Implementation of the FIRM (Foley Insertion, Removal, and Maintenance) protocol in skilled nursing facilities

Murthy Gokula [a] **and Phyllis M. Gaspar** [a 1]

[a] University of Toledo Health Science Campus, Toledo, OH 43614

The purpose of this study was to determine the feasibility and outcomes of the implementation of an evidence based protocol, Foley Insertion Removal and Maintenance (FIRM) for the use and care management of indwelling urinary catheters (IUC) for skilled nursing facilities (SNF). The protocol consists of an order set for insertion, maintenance, and removal complemented with an education program for health care providers of SNF. It was implemented over a six month period in two SNF. Prospective chart review following implementation revealed an 11.3 rate of IUC per month. Documentation of the indication for placement of an IUC was 98.5%. Retrospective chart review revealed a lower use of IUC prior to implementation of the protocol but the lack of documentation of orders for IUC artificially reduced the rate. FIRM protocol is advocated as a facility policy with a nurse champion to facilitate implementation and surveillance.

urinary catheters | skilled nursing facilities

The percent of skilled nursing facility (SNF) residents who have indwelling urinary catheter (IUC) over the last decade varies between 4.5-14 % of the resident population (1,2). This rate has remained static with similar rates reported in the 1990s (3,4). A retrospective study using the minimum data set (MDS) of 2003 found the prevalence of IUC to be 12.6% at admission and 4.5% at annual assessment ($p<.001$). Even though the prevalence may not be perceived as a major problem, the complications of IUC raise inappropriate use as a quality care concern.

The concern was addressed by the Centers for Medicare and Medicaid Services (CMS) with the lack of a valid medical justification for the use of IUC identified as a publicly reported quality measure (5,6,7). Quality standards indicate that residents entering a facility without a urinary catheter should not be catheterized unless an appropriate medical indication is present. Only four absolute indications for urinary catheterization beyond 14 days have been identified by CMS (7). These four indications are:

1. Urinary retention that could not be otherwise corrected and was characterized by post-void residual volumes greater than 200 mL;
2. Infeasibility of intermittent catheterization and persistent overflow, symptomatic infection or renal dysfunction;
3. Poorly healing Stage 3 or 4 pressure ulcers in which urine contamination impedes healing; and
4. Terminal illness or severe impairment when repositioning would be uncomfortable or painful.

Long term use of IUC is associated with increased risk of UTI and bacteremia with mortality three times higher than among non-catheterized residents (4,8,9). In studies of residents of SNF, the use of IUC has been found to increase the number of hospitalizations, duration of hospitalization, and use of antimicrobial drugs by three fold (8). Moreover, IUC are an added concern as they are one point restraints (10).

A recent study by Mody et al. (11) raises a concern about the adequacy of the knowledge of health care workers of SNF related to the evidence based recommendations in the use and care of IUC. The survey responses of 356 health care workers of seven SNF indicated that there were deficits in knowledge about several research based recommendations including: not disconnecting the catheter from its bag, not routinely irrigating the catheter, and hand hygiene after casual contact. Yet it was encouraging that over 90% of staff were aware of measures such as cleaning around the catheter daily, glove use, and hand hygiene with catheter manipulation.

Reports of a reduction in IUC as a result of implementation of comprehensive programs in acute care are numerous. However, reports about programs implemented in SNF are limited. Von Preyss-Friedman (12) implemented a QI project in a SNF focused on IUC and included guidelines for IUC use, follow up audit process, and an in-service of nursing staff. A reduction from 67 to 25 residents with an IUC was reported following the implementation. The reduction of IUC resulted in a decrease in the number of catheter associated urinary tract infections (CAUTIs). The FRIM protocol, which was successfully implemented in an acute care facility by the authors (13), and incorporated the approaches used by Von Preyss-Friedman, provided a strong foundation for changing practice based on evidence based systematic approaches for the SNF setting.

This study was conducted to determine the feasibility and outcomes of the implementation of the evidence based FIRM (Foley Insertion Removal and Maintenance) protocol revised for the SNF regarding the use and maintenance care of IUC in the long term care setting. The outcomes explored were the rate of IUC use, and documentation of indication for use and of care maintenance strategies. In addition the occurrence of CAUTI occurrence and associated antibiotic orders were explored.

