

06

Discussion

Discussion

The PUPPS 2 report presents data obtained from health services involved in the second state-wide pressure ulcer prevalence survey. The changes between PUPPS 1 and PUPPS 2 are highlighted along with practical strategies to assist health services prevent pressure ulcers.

Overall, the PUPPS 2 data shows improvement in pressure ulcer prevention and management evidenced by a significant reduction in pressure ulcer prevalence, and positive changes related to a take up of or action on most of the key recommendations from PUPPS 1. Examination of the results of PUPPS 2, at both a state and individual health service level, may be useful for health services to measure the impact of their implementation of key recommendations from PUPPS 1. Clinicians and managers may also use this information to assist them to effectively target resources for pressure ulcer prevention and management in a way that is relevant to their health service. Sustained decreases in pressure ulcer prevalence are possible through the implementation of comprehensive programs that incorporate multiple strategies such as: pressure ulcer risk assessment tools, evidence based clinical guidelines, a multi or interdisciplinary approach, care delivery systems that integrate pressure ulcer policy and education or information sharing for patients, carers and staff in the prevention and treatment of pressure ulcers⁵¹.

Organisational environment & improvement

Contextual data was collected to quantify health services progress in implementing the PUPPS 1 recommendations. Health services responded to questions on their organisation's pressure ulcer prevention and management policies, allocation of staff and equipment resources, use of risk assessment tools, patient information and education for patients and staff. Despite the subjective nature of these responses it is valuable to discuss these data in more detail as it describes and qualifies the environmental and organisational context in which the quantitative data were collected.

PUPPS 2 further demonstrated that there are diverse practices in pressure ulcer prevention and management. The contextual data indicates improvements across the state that could also be translated as an intention to change as most health services that participated in PUPPS 2 were demonstrating a degree of progress on implementing the recommendations from PUPPS 1. All contextual factors showed progress except the

allocation of qualified wound management staff time. However, improvement in the organisational environment has not necessarily translated directly to lower pressure ulcer prevalence. There were no strong statistical associations identified between contextual data responses on pressure ulcer prevention strategies and pressure ulcer prevalence. There was, however, a trend towards a positive association between the use of pressure reduction mattress replacement programs, and the existence of pressure ulcer prevention and management policies with lower pressure ulcer prevalence.

The lack of statistical association between the contextual factors and pressure ulcer prevalence was not unexpected. Achieving sustained change in organisations takes time. For most health services 12 months is a relatively short time in which to have planned, implemented and achieved significant practice changes and improvements in clinical outcomes, particularly if there were no prior programs or strategies in place. Whilst contextual changes reported between PUPPS 1 and PUPPS 2 were considerable several factors make the link to pressure ulcer prevalence complex. An additional 39 health services participated in PUPPS 2, with the majority of those having less than 50 beds and generally lower casemix acuity, i.e. patients at less risk of developing a pressure ulcer. The use of units of analysis at an individual health service level also add complexity to the analysis of prevalence data which is primarily used to inform planning on a broad scale. Specific or targeted planning at a health service level is more appropriately informed with incidence data. The complexities of providing care in health services with a wide acuity of casemix and throughput also makes it difficult to 'attribute causation to a particular policy or action because it cannot be isolated from all the other reform drivers within the health system'⁵². This tends to undermine the ability to draw strong statistical conclusions from the 84 health service units which range in bed size from 4 to 1,000. Expectations that the PUPPS CG

group (which represents the 48 health services who participated in both PUPPS 1 & PUPPS 2) may have performed better in this area than the state as a whole were not realised. This finding may have been influenced by a number of factors such as the state-wide distribution of the PUPPS 1 report; the inclusion of some of the recommendations in the DHS Policy and Funding Guidelines; the continuing high profile of pressure ulcers through the DHS Mattress Replacement Program, and the existence of pre-PUPPS pressure ulcer prevention programs in many health services who did not participate in PUPPS 1.

Additional assessment or review of the degree to which key recommendations from PUPPS 1 may have been implemented by health services was beyond the scope of this audit. However, impressions gained from qualitative contextual data suggest barriers to implementation are more related to underdeveloped organisational change management skills, competing clinical priorities and management of limited resources rather than any ineffective or inappropriate recommendation or an unwillingness by organisations to commit to improvement. Many health services have reportedly made the recommended changes to their policies but this unfortunately has not yet translated to organisational wide changes in practice or sizeable decreases in prevalence. Several respondents commented that while certain key recommendations had been incorporated into health service policy, the existence of the policy alone did not make the implementation occur. A variety of reasons were identified as barriers to change such as lack of communication, executive support, time, resources, equipment and staff resistance to change. This is not a problem unique to Victorian health services. O'Dea commenting on pressure ulcer prevalence in the UK noted 'the most striking finding on examining all the information from these surveys is the lack of a systematic approach to pressure damage prevention and treatment, even where lengthy protocols have been produced'⁴⁷.

In PUPPS 2 there were many examples of single health services, hospitals or units effecting change with a focused, clinical leader driving implementation strategies resourced with the support of executive and direct care clinical staff. One metropolitan multi-campus health service that used a targeted 2-year project to implement sustained change in pressure ulcer prevention strategies realised a decrease in pressure ulcer prevalence of more than 50% from 33% to 12.8%.

Critical elements for successful change in this area are the use of pressure ulcer risk assessment tools linked to prevention and management plans, education of patients and staff and regular reporting^{7,51,53}.

The effectiveness of similar strategies internationally are well documented and has been seen to reduce pressure ulcer prevalence by up to 30%^{54,55}. It is also well recognised that long term improvements are incremental and require 'extraordinary effort and dedication', particularly from local champions and clinical leaders^{51,56}. Staff are more likely to embrace and value reforms if they are supported by executive management, they demonstrate quick wins towards a well articulated vision, and they lead to demonstrable improvements in patient outcomes⁵².

Leadership is also required on a state level for pressure ulcer prevention strategies to be successful. Mainstreaming of the key elements of the PUPPS projects, lessons learned and subsequent recommendations requires an ongoing commitment from government. This commitment could take the form of facilitation of ongoing prevalence surveys, coordinated surveillance methods and reporting mechanisms from health services, funding for wound management staff and equipment resources in health services, and support for education and research.

