



Do Healthcare Systems Promote the Prevention of Pressure Ulcers?



Acronyms

AHRQ	Agency for Healthcare Research and Quality (US)
ANAES	Agence nationale d'accréditation et d'évaluation en santé (National Evaluation and Accreditation Agency (France))
AQUA-Institute	Institut für angewandte Qualitätsförderung und Forschung im Gesundheitswesen (Applied Quality Improvement and Research Institute (Germany))
BMI	Body Mass Index
BQS-Institute	Bundesgeschäftsstelle Qualitätssicherung (Institute for Quality and Patient Safety (Germany))
CCG	Clinical Commissioning Groups (UK)
CMS	Centre for Medicare and Medicaid's (US)
COMPAQ	COordination pour la Mesure de la Performance l'Amélioration de la Qualité (Coordination for Measuring Performance and Assuring Quality in Hospitals (France))
CQUIN	Commissioning for Quality and Innovation
DRG	Diagnosis-Related Group
EPUAP	European Pressure Ulcer Advisory Panel
G-BA	Gemeinsamer Bundesausschuss (German Federal Joint Committee (Germany))
GHM	Groupe homogène de malades (DRG-equivalent) (France)
HAS	Haute Autorité de Santé (French National Health Authority (France))
HAPU	Hospital-Acquired Pressure Ulcers
HES	Hospital Episode Statistics
HRG	Healthcare Resource Group (UK)
HSCIC	Health and Social Care Information Centre (UK)
ICD	International Classification of Diseases
LTC	Long-Term Care
MDK	Medizinischer Dienst der Krankenversicherung (Medical Service of the Health Funds (Germany))
NHS	National Health Service (UK)
NICE	National Institute for Health and Care Excellence (UK)
NPUAP	National Pressure Ulcer Advisory Panel
PMSI	Programme de médicalisation des systèmes d'information (French DRG-Based Information System (France))
SGB V	Sozialgesetzbuch Fünftes Buch (German Social Code, Book Five (Germany))
SEM	Sub-epidermal Moisture
WUWHS	World Union of Wound Healing Societies

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Foreword

Few disease states ever present themselves to an attainable and near-term solution as pressure ulcers. Pressure ulcers incidence can and should be reduced.

Realizing a goal of preventing preventable pressure ulcers benefits the millions of people worldwide who are affected and to the tens of thousands who die from complications from pressure ulcers on an annual basis. Economic savings through prevention, mostly accruing to public payers, extend to many tens of billions of Euro and Dollars annually. These results are worthy and have been the lifelong work of legions of caregivers and academics globally. This whitepaper is a call to action - a challenge - that extends well beyond the clinical community to provider managers, quality and risk practitioners to healthcare policy makers. No matter how diligent and committed caregivers are to the highest quality of care, unless systemic conditions that reward treatment and penalize prevention are reversed, pressure ulcers will stubbornly persist.

The temptation of provider managers and policy makers is to make a policy tweak here and another there: hire quality nurses, add new reporting metrics, launch awareness campaigns or provide additional training. These initiatives risk adding burden rather than addressing the systemic root causes of pressure ulcers. "Do more" alienates caregivers, adds stress to lean care organizations, and typically fail to inculcate long-term changes. The return on investment is low.

A singular goal – preventing preventable pressure ulcers – when addressed systemically and collectively holds the promise of compelling and sustaining pressure ulcer incidence near zero. Incentivizing prevention and creating conditions intolerant of pressure ulcer incidence applied to the whole healthcare hierarchy, is the right strategy. This whitepaper challenges caregivers to seek out and adopt new technologies capable of detecting tissue damage earlier than visual inspection and risk scales can. We challenge provider managers to create institutional transparency of the true costs of pressure ulcers and raise awareness within their organizations of the benefits of a reduction in incidence. Managers are able to drive localized policies and incentives to support front-line caregivers in this task. We encourage policy makers to craft system-wide policies to drive consistency of detection protocols and to accelerate policy moves towards rewarding prevention and penalizing incidence and subsequent treatment costs.

With newly available technology and collective, systemic action, this is a disease state whose persistent incidence is tantalizingly close to becoming a "never event".



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Executive Summary

- Pressure ulcers represent a serious health problem to patients in acute as well as long-term health care. According to the Joint Commission in the United States, "more than 2.5 million patients in United States (US) acute care facilities suffer from pressure ulcers, and 60,000 die from pressure ulcer complications each year."
- Pressure ulcers place a profound economic burden on healthcare sectors across Europe with estimates of between £1.4 and £2.1 billion for the United Kingdom (UK) and Germany in the magnitude of €1.0 to €2.3 billion. For many this expenditure is considered avoidable and wasteful.
- In Belgium, France, Germany and the UK, 12.1%, 8.9%, 11.0% and 10.2% respectively of inpatients in hospital settings suffer from pressure ulcers. Care-setting specific studies have shown higher prevalence rates for both hospital and long-term care settings across European countries.
- Pressure ulcer aetiology has been extensively studied. The causes of pressure ulcer prevalence beyond their aetiology are only recently being assessed and acted upon. Sadly the majority of cases are considered to be avoidable. Our research revealed systemic conditions, which create the conditions for the problem of pressure ulcers to persist.
- Clinical practice has historically concentrated on pressure ulcer risk assessment and treatment. Health economic policies have also historically tended towards treatment. Indeed in only one care setting studied there were specific reimbursements for the costs of preventative care and only then in very modest amounts.
- Although the burden is high, the issue has until recently received unassertive attention from economists, politicians and clinicians. Select countries in Europe and also the United States (US) have adopted policies modestly focused on preventing pressure ulcers such as the UK's Safety Thermometer. Thorough and detailed prevention policies lack in most other countries.
- Current clinical assessment of pressure ulcers detection still relies on risk assessment scales and visual inspection of skin areas where pressure ulcers are most likely to occur: these methods are decades old, not evidence-based nor standardised within or across countries.
- Contrary to common knowledge, costs for pressure ulcer treatment are not financed as much as is assumed by healthcare providers. For example, in Germany an increase in Diagnosis-Related Group (DRG) payments occurs for only 7.18% of patients incurring pressure ulcers (after some defined exclusions), while in the entire UK National Health Service (NHS) it is 25.3%. Surprisingly, the awareness of the financial impact of pressure ulcers on hospital financing appears to be low among stakeholders: providers are incurring more treatment costs and being reimbursed less than they realize.
- To prevent most pressure ulcers – one of the most readily achievable hospital efficiency targets according to many clinicians - new strategies are needed to accelerate pressure ulcer detection and prevention. The opportunity for new prevention strategies extend to national and European-wide health system managers and policy makers. This situation requires a systemic response from policy makers and hospital managers alike. Pressure ulcer management strategies need to become more effective and should be backed by focused healthcare policy initiatives allowing for more research and the adoption of innovative methods to diagnose, prevent and manage pressure ulcers. Additionally, innovative clinical practices to enable early detection would provide the most favourable results both from a clinical and economic point of view.

In 2012, the Applied Quality Improvement and Research (AQUA) Institute in Germany reported an overall national prevalence of 4.7% which is far below the prevalence indicated by Lahmann et al. (2012). The overall prevalence of 4.7% consists of an incidence rate of 0.9% and a prevalence rate of 3.8% including patients that were admitted to the hospital with pressure ulcers. (AQUA, (2012), DEK – Pflege: Dekubitusprophylaxe Qualitätsindikatoren)

Introduction

Pressure ulcers, commonly known as bedsores or decubitus ulcers, are areas of localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure or pressure in combination with shear . The tissue injury is caused by the inability of the skin and the supporting structures to redistribute external pressure causing alterations to the pressure gradient within the local vascular network. Approximately 70% of all pressure ulcers occur over the sacral area, heels and buttocks³ . Six stages^{4,5}, have been identified, each characterizing wounds of differing severity of types of tissue damage⁶ . In Europe however, only stages I to IV are considered⁷ .

Pressure ulcers present a serious problem to society, causing pain and mortality in patients and leading to increased healthcare costs⁸ . Across countries, prevalence rates of pressure ulcers are high within both hospital and long-term care settings⁹ , where patients and residents are often bedridden and restricted in their mobility and health status¹⁰ . Although, the aetiology of pressure ulcers is increasingly understood, prevalence rates remain high. Commonly cited peculiarities accounting for the high prevalence rates to occur are:

- No reliable and consistent measures to detect the earliest signs of pressure ulcers¹¹
- Particular difficulties in detecting stage I pressure ulcers in patients with dark skin tones⁶
- Lean care organizations which are challenged by tight nursing care schedules and limited resources that have an impact on staffing levels¹²
- Prevention strategies, which are not based on objective evidence
- A level of scepticism of much of the existing evidence about prevention leading to inconsistent adoption. Existing evidence has to rely on subjective expert opinion and panel consensus given the limited availability of technologies that might be capable of generating repeatable, verifiable evidence

According to the World Union of Wound Healing Societies (WUWHS) and clinical experts, having appropriate national policies and well-targeted local management standards in place could avert the preponderance of pressure ulcer cases¹³ . New technologies could optimise the diagnosis and management of pressure ulcers and reduce the severity of the wounds, thereby minimising the associated financial burden through reduced recovery times and shorter lengths of inpatient stays.

By providing a systematic, comparative assessment of the different national policies and incentives designed to curb the increase in pressure ulcers and to reduce their impact on healthcare systems and providers, this report seeks to raise the pressure ulcer debate beyond a narrowly focused discussion of aetiology to a strategic and management level.

