



Prevention of Health Care-Associated Infection in Long-Term Care Facilities



LONG-TERM CARE FACILITIES

I. INTRODUCTION

A. Overview

This chapter provides a guide to identify and prioritize efforts for the prevention of health care-associated infections (HAIs) in long-term care facilities (LTCFs). It is an addition to the original *National Action Plan to Prevent Health Care Associated Infections: Road Map to Elimination* (HAI Action Plan) and constitutes Phase Three of the HAI Action Plan. The chapter represents a culmination of several months' deliberation by subject matter experts across the U.S. Department of Health and Human Services' (HHS) operating and staff divisions, including the Administration on Aging (AoA), a component of the Administration for Community Living (ACL); Agency for Healthcare Research and Quality (AHRQ); Centers for Disease Control and Prevention (CDC); Centers for Medicare & Medicaid Services (CMS); Health Resources and Services Administration (HRSA); Indian Health Services (IHS); Assistant Secretary for Planning and Evaluation (ASPE); and Office of the Assistant Secretary for Health (OASH) along with representatives from the Department of Defense (DoD) and Department of Veterans Affairs (VA). The LTCFs Chapter is also offered to the Federal Steering Committee for the Prevention of Health Care-Associated Infections as a starting point for determining policy direction, quality improvement guidelines and further areas of research that will benefit those residing in LTCFs.

HAIs are a leading cause of death in the United States and cause needless suffering and expense. At any given time, about one in every 20 hospitalized patients has an HAI, and more than one million HAIs occur every year. Although these data are specific to acute care hospital patients, HAIs can occur in any health care setting, including LTCFs.

LTCFs are defined as facilities providing a spectrum of institutional health care programs and services outside the acute care hospital. Since the publication of Phase One of the HAI Action Plan in 2009, which focused on the acute care setting, awareness of the need for a chapter to address LTCFs has grown. HAIs can worsen health status and increase health care costs. This chapter will review the current state of HAIs in LTCFs, current promising practices in infection control, and surveillance data sources and will propose priority measures and goals to guide federal HAI prevention initiatives in LTCFs.

B. Burden of HAIs in LTCFs

For the purposes of this document, several terms will be defined. "Nursing home" (NH) is the term used to describe a nursing facility providing primarily long-term maintenance and restorative care for individuals needing support with their activities of daily living. Skilled nursing facilities (SNFs) are defined as facilities offering more intensive medical and nursing services, such as subacute care, but not as intensive as acute care hospital levels. The vast majority of certified nursing homes in the U.S. provide a combination of long-term nursing care or restorative services and skilled nursing services. We are combining the terms "nursing homes"

and “skilled nursing facilities” (NHs/SNFs) to represent this health care provider setting. CMS classifies NH/SNF residents as “short-stay” with a length of stay anticipated to be less than 100 days or “long-stay” with a length of stay greater than 100 days.

In 2000, it was estimated that the burden of HAIs ranges from 1.6 to 3.8 million infections among 1.5 million Americans in 16,700 U.S. NHs/SNFs every year.¹ Data used to calculate these burden estimates were limited to reports from research studies involving small numbers of facilities using different methodologies to define HAIs. Additionally, these studies represent NHs and SNFs exclusively and were conducted more than 10 years ago. Data are lacking from other long-term care settings, such as assisted living facilities, residential care facilities, and independent senior living communities. These burden estimates, therefore, may not reflect the current population residing within the full spectrum of LTCFs.

More recent estimates of the rates of HAIs occurring in NH/SNF residents range widely from 1.4 to 5.2 infections per 1,000 resident-care days.^{2,3} Extrapolations of these rates to the approximately 1.5 million U.S. adults living in NHs/SNFs suggest a range from 765,000 to 2.8 million infections occurring in U.S. NHs/SNFs every year.⁴ Given the rising number of individuals receiving more complex medical care in NHs/SNFs, these numbers might underestimate the true magnitude of HAIs in this setting. Additionally, morbidity and mortality due to HAIs in LTCFs are substantial. Infections are among the most frequent causes of transfer from LTCFs to acute care hospitals and 30-day hospital readmissions.^{5,6} Data from older studies conservatively estimate that infections in the NH/SNF population could account for more than 150,000 hospitalizations each year and a resultant \$673 million in additional health care costs.⁵ Infections also have been associated with increased mortality in this population.^{4,7,8} Extrapolation based on estimates from older publications suggests that infections could result in as many as 380,000 deaths among NH/SNF residents every year.⁵

¹ Strausbaugh LJ, Joseph CL. The Burden of Infection in Long-Term Care. *Infect Control Hosp Epidemiol* 2000; 21: 674-679.

² Pennsylvania Patient Safety Authority. 2009 Annual Report.

³ Koch AM, Eriksen HM, Elstrøm P, Aavitsland P, Harthug S. Severe consequences of healthcare-associated infections among residents of nursing homes: a cohort study. *Journal of Hospital Infection* (2009) 71, 269-274.

⁴ Strausbaugh LJ, Joseph CL. The Burden of Infection in Long-Term Care. *Infect Control Hosp Epidemiol* 2000; 21: 674-679.

⁵ Teresi JA, Holmes D, Bloom HG, Monaco C & Rosen S. Factors differentiating hospital transfers from long-term care facilities with high and low transfer rates. *Gerontologist*. Dec 1991; 31(6):795-806.

⁶ Ouslander JG, Diaz S, Hain D, Tappen R, Frequency and Diagnoses Associated With 7- and 30-Day Readmission of Skilled Nursing Facility Patients to a Nonteaching Community Hospital. *J Am Med Dir Assoc* 2011; 12: 95-203.

⁷ Boockvar KS, Gruber-Baldini AL, Burton L, Zimmerman S, May C & Magaziner J. Outcomes of infection in nursing home residents with and without early hospital transfer. *J Am Geriatr Soc*. Apr 2005; 53(4): 590-596.

⁸ Ahmed AA, Hays CL, Liu B, et al. Predictors of in-hospital mortality among hospitalized nursing home residents: an analysis of the National Hospital Discharge Surveys 2005-2006. *J Am Med Dir Assoc*. Jan 2010; 11(1):52-58. Epub 2009 Dec 10.

C. Scope of Long-Term Care Settings in the National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination

Taking into account the heterogeneity of resident populations in different LTCFs, as well as differences in oversight, staffing levels, and payment incentives, we decided to focus on NHs and SNFs for the first iteration of this chapter. The ultimate goal is to develop a more comprehensive federal HAI prevention schema for the entire spectrum of LTCFs.

Because this chapter is intended to best guide current and future federal efforts in HAI prevention in LTCFs, the Federal Steering Committee's for the Prevention of HAIs LTCFs' Working Group decided upon an approach that would allow for the discussion of various infections and metrics. This discussion led to a chapter that is limited in scope. We have decided to focus on the NHs and SNFs settings and five priority areas and goals: National Healthcare Safety Network (NHSN) enrollment, urinary tract infections/catheter-associated urinary tract infections (UTIs/CAUTIs), *Clostridium difficile* infection (CDI), resident influenza and pneumococcal vaccination, and health care personnel influenza vaccination. These are intended not as a final goal but as a first step.

Other settings and HAIs that are discussed in this chapter are intended to provide background on the current status of HAIs in LTCFs. Although we have chosen not to focus on these other settings and issues in this iteration, we understand their importance and the potential for HAI occurrence in these settings, as demonstrated by numerous outbreaks of viral hepatitis infections in assisted living facilities due to unsafe blood glucose monitoring practices in that setting.^{9,10} We have focused on a select group of infections in certain settings, but we understand that fundamental infection prevention practices, such as hand washing, will aid in reducing HAIs in any setting.

II. DESCRIPTIONS OF LONG-TERM CARE SETTINGS

A. Understanding Long-Term Care

Establishing guidelines for an appropriate approach to infections in LTCFs is complicated by the heterogeneity of these settings and the patient populations residing in them. Varying terms and degrees of inclusiveness make it difficult to provide a single definition of long-term care. Therefore, we will use the Medicare definition. Medicare defines long-term care as “a variety of services that include medical and non-medical care that supports both the health and personal care needs of individuals who may have a chronic illness or are living with a disability, either

⁹ Thompson ND, Barry V, Alelis K, Cui D & Perz JF. Evaluation of the potential for bloodborne pathogen transmission associated with diabetes care practices in nursing homes and assisted living facilities, Pinellas County. *J Am Geriatr Soc.* 2010; 58(5); 914-8.

