities and condition of the soft tissue.

Pressure Injury Stages

Mucosal Membrane Pressure Injury: Mucosal membrane pressure injury is found on mucous membranes with a history of a medical device in use at the location of the injury. Due to the anatomy of the tissue, these injuries cannot be staged.

Medical Device Related Pressure Injury: This describes the etiology of the injury. Medical device related pressure injuries result from the use of devices designed and applied for diagnostic other therapeutic purposes. The resultant pressure injury generally conforms to the pattern or shape of the device. The injury should be staged using the staging system.

Stage 2: Partial thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), medical adhesive related skin injury (MARSI), or traumatic wounds (skin tears, burns, abrasions).

Stage 3: Full thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epiboly (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss, this is an Unstageable Pressure Injury.

Stage 4: Full thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer. Slough and/or eschar may be visible. Epiboly (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss, this is an Unstageable Pressure Injury.

Deep Tissue Pressure Injury: Intact or non-intact skin with localized area of persistent non-blanch able deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood-filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forced at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury or may resolve without tissue loss. If necrotic tissues, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full thickness pressure injury (Unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions.

Unstageable: Full thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e. Dry, adherent, intact without erythema or fluctuance) on an ischemic limb or heel(s) should not be removed.

All Harm Numerator: Number of Mucosal, Stage 2, 3, 4, deep tissue pressure injuries (DTPI), and unstageable pressure injuries as defined below.

> All Harm **Excludes** Stage I pressure injury: Intact skin with a localized area of non-blanch able erythema, which may appear differently in darkly pigmented skin. Presence of blanch able erythema or changes in sensation, temperature or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.

Serious Harm Numerator: Number of Stage 3, 4, and unstageable pressure injuries as defined below.

Note: effective January 2015, Suspected Deep Tissue Injuries are not reported as a serious harm measure. Suspected deep tissue injuries will still be reported to SPS each month and included in the All Harm measure. Injuries detected and determined to be suspected deep tissue injuries should be monitored every 2 to 3 days for the first week following discovery, then weekly until injury fades or the patient is discharged. If these injuries progress and develop into Stage III, Stage IV or Unstageable pressure injuries then the progression of this injury should be reported to SPS.

> Serious Harm **Excludes**: Stage 1, 2, Mucosal Injuries, and DTPI.

***When counting PI's (Pressure Injuries):**

For Immobility:

Separate pressure injuries, due to immobility, that are detected on the same location of the body within 24 hours are counted as a single pressure injury of the highest stage, even if they are not contiguous.

Example 1*:* Patient with a stage 2 PI on the sacrum and stage 3 PI on coccyx (detected at the same time or within 24 hours) would be one injury, and should be captured at the highest stage, which would be a stage 3.

Example 2*:* Patient with a stage 2 PI on heel, and stage 3 PI on coccyx (detected at the same time) would be counted as 2 separate PI's.

For Device Related PI's (Pressure Injuries):

If multiple PI's are caused by a single device and are detected within 24 hours of each other, they are counted as a single pressure injury of the highest stage.

Example 1*:* Patient with two PI's identified within 12 hours of each other (one stage 3 PI on the chin and one stage 4 PI on the back of the neck – both caused by a C-Collar); This would count as one PI at the highest stage, which would be a stage 4.

Example 2: Patient with a stage 3 PI identified on the right side of the neck caused by trach ties, and 48 hours later, a stage 3 PI is identified on the back of the neck and caused by trach ties. This would count as two separate stage 3 PI's.

Example 3: Patient with two PI's identified simultaneously (one stage 3 PI identified on the right hand and one stage 3 PI identified on the left forearm – both caused by the hub of PIV's); This would count as two separate stage 3 PI's.

Example 4: Patient with a stage 3 PI identified on the bridge of the nose, caused by CPAP mask, and 8 hours later, a stage 2 PI is identified on the chin, also caused by CPAP mask; This would count as one PI at the highest stage, which would be a stage 3.

Example 5: Patient with SCD's on bilateral legs (one stage 3 PI identified on right knee, and one stage 3 PI identified simultaneously on right ankle); This would count as one PI at the highest stage, which would be a stage 3.

Example 6: Patient with SCD's on bilateral legs (one stage 2 PI identified on left knee, and 12 hours later, one stage 2 PI is identified on right knee); This would count as two separate stage 2 PI's.