Prevalence

The prevalence of pressure ulcers identified in PUPPS 2 was 20.8%, a statistically significant improvement from that of PUPPS 1. This change of 5.7 from the PUPPS 1 26.5% is an overall improvement of 21.5%. For the PUPPS CG group, the overall prevalence was 22.7%, a decrease of 3.8 which equates to an improvement of 14.3% from PUPPS 1. Discussion comparing changes in results between PUPPS 1 and PUPPS CG, and to a lesser extent PUPPS 1 and PUPPS 2, can be made with a degree of confidence given the use of a consistent, validated methodology for data collection and small differences in population demographic and clinical variables.

Across the DHS comparative groups, the results reflect an overall trend towards improvement with decreased ulcer prevalence in 5 of the 7 comparative groups (Tables 3b & 3bCG). Overall, 2,559 pressure ulcers were found on 1,381 patients, which equates to 1 in 5 Victorians still experiencing at least 1 pressure ulcer during their acute or subacute admission. This result is an improvement over the previous survey (which identified 1 in 4 Victorians with a pressure ulcer), but does not yet reflect a 'zero tolerance' proposal as was recommended in PUPPS 1. This improvement may be attributed to a number of influences linked to the learning experiences of PUPPS 1: the raised profile of pressure ulcer prevention and management in Victoria through PUPPS; and the Mattress Replacement Program; the inclusion of several PUPPS recommendations in the Victorian - Public Hospital and Mental Health Services Policy and Funding Guidelines 2004-2005⁵⁷, and the training of several hundred clinical staff as surveyors who are now empowered with increased knowledge and skills relating to pressure ulcer prevention and management.

Although zero tolerance on pressure ulcers is advised, there will be situations where even faithful adherence to the principles of preventative care will not prevent the development of pressure ulcers in some patients due to the health status of the patient⁵⁸. The knowledge, methods and time required to reduce the risk in all

patients may not be available⁵⁸. This presents a dilemma: do we identify and accept a certain, low level of pressure ulcer prevalence as the realistic target of caring for patients, or will such an arbitrary value be used to excuse pressure ulcer prevalence rates?

Prentice's national pressure ulcer study in 2000 found that pressure ulcer prevalence decreased from 26.5% to 22.0% after the introduction of pressure ulcer prevention and management guidelines, but that this reduction was smaller than expected and pressure ulcer prevalence remained high¹⁴. The improvement in pressure ulcer prevalence from PUPPS 1 to PUPPS 2 is an improvement which re-positions Victoria closer to this national data and to a lesser extent results from comparable international studies which range from 14.8% to 18.1%^{4,11,15,16}.

Health services in the USA, UK and Europe have spent a great deal of energy and resources over many years in lowering the prevalence and incidence of pressure ulcers in their respective regions. This suggests that whilst lowering incidence and prevalence rates is not impossible, it does require sustained effort⁵⁹. It is important that Victorian health services take the opportunity to learn from the experiences and successes of our international counterparts in how they have achieved these reductions. There should be recognition of the incremental nature of improvement by clinicians and managers so that expectations of change are reasonable and achievable. Incremental improvement can be more sustainable as it is often a reflection of changes in organisational philosophy and practice rather than a single high-energy program of change that implements broad, quick changes the effect of which are negated over time⁶⁰.

The improvement in results for PUPPS 2 and PUPPS CG may be considered as paralleling other published serial prevalence data^{10,13,14,61}. The effect of serial prevalence studies done in Tasmania and Western Australia have shown decreases in prevalence and plateauing of prevalence at 12% to 14%^{10,62}. This is a national benchmark we should all be aiming for and adds weight to the argument for zero tolerance.

A European study found that pressure ulcer prevalence decreased incrementally when tracked over 5 years⁶¹ and that the feedback provided to health services assisted in facilitating this reduction. Although feedback from point prevalence surveys is a valuable and effective tool to assist health care professionals to focus on the issue, there has been no clear definition of what is the best form for this feedback to take⁶¹. Further investigation of this particular aspect would be valuable for future state-wide strategies.

Length of stay

The impact of developing a pressure ulcer on both patients and the organisation is evident in the analysis of length of stay (LOS). In PUPPS 2 patients who had a pressure ulcer (hospital acquired or present on admission) stayed longer than those without an ulcer. The more severe the ulcer, the longer the patient had stayed.

While it is unclear if patients stay longer because they have a pressure ulcer or have a pressure ulcer because they stay longer, the implications of these results are clear. Pressure ulcers lead to preventable increased hospital LOS over and above the usual LOS associated with patients diagnostic groupings. In PUPPS 2 patients with pressure ulcers had a 45% longer time from admission to survey day than patients without ulcers. Modelling of the Victorian Admitted Episodes Dataset (VAED) data indicated that patients with pressure ulcers had a 50% longer LOS than patients without ulcers, accounting for 44,406 beddays per annum. Although factors other than pressure ulcers may play a role in this extended LOS, the risk-adjusted cost of these additional beddays is \$19 million per annum. State-wide the additional LOS associated with pressure ulcers represents not only preventable additional costs for health services and patients, additional time and stress for the patients, families and carers, it also represents missed opportunities for admission and treatment of other patients.

Hospital acquired pressure ulcers

There has been little change in the proportion of hospital acquired pressure ulcers between PUPPS 1 & PUPPS 2, with approximately two thirds of all pressure ulcers identified being acquired during their current admission (66.2%). This result reiterates the iatrogenic nature of pressure ulcers and follows the trend of national and international data^{14,47}. Of the 455 patients who had a pressure ulcer on admission, 98 (21.5%) developed an additional 169 pressure ulcers during their admission. Patients who had a pressure ulcer on admission had greater numbers of Stage 3 and Stage 4 pressure ulcers. The development of additional pressure ulcers on patients with co-existing pressure ulcers on admission has not been extensively examined in the literature. One study reported that of the four people admitted with a pressure ulcer (out of 275 patients), two developed further pressure ulcers⁶³. Another reported that of the 20% of patients admitted with a pressure ulcer, 55% went on to develop further pressure ulcers during their admission⁶⁴. This data puts the findings of PUPPS 2 in a positive light in that the prevalence rate for patients admitted with pressure ulcers was less than half that of international studies.

It has been suggested that that "the development of pressure ulcers in a patient should always be viewed as an adverse outcome of treatment"⁶. It is well documented in the literature that a comprehensive program of risk assessment, risk management, increased staff knowledge and incidence reporting in a no blame environment can effect a reduction in pressure ulcer prevalence^{3,65}. The presence of an organisation wide strategy for reducing hospital acquired pressure ulcers is reported by 81.7% of health services, and 92.4% reported the use of a risk assessment tool on admission. The fact that only 52.8% of patients assessed had a risk assessment undertaken and only 45.0% of patients with a pressure ulcer had any documentation regarding the management of their pressure ulcer in the previous 5 days suggests that these intentions do not always lead to actual change. As previously noted, hospital acquired pressure ulcers are increasingly associated with litigious action^{6,38-40}.