¹⁰ Patel AS, White-Comstock MB, Woolard CD & Perz JF. Infection control practices in assisted living facilities: a response to hepatitis B virus infection outbreaks. *ICHE*; 30(3);209-14.

physical or intellectual. Long-term care services support individuals in their activities of daily living (ADLs), and provide assistance in typical tasks such as bathing, dressing and eating.”¹¹

These various combinations of services can be stratified in a number of ways — by regulating body (state or federal), by location of the services, by the level of care or length of time support is provided, or by the goal of the care.^{12,13} The goal for care of some residents of LTCFs, especially those in NHs, may be to maintain their health and functional status by addressing their health care and ADL needs, whereas for others it might be to maximize dignity and comfort as their health and functioning decline. In other settings, the goal of care may be to provide transitional support until an individual’s return to a community setting (skilled nursing/sub-acute rehabilitation) or to maintain independence and connection to community living (home health services or community-based long-term services and support). Another goal of long-term care may be to provide respite for informal caregivers (e.g., adult day services).

B. Long-Term Care Settings

Long-term care services are delivered in a variety of settings and provide various levels of support across the continuum of care. The blending of services and workforces will continue to span many long-term care settings as new models of care emerge and technology allows for delivery of complex care in a greater number of environments outside of traditional health care facilities.^{14,15}

We are focusing on LTCFs. However, it is important to be able to view LTCFs within the context of the continuum of long-term care services. The processes for setting standards, monitoring outcomes and evaluating quality of care in these arenas are related. To define the scope of this strategic action plan for addressing HAIs in LTCFs, we examined three common settings along the continuum of LTCF services and categorized frequently used settings within each one ([Appendix A](#)):

Facility-Based Long-Term Care

At a minimum, these models or settings provide housing for individuals needing long-term care support, but level of support can range from minimal support for ADLs to full 24-hour skilled nursing care. A main feature of facility-based long-term care is optimizing the

¹¹ What is Long-Term Care? (n.d.) Retrieved August 11, 2011, from Medicare

¹² Plochg T, Deloij DMJ, van der Kruk TF, Janmaat TACM, Klazinga NS. Intermediate care: For better or worse? Process evaluation of an intermediate care model between a university hospital and a residential home. *BMC Health Services Research*. May 2005; 35(5).

¹³ Transitions of Care in the Long-term Care Continuum, AMDA Clinical Practice Guideline, 2010.

¹⁴ Plochg T, Deloij DMJ, van der Kruk TF, Janmaat TACM, Klazinga NS. Intermediate care: For better or worse? Process evaluation of an intermediate care model between a university hospital and a residential home. *BMC Health Services Research*. May 2005; 35(5).

¹⁵ Leff B, Burton L, Mader SL, Naughton B, et al. Hospital at home: Feasibility and outcomes for a program to provide hospital-level care at home for acutely ill older patients. *Annals of Internal Medicine*. Dec. 2005; 143(11): 798-808.

functional status of residents.¹⁶ Also, many models of facility-based care provide a scale of services that allows for an increasing level of support without having to transfer to another facility.¹⁷ Continuing care retirement communities, which may include independent living, assisted living, and certified NFs on the same campus, are examples. These settings may be regulated at the state or federal level or both (for NHs).

Home- and Community-Based Supports and Services

The major goal of home-based supports and services is to maintain and support independence and community living. This goal is accomplished through the provision of various social and clinical services in an individual's home or residential setting. In many states, home- and community-based supports and services also are furnished in some facility-based settings, such as assisted living and board and care residences, with the goal of supporting maximum independence and avoiding transfer to a higher, more expensive level of care. Home- and community-based long-term supports and services also combine formal workforce supports and services with informal caregiver support.^{18,19} Services can include personal care services (assistance with ADLs), home health, skilled nursing, and many others.^{20,21} As technology becomes more accessible and is combined with improvements in medical care, more care will be provided formally (through paid support) in the home and supported by increased financial resources for home-based care. The Money Follows the Person Demonstration, the Balancing Incentive Program, Health Homes Demonstration, Independence at Home Demonstration, Community First Choice, and Person-Centered Medical Homes are examples. As these programs continue to develop and evolve, their defining qualities, such as workforce, training, and HAI prevention, will further blend the continuum of long-term care settings.

Bridge or Substitutive Care

This term refers to models of care that span settings and bridge between medical and social service needs or allow for facility-based levels of care to be provided in community-based

¹⁶ Transitions of Care in the Long-term Care Continuum, AMDA Clinical Practice Guideline, 2010.

¹⁷ Sanders, J. Continuing Care Retirement Communities: A Background and Summary of Current Issues, Department of Health and Human Services, 1997.

¹⁸ Skarupski KA, McCann JJ, Bienias JL, Wolinsky FD, et al. Use of home-based formal services by adult day care clients with Alzheimer's disease. *Home Health Care Service Q.* 2008; 27(3): 217-239.

¹⁹ Davey A, Femia EE, Zarit SF, Shea DG, et al. Life on the Edge: Patterns of formal and informal help to older adults in the United States and Sweden. *Journal of Gerontology: Psychological and Social Sciences.* Sept. 2005; 60(5): S281-88.

²⁰ Definitions & Need of LTC (n.d.) Retrieved September 27, 2011, from The National Clearinghouse for Long-Term Care Information

²¹ Types of Long-Term Care (n.d.) Retrieved August 11, 2011, from Medicare

settings.^{22,23} Models such as adult day care incorporate various levels of medical care and social support that have been evaluated to varying degrees.²⁴ Medically oriented models, such as the Program of All-Inclusive Care for the Elderly (PACE), provide in-home medical care to individuals needing NH/SNF levels of support. Other socially oriented models feature a main goal of providing support to both the individual and caregiver and provide social interaction, personal care services, and chronic disease management.^{25,25} Respite care, or “care provided in the home or facility intermittently in order to provide temporary relief to a family home care giver,” is an additional example of a type of long-term care service that may span settings but supports an individual’s goal to remain in a community residential setting.²⁶

C. Differentiating Long-Term Care and Post-Acute Care

The Medicare payment structure identifies four post-acute care providers (i.e., services following acute care hospitalizations): long-term care hospitals (LTCHs), inpatient rehabilitation facilities (IRFs), NHs/SNFs and home health agencies (HHAs).²⁷ With the exception of HHAs, all of these are considered to be LTCFs. LTCHs, also known as long-term *acute* care hospitals, provide complex medical services to a population more comparable to an acute care intensive care unit (ICU) population than those receiving traditional long-term care. Similarly, IRFs, also referred to as *acute* rehabilitation facilities, provide intensive rehabilitation services, which differentiates them from the sub-acute rehabilitation provided in NHs and SNFs. Although the population in these post-acute care settings has overlapping long-term care service needs, the differences in acuity and complexity of care delivered and resources available in LTCHs and IRFs make them separate and distinct from the traditional settings of long-term care.

III. STATUS OF HAIs AND INFECTION CONTROL IN LONG-TERM CARE

A. Epidemiology of HAIs in Long-Term Care

Although the long-term care setting covers a broad array of facility types and services, the majority of HAI data available in the U.S. relates to NH/SNF residents. A recent study reported the prevalence of NH/SNF-associated infections to be 5.3% based on a single-day point

²² Ploch T, Deloij DMJ, van der Kruk TF, Janmaat TACM, Klazinga NS. Intermediate care: For better or worse? Process evaluation of an intermediate care model between a university hospital and a residential home. *BMC Health Services Research*. May 2005; 35(5).

²³ Leff B, Burton L, Mader SL, Naughton B, et al. Hospital at home: Feasibility and outcomes for a program to provide hospital-level care at home for acutely ill older patients. *Annals of Internal Medicine*. Dec. 2005; 143(11): 798-808.

²⁴ Baumgarten M, Lebel P, LaPrise H, LeClerc C, Quinn C. Adult day care for the frail elderly: Outcomes, satisfaction, and cost. *Journal of Aging and Health*. May 2002; 14(2): 237-59.

²⁵ Hartle, M., Jensen, L. (n.d.) *Planning and Creating Successful Adult Day Services and Other Home and Community-Based Services* [White paper].

²⁶ MeSH, 1985.

²⁷ Medicare Payment Policy, MedPAC report March 2011.

prevalence survey.²⁸ The mandatory public reporting system for NHs in Pennsylvania published the most recent data available on incidence of HAIs in NHs. That state reported an overall incidence of 1.4 infections per 1,000 resident days based on data from 645 NHs over a six-month period.²⁹ This rate is considerably lower than those reported by epidemiologic studies in NHs, where incidence ranges from 3.6 to 5.2 infections per 1,000 resident days.^{30,31} These differences may be accounted for by differences in definitions used, differences in facility types, and how and why data were collected (i.e., for research versus for public reporting).

