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Improving Infection Management of the Institutionalized Elderly

Jovel Angela Viloría Broqueza

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Title: Improving Infection Management of the Institutionalized Elderly

Author: Jovel Broqueza, MSN, APN, FNP-BC

Introduction of the Problem

The CDC recommends the use of a systematic assessment tools for recognizing and controlling long-term care facility (LTCF) infection (NHSN, 2017). The lack of guidance, training, and use of appropriate protocols or algorithms for health care provider (HCP) contribute to escalating infection rates, hospital transfers, and health care costs (Ouslander et al., 2016). No algorithm was in use for managing common sources of infection at one urban Midwestern LTCF. With the complexity of infection in the elderly population, an algorithm is needed to guide staff in the assessment of signs and symptoms of infection, facilitate timely communication to PCP, and provide targeted interventions that can prevent complications, reduce hospital transfers, and improve patient outcomes.

Literature Review

By 2030, the number of institutionalized elderly >65 years old will reach approximately 5.3 million (Knickman & Schnell, 2002), doubling its population. The "frail elderly" are very old with age-related immunologic changes, cognitive and/or functional impairments, and chronic diseases that alter host resistance increasing their risks of infections. LTCFs which include nursing homes, skilled nursing facilities (SNF), assisted living, and group homes are utilized for intermediate, skilled services or both to meet the elderly's functional deficit prior to being discharged back to the community. However, due to longer post-acute confinement and functional decline, many elderly are ultimately institutionalized. Infection remains one of the top five reasons for older adult hospital transfers (Englert & Ross, 2015). Chronic conditions such as chronic obstructive pulmonary disease, diabetes mellitus,

cardiovascular disease, degenerative joint diseases increase infection susceptibility, acuity, hospital transfers, mortality, and health care expenditures (Juthani-Mehta & Quagliarello, 2010; Esper et al., 2006). The three most common infection sources in nursing homes are pneumonia, urinary tract infection (UTI), and skin and soft tissue infection (SSTI) (Novossad, et al., 2016; Juthani-Mehta & Quagliarello, 2010).

Pneumonia

The Centers for Disease Control and Prevention (CDC) considers pneumonia the leading infection cause of hospitalization and death (Curns et al., 2005; Jackson et al., 2004) with an average hospitalization cost of approximately \$10,000 per admission (Konetzka et al., 2004). Pneumonia incidence is augmented in residents with feeding tubes (Wang et al., 2011), seasonal respiratory infections such as flu or RSV, risks of aspiration pneumonia (Montoya & Mody, 2011), and periodontal diseases and dental plaques (Quagliarello et al., 2005). With limited access to diagnostic procedures and delayed evaluation of the patient condition, the institutionalized elderly is at higher risk of complications from infection if left untreated (Montoya & Mody, 2011; High et al, 2009).

UTI

UTI is the second most common infection in the institutionalized elderly (Curns et al., 2005) and costliest infection among Medicare beneficiaries due to the pervasive use of empirical antibiotics (Litwin et al., 2005). Insertion of indwelling catheters and longer periods of urinary device placement, increase the chance of developing bacteriuria with and without UTI symptoms. Institutionalized elderly adults with dementia, functional limitations, and immunocompromised, often have atypical symptoms that are more difficult to decipher from true signs of infections. Recognizing early nonspecific, vague clinical presentation in elderly adults requires

comprehensive assessment skills that promote prompt treatment, thus reducing complications. However, due to limited clinical assessments and attempts to prevent complication, aggressive use of antibiotics often results in bacterial colonization and multi-drug resistant organisms (MDROs) (Rogers et al., 2008).

SSTI

Due to age-related bodily changes including diminished skin integrity, the frail elderly are more vulnerable to SSTI. Skin breakdown from skin tears, pressure ulcers, pruritus, skin infestations such as scabies or herpes zoster, and chronic wounds from debilitating conditions favors bacterial infection. If LTC staff lack prudence in recognizing signs of infection, SSTI can be easily underestimated and not treated promptly resulting in cellulitis, osteomyelitis, necrotizing fasciitis, and erysipelas.

Health care providers (HCPs) of the LTCF face a burden in managing infection of the institutionalized elderly. Studies reveal the benefits of using a clinical pathway for infection for decreased rates of morbidity and reduced hospital transfers (Ouslander et al., 2016; Loeb et al., 2006; Loeb et al., 2005). LTCF staff members need guidance in identifying the overt and subtle signs suggesting infection. However, ensuring its feasibility requires nurse practitioners and other health providers to play a key role collaborating with other LTC staff in bolstering the NHSN and IDSA guidelines in the control and prevention of infection among institutionalized elderly.

