



How-to Guide: Prevent Pressure Ulcers

Prevent pressure ulcers by reliably implementing the six components of care recommended in this guide.

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Introduction

What is the Institute for Healthcare Improvement (IHI)?

The Institute for Healthcare Improvement (IHI) is a not-for-profit organization leading the improvement of health care throughout the world. IHI helps accelerate change by cultivating promising concepts for improving patient care and turning those ideas into action. Thousands of health care providers participate in IHI's groundbreaking work.

What is a How-to Guide?

IHI's How-to Guides address specific health care interventions hospitals and/or entire health systems can pursue to improve the quality of health care. These interventions align with several national initiatives of the IOM, AHRQ, CMS, Joint Commission, CDC, as well as the Department of Health and Human Services' "Partnership for Patients" initiative.

This material was developed for the IHI 100,000 Lives Campaign (2004-2006) and the 5 Million Lives Campaign (2006-2008), both voluntary initiatives to protect patients from medical harm. Both Campaigns involved thousands of hospitals and communities from around the United States in specific interventions.

5 Million Lives Campaign Donors

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 Robert Wood Johnson Foundation
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 David Calkins Memorial Fund

Contributors

The work of leading organizations has informed the development of this guide. These include the National Pressure Ulcer Advisory Panel (NPUAP), Ascension Health, Advancing Excellence in America's Nursing Homes, the New Jersey Hospital Association (NJHA), OSF St. Francis Medical Center, and Owensboro Medical Health System.

What Is a Pressure Ulcer?

A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction. Because muscle and subcutaneous tissue are more susceptible to pressure-induced injury than skin, pressure ulcers are often worse than their initial appearance. Pressure ulcers are then staged to guide clinical description of the depth of observable tissue destruction.¹

The Case for Preventing Pressure Ulcers

Although pressure ulcers are preventable in most every case, pressure ulcers are increasingly common in US hospitalizations. In 2006, there were 503,300 hospital stays during which pressure ulcers were noted — a 78.9% increase from 1993.²

Pressure ulcer incidence rates vary considerably by clinical setting — ranging from 0.4% to 38% in acute care, from 2.2% to 23.9% in long-term care, and from 0% to 17% in home care.³

It is estimated that pressure ulcer prevalence (the percentage of patients with pressure ulcers at any one point in time) in acute care is 15%, while incidence (the rate at which new cases occur in a population over a given time period) in acute care is 7%.^{4,5}

It is estimated that 2.5 million patients are treated for pressure ulcers in US health acute-care facilities each year.⁶

An Example from...

Owensboro Medical Health System · Owensboro, KY

Owensboro Medical Health System has decreased the incidence of pressure ulcers in the acute care inpatient population from a high of 22% in March 2003 to 0% in September 2010. During this period, the incidence in the extended care population decreased from 40% to 0%, and their rate has been 0% for thirteen of the last sixteen incidence studies. It is estimated more than 1,200 ulcers have been prevented and over \$100,000 saved in supplies due to the decrease in pressure ulcers since the project began.

¹ Black J, Baharestani MM, Cuddigan J, et al. National Pressure Ulcer Advisory Panel's updated pressure ulcer staging system. *Adv Skin Wound Care*. 2007;20(5):270-274.

² Russo CA (Thomson Reuters), Steiner C (AHRQ), Spector W (AHRQ). Hospitalizations Related to Pressure Ulcers, 2006. HCUP Statistical Brief #64. December 2008. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb64.pdf>

³ Reddy M, Gill SS, Rochon PA. Preventing pressure ulcers: A systematic review. *JAMA*. 2006;296:974-984.

⁴ Wound, Ostomy, and Continence Nurses Society. *Prevalence and Incidence: A Toolkit for Clinicians*. Glenview, IL: WOCN; 2004.

⁵ National Pressure Ulcer Advisory Panel. Cuddigan J, Ayello EA, Sussman C, Editors. *Pressure Ulcers in America: Prevalence, Incidence, and Implication for the Future*. Reston, VA: NPUAP; 2001.