² Gebhardt, K.S. (2002) Part 1. Cause of pressure ulcers. *Nursing Times*, 98 (11): 41

³ Bates-Jensen, B.M. "Pressure Ulcers: Pathophysiology, Detection, and Prevention." In Sussman, C. & Bates-Jensen, B.M. (Eds) *Wound Care: A Collaborative Practice Manual for Health Care Practitioners*. Fourth Edition. Baltimore, Maryland: Lippincott Williams & Wilkins. 2012.

⁴ In the EU, the term "Grade" is most commonly used in place of "Stage", a predominantly US-based term

⁵ According to the National Pressure Ulcer Advisory Panel (NPUAP) (n.a.), the six stages are categorised as follows: (1) Stage I: non-blanchable erythema, (2) Stage II: Partial thickness; (3) Stage III: Full thickness skin loss; (4) Stage IV: Full thickness tissue loss; (5) Unstageable/ unclassified: full thickness skin or tissue loss – depth unknown; (6) Suspected deep tissue injury- depth unknown

⁶ NPUAP (n.a.). NPUAP Pressure Ulcer Stages/ Categories. [online] Retrieved February 2014, from: <http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/>

⁷ NPUAP (2009). International Guideline. Prevention of pressure ulcers: quick reference guide. [online] Retrieved February 2014, from: http://www.npuap.org/wp-content/uploads/2012/02/Final_Quick_Prevention_for_web_2010.pdf

⁸ Agency for Healthcare Research and Quality [AHRQ] (2011). 1. Are We Ready for This Change? Preventing Pressure Ulcers in Hospitals: A toolkit for Improving Quality of Care. Rockville, MD: AHRQ (US) [online] Retrieved February 2014, from: <http://www.ahrq.gov/professionals/systems/long-term-care/resources/pressure-ulcers/pressureulcertoolkit/putool1.html>

⁹ Vangilder, C, Amlung, S, Harrison, O. & Meyer, S. (2009). Results of nine international pressure ulcer prevalence surveys: 1989 to 2005. *Ostomy Wound Management*, 55(11): 39 -54

¹⁰ Kuwahara, M, Tada, H., Mashiba, K., Yurugi, S., Iioka, H, Niitsuma, K, & Yasuda, Y. (2005). Mortality and recurrence rate after pressure ulcer operation for elderly long-term bedridden patients. *Annals of Plastic Surgery*, 54(6): 629-32

¹¹ Gehin, C, Brusseau, E, Meffre, R, Schmitt, PM, Deprez, JF & Dittmar A. (2006). Which techniques to improve the early detection and prevention of pressure ulcers? Conference Proceedings of the IEEE Engineering in Medicine and Biology Society, 1: 6057-60

¹² Hughes, R. G. (2008). *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville, MD: AHRQ (US)

¹³ WUWHS (2008). *Principles of best practice: Diagnostics and wounds. A consensus document*. London: MEP Ltd

Study Aims and Methodology

The aims of the study were to:

- Identify the challenges that pressure ulcers pose to the clinical and political communities and the factors influencing their prevalence
- Comparatively analyse the current status and shifting dynamics of pressure ulcer policies
- Assess the role of existing and potential financial incentives and quality initiatives in improving outcomes of care
- Detail potential early detection technologies targeted at making pressure ulcer prevention possible

The analysis focused on the hospital sector in four European countries: Belgium, France, Germany and the UK. Additional details of the US and other countries' systems are provided for analytical benefit, but were not studied as extensively as the countries in focus.

Extensive desk research was conducted to gain an in-depth understanding of the implications of policy and care quality measures on the prevalence of pressure ulcers and the financing of how pressure ulcers are managed in this area, covering both the hospital and long-term care (LTC) sectors in the four selected countries. Insights from a wide range of stakeholders – including leading academics, clinical staff, nursing care directors and payers – were collected through phone interviews of 30 to 60 minutes and face-to-face interviews of 120 and 150 minutes. On the basis of initial interviewees' suggestions, additional stakeholders were identified and their participation included. Response rates in the hospital sector were high in Belgium, Germany and the UK, while lower in France and in the LTC sector in general. In total, 42 EU wide expert interviews were carried out.

Interviews covered four main topics:

- Current care processes and organisation for patients with pressure ulcers
- Reimbursement of prevention and treatment costs relating to pressure ulcers
- Reasons for successful pressure ulcer reduction
- The added value of new strategies to help overcome barriers to pressure ulcer prevention

Questions were tailored to interviewees' specific areas of expertise and responses were grouped under the four topics. A review of quality measures and current initiatives was also carried out for each of the selected countries and is included in this report. Reimbursement approaches to pressure ulcer care were further investigated through collaboration with medical controllers¹⁴ in each of the countries in scope.

¹⁴ A medical controller is a person who checks the suitability of diagnosis-related groups that are assigned to patients by their physicians with the national definition of those DRG codes. Example: There are several DRG codes related to pressure ulcers. A medical controller checks whether a patient is properly assigned to a DRG code.

Pressure Ulcers: A Chronic Clinical Challenge

The Ageing Patient Community

Recent decades have witnessed a remarkable demographic shift worldwide, particularly in developed countries.

Economic development and improved medical care have helped to produce sustained growth in the proportion of older people¹⁵.

Such trends pose serious challenges to healthcare systems. Older populations need higher levels of care, and particularly create a higher demand for nursing services. This has put additional financial strains on health and nursing budgets.

In Germany, for example, the number of patients in need of nursing care rose to the highest ever level of 2.5 million in 2013¹⁶, leading to expenditures of €22.9 billion that same year. By 2050, researchers project that 4.5 million ageing Germans will need care. In response to these projections, the Ministry of Health plans additional increases in co-payments for nursing care from January 2015¹⁷ only two years after the most recent financial reform of nursing insurance took effect in 2013.

Between 30% and 50% of residents of LTC settings are at risk for pressure ulcers in Germany¹⁸.

The indirect costs of looking after elderly with pressure ulcers in hospitals and LTC is also very high, and estimated to be €10,500 per year and per case¹⁹

Preventive measures are urgently needed to mitigate the increasing costs related to pressure ulcers in this population group.

Even more pressure ulcers represent a serious health problem to patients: According to the Joint Commission in the United States, "more than 2.5 million patients in United States (US) acute care facilities suffer from pressure ulcers, and 60,000 die from pressure ulcer complications each year."²⁰

Pressure Ulcers: A Burden for the Clinical Community

Across Europe, the clinical and financial burden of pressure ulcers is high but often remains unrecognised or unreported, despite their serious health and financial implications. Co-morbidities and complications typical in pressure ulcer patients increase care use and length of hospital stay, resulting in higher healthcare costs⁸.

Although the problem of pressure ulcers is widely acknowledged in the healthcare sector – and is currently gaining in political importance – prevalence rates among inpatients in hospital settings remain stubbornly high at 12.1%²¹, 8.9%²², 11%^{1,23}, and 10.2%²⁴ respectively in Belgium, France, Germany and the UK. A limited number of other studies confirm similar or higher prevalence rates of pressure ulcers both for hospital and long-term care settings across countries. In addition, pressure ulcers increase the average length of hospital stay by approximately eight days²⁴. Pressure ulcers present an economic burden to healthcare financing although true costs for the healthcare sector are not fully transparent. For example, in the UK the economic impact due to pressure ulcers amounts to between £1.4 and £2.1 billion²⁶ and in Germany the range is between €1.0 and €2.3 billion.

We provide an explanation of this stubbornness through a systemic root cause analysis. Examination of causality through the systemic root cause lens suggests that new strategies and technologies are needed to address the healthcare challenge of preventing and managing pressure ulcers. Newer evidence-based approaches, including the use of medical devices, are needed to change and improve the way patients are assessed globally.

¹⁵ Bongaarts, J. (2009). *Human population growth and the demographic transition*. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364 (1532): 2985 - 2990

¹⁶ "Pflegerreport" 2013 der BARMER GEK (National Report on Nursing Care 2013)

¹⁷ Federal Minister of Health, Hermann Gröhe (as of 23.01.2014)

¹⁸ Robert-Koch-Institut, Statistisches Bundesamt (2000). *Gesundheitsberichterstattung des Bundes. Heft 12 Dekubitus*.

¹⁹ "Pflegerreport" 2012 der BARMER GEK (National Report on Nursing Care 2012)

²⁰ *The Role of Nutrition in Pressure Ulcer Prevention and Treatment: National Pressure Ulcer Advisory Panel White Paper, 2009*
<http://www.npuap.org/wp-content/uploads/2012/03/Nutrition-White-Paper-Website-Version.pdf>

²¹ Vanderwee K, Defloor T, Beeckman D, Demarre L, Verhaeghe S, Van Durme, T & Gobert, M. (2011). *Assessing the adequacy of pressure ulcer prevention in hospitals: a nationwide prevalence survey*. *BMJ Qual & Safety*, 20(3): 260-7.

²² Barrois, B, Labalette, C., Rousseau, P, Corbin, A., Colin, D., Allaert, F. & Saumet, J.L.(2008). *A national prevalence study of pressure ulcers in French hospital inpatients*. *Journal of Wound Care*, 17(9): 373 - 379

²³ Lahmann N, Dassen T, Kottner J. (2012). *[Frequency of Pressure Ulcers in German Hospitals.]*. *Gesundheitswesen*, 74 (12): 793 - 797

²⁴ Phillips L, & Buttery J. (2009). *Exploring pressure ulcer prevalence and preventative care*. *Nursing Times*: 105(16):34-6.