Severity and distribution of pressure ulcers

The results for PUPPS 2 reflect a trend similar to PUPPS 1 for severity and anatomical distribution of pressure ulcers. There was a slight increase in the proportion of sacral pressure ulcers, making these the most frequent site for pressure ulcer formation (21.2%), closely followed by the heel (21.0%). Notably, 48.8% of pressure ulcers occurred below the knee. Anti-embolic stockings, or normal socks that often cover lower limbs make incidental observation of the lower limb and heel difficult. When combined with a medical condition that places a patient at risk for developing a pressure ulcer, there is a strong potential for pressure ulcers to develop undetected. If the energy of pressure ulcer prevention programs was directed solely at reducing the pressure prevalence at these 2 sites by 50%, the overall number of pressure ulcers could drop by 20% (or could reduce the overall state-wide prevalence to 16.6%). Considering that a concentrated effort in 2 anatomical locations would raise the awareness of the issue overall, and monitoring of adjacent high frequency sites would be incidental, this reduction would be a conservative estimate.

As previously discussed, the involvement of allied health staff such as podiatrists and occupational therapists, who by the nature of their work often examine the lower limb, can add to the potential benefit of this proposal. Allied health staff also work mainly one on one with the patient, creating more opportunity for the patient to communicate any areas of concern. The involvement of allied health clinicians could be as simple as asking every patient they see if they have any sore bony areas. Repeated raising of the issue increases awareness and places pressure ulcer prevention high on the agenda for the clinician and the patient.

PUPPS 2 found a slight increase in the number of pressure ulcers on the elbow, possibly the result of altered lifting techniques and the increased emphasis on patients assisting with their own repositioning. Some health services have used the 'back safe prevention strategy' to remind staff that if they identify

a patient that can independently reposition they need to be encouraged do so on a regular basis.

Although there was a lower state-wide prevalence for PUPPS 2, there seems to have been an increase in the severity of pressure ulcers found, i.e. more Stage 3 and 4 ulcers. There was also an increase in the proportion of Stage 2 pressure ulcers. Whilst Stage 2 pressure ulcers are often not considered 'severe' by clinicians, the impact of the healing process on the patient and their family can be considerable. For one patient, a Stage 2 heel pressure ulcer took 18 months to resolve and involved multiple visits to an outpatient department for extensive and expensive wound management, as well as requiring additional wound care by his wife at home²⁵. The direct wound care costs alone totalled over \$20,000. Overall 71% of patients surveyed had a Stage 2 or above as their highest stage of pressure ulcer. The implementation of guidelines, education, regular reporting and the use of a risk assessment tool can have the effect of not only changing the total number of ulcers found, but the severity as well. This has not been reflected in the Victorian data.

Paediatric prevalence

Pressure ulcer prevalence in patients under the age of 18 years was 1.4% (n = 20) and reflected the lower prevalence of pressure ulcers for this group reported in the international literature^{49,50}. This result is still of concern, as for every 4 – 7 year age group under 17 years there was at least one patient with a pressure ulcer. Paediatric and neonatal patients have a variety of risk factors which increase their risk of developing pressure ulcers, some in common with the adult population and some unique to their age. Most differences are usually explained by the diverse nature of illness or variations in body size and shape. It has been reported in the international literature that paediatric patients are more likely to develop pressure ulcers in the sacral area, but neonatal patients tend to have pressure ulcers occur in the occipital region due to a proportionally larger head to body ratio than paediatric or adult patients^{50,66}. The anatomical

distribution seen in the PUPPS 2 paediatric and neonatal patients identified 9.4% of pressure ulcers were on the occiput and no ulcers were identified in the sacral area. The head region accounted for 34.4% and the lower limb accounted for 56.3% of pressure ulcers in this group.

Clinical and demographic variables

Patients surveyed in PUPPS 2 were more likely to develop a pressure ulcer if they were male, an emergency admission, had a lighter skin colour, diabetes, renal failure or an acquired brain injury and were unable to independently reposition themselves. This follows the trend of PUPPS 1 with the exception of gender. However, this change was limited and little clinical value can be placed on the change. Over 80% of people with pressure ulcers were greater than 60 years of age, reflecting the findings of the international literature^{46,47}. As for PUPPS 1, aside from immobility, none of the clinical and demographic variables were significantly associated with risk for developing a pressure ulcer. This may reflect the interrelated nature of these variables and the complex environment of patients with multiple co-morbidities. The value of collecting this data as a predictor of pressure ulcer development in future prevalence surveys should be questioned.

Risk factors

Immobility remains strongly associated with risk of pressure ulcer development. This reinforces the 'Move, Move, Move' message of VQC's patient education brochures and the importance of frequent position changes^{17,18}. To decrease the risk associated with immobility a comprehensive prevention plan that includes regular skin assessment, hygiene/skin care, a turning or re-positioning regimen, adequate nutrition and maximising opportunities to mobilise combined with pressure reducing support services is required^{2,19}. Staff awareness of the relationship between immobility and pressure ulcer development must also be improved. Patients may be able to independently reposition themselves but be confined to strict bed rest, or have diabetes related peripheral neuropathy

where they do not feel pain in their feet and therefore are not aware of the need to reposition. Patients moved from a lying position to sitting in a chair are still at risk of pressure ulcers, albeit in different anatomical locations, if they are left for long periods of time with no pressure relief. Again implementation of individual prevention plans should be coupled with clinical judgement and frequent review.

Comparisons across medical specialities

Across the medical specialities little change was noted from PUPPS 1 to PUPPS 2 apart from the Critical Care group, which incorporated Intensive Care, Neonatal Intensive Care, High Dependency and Critical Care Units. The prevalence of this group reduced by 50.1% from 47.7% in PUPPS 1 (the highest medical speciality prevalence identified in the first survey) to 23.5% for PUPPS 2.