⁶ Reddy M, Gill SS, Rochon PA, 974.

Pressure ulcers cause considerable harm to patients, hindering functional recovery, frequently causing pain and the development of serious infections. Pressure ulcers have also been associated with an extended length of stay, sepsis, and mortality. In fact, nearly 60,000 US hospital patients are estimated to die each year from complications due to pressure ulcers. The estimated cost of managing a single full-thickness pressure ulcer is as high as \$70,000, and the total cost for treatment of pressure ulcers in the US is estimated at \$11 billion per year.^{7,8}

⁷ Reddy M, Gill SS, Rochon PA, 974.

⁸ Redelings MD, Lee NE, Sorvillo F. Pressure ulcers: More lethal than we thought? *Adv Skin Wound Care*. 2005;18(7):367-372.

Six Essential Elements of Pressure Ulcer Prevention

Most pressure ulcers are preventable.⁹

Preventing pressure ulcers boils down to two major steps: first, identifying patients at risk; and second, reliably implementing prevention strategies for all patients who are identified as being at risk.

1. Conduct a Pressure Ulcer Admission Assessment for All Patients

The admission assessment should include both a risk assessment (to evaluate risk of developing a pressure ulcer) and a skin assessment (to detect existing pressure ulcers). These two assessments should be thought of as a single process step: a pressure ulcer admission assessment.

Many patients are at risk for developing a pressure ulcer. Key factors contributing to the development of pressure ulcers include the following: age, immobility, incontinence, inadequate nutrition, sensory deficiency, device-related pressure, multiple co-morbidities, circulatory abnormalities, and dehydration.¹⁰

The Joint Commission and National Quality Forum recommend pressure ulcer admission assessment as well.

Joint Commission National Patient Safety Goals

National Quality Forum Pressure Ulcer Framework

The prompt identification of at-risk patients using a validated risk assessment tool is essential for accurate, prompt identification of at-risk patients and timely implementation of prevention strategies. The risk assessment must include an assessment of several components: mobility, incontinence, sensory deficiency, and nutritional status (including dehydration). The Braden Scale is the most widely utilized assessment tool in the US. Additional tools to assist with a comprehensive assessment include the Norton Scale, Gosnell Scale, Knoll Scale, and Waterlow Scale. An age-appropriate pressure ulcer risk assessment tool should be used in pediatrics.^{11,12}

What processes can be put in place to ensure the pressure ulcer admission assessment of all patients?

Hospitals can test the following process changes to ensure compliance with the assessment and identification of any patient at risk for pressure ulcers:

⁹ Black JM, Edsberg LE, Baharestani MM, Langemo D, Goldberg M, McNichol L, Cuddigan J, and the National pressure Ulcer Advisory Panel Consensus Conference. Pressure ulcers: avoidable or unavoidable? Results of the National Pressure Ulcer Advisory Panel Consensus Conference. *Ostomy Wound Management*. 2011;57(2):24-37.

¹⁰ Statement on Pressure Ulcer Prevention. National Pressure Ulcer Advisory Panel. 1992. www.npuap.org/positn1.htm

¹¹ Ayello EA, Braden B. How and why to do pressure ulcer risk assessment. *Adv Skin Wound Care*. 2002;15(3):125-131.

¹² Baharestani MM, Ratliff C, and the National Pressure Ulcer Advisory Panel. Pressure ulcers in neonates & children: An NPUAP White Paper. *Adv Skin Wound Care*. 2007;20(4):208-220.

- Improve processes to ensure that risk assessment is conducted within four hours of admission for all patients.
- Include a visual cue on each admission documentation record for the completion of a total skin assessment and risk assessment.
- Agree on the use of a standard risk assessment tool (for example, Braden Scale); facilities may wish to adapt the tool to allow for easy completion, using checkboxes and short phrases to ensure completion.
- Utilize multiple methods to visually cue staff as to which patients are at risk. For example, consider using stickers in the patient chart or on the patient's door so that all who enter will realize the patient is at risk for pressure ulcer development. This allows for a quick identification by any staff of patients at risk, both in the patient's room or while the patient is in other departments, and prompt implementation of prevention strategies.
- Build shared pride in progress; post "Days since Last Pressure Ulcer" data.