²⁵ *Dexia MAHA analysis (2012)*; <http://www.devicemed.de/szene/articles/375760/>; *OECD health data (2013)*

Why Pressure Ulcers Occur

Patients, provider settings, clinicians, care protocols, and interventions differ in, and between, countries. In most aspects, country health systems are completely separate from each other and pressure ulcers are non-communicable. Yet, pressure ulcers still have a very similar impact across different countries.^{23,24,27,29}

Why is this the case? Why do patients in the UK, for example, develop pressure ulcers at broadly the same rate as in so many other developed countries when patients, care settings, clinicians are distributed and mutually exclusive between countries?

Our root cause work was motivated by a desire to develop an understanding of the underlying, more fundamental reasons for pressure ulcer incidence, the difficulties in remediation, and the malaise across much of healthcare practice. Equipped with this knowledge, an assessment of the possibility for better clinical and economic outcomes through smart, systemic changes was anticipated.

Foundations of our Root Cause Analysis

Many of us are familiar with the phrase “root cause”, particularly related to explaining, “Why things go wrong.” Historically, formal root cause analyses in engineering were focused on a linear investigation of cause and effect. The phrase ‘root cause’ tends to be used to imply a specific cause linearly related to an event or situation. The linear approach, however, is limited when systems are complex, human-driven and the interdependencies are hard to untangle and map in a direct manner. Root cause analysis based on a system-level view acknowledges the complexity faced and the role of context and judgment in assessing performance.

In this section, the root cause framework is described; in the next, a number of causal factors identified through our work are explained. Desk research, and interviews with both healthcare practitioners and researchers were employed to identify root cause themes generally applicable to all health systems studied. The root causes of pressure ulcers in each system are worthy of additional research to provide in-country and pan-European policy makers with substantial, nuanced details required for tailored interventions.

²⁶ NHS for Innovation and Improvement (n.a). [online] Retrieved February 2014, from: http://www.institute.nhs.uk/building_capability/general/your_skin_matters.html

²⁷ Assadian, O., Oswald, J. S., Leisten, R., Hinz, P., Daeschlein, G., & Kramer, A. (2011). Management of leg and pressure ulcer in hospitalized patients: direct costs are lower than expected. *GMS Krankenhaushygiene interdisziplinär*, 6(1).

²⁸ Gunningberg, L. (2006). EPUAP pressure ulcer prevalence survey in Sweden: a two-year follow-up of quality indicators. *Journal Wound Ostomy & Continence Nursing*, 33(3): 258-66

²⁹ VanGilder, C., Amlung, S., Harrison, P, and Meyer, S., (2009). Results of the 2008-2009 international pressure ulcer prevalence survey and a 3-year, acute care, unit-specific analysis. *Ostomy Wound Management*, 55(11): 39-45

Discussion of Root Causes within the Healthcare Sector
 Causality in complex systems such as the healthcare system can be broken down in a multi-level hierarchy of four interrelated groups of potential factors that can account for the incidence of pressure ulcers: (1) Proximate events that can directly result in an ulcer. These are events, which establish the linear relationship between the development of an ulcer and its direct causes; (2) and (3) Clinical care and Provider factors establish the way clinicians' organise, operate, practice and manage; and, (4) External factors capture the environmental changes impacting healthcare providers (see Figure 1).

EXTERNAL FACTORS		PROVIDER FACTORS	
Reimbursement policies paying for treatment over prevention	Imbalanced focus on treatment over prevention	CLINICAL CARE FACTORS Need for evidence-based assessment of tissue status No devices to detect wounds earlier than visual and risk assessment Lack of pressure ulcer awareness	
Pressure ulcer aetiology and treatment research more pervasive than prevention research	Inconsistent coordination of preventative care within and between care settings		
Limited patient and consumer awareness	Variable competency in risk assessment and prevention	Poor compliance with intervention protocols	Limited time and resources
		PROVIDER FACTORS	
		Patient Factors	Pressure ulcer incidence
		Pressure, shear and/or friction Immobility and/or surgeries lasting more than 4 hours Advanced age, fragile skin, and incontinence Poor nutrition BMI <18 or BMI > 30 Dark skin tones	

Figure 1 Hierarchy of Causality for Pressure Ulcers in Complex Systems²⁹

Promixate Events: Patient Factors

Direct causal factors include malnutrition and the patient's body mass index (BMI). If the BMI is below 18.5 (indicating underweight) or above 25 (indicating overweight to obese)³⁰ patients have more bony areas exposed to higher shear and friction forces or greater pressure on vulnerable parts of the body³¹. Advanced age, fragile skin and incontinence all also increase the risk of pressure ulcers. Immobility, whether due to age, weight, morbidity or surgery, easily leads to pressure ulcers if not closely watched by nursing staff.

Complete avoidance of pressure ulcers is not always possible even when a patient is closely observed and well cared for as some patient factors can unfavourably affect health outcomes. Frail, elderly patients are mostly commonly cited as being susceptible to unavoidable pressure ulcers.

Clinical Care Factors

These factors set the context in which nurses and clinicians are expected to provide care. Easy detection methods for pressure ulcers that provide evidence of subcutaneous damage before becoming visible at the skin's surface are only now becoming available. Ultrasound imaging has been available for some time, but is expensive and complex to deploy in a clinical setting. Once erythema (reddening of the skin) is visible, tissue damage has already occurred. Detection of pressure ulcers via visual inspection and risk assessment scales – the current "Gold Standard" – is notoriously unreliable and challenging. Even with the best training, caregivers' ability to affirmatively assess patients for the existence or absence of pressure ulcers can be as low as 47%³²; odds lower than randomly guessing. Assessment of patients with dark skin tones is more difficult with the currently applied detection methods. Thus, people with dark skin tones are more likely to be diagnosed with stage II to IV pressure ulcers rather than stage I pressure ulcers, compared to people with lighter skin tones³³.

The World Union of Wound Healing Societies 2008 Consensus Document on diagnostics in wound care recognised the magnitude and urgency of the need for a safe, easy to use and reliable wound care diagnostic, which employed a tissue status biomarker³⁴. Such technology has been unavailable until recently and is not yet fully embedded in clinical practice (see later section "Overcoming barriers to pressure ulcer prevention").

Pressure ulcer awareness and reporting have started to be implemented in the last twenty years, although the extent of their implementation varies (Figure 5). While increased awareness is welcomed, practitioners reported being besieged by demands to "do more" without new resources, or appropriate technologies. One British Registered Nurse articulated her daily reality of competing demands and the implementation of quality policies as, "being set up for failure every day".

Practitioners reported that the high average incidence of pressure ulcers in some facilities may in part be due to the very tight time schedules for nursing care that result from heavy caseloads for staff. Providers' budget restrictions also have an impact on care quality and indeed a section of this report is dedicated to that topic. Separately, risk assessment documentation and intervention protocols may exist but compliance can be poor in some countries.

The latter is also dependent on the healthcare system and the extent to which quality incentives and regulations are established and how closely external parties monitor them.

²⁹ Framework adapted from Johnson, William G (1980) "MORT Safety Assurance System", Marcel Decker, New York, NY as cited in Leveson, Nancy (2011) "Engineering a Safer World", MIT Press, MA

³⁰ Centers for Disease Control and Prevention (2011). *Healthy Weight – it's not a diet, it's a lifestyle! About BMI for Adults. CDC 24/7: Saving Lives. Protecting People* [online] Retrieved March from: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html

³¹ Dean, J. (2011). Article 4 - Skin Health: Prevention and Treatment of Skin Breakdown. *Transverse Myelitis Association*, (5)

³² Thomas, D.R., 2001. *Issues and dilemmas in managing pressure ulcers. J Gerontol Med Sci*, 56: 238-340.

³³ Rosen, J., Mittal, V., Degenholtz, H., Castle, N., Mulsat, B.H., Nace, D., & Rubin, F.H. (2006). *Pressure ulcer prevention in Black and white nursing home residents: a QI initiative of enhanced ability, incentives and management feedback. Advances in skin & wound care*, 19 (5): 262 - 269

³⁴ WUWHS (2008). *Principles of best practice: Diagnostics and wounds. A consensus document. London: MEP Ltd*

Provider Factors

The focus by providers on treatment versus prevention has been similarly constrained: the management and allocation in hospital settings of therapeutic items such as speciality-surface mattresses is frequently based on subjective tests. Allocations - which patients are targeted, at what stage of their treatment - are made solely on visual inspections and traditional risk assessment scales to assess whether a patient is at high risk of developing pressure ulcers or has already developed a higher-stage pressure wound. Objective support from studies showing the efficacy of these often high-cost interventions is mostly absent but continue to be employed based as best-available measures.

Pressure ulcer incidence persists and costs remain nonetheless.

Coordination of care within and between care settings was cited by interviewees as highly challenging: patients moving from the emergency room to acute or sub-acute wards would be better identified for pressure ulcer treatment with complete records inclusive of assessment of tissue status.

Similarly, patient records and tissue status assessments from patients being admitted from or discharged to other care settings, such as nursing homes, are frequently missing. Interviewees complained repeatedly of receiving patients with “incomplete records” where the patient’s tissue was compromised but that status not recorded in their charts. Interviewees reported trying to obtain a complete patient pressure-ulcer history from the discharging care setting only to be told that the patients had healthy tissue at discharge and therefore any damage observed, “must have occurred in the ambulance between discharge and admission”. The absence of objective measures of tissue status clearly hinders the ability of caregivers to pass complete records and care instructions both between and within care settings.