Intensive Care Units in major metropolitan hospitals, which formed approximately 50% of the critical care group, were involved in a DHS Breakthrough Collaborative approximately 18 months ago which aimed to reduce hospital acquired pressure ulcers. This project served to raise the profile of the pressure ulcer issue, produced data for trending and benchmarking, and improved local education, communication and prevention planning with a subsequent reduction in pressure ulcer prevalence and incidence. Discussions with staff involved in these areas noted that the issue waned following the collaborative and the PUPPS 1 project, which occurred a short time after the collaborative served to reenergise these units. This reenergising appears to be built on a foundation of a good pressure ulcer preventative planning program, including management support, clinical leaders, education, communication, data collection and feedback of data. These units have the advantage of having, in most instances, a small establishment of staff who have a strong focus on research and data collection for clinical outcomes that may have assisted with their communication and education.

The specialties of medicine, surgery and rehabilitation accounted for 87.0% of all patients surveyed and for 86.8% of patients with ulcers. Although these specialties demonstrated a decrease in prevalence between PUPPS 1 and PUPPS 2 this finding has implications for where resources are best allocated to reduce prevalence. Even though spinal and palliative care units had higher prevalence within their specialties they accounted for only a small proportion of all patients with ulcers. These specialties are well recognised as having patients with higher levels of risk and often have sound strategies in place to minimise this risk.

Although the overall prevalence for the medical group has decreased, it constitutes the largest proportion of all patients with pressure ulcers. This group consists of a large number of diverse specialties, perhaps making any risk management plan difficult to implement across the entire group considering the matrix of patients and staff across many discrete wards and units. Many of the patients admitted under the group designated 'general medicine' are elderly with complex co-morbidities. This group inherently has many of the previously identified risk factors for developing a pressure ulcer, such as an inability to independently reposition, incontinence and poor nutrition which are often exacerbated by underlying aetiologies that precipitated the patient's admission in the first instance.

Patients in the Emergency Medicine group were found to have a pressure ulcer prevalence of 24.7%, an 11.5% increase from PUPPS 1 at 13.2%. These data were derived from a small group of patients and should not be seen as representative of all patients cared for in Emergency Departments. The criteria for inclusion in PUPPS 2 was that the patient had been admitted or flagged for admission which generally only accounts for a small proportion of patients in the Emergency Department. The collection of incidence data on all patients in Emergency Departments would provide a more accurate assessment of the rate of pressure ulcers in this area. It is important to note emergency patients flagged for admission may spend

extended periods of time lying immobile on trolleys waiting for review by medical and other staff or waiting for a range of tests to be done. Trolley mattresses are usually much thinner and of poorer quality than most standard hospital mattresses. High quality pressure reduction foam trolley mattresses have been included as a product option in the DHS Mattress Replacement Program funding. Secondly in Emergency Departments the focus is on managing the presenting diagnosis and other concerns, including pressure ulcer prevention are ranked less important.

There were no obstetric patients identified with pressure ulcers in PUPPS 2 as opposed to 2 patients with ulcer in PUPPS 1. Although predisposing risk factors for this group are cited in the literature they are considered to be at very low risk^{67,68}.

Risk assessment

Over 90% of health services that participated in PUPPS 2 reportedly require patients to be risk assessed for pressure ulcers on admission (Table 16), with many requiring this assessment to be repeated on at least a weekly basis or when the patients condition changed. However, only 52.8% of patients surveyed were identified as having had a risk assessment undertaken on admission. Although this finding equates to an improvement of 11.9% from PUPPS 1 40.9%, it pinpoints a significant gap between organisational policy and actual clinical practice.

Undertaking a risk assessment without putting an action plan in place is counterproductive. Over 70% of the health services that participated in PUPPS 2 stated that they use a risk assessment tool linked to interventions based on level of risk (Table 16). This policy is not reflected in the practice observed in PUPPS 2 where only 65% of patients assessed as medium risk or above have a pressure reducing device insitu. The use of pressure reducing devices forms only a part of any preventative plan, but in patients identified at high risk some form of pressure reducing equipment should be employed².

Data collected during PUPPS 2 included the presence or absence of a pressure reducing/relieving devices, but not whether the device was appropriate to the patient and their level of risk. And although PUPPS 2 did not collect data on whether other risk minimisation strategies had been implemented, such as 2 hourly repositioning, this result contributes to the overall impression of gaps between policy and practice.

Assessment and accurate documentation of a patient's skin integrity prior to, or on admission to, a health service, during the period of hospitalisation, and prior to any inter-health service transfer, is essential for both continuity of care and improved service delivery.

Too often, risk assessment is seen as one more administrative task that takes clinician time away from direct patient care. Clinicians need to be supported in developing the necessary knowledge and skills and be given time to appropriately assess their patients and implement a targeted individual prevention and management plan. Pressure ulcer risk assessment on admission is an ideal opportunity to pro-actively implement prevention strategies rather than reactively managing a pressure ulcer once it has developed. Repeated risk assessments are crucial in those patients deemed not 'at risk' but whose health status may have changed due to intrinsic or extrinsic factors such as an operative or diagnostic procedure. When pressure ulcers develop in patients who fit this clinical picture it is more indicative of the quality of care provided and of how well evidence based principles of practice are implemented. This supports the argument that pressure ulcers should be universally recognised as a clinical indicator for patient safety^{41,69}.

There is international consensus around the value of undertaking a risk assessment. It is widely accepted that early detection and appropriate intervention to relieve pressure from 'at risk' tissue will lead to restoration of the blood supply and tissue recovery. The reverse is also true, as unrelieved pressure or repetitive reperfusion injury will lead to progressive destruction of skin and underlying tissue^{37,70}.



Pressure ulcer prevention is presumed to commence with risk assessment that identifies those patients at risk of developing a pressure ulcer and informs preventative planning^{37,71}. It is also assumed that by undertaking a risk assessment, the risk for developing a pressure ulcer for the person who has been assessed as 'at risk' reduces due to the implementation of preventative measures³⁷. These assumptions are sound where action (preventative measures) is taken. Data from PUPPS 2 suggests that preventative action based on risk assessment is performed inconsistently in many Victorian health services.

A greater understanding by health service staff of the aetiology of pressure ulcers, combined with thorough risk assessment processes are integral to early detection, prevention, or subsequent treatment of pressure induced tissue injury. Consistent commitment to implementing this approach is required by organisations and all staff if sustained improvements in the rate of hospital acquired pressure ulcers are to be achieved.

Pressure relieving/reducing equipment

The use of pressure relieving/reducing devices remains inconsistent and no improvement in the use of devices was seen in PUPPS 2. Across the population surveyed, 42.1% of patients were identified with a pressure relieving/relieving device insitu. Patients who had been risk assessed had a higher rate of devices insitu (46.1%) than those not risk assessed (37.5%). Of particular concern are the group of patients assessed as being at high or very high risk where 28.9% had no pressure relieving/reducing devices insitu, including 54 patients (9.2%) with ulcers.