FIRM Protocol

The FIRM Protocol was adapted for a SNF population from a FIRMS protocol developed and implemented by the authors in an acute care setting (13). The protocol includes the FIRMS (Foley Insertion, Removal, and Maintenance Sheet) order sheet, complemented with an education program for health care providers. The FIRMS is a one page document that provides the orders for use, removal and maintenance care (Appendix A). Following an order for the insertion of an IUC, the nurse reviews the FIRMS with the provider regarding indication, justification, alternative option and removal order. The back page of the FIRMS reviews key evidence based aspects of the care management of IUC. These key aspects are implemented in conjunction with the policy and procedures of the institution. (Appendix A).

The education program was offered for health care providers and licensed nursing staff members at each facility. The one hour pro-

[1] To whom correspondence should be sent: Phyllis.Gaspar@utoledo.edu

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gram included content on the indications for use, correct insertion and removal techniques, care management strategies and complications. The process for implementation of the FIRMS was discussed.

The FIRM Protocol (available as a supplementary file, Appendix A) was implemented following completion of the education session at each facility. The Director of Nursing was actively involved in implementation of FIRMS in each facility. The monthly use of the FIRMS order sheet was provided to the Director of Nursing for feedback purposes and to serve as part of the facilities quality improvement initiative.

Methods

This study used a prospective chart review to determine outcomes of the implementation of the FIRMS protocol. These outcomes are compared with the pre-intervention rates. Approval to conduct the study was obtained from the IRB of The University of Toledo. A retrospective review of charts of residents identified as having an IUC was necessary as there was a lack of documentation of prior data for comparison. Charts of residents identified through the infection control department and communication with nursing staff as having an IUC were reviewed for a 10 month period prior to the implementation of the protocol. A structured data collection sheet was used to record the documented order, indication for use, and care maintenance strategies. Following implementation of the protocol, chart review was conducted prospectively on a monthly basis for six months of residents identified as having an IUC. The data collected were the same as for the retrospective review.

Data were entered into a SPSS version 17 database. Frequencies and distributions were analyzed. Rates of IUC use were calculated based on bed occupancy rate for each facility and number of months of data collection. The rate of CAUTIs was calculated based on the number of IUC at each facility.

Setting. Two SNF in a Midwest metropolitan area served as settings for implementation of the FIRM protocol. The size of the facilities ranged from 135 to 164 beds with an average daily census of approximately 100 long term care residents and transitional care census of 38 and 46.5 residents respectively. Refer to Table 1 for facility characteristics.

Table 1: Characteristics of the facilities

Facility Characteristics	Facility 1	Facility 2
Profit/Nonprofit	Nonprofit	Profit
Total Beds	135	164
Skilled	135*	164*
Average daily census of skilled residents	38	46.5
Average daily census of non-skilled residents	103	104
Total admissions (Jan-June 2009)	192	472

*dual certified

Results

During the six month chart review following implementation of the protocol, 68 residents had an IUC for a rate of 11.3 IUC per month. The length of time the catheter was in place ranged from 1 to 330 days, with only three residents having an IUC for three days or less. Over two thirds of the IUC were in place for over 30 days indicating long term use. Sixty seven of the 68 (99.5%) catheters had a documented reason that met an acceptable criterion.

The retrospective chart review conducted for comparison purposes proved difficult. Even though a list of residents were identified as having an IUC, a search of their record many times proved unsuccessful in locating an order for the IUC, an indication for an order, a removal order, occurrence of a CAUTI or documentation of any care management strategies. For those with documented orders the retrospective review identified 52 residents of the SNF who had IUC over the 10 months (5.4/month) prior to the implementation of the FIRM Protocol. A rationale for IUC use was documented for only 37 of the 52 (69%) catheters placed.

It is important to note that care maintenance strategies, even though essential for prevention of complications of IUC, were not recorded either prior to implementation or following implementation of the protocol. These care strategies were indicated by the nurses as being completed but not documented. These findings indicate the need to have a specific order for each care strategy is essential if documentation is going to occur.

Discussion

The monthly rate of IUC use based on bed size indicated that 11.3% of the residents had an IUC following implementation of the protocol.. This rate is slightly lower than the admission rate reported by Rogers et al. (1) and of that found at the Department of Veterans Affairs (DVA) nursing homes (2). Rogers et al. (1) reported that upon admission the prevalence of IUC was 12.6% and that it decreased to 4.5% at the annual MDS review. Within nursing homes in the DVA system, 14% of residents were reported to have an IUC (2). The rate of IUC has decreased steadily since the implementation of CMS requirement tag F315 and this may be reflected in the lower rate of IUC use as the previous studies were conducted over three years earlier.