External Factors

Over the past five years, limited external pressure to avoid pressure ulcers has been exercised by payers of healthcare such as governments. While not completely applicable to all countries, reimbursement approaches implemented in the countries covered by this study have “misaligned” their quality incentives: treatment of pressure ulcers being reimbursed, rather than quality improvements or prevention.

A positive change is currently underway in certain countries so that low quality care will no longer be reimbursed and efforts to prevent pressure ulcer prevalence will be incentivised (Table 1).

Table 1 Government Programs that Penalise Providers for Pressure Ulcers and/or Incentivize the Prevention of Pressure Ulcers

Country	Programs to Incentivize Pressure Ulcer Prevalence	Programs that Penalize Pressure Ulcer occurrence
Belgium	-	Proposed 2015 legislation limiting payment for additional hospital days associated with hospital-acquired pressure ulcers
France	-	General accreditation and quality indicators
Germany	-	General accreditation and quality indicators
United Kingdom	Safety Thermometer (£18,525 payments each for incidence <50/1,000 inpatient discharges, assessment, care plan, reporting)	Specific quality indicators (CQIN framework)
United States	Non-specific Evaluation and Management codes	Present on admission testing Penalty for readmission Never events Failure to reporting stages III and IV incidence penalties

Further, patient-initiated litigation and pressure ulcer awareness programmes are neither ubiquitous across Europe nor cited as a driving force for changing clinical behaviour. The UK is an exception where litigation for pressure ulcer incidence is rising. Litigation in the US sets benchmarks for both plaintiff-defendant win-loss ratios and settlement size: Providers lose up to 91% of pressure ulcer-related lawsuit and the median litigation settlement is approximately \$250,000³⁵.

Individual awards exceeding \$300 million for pressure ulcer failures have occurred.

Finally, the majority of clinical research thus far has focused on pressure ulcer treatment, risk assessment tools and tissue characteristics rather than prevention or early detection.

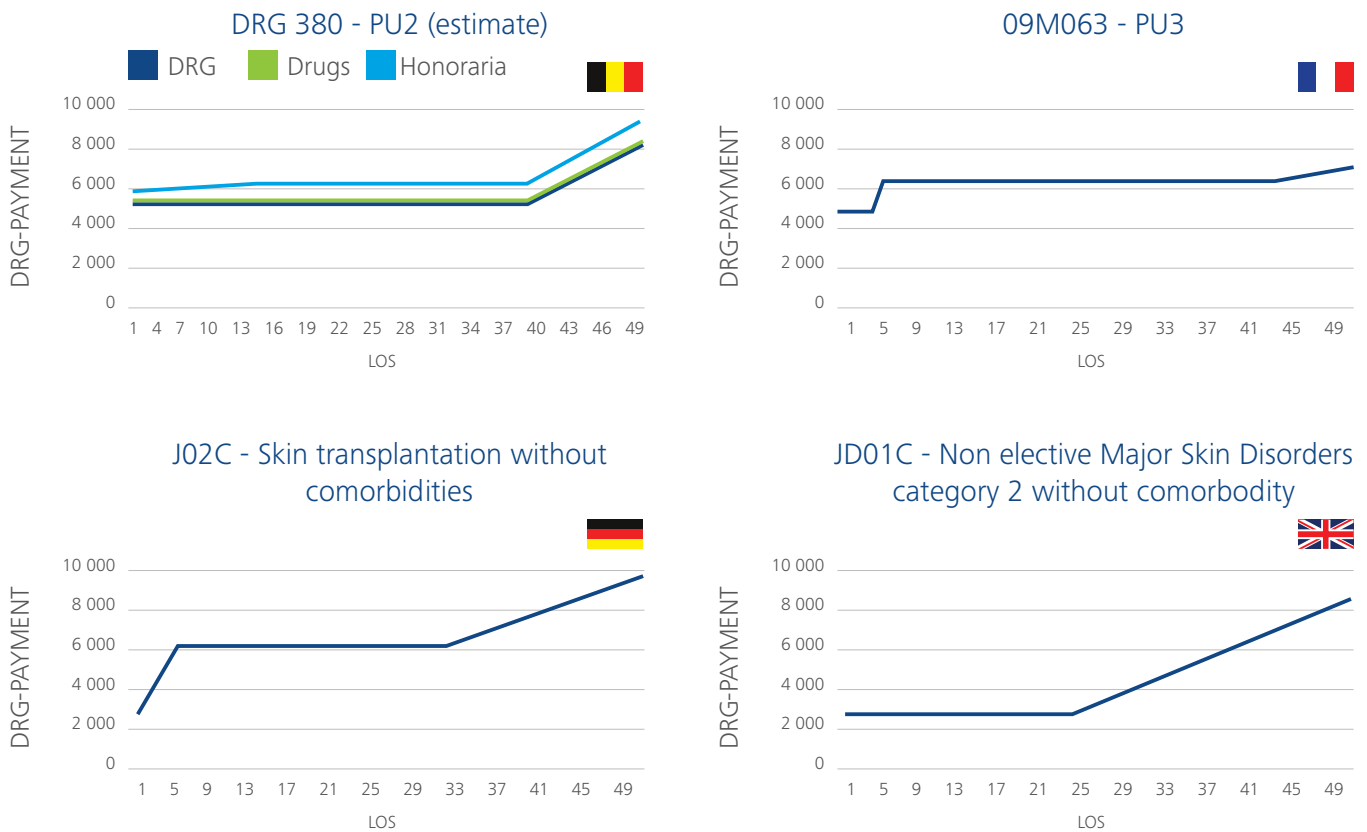
Further sections of this report explore the quality and economic policy aspects of pressure ulcer care in detail.

³⁵ Voss AC, Bender SA, Ferguson ML, Sauer AC, Bennett RG, Hahn PW. Long-term care liability for pressure ulcers. *Journal of American Geriatrics Society*. 2005 Sep;53(9):1587-92.

Hospital Financing of Pressure Ulcer Interventions is Not What it Seems to Be

Hospital financing mechanisms differ across the countries in scope and are particularly complex in Belgium and France. Still, in all four countries, DRGs partially determine inpatient hospital reimbursement. Figure 2 compares payments for pressure ulcer specific episodes against reimbursed lengths of stay for those episodes. The “kinks”, also known as “trimpoints” in the lines shown in Figure 2 indicate lengths of stay where the DRG-reimbursed amount steps-up to a higher overall reimbursement for the total length of stay.

Figure 2 Pressure Ulcer Reimbursement approaches in Belgium, France, Germany and the UK for Typical Length of Stay (LOS) for Pressure Ulcer Specific DRGs (LOS in Days)



LOS= Length of stay in nights

Taking the UK as an example, prices for hospital care are defined in terms of Healthcare Resource Group (HRG) spells of stay in hospital. A spell of activity is a hospital stay from admission to discharge and is a measure of the hospital's output. A HRG code is assigned to each spell of activity. The HRG code JD01 covers the treatment of pressure ulcers, named in the tariff as a major skin condition.

Pressure ulcers are recognized as a comorbidity and therefore increase the severity (and funding) of the primary HRG, although not for all patients. Hospitals treating patients staying in hospital for longer than the trimpoint of a treatment for a given HRG, receive payment per excess bed day. The trimpoint does not represent expected length of hospital stay, but is used as a way to fund outliers (in terms of length of stay).

In some Clinical Commissioning Groups (CCG) and Trusts, payment of excess hospital bed days due to hospital-acquired pressure ulcers (HAPUs) has been removed, to act as a financial disincentive to avoid occurrence of pressure ulcers.

Generally, hospital reimbursement is conceived to recognize the additional efforts for treatment of pressure ulcers since in most cases, pressure ulcers are deemed to occur as comorbidity of a primary diagnosis. Treatment activities associated with pressure ulcers are part of the DRG³⁶ of the main diagnosis and treatment of pressure ulcers is financed through a higher DRG. This higher DRG is designed to account for the associated increase in the severity level of the main diagnosis and the higher cost weight that are due to pressure ulcers.

Most stakeholders such as politicians, payers and clinical professionals assume that this financing structure means that hospitals are getting paid for the treatment of pressure ulcers. Or as one interviewee stated: "We have limited incentives to invest in prevention as these investments have to be paid for by the hospital, while treatment is paid for by the public payer."

In theory, in all four countries included in this study, prevalence of pressure ulcers will result in higher reimbursements. This is through a higher HRG in the

UK and higher DRG, GHM and G-DRG severity levels and cost weights in respectively Belgium, France and Germany.

Faulty Assumptions

Most stakeholders in the selected countries are seemingly unaware that in practice approximately only 9% to 25% of all pressure ulcer cases result in DRG-payment increases. This DRG-payment range was calculated during a Deloitte investigation of hospital inpatient data in the selected countries.

The main reason is that patients with pressure ulcers typically suffer from other co-morbidities such as diabetes, obesity and pneumonia, which by themselves lead to several sub-diagnoses that increase the disease severity level and thus the cost weight and DRG payment. This means that the development of a pressure ulcer is coded, but the associated diagnosis and treatment procedures will not necessarily have any additional return-relevant effect. As a consequence, there will be no further impact on the already increased DRG-payment.

The financial burden of pressure ulcer treatment and the longer inpatient length of stay of 6.5 days³⁷ to 9.8 days³⁸ must be wholly covered by the hospital. Only the treatment of the most severe stage IV and part of stage III pressure ulcers will lead to an increase in DRG payment reflecting the cost of procedure-relevant measures such as moist dressings, surgical interventions or vacuum therapy.