However, among all these studies and reports, the most commonly reported HAIs in NHs are UTIs, lower respiratory tract infections (LRTIs), skin and soft tissue infections (SSTIs), and gastroenteritis (GE).^{32,33,34} Cases of LRTI can be further broken down into influenza-like illness and pneumonia, whereas most cases of GE are due to either CDI or outbreaks of norovirus GE. Although some studies reported data on blood-stream infections in NHs, no recent data could be found on the incidence or prevalence of central-line-associated blood stream infections (CLABSIs) in NHs or current estimates of central-line use in this setting.³⁵

B. Pathogenesis of Infections in Older Adults

CMS reports that in 2009, 84.8% of LTCF residents in CMS-certified NHs/SNFs were 65 years old or older, and 36.9% were 85 or older.³⁶ Many factors contribute to the severity and frequency of infections in the geriatric population, including limited physiologic reserve, defects in host defenses, higher rates of coexistent chronic diseases (i.e., Type 2 diabetes, chronic obstructive pulmonary disease [COPD]), increased risk of poor nutrition and loss of functionality and mobility, poorer responses to therapy, increased frequencies of therapeutic toxicity (secondary to increased rates of liver and renal failure), and complications from invasive diagnostic procedures. The older adults residing in NHs/SNFs face the additional risks of infection from exposure to multidrug-resistant pathogens, delays in diagnosis and therapy, and complications from treatments. Symptoms of infections also may be absent or present in vague or atypical ways compared with younger populations.

²⁸ Tsan L, Langberg R, Davis C, Phillips Y, Pierce J, et al. Nursing home-associated infection in Department of Veterans Affairs community living centers. *American Journal of Infection Control*. Aug. 2010; 38(6): 461-466.

²⁹ Pennsylvania Patient Safety Authority. 2009 Annual Report.

³⁰ Stevenson KB, Moore J, Colwell H, Sleeper B. (2005). Standardized infection surveillance in long-term care: Interfacility comparisons from a regional cohort of facilities. *Infect Control Hosp Epidemiol*. 26:231-238.

³¹ Koch AM, Eriksen HM, Elstrøm P, Aavitsland P, Harthug S. (2009). Severe consequences of healthcare-associated infections among residents of nursing homes: a cohort study. *Journal of Hospital Infection* 71, 269-274.

³² Tsan L, Langberg R, Davis C, Phillips Y, Pierce J, et al. Nursing home-associated infection in Department of Veterans Affairs community living centers. *American Journal of Infection Control*. Aug. 2010; 38(6): 461-466.

³³ Pennsylvania Patient Safety Authority. 2009 Annual Report.

³⁴ Eikelenboom-Boskamp A, Cox-Claessens JH, Boom-Poels PG, Drabbe MI, Koopmans RT, Voss A. (2011). Three-year prevalence of healthcare-associated infections in Dutch nursing homes. *Journal of Hospital Infection* 78: 59-62.

³⁵ Mylotte JM. Nursing home-acquired blood stream infections. *ICHE*. 2005 Oct; 26(10):833-7.

³⁶ CMS Nursing Home Data Compendium.

Another important factor for older adults is a reduced response to antigens. This is especially important for those residing in NHs/SNFs, who generally have more frequent contact with other people, increasing exposure risk during times of community outbreaks of seasonal influenza and other respiratory or gastrointestinal infections. For older adults, this means that immunizations with tetanus toxoid, pneumococcal, or influenza vaccine may not be as effective and may not provide adequate protection. In addition, immunizations, although widely used in the young, appear to be provided inconsistently to older adults.

Older adults also are at risk from underreporting of signs and symptoms. In the NH/SNF setting, the majority of primary care is provided by staff who have less formal clinical training than staff in acute care settings. Older adults may not be able to verbalize early signs and symptoms of infection due to impaired communication caused by underlying conditions that lead to some level of cognitive impairment (e.g., Alzheimer's disease), mental health impairment that causes confusion, or exacerbation of symptoms of other neurologically compromising conditions (e.g., stroke). Confusion due to infection may be hard to differentiate from progression of underlying neurological conditions or non-infectious processes, such as dehydration and medication side effects. NH/SNF residents also may have delays in diagnosis and therapy because of transportation issues, lack of access to technology such as chest x-rays or blood tests, and challenges with communication from clinical providers who are off site.

C. Antibiotic Use and Resistance in Nursing Homes

Antimicrobials account for approximately 40% of all systemic drugs prescribed in LTCFs; the likelihood is 50-70% that a resident will receive at least one course of a systemic antimicrobial agent during a one-year period.³⁷ Few studies have examined the percentage of inappropriate use of antibiotics in LTCFs, and estimates of appropriate use range from 49% to 62%.³⁸ Studies estimate that 25-75% of systemic antibiotic use may be inappropriate in the long-term care setting. All this antibiotic exposure carries the risk of adverse drug reactions and complications such as CDI, and it promotes the emergence of multidrug-resistant organisms (MDROs). A study of NH/SNF data aggregated from five states calculated the incidence of antibiotic resistant infections among 56,000 long-term care residents in SNFs as 12.7 per 1,000 residents in a one-year period.³⁹ Devices, wounds, antibiotic use, and recent hospitalization are some of the major risk factors for development of an MDRO infection in NH/SNF residents.

³⁷ Nicolle LE, Bentley DW, Garbaldi R, Neuhaus EG & Smith PW. Antimicrobial use in long-term-care facilities. SHEA Long-Term-Care Committee. *Infect Control Hosp Epidemiol.* Aug 2000; 21(8):537-45.

³⁸ Van Buul, LW, van der Steen, JT, Veenhuizen, RB, Achterberg WP, Schellevis, FG, Essink, RTGM, van Benthem, BHB, Natsch, S, and Hertogh, CMPM. (2012). Antibiotic use and resistance in long-term care facilities. *JAMD*. PMID: 22575772, e-publication ahead of print.

³⁹ Rogers MAM, Mody I, Chenoweth C, Kaufman SR & Saint S. Incidence of antibiotic-resistant infection in long-term residents of skilled nursing facilities. *American Journal of Infection Control.* Sept 2008; 36(7): 472-5.

D. Specific HAIs among Nursing Home Residents

Urinary Tract Infections

Data from many studies show that UTIs are the most commonly reported and treated infection in NH/SNF residents. The national average for urinary catheter use in these facilities is approximately 5%, suggesting that the majority of UTIs manifesting in long-term care are not catheter-associated.⁴⁰ Many older individuals develop weakened pelvic muscles, resulting in incomplete emptying of the bladder, urinary retention, and bacterial colonization of the urinary tract. Significant morbidity is associated with these infections. In a study of blood stream infections manifesting in NH/SNF residents, 50% were related to UTI.⁴¹ UTIs are a leading driver of hospitalizations, accounting for almost 30% of hospital readmissions from NH/SNF within 30 days.⁴² Impaired renal function in older adults can complicate management of UTIs and pyelonephritis, which makes the choice of antibiotics difficult.

The prevalence of asymptomatic bacteriuria (ASB), bacterial colonization of the urinary tract without local signs or symptoms of infection, ranges from 23-50% in non-catheterized NH/SNF residents to 100% among those with long-term urinary catheters.⁴³ The challenges in differentiating ASB from symptomatic UTI can lead to inappropriate antibiotic use and its related complications. The high prevalence of ASB and the challenges with diagnosing symptomatic UTI in NH/SNF residents have led to antibiotic overuse in this population. This overuse increases the likelihood of adverse events and complications of previous antibiotic treatment (e.g., CDI) along with emergence, transmission, and acquisition of MDROs. Therefore, highlighting appropriate diagnosis and management of symptomatic UTI is a critically important issue in the NH/SNF setting.

Lower Respiratory Tract Infections

Between 2000 and 2002, the leading infectious disease cause of both hospitalization and death among people over 65 years old was LRTI.⁴⁴ Pneumonia is the fifth leading cause of death in people over 65, and *Streptococcus pneumoniae* (also known as pneumococcus) is the most frequently identified cause of bacterial pneumonia in this population. Diagnosing LRTI is difficult because the presentation frequently is atypical. For example, the only evidence of infection might be general malaise, anorexia, nonspecific weakness, behavioral changes, or weight loss. Occasionally, pneumonia in older adults may present with little cough, no fever, and few changes to the bedside lung exam. Instead, altered mental status has been found to be the most common presenting symptom in 40% of elderly adults with bacterial

⁴⁰ CMS Nursing Home Compare. Available at <http://www.medicare.gov/NHCompare/>. Accessed January 13, 2012.

⁴¹ Mylotte JM. Nursing home-acquired blood stream infections. *ICHE*. 2005 Oct; 26(10):833-7.

⁴² Ouslander JG, Diaz S, Hain D, Tappen R (2011). Frequency and diagnoses associated with 7- and 30-day readmission of skilled nursing facility patients to a nonteaching community hospital. *J Am Med Dir Assoc* 12: 195-203.