2. Reassess Risk for All Patients Daily

The complexity and acuity of hospitalized patients require daily reassessment of the potential and degree of risk of pressure ulcer development. For example, changes in mobility, incontinence, or nutrition may change the patient's risk of developing pressure ulcers. Assessing risk daily provides caregivers the opportunity to adjust prevention strategies according to the changing needs of the patient. The degree of risk, as specified in several standardized risk assessments, allows providers to implement targeted strategies for each patient. For example, after several days in the hospital, a patient's nutritional intake may diminish, either due to patient preferences or condition. A daily risk assessment enables caregivers to quickly identify the patient as having a nutritional need and initiate a consult to the clinical dietician.^{13,14}

What processes can be put in place to ensure daily reassessment of risk?

- Adapt documentation tools to prompt daily risk assessment, documentation of findings, and initiation of prevention strategies as needed. For example, include this information in daily clinical notes.
- Educate all levels of staff about potential risk factors of pressure ulcer development and the process for implementing prevention strategies.
- Use validated risk assessment tools for staff to easily identify degree of risk and potential prevention strategies.

¹³ Ayello EA, Braden B, 125-131.

¹⁴ Bergstrom N, Braden BJ, Boynton P, Brunch S. Using a research-based assessment scale in clinical practice. *Nursing Clin North Am.* 1995;3:539-551.

Implement steps 3-6 for all patients identified (in steps 1 and 2) as being at risk for pressure ulcers:

3. Inspect Skin Daily

Skin integrity may deteriorate in a matter of hours in hospitalized patients. Because risk factors change rapidly in acutely ill patients, daily skin inspection is crucial. Patients identified as being at risk need a daily inspection of all skin surfaces, “from head to toe.” Special attention should be given to areas at high risk for pressure ulcer development such as the sacrum, back, buttocks, heels, elbows, and areas subjected to device-related pressure. Ideally, staff should incorporate a skin inspection into their work, every time they assess the patient.^{15,16}

What processes can be put in place to ensure daily inspection of the skin?

- Adapt documentation tools to prompt daily skin inspection, documentation of findings, and initiation of prevention strategies as needed.
- Educate all levels of staff to inspect the skin any time they are assisting the patient, for example, when assisting the patient to the chair, moving from one area to the other, while bathing, and when repositioning devices such as nasal oxygen tubing, oxygen masks, etc. Upon recognition of any change in skin integrity, notify staff so that appropriate interventions can be put in place.

4. Manage Moisture: Keep the Patient Dry and Moisturize Skin

Wet skin is conducive to the development of rashes, is softer, and tends to break down more easily. Skin should be cleansed at time of soiling and at routine intervals. The process of cleaning the skin should include gentle use of a mild cleansing agent that minimizes irritation and dryness of the skin. Treating dry skin with moisturizers has been shown to be especially effective in preventing pressure ulcers.¹⁷

Care should be taken to minimize exposure of the skin to moisture due to incontinence, perspiration, or wound drainage. When these sources of moisture cannot be controlled, use underpads made of materials that absorb moisture and present a quick-drying surface to the skin. Also use topical agents that act as moisture barriers and moisturize the skin.^{18,19,20,21}

¹⁵ National Pressure Ulcer Advisory Panel. Cuddigan J, Ayello EA, Sussman C, Editors. *Pressure Ulcers in America: Prevalence, Incidence, and Implication for the Future*. Reston, VA: NPUAP; 2001.

¹⁶ Baharestani MM, Ratliff C, and the National Pressure Ulcer Advisory Panel, 208-220.

¹⁷ Pressure Ulcers in Adults: Prediction and Prevention. May 1992.

¹⁸ Reddy M, Gill SS, Rochon PA, 974.

¹⁹ Gibbons W, Shanks HT, Kleinhelter P, Jones P. Eliminating facility-acquired pressure ulcers at Ascension Health. *Joint Commission Journal on Quality and Patient Safety*. 2006;32:488-496.

