

Pressure Ulcer Incidence:

The Development and Benefits of 10 Year's-experience with an Electronic Monitoring Tool (PUNT) in a UK Hospital Trust

INTRODUCTION

In settings without any systematic, on-going and validated pressure ulcer registration system, estimating the incidence and prevalence of pressure ulcers will most often be an academic and time consuming exercise leading to imprecise estimations based on subjective data. This is the case in most places, both nationally (within the United Kingdom, UK) and internationally, as the data behind these numbers are generally incomparable across local and national boundaries because the reported data are collected using various criteria in both clinical and academic settings.

The development of an electronic tool like the Pressure Ulcer Notification Tool "PUNT" offers the opportunity to report reliable and comparable data. Although there have been efforts to develop a national Registry of Ulcer development¹, the need for such a tool to be widely available is evident given the need for accurate and easily accessible data locally, nationally, and internationally. These data may illustrate the magnitude of the problem in different settings, supporting the development of targeted prevention strategies and health economic evaluations of available pressure ulcer prevention and management strategies.

BACKGROUND

Pressure ulcers, referred to in the literature as bedsores or decubitus ulcers and commonly referred to as "pressure sores" by patients and their relatives, 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 shear². The resultant 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.

The prevention and management of pressure ulcers represents a serious health problem in both acute and long-term health care settings worldwide. According to the Joint Commission in the United States, "more than 2.5 million patients in United States acute care facilities suffer from pressure ulcers, and 60,000 die from pressure ulcer complications each year." The economic burden associated with pressure ulcers is also profound. Across Europe, the cost estimates for pressure ulcer care range from between £1.4 and £2.1 billion for the (UK)⁴ to €1.0 to €2.3 billion in Germany. For many this expenditure is considered at the very least wasteful, and many feel it could be avoided⁵. Although the economic burden is high and likely to continue to increase as a result of demographic changes and an ageing population, it could be argued that the issue has until recently received unassertive attention from economists, politicians, and clinicians alike⁵.

Pressure ulcer aetiology has been extensively studied, and clinically, relevant research has historically focused on pressure ulcer risk assessment and treatment. Health economic policies have also historically focused on treatment – not prevention. Prevalence rates are commonly cited to suggest the development of relevant and innovative care



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strategies⁶, however, pressure ulcer incident data is likely to be a better indicator of an organisation's performance in pressure ulcer prevention and damage minimisation.

AIM

The aim of this paper is to illustrate the development and the redevelopment of an online Pressure Ulcer Notification Tool (PUNT) used within the United Lincolnshire Hospitals NHS Trust (ULHT) to facilitate 'real-time' recording of any assessed in-patient pressure damage - all categories² (PUNT is also directly linked to the Trusts patient management system, which allows the author to report current prevalence and incidence rates every day if required) - irrespective of whether new or developed elsewhere at the time of the patients admission to secondary care.

A basic online form was originally developed and launched in early 2004, but more recent interest and guidance on pressure ulcer prevention/management within the UK prompted the latest major redevelopment of PUNT in 2011. This redevelopment effort resulted in a more robust tool to record and report all pressure ulcer activity within the United Lincolnshire Hospitals NHS Trust (ULHT) in line with all relevant national and international guidance^{2,9,10,11}. PUNT has been reported to greatly reduce the overhead / staff time required to report and monitor pressure ulcers^{6,8}. PUNT has also led the way in the development of other electronic tools for recording pressure ulcers throughout the NHS¹² and was part of both a body of research information provided by the Royal College of Nursing and a recent major White Paper report released by Deloitte Consulting⁵.

DEVELOPMENT PROCESS AND TOOL DESCRIPTION

PUNT improves the process of patient information management across all four hospital sites (six in 2003) that make up ULHT. The original idea for PUNT was pitched by the author and was developed with the technical assistance of Christopher Bailey, Senior Applications Developer, ULHT Information Communication Technology "ICT" Department. Development was driven by the desire to report accurately (both externally as well as internally) the Trusts pressure ulcer incidence across the Trust as a whole and also within each hospital location across a rural setting. This goal was originally supported by only one other team member; but is now fully supported by seven team members. The Trust, one of the largest acute trusts in the country, primarily serves the 757,000 residents of Lincolnshire, which is one of the fastest growing populations in England.

