

Reducing hospital acquired pressure ulcers in intensive care

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Abstract

Pressure ulcers are a definite problem in our health care system and are growing in numbers. Unfortunately, it is usually the most weak and vulnerable of our culture that faces these complications, causing the patient and their families discomfort, anguish, and economic hardship due to their expensive treatment.

Data collected by the tissue viability department showed high incidence of hospital acquire pressure ulcers in the intensive care unit in March 2013. An action plan was initiated and implemented by the tissue viability team, senior nursing management, pressure ulcer prevention (PUP) team and respiratory therapists (RT's) within the ICU. Our objective was to reduce hospital acquired pressure ulcers in the intensive care unit using the plan, do, check, act quality improvement process.

Problem

Monthly hospital acquired pressure ulcer incidence data were collected and recorded by the tissue viability department commencing in January 2013. These numbers included hospital and home acquired pressure ulcers. The incidence rate fluctuated from a month to month basis and problem areas were identified and noted. The month of March 2013 was noted to be very high, with a total incidence rate of 16. Of this number, 12 were hospital acquired pressure ulcers, with six of these occurring in the intensive care unit (ICU).

An in depth root cause analysis (RCA) was also carried out by the ICU PUP team which showed that although all six ICU patients had common factors such as being intubated and ventilated and on inotropes, they were also all on complete bed rest or had very restricted mobility. Three patients also suffered from diarrhoea. Having incontinence does not cause pressure ulcers, although it does predispose the patient to the development of pressure ulcers due to the damage of the skins mantle by the corrosive effects of urine and faeces. Another factor raised was the number of patients with medical device related pressure ulcers, caused by oxygen bilevel positive airway pressure (BIPAP)/continuous positive airway pressure (CPAP) masks.

Background

Pressure ulcers are a real and definite problem in our medical system.[1] Regardless of all our new equipment and know how, pressure ulcers are not on a downward trend.[2] Pressure ulcers are growing in incidence,[3] and it is usually the most vulnerable, elderly, and weak of our society who face these complications.[4] Pressure ulcers cause the patient pain and misery and are expensive to treat.[5] They can also be a aspect in patients' mortality rates.[6] High incidences of pressure ulcers in an organization may imply a diminished quality of care.[4]

A pressure ulcer is defined as "a 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".[7] They are six classes of pressure ulcer, grades 1-4, unstageable and deep tissue injury.[7]

Figures show that despite an increase in technology and medical advances, the incidence and cost of hospital acquired pressure ulcer management are extensive and increasing.[8] The cost of treating these mainly preventable occurrences in the United Kingdom (UK) fluctuates from £1.4- £2.1 billion annually or 4% of the total National Health Service (NHS) expenditure.[9] In one Irish study, the cost of treating a patient with several Grade 4 pressure ulcers over a five month period to total healing was €119,000 [10]. However, a successful outcome is not always likely as complications often arise in the grade 3 and 4 stage pressure ulcers, causing infection and in some cases even death.[11]

Pressure ulcers are a mostly avoidable incidence.[12] Research has shown that when nursing staff are educated and knowledgeable on pressure ulcer prevention, nursing practice can then change and improve[13] According to Land,[14] pressure ulcer prevention is such a vital recurring aspect of nursing care that many staff fail to concede its importance and consequence in maintaining standards of care. Conversely, evidence has shown that patient acuity and nursing assignments have amplified in the last 30 years.[15] The challenges of this demanding environment impacts on nursing staffs' ability to practice quality care, show support, and act as a good role model for newly qualified or junior staff.[16]

There is a misunderstanding that pressure ulcers are a result of poor nursing care. While quality of care does play a role, pressure ulcers are a complicated, multifactorial disease that is often disregarded by medical staff.[17] Pressure ulcers are complex wounds requiring an overabundance of skills and knowledge to manage and care for.[12] There are many policies and guidelines on pressure ulcer prevention and management.[7,19] Regrettably, studies have shown that many qualified staff nurses do not adhere

to these guidelines or evidence based practice, leading to insufficient pressure ulcer prevention practice.[20]

According to Dealey,[21] a prevalence is described as a "snapshot" and is an effective tool for identifying where the pressure ulcers occurred, the grade of pressure ulcer, and the site of occurrence. This prevalence acts as a reference point measurement and can be used to monitor developments or the effectiveness of a prevention programme. An incidence is a measure of the risk of developing some new condition within a specified period of time.[21] One study showed a prevalence of 13% in a short stay ICU whilst it increased to 42% for a long stay unit.[22] Incidences of pressure ulcers in ICU's vary between 10-41%.[22]