The lack of attention to the removal of IUC, especially when an indication was not provided, is of concern. A number of residents were admitted to the facility from an acute care setting with an IUC in place, with little or no documentation of when the IUC was inserted or a rationale for the placement. Without implementation of the FIRMS protocol the same situation would be allowed to continue and increased untoward effects of the IUC would needlessly occur.

The FIRM protocol incorporated elements that were evidence based as well as considered essential by CMS in reducing the use of IUC use among long term care residents. The order sheet provided a quick check to document IUC use. Attaining almost 100% documentation of rationale for catheter use resulted from implementation of the protocol and efforts of the inter-professional team. The collaboration of staff nurses and providers in recognizing the need to document rationale for IUC use contributed to this outcome. Education of licensed nurses and providers (MD and NP) increased their awareness of the potential inappropriate use of IUC as well as the evidence for management of IUC.

Several limitations contribute to the results of the study. The results of the study were contrary to the intent of the protocol implementation with an increase in the number of IUC documented. One factor attributing to these results is the increased awareness and attention to the documentation of IUCs by the nurses following the education program. The routine presence of the data collectors on the units doing the chart review may have contributed to use of the FIRMS and improved documentation of IUCs.

The method of the study is recognized as a limitation of the study. The retrospective chart review proved challenging for several reasons. First the identification of those residents who had IUC over the past ten months was difficult. Various methods for identification of residents retrospectively were used including the infection control list and informal lists kept by the nursing staff. During the process of the retrospective chart review the lack of identification of residents who were admitted from another setting with an IUC in place was recognized. Documentation of the insertion and removal of IUC was difficult to identify in the paper charts as was the occurrence of a

CAUTI and related treatment. As only code numbers were used to record data, the residents who were in the facility prior to and during implementation of the project were included in both samples; thus the increase in length of time the IUC was in place subsequently increased. It was also noted that during the period of implementation the facilities increased the number of residents at a higher level of acuity. The increased acuity potentially contributed as residents were transferred from the hospital for recovery and rehabilitation without the discontinuation of an IUC they already had in place.

One important aspect of the FIRM protocol is the maintenance IUC care. The implementation of this aspect of the protocol was unable to be evaluated as there was no documentation available of this level of care.

Recommendation. The implementation of the FIRM protocol as an systemic approach was successful in increasing the staff awareness of the need for a documented order for an IUC. The orders with rationale for use of IUC reached over 99% following implementation of the protocol. This is the first step in ensuring the appropriate use of an IUC.

Implementation of a policy to address the problem of inappropriate use of IUCs in SNF would include the following essential elements: a) an order set that addresses rationale for placement, removal, and maintenance care, b) a documentation process of maintenance care, and c) an assessment process of those with IUC on admission to the facility to determine if use is appropriate. In addition to the policy, the appointment of a nurse champion for ensuring the implementation of the policy is critical. The development of electronic health records in SNF has potential to facilitate implementation of the policy with triggered drop down menu prompts. A review of the surveillance for IUC use and CAUTIs is advocated to ensure adherence to the policy. This study provides the basis for revisions to the protocol to facilitate further testing of implementation of the FIRM protocol in SNFs. The knowledge gained in implementation of the protocol as well as the method of data collection was incorporated into a currently funded study.

Conclusion. Inappropriate use of IUC contributes to serious economic and quality of care issues and needs to be addressed. The FIRM protocol can serve as one example of a systemic approach to guide implementation of best evidence for the use and care of IUC for residents of long term care facilities. Further research to establish the validity of the FIRM protocol in a perspective study design with a control group is in order.

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Appendix A

FIRMS: Foley Insertion, Removal and Maintenance Sheet

Note: Protocols do not replace clinical judgment and should be modified according to individual resident needs.

INDICATIONS FOR INSERTION Mark box for rationale for insertion and use:

Absolute Acute Indications:	**Relative Indications:**
☐ Obstruction distal to the bladder.	☐ Morbid obesity >400lbs
☐ Alteration in blood pressure or volume status	☐ Continuous epidural anesthesia
☐ Worsening renal failure	☐ Congenital urologic abnormalities.
☐ Continuous bladder irrigation	☐ Other_____
☐ Neurogenic bladder.	

OR

CMS Justifiable Indications beyond 14 Days (Tag F315):

- ☐ Urinary retention that could not be otherwise corrected and was characterized by post-void residual volumes greater than 200 mL
- ☐ Infeasibility of intermittent catheterization and persistent overflow, symptomatic infection or renal dysfunction
- ☐ Poorly healing Stage 3 or 4 pressure ulcers impaired with contamination with urine
- ☐ Terminal illness or severe impairment of whom reposition would be uncomfortable or painful

Other indication not listed:

If your reason for urinary catheter is not listed in the appropriate indications, resident may not need a urinary catheter. Please reconsider decision.