²⁰ Roosen K, Fulbrook P, Nowicki T. Pressure injury prevention: continence, skin hygiene and nutrition management. *Australian Nursing Journal*. 2010;(18)2:31-34.

²¹ Ayello EA, Braden B. Why is pressure ulcer risk assessment so important? *Nursing*. 2001;31(11):74-80.

What changes can we make to ensure effective management of moisture?

- Look for opportunities to design a process for periodic activities such as repositioning, assessing for wet skin, applying barrier agents, offering toileting opportunity, and even offering P.O. fluids (water). By combining routine activities in a protocol such as a “pressure ulcer prevention protocol,” staff can complete multiple tasks while in the room every two hours and document them all at once.
- Provide supplies at the bedside of each at-risk patient who is incontinent, maybe in a tray or basket of some kind. This provides the staff with the supplies that they need to immediately clean, dry, and protect the patient’s skin after each episode of incontinence.²²
- Provide underpads that pull the moisture away from the skin, and limit the use of disposable briefs or containment garments if at all possible.
- Provide pre-moistened, disposable barrier wipes to help cleanse, moisturize, deodorize, and protect patients from perineal dermatitis due to incontinence.

5. Optimize Nutrition and Hydration

Assessment of the patient for possible risk of pressure ulcer development should include a review of nutritional factors and an assessment of hydration. Patients who are assessed with deficits in nutritional intake and hydration may have muscle mass loss and weight loss, making the bones more prominent and making it hard for patients to be mobile. Often with nutrition deficits and fluid imbalance there may be edema and reduced blood flow to the skin, causing ischemic damage, which contributes to skin breakdown.^{23,24}

²² Roosen K, Fulbrook P, Nowicki T. Pressure injury prevention: continence, skin hygiene and nutrition management. *Australian Nursing Journal*. 2010;(18)2:31-34.

²³ Reddy M, Gill SS, Rochon PA. Preventing pressure ulcers: A systematic review. *JAMA*. 2006;296:974-984.

²⁴ Gibbons W, Shanks HT, Kleinhalter P, Jones P. Eliminating facility-acquired pressure ulcers at Ascension Health. *Joint Commission Journal on Quality and Patient Safety*. 2006;32:488-496.

An Example from...**Trinitas Regional Medical Center – Elizabeth, NJ**

A risk assessment, the Braden Score, is completed on all patients on admission and each shift (every 12 hours) to identify changes in condition or increased risk. The at-risk patients (with a score of 16 or less) are referred to other disciplines as needed, including Nutrition, Wound Care, Surgical Consultation, Case Management, Social Work, Physical Therapy, and Palliative Care.

Nutritional consults are done within 48 hours for at-risk patients with pressure ulcers and/or a Braden Score of 16 or less. The consult includes assessment, evaluation, and recommendations for fluids, caloric intake, and supplements—including enteral feeding, concentrated protein, vitamins, and minerals. Nutritional re-assessment is determined by the dietician based on the patient's needs. Also, daily multidisciplinary rounds include discussion of nutritional and educational needs and follow-up care.

Patients who are malnourished may be twice as likely to develop skin breakdown.²⁵ Fluid, protein, and caloric intake are important aspects of maintaining adequate general nutrition. Nutritional supplements or support may be needed if dietary intake is insufficient. If a patient is identified with significant nutritional needs, a registered clinical dietician should be consulted to assess and suggest feasible nutritional interventions.²⁶

What changes can we make to optimize nutrition and hydration?

- Assist patient with meals, snacks, and hydration. Every effort should be made to allow patient preferences when medically appropriate.
- Document the amount of nutritional intake, and notify the dietitian or physician if the patient does not have adequate intake.
- Offer water to every patient who is scheduled to be turned. The process could include these steps: offer toileting, assess for needs of cleanliness, change wet surfaces, and offer water.

²⁵ Thomas DR, Goode PS, Tarquine PH, Allman R. Hospital acquired pressure ulcers and risk of death. *Journal of the American Geriatric Society*. 1996;44:1435-1440.