Denominator for both All Harm and Serious Harm: Total number patient days.

Serious Harm Calculation:

Number pressure injuries (stages 3-4, unstageable) per number patient days per 1000 patients

Rate= (Numerator/Denominator) * 1000

VI. Data Quality Audit Procedures

Each hospital will report data using active surveillance definition as defined in Section IX.

VII. Notes

N/A

VIII. Experts/Resources

https://www.nursingquality.org/

IX. Active Surveillance Definition

SPS recommends active surveillance as a duplicate method of detection for pressure injuries, in addition to an intervention that helps with early identification and mitigation to reduce risk of PIs. The network recommends this assessment be conducted weekly. Active surveillance is a head to toe assessment for pressure injuries, along with recommendations for prevention interventions not already in place. Active surveillance is completed on every patient in high-risk units* and high-risk patients** on general specialty units. It is completed by a team***, led by a PI champion to include the beside RN. A certified wound ostomy nurse needs to be available for questions, consultation and/or staging during active surveillance. **A routine (e.g. daily) assessment by the nurse is not considered active surveillance.**

*High-risk unit: consider PICU, CICU, NICU (or as per local data)
**High-risk patients: score "at risk" based upon your hospital's risk assessment tool (or as per local data, bearing in mind that SPS data indicate that many patients with PI may not have been identified by traditional screening criteria)
***Teams could include respiratory therapy, MD/CNS, PT, quality leader

Description and Rationale

This measure answers the question(s): What is the trend over time of percent of hospitals who conduct active surveillance for pressure injury? Which hospitals are following the active surveillance definition?

Population Definition

The population for this measure is defined hospitals that are members of the SPS Network.

Data Source(s)

Each hospital PI HAC Leader will review the active surveillance questions, and report status on active surveillance to their SPS data manager utilizing the definition below. The data manager will enter status on the SPS Web forms when changes occur.

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Sampling and Data Collection Plan – Active Surveillance

Hospitals will answer a series of questions on the SPS PI Web form to determine active surveillance status. If they have no change in status, they can leave the previous months answers.

Active Surveillance Questions:

The Active Surveillance fields on the Pressure Injuries web form should be filled out with the initial information for your active surveillance program and only edited if something changes. These fields **do not** have to be filled out monthly.

Please select the outcome detection methods used

Active Surveillance Data Definition:

The network recommends active surveillance as a duplicate method of detection for pressure injuries, in addition to an intervention that helps with early identification and mitigation to reduce risk of PI's. The network recommends this assessment be conducted weekly. Active surveillance is a head to toe assessment for pressure injuries. It provides recommendations for prevention interventions not already in place. Active surveillance is completed on every patient in high-risk units* and high-risk patients** on general specialty units. It is completed by a team***, led by a PI champion to include the beside RN. A certified wound ostomy nurse needs to be available for questions, consultation and/or staging during active surveillance. **A routine (e.g. daily) assessment by the nurse is not considered active surveillance.**

*Teams could include respiratory therapy, MD/CNS, PT, quality leader
**High-risk units: Consider PICU, CICU, NICU
***High-risk patients: Score "at risk" based upon your hospital's risk assessment tool

How often does your hospital conduct active surveillance in high-risk units? (Select the least frequent occurrence in your hospital's high-risk units. For example, if you do weekly in PICU and monthly in high risk unit such as NICU, select other.)	Drop-down options: Weekly Quarterly Other Not doing
How often does your hospital conduct active surveillance on high risk patients in general and specialty care units? (Select the least frequent occurrence. For example, if you do weekly in general care medical unit and monthly in general care surgical unit, select other.)	Drop-down options: Weekly Quarterly Other Not doing N/A

Q1. How often does your hospital conduct active surveillance in ICU units and high-risk units? (Select the least frequent occurrence in your hospital's ICU units and high-risk units. For example, if you do weekly in PICU and monthly in high risk unit such as HEM/ONC, select Monthly.)

- This question is answered by picking a value from a drop-down menu.
- The values available are: Weekly, Quarterly, Other, Not doing, N/A.

Q2. How often does your hospital conduct active surveillance on high risk patients on general care units? (Select the least frequent occurrence in your hospital general care units. For example, if you do weekly in general care medical unit and monthly in general care surgical unit, select Monthly.)