⁴³ Nicolle LE, Bentley DW, Garbaldi R, Neuhaus EG & Smith PW. (2000). Antimicrobial use in long-term-care facilities. SHEA Long-Term-Care Committee. *Infect Control Hosp Epidemiol*. Aug 2000; 21(8):537-45.

⁴⁴ Curns AT, Holman RC, Sejvar JJ, Owings MF & Schonberger LB. Infectious disease hospitalizations among older adults in the United States from 1990 through 2002. *Arch Intern Med*. Nov 2005; 165(21): 2514-20

pneumonia.⁴⁵ The attack rate for pneumonia is highest among those in NHs/SNFs. One study found that 33 of 1,000 NH/SNF residents per year required hospitalization for treatment of pneumonia, compared with 1.14 of 1,000 elderly adults living in the community.⁴⁶ Because of the altered oral flora previously mentioned, there is a high rate of gram-negative pharyngeal colonization, making the diagnosis difficult. Declining oral hygiene also increases the risk of aspirating bacterial agents into the lungs among individuals with difficulty swallowing or diminished cough reflex, especially in LTCF residents with underlying neurologic conditions (i.e., stroke). Complicating treatment is the frequency of underlying respiratory diseases, including asthma and COPD. These coexisting conditions increase the risk of developing pneumonia in this population and contribute to greater morbidity from an infection.

Influenza and Influenza-like Illness

Despite the availability of a safe and effective vaccine, influenza infections continue to be the eighth leading cause of death in the U.S.⁴⁷ CDC estimates that 3,000 to 49,000 influenza-associated deaths occur each year, and studies indicate that 90% of influenza-associated deaths occur in patients aged 65 years or older.^{48,49} Moreover, influenza-associated morbidity and mortality are significantly higher in elderly patients (older than 85 years) and patients with chronic medical conditions, such as respiratory, cardiovascular, or onco-hematological disease.⁵⁰

Residents of LTCFs are of notable risk for influenza infection due to their close proximity with fellow residents and their frequent interactions with health care personnel (HCP) as well as relatives and other visitors.⁵¹ Influenza outbreaks in LTCFs have been attributed to low influenza vaccination rates among HCP.⁵² Increased vaccination coverage of HCP, combined with high vaccination coverage in residents, has been shown to reduce both the incidence of health care-associated influenza and influenza-related mortality among older patients in LTCFs.^{53,54}

⁴⁵ Mathe C, Niclaes L, Suetens C, Jansb B & Buntinx F. Infections in residents of nursing homes. *Infect Dis Clin N Am* 21 (2007) 761-772.

⁴⁶ Marik PE & Kaplan D. (2003). Aspiration pneumonia and dysphagia in the elderly. *Chest*, 124;328-336.

⁴⁷ Kochanek, K., et al. (2011). Deaths: preliminary data for 2009. *National Vital Statistics Reports*, 59(4): 1-51.

⁴⁸ CDC. *Estimating Seasonal Influenza-Associated Deaths in the United States: CDC Study Confirms Variability of Flu*. [cited 2011 17 November].

⁴⁹ Thompson, W., et al., Mortality associated with influenza and respiratory syncytial virus in the United States. *JAMA*, 2003. 289(2): p. 179-186.

⁵⁰ Gaillat, J., et al., Morbidity and mortality associated with influenza exposure in long-term care facilities for dependent elderly people. *Eur J Clin Microbiol Infect Dis*, 2009. 28(9):1077-1086.

⁵¹ DJ, S., G. Kerr, and C. WF, Nosocomial transmission of influenza. *Occup Med*, 2002. 52(5): p. 249-253.

⁵² CDC, *Outbreaks of 2009 pandemic influenza A (H1N1) among long-term-care facility residents - three states, 2009. MMWR Morb Mortal Wkly Rep*, 2010. 59(3):74-77.

⁵³ Carman, W., et al., Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomised controlled trial. *Lancet* 2000; 355(9198):93-97.

⁵⁴ Potter J, Stott DJ, Roberts MA, Elder AG, O'Donnell B, Knight PV, and Carman WF. Influenza vaccination of health care workers in long-term hospitals reduces the mortality of elderly patients. *Journal of Infectious Disease*, 1997; 175:1-6.

Clostridium difficile Infection

The incidence of CDI-related hospitalizations doubled from 5.5 per 10,000 population in 2000 to 11.2 per 10,000 in 2005. CDI-associated mortality increased from 5.7 per million population in 1999 to 23.7 per million in 2004. The numbers of hospitalizations and deaths were disproportionately higher among individuals over the age of 65.⁵⁵

CDI is becoming the number one cause of diarrhea in NH/SNF residents, accounting for more than 50% of all GE infections reported in Pennsylvania NHs.⁵⁶ It is estimated that more than half of all health care-associated CDI cases will manifest in NHs; reported rates are between 1.7 and 2.9 per 10,000 resident days.⁵⁷ Recent data demonstrated that 75% of health care-associated CDIs were manifesting outside of hospitals, and a substantial portion of these infections are now occurring in NHs.⁵⁸ The increasing rate and morbidity of CDI make it imperative to use antibiotics judiciously in this population.

Skin, Soft Tissue and Wound Infections

With aging, the physical barrier of the epidermis becomes thinner and protective subcutaneous fat declines, which allows for skin tears, decubitus (pressure) ulcer formation, and subsequent bacterial infection. Approximately 12% of short-stay NH/SNF residents and 10% of high-risk, long-stay residents had pressure ulcers in 2010.⁵⁹ Skin and soft-tissue infections are the third most common infection in LTCF residents, with a reported prevalence of 1-9%.⁶⁰ Cellulitis and infected pressure ulcers are two of the most common types of SSTIs in the nursing home population.⁶¹ Infections occur in up to 65% of pressure ulcers and may lead to osteomyelitis and sepsis, requiring costly and aggressive therapy.⁶²

In the NH/SNF setting, Group A *Streptococcus* (GAS) and methicillin-resistant *Staphylococcus aureus* (MRSA) are particular clinically important pathogens that can cause skin, soft tissue, and wound infections. GAS has been associated with severe invasive

⁵⁵ Lyytikäinen O, Turunen H, Sund R, Rasinperä M, Könönen E, Ruutu P, and Keskimäki I. Hospitalizations and deaths associated with *Clostridium difficile* infection, Finland, 1996–2004. *Emerging Infectious Diseases*. 2009; 15(5): 761–765.

⁵⁶ Pennsylvania Patient Safety Authority. 2009 Annual Report.

⁵⁷ Campbell RJ, Giljahn L, Machesky K et al. *Clostridium difficile* infection in Ohio hospitals and nursing homes during 2006. *Infect Control Hosp Epidemiol* 2009;30:526–533.

⁵⁸ McDonald, Clifford L. Vital signs: Preventing *Clostridium difficile* infections. *MMWR*, 61(09); 157-162 March 2012.

⁵⁹ CMS Nursing Home Compare.

⁶⁰ Nicolle LE. Infection control in long-term care facilities. *Clinical Infectious Disease*. 2000 Sep; 31(3):752-6.

⁶¹ High KP, Bradley SF, Gravenstein S & et al. Clinical practice guidelines for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Disease Society of America. *Jour Amer Geriatr Society*. 2009; 57(3):375-94.

⁶² Yoshikawa TT, Norman DC. Approach to fever and infection in the nursing home. *J Am Geriatr Soc* 1996 Jan;44(1):74-82.

infections, hospitalizations, and deaths in the NH/SNF population.⁶³ MRSA is well known as a cause of HAIs, especially related to device use and wounds in the acute care hospital setting. The prevalence of MRSA in residents of LTCFs has been reported to be as high as 58%.^{64,65} Because of the movement of NH/SNF residents between acute care and long-term care, risk is likely greater for development of clinically significant MRSA infections associated with the high rates of carriage in this population.

E. Challenges for HAI Prevention in Long-Term Care Settings

NHs/SNFs must maintain infection control and prevention (ICP) programs to comply with the federal regulations governing licensing and certification. The expectations for those programs are outlined within the Interpretive Guidance for Infection Control at F tag 441, last revised by CMS in December 2009.⁶⁶ Most NHs/SNFs lack adequately trained and committed personnel and resources for this task. A study from Maryland demonstrated that the number of infection preventionists (IPs) in NHs is fourfold lower than the number of IPs in acute care facilities of similar size.⁶⁷ The vast majority of NH/SNF IPs have multiple titles and work part-time on infection prevention regardless of bed size or acuity of the residents cared for in their facilities.⁶⁸ Additionally, less than 10% of IPs in NHs/SNFs have any specific ICP training (e.g., Certification in Infection Control) compared with more than 95% of acute care IPs.⁶⁹

Personnel resources dedicated to ICP vary widely across the NH/SNF spectrum; some states have regulatory expectations that infection control coordinators in NHs have documented training, but most do not have specific requirements for infection prevention training or staff time dedicated for the infection control coordinators in these facilities.⁶⁹ Other barriers to implementing an effective ICP program include limited staff resources, high staff turnover, funding difficulties, and limited information technology (IT) access and infrastructure to support ICP activities. A recent study from Utah demonstrated that although most facilities had desktop computers available for their infection prevention programs, 25% had outdated operating systems and less than 20% had fully integrated radiology, diagnostic laboratory, or microbiology data with their facility computer systems. The primary use of the computer was for Internet

⁶³ Schwartz B, Ussery X. T. Group A streptococcal outbreaks in nursing homes. *Infect Control Hosp Epidemiol.* 1992;13:742-747.