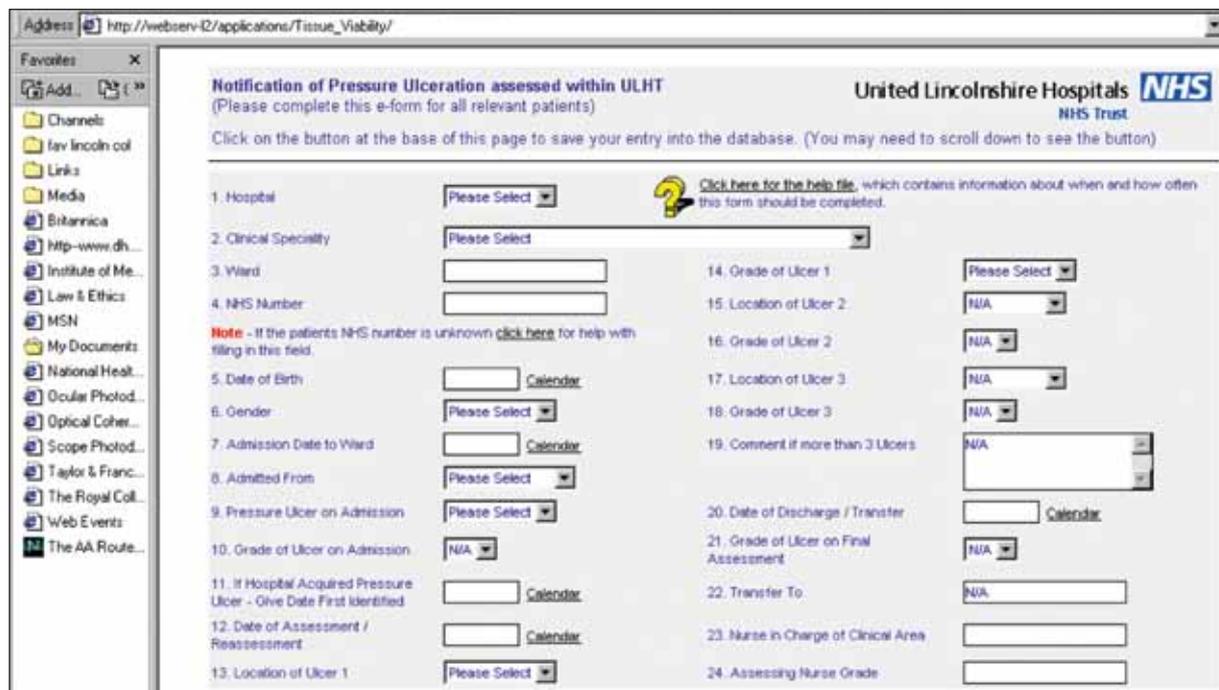
PUNT was developed according to the industry stand-

ard technologies and meets all patient safety related Data Standard Change Notifications, including the use of NHS/Microsoft Common User Interface components. Following a patient's clinical skin assessment, which is performed either on admission or ongoing (at least weekly or as the patients clinical condition changes), the health practitioner working with the patient will record any noted pressure damage using the PUNT system, which can then be accessed at any time via the Trust intranet.

The minimum dataset that is completed for all patients on initial assessment includes: admission date to hospital and ward or clinical area (Adult, Paediatrics, or Maternity), speciality of the clinical setting to which the patient was admitted, and several relevant patient details including NHS number, date of birth, gender, date of admission, prior physical location (home, internal hospital transfer, or transfer from other hospital or nursing home), pressure ulcer present on admission (yes/no), grade/category of ulcer on admission, date ulcer was first assessed, locations and categories of any further ulcers (the most pressure ulcers reported in the system on initial assessment to date has been 24), initial diagnosis, and a free-form text box to input other relevant information such as Suspected Deep Tissue Injury. Additionally, appropriate 'at risk' scores, such as the Waterlow, Glamorgan or Plymouth scores, are included in the tool (the tool will default in the assessment risk score box as the user identifies the clinical area in which the patient is being nursed) and may be updated either weekly or as the patient's clinical condition dictates.

Finally, a number of appropriate care interventions are also included in the tool (all linked to current evidence based guidance) to assist the practitioner in both planning immediate care and to facilitate audit of subsequent care. See (Fig. 1) for an illustration of the PUNT data recording schematic.

Whenever relevant pressure ulcer guidelines are updated, PUNT can be updated at the same time; however, it should be noted that the classification/grading tool currently used by PUNT is consistent with the latest National Institute for Clinical Excellence "NICE" pressure ulcer guidance¹⁴ even though this does differ slightly from the classification tool within the latest EPUAP/NPUAP PU Guidelines¹⁵. Within the United Kingdom, all NHS Trusts are expected to utilize/comply with all current and relevant NICE guidance and compliance rates with this instruction are measured by the Department of Health/NHS England. Only trained personnel can use the system and are mandatorily trained at the start of employment using an e-learning application within ULHT that trains and tests the user and only permits system access when the user has



Figur 1: Screen shot of initial PUNT data recording page.

met the required competency level (pass mark = 100%).