Hospital acquired pressure ulcers have been acknowledged as the most recurrent occurring nurse sensitive indicator among hospitalised patients.[23] The Agency for Healthcare Research and Quality (AHRQ), found that patients with a pressure ulcer stayed in hospital three times longer, than patients without a pressure ulcer.[24] One study suggested that employing experienced registered nurses can improve the quality of care a patient receives.[25] In their study they examined the National Database of Nursing Quality Indicators (NDNQI) and found that having a higher percentage of experienced registered nurses in a clinical area resulted in fewer patient falls and a lower hospital acquired pressure ulcer prevalence rate.[25]

Baseline measurement

Monthly incidence reports of all pressure ulcers were reported by nursing staff through a hospital patient safety net (PSN) system and collected and verified by the tissue viability team. Although home acquired pressure ulcers were also reported, our priority was in reducing and preventing hospital acquired pressure ulcers.

March 2013 incidence data showed a total of 16 patients with pressure ulcers. Of these, 12 were hospital acquired pressure ulcers (HAPU), and four were home acquired. Of the 12 HAPU six occurred in the intensive care unit, resulting in an incidence rate of 50% which is higher than international standards.[22] Further breakdown of the data and a root cause analysis (RCA) showed that three out of the six patients suffered diarrhoea leading to skin excoriation before they presented with a pressure ulcer.

See supplementary file: ds5428.pdf - "January March 2013 ICU pu incidence 1"

Design

An initial meeting was planned between the tissue viability manager, the intensive care unit (ICU) nurse manager, the assistant director of nursing, ICU head of department, head of the respiratory department and head of the pressure ulcer prevention (PUP) team. Our main objective was to reduce hospital acquired pressure ulcers in the ICU. Weekly meetings were organized between nursing, respiratory technicians and ICU physicians and a plan of action was put into force.

The four main areas targeted were: improving staff education and knowledge of pressure ulcer prevention, correct and timely risk assessment of the patient, frequent patient offloading/relieving pressure, and moisture management.

During our meetings, it was decided to follow the plan, do, check, act quality improvement process of reducing hospital acquired pressure ulcers in our ICU department. The plan, do, check, act cycle is a four step management method used in business for the control and continuous improvement of processes and products. It has now been incorporated into the health care setting and helps identify issues and resolve them using a four step plan, do, check, act cycle.

Strategy

PDCA cycle 1: In relation to improving staff education and knowledge of pressure ulcer prevention, the tissue viability team (TVT) ensured all pressure ulcer prevention guidelines and policies were reviewed and updated and staff were following evidence based practices.

In relation to risk assessment, it is policy in our hospital to carry out a risk and a skin assessment within six hours of admission to the hospital. Nursing staff were encouraged to risk assess patients within this timeframe and complete a skin assessment every time they repositioned the patient. The hospital uses a validated risk assessment scale called the Braden scale which was developed to identify patients at risk of developing pressure ulcers.[29] The lower the score the higher the risk, and any patient with a score of 18 or below is deemed at risk. However, as most of the ICU patients score below 18 then there needed to be some other method to identify or highlight their risk.

In response to this issue, the PUP team in the ICU developed a traffic light system of red, yellow, green sign to identify the most at risk patients. The staff placed a red coloured sign outside of the door for a high risk patient with a score of 9 or less, yellow for medium risk which is 12 or less, and green for low risk which is greater than 12. These signs are instantly visible to all nursing staff, doctors and allied healthcare professionals and highlights who are the most vulnerable and at risk patients. The PUP team audited patient's admission file weekly and the charge nurse recorded all patients' daily Braden scores at morning report. The majority of ICU patients are nursed on specialised pressure relieving mattresses, however, the duration and length of time between turns was an issue. It was decided to reposition, turn and off load patients every two hours instead of every three hours. This was a huge undertaking and a significant change to nursing practice. It was also very time consuming and required extra manpower. Compliance was monitored daily by the PUP team.

Respiratory technicians were encouraged to incorporate a pressure relieving dressing on bony prominences for example, nasal bridge when using a BIPAP/CPAP masks.

