

Evidence-Based Nursing & Reducing Catheter-Associated Urinary Tract Infections

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Nursing practice is a constantly evolving profession that all the while keeps one goal in mind: the patient. Nursing in its earliest form was based on the need of physical and emotional comfort for the ill. Nursing as we now know it began in the mid 18th – mid 19th century and has continued to establish itself as a professional discipline (Taylor, 2011, p. 7). Within the last 20 years nursing has undergone another change in its practice. Evidence-based practice (EBP), also referred to as evidence-based nursing (EBN) within the profession, has come to the forefront of nursing care. Nursing literature now focuses on research proven best-practices that continue to support the one target of all nursing care, the patient.

Evidence-Based Practice In Nursing

Although Florence Nightingale referred to nursing research, it was not until a century later that nurses began receiving advanced nursing degrees and developing studies of nursing practices (ANA, 2010, p. 16). This beginning of nursing research in the early 20th century was the beginning of evidence-based practice in nursing. As defined by the American Nurses Association, EBP is “A scholarly and systematic problem-solving paradigm that results in the delivery of high-quality health care” (2010, p. 65). EBN blends current evidence, practice-generated data, expertise from a multidisciplinary team and patient values and preferences in an effort to achieve the best possible outcomes for patients (ANA, 2010, p. 16). The current body of research indicates that evidence-based practice, mixed with a good dose of caring, results in improved quality of care for patients thus, less varied and better patient outcomes.

History of Urinary Tract Infections

Urinary tract infections (UTI) have been recorded throughout history, as far back as ancient Egypt and they continue to be one of the most common infectious diseases to this day

(Nickels, 2005). It was not until the mid-19th century that UTI was understood to be the result of microorganisms. Even after knowledge of this microbial etiology, UTIs were not appropriately treated until the early 20th century with the advent of antimicrobial agents. As Nickels perfectly summarizes, “management of UTI has evolved from essentially palliative care to an efficient, evidence based strategy” (2005). As previously stated, UTI continues to be one of the most prevalent infectious diseases, yet the concern has now shifted to the prevalence of hospital acquired infections (HAI), specifically CAUTI.

Catheter-Associated Urinary Tract Infections

As defined by the California Department of Public Health (CDPH), a CAUTI is “a UTI where an indwelling urinary catheter was in place for >2 days when all elements of the UTI infection criterion were first present together” (2013). Approximately 1.7 million patients acquire an HAI and 36% of these infections are catheter-associated urinary tract infections (Finan, 2012). A number of risk factors have been identified, such as age, gender, length of catheterization, diabetes, malnutrition, and fecal incontinence as well as lack of policy/procedure implemented by the facility (CDPH, 2013). Although these risk factors exist, the biggest risk factor seems to be length of catheterization. Statistically, risk for UTI rises to 9.4% if an indwelling catheter remains in place for 2 days and increases by 5% for each day past that (Liljenstolpe, 2013). According to the CDPH CAUTI is the leading cause of secondary bloodstream infection, increases a hospital length of stay 2-4 days and can result in the overuse and resistance of antimicrobial agents. In addition, an estimated 69% of CAUTI can be prevented, approximately 380,000 annually (2013). Naturally, such a high prevalence and risk of complications is concerning, yet the major reason behind action to resolve CAUTIs is a result of payments The Centers for Medicare and Medicaid Services (CMS). As of October 1st, 2008,

facilities do not receive additional compensation to treat a CAUTI (Finan 2012). This termination in payment has resulted in an avalanche of research in an effort to find evidence-based practice in decreasing incidence of such HAIs.

Evidence-Based Practice To Resolve CAUTI

This influx of research has resulted in a mixed bag of techniques and protocols, many of which have been met with some success in reducing CAUTI. The Bladder Bundle is once such protocol, initiated by the Michigan Health and Hospital Association (MHA) that touches on the seemingly overarching themes of most CAUTI prevention recommendations. The five key practices of this protocol are:

1. Nurse-initiated urinary catheter discontinuation protocol.
2. Urinary catheter reminders and removal prompts.
3. Alternatives to indwelling urinary catheterization.
4. Portable bladder ultrasound monitoring.
5. Insertion care and maintenance. (Saint *et al*, 2009)

The first key practice, a nurse controlled catheter discontinuation, eliminates one step of the catheter removal process. According to the CDPH, physicians are frequently unaware of length of catheterization (75%) or even which of their patients are catheterized (>50%) (2013). This is by no means a critique of physician practices, but evidence that nurses are able to alleviate some responsibility from physicians, which will result in better patient care.

As previously stated, each day that an indwelling urinary catheter is left in place, risk of bacteriuria increases by 5%, adding up to 100% risk of infection by day 30 (CDPH, 2013). Implementation of catheter reminder and removal prompts will serve as another cue to physicians and/or nurses to reevaluate the current placement of a urinary catheter. This cue may

change the length of catheterization from 7 days to 4, 5, or 6 days, thus decreasing the chance of infection.

A major factor in CAUTI is inappropriate catheter use. The CDPH estimates that 10 – 30% of medical surgical, 60 – 90% of intensive care (ICU) and 5 – 10% of nursing home patients have a urinary catheter placed. Of the non-ICU patients, 40 – 50% have no medical/valid indication for urinary catheter use (2013). Facilities need to determine clear protocols and criteria to necessitate insertion of an indwelling catheter. The Center for Disease Control has developed a list of appropriate indications for indwelling urinary catheters. This list should be present in all facilities and protocol developed based upon these appropriate indications.

Bladder scanners are used to determine the amount of urine within the bladder. They can measure the amount of urinary retention and determine if decreased urine output is due to urinary retention or simply reduced urine in the bladder (CDPH, 2013). Determining whether urinary retention is an actual issue and how much urinary retention is present can help to decrease the use of indwelling urinary catheters or determine whether a catheter should be used long term or intermittently.

Lastly, the catheter insertion and maintenance is of the utmost importance. There are only two sources for bacteria causing a CAUTI: the own patients perineal flora and bacteria on the hands of personnel. Microbes can enter the bladder via the external surface or internal surface of the catheter (CDPH, 2013). Extraluminal contamination implies a breach in the aseptic technique of catheter insertion or improper cleansing of the catheter line post-insertion. Intraluminal contamination indicates a break in the closed drainage line or contamination of the urine collection bag. What all of this indicates is that only trained personnel should be inserting

and/or cleaning the catheter and its associated apparatus. Without proper aseptic and cleansing techniques, the catheter can easily be contaminated and bacteria can enter the bladder on the internal or external side of the catheter tubing.

In addition to the clear list of “Do’s”, the CDPH also compiled a list of procedures/techniques that have no evidence to support their use in preventing a UTI. These include, “Complex urinary drainage systems, routinely changing catheters or drainage bags, routine antimicrobial prophylaxis, cleaning the periurethral area with antiseptics, antimicrobial irrigation of the bladder [and] antiseptic/antimicrobial solution instillation into drainage bags” (2013).

Conclusion

This specific problem of CAUTI lends itself to being a great vessel for nursing driven research. Nurses are the medical personnel most closely taking care of the patients and are in the best position for conducting and monitoring such endeavors. Research continues to grow on a daily basis and thus incidences of such hospital acquired infections decrease. A chain reaction follows so that complications related to CAUTIs decrease, patient hospital length of stay decreases and finally, positive patient outcomes increase. All of the research that may seem to be conducted because of insurance compensation and money is ultimately done for the patient, the number one priority of every nurse.

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