²⁶ Dorner B, Posthauer ME, Thomas D, and National Pressure Ulcer Advisory White Paper. *The Role of Nutrition in Pressure Ulcer Prevention and Treatment: National Pressure Ulcer Advisory Panel White Paper*. 2009;(22)5:212-221.

6. Minimize Pressure

Redistribution of pressure, especially over bony prominences, is of primary concern. Patients with limited mobility are especially at risk for the development of pressure ulcers. Every effort should be made to redistribute the pressure on the skin, either by repositioning or by utilizing pressure-redistribution surfaces.^{27,28,29}

Two key components have proven especially effective in minimizing pressure:

Turn/reposition patients every two hours.

The aim of repositioning is to redistribute pressure, thereby maintaining circulation to areas of the body at risk for pressure ulcers. The literature does not suggest how often patients should be turned to prevent ischemia of soft tissue, but two hours in a single position is the maximum duration of time recommended for patients with normal circulatory capacity. Turning patients every two hours is a foundational element in most pressure ulcer prevention protocols. The turning, or repositioning, of the at-risk patient temporarily shifts or relieves the pressure on the susceptible areas, diminishing the risk of pressure ulcer development.

Pillows and blankets are simple, readily available supplies that may be utilized to assist in pressure redistribution. When used wisely, they may expand the weight-bearing surface by molding to the body. Use pillows under the calf to elevate the patient's heels off the bed surface. Place cushioning devices between the legs/ankles to maintain alignment and prevent pressure on bony prominences (NPUAP clinical guidelines, 1992). Often the skin of patients identified at risk for pressure ulcers is easily torn inadvertently during repositioning. Clinicians should take care while actually turning the patient to protect the skin. Clinicians should consider using lift devices or "drawsheets" to move, rather than drag, individuals who are not able to assist during transfers and position changes.

Use pressure-redistribution surfaces.

Specialized support surfaces (such as mattresses, beds, and cushions) redistribute the pressure that the patient's body weight exerts on the skin and subcutaneous tissues. If a patient's mobility is compromised and this interface pressure is not redistributed, the pressure can lead to impaired circulation and ulcer formation. Many studies have examined the benefits demonstrated by pressure-redistribution surfaces in the prevention of pressure ulcers.

Pressure-redistributing surfaces may be classified as powered or non-powered, reactive or active. A powered support surface is one requiring external sources of energy for operation. A non-powered

²⁷ Pressure Ulcers in Adults: Prediction and Prevention. May 1992.

²⁸ Reddy M, Gill SS, Rochon PA. Preventing pressure ulcers: A systematic review. *JAMA*. 2006;296:974-984.

²⁹ Gibbons W, Shanks HT, Kleinhalter P, Jones P. Eliminating facility-acquired pressure ulcers at Ascension Health. *Joint Commission Journal on Quality and Patient Safety*. 2006;32:488-496.

support surface does not require external energy sources of energy for operation. Reactive support surfaces are powered or non-powered, possessing the capability to change their load distribution properties only in response to an applied load. An active support surface is a powered support surface, with the capability to change its load distribution properties, with or without applied load.^{30,31,32,33}

Because surgical patients who are under anesthesia for extended periods of time often have an increased risk of developing pressure ulcers, all surgical patients (pre-operative, intra-operative, and post-anesthesia) should receive a skin assessment and a risk assessment. Caregivers should then implement prevention strategies such as ensuring repositioning and placing patients on appropriate redistribution surfaces for all surgical patients who are identified as being at risk.³⁴

An Example from...

OSF Saint Francis Medical Center – Peoria, IL

Once a Six Sigma team initiative, two-hour turns have become part of the culture at OSF Saint Francis Medical Center. A lift team that rounds in the ICUs helps with turns and plays music over the intercom system as a reminder to turn patients. All the nurses carry pagers and receive reminder pages every two hours as well. As with human nature, some staff members find the reminders annoying while others find them helpful.

All at-risk patients are put on the prevention protocol. The standard hospital mattress provides effective pressure redistribution.