⁶⁴ Stone ND, Lewis DR, Johnson TM 2nd, Hartney T, Chandler D, Byrd-Sellers J, McGowan JE Jr, Tenover FC, Jernigan JA, Gaynes RP, Methicillin-resistant *Staphylococcus aureus* (MRSA) Nasal Carriage in Residents of Veterans Affairs Long-Term Care Facilities: Role of Antimicrobial Exposure and MRSA Acquisition. *Infect Contr Hosp Epidemiol.* 2012 Jun; 33(6): 551-7. Epub 2012 Apr 13.

⁶⁵ Mody L, Kauffman CA, Donabedian S, Zervos M, Bradley SF. Epidemiology of *Staphylococcus aureus* colonization in nursing home residents. *Clin Infect Dis* 2008; 46(9): 1368-1373.

⁶⁶ For further information see the CMS State Operations Manual

⁶⁷ Roup BJ, Roch JC & Pass M. Infection control program disparities between acute and long-term care facilities in Maryland. *AJIC* 2006; 34(3):122-27.

⁶⁸ Smith, P, Bennett G, Bradley S, Drinka P, Lautenbach E, Marx J, Mody L, Nicolle L, Stevenson K. SHEA/APIC guideline: infection prevention and control in the long-term care facility, July 2008 *Infection Control and Hospital Epidemiology* 2008; 29(9): 785-814.

⁶⁹ Roup BJ & Scaletta JM. How Maryland increased infection prevention and control activity in long-term care facilities, 2003-2008 *AJIC*, 2011; 39:292-295.

access to identify ICP resources (77%), but IT tools were largely underutilized for implementing the ICP program.⁷⁰

IV. HHS DATA SOURCES AND PROJECTS ON REDUCING AND PREVENTING HAIs IN LTCFs

A. Overview

Reliable measurement of HAIs in any health care setting requires a readily available data source with standardized elements that can be collected accurately with minimal burden to care providers. The long-term goal for HAI surveillance is to develop a data collection system that can support multiple components for assessing the quality of health care delivery, including disease surveillance, effectiveness of prevention and control activities, quality improvement, public reporting, and financial incentive determinations. Currently, many individual data sources fall short of this goal. However, when routine data sources in clinical settings, such as mandated assessments and billing codes, do not provide valid epidemiologic data, additional procedures can be imposed if regulatory agencies judge them high priority or if they are able to serve multiple uses.

An informal survey of agencies participating in the working group was conducted to identify potential data sources in development or already in use in the long-term care setting. We also have included data sources in use in other care settings that could be considered for long-term care.

Standardized Assessment Instruments

The Social Security Act requires that all persons (regardless of payer) who reside in a Medicare- or Medicaid-certified nursing facility must have a resident assessment, which includes use of a Minimum Data Set (MDS), completed at certain intervals (e.g., admission, quarterly, annually, when there is a significant change in the resident's condition, and at discharge). CMS has established requirements for the content and electronic transmission of the MDS.

The MDS was implemented nationally in 1990 and updated to its current version in October 2010. It uses a variety of sources, including resident interviews and medical records, to capture information on clinical diagnoses, medication, physical and cognitive functioning, mood, and resident preferences in diet and activities.

Using the MDS, NHs report data for all residents on UTIs and catheters. Two National Quality Forum (NQF)-endorsed measures (684 and 686) have been developed from these MDS data and are used as part of the NH Quality Initiative for quality reporting and public reporting purposes. These quality measures apply to long-stay NH/SNF residents; neither measure is endorsed for short-stay residents.

⁷⁰ Jones M., Samore MH., Carter M. & Rubin MA. Long-term care facilities in Utah: A description of human and information technology resources applied to infection control practice. *AJIC*. 2011 Sep 10 [Epub ahead of print].

NQF 684 Percentage of Residents with a Urinary Tract Infection (Long-Stay)⁷¹

This measure reports the percentage of long-stay NH/SNF residents with a UTI within 30 days of the most recent assessment. These data are reported at the facility level over a six-month period. The MDS 3.0 has more extensive instructions for identifying UTIs to reduce the number of false positives. This measure does not specifically address CAUTI. To do so, a positive assessment for a UTI would need to be paired *at the patient level* with a positive assessment for an indwelling catheter (MDS item H0100 A), but this would be only an approximate approach. The look-back periods for the two measures can differ. So, attribution could be problematic.

NQF 686 Percentage of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long-Stay)

This measure assesses the percentage of long-stay NH/SNF residents who have or had a catheter within the seven days prior to the most recent assessment. Note that despite the title, this measure does *not* specifically assess new insertions of catheters. This measure is subject to the same limitations as NQF 684.

Despite refinements made to the MDS 3.0 that include documentation of the presence of UTIs, and use of devices such as urinary catheters, seasonal influenza and pneumococcal vaccinations, clinical assessments, care areas triggered, and care plans, there is a limitations to using MDS data as a universal data source to track HAI in nursing homes. Assessments provide snapshots of patients at a particular point in time, and the time between assessments may not capture important changes. For instance, assessments on long-stay residents may occur as infrequently as quarterly. Therefore, infection events could be missed between measurement periods. Despite this limitation, electronic MDS assessment data are available from approximately 16,000 nursing homes for approximately 3 million individuals who reside in nursing homes each year.

Administrative Claims Data

Administrative claims data cover many different types of sites. Within Phase One of the HAI Action Plan, one measurement system for tracking CDI is hospital discharge data (hospitalizations with *C. difficile* per 1,000 patient discharges). Although there may be technical challenges for the transition from ICD-9 (International Classification of Diseases, Ninth Revision) to ICD-10 (International Statistical Classification of Diseases and Related Health Problems, Tenth Revision) and for cross-walking codes across different settings and payment systems, these are likely to be surmountable. More concerning is that coded diagnosis of UTI, CAUTI, and CDI is neither a sensitive nor a specific indicator of clinical diagnosis. Moreover, several authors have shown that ICD-9-CM coding of CAUTI is poor because the procedure code for catheter insertion is rarely used.⁷² Despite these limitations,

⁷¹ Replaces NQF 196 in the MDS 3.0.

⁷² Zhan C., Elixhauser A., Richards CL Jr., et al. Identification of hospital-acquired catheter-associated urinary tract infections from Medicare claims: sensitivity and positive predictive value. *Medical Care*. Mar 2009; 47(3): 364-9.

these Medicare claims are the basis for the hospital-acquired conditions (HACs) policy and payment adjustments as published in the Inpatient Prospective Payment System (IPPS) Final Rule 2011.

National Healthcare Safety Network

CDC's National Nosocomial Infections Surveillance (NNIS) system began in 1970 as a voluntary, hospital-based reporting system to monitor HAIs and inform local and national prevention efforts. Between 1970 and 2004, participation in NNIS increased from 62 hospitals in 31 states to almost 300 hospitals in 37 states. NNIS data reporting concluded in 2004 and was succeeded by NHSN in 2005. NHSN data were first provided in 2006. A sharp increase in NHSN participation began in 2007 as a result of open enrollment and enactment of several state laws mandating HAI reporting to NHSN. In terms of coverage, more than 11,000 health care facilities have enrolled in NHSN as of November 2012.

NHSN provides a secure, Internet-based surveillance reporting infrastructure, as well as standardized surveillance tools and methodology for performing prospective, active surveillance for a variety of HAI events for use in a broad array of health care settings. NHSN allows for monitoring and reporting a wide array of infections and process measures through two components, the Healthcare Personnel Safety Component and the Patient Safety Component.

In September 2012, NHSN released a LTCFs Component. This component was developed in response to a growing interest in HAI data from non-acute care settings and to promote and facilitate infection surveillance specifically for LTCFs, in settings such as NHs/SNFs. In recognition of the resource limitations often facing LTCFs, the processes of data collection and reporting for this component have been streamlined and simplified, and the component uses data collection forms specifically designed for use by LTCFs. Instructions and standardized definitions for use with each module are provided along with detailed surveillance protocols. Data reported will allow LTCFs to independently analyze their data within NHSN. HAI events can be characterized by both resident and facility characteristics.