PUNT data can be referenced at any time between planned assessment dates, which should be no more than one week apart, via individual ward dashboards. To aid the user, the system highlights when subsequent assessments are overdue. User feedback confirms that the system is easy to use and subsequent (weekly) ulcer reviews only require a quick record edit.

When any patient record is assessed, appropriate ulcer history (category 3 or 4 damage reported during any previous hospital admission), will appear as an alert to assist practitioners in the identification of potential 'at risk' anatomical areas at the time of the patient's new admission, readmission, or reassessment.

On the rare occasion when a patient's pressure ulcer is the subject of an ongoing complaint or root cause analysis

Table 1: All PUNT reported pressure ulcers (hospital acquired or inherited) across six body sites are listed for years 2004-2015.

All sites	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
All PU	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Heel	21	143	169	261	299	356	367	537	627	631	696
Lower Limb	33	117	112	159	217	307	329	565	504	418	499
Occiput	1	13	10	12	21	27	16	15	1	9	2
Sacrum	156	698	817	1013	1257	1781	1927	2069	2099	2267	2401
Trunk	3	20	31	42	39	72	63	56	36	26	26
Upper Limb	4	27	36	29	40	87	63	116	94	95	120
Total	218	1018	1175	1516	1873	2630	2765	3358	3361	3446	3744
Hospital acquired PU	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Heel	5	43	59	95	99	168	146	181	156	126	135
Lower Limb	7	13	14	24	35	70	56	107	74	72	78
Occiput	0	4	5	8	11	18	8	10	0	3	1
Sacrum	30	139	202	314	404	535	556	608	470	453	366
Trunk	2	6	9	21	14	34	22	23	4	6	2
Upper Limb	0	7	13	12	12	28	33	28	32	22	28
Total	44	212	302	474	575	853	821	957	736	682	610

investigation (RCA), the patient's complete pressure ulcer record can be retrieved via the ICT Department during normal working hours and reviewed for all relevant demographic and specific pressure ulcer details to assist with complaint or RCA investigation resolution.

RESULTS

The current Trust pressure ulcer incidence (all categories) equals 0.5% hospital acquired (HA) ulceration – down from a peak of 6% since PUNT was introduced in 2004, although initially, pressure ulcer incidence increased as a result of improved ulcer monitoring and reporting. Specifically, peaks were noted as additional Tissue Viability (TV) staff were recruited to support the use of the tool internally on various hospital sites. Professional compliance with PUNT has risen from around 50% to over 95% (internal safety and quality monitoring data) since the launch of the redeveloped tool in April 2011.

Furthermore, a review of PUNT data at this time highlighted that the Trust had a Heel Pressure Ulcer incidence rate of around 25%. Therefore in late 2011, a 'pilot' Standard Operating Procedure (SOP) was introduced within an Orthopaedic ward in one of the Trust Hospitals that included the use of an alternating pressure mattress (e.g., Nimbus 3) and prophylactic heel protection pads and devices for all patients with a fractured neck of femur. These therapeutic measures were used from the time of admission until the patient was actively mobile and resulted in a decreased incidence of hospital acquired heel pressure ulcers. Due to the success of this pilot SOP - the incidence within this one clinical setting reduced from 25% to NIL within the first six months - the use of prophylactic heel protection in conjunction with all specialist patient support surfaces, e.g., alternating pressure mattresses, has been promoted actively Trust-wide since 2012, with positive outcomes clearly evidenced pan-trust (Table1). Notably, the number of reported hospital acquired heel pressure ulcers has decreased by over 30% since 2011.

Patient quality of care has been demonstrably improved since the implementation of PUNT. Specifically:

- The updated PUNT process has already been demonstrated to improve skin assessment and the patient's relevant personal care needs.
- The tool includes data about where patients were admitted from – home, nursing home, internal trust transfer or other hospital - which is instrumental in informing the local Care Commissioning Groups and other community care settings of potential 'hot spots' or areas for further support.
- Previous significant ulcers (category 3 and 4) are always highlighted when a patient record is retrieved.

- PUNT is fully audited so all user actions can be identified to an individual. This enhances the accountability of an individual for the benefit of their patients.
- PUNT is linked to the Trusts patient administration system – initially TotalCare PAS but now Medway - for positive identification of patients and patient demographics, which minimises the risk of incorrect entries and therefore inappropriate care planning for any hospitalized patient with a pressure ulcer.
- All data is validated by a member of the ULHT TV team to avoid invalid data input and reporting.
- To ensure assurance for any requested or required data reports (both internal and external), data in the PUNT system can only be altered by an identified individual within the ULHT ICT Team (Chris Bailey or David Black) with the express permission of the Nurse Consultant - Tissue Viability and with a full e-mail trail clearly identifying the rationale for the change.
- PUNT improves the legibility of information transferred between clinicians.
- PUNT improves the reliability of data required by and reported to external agencies.