What changes can we make to minimize pressure?

- Use tools inside the patient room to remind caregivers to turn/reposition the patient every two hours.
- Utilize unit- or hospital-wide “musical” cues (for example, setting caregiver beepers to sound every two hours) to remind staff to turn/reposition all at-risk patients at two-hour intervals.
- Utilize positioning, transferring, and turning techniques to minimize friction/shear injury.
- Use pressure redistribution mattresses/overlays to assist with minimizing pressure.

³⁰ National Pressure Ulcer Advisory Panel (NPUAP) Support Surface Standards Initiative. Terms and Definitions Related to Support Surfaces. 2007. www.npuap.org

³¹ Reddy M, Gill SS, Rochon PA. Preventing pressure ulcers: A systematic review. *JAMA*. 2006;296:974-984.

³² Courtney BA, Ruppman JB, Cooper HM. Save our skin: Initiative cuts pressure ulcer incidence in half. *Nursing Management*. 2006;37(4):35-46.

³³ Gibbons W, Shanks HT, Kleinhelter P, Jones P. Eliminating facility-acquired pressure ulcers at Ascension Health. *Joint Commission Journal on Quality and Patient Safety*. 2006;32:488-496.

³⁴ Courtney BA, Ruppman JB, Cooper HM. Save our skin: Initiative cuts pressure ulcer incidence in half. *Nursing Management*. 2006;37(4):35-46.

Forming the Team

IHI recommends a multidisciplinary team approach to the prevention of pressure ulcers. Teams offer the value of bringing diverse personnel together, all with a stake in the outcome and working to achieve the same goal. All the stakeholders in the process must be included, to gain the buy-in and cooperation of all parties.

In order to be most effective, a core team of no more than five to seven people should oversee the work. As different changes are tested, other key people in the organization can be included on an *ad hoc* basis, especially if they can offer some special expertise that is limited to one area of the work. Team members for preventing pressure ulcers may include the following:

- Team Leader/Champion
- Nursing (for example, RN, assistant, technicians, staff representing different levels of care, etc.)
- Education
- Performance Improvement
- Dietary/Dietitian
- Materials Management staff

(Note: In addition, consider including a patient or family member on the team.)

Some suggestions to attract and retain excellent team members include using data to define and solve the problem; identifying champions within the hospital who are passionate about preventing pressure ulcers and have credibility with staff and administration; and working with those who want to work on the project, rather than trying to convince those who do not.

The team needs encouragement and commitment from senior leadership; an administrative representative on the team is powerful in keeping the team focused and removing barriers. Identifying a champion increases a team's motivation to succeed. When measures are not improving, the champion readdresses the problems with staff and helps to keep everyone on track toward the aims and goals.

Another approach to the improvement work is to create sub-teams to work on specific care components or groups of care components. For example, one sub-team might work on education strategies for all staff. Another sub-team might focus on the supplies, availability of equipment needed as options for patients at risk, such as pads, cleansing wipes, and bed surfaces. A third team might be responsible for the testing and piloting of tools and standard processes. These are just a few examples of sub-groups, which can be an effective way to divide the work and achieve improvement more quickly. The sub-groups should report their work and results to the core team, which oversees the entire project and ensures coordination.

Setting Aims

Improvement requires setting aims. An organization will not improve without a clear and firm intention to do so. The aim should be time-specific and measurable; it should also define the specific population of patients that will be affected. Agreeing on the aim is crucial; so is allocation of people and resources necessary to accomplish the aim.

Aim statements for preventing pressure ulcers should specify percentage reductions within a set timeframe. A sample aim statement might be:

Reduce the incidence of pressure ulcers by 50% by February 2012.

Teams are more successful when they have unambiguous, focused aims. Setting numerical goals clarifies the aim, helps to create tension for change, directs measurement, and focuses initial changes. Once the aim has been set, the team needs to be careful not to back away from it deliberately or "drift" away from it unconsciously.

This is only meant to be an example; your team should develop its own aim statement so that the team will feel ownership of the aim.

An Example from...