- This question is answered by picking a value from a drop-down menu.
- The values available are: Weekly, Quarterly, Not doing, Other, N/A.

X. Revision History

Version	Primary Author(s)	Description of Version	Date Completed
Draft	Karen Zieker	Initial Draft	30-Mar-2012
1	Sharyl Wooton	Clarified DTI definition, and the Network Goal/All Harm	30-Oct-2012
2	Sharyl Wooton	Added mucosal pressure ulcer "stage"	20-May-2013
3	Sharyl Wooton	Updated to include standard definition for detection – Section IX – Active Surveillance	17-Nov -2014
4	Sharyl Wooton	Updated the definition of serious harm with removal of DTIs – effective Jan '15	19–Jan-2015
5	Trish Burdett, Matt Short	Updated definition to stay aligned with NPUAP guidelines released in April 2016. Changing name from Pressure Ulcer to Pressure Injury.	21 – Jun-2016
6	SPS staff	Added exclusion criteria and added additional information to provide more clarity under the section of serious harm numerator	17 – April-2017
7	SME's, Co-leaders	Revised active surveillance definition	21 – August 2017
8	SME's, Co-leaders	Active surveillance definition changed from monthly to weekly and to include WOC nurse	March 2020

March 2020: *Thank you to the following PI Co-Leaders, Subject Matter Experts, and Taskforce Members who contributed to revising this document:*

Trish Burdett, Children's Healthcare of Atlanta; Trey Coffey, SickKids, Gary Frank, Children's Healthcare of Atlanta; Ginny Fowler, Advocate Children's; Cindy Henderson, Children's Healthcare of Atlanta; Denise Lauderbaugh, Rady Children's Hospital – San Diego; Pam Paige, Children's Healthcare of Atlanta; Michelle Miller, Nationwide Children's Hospital; Shelly Morning, Cincinnati Children's; Sandy Quigley, Boston Children's; Brenda Ruth, Nationwide Children's Hospital; Stephanie Stafford, Nationwide Children's Hospital; Jennifer Werner, Texas Children's Hospital

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SPS PREVENTION BUNDLE

Pressure Injuries (PI)

Table of Contents

I. Background & Team

PI (Pressure Injuries) is the fifth largest contributor to harm across the SPS network. The PI team formed in May 2012 to develop strategies consistent with high reliability concepts to reduce harm caused by PI. Using data obtained from the SPS network as well as external evidence in the medical literature, the PI team identified those bundle elements that when reliably implemented are highly likely to result in decreased harm to hospitalized children, and in 2014 released the first PI prevention bundle to the network. In 2019, subject matter experts convened to revise the bundle, incorporating new evidence, clarifying language, and aligning with external organizations.

SPS stratifies bundle elements based on their level of evidence to assist hospitals in prioritizing their efforts in preventing PI and other HACs:

- *Standard Element:* Strong evidence suggests that implementation of this element is associated with significant decrease in patient harm; **all SPS hospitals should implement and measure reliability of this element.**
- *Recommended Element*: Preliminary data and clinical expert opinion support the implementation of this element; **SPS hospitals should strongly consider implementing this element.**

The network strategy has been successful[1], resulting in a 37% decrease in PI across the network as of August 2018. The network has been challenged to sustain these results, seeing a shift up of 16% in September 2018, for a net reduction of 27% since initiating the work. We estimate that as of early 2020, 438 serious harm PIs have been prevented across the network.

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II. Prevention Bundle Elements* – Overview

SPS Standard Elements

- Skin Assessment
- Medical Device Rotation/Reposition
- Patient Positioning
- Appropriate Surface
- Moisture Management

SPS Recommended Elements

- Regular frequency of offloading pressure of respiratory device, straps, tubing, etc.
- Padding (non-device)
- Padding under devices
- Assessment for proper fit of respiratory device

* All bundle elements are applied to patients who score as a high risk for Pressure Injuries

SPS recommends that hospitals review their PI data and consider applying the prevention bundle to any units/populations/scenarios where PI are occurring, even when patients are not screening as high risk. A particular vulnerability related to screening is that, while SPS data suggests 44% of serious harm PI are device-related, traditional scoring tools may not identify these patients as at-risk. We recommend reviewing recent literature on PI risk identification and consider updating to newer screening tools including Braden QD[10].