The fourth area examined was managing moisture via incontinence care. It had also been noted in the data collected that many of the

patients that developed hospital acquired pressure ulcers in the ICU department initially complained of faecal incontinence. Research into this issue reported that care of the perianal skin by cleaning, moisturizing, and protecting with barrier creams was very important as a preventative measure.[30]

PDCA cycle 2: Further accredited education sessions were organised by the TVT and clinical resource nurse on pressure ulcer prevention, including risk assessment, the Braden scale, offloading pressure, skin protection, and appropriate referrals to other multi-disciplinary team members, ie dieticians and physiotherapists. The TVT also involved outside agencies such as wound care representatives to discuss correct use of their products such as skin barriers and faecal management products. Overall these lectures were very well attended by ICU staff and evaluation forms and feedback demonstrated a positive reinforcement of prevention and identifying at risk patients.

Audit results showed 100% compliance with completion of daily Braden risk assessment score. Compliance of placing colour-coded signs outside patient rooms was 80%. The PUP team arranged more teaching sessions to nursing staff and monitored compliance again.

Compliance of turning patients every two hours was poor to begin with, coming in at only 50%. The ICU nurse manager and the CRN encouraged and motivated the staff and lead by example. The PUP team also introduced a turning clock thereby reminding staff to reposition their patients every two hours and also onto a certain side or position, for example left lateral side or supine.

We visited our neighbouring hospital intensive care unit to observe and discuss their best practice initiatives. The outcome was the use of a skin barrier spray the applying an adhesive foam dressing, which can be cut to size and help prevent medical device related pressure ulcers developing on patients. Compliance was audited daily by the PUP team. Medical device related pressure ulcer incidence rates were audited monthly by the TVT department.

Other measures included the use of a rectal catheter which when inserted into the rectum stays in-situ for 28 days draining the faeces and allowing the damaged perianal skin to repair. The company representative was invited to present lectures on this device and nursing staff and ICU physicians were taught how to insert and manage this device. This new nursing practice was audited weekly by PUP team and ICU staff were encouraged to refer any patient with skin excoriation to the TVT team via the computerised referral system.

Results

The measures or changes to practice used to reduce hospital acquired pressure ulcers in the intensive care department achieved their goal and incidences of hospital acquired pressure ulcers decreased. In April 2013 we had reduced our number to four incidences and in May 2013 there was a zero incidence of hospital acquired pressure ulcers in ICU, and indeed within the whole hospital. For the remainder of 2013 our pressure ulcer incidence

rate for the ICU department remained at 2 or below. The TVT continued to monitor and audit pressure ulcer incidence on a monthly basis.

Within the ICU department due to our highlighted awareness of pressure ulcer prevention, nurses, doctors and the allied health care professionals were more educated, knowledgeable and informed on pressure ulcers in general. Repositioning the patient every two hours is now normal practice within the ICU and adherence to the turning clock and carrying out risk and skin assessments is high. The PUP monitors compliance and regularly audits this.

Respiratory therapists were more aware of the implications and complications of device related pressure ulcers, and by applying a skin barrier spray and a simple foam dressing this could help reduce the incidence of pressure ulcers.

See supplementary file: ds5427.pdf - "January Dec 2013 ICU PU incidence"

Lessons and limitations

Involving key stakeholders and a multi-disciplinary team to identify and improve patient care can be difficult to coordinate, but it can lead to a more successful outcome. Some healthcare professionals have a more positive attitude towards a team approach than others and are more accommodating. However, we have to remain focused on our one common goal: to improve patient's outcome and standards of care. Involving our respiratory therapy department assisted us in changing practice in regard to medical device related pressure ulcers and improved our links with them.

Unfortunately, we were forced to limit our quality improvement process to our ICU department due to manpower and time restraints. We are planning to initiate and develop this quality improvement process throughout the facility.

Conclusion

Hospital acquired pressure ulcers can cause a significant disturbance and problem to the patient and their families.[2] The effect of pressure ulcers also affects the nursing staff and allied health care professionals, by increasing their work load, changing their patients' plan of care and prolonging the patient's length of stay in the medical facility.[15] Prevention of pressure ulcers is the key and essential aspect of nursing practice. Indeed, unless nursing staff are educated on current practices and have the skills and training to prevent pressure ulcers occurring then they will continue to develop and cause interruption and concerns to patients and our healthcare system.[31]

Key buy in from our senior leaders was vital for this project and ensured compliance to the changes in practice. Staff, ICU doctors, respiratory therapists, and senior management were kept aware of the projects results by postings on the staff bulletin board and weekly debriefing sessions. Pressure ulcer prevention and

commitment to patient safety remains high on the priority list in the ICU department.

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Declaration of interests

Nothing to declare.

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Ethical approval

Ethical approval is not necessary in collecting our pressure ulcer data as it is collected monthly as part of our hospital Key

Performance Indicator.