The modules available within the LTCFs Component include UTI surveillance (both catheter-associated and non-catheter-related events), MDRO and CDI surveillance by laboratory-identified events, and monitoring of hand hygiene and gown and glove use as prevention measures. Of note, the endorsement of CAUTI quality measures for hospitals has been broadened to include IRFs and LTCHs. IRFs and LTCHs began collecting data on October 1, 2012. Also of note, LTCHs enrolled in NHSN will also have access to the Healthcare Personnel Safety Component to allow for monitoring of health care staff influenza vaccination coverage rates.

National Center for Health Statistics

The National Center for Health Statistics (NCHS) Long-Term Care Statistics Branch (LTCSB) conducts a nationally representative sample survey on long-term care providers and their care recipients. The National Nursing Home Survey (NNHS) has been conducted seven times since 1973, and the National Home and Hospice Care Survey (NHHCS) has been conducted seven times since 1992. NNHS and NHHCS record medical conditions of sampled residents and patients, including infections, some of which are health care associated. In 2010, NCHS fielded the first ever National Survey of Residential Care Facilities (NSRCF), which includes assisted living communities and residents.

NCHS collected information on the following infection-related topics in one or more of its recent LTCSB surveys: strategies to encourage influenza vaccinations among employees, percentage of employees and patients/residents receiving the influenza vaccine in the last influenza season, influenza and pneumonia vaccination programs for patients/residents, percentage of patients/residents ever receiving pneumonia vaccinations, presence of infection control staff, and use of a written plan for managing patients/residents during an influenza pandemic. The new LTCSB survey, the National Survey of Long-Term Care Providers (NSLTCP), which will replace NNHS, NHHCS, and NSRCF, will expand its core coverage of long-term care providers to include residential care facilities and adult day services centers (using survey data) in addition to NHs, HHAs, and hospices (using existing administrative data). HAI-related modules could be added to NSLTCP core content to measure HAI prevalence among long-term care recipients and document HAI prevention programs across long-term care providers.

Patient Safety Organizations and Common Formats

The Patient Safety and Quality Improvement Act of 2005 (Patient Safety Act) authorized the creation of Patient Safety Organizations to improve the quality and safety of U.S. health care delivery. The Patient Safety Act encourages clinicians and health care organizations to voluntarily report and share quality and patient safety information without fear of legal discovery. AHRQ is coordinating the development of the Common Formats, which standardize the definitions and reporting formats for patient safety events. In early 2011, AHRQ released a beta version of the Common Formats for NHs/SNFs. The NQF reviewed public comments on the beta version and provided feedback in September 2011. AHRQ plans to publish a revised version with specifications for electronic implementation in 2013. The Common Formats for LTCFs contains a module for HAIs that includes CLABSI, CAUTI, and CDI.

Quality Improvement Organizations

CMS contracts with one organization in each state and U.S. territory to serve as that jurisdiction's quality improvement organizer. Quality Improvement Organizations (QIOs) are tasked with improving the effectiveness, efficiency, and quality of health care delivered to Medicare beneficiaries as stipulated under Section 1152-1154 of the Social Security Act. In the QIO Program's 10th Statement of Work (SOW), QIOs are tasked with facilitating

statewide collaboratives of NHs with the aim of ensuring that every resident receives the highest quality of care. Specifically, the collaboratives will strive to instill quality and performance improvement practices, eliminate HACs, and dramatically improve resident satisfaction. One of the key premises behind this body of work is that for quality health care to be provided, the foundational systems that support high quality, such as staffing, finance, and leadership, must be in place. Important for supporting the HAI Action Plan for LTCFs is a keen focus on best practices associated with workforce stability and work processes as they relate to the reduction of HAIs. Collaborative recruitment began in August 2012, and the collaborative launch will be on February 1, 2013.

Department of Veterans Affairs

With 133 Community Living Centers (CLCs; previously known as Nursing Home Care Units), VA is a large provider of long-term care in the United States. In 2005, VA conducted a national point prevalence survey in CLCs using modified CDC definitions for HAIs excluding SSTIs and infections of the reproductive system.⁷⁵ This survey was repeated in 2007 and in 2009. In addition to the point prevalence surveys, VA has the potential for measuring the impact of some prevention measures. For example, because UTI was the number one HAI identified on all three point prevalence surveys, all CLCs are participating in ongoing surveillance for CAUTI with optional participation for reporting on compliance to a urinary catheter maintenance bundle.

V. METRICS AND EVALUATION

A. Overview

This section provides a framework to assess short- and long-term measurement of progress toward HAI prevention in LTCFs that reflects the National Strategy for Quality Improvement in Health Care (National Quality Strategy) and HHS priorities. Its objective is to provide a framework to measure HAI surveillance, prevention, and elimination initiatives across LTCFs. This proposed strategy was developed to be consistent with the aims of the National Quality Strategy, better care, healthy people and communities, and affordable care, which will be used to guide and assess local, state, and national efforts to improve health and the health care delivery system.

B. Health Care-Associated Infections Metrics for Long-Term Care Facilities

Consistent with other phases of the HAI Action Plan, we focused on HAIs that are nationally burdensome, due to high prevalence or high cost, and known to be preventable through implementation of evidence-based care practices. Based on the literature reviewed, the following HAIs were proposed: (1) UTIs, including CAUTIs and catheter care processes, and (2) CDIs.

⁷⁵ Tsan L, Langberg R, Davis C, Phillips Y, Pierce J, et al. Nursing home-associated infection in Department of Veterans Affairs community living centers. *American Journal of Infection Control*. Aug. 2010; 38(6): 461-6.

Two additional priority modules focus on vaccination of residents and HCP to prevent influenza and pneumonia. The inclusion of these vaccine priorities supports the HCP influenza vaccination module included in Phase Two of the HAI Action Plan and the current CMS NH/SNF quality measures promoting resident vaccinations.

We favor consensus body endorsement (e.g., NQF), where feasible, for all quality measures of HAI outcome and care processes in LTCFs once these measures have been piloted and assessed for accuracy and validity. Additional measures implemented in other care settings may be considered for use in long-term care, if they are found to be relevant and data collection is feasible. We have included as an additional priority a measure of enrollment into NHSN, because we believe this will be an important surveillance tool for assessing the impact of HAIs in long-term care and because enrollment in this program may serve as an indicator of both provider awareness of and provider engagement toward the reduction of HAIs.

C. Priority Areas, Measures and Goals

Enrollment in NHSN for Nursing Home Infection Surveillance Activity

Priority Area 1

One of the largest challenges in addressing HAI prevention in long-term care is the lack of universally applied methodology and infrastructure to support infection surveillance activities in LTCFs. To address this gap in infection surveillance data collection infrastructure, the new NHSN LTCF Component was developed to promote and facilitate infection surveillance specifically for LTCFs. One of the core purposes of this tool is to support HAI prevention efforts and process improvement work by individual facilities.

The use of the NHSN LTCF Component could help facilities demonstrate their commitment to ongoing Quality Assessment and Performance Improvement (QAPI) activity. In 2013, all NHs will be required to have a QAPI program in place. The quality assessment aspect of the QAPI program is often a challenge for health care providers because of limits of their ability to collect or analyze their own care processes and outcomes data.

The reduction of HAIs is an excellent goal for facilities' initial QAPI projects for multiple reasons. First, improving resident outcomes and reducing costs by addressing preventable HAIs would have high impact. Second, the LTCF Component of NHSN can provide facilities with standardized data collection tools that will reduce variation in the application of the criteria used by facilities to define HAI events. Third, it will provide an external surveillance system to monitor and analyze data on the incidence of HAIs in their facility. This would provide an essential feedback loop (quality assessment) for facilities to determine their baseline rates of HAIs, perform root cause analyses, and collect ongoing data to assess the impact of their prevention initiatives (performance improvement).

This alignment with NHSN and the QAPI initiative would benefit all long-term care stakeholders. For instance, it would provide the public health and payer communities with data to both monitor HAIs in long-term care and drive down costs associated with these

preventable events across the care continuum. The providers and customers would benefit greatly from this because NHSN would provide the facilities with crucial data for their own quality initiatives that could shift their costs to prevention and improve the health of the residents. Additionally, with sufficient LTCFs reporting data in the NHSN system, national HAI benchmarks can be determined, allowing for meaningful interpretation of data and facilitating evaluation of the impact of implemented prevention efforts. Tracking increases in the number of LTCFs using NHSN over time can be a way to track the successful implementation and adoption of the NHSN LTCF Component. However, given that this is a new reporting system for nursing home users, there should be opportunity to pilot and obtain feedback on the ease in which providers can access the system and assess the validity of the data submitted. Therefore, a controlled implementation of the use of NHSN by LTCFs has been proposed that will ensure that reporting requirements and tools meet usability requirements and support improvement nationally.