III. Prevention Bundle Elements* – Evidence Reviewed

* All bundle elements are applied to patients who score as a high risk for Pressure Injuries

Prevention Bundle Element	Level of Evidence SPS**	Evidence Cited (Numbers refer to Reference Section)
Standard Elements		
Skin Assessment	*Level 2/**Scenario 1	4, 5, 10, 11, 14
Medical Device Rotation/Reposition	*Level 5 /**Scenario 1	2, 5, 13, 14, 17
Patient Positioning	*Level 5/**Scenario 1	5, 12, 13
Appropriate Surface	*Level 1/**Scenario 1	5, 7, 13
Moisture Management	*Level 5/**Scenario 1	5, 8, 14

Prevention Bundle Element	Level of Evidence SPS**	Evidence Cited (Numbers refer to Reference Section)
Recommended Elements		
Non-device padding	*Level 5/**Scenario 6	13, 18
Assessment for proper fit of respiratory device	*Level 5/**Scenario 5	11, 13, 15
Device padding	*Level 5/**Scenario 6	11, 13, 15, 16, 18
Regular frequency of offloading pressure of respiratory device, straps, tubing, etc.	*Level 5/**Scenario 6	14, 15, 19

***Muir Gray Classification Levels**

- **Level 1** – meta-analysis of a series of randomized controlled trials
- **Level 2** – at least one well designed randomized controlled trial
- **Level 3** – at least one controlled study without randomization
- **Level 4** – non-experimental descriptive studies
- **Level 5** – reports or opinions from respected authorities

****SPS Evidence**

- **Scenario 1**: Reliably implementing element is associated with statistically significant improvement
- **Scenario 2**: Failing to implement element is associated with statistically significant failure to improve along with the system,
- **Scenario 3**: In cases where all hospitals implement, implementing an element without measuring reliability of the element is associated with statistically significant failure to improve along with the system,
- **Scenario 4**: Reliably implementing element is not associated with statistically significant improvement; however, literature supports adoption of element as an SPS Standard
- **Scenario 5**: Hospitals that implement element with less than 80% reliability had a higher rate
- **Scenario 6**: SPS subject matter expert opinion

IV. Prevention Bundle Elements† Care Descriptions

†All bundle elements are applied to patients who, score as high risk with a pressure injury risk assessment scale or have clinical "risk factors" for pressure injury development

Prevention Bundle Element - Maintenance	Care Descriptions
Standard Elements	

Skin Assessment¥	• Perform full skin assessment AND PI risk assessment within 24 hours of admission (consensus best practice is within 8 hours)
	• Repeat:
	  • At least every 24 hours (as per NDNQI, consensus best practice is every shift change particularly for high risk units and high-risk patients)
	  • In operating room at end of cases lasting 4 hours or more, and/or upon arrival to post-operative inpatient unit
	  • Change in patient condition e.g. decreased level of consciousness or casting

Medical Device Rotation/Reposition	• Assess skin in contact with medical devices at minimum each shift • Medical devices known to cause PI include: Respiratory devices (masks, cannula, securement devices, ETT), immobilizers, orthotics, nasal and enteral feeding tubes, peripheral and central venous access devices and related securement devices, external monitoring devices (EEG leads, pulse oximetry probes), VTE prevention equipment (stockings and compression devices), and miscellaneous equipment unintentionally in contact with patient (cords, tubes)§. • Reposition/rotate medical devices per manufacturer recommendations • For respiratory devices see recommended element below • Rotate pulse -ox probe at least every 8 hours or more often if able • C-collars: skin care and assessment daily, remove collar at least twice daily (unless it's medically contraindicated), change the collar padding if soiled §Defer to manufacturer recommendation when more frequent Note: NDNQI supports inspecting skin under or around removable devices at least twice a day