Robert Wood Johnson University Hospital – Rahway, IL

The Skin Care Team – which meets monthly to conduct prevalence/incidence studies hospital-wide, including the 24-bed Sub Acute unit – has worked diligently over the last few years to implement “best practices.”

The original Skin Care Team comprised just a handful of nurses. Today, the Skin Care Committee comprises RNs (four of whom are Wound Care Certified), LPNs, Dietary, Infection Control Nurse, and the Quality Director. There is representation from all acute care areas of the hospital including the Emergency Center, Medical/Surgical Units, CCU, SICU, Telemetry, SDS, OR, PACU, Endoscopy, Radiology, and Post Acute (SNF) unit.

Originally established in 1998, the present committee has RN representation from both 12-hour shifts who act as the “resource” liaisons to assist staff/physicians with making appropriate choices in caring for those at risk of breakdown or those who present with pressure ulcers/wounds.

Using the Model for Improvement

In order to move this work forward, IHI recommends using the Model for Improvement. Developed by Associates in Process Improvement, the Model for Improvement is a simple yet powerful tool for accelerating improvement that has been used successfully by hundreds of health care organizations to improve many different health care processes and outcomes.

The model has two parts:

- Three fundamental questions that guide improvement teams to 1) set clear aims, 2) establish measures that will tell if changes are leading to improvement, and 3) identify changes that are likely to lead to improvement.
- The Plan-Do-Study-Act (PDSA) cycle to conduct small-scale tests of change in real work settings — by planning a test, trying it, observing the results, and acting on what is learned. This is the scientific method, used for action-oriented learning.

Implementation: After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team can implement the change on a broader scale — for example, for an entire pilot population or on an entire unit.

Spread: After successful implementation of a change or package of changes for a pilot population or an entire unit, the team can spread the changes to other parts of the organization or to other organizations.

You can learn more about the [Model for Improvement](http://www.IHI.org) on www.IHI.org.

The sample PDSA Worksheet that follows illustrates how an improvement team might document the first test cycle using this tool.

PDSA Worksheet

CYCLE: 1

DATE: 1/10/11



Project: Pressure Ulcer Prevention

Objective for this PDSA Cycle: Test the process for completing a pressure ulcer risk assessment on admission to the hospital.

Plan:

Questions: How can we ensure total compliance with completion of a pressure ulcer risk assessment on each admission to the hospital?

Predictions: Adding cues to the admission packet will help ensure compliance with identification of patients at risk for pressure ulcers on admission.

Plan for change or test – who, what, when, where:

What: Add a risk assessment tool to admission packet.

Who: Bonnie (nurse) to do a risk assessment on each patient admitted on 4 North.

Where: Admission packets (Make up 3 packets for pilot test.)

When: January 15

Plan for collection of data – who, what, when, where:

Who: Bonnie (nurse)

What: Compliance with any patient admitted

When: January 15

Where: 4 North

Do: Carry out the change or test. Collect data and begin analysis.

Four patients were admitted to 4N on 1/15; the assessments and the risk assessments were completed by Bonnie.

Study: Complete analysis of data.

How did or didn't the results of this cycle agree with the predictions that we made earlier? Summarize the new knowledge we gained by this cycle: All assessments of risk were completed as designed for these four patients.

Act:

List actions we will take as a result of this cycle: Test for all admissions to 4N for the week of January 20. Plan for the next cycle (adapt change, another test, implementation cycle?): Will see if additional cues are needed, look for completion and compliance with all elements of tools.