Proposed Metric:

- Number of certified nursing homes enrolled into the NHSN LTCF Component / Number of certified nursing homes in the U.S.

Goal: 5% of certified nursing homes enroll in NHSN over the five years following launch of the component.

Clostridium difficile Infection

Priority Area 2

CDI surveillance using laboratory identified (Lab ID) events as a proxy measure has been incorporated as a reporting option within the NHSN LTCF Component. As in other health care settings, there may be some limitations to using Lab ID events within the LTCFs because access to microbiology labs and stool testing practices vary across facilities. The Lab ID event surveillance methodology has been well tested and adopted by CMS for the IPPS fiscal year 2012 rule for inpatient acute care facilities. The LTCF Component Lab ID event uses the same definitions as the acute care reporting to maintain a standard methodology across care settings. Data from a small pilot indicate that Lab ID event methodology is feasible in nursing homes. This methodology provides a simple and standardized approach to performing CDI surveillance in the long-term care setting.

Proposed Metric:

- Incident NH-onset CDI Lab ID events: Number of events / 10,000 resident days
 - Incident lab events are defined as no previous positive or last prior positive more than eight weeks ago.
 - Only events occurring more than three calendar days after resident admission are considered NH-onset.

Goal: Pilot implementation of reporting to NHSN, evaluate variability in measure, and obtain consensus on measurable five-year goal.

Vaccination for Residents (Influenza, Pneumococcal)

Priority Area 3

Vaccination for seasonal influenza and pneumococcus are widely available and highly effective in reducing the risk of infection events in older adults; therefore, LTCF resident influenza and pneumococcal vaccination have been selected as the priority measures. CMS has required the reporting of resident vaccination status for influenza and pneumococcus through the MDS for both short- and long-stay residents since 2005. Data from the first six months of use of the newest version of the MDS show long-stay residents with higher rates of vaccination for seasonal influenza and pneumococcus (81.7% and 79.8%, respectively) than for short-stay residents (60.1% and 61.2%).⁷⁷ Our proposed goal is a combined rate for both short- and long-stay residents and is in line with the Healthy People 2020 goal of 90% vaccination coverage for both seasonal influenza and pneumococcal disease (IID-12.8 and IID 13.3).⁷⁸

Proposed Metrics:

- Number of residents receiving influenza vaccine either within the facility or outside the facility during the current or most current influenza season / Number of residents eligible for the influenza vaccine
- Number of residents receiving pneumococcal vaccine or who are up-to-date with their pneumococcal vaccination / Number of residents eligible for pneumococcal vaccine

Goal: We propose a goal of 85% vaccination coverage of LTCF residents for seasonal influenza and pneumococcus in five years.

Health Care Personnel Influenza Vaccination

Priority Area 4

Increasing influenza vaccination coverage among HCP is a national priority, as indicated by the inclusion of a chapter in Phase Two of the HAI Action Plan. The proposed goal is in alignment with the influenza vaccination of HCP chapter of the HAI Action Plan and the Healthy People 2020 goal of increasing the percentage of HCP receiving the seasonal influenza vaccine each year to 90% using the National Health Interview Survey (NHIS) conducted by CDC. The most current NHIS data are from the 2007-2008 season, in which HCP working in long-term care trailed HCP in acute care settings in reporting receiving the influenza vaccine (36.2% compared with 63.4%). Data from an Internet panel survey conducted by CDC for the 2009-2010 influenza season indicated that this gap was closing

⁷⁷ CMS internal data.

⁷⁸ Healthy People 2020 Immunization and Infectious Disease Objectives, IID-12.8 and IID-13.3

with 64.4% of HCP in long-term care reporting receiving the influenza vaccine compared with 71.1% of HCP in acute care hospital settings.⁸²

Proposed Metric:

- Proportion of HCP who work in long-term care who received the seasonal influenza vaccine as measured by NHIS

Goal: In alignment with the previous Influenza Vaccination of HCP chapter, 75% of HCP in long-term care receive the seasonal influenza vaccination by 2015.

Urinary Tract Infections, Catheter-Associated Urinary Tract Infections, and Catheter Care Processes

Priority Area 5

UTIs are consistently one of the highest reported infections in LTCFs. They account for a significant proportion of hospital admissions and emergency department visits.⁸³ Due to this high prevalence, UTIs are a priority in LTCFs, though we must emphasize the importance of reporting only symptomatic UTIs to avoid promoting the antibiotic treatment of ASB and the associated consequences from antimicrobial misuse and overuse in this population. The future measure will need to take this emphasis into account; for example, the NHSN long-term care UTI definitions identify symptomatic infections by incorporating criteria captured through prospective surveillance using relevant clinical data from medical record review. Laboratory tests, while part of the surveillance definition, are not the sole means for identifying UTI events. The combination of signs, symptoms, and confirmatory laboratory data should minimize the inclusion of ASB within UTI event reporting. As the NHSN LTCF Component and other surveillance systems are developed, we will look to obtain consensus on what data source(s) to use.

Proposed Metrics:

- Non-catheter-associated symptomatic UTI incidence rate: Number of events / 1,000 resident days
- Catheter-associated symptomatic UTI incidence rate: Number of events / 1,000 catheter days
- Catheter utilization ratio: Catheter days / Resident days

Goal: Pilot reporting to NHSN, evaluate variability, and obtain consensus on measurable five-year goal.

⁸² Centers for Disease Control and Prevention. Influenza vaccination coverage among health care personnel--United States, August 2010-April 2011. *Morbidity and Mortality Weekly Report (MMWR)*; 60(32):1073-1077.

⁸³ Ouslander JG, Diaz S, Hain D, Tappen R, Frequency and Diagnoses Associated With 7- and 30-Day Readmission of Skilled Nursing Facility Patients to a Nonteaching Community Hospital. *J Am Med Dir Assoc* 2011; 12: 95-203.

D. Implementation Obstacles for Data Collection and Surveillance

Although this LTCFs HAI prevention plan is establishing national priorities and metrics for the long-term care setting, we recognize there may be several obstacles to achieving these HAI surveillance goals in LTCFs:

Provider Burden

As with any proposed measurement, the choice of measure should take into account the burden of collecting, validating, and reporting the outcome. To assure the adoption and use of any reporting system, the system itself must be simple and must provide feedback that can be used to improve quality and efficiency within the facility.

Data Collection Vehicles and Infrastructure

Currently, LTCFs are in various states of “electronic” readiness and may need to build an IT infrastructure. Data transfer and sharing agreements are needed for implementation of electronic surveillance systems, such as NHSN. Although the current state of electronic data collection is limited, it does present an opportunity for federal partners to align current (such as the MDS 3.0) and future (NHSN and Common Formats) data systems.⁸⁴

Measure Reliability Issues

Because of the diversity of services provided across the spectrum of LTCFs, the HAI rates may vary greatly across facilities. Infrequent HAI events, low utilization of devices (i.e., urinary catheters) and variability in the size of facilities could contribute to widely varying rates, which may pose challenges for the development of benchmarks and standards.

Risk Adjustment

Risk adjustment is necessary for some outcome measures. Patient populations and use of catheters and antibiotics may differ vastly across care settings and may compound the definitional issues and introduce variability into the proportion of preventable infections. However, due to the lack of knowledge about important variables required for appropriate risk adjustment of HAI rates in the long-term care setting, further research will be required to ensure that risk adjustments are conducted appropriately.

E. Success Stories and Opportunities

Success Stories

The acute care hospital experience with NHSN reporting can serve as an example of successful enrollment and participation. Since the implementation of NHSN in 2005, the

⁸⁴ MDS 3.0 data elements have been linked to the Office of the National Coordinator's Accepted Health Information Technology Vocabularies. The vocabularies include SNOMED and LOINC.

number of hospitals enrolled and participating in various modules of NHSN has steadily increased. Increases have been driven by state-specific HAI mandates that require reporting through NHSN. Since CLABSI reporting for ICUs to NHSN was added to the 2011 CMS IPPS, hospital enrollment in NHSN has grown dramatically. To achieve such results in LTCFs, enrollment in NHSN will need to be a primary process metric that will provide context to subsequent data reporting through NHSN.

Opportunities

Several policy levers may be considered, including public reporting of LTCF prevalence or incidence estimates, rates or standardized infection ratios (SIRs) for UTIs (already in place), CAUTIs and CDIs. MDS 3.0-based quality measures are in place for UTIs and urinary catheter use. Because MDS 3.0 is nationally mandated for all residents in Medicare or Medicaid participating LTCFs, data collection necessarily provides a readily available data source for public reporting purposes. Similarly, NHSN participation in the LTCF module could likewise be publicly reported. Reliable data require robust participation. However, once achieved, such data can serve as a basis of quality improvement measurement and reporting. In the future, NHSN-based quality measures may be further incentivized or included in LTCF survey and certification processes.