For each risk class the patients with a pressure relieving/reducing device insitu have a higher rate of ulcers than patients without. This may reflect the use of devices being reactive rather than proactive, that is, equipment is used once an ulcer is identified, rather than as part of a preventative plan. Although pressure relieving devices are only one aspect in the treatment of pressure ulcers it is of major concern that 83 people

with either a Stage 3 or 4 pressure ulcer had no devices in situ. In this group such devices are essential adjuncts to treatment plans. Strategies for 'stepping down' the use of pressure reducing/relieving devices as the patient's risk decreases need to be incorporated into organisational policies. Costs associated with the hire or purchase of this specialised equipment has significant financial implications for health services. While not assessed as part of PUPPS 2, anecdotally the impression gained from staff involved is that appropriate selection of support surfaces is based on availability rather than patient need, reinforcing the importance of linking risk assessment to an individual plan for intervention⁴⁷.

The US Agency for Healthcare Research and Quality found that the use of pressure relieving equipment to prevent pressure ulcers was one of only three clinical practices for improving patient safety to meet 'greatest level' criteria for strength of evidence regarding impact and effectiveness⁷². An important point to note in advocating the increased use of pressure reduction devices is that while they are an essential element of any prevention plan, particularly for any patient identified as medium risk or above, it should be remembered that they should be viewed as a supplement to frequent repositioning. Anecdotal reports, supported by published comment, suggest that the 'downside' of any staff education program tends to be an increase in the number of speciality beds ordered inappropriately⁵¹. This reinforces the notion that some staff tend to see these beds or devices as a solution, rather than a component of an individual prevention or management plan, including: regular turning and management of hydration and nutrition. One of the more successful approaches observed was in a metropolitan ICU who conducted a vigorous and sustained pressure ulcer prevention program which decreased their prevalence and incidence. This program incorporated clinical champions, staff education, active surveillance and regular audit feedback.

The large number of patients at high risk or with ulcers and no device insitu may reflect a lack of planning related to the absence of a guide to prevention strategies. Alternatively, the result could reflect the feedback from PUPPS 2 site coordinators, particularly in rural areas, who cite a lack of equipment to use even when a patient is assessed as being at increased risk. Many reported 'lack of available equipment' as the most frustrating aspect of the work they are undertaking in their health services in relation to pressure ulcer prevention programs. The rollout of the state-wide DHS Mattress Replacement Program, which was initiated from the PUPPS 1 recommendation to improve basic hospital mattresses, should alleviate this equipment shortage to some degree, with most health services replacing more than half their current mattresses with high quality static pressure reduction foam mattresses⁷³. This should allow health services to more appropriately target high risk patients with more specialised equipment. A third state-wide survey would be required to track the influence of this initiative on state-wide pressure ulcer prevalence.

Documentation

PUPPS 2 demonstrated a gap between health service policy and clinician practice in the area of documentation in relation to pressure ulcers. Only 45.0% of patients with a pressure ulcer had any documentation detailing the management of that ulcer within the 5 days prior to the day of survey. The PUPPS 1 report identified a much higher rate of documentation (over 90%), which differed from the published literature^{13,14,74}. This may have been due to a Hawthorne effect secondary to the long lead time and project timeframe of over 20 weeks. Preparation time for PUPPS 2 was much shorter with all education and surveys being completed over 7 days. As previously discussed, the energy required to sustain prevention and management programs for pressure ulcers may also have combined to produce this result. The purpose of health documentation is to provide essential data on the patient's medical history and current diagnosis, clinical

parameters, results of examinations and the plan of care⁷⁴. Documentation of patient care is a legal requirement that records health professionals clinical decision-making, care provided and outcomes of clinical care should litigation occur. That the documentation was found to be so poor around such a potentially litigious condition is of concern, as 'quality and clarity of medical records is an essential ingredient in good risk management'⁶. The PUPPS 2 surveyors were not asked to determine the degree of detail and appropriateness of documentation, only to note if there was any evidence of pressure ulcer management and classification.

Appropriate documentation is also critical to state-wide planning, funding and research. The Australian Classification of Diseases and Procedures (ICD 10AM) introduced L89 codes in July 2004, which align to the AWMA guidelines for pressure ulcer classification⁴². This should assist with ongoing identification of the extent and severity of the pressure ulcer issue. Poor documentation, however, leads to less efficient coding resulting in the potential for less funding.

Poor documentation of pressure ulcers is not a problem unique to Victorian health services^{14,75}. A recent Swedish study found that 'patient records did not present valid and reliable data about pressure ulcers', and additionally that even where documentation had occurred it was poor, failing to detail much information beyond the presence and location of the ulcer⁷⁴. There is a demonstrable need to emphasise the importance of medical nursing and allied health documentation during an episode of care. Further education of the salient points to be recorded in relation to the prediction, prevention and management of pressure ulcers should be a priority of health care services. The integration of organisational policy and documentation with clinical practice requires considerable reinforcement.

Wound management staff

The benefit of dedicated staff positions in wound management or tissue viability nationally and internationally are well documented⁵⁰. Less than 38% of health services that participated in PUPPS 2 employ wound management consultants or tissue viability nurses. Those that did undertake these roles in either a designated position or as part of a clinical portfolio reported lack of resources, and time in particular, as the greatest hindrance to implementing the key recommendations from PUPPS 1. This contextual factor demonstrated the least improvement since PUPPS 1; no improvement in the PUPPS CG and a decrease of 8.8% across PUPPS 2. In comparison improvements with other contextual factors ranged from 19.3% to 39.2%. Cost and availability of experienced staff to fill this type of position were most often quoted as reasons for not creating these roles. However, given conservative estimates of the direct and indirect costs associated with Stage 4 pressure ulcers being up to \$100,000, it would seem sensible to invest in a clinical leader whose role it would be to assist an organisation to formulate policy and educate staff and patients in the prediction, prevention and management of pressure ulcers. The prevention of 1 or 2 Stage 4 pressure ulcers would see the investment realised with interest.

Some rural health services reported that they did have funding for these positions but were unable to recruit staff to fill them. The availability of wound management resources are especially important for rural and regional staff as these areas are often isolated from continuing education opportunities geographically, and smaller numbers of staff within their health service reduces opportunities for vocational learning and sharing of knowledge and experiences within the clinical environment.