Tips and Tricks

- Use pressure ulcer prevalence data to assist with the choice of a pilot unit. (Start with the units, and the populations, with the highest prevalence.)
- Use process measures to drive change (e.g., Percent of Patients Receiving Pressure Ulcer Admission Assessment), not outcome measures (e.g., Pressure Ulcer Prevalence).
- Collect data on process measures weekly (10 charts/week) on units piloting and implementing strategies, until reliability is achieved.
- Begin with one pilot unit, design specific processes for compliance with strategies, and roll out by units.
- Set a schedule to bring on units systematically, and keep to the schedule.
- Match the education schedule with the roll-out schedule.
- Develop a “pocket guide” for staff, containing helpful tips for patients at risk for pressure ulcers.
- Include the patient and family in education regarding pressure ulcer prevention. Include an overview of the patient’s risk factors and the importance of nutrition and fluid intake, appropriate repositioning, attention to high-risk areas for skin breakdown, and the need to keep the patient dry. (A [patient and family fact sheet](#) is available on www.ihl.org.)³⁵
- Consider designating a team leader/champion for each unit or area. This person would be the unit resource for skin breakdown prevention and coordination of the process with the unit manager.³⁶

Weekly Operations Team Meetings

Nurse Unit Leader, Unit Champion, and key staff from the pilot unit attend weekly operations meeting to report pressure ulcers identified during the previous week.³⁷

Nurse Unit Leader and Unit Champion report results of weekly chart audits for compliance with components of pressure ulcer prevention for pilot unit, and as units roll out, compliance measures are measured until reliability is demonstrated.³⁸

³⁵ Zeller JL. Patient pages: Pressure ulcers. *JAMA*. 2006;296(8):1020.

³⁶ Courtney BA, Ruppman JB, Cooper HM. Save our skin: Initiative cuts pressure ulcer incidence in half. *Nursing Management*. 2006;37(4):35-46.

³⁷ Gibbons W, Shanks HT, Kleinhelter P, Jones P. Eliminating facility-acquired pressure ulcers at Ascension Health. *Joint Commission Journal on Quality and Patient Safety*. 2006;32:488-496.

³⁸ Courtney BA, Ruppman JB, Cooper HM. Save our skin: Initiative cuts pressure ulcer incidence in half. *Nursing Management*. 2006;37(4):35-46.

Measurement

Measure compliance with each of the key components of evidence-based pressure ulcer care. Document whether each component of care was provided or contraindicated; these are “process measures.” While improvements in individual measures indicate the processes surrounding those care elements have improved, improvement in actual patient outcomes requires improvement in all component measures.

IHI recommends the use of some or all of the following measures, as appropriate, to track your progress. In selecting your measures, consider the following:

- Whenever possible, use measures you are already collecting for other programs.
- Evaluate your choice of measures in terms of the usefulness of the final results and the resources required to obtain them; try to maximize the former while minimizing the latter.
- Try to include both process and outcome measures in your measurement scheme.
- You may use different measures or modify the measures described below to make them more appropriate and/or useful to your particular setting. However, be aware that modifying measures may limit the comparability of your results to others’.
- Posting your measure results within your hospital is a great way to keep your teams motivated and aware of progress. Try to include measures that your team will find meaningful and exciting.

Different strategies for collecting the data needed to calculate this measure are outlined in the Measure Information Form (MIF).

We recommend three process measures for pressure ulcer care:

Process Measures

1. Percent of Patients Receiving Pressure Ulcer Admission Assessment

(Skin Assessment, Risk Assessment)

2. Percent of At-Risk Patients Receiving Full Pressure Ulcer Preventive Care

(Inspect Skin Daily, Manage Moisture, Optimize Nutrition, Reposition, Use Pressure-Redistribution Surfaces)

3. Percent of Patients Receiving Daily Pressure Ulcer Risk Reassessment

Note that Measures 1 and 2 use an “all-or-none” format: all components must be performed (or contraindications documented) for compliance to be recorded. While this sets a high standard and is somewhat unforgiving for new teams beginning work, it has been successful in improvement projects. For a discussion of this “all-or-none” approach to measurement, see Nolan T, Berwick DM, “All-or-none measurement raises the bar on performance” (*JAMA*. 2006;295(10):1168-1170).

Outcome Measures

In addition to the process measures for each of the key components of pressure ulcer care, we recommend measuring **pressure ulcer prevalence** (patients with pressure ulcers at a point in time, regardless of whether the pressure ulcer developed during or before the current admission) as an outcome measure. Prevalence is a widely used outcome measure for pressure ulcer tracking, particularly in epidemiological studies.