

Practice Change in Peritoneal Dialysis Exit Site Care

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Abstract

Preventing exit site infection is important in maintaining catheter life for a patient on peritoneal dialysis and it is necessary for clinical practice to embrace current research. A literature search revealed that there was no significant difference in infection rates when using povidine iodine compared to soap and water and that povidine iodine may prevent healing at the exit site. Our group changed from povidine iodine to antibacterial soap with the addition of mupirocin cream on patient's exit site after the first episode of *Staphylococcus aureus* exit site infection. The process by which this policy was developed, implemented and evaluated is discussed in the context of change theory and the impact on clinical practice.

Introduction

In light of new research and advances, nurses inevitably need to consider practice change. This article is focused on the need to review and change the management of chronic exit site care at a major tertiary referral centre and how this change process was achieved.

A literature review which examined peritoneal dialysis (PD) catheter exit site care was undertaken and found that clinical leadership, a management model and research related to cleansing solutions were important to develop new clinical practice policies. A strategy needed to be planned prior to the change taking place. The change process involved stakeholders and boundaries/scope of change. Planning for change also required a developmental time line which included the planning, implementation and evaluation processes. These components will be addressed in this paper.

Issue to Change

PD exit site care is vital in the prevention of exit site infection (ESI), and the prolongation of PD catheter life. The

standard management at our centre was to clean the exit site with a povidine iodine swab after showering. Soap was not encouraged at the exit site during showering. Mupirocin ointment was used in a small number of patients to treat ESI but not prophylactically. A review of the standard exit site care was identified as a real need as sixty-four percent of ESIs were found to be due to *Staphylococcus aureus* at our centre. Therefore, we proposed that mupirocin ointment be used prophylactically in patients with an increased risk of developing *Staphylococcus aureus* ESI.

Literature review

Nurses need to observe, question, be vigilant, and monitor the care of patients. Nurses need to keep up to date with current technologies, drugs, and procedures to ensure the best care for their patients (Jones & Cheek, 2003). Clinical leadership provides for the promotion of clinical practice change and better patient outcomes when supported by current research.

For change to occur individual nurses need to become leaders to transform

Key Words

peritoneal dialysis, catheter, exit site, infection, change, clinical leadership

cultures and promote change (Rycroft-Malone, Harvey, Kitson, McCormack, Seers & Titchen, 2002). By becoming a leader one can create a vision and make it a reality (Rycroft-Malone et al. 2002). Leadership can be defined as "the process of motivating other people to act in particular ways to achieve specific goals by a variety of means" (Beech, 2002, p.35). Change becomes easier when there is clinical leadership (Rycroft-Malone et al. 2002). Clinical leaders become the facilitators of implementing the change and making the transition easier for those involved (Rycroft-Malone et al. 2002). Therefore, nurses need to be open to and aware of new research and become clinical leaders by promoting change to benefit both nursing practice and patient care.

A management model for change can be used when implementing change. Lewin's theoretical model of change is based on three steps (Bozak, 2003). These steps are unfreezing the current level, changing the new level, and refreezing. Unfreezing the current level refers to identifying a current need or problem. Changing the new level refers to the change actually occurring. Finally, refreezing is when the change is established (Bozak, 2003).

PD Care

PD is a form of renal replacement therapy offered to individuals with end stage renal disease. PD requires a specifically designed silicon catheter to be inserted through a subcutaneous tunnel into the peritoneal

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cavity. The area that surrounds the catheter at the exit point on the abdomen is known as exit site. It is important that evidenced based exit site care occurs to reduce the risk of ESI (Lockwood, Hodgkinson & Page, 2003). Organisms at the exit site can migrate from the skin and descend to the peritoneal cavity via the subcutaneous tunnel leading to peritonitis. A patient's risk of peritonitis doubles after an ESI (Waite, Webster, Laurel, Johnson & Fong, 1997). Infection is the leading cause of catheter removal.

Current wound healing theory suggests it is more beneficial for the wound to be moist for optimal healing (Kozier, Erb, Berman & Burke, 2000). However, this is not the case for chronic exit sites. The conventional management for PD exit sites is for the catheter to be immobilised with a dry exit site to prevent microorganism growth. Furthermore, trauma to the exit site should be prevented and immersion of the exit site in water should be avoided. By adhering to these conventions the risk of an ESI is reduced (Twardowski & Prowant, 1997; Thomas & Harris, 2002; Thodis & Oreopoulos, 2001).