VI. PROMISING PRACTICES IN INFECTION CONTROL IN LTCFS

A. Overview

Multiple federal, national, state, and local health care and public health organizations have contributed to the development of evidence-based information about effective strategies to prevent HAIs within LTCFs. This section provides a summary of selected promising practices from this work. These practices were included based upon the supporting evidence, identified needs and prevention priorities, recommendations from professional organizations, and feasibility of implementation within LTCFs. The section has been separated into four subsections: Infection Surveillance, Health Care Personnel Influenza Vaccine, Education and Training Initiatives, and State Financial Incentives.

B. Infection Surveillance

Conducting surveillance and monitoring infection rates are the cornerstones of HAI prevention.⁸⁵ Successful use of a collaborative approach to infection surveillance and prevention has been demonstrated in the acute health care settings, where large and sustained decreases in CLABSI

⁸⁵ Gaynes RP, Solomon S. Improving hospital-acquired infection rates: the CDC experience. *J Qual Improv* 1996; 22:457-67.

have been reported.^{86,87,88} In the long-term care setting, the feasibility of forming a collaborative to perform HAI surveillance using standardized methodology also has been demonstrated. Pennsylvania requires reporting of HAIs in all NHs and has been collecting data since 2009.⁸⁹ Although this is one of the most comprehensive public reporting statutes in the nation, it is too early to state whether public reporting has led to a reduction in HAI incidence. Other states have implemented smaller collaborations. For example, in Idaho, 17 LTCFs participated in active surveillance for HAIs and collected data for a period of 12 months.⁹⁰

Recently, several state public health departments have developed collaboratives to promote HAI prevention and initiate infection surveillance within LTCFs in their respective states

In Indiana, the state Department of Health and the University of Indianapolis created a surveillance reporting system for LTCF collaborative participants, including acute care hospitals and LTCFs, and developed a goal to reduce CDI and CAUTI SIR by at least 12.5% over the 15-month initiative.⁹¹ In Vermont, a multicenter, evidence-based HAI collaborative was formed among acute care hospitals and LTCFs.⁹² A planning committee, comprising IPs from acute care facilities; administrators from LTCFs; and staff from the state health department, the Vermont Program for Quality in Health Care, and CDC, was formed to define the educational objectives of the collaborative. MRSA and *C. difficile* were identified as the collaborative focus, and the goal is reducing and eliminating the transmission of MDROs across the health care spectrum.

C. Health Care Personnel Influenza Vaccination

Over the past two years, 11 professional societies (including the American Medical Association, the Society for Healthcare Epidemiology of America [SHEA], the American Medical Directors Association, and the American Public Health Association) have recommended some form of mandatory influenza vaccination for their members. Other groups, such as the American Nurses Association and the Service Employees International Union in 2010, recognize the importance of influenza vaccination but also emphasize that workers' rights and due process must be part of any requirement or mandate. More than 200 hospitals have now adopted mandatory influenza vaccination policies for their employees. CDC reports that overall influenza vaccination coverage

⁸⁶ CDC. Reduction in central line-associated bloodstream infections among patients in intensive care units — Pennsylvania, April 2001-March 2005. *MMWR*; 54:1013-16.

⁸⁷ Pronovost P, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. *NEJM* 2006; 355:2725-2732.

⁸⁸ Pronovost PJ, et al. Sustaining reductions in catheter related bloodstream infections in Michigan intensive care units: observational study. *BMJ* 2010; 340:c309.

⁸⁹ Pennsylvania Patient Safety Authority. Act 52 – Medical Care Availability and Reduction of Error Act.

⁹⁰ Stevenson KB, Moore J, Colwell H, Sleeper B. Standardized infection surveillance in long-term care: interfacility comparisons from a regional cohort of facilities. *Infection Control and Hospital Epidemiology* 2005; 26:231-8.

⁹¹ Indiana. Collaborative information.

⁹² Vermont. Collaborative information.

among HCP was 63.5%, but among the 13% of HCP with an employer requirement for vaccination, coverage was 98.1%.⁹³

In 2011, NQF endorsed a standardized measure for reporting HCP influenza vaccination, which was tested for usability in a variety of health care institutions, including LTCFs. The implementation of this measure will start in acute care hospitals through use as a standard by the Joint Commission and as part of a CMS rule for the fiscal year 2015 Hospital Inpatient Quality Reporting Program, which includes HCP influenza vaccination. However, CDC's NHSN reporting system will use the measure in a new module for reporting aggregate HCP influenza vaccination rates that will be available to both acute care facilities and LTCFs. The acute care experience and long-term care demonstration projects could inform further use of this measure for LTCFs.

D. Education and Training Initiatives

The American Medical Directors Association, the national professional association of medical directors, attending physicians and others practicing in the long-term care continuum, has developed clinical practice guidelines (CPGs) titled "Common Infections in the Long-Term Care Setting," intended as a resource for all members of LTCF interdisciplinary teams. The document includes the following elements:

- An introduction, including discussion of susceptibility, risk factors, and critical elements of a comprehensive institutional infection prevention program
- Criteria and recommendations for recognition of changes in status that may indicate presence of infection as well as admission assessment for infection
- Discussion of assessment
- A section on treatment
- Discussion of monitoring, including recognition of outbreaks; implementation of vaccination programs, surveillance practices, staff practices, and employee health and education practices; and antibiotic use monitoring

The Association for Professionals in Infection Control and Epidemiology and SHEA have also developed guidelines for ICP in LTCFs. These guidelines were originally developed in 1997 and updated via a position paper published in 2008 that incorporated new research and experience in the field. Both sets of guidelines offer providers extensive information on additional resources and a detailed set of practice recommendations. These guidelines address the following elements:

- Epidemiology
- Nosocomial infections in the long-term care setting
- Aspects of effective infection control programs
- Regulatory requirements

⁹³ CDC. Influenza vaccination coverage among health-care personnel, United States, 2010–11 Influenza Season. *MMWR* 2011; 60(32):1073-1077.

One promising initiative called ECHO-AGE is being piloted at Boston's Beth Israel Deaconess Medical Center. The initiative is based on the highly successful ECHO project piloted in New Mexico, which used Skype technology to educate rural physicians about the management of hepatitis C. ECHO has significantly reduced the morbidity and costs associated with this disease in numerous underserved areas.⁹⁶ In similar fashion, ECHO-AGE will educate NH/SNF physicians and nurses about the management of geriatric conditions common in NHs. Rural NH/SNF physicians will present cases to academic geriatricians on a weekly basis over the Internet, enabling them to access expert opinions from a distance. As these NH/SNF physicians and nurses become experts in geriatric care, they will serve as local resources for other physicians in their local area.

Other efforts have focused on improving prescribing practices in LTCFs. Several guidelines to reduce antibiotic resistance in health care settings, including LTCFs, have been published.^{97, 98, 99, 100} Even though antimicrobial stewardship is acknowledged as being a component of the LTCF infection control program,^{101, 102} as stated above, implementing antimicrobial stewardship programs in LTCFs involves many challenges. To address these challenges, educational materials and guidance have been developed to aid the implementation of antimicrobial stewardship programs in LTCFs. For example, collaboration among the Michigan Antibiotic Resistance Reduction Coalition (MARR), Michigan Department of Community Health, Michigan Society for Infection Prevention and Control, and CDC resulted in a toolkit designed to help LTCFs implement "12 Steps to Prevent Antimicrobial Resistance Among Long-Term Care Residents."¹⁰³ Recently, an antimicrobial stewardship program toolkit was developed through a collaboration between the Greater New York Hospital Association and the New York State Department of Health that included both acute care hospitals and LTCFs.¹⁰⁴

⁹⁶ Arora S, Thornton K, Murata G, et al. Outcomes of treatment for hepatitis C virus infection by primary care providers. *New England Journal of Medicine* 2011; 364(23):2199-207.

⁹⁷ Dellit TH, et al. IDSA/SHEA Guideline for developing an institutional program to enhance antimicrobial stewardship. *Clinical Infectious Diseases* 2007; 44:159-77.

⁹⁸ Cohen AL, Calfee D, Fridkin SK, Huang et al. Recommendations for metrics for multidrug-resistant organisms in healthcare settings: SHEA/HICPAC Position Paper. *Infection Control and Hospital Epidemiology* 2008; 29:901-13.

⁹⁹ APIC Guide 2009a. Guide to the Elimination of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in the Long-Term Care Facility.

¹⁰⁰ APIC Guide 2010. Guide to the Elimination of Multidrug-resistant *Acinetobacter baumannii* Transmission in Healthcare