Project Methods

The primary purposes of this DNP project were to establish best clinical practice guidelines for infection recognition and management and to determine the effectiveness of algorithm usage in managing infection of the institutionalized elderly. The setting was a 110 bed

SNF in a large suburban Midwest town. The project intervention targeted the SNF staff which includes a healthcare team of nurses, certified nursing assistants (CNA), a Director of Nursing (DON), in-house nurse practitioners (NPs)/physician assistant (PAs), and physician, and other healthcare providers and specialists who visit specific patients. A proposal to conduct research involving human subjects entitled “Human Subjects DNP Project,” was submitted and reviewed by the Institutional Review Board (IRB) at Southern Illinois University and Edwardsville and found to be exempt from IRB review on April 11, 2018.

This project implemented the use of evidence-based infection identification methods and algorithm protocols for early recognition and treatment of pneumonia, UTI, and SSTI. The algorithm, based on the updated McGreer criteria (Stone et al., 2012), provided guidance in recognizing the presence of infection. Signs and symptoms were grouped into three categories-- fever, acute mental status changes, and acute functional decline.

Prior to project implementation, focus groups were convened at the SNF to determine current infection recognition and management practices. Focus questions were used to determine SNF's staff (PCPs, NPs/PAs, nurses, CNAs) usual care in recognizing and managing infection. Focus group sessions were presented before and after project implementation to 8 nurses, 4 CNAs, 4 NPs, and the Medical Director to gain feedback about project implementation and algorithm usage. Educational in-service sessions to introduce the algorithm project in late May 2018 were offered to NPs, nurses, and CNAs at the facility. A 30-minute face-to-face session was conducted on all three shifts at the facility. In addition, the project leader met with the SNF's medical director to familiarize the physician with the algorithms and protocol implemented for this project. The algorithms were available on each patient care floor from May 10, 2018, to June 10, 2018 for nurses' use when acute changes in patients were reported by CNA or identified

by nurses. The staff member initiating the algorithm communicated identified criteria with the in-house HCP to verify his or her assessment. Communication or orders received from the HCP, such as orders for a chest x-ray or laboratory tests, were documented on the algorithm. Upon receipt of test results validating the presence of infection, the nurse secured treatments or plan of care from the PCP such as initiating antimicrobial agents. When a patient's condition is unstable, the patient is transferred to acute care hospital for further treatment. All treatment plans were indicated in the algorithm and documented in the electronic medical record (EMR). The nurse completing the algorithm indicated the source of infection (pneumonia, UTI, SSTI, others) listed and signed the algorithm. Information gained from the algorithms was compared to the facility's March 2018 infection incidence.

Evaluation

The total incidence of infection within a 30-day period using the infection algorithm significantly increased to twofold. Among the three common sources of infection, UTI significantly increased to 6% from less than 1%. SSTI and pneumonia remained increased by almost 1%. Among the algorithms utilized, 80% sensitivity to infection was identified and 20% specificity (no infection and cardiac related). However, there was no complication identified that required hospitalization.

Impact on Practice

The completion of this DNP project is a step toward the implementation of NHSN that allows LTCF to track down infections. Practice change with the use of algorithm promotes staff awareness in infection management requiring cultural shift among HCPs, stakeholders, and PCPs to overcome barriers that can prevent complications of infection. At the LTCF, HCPs and stakeholders were supportive and adherent to algorithm use. Although improvement in infection

documentation and accurate infection tracking was facilitated, shared goal approaches to improve interprofessional collaboration with stakeholders were required. A laminated algorithm is currently available in all nursing stations used as a reference tool for nurses in infection surveillance and management.

Additional research is recommended to determine evidence-based practice algorithms and protocols that will increase sensitivity and specificity in infection surveillance. In addition, acuity in LTCF must be re-evaluated to address workload that will meet the increasing need of a sicker and frail institutionalized elderly. The algorithm used in this DNP project provided guidance to LTCF staff members in mitigating complications of infection, reduce hospital transfer, and improve patient outcomes.

Conclusions

The aim of this DNP project was to prevent infection complication, reduce hospital transfers and improve patient outcomes of the institutionalized elderly by utilizing an algorithm in infection surveillance. During the 30-day algorithm implementation period, early recognition and timely management of infection was facilitated and prevented infection complications that required hospital transfer. Loeb et al (2006) also noted a 12% hospitalization rate reduction when clinical pathway was used to nursing home patients ages >65. However, a strong interprofessional collaboration with the stakeholders in sharing this vision is necessary to promote the use of algorithm to promote practice change. Algorithm integrated into the EMR facilitates documentation and infection tracking. Evaluating patient acuity in the LTCF for thoughtful use of staff improves patient outcomes and staff retention. Limitation of the study includes the exclusion of gastrointestinal infections that affect LTCF mortality and morbidity. Staff use of algorithm was limited to nursing units with a higher incidence of infection only.

Continuity of care remains a challenge due to staffing issues and the growing complexity of the elderly population residing in LTCF. Length of study of more than 60 days and addressing barriers in promoting practice change using an algorithm is recommended.

Author Contact Information: Jovel Broqueza @jbroque@siue.edu