The cleaning of the exit site is an important measure to prevent organisms multiplying and leading to ESI. Standard practices within our renal unit discouraged the use of soap at the exit site and promoted cleaning with povidine iodine swabs. Povidine iodine has been reported to reduce the incidence of ESI by preventing bacterial growth at the exit site (Waite et al. 1997). However, research that compares soap and water with povidine iodine shows no significant difference in the rates of ESI (Strippoli, Tong, Johnson, Lockwood et al. 2003; Twardowski & Prowant, 1997). Lockwood et al (2003) also reported findings of a study which compared povidine iodine and soap and water. This study showed a lower incidence of *Staphylococcus aureus* ESI in the soap and water group and povidine iodine delayed the occurrence

of ESI for up to 140 days (Lockwood et al. 2003). In the above studies (Strippoli et al, 2004; Lockwood et al. 2003; Twardowski & Prowant, 1997), the type of soap used was a non-disinfected liquid soap. However, Gokal et al (1998) pointed out that antibacterial liquid soap was shown to be better than povidine iodine.

The literature reviewed questioned the effect of povidine iodine on healing cells. Povidine iodine had been reported as being cytotoxic to mammalian cells and therefore harmful to granulation tissue if it enters into the sinus (Twardowski & Prowant, 1997) and care should be taken to ensure that the solution does not enter the catheter sinus (Waite et al. 1997). From these studies it can be suggested that povidine iodine may not be the ideal solution to be used in early catheter care if it is cytotoxic to cells as the healing time may be prolonged significantly. However in long term routine care of the exit site it maybe appropriate.

Staphylococcus aureus is described as the "Achilles heel" of ESI and peritonitis (Dasgupta, 2000). Studies have shown that prophylactically treating exit site with mupirocin significantly reduces ESI compared with no prophylaxis (Lockwood et al. 2003). However, one study reported that ESI from all organisms was reduced by using mupirocin (Lockwood et al. 2003). The use of mupirocin has been reported as being effective in the prevention of ESI, especially when the causative organism is *Staphylococcus aureus* (Casey, Taylor, Clinard, Graham, Mauck, Spainhour, Brown & Burkart, 2000; Thodis et al. 1998; Dasgupta, 2000). Mupirocin has been to be especially effective in the reduction of ESI when applied to the nasal mucosa of *Staphylococcus aureus* carriers (Thodis, Bhaskaran, Pasadakis, Bargman, Vas & Oreoploulos, 1998; Strippoli et al. 2004). The guidelines set out by Caring for Australians with Renal Impairment (CARI, 2004) suggest that prophylactic use of mupirocin at the exit site or intranasally is recommended, especially in patients who

are *Staphylococcus aureus* carriers, and in those patients who have a high risk for ESI. These include people with diabetes mellitus and other immunocompromised patients (Strippoli et al. 2004; Thomas & Harris, 2002).

There have been concerns raised that resistance occurs with frequent use of mupirocin. A study over 4 years investigated mupirocin resistant *Staphylococcus aureus* (MuRSA) with frequent application of mupirocin (Annigeri et al 2001). Findings from this study reported that 4 out of 26 (3%) patients who were *Staphylococcus aureus* carriers developed MuRSA. Another 7 year study reported that 2.7% of patients using mupirocin developed MuRSA (Lobbedez, Graham, Dedier, Burdzy, Chu, Izatt, Bargman, Jassal, Vas, Brunton & Oreopoulos, 2004). Although the numbers of patients developing MuRSA appear to be small further research needs to be conducted into the effectiveness of the use of mupirocin in the prevention of ESI.

In summary, there were no differences in ESI rates regardless of the cleansing agent used (Thodis and Oreopoulos 2001) and the use of mupirocin for the prevention of ESI is effective. Therefore, it was recommended that practice be changed to the use of an antibacterial soap to clean the exit site providing that it is a liquid soap and that the exit site is thoroughly dried after cleaning (Gokal et al. 1998; Twardowski & Prowant, 1997). Furthermore, those patients who had an *Staphylococcus aureus* ESI or peritonitis should incorporate the use of mupirocin ointment into the routine daily exit site care. It was proposed that these two changes in clinical practice would reduce the risk of ESI. Once the evidence for change had been found, and the recommendation for clinical practice made, planning for the change was commenced.