Prevention Bundle Element - Maintenance	Care Descriptions
Patient Positioning	• Reposition or turn immobile patients or those with limited mobility at least every 2 hours (or timed with care in NICU) • Maintain HOB less than or equal 30 degrees (unless medically contraindicated) • Patients in chairs or upright in bed greater than 2 hours must still be repositioned to redistribute pressure (consider appropriate surface and consider time limit) Note: "Do Not Turn" instructions should require a provider order and be re-evaluated every 24 hours
Appropriate Surface	• Utilize the support surface that meets the individual's needs for pressure redistribution • Evaluate need for specialty surface based on PI Risk Assessment. • Use gel pads, fluidized positioners, and/or other pressure redistribution positioning aids to cushion bony prominences.
Moisture Management	• Keep all skin clean, dry and appropriately hydrated (including perineum, skin near devices such as tracheostomies, tubes, drains and casts). • Apply moisture barrier and/or wicking product to keep skin dry
Recommended Elements	
Non-device padding	• Consider use on bony prominences: assess the skin under the prophylactic dressing **at least daily**
Assessment for proper fit of respiratory device Recommend capturing compliance through observation	Assessment for proper fit of respiratory device (Preferred every 4 hours; minimum every 6 hours): • CPAP/BIPAP (assessment of proper fit per your institutional practice) • Tracheostomy (assessment that trach ties/collar is not too tight by being able to fit one finger between neck and ties/collar) • Endotracheal tube (ETT) (assessment that the tension from ventilator circuit to the ETT is minimized); best practice with every position change • Nasal cannula (assessment that the tubing is not too tight where in contact with the skin)
Device padding	• Use prophylactic padding to protect skin under medical devices to reduce pressure injuries, follow manufacturer instructions for use if available (NPIAP), unless contraindicated

Prevention Bundle Element - Maintenance	Care Descriptions
Regular frequency of offloading pressure of respiratory device, straps, tubing, etc. Recommend capturing compliance thru observation or discussion with staff (can capture alternating of CPAP/BiPAP mask through documentation if hospitals have that available)	Regular frequency of offloading pressure of respiratory device, straps, tubing, etc. (Preferred every 4 hours; minimum every 6 hours): • CPAP/BIPAP mask (alternate between 2 different types of mask if possible, to redistribute pressure - if not possible, ensure that mask is clean and dry) • Tracheostomy (reposition head/neck as needed to minimize pressure) • Endotracheal tube (secure without creating additional pressure) • Off load pressure of ventilatory circuit, tubing and connections • Nasal cannulas can be excluded from this element – please refer to Assessment for proper fit of respiratory device element.

¥Skin Assessment for high risk patients is in addition to Active Surveillance for all patients.

V. Measurement – Prevention Bundle Reliability

Measurement	Formula	Standards	Reporting Period
PI Prevention Bundle	Number of audits totally compliant with SPS Prevention Bundle Elements/ Number of audits completed* x 100	• Your bundle reliability data should include **all** the SPS Standard elements • Hospitals can choose to include additional elements. Please note that including too many (>5) elements may confuse and overwhelm care providers so proceed with caution. • Measure your bundle as ALL or None. See Reference 10 for IHI description of All on None. • Minimum of 20 audits per month. If procedures are fewer than 20, then include all procedures.	Monthly

VI. Spotlight Tools

We have asked hospitals to share their spotlight tools, and have highlighted a few in this SharePoint folder (note: this folder is password protected and can only be accessed by SPS network member hospitals). The highlighted categories are: Bundle Measure Methodology, PDSAs and Interventions, Risk Assessment, Training, Patient & Family Engagement and Failure Analysis.

VII. Spotlight Hospitals

Please click here to view the Sharing Hospitals' Innovation for Network Engagement (SHINE) report.

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IX. Revision History

Version	Primary Author(s)	Description of Version	Date Completed
Version 1	SPS Staff	Initial Draft	Nov 9, 2012
Version 2	Leah Keller, Maggie Killgore	Addition of Standards of Care, Levels of Evidence, and Measuring Reliability	Jan 29, 2013
Version 3	HAC Co-Leader Team	**Release of new SPS Prevention Bundle content**	June 10, 2014
Version 4	Matt Short & Erin Goodman	Format & Update of HAC name and minor changes to numbering of stages	June 21, 2016
Version 5	SPS Staff	Contact information updated	April 5, 2017
Version 6	PI Co-Leaders and SMEs	**Major revision:** Language throughout; clarified all "Standard" elements particularly medical device rotation/reposition; added all four "Recommended" elements focused on padding and respiratory devices	March 2020

June 2014: *Thank you to the following PI Co-Leaders and Subject Matter Experts who contributed to this document:*

Gary Frank, Children's Healthcare of Atlanta; Rich Brilli, Nationwide Children's Hospital; Trish Burdett, Children's Healthcare of Atlanta; Brenda Ruth, Nationwide Children's Hospital

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