Historically, pressure ulcer prevention and management has been considered a 'nursing problem and nurses have been defensive about their occurrence'³³. Multidisciplinary teams can work together to address all aspects of pressure ulcer prevention and management

across the spectrum of care settings. The benefits of a multi-disciplinary approach in improving clinical outcomes for patients with pressure ulcers is well documented^{3,76-78}. One solution therefore to address the dearth of appropriately skilled staff in rural health services would be to include and develop the role of allied health staff in pressure ulcer prevention and management programs.

There is no expectation that allied health will replace the nurse's role in monitoring and managing patients with pressure ulcers. Allied health staff, however, can assist nurses with the more complicated high risk patients through the addition of specialist knowledge. Dietitians for instance can assist in establishing patients' nutritional status and develop a plan to reduce any deficits found, thereby playing an important role in the prevention and management of pressure ulcers⁶³. Occupational therapists can assist with appropriate pressure relieving devices, as well as aids and appliances to minimise pressure over vulnerable areas or existing pressure ulcers, both in the acute/subacute setting or at home. Physiotherapists can assist with educating patients on self-repositioning regimens for the bed or chair, as well as exercise programs that prevent stasis, loss of muscle tone and minimises pressure on bony prominences. Podiatrists have a role in assisting team members to develop appropriate pressure relieving devices for the lower limb, as well as managing pressure ulcers particularly on the feet of patients with diabetes. Medical staff have an important role in managing primary illnesses and co-morbidities that can affect the development or healing of pressure ulcer.

The myth that pressure ulcer prevention and management is solely a nursing responsibility is just that; pressure ulcer prevention and management is everybody's responsibility from the point of admission until discharge. Comprehensive risk management programs that are supported by executive and clinical leadership and a multi-disciplinary approach that does not attempt to accrue blame to any one person or discipline are therefore vitally important in reducing the prevalence and incidence of pressure ulcers.

Staff education

Successful pressure ulcer prevention programs are dependent on staff knowledge, skill and attitude⁷⁶. Many health services (66.7%) that participated in PUPPS 2 have subsequently implemented staff pressure ulcer education programs. Less than 30% of health services include non-clinical staff in these programs, but even those that do report a poor uptake by this group. Considering many non clinical staff such as personal care attendants assist with repositioning or transferring patients to and from the bed, awareness of the aetiology of pressure ulcers and the ability to recognise the early signs of skin damage from pressure would be beneficial to patient outcomes.

It is often assumed that all clinical staff have adequate and current knowledge regarding the prevention and management of pressure ulcers, yet feedback from the PUPPS 1 surveyors highlighted concerns around the lack of undergraduate education on pressure ulcers in all health disciplines. Prentice and Stacey found that knowledge of pressure ulcer prevention and management was low among nursing and junior medical staff, and, that these staff believed their undergraduate education in this area was inadequate³. The lack of staff knowledge may be addressed somewhat by having clinical personnel and other resources available mentor and empower staff in this area. Even where less experienced staff have sound of knowledge and skill levels, they may lack the confidence to implement this knowledge, especially when confronted by some senior staff who may still support outmoded practices. Concerns also arise where staff who do not have adequate knowledge in pressure ulcer prevention and management, seek to direct the care for patients against the advice of staff with current expertise. Anecdotal reports of inappropriate practices are endemic. The conflict that arises from lack of consensus between health professionals both within and between disciplines, from health service to health service, state to state and across international boundaries is not only detrimental to the implementation of best practice,

but also places stress on staff, patients, carers and health services. Compounding this is that pressure ulcers are not a topic that engenders a great deal of interest for many clinicians, with the flow on effect a lack of motivation to keep abreast of new developments⁷⁹.

Staff education requires consistent and ongoing commitment of resources. VQC has facilitated 3 state-wide basic education programs on pressure ulcers. Individual health services committed to improving pressure ulcer prevention have invested time and resources in pressure ulcer education, creating pockets of excellence around the state. VQC's ongoing commitment to reducing pressure ulcers is currently demonstrated by the development of a competency program for pressure ulcer education that may be used by health services or as part of a state-wide strategy to ensure dependable dissemination of information regarding pressure ulcer prevention and management.

Surveyor education program

As with PUPPS 1, PUPPS 2 used inter-rater reliability testing to ensure all surveyors were able to consistently and accurately stage pressure ulcers ensuring the data collected was robust, reliable and able to be compared between the two surveys.

The results from the inter-rater reliability testing suggested that surveyor knowledge of pressure ulcers had improved in the 12 months since the first survey with 73.7% achieving a first time pass for PUPPS 2 compared to 60.5% for PUPPS 1. This may be accounted in part by the proportion of PUPPS 2 surveyors who had also participated in PUPPS 1, or that the surveyors who volunteered to participate may have had a greater knowledge base because pressure ulcers were their area of clinical interest. It is also possible that the increased number of health services with a pressure ulcer prevention and management program in place by the time PUPPS 2 occurred resulted in increased clinician knowledge. Only 43.8% of health services in PUPPS 1 had such a program, a figure that has increased to 68.2% in

PUPPS 2 or to 74.7% for PUPPS CG. Alternatively, the greater number of core team providing the education sessions may have resulted in slight variability in the education and testing process and affected the results accordingly. The most likely scenario is that the apparent increase in clinician knowledge seen from PUPPS 1 to PUPPS 2 was due to a combination of the above factors.

PUPPS 2 surveyor feedback on the education program indicated that staff appreciated changes to the program resulting from PUPPS 1 feedback. The addition of a short session on basic pressure ulcer prevention and management strategies was particularly valued. In addition, surveyors enjoyed opportunities to discuss evidence based best practice, especially in regard to challenging myths that exist in relation to pressure ulcers and felt better equipped to return to their clinical areas to act as clinical champions. Some reflected that though they thought their knowledge was current they were pleased to have the opportunity to update their knowledge.

Patient/carer education

Reviews of patient's experiences of living with a pressure ulcer have been undertaken. It was found that 'pressure ulcers had a profound impact upon the subjects' lives' across the emotional, physical and practical spectrum⁶⁷. These studies highlight patients' need for knowledge regarding their pressure ulcer and a feeling of being excluded from discussions around their care and concerns around staff attitudes to patients who developed pressure ulcers^{24,80}.