Planning for Change

The stakeholders are those people who should be involved within the decision

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making process for the change (National Health and Research Council [NHMRC], 1999). The stakeholders for this change included patients, carers, nurse managers and renal nurses (from the home training unit and the nephrology ward), nurse educators, and renal physicians.

The scope of this change involved chronic PD catheter exit site care. Chronic exit site care refers to greater than one month post implantation of the catheter (Piraino, et al, 2005).

The boundaries of the change included changing from using povidine iodine swabs to using antibacterial soap as the preferred option for cleaning the exit site and using mupirocin at the exit site routinely after a patient has had one

episode of ESI or peritonitis where *Staphylococcus aureus* had been the principle causative organism. No other changes to exit site care were made.

Implementing the Change

The strategy that was used to implement the change is shown in table 1. This strategy was chosen as it was predicted that resistance to the change would be minimised because all stakeholders and consequences of the change were included. A timetable for the change was developed, it must be highlighted that there can be disruptions to predicted time lines due to unforeseen variables such as workloads, changes in staffing, availability of educational and medical support.

Evaluation for the Change

According to the NHMRC (1998) the following areas are important in determining the effectiveness of guidelines and will point out any flaws in the guidelines. These areas include assessing the guideline dissemination, the movement of clinical practice towards the recommendations, and the impact on the patient's understanding and knowledge. Also, determining if health outcomes have changed and if the guidelines contributed to changes in clinical practice help in determining the effectiveness of the guidelines

To ensure the effectiveness of the new guidelines they were evaluated by comparing the rate of ESI before and after

Table 1: Strategy to Facilitate the Change Process

1	Placing the proposal on renal service quality meeting agenda
2	Preparation and Dissemination of a Written Submission re Proposed Change to all Stakeholders. This submission includes: <ul style="list-style-type: none"> The rationale for the change: <ul style="list-style-type: none"> Current high ESI incidence (40%) Lack of current policy for PD catheter exit site care Research to support recommended changes to routine exit site care The potential beneficial of change: <ul style="list-style-type: none"> a reduction in the ESI rates reduced costs to the health care service (reduction in antibiotic use, reduction in PD catheter removal +/- replacement, reduced cost of exit site cleansing agent, reduction in microbiological diagnostic A draft proposal for the new guidelines Change evaluation strategy
3	<ul style="list-style-type: none"> Clinical Practice Leader to attend the quality meeting to present the proposed change in routine clinical practice in relation to PD catheter exit site care. This allows stakeholders to ask questions regarding the basis for the proposed changes and how these are to be implemented, disseminated and evaluated.
4	<ul style="list-style-type: none"> Development of a working party, with representatives from all stakeholder groups (including patients) is established. The terms of reference for this group are: <ul style="list-style-type: none"> To develop a draft of a policy for the routine care of PD catheter exit site care Establish a timeframe for the dissemination of the draft policy and the return of comments from stakeholders
5	<ul style="list-style-type: none"> Once draft policy agreed to by stakeholders – policy then submitted to Health Service Clinical Practice Unit for ratification and formal approval to implement the changes.
6	<ul style="list-style-type: none"> On formal approval by Health Service Management changes are implemented by: <ul style="list-style-type: none"> Relevant staff education The education and dissemination of the new exit site care policy to patients and their carers
7	<ul style="list-style-type: none"> Evaluation of new policy and providing a report of the outcome to all stakeholders.

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the change, and by conducting nursing staff and patient satisfaction surveys to determine the understanding and compliance with the change. A discussion was held with all the stakeholders about the implementation of the change and if the staff need further education. Finally, an evaluation of the dissemination by how many guidelines were mailed out to patients and the number of staff that attended education.

Conclusion

There are many steps to the change process, however they are needed to ensure change is accepted and implemented with minimal resistance. This article has discussed change in relation to the introduction of new policy guidelines in relation to a change in the standard care which involved the use of a liquid antibacterial soap to cleanse the exit site and the use of mupirocin in identified at risk patients as a prophylactic measure to prevent ESI within the PD population. The use of a change theory model enabled the change to be introduced relatively easy. Clinical leadership is also vital in relation to clinical practice change, and this leadership is based upon the use of best practice research. The development of new guidelines for exit site care may optimise outcomes for the patient and health care service.

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