REMEMBER: Catheters are one point restraints, longer it stays the higher risk of infection!

Alternatives for Bladder Management Mark box of alternative to use:

- ☐ Condom catheter
- ☐ Bladder toileting program (TAN)
- ☐ Dementia residents: Check and change strategy
- ☐ Bedside urinal
- ☐ Prompted voiding
- ☐ Intermittent straight catheterization(ISC) briefs

MAINTENANCE CARE ORDER

☐ Systematic Evidence Based Protocol (SEBP) to be followed for initiation, maintenance and removal of urinary catheter (Refer to back page for key care maintenance points and to Policy and Procedure Manual for details).

REMOVAL ORDER:

- ☒ Remove catheter post insertion (48 hours) unless otherwise stated by physician
- ☒ Reminder will be placed in the chart for Foleys continued ≥ 48 hours. The remainder will be signed for continued use of urinary Catheter
- ☒ Systematic Evidence Based Protocol (SEBP) to be followed for initiation, maintenance and removal of urinary catheter ***(Details in Policy and Procedure Manual)***
- ☐ Bladder ultrasound protocol will be followed following discontinuation of the catheter. OK for nurse directed ISC ***(Details in Policy and Procedure Manual)OR follow defined protocol developed by physician preference***

Physician Signature _____ *Date & Time* _____

Physician Printed Name _____ _____

RN Signature _____ *Date & Time* _____

RN Printed Name _____

Key Maintenance Care Orders (Refer to Policy and Procedures Manual and Standards of Care for Details)

1) Wash hands before/after catheter care

2) Catheter system is a sterile environment and a closed system needs to be maintained.
    i) If necessary to open the system strict aseptic technique needs to be followed.
    ii) Use the distal emptying spout to empty the drainage bag. Avoid contamination of the distal emptying spout by preventing contact with any surface. Cleanse the distal end of the emptying spout with an alcohol wipe before reinserting it into the holder.
    iii) Cleanse the catheter/drainage bag junction with an alcohol wipe prior to changing to the leg bag and/or drainage bag.

3) Provide perineal catheter care every shift and as needed (following any possible contamination). This is a clean procedure. Routine cleaning of the meatal area with antiseptic solutions should be avoided.

4) Excessive manipulation of the catheter is to be avoided. Motion of the catheter at the urethral junction may increase the risk of infection.
    i) Anchor the catheter to the resident's thigh. Anchor the suprapubic catheter to the abdomen.
        (i) Allow slack on the catheter between the meatus and the tape.
        (ii) Change the anchoring site daily to prevent skin breakdown.
        (iii) If desired, a Foley catheter leg strap holder can be used to anchor the catheter. The leg strap site should also be changed daily - alternate legs.

5) Position the drainage bag below the level of the bladder. Assure that there are no kinks or dependent loops in the tubing. Attach the drainage bag to the bed, NOT the side rail.

6) Check that urine flow in the tube is unobstructed on routine basis.

7) Collection of urine:
    i) Small sample -Collect from the sample port with a sterile needle and syringe after cleansing the port with disinfectant. Send the urine specimens for culture to the lab promptly.
    ii) Larger sample -Collect from drainage bag for special analyses using aseptic technique.

8) Use separate container for each resident to drain the collecting bag. Do not touch the draining spigot to the collecting container

9) Cross infection can be minimized by clustering residents with urinary catheter associated infections

10) Monitor for Signs/Symptoms of UTI routinely:

New onset Flank pain	Fever $\geq$100.3° F
Rigors	Hypertension
Change of Condition	Delirium
Recent catheter obstruction	

11) Use Bladder Ultrasound Protocol following removal of catheter:
    i) Initiate bladder ultrasound protocol if resident has not voided 4-6 hours after catheter removal
        (a) If ultrasound urine volume is less than 250 ml reassess in 2 hours
        (b) If ultrasound volume >250 encourage to void into a bedpan or lavatory
            1. Measure voiding volume and record
        (c) If not able to void and
            1. volume is <400 ml continue observation for 2 hours
            2. volume >400 ml perform intermittent straight catheterization and record urine volume

12) Assess daily need and obtain order for removal when no longer needed

13) Removal of catheter
    i) Allow catheter balloon to deflate passively without aspiration.
    ii) Do not cut off the inflation port

Remember to document the care of urinary catheter