FURTHER PLANNED DEVELOPMENTS

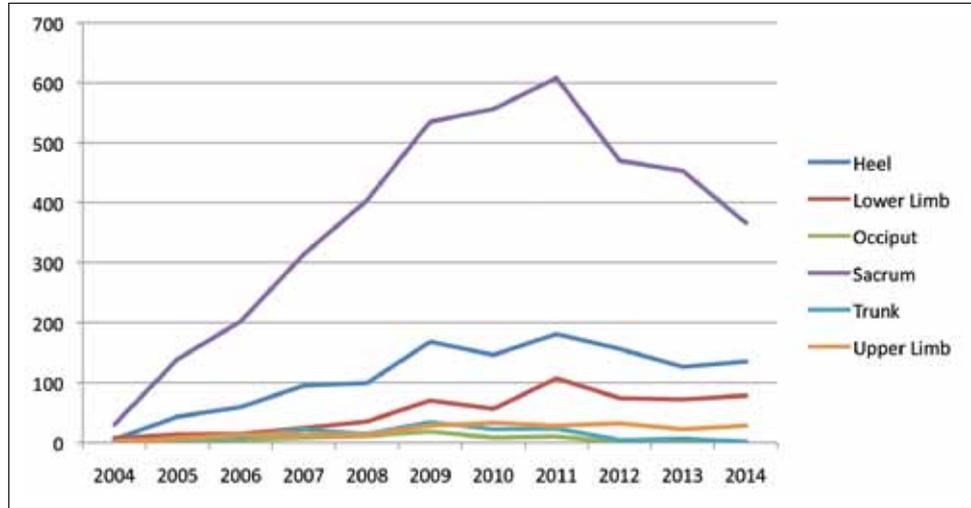
A further functionality of the PUNT system is currently being developed and tested by David Black, a ULHT ICT Applications Developer who is primarily responsible for the day to day smooth running of the system. The new PUNT functionality will allow clinical photographs of pressure ulcers recorded within PUNT to be taken both on admission and discharge and then uploaded into PUNT for review in conjunction with the concordant individual pressure ulcer record (all pressure ulcers recorded have a unique identifier clearly visible in all relevant viewing fields).

NATIONAL PERSPECTIVES

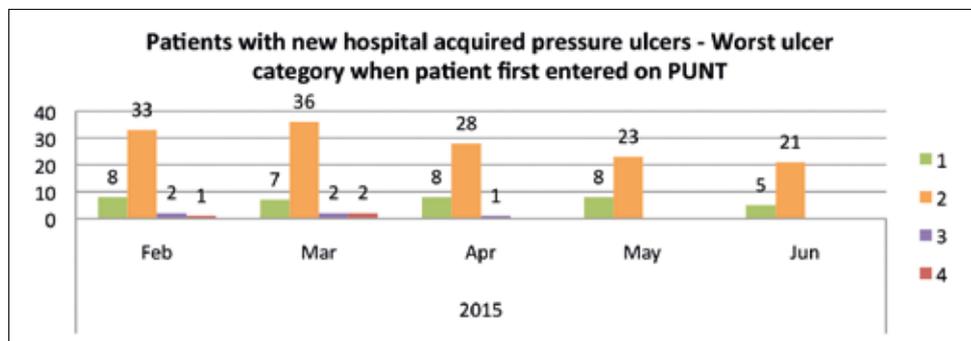
In spring 2012, the Stop the Pressure campaign¹⁰, a national drive to reduce the incidence of all preventable pressure ulcers kicked off in the UK. The campaign was an effort by department of health to ensure all hospitals report pressure ulcer data in a consistent and comparable way. The tool Safety Thermometer was chosen to record and report this data; however, because the tool only facilitates once monthly data collection, only prevalence data is collected. Because incidence data is likely to be a better indicator than prevalence data of an organisation's performance in pressure ulcer prevention and damage minimisation, the collection of this data is integral to the evaluation of pressure ulcer treatment and prevention strategies. In the UK, incidence data is generally collected in paper format, representing a very labour intensive task, particularly as the data are collated retrospectively and are usually circulated

only after the patient has been discharged. In this author's experience, using a paper based system can result in a time lag of between 6 and 12 weeks between the creation of a pressure ulcer record by a health care professional and the official report of said ulcer. This is due to the use of a paper "register," which is collected either weekly or monthly, followed by manual input of the data from the paper register into a relevant database, at which point a report can finally be generated¹². PUNT can make the collection of incidence data much simpler than this because it facilitates the reporting of both prevalence and incidence data at any time, including in 'real time,' since this data is updated immediately after assessment. Therefore, the latest information is always available to all ward based clinical staff, the TV team, the Risk Management team, and other designated senior individuals within the organisation. PUNT also allows frequent reports, including Weekly, Monthly, Quarterly, Annual Directorate, and Trust Board reports, to be generated for review and discussion (Graph 1-4).