Both patients and staff have an active role to play in pressure ulcer prevention. Patients should feel part of the 'team' when plans for preventing and managing their pressure ulcers are developed⁷⁶. This can be achieved by enabling patients to report any sore or tender areas to clinical staff so that action can be taken prior to permanent tissue damage occurring. Anecdotal feedback suggests that many patients, when asked why they have not done this, will report 'the staff were too busy' or 'I did not want to bother anyone'. Failure to report a pressure ulcer in its

earliest stage can result in much greater inconvenience in the long term for both patients and the clinical team. It is also important to ensure that patients do not feel that they caused their pressure ulcer as many have reported they do²⁴.

The value of educating patients, families and carers and including them in the development of pressure ulcer prevention and management plans is well-documented^{53,76,77,81}. This is critical to patients, families and carers being more involved and responsible for their own care and ensures greater collaboration between clinicians and patients in understanding and adhering to the plan of care. Successful patient education motivates patients to take responsibility for their own health within the limits of their own ability and aims to change their behaviour in a positive way⁸¹.

Creating an environment where personal accountability for maintenance of one's health is desired requires that specific consumer-focussed information is made available to allow participants to make informed choices. Approximately 25% of health services stated they provided their patients with some type of education regarding pressure ulcer prevention on admission (Table 16). This is a significant improvement from PUPPS 1 (4.2%). Whilst this has not met VOC expectations post PUPPS 1, it may be that many health services preferred to wait for patient education brochures being developed by VOC to be released. These publications, in eleven alternate languages, have been available on VOC website since December 2004^{17,18}. Shared responsibility for the prevention and management of pressure ulcers between the health service, all members of the clinical team and the patient creates the best opportunity for a comprehensive and effective approach.

Sustainability

The key message of PUPPS 2 is that, while there has been across the board improvement in pressure ulcer prevention, there is a need to further "implement, focus and sustain" pressure ulcer prevention and treatment strategies.

The recommendations developed for PUPPS 1 still stand as a strong framework to efficiently and effectively prevent and manage pressure ulcers. Health services should take comprehensive and systematic action to reduce the prevalence and incidence of pressure ulcers. A small number of health services had long term pressure ulcer prevention programs in place and their lower prevalence identified through PUPPS 2 justifies the long-term commitment. The majority of health services show evidence of an intention to change. The individual results identified for PUPPS 2 give health services an opportunity to focus their resources on the areas of greatest need in their organisation. This may equate to health services targeting the 'big 2' medical specialities (medical and rehabilitation) or the 'big 2' anatomical locations (sacrum and heel) or a more specific combination of both such as sacral pressure ulcers in the medical unit or heel ulcers in the orthopaedic unit. Changes required to target these areas could be the inclusion of a 'heel check' as part of 4 hourly observations, or targeting allied health staff to document the condition of a patient's heels and sacrum each time they are reviewed. Piloting targeted resources, sharing quick wins (such as a decreased incidence or prevalence) and communicating the change and implementation experience with the larger organisation should assist with planning whole of organisation implementation strategies.

It is important to remember to identify with what staff value and communicate results related to this. For example, clinical staff value positive improvements in patient outcomes, so showing them audits of compliance for completing and documenting risk assessment processes may make them less likely to reiterate concerns about paperwork taking them away from the bedside if it can be demonstrated that their efforts have resulted in changes in pressure ulcer development. Managers with financial accountability may find a reported reduction in pressure ulcer prevalence linked to increased cost due to the hire of specialised pressure reduction devices more balanced

if they are also shown any associated reduced length of stay and a reduction in severity of pressure ulcers with subsequent reduction in the use of wound dressing products.

Another targeted opportunity for improvement is risk assessment. The benefits of undertaking a risk assessment on admission have been previously discussed. Health services may benefit from starting small with one speciality or ward that is keen to implement the changes. Again, sharing the small wins in a pilot such as this will identify the successful elements of the implementation and highlight any barriers to change that need to be addressed for an organisational rollout. Alternatively, health services may look to where they will get the best value for money. Organisations may decide to implement the key recommendations across the general medical specialities, where the greatest numbers of patients develop pressure ulcers.

If an improvement, and subsequent saving in patient days and costs, can be demonstrated in a small area through the use of focussed and sustained change, then it should be easier to expand the change program to other areas within the health service. PUPPS 1 and PUPPS 2 have provided health services with prevalence data; health services now need be collecting their own incidence data to identify local specific causative factors. An example of this is a health service that identified their fractured neck of femur (#NOF) patients as being at particular risk for developing pressure ulcers. The #NOF clinical pathway was launched with a requirement to hire an alternating pressure reduction mattress as soon as a diagnosis was made. This small change in practice almost halved the number of patients that developed an ulcer and reduced average LOS from 24 to 15 days. Based on the reduced LOS only, a saving of \$20,000 was made after the cost of hiring the mattresses was taken into account⁶⁰. This is an excellent example of what can be achieved through the focus of resources on a targeted at risk population.

In the interest of providing workable solutions for health services, it may be that a decision is made to risk assess those patients who have been previously identified at risk, perhaps through an admission screening tool or discharge risk assessment, and linking this to the implementation of a proactive prevention plan.

Another simple strategy is to engage the patient, their family and carers into acting in their own interest by providing them with an information brochure outlining what a pressure ulcer is, simple strategies they can undertake to minimise their risk and the importance of letting clinical staff know if they have any sore areas.

Pressure ulcers are an area of clinical risk and strategies for managing risk should include a reporting, communication and feedback loop, and should occur both formally and informally. It is important at both health service and state-wide level that pressure ulcer prevalence continue to be collected, and results are communicated with all stakeholders (patients, carers, clinical staff, managers, government). It has been demonstrated that this process of monitoring and providing feedback can result in a decrease in prevalence and an increase in the use of preventative measures⁷⁹.

The value of participation

PUPPS 2 has provided a comprehensive baseline data set which will assist health services to plan quality improvement activities to address the problem of pressure ulcers, measure progress towards an agreed goal and be used as a benchmark for future data. It has also continued to raise awareness of the problem and facilitated a broad education program across the state. Data from PUPPS 2 provides health services with the evidence they need to continue with or to develop pressure ulcer prevention and management strategies to support the key recommendations of PUPPS 1 and 2. Positive action emanating from participation alone has also been noted in other studies^{82,83}.

As a result of the experience of PUPPS, some health services that also provide aged care services have undertaken prevalence surveys in these units based on the PUPPS methodology. Staff have taken their PUPPS experience back to their own work areas and used this increased knowledge to drive strategies for preventing and managing pressure ulcers on a broader scale.