The analysis above, and its conclusions, was carried out in collaboration with the University Hospital of Essen in Germany, the University Hospital Est Parisien in France, and data collected from the Health and Social Care Information Centre (HSCIC) in the UK. The rest of this section describes in detail the approach and outcomes of this work, which was conducted with medical controllers of these institutes.

³⁶ *Diagnosis-related groups determine inpatient hospital reimbursement to create more transparency, efficiency and quality in hospitals*

³⁷ Nestrigue V., & Or, Z. (2007). *Working Paper. Surcoût des événements indésirables associés aux soins à l'hôpital. DT no.44*

³⁸ Posnett, J., Gottrup, F., Lundgren, H. & Saal, G. (2009). *The resource impact of wounds on health-care providers in Europe. Journal of Wound Care: (18): 4, 154–16*

Approach and Outcomes by Country

The study's aim was the identification of the number of patients for whom the presence of a pressure ulcer in fact led to a higher category of DRG and thus to a higher DRG payment. Inpatient records from the two hospitals and the NHS over a period of one year were retrieved and searched for the coding of pressure ulcers as the main or sub-diagnosis. A database was established containing the relevant DRG/HRG codes and, if available, cost weights of all inpatients identified with at least one pressure ulcer. In order to establish a baseline for comparison, from these inpatients, DRGs were simulated by excluding pressure ulcer as diagnosis or pressure ulcer related procedure codes. Data was analysed to identify the proportion of pressure ulcers that led to a higher cost weight and more severe DRG and the average increase in DRG-payment.

This approach is visualised in Figure 3 showing a DRG payment related to a patient's length of stay. The upper line represents a main diagnosis (for example a cardiac condition) in combination with pressure ulcer as the sub-diagnosis. Disentangling additional impacts of the occurrence of pressure ulcers on the overall DRG

payment is possible by analysing real world hospital DRG payment schedules from hospital inpatient data. The existence and the amount of additional DRG payments made to a hospital when a patient is diagnosed by a secondary diagnosis, such as the pressure ulcer, were simulated by excluding pressure ulcers as additional diagnosis and evaluating the differences in payments with or without the pressure ulcers. The lower line in Figure 3 represents the payment that would be made for the primary diagnosis and the upper line represents the DRG payment when the primary diagnosis is coupled with a secondary pressure ulcer diagnosis. Usually, also a reduction in the length of stay would have been assumed, which does not become apparent in Figure 3. From the data available it was not possible to determine to what extent pressure ulcers, next to other co-morbidities contribute to an additional length of stay. Hence, patients' length of stay was disregarded in the analysis. The main focus was on the difference in DRG-payment represented by the difference between the two lines.

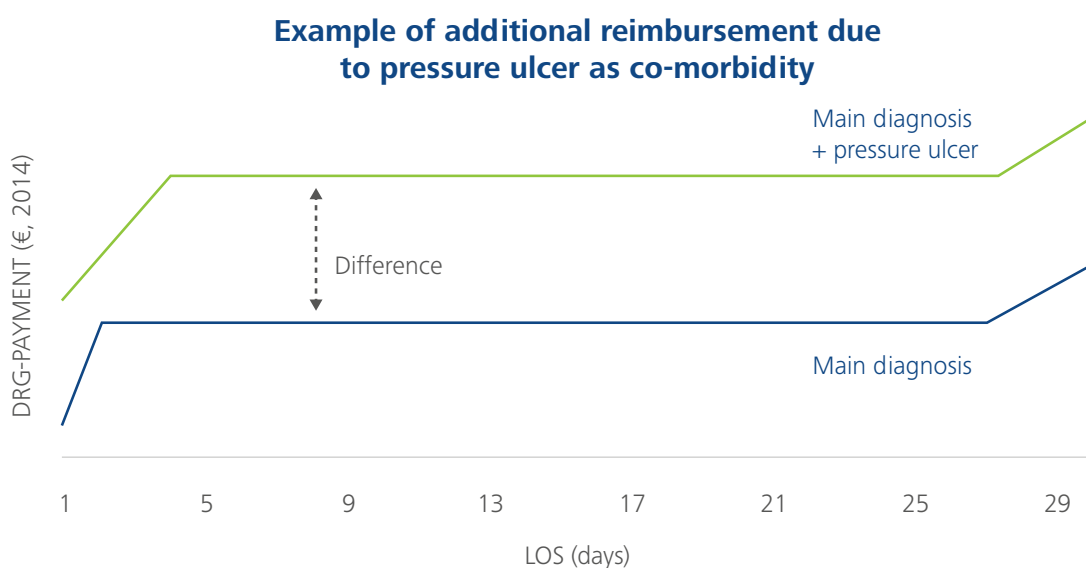


Figure 3 Model for the Deduction of Additional Reimbursement due to Pressure Ulcers as Comorbidity

France

In 2013, the University Hospital Est Parisien recorded 520 inpatients coded with pressure ulcers. The average age among this patient group was 81 years, with a range of 28 to 102 years of age. Pressure ulcers were closely distributed in men (47.85%) and women (53.15%). For 75.56% (393) of patients with pressure ulcers no change in DRG-payment was found after excluding pressure ulcer-relevant diagnoses and procedure codes. Hence, for only 24.44% (127) of these patients did pressure ulcers have an effect on DRG severity and reimbursement level. The average increase in DRG-payment for this group of patients was € 2,821.28. The cost of care for pressure ulcer prevalence directly incurred by the hospital group for the 393 patients for whom no increase in DRG related reimbursement was received was therefore in a range of €105 thousand and €3.6 million in that year. The median reimbursement level was approximately €953 thousand.

Germany

In 2013, 1.74% (878) of all patients admitted to and treated in the University Hospital of Essen were coded with at least one pressure ulcer. For 90.66% (796) of these patients the diagnosis of pressure ulcers did not change the DRG severity level, hence only for 9.34% (82) of these patients did the pressure ulcers have an effect on DRG severity and payment. Within the dataset of the University Hospital of Essen we observed, that of these 82 patients, 23.17% (19) had either an exceptionally high increase in DRG-payment (8) or the DRG-payment decreased (11) when pressure ulcers were coded. The decrease in DRG payment after diagnosing pressure ulcers may be explained by the fact that the increased length of hospital stay associated with pressure ulcers could not be removed when analysing the results. As a consequence, the payments for additional length of stay which could not be adjusted for pressure ulcer removal (in addition to the value of the simulated DRG) exceed the value of the original DRG. Hence, the following cases were not included: All pressure ulcers coded as a main diagnosis were excluded because removal of a pressure ulcer code would negate the patient's need to be treated in

the hospital. Furthermore, the DRG would become ungroupable. This was the case for eight patients. All data points were removed where the presence of pressure ulcers led to a decrease in DRG severity and concomitantly to a lower DRG payment. This was the case for eleven patients.

After excluding these patients, only 7.18% (63) of patients with pressure ulcers had an increase in DRG severity and payment. Among the 7.18%, the gender distribution was similar between men (52.38%) and women (44.44%), and the average age was 69 years, with a range of 17 to 95 years of age. The average increase in DRG payment for this group was €1,986.18 with the largest amounts predictably being spent on patients with stage IV pressure ulcers. This analysis showed that, based on the average across all patients suffering from pressure ulcers (after excluding specific cases), the additional DRG payment per patient is only €146. This figure, however, understates the real overall picture because it does not reflect that the majority of patients with pressure ulcers do not lead to a more severe DRG and therefore treatment costs have to be borne by the hospital itself. It should be reiterated that for 796 patients no higher DRG payment was received. This means that the costs of care for pressure ulcers directly incurred by the hospital were in a range of €54 thousand and €6.2 million in 2013 with a median reimbursement level of €1.1 million. Forty-nine out of the 796 patients were diagnosed with stage III pressure ulcers and fifteen patients with stage IV pressure ulcers, which lead to an additional length of stay of between 6.5 days³⁷ to 9.8 days³⁶ or to €60 variable treatment cost per day³⁹.

Within and across hospitals DRG categorisation can vary significantly due to a number of influencing factors in addition to case severity. For example in the University Hospital of Essen, the DRG severity and payment increased significantly for patients with pressure ulcers in the specialist departments of thoracic surgery, dermatology and general surgery, but there were only minor increases for patients in the neurology or internal medicine departments.

³⁹ Nord D. (2007). *Effektivität und Effizienz in der Wundversorgung. Moderne Wundversorgung vs. Vakuumver-siegelungstherapie. Kapitel 17.* In Wild, T. & Aubock, J. (2007). *Manual der Wundheilung. Seventh edition.*

⁴⁰ HES is a data warehouse containing details of all admissions, outpatient appointments and A&E attendances at NHS hospitals in England.