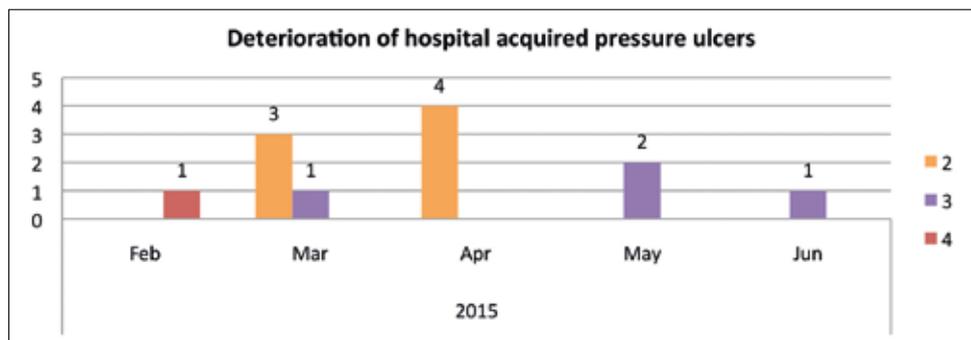
PUNT could potentially be used by any hospital and in any healthcare setting, and a number of healthcare organisations have already shown interest in the system when PUNT data has been presented at various conferences, both nationally and internationally^{7,8}, including the Healthcare Events "Avoiding Preventable Pressure Ulcers" annual meet-



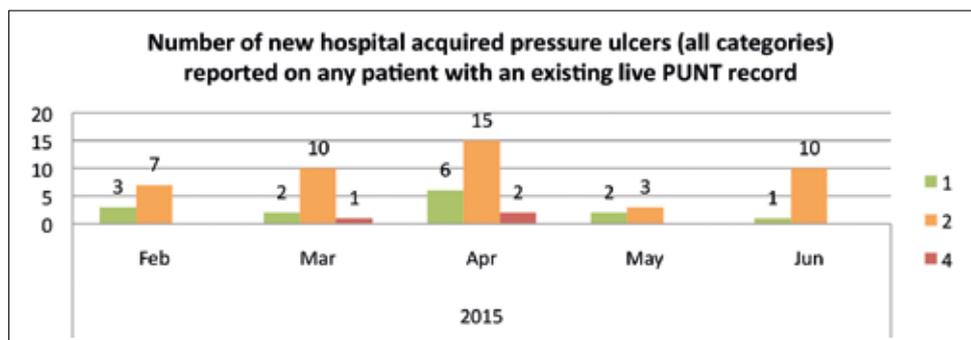
Graph 1. Hospital acquired PUNT monitoring data for each recorded anatomical site from 2004 to 2014. Further examples of ULHT PUNT report graphs generated for the ULHT Trust Board (as titled)



Graph 2. Highlights the number of new patients reported via PUNT (first assessment) with Hospital Acquired Pressure Ulcers per month.



Graph 3. Highlights the number of ulcers reported via PUNT that have deteriorated (worst category only) within the month.



Graph 4. Highlights the number of additional pressure ulcers that have developed (all categories) in the month on any patient already reported via PUNT.

ing. Furthermore, an international company recently approached ULHT to discuss the possibility of developing PUNT further for wider national use across the NHS and possibly implementing PUNT as an “add-on value product” to support their own commercial activities.

IN SUMMARY

Since the launch of PUNT in 2004, clinical staff across the Trust have not only been able to both review and report reliable pressure ulcer data, both internally and externally, but have also been able to make and demonstrate improvements in patient care. Most importantly, improved patient outcomes, such as the reduction in the incidence of pressure ulcer development, have been reported. The author would recommend the use of this tool to all when

commercially available or the development of a tool whilst PUNT is not commercially available to record data as accurately as possible (note: any electronic tool can only be as accurate as the input data) and report pressure ulcer incidence, whether in the primary or secondary care setting. ■

Remember: *The accurate monitoring of performance improvement is impossible unless you have a robust and reliable monitoring system in place first!*

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