Many health services have made comprehensive advances towards improving their pressure ulcer prevalence by implementing the key recommendations of PUPPS 1, some in addition to their existing prevention programs. Sustaining these strategies will continue the improvement^{60,79,84,85}.



PUPPS 2

Now in its second year of use, the PUPPS dog mascot was key to raising staff and patient awareness of the project and assisted with facilitating introductions and communicating processes.

Limitations of the study

The limitations of PUPPS 2 remain similar to those of PUPPS 1. As previously noted, interrater reliability testing was limited to theoretical assessment as it was deemed logistically impractical and costly to have all surveyors clinically assessed.

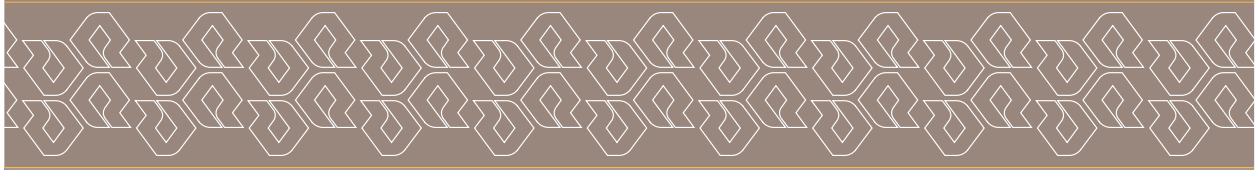
The risk to data collection presented by this limitation was reduced by several factors. The protocols ensured the presence of a member of the Core Team of pressure ulcer experts on survey day, which supported clinical decisions regarding staging, particularly if there were 5 or more pressure ulcers found on one patient. Surveyors also repositioned patients with reactive hyperaemia off the affected area and re-assessed the area 30 minutes later for signs of residual non-blanchable erythema.

PUPPS 2 used 3 additional educators to roll out the education program. The educators delivered all sessions for the Education Day including the survey protocols and guidelines session, which in PUPPS 1 had been delivered at all sites by the

PUPPS project manager. These factors may have altered the emphasis placed on different areas of the education sessions and had the potential to impact on interrater reliability. However, the influence of this factor is not immediately apparent in the outcome of the interrater reliability assessment.

Limitations to staging within the AWMA definitions:

- All blisters were staged as Stage 2 irrespective of whether tissue within or surrounding the blister showed evidence of necrosis;
- In the presence of eschar (black, dry, necrotic tissue) the pressure ulcer was staged as a Stage 4 pressure ulcer as opposed to being defined as unstageable⁸⁶.



08

Conclusion

Conclusion

Victorian public hospitals have reduced the prevalence of pressure ulcers in their acute and subacute facilities. The 21.5% decrease in prevalence from 26.5% to 20.8% represents a significant improvement. However, pressure ulcers are a largely preventable event and much work is still to be done in Victorian health services to reduce this risk.

One in five patients have a pressure ulcer at some point in their acute or subacute admission and two out of three develop these ulcers during that admission. Pressure ulcers were identified in 20 paediatric patients. Pressure ulcer development adversely affects the quality of life, morbidity and mortality of patients. The associated increased length of stay, and financial costs related to managing pressure ulcers, are a considerable burden not only for inpatient services but also for outpatient and community based health care services.

Decreases in pressure ulcer prevalence are possible through the implementation of comprehensive programs that incorporate: evidence based clinical guidelines, risk assessment, multi or interdisciplinary approach, organisational risk management processes, and education and information sharing for patients, carers and staff^{51,53,77,79}. On the whole, health services appear to have improved their organisational planning and commenced a multifaceted approach, but few have a comprehensive program in place incorporating all of the above factors.

The development of pressure ulcer policies and adoption of clinical guidelines alone does not lead to improvement in the clinical setting. This gap between policy and practice needs to be targeted with specific improvement planning, active surveillance and regular feedback. Practical strategies driven and supported by executive management and clinical leaders are required to facilitate implementation, awareness and daily use of policies and guidelines. An effective way of doing this is to focus on an area of greatest need in order to realise small successes that lead to greater organisational gains. Acquisition and allocation of resources should be driven by patient need and the risk status of individual or clustered patient populations. Education should be inclusive of all staff, and be embedded into all hospital orientation programs, annual competency programs, and a constant feature within in-service education programs. Clinical improvements and ongoing management can be facilitated through the appointment of wound care consultants, tissue viability nurses or staff from a range of disciplines trained specifically in pressure ulcer prevention and management.

Barriers to implementation should be identified and action taken to manage competing clinical priorities, negative staff attitudes and limited resources.

A systematic approach can achieve sustained improvement.

Early detection and appropriate intervention will lead to a decrease in pressure ulcer development. Early detection can be aided by increased use of a risk assessment tool to identify a patient's status on admission and when the risk status of the patient alters. Immobility remains the strongest predisposing factor for pressure ulcer development in PUPPS 2. Individual preventative plans, patient, carer and staff education should be focused on reinforcing the critical importance of frequent position changes and maximising mobility in preventing pressure ulcers. Preventative plans should be developed using multidisciplinary expertise and, as well as scheduling repositioning and mobilisation, aim to maintain skin integrity with regular skin assessment and hygiene, optimise nutritional status and reduce shear and friction by appropriate use of support surfaces and other pressure relieving devices.

Commitment to an ongoing mattress replacement program and provision of access to more specialised pressure reduction equipment for patients at higher risk is required to meet patient needs. An increased focus on appropriate and regular documentation is also recommended to record risk and skin assessments, communicate plans and track management and progress of care and meet reporting and audit requirements.

Pressure ulcer prevalence and incidence should be collected as part of all health services' minimum data set. Regular reporting on pressure ulcer data should be maintained at a state-wide level. Main-streaming of an annual prevalence survey utilising the PUPPS methodology is recommended to co-ordinate and encourage state-wide active surveillance, track improvement in prevalence and progress on the implementation of recommended strategies.

PUPPS 2 has added to a comprehensive baseline data set provided by PUPPS 1 and has tracked improvement in prevalence and organisational approaches to preventing and managing pressure ulcers. These data assist health services to build on sound information and plan focused quality activities aimed at reducing the problem of pressure ulcers. The findings of this audit indicate there is still a need for a coordinated state and organisation-wide commitment to improve the prevention and management of pressure ulcers. The key message, derived from both PUPPS 1 and PUPPS 2, is the need to develop evidence-based, targeted strategies and to "implement, focus and sustain".