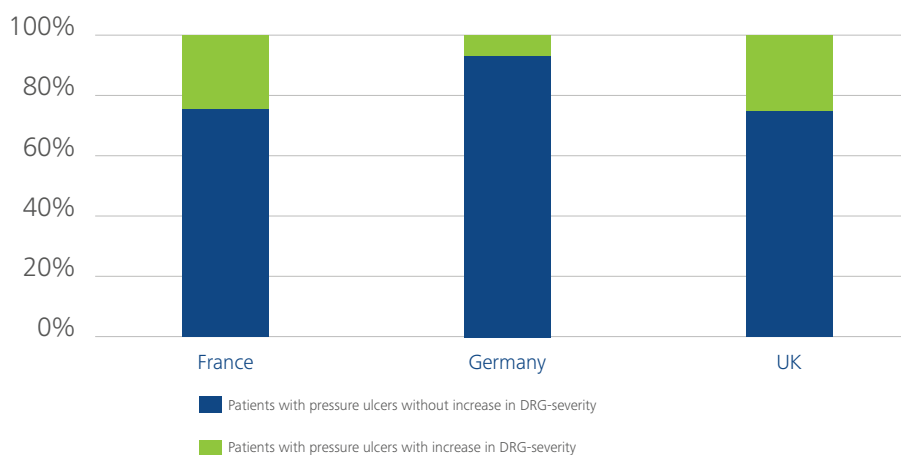
United Kingdom

Hospital Episode Statistics (HES)⁴⁰ inpatient data from 2012 to 2013 included over 19 million patients, of whom 1.05% (200,113) were found to have a pressure ulcer diagnosis or procedures. For 74.7% (149,484) of these inpatients spells did not result in an increased payment when pressure ulcers were diagnosed, this was only the case for 25.3% (50,628) of spells.

Out of the 74.7% of inpatients, 3.9% (5,829) of spells resulted in a reduced payment when pressure ulcer was diagnosed. As is the case in Germany, this decrease in spell tariff reduction may be explained by the fact that increased length of hospital stay associated with pressure ulcers cannot be removed when analysing the results. Consequently, certain long stay payments exceeding the value of the original spell (HRG) could not be adjusted for the removal of pressure ulcer diagnosis (in addition to the value of the simulated spell).

Among the 25.3%, the gender distribution was similar between men (50.47%) and women (49.53%), and the average age was 84 years, with a range of new-borns to 105 years of age. The average increase in DRG payment for this group was £2,332. Based on the average across all inpatients in 2013 (including 1.05% of patients), the additional spell payment per patient with pressure ulcers is £509. For 74.4% (149,484) inpatients there was no increased payment. Hence, costs for these inpatients had to be incurred by hospitals in the UK. Due to the large sample size an average reimbursement was assumed. The costs of care for pressure ulcers directly reimbursed to hospitals within the NHS calculated using our method amounted to £348.6 million between the years 2012 and 2013. The difference between this reimbursed amount versus the published estimations of £1.4 and £2.1 billion⁴¹ are explained by costs not directly reimbursed for pressure ulcer care, such as hospital services.

Figure 4 Share of Patients in France, Germany and the UK with an Increase in DRG Severity and Payment.



⁴¹ NHS for Innovation and Improvement (n.a). [online] Retrieved February 2014, from: http://www.institute.nhs.uk/building_capability/general/your_skin_matters.html

United States

Two sets of legislative changes⁴² in combination with policy initiatives targeted at pressure ulcer prevalence reduction and cost savings are being implemented gradually. Concepts of “present on admission” testing, “never events”, “penalties for readmission due to pressure ulcers” are now commonly applied in US acute, sub-acute and long-term care settings. Further, the Centre for Medicare and Medicaid’s (CMS) “Evaluation and Management Codes” - distinct from CPT, HCPCS, or ICD-9-CM codes - for physician and patient encounters for a wide variety of physician services including patient history, physician exam and medical decision-making may extend to pressure ulcer preventative assessment. Our analysis of the Federal Register identified five Evaluation and Management codes which, while vague in their language would provide for more than \$300 of additional reimbursement to physicians and hospitals for a comprehensive assessment and evaluation of patient status, including pressure ulcers⁴³. Funding for preventative assessments provides a model for other care systems to observe and assess. The effects of legislation and quality initiatives on US care settings are yet to be determined.

To conclude, costs for pressure ulcer prevention and treatment are not reflected in financing as much as is assumed by stakeholders. Cost of treating pressure ulcers and the associated additional length of stay of 6.5 days³⁷ to 9.8 days³⁶ is mainly borne by hospitals. The financial impact ranges from €54 thousand to €6.2 million for an individual hospital group, while it was £348.6 million for all hospitals within the NHS. Yet, stakeholders generally perceive all costs to be covered.

New policy measures planned in Belgium and the UK may even lead to a reduction in the proportion of patients with pressure ulcers for whom there is an ulcer-related increase in DRG severity and corresponding payment.

A separate driver of the financial burden of pressure ulcers is the cost of litigation, although this is still limited in most European countries except for the UK. The next section will provide a more detailed perspective on legal aspects.

⁴² Deficit Reduction Act (DRA) of 2005, section 5001(c) requires that Medicare and Medicaid no longer pay for the costs of treating 8 conditions which should “never” occur in a care setting, Stage III and IV pressures being high on that list. The legislation is gradually being implemented. The Patient Protection & Affordable Care Act (PPACA, 2010), commonly known as “Obama Care” imposes reimbursement penalties on non-reporting and high-incident care settings, mostly effective starting October 2014.

⁴³ Federal Register, Vol. 77, No. 22. Medicare Program; Revisions to Payment Policies Under the Physician Fee Schedule, DME Face-to-Face Encounters, Elimination of the Requirement for Termination of Non-Random Prepayment Complex Medical Review and Other Revisions to Part B for CY 2013; Final Rule. Nov. 16, 2012; as amended by American Taxpayer Relief Act of 2012 dated Jan. 3, 2013; PPRVU13 file dated Jan. 3, 2013.

The Importance of Quality Measures and Incentives to Reduce Pressure Ulcer Prevalence

Over the last decade, risk assessment for pressure ulcers and evaluation of related interventions has become standard practice in the four countries included in this study and pressure ulcer prevalence is now a commonly used indicator to assess general quality of care. However, the compliance and frequency of measurement and the consequences of low or high-pressure ulcer prevalence differ markedly between and within the four countries, mainly due to variations in national and regional public authorities and policies.

Quality-related measures relating to pressure ulcers are well established and closely monitored in Germany and the UK, and in parallel there has been an increasing focus on hospital accreditation and awareness of care


quality in Belgium. Since the late nineties, hospital accreditation has been mandatory in France and publication of outcomes on specific quality criteria, including also pressure ulcers, has been publicly available in all four countries (see Figure 5).

This study's analysis suggests that up-to-date quality criteria and associated financial incentives appear to have the greatest potential for focusing the attention of healthcare providers on pressure ulcers and may be the key driver for avoidance of their development.


The following sub-sections discuss details of each country's history of implementation of quality incentives to reduce pressure ulcer prevalence.

Figure 5 Timeline on the Implementation of Quality Incentives


Timeline	Belgium	France	Germany	UK
Importance of quality indicators	2006	2003	2001	2005
First quality report published	2014	2006	2005	2012
Increase in importance of quality indicators & reports	2014	2009	2007	2009
Projects linking reimbursement to performance targets		Expected	Expected	2009
Projects focusing on prevention and treatment of care related to adverse events such as pressure ulcers			Expected	2012

Belgium 

Measures limiting the reimbursement of extra LOS associated with HAPUs will be implemented.

UK 

Next CQUIN phase: financial sanctions for falling below target & public reporting of pressure ulcers.

Germany 

There will be a reform change towards a more quality-oriented G-DRG system in the future.

France 

It has been suggested to discontinue reimbursement for treatment side effects.

Belgium

In Belgium, pressure ulcer prevalence among hospital inpatients is reported to be 12.1%⁴⁴. During recent years, quality assessment has become increasingly important within Belgian hospitals. In 2006, the first multidimensional feedback report including data on clinical performance was provided to hospitals.

Only one year later, €6.8 million was allocated to an initiative to monitor the quality of care in Belgian hospitals. The majority (91%) of hospitals agreed to participate in the new programme and the first hospital accreditation took place in 2008. From then onwards, hospital accreditation was encouraged and steadily increased. Since 2012, 58 Belgian hospitals have committed to obtain accreditation by 2017. The first reports on the quality of hospital care will become public in 2014 and policy measures limiting payment for additional hospital days associated with HAPUs were proposed to be introduced between 2014/15.

At present, pressure ulcer prevalence is assessed in all hospitals as part of a quality audit by the public payer. Unfavourable quality outcomes may lead to mandatory recommendations to improve quality of care. In worst-case scenarios, a hospital can be financially penalised or instructed to stop providing certain specific services.

To date, such penalties and restrictions seem to be rare. Detailed audit results are not public, but some hospitals publish quality of care indicators such as hospital-acquired infection rates, treatment success rates (for example breast cancer survival), hand hygiene, and patient surveys of treatment satisfaction. In the near future, Belgian hospitals will be required to report a larger number of quality-related indicators and these are becoming a main driver for quality improvement.

France

In France, the national prevalence of pressure ulcers in hospital inpatients is estimated to be between 7.8%⁴⁵ and 8.9%⁴⁶ and accounts for an extended hospital stay of 9.8 days³⁶.

In 1999, the first accreditation of hospitals was commissioned by the French National Health Authority (HAS). In 2003, the “Coordination for Measuring Performance and Assuring Quality in Hospitals” (COMPAQ) research project was initiated by the French National Institute for Medical Research, with the support of the French Ministry of Health and the National Evaluation and Accreditation Agency (ANAES). Within the project, a set of 81 quality indicators was recommended. Forty-two out of 81 quality indicators were implemented throughout 2004 and 2005 in a group of 36 hospitals⁴⁷. Since 2006, a number of quality indicators, such as those on hospital-acquired infections and the quality of patient records, have been made public by the Ministry of Health^{48,49,50}.

With regard to pressure ulcers ANAES published a first guide on the evaluation of prevention of pressure ulcers in 1998. Eleven years later, within the Programme de Médicalisation des Systèmes d'Information (the French DRG-Based Information System (PMSI)) there are five indicators allowing for inter-institutional comparisons⁵¹. The identification and assessment of risk factors of pressure ulcers became an optional indicator for inpatient hospital settings, and in 2010 it became a mandatory indicator for outpatient hospital activities (home care)⁵². When developing this indicator, COMPAQ started with a generalised indicator on risk assessment at hospital admission and then developed it into an indicator combining compliance with good pressure ulcer clinical practices and prevention⁵³.

Several interviewees indicated that reimbursement of treatment side effects may be discontinued in the near future; no specific dates for implementation were indicated.

Germany

In Germany, pressure ulcer prevalence rates are under debate. Official data stated by the Institute for Applied Quality Improvement and Research in Health Care (AQUA-Institute) differ by a marked 6.3 percentage points from prevalence rates in studies such as those cited in Lahmann, Dassen & Kottner (2012): According to data from the AQUA-Institute, the German national average prevalence of pressure ulcers was 4.7% in 2012, whereas Lahmann et al. (2012) reported a prevalence of 11% in the same year based on 2007/8 data from a study at Charité Berlin.

In 1988, the Medical Service of the Health Funds (MDK) was established as an advisory body for healthcare insurance companies. In one of its several tasks the MDK focuses on the quality assurance in in- and outpatient care settings as well as LTCs.

The AQUA-Institute was established in the nineties as a service company specialising in quality improvement projects⁵⁴. Several years later, in 2000, the Institute for Quality and Patient Safety (BQS) was founded to coordinate cross-sectorial quality assurance in hospital settings in accordance with Section 137 of the German Social Code, Book Five (SGB V)⁵⁵.

Since 2004, every hospital has been mandated by law to publish a detailed report on its quality assurance and quality outcomes. In 2005, the first quality reports were published and quality was evaluated based on information from 33 indicators in 12 service areas. Since 2007, reports on the quality of about 1,800 hospitals are publically available⁵⁶.

On behalf of the German Federal Joint Committee (G-BA), the AQUA-Institute took over the role of the BQS in late 2009. Both, the G-BA and AQUA agreed to increase the number of quality indicators from 33 to 316 in 25 service areas, of which 182 indicators were to be made publically available.

In 2013, the AQUA-Institute intensified measuring hospital quality even further by increasing the number of indicators to 464 in 30 service areas. Of these, 289 indicators are made public while the others are open or not recommended for publication⁵⁴. Six to eight of the key quality indicators specifically focus on pressure ulcers and they are the only driver for the evaluation of nursing care^{57,58}.

Quality reports are published on an annual basis. Good quality outcomes are important for hospitals' reputation and are used as a marketing tool to attract more patients. Several interviewees stated "the importance of these quality criteria may be reflected in an underreporting of pressure ulcers leading to the low national average in pressure ulcer prevalence". It needs to be clarified whether these statements are individual opinions or rather of systemic character since it also was observed that national prevalence data provided by AQUA are much lower compared to other countries. With the recent election of a new government, there were also rumours of a reform change towards a more quality-oriented G-DRG system in the future. Further, a new institute measuring and controlling the quality in in-and-outpatient settings will be established. There will be financial penalties if insufficient quality is proven⁵⁹.

⁵² HAS. (2013). Fiche descriptive TRE 26.11.13. [online] Retrieved February 2014, from: http://has-sante.fr/portail/upload/docs/application/pdf/2010-12/ipaqss_had_fiche_tre.pdf

⁵³ COMPAQ-HPST. (2014). Expertise. [online] Retrieved February 2014, from: <http://www.compaqhpst.fr/fr/espace-indicateurs/expertise>

⁵⁴ AQUA-Institut (2014). Die Meilensteine der AQUA-Historie. [online] Retrieved February 2014, from: <http://www.aqua-institut.de/de/ueber-aqua/aqua-historie/index.html>

⁵⁵ Pflegeversicherung Heute (n.a.). Private Krankenversicherung Qualitätssicherung und Qualität. [online] Retrieved February 2014, from: <http://www.pflegeversicherung-heute.de/2014/02/21/private-krankenversicherung-qualitaetssicherung-und-qualitaet/>

⁵⁶ G-BA (2014). Themenschwerpunkte. Die gesetzlichen Qualitätsberichte der Krankenhäuser lesen und verstehen. [online] Retrieved January 2014, from: <http://www.g-ba.de/institution/themenschwerpunkte/qualitaetssicherung/qualitaetsbericht/qualitaetsberichte-lesen/>

⁵⁷ AQUA-Institut (2012). DEK – Pflege: Dekubitusprophylaxe. Qualitätsindikatoren. [online] Retrieved January 2014, from: https://www.sgg.de/downloads/Bundesauswertungen/2012/bu_Gesamt_DEK_2012.pdf

⁵⁸ AQUA-Institut (2013). Pflege: Dekubitusprophylaxe. Indikatoren 2012. [online] Retrieved January 2014, from: www.sgg.de/downloads/QIDB/2012/AQUA_DEK_Indikatoren_2012.pdf

⁵⁹ Ärzte Zeitung (2014). Auch Größe macht Tempo beim Qualitätsinstitut. [online] Retrieved February 2014, from:

http://www.aerztezeitung.de/praxis_wirtschaft/qualitaetsmanagement/article/853227/neue-behoerde-groesse-macht-tempo-qualitaetsinstitut.html

United Kingdom

In the UK, pressure ulcers account for an average extra length of stay of 6.5 days⁶⁰ national prevalence among hospital patients of 10.2%⁶¹.

Pressure ulcer prevention has been high on the agenda for several years and can be traced back to the nineteenth century when Henri Brown-Sequard (1853) wrote: "On guinea pigs ... I have found that no ulceration appeared when I took care to prevent any part of their bodies from being in a continued state of compression, and of washing them many times a day to remove the urine and faeces..."⁶².

In 2005, the National Institute for Health and Care Excellence (NICE) provided clinical guidelines on pressure ulcer prevention and treatment⁶³. Four years later in 2009, the Commissioning for Quality and Innovation (CQUIN) payment framework was introduced by the NHS to provide financial and quality incentives for the reduction of pressure ulcers.

The main goal of the CQUIN framework for 2013/14 is securing quality care improvements of hospital services and patient outcomes, while also maintaining strong financial management by making a proportion of income of healthcare providers conditional. The latter is based on providers' achievement of local performance targets⁶⁴.

With the rise of CQUIN targets related to pressure ulcers, clinicians are also developing innovative tools in order to capture the occurrence of pressure ulcers, with the aim of improving clinical awareness and introducing better management of risks related to pressure ulcers.

A prominent example of such tools is the Pressure Ulcer Notification Tool (PUNT) developed in 2011.

PUNT aims to record and report all pressure ulcer incidents in a health care provider, whether already present on admission or hospital-acquired. Consistent with national and international guidance, the use of PUNT leads to reductions in overheads being relevant for monitoring and reporting on pressure ulcers. PUNT has stimulated pressure ulcer management debate throughout the NHS England and introduced research information to the Royal College of Nursing⁶⁵.

In 2012, another incentive, the NHS Safety Thermometer, was introduced as part of the CQUIN reimbursement system. The NHS Safety Thermometer serves as an instrument measuring and analysing adverse events and "harm free" care in patients. It includes the monitoring of pressure ulcers as well as of falls and urinary infections of patients⁶⁶ with a catheter. Over time, this instrument establishes baseline data against which changes in patient care are tracked.

Evidence collected with the Safety Thermometer suggests that pressure ulcer prevalence can be reduced by 50% within one year. Reductions are achieved by "strong leadership, high quality evidence (NICE guidelines), improvement materials ... and through integration of the goal into local change plans"⁶⁷.

When providers meet performance targets and achieve a CQUIN goal, in this case surveying monthly all eligible NHS-funded patients using the NHS Safety Thermometer, they can earn additional payment equal to a proportion of the value of the provider contract⁶⁸. Regular coverage by the popular press and other initiatives such as the “Stop the pressure campaign” and the “Change Day” confirm the national focus on pressure ulcer prevention. Incentives to improve clinical practices by applying financial rewards and performance measurements have become a key mechanism for improving the care activities and outcomes⁶⁹ of pressure ulcer rates. In contrast to the Safety Thermometer, the PUNT can measure both prevalence and incidence. Data are not collected on a pre-specified day, but can rather be recorded and updated on a daily basis if necessary. Hence, provider organisations always have access to the latest patient information⁶³.

One of the emerging issues particularly in the UK is the rise in personal injury claims leading to financial penalties against the health care providers. The rise in such litigation cases has also influenced these developments in the UK. In many cases compensation is claimed from the NHS following clinical negligence. Compensation claims from the provider institutions are made on the basis of pain, suffering and loss of amenity, loss of earnings, medical and nursing care costs, special equipment needed to carry out daily activities and any costs involved in adapting patients’ home, other expenses incurred as a result of injury, for example, travel expenses incurred whilst receiving medical treatment. In the UK, therefore, maintaining quality standards and reducing litigation costs are interrelated drivers of lower pressure ulcer prevalence.

In conclusion, quality incentives relating to pressure ulcers are high on the German and British agendas, with the UK putting greatest focus on reducing pressure ulcer prevalence. There is thus the potential for countries such as Belgium and France to learn from good practices elsewhere, such as root cause analysis and reimbursement (dis)incentives that are linked to improvements in clinical practice.

⁶⁷ NHS England (2013) Commissioning for quality and innovation (CQUIN): 2013/14 guidance. [online] Retrieved February 2014, from: <http://www.england.nhs.uk/wp-content/uploads/2013/02/cquin-guidance.pdf>

⁶⁸ NHS 2012. Delivering the NHS Safety Thermometer CQUIN 2013/14

⁶⁹ Maynard, A. (2013). Contracting For Quality in the NHS. Putting the Francis Report in Perspective. 20th Annual Lecture 2013. Office of Health Economics, Research & Consulting

Overcoming Barriers to Prevention

In light of the trends described, raising awareness among various stakeholders of the potential for improved pressure ulcer management is urgently needed.

A Caution

Tempting as issuing missives to clinicians “do more” may be, the conditions in which pressure ulcers occur are systemic in nature. Each health system has unique, nuanced complexity. As system complexity increases, the ability to spot a single cause and being confident that remedial action will be effective declines sharply. Observations and interventions need to weave into a logical narrative that describes and suggests changes to the practice beyond the incident. Narratives, uniquely tailored to each care setting and between care settings in country need to be crafted knowing that interventions appropriate for the UK will unlikely be totally appropriate for other systems. Pan-European authorities also should resist the desire to require blanket changes that impose greater obligations on clinicians without fully knowing their systemic environments.

The strategies proposed here to overcome barriers to prevention are systemic and broadly applicable.

Making Current Pressure Ulcer Management More Effective

Several existing and planned incentive frameworks have been designed to reduce pressure ulcer prevalence, as described for the four countries in this study. Unfortunately changes in management practice have often been slower than appropriate, for instance in the adoption of early and reliable pressure ulcer detection procedures contributing to the current persistent high burden of pressure ulcer prevalence across many countries including those covered by this study. Prevention and enforcement of new pressure ulcer management practices has not always been vigorously adopted, despite the large benefits to be gained.

Importance of Awareness

Awareness programmes need to be introduced with several clear messages. They should demonstrate that the same pattern of pressure ulcer prevalence still persists across many countries, despite a general understanding of the causes of pressure ulcer development. These high prevalence rates indicate insufficient and/or inefficient management efforts on pressure ulcers. Information should also be provided on

the quality incentives and the financial drivers (such as litigation costs) that should reduce pressure ulcers, but that tackling the problem at source must be at the core of pressure ulcer management.

Many hospital staff members remain unaware even of the pressure ulcer prevalence rates in their hospital or on their own wards, and this lack of knowledge can readily be solved (see for example the PUNT tool’s deployment in the NHS Lincolnshire Trust; previously discussed). Financial stakeholders are similarly ill-informed, often assuming that the financing of pressure ulcer interventions is sufficient and being unaware that the pressure ulcer associated costs of only 9.34% to 25.3% of all hospital inpatients with pressure ulcers are reimbursed. Those currently paying the current costs of care, most of it avoidable, ought to have access to easy to understand, transparent, bluntly communicated calculations of how much they are paying and for what outcomes.

Greater appreciation among policy makers is also needed of the disincentives built into reimbursement systems – specifically that despite the small percentage of patients being reimbursed, it is stage III and IV HAPUs that are financed, providing no encouragement to hospitals to prevent the transition of pressure ulcers to more serious wounds.

Early Detection as a First Step to Prevention

Current standards of care relating to pressure ulcer prevention need a fundamental adjustment if healthcare systems are to ensure patients’ well-being at all times. This is because by the time tissue damage can be seen on the skin surface, it has already occurred at a deeper level. Detecting the underlying skin damage in the soft tissue before the problem becomes visually evident (“sub-clinical” information) is vital and achievable via technology.

With current assessment practices it can be difficult to capture the difference between skin irritations, sub-epidermal tissue damage and other skin-related wounds. In addition, the accuracy of visual skin assessment relies on the educational level and skills of clinical staff; this means that diagnoses can be different between several staff members. As a consequence, inconsistent or insufficient prevention and treatment plans for patients may be introduced⁷⁰.

Patients with dark skin tones are less likely to be detected with a stage I pressure ulcer as the discoloration of the skin surface associated with stage I is less evident than in patients with lighter skin tones. According to Rosen et al. (2006), patients with dark skin tones are more likely to suffer from several stage II to IV pressure ulcers rather than stage I pressure ulcers at the time of diagnosis. Hence, the late detection is particularly acute in patients with dark skin tones, making higher-staged pressure ulcers and skin-colour related health-care disparities more prevalent.

Overall, early detection routines are necessary for all at-risk patients. If tissue damage is detected, mitigation therapies can be started immediately to prevent the progression of pressure ulcers to higher stages. Therefore, current policies and clinical practices across countries have to change to enforce and incentivise early pressure ulcer detection as the first step to effective pressure ulcer prevention.

Further, pressure ulcers are mainly detected hours to days after the initial tissue damage has taken place, making it difficult to comprehend which care setting or ward is responsible for the development of pressure ulcers. Hence, responsible parties cannot be identified or targeted for the right incentives. Early detection routines can help to determine the onset of these pressure ulcers and to put the right incentives for prevention into place.

⁷⁰ WUWHS (2008). *Principles of best practice: Diagnostics and wounds. A consensus document.* London: MEP Ltd

Standardised and Objective Detection

New tools for early diagnosis can contribute positively to the management of pressure ulcers by providing the information needed for decisions about prevention and treatment practices. These diagnostic tools can be used routinely at initial assessment of patients, and are accurate enough to detect a single marker – thus making assessment and diagnosis more reliable. As a consequence, patients' clinical pathways can be adjusted shortening pain and disfigurement of patients as well as their length of inpatient stay⁶⁹.

Specifically, technology has recently become available – Bruin Biometrics' SEM Scanner - to detect sub-epidermal moisture (SEM)⁷¹, or localised tissue oedema associated with the inflammatory phase of wounds. The technology can be used in combination with the assessment standards that are currently in place to produce more reliable and consistent diagnoses. This can help to optimise the diagnosis of pressure ulcers and provides the foundation of a standardised and objective management approach, based on objective indicators.

The new technology (Box 1) can be embedded in daily processes of clinical practice facilitating the early detection of pressure ulcers. Technical skills required for the accurate use of the device are minimal and do not require extensive training. Staff members can use the tool without having to consult a wound care specialist.

The device leads to precise and efficient measurements, making wound detection objective. Patients can directly be screened on admission to hospital to determine whether pressure ulcers were already prevalent, or occurred after admission. Such information can assist a hospital to receive full reimbursement and avoid litigation. In the future, this latter issue will be a relevant incentive across all countries, as it already is for instance in the UK.

Furthermore, the device can be used in patients' follow-up measurements to help avoid the progression of pressure ulcers to more serious wounds. Among patients with darker skin tones this could mean a reduction of initial diagnoses of pressure ulcers at the stage III and IV level, and greater earlier diagnosis and treatment. Overall, additional lengths of stay times could be minimised.

Based on more reliable measurements, there would be scope for more pressure ulcer related indicators for hospital quality, based on incidence and prevalence levels.

Box 1 Clinical Advantages of a New Technology

The SEM Scanner™ – Making Pressure Ulcer Prevention Possible

Hospital patients can appear to have healthy skin, when in reality there is significant damage beneath the skin's surface (BBI's proposed Pressure Ulcer "Stage/Category Zero"). While current diagnostic and risk assessment methods may identify a patient as being free of pressure ulcers, SEM Scanner readings obtained from clinical study patients show patients to have compromised tissue with up to 91% positive and 90% negative predictive accuracy. Clinical staff need to be equipped with new technologies that make possible reliable and consistent detection of pressure ulcers. Devices such as the innovative SEM Scanner can determine patients' tissue condition, allowing detection of pressure ulcers. Early detection impacts practitioners' abilities to make the necessary adjustments to patients' prevention and treatment plans prior to the worst effects of tissue damage taking hold and minor stage pressure ulcers deteriorating to later, severe stages.

Clinical Advantages Include:

- SEM Scanner – the 6th Vital Sign
- Non-invasive
- Hand-held, portable
- Reliable, rapid results
- Objective measurements
- Easy-to-use by all practitioners
- Up to 91% true positive and 90% true negative



⁷¹See the SEM Scanner on www.bruinbiometrics.com and works by Bates-Jensen previously cited

Conclusion:

Towards safer health systems

The legislative pendulum in the UK and US has swung decisively in the direction of "fix it". Payers and Policy Makers in those countries are aligned in their assertion that paying avoidable health costs is wasteful, intolerable and that curing avoidable pressure ulcers is profitable.

Other countries and pan-EU initiatives focused on health quality are following suit, albeit more slowly. Prevention will not happen by accident. For change to occur, prevention has to be a clearly stated health system goal with dedicated, powerful leadership committed to patient safety; this is the power of the legislative pendulum.

The speed the legislative pendulum swings is the choice of policy makers. In the context of large, avoidable human and economic costs of treatment this is a time for resolute choices. These are choices between:

- Issuing demands to front-line caregivers to "do more" with the same or fewer resources and expecting a better outcome, or engaging the entire hierarchy of healthcare practitioners and leaders in the requirement to focus on pressure ulcer prevention;
- Continuing to pay for treatment and not paying for prevention; and,
- Relying on outdated clinical methods or adopting new technologies to assess tissue status.

For this report we interviewed a large number of clinicians and validated our findings with healthcare specialists who focus on preventative methods. All of these individuals were committed to safer patient care and actively seek better care methods. The existence of committed and motivated practitioners should be a relief and an opportunity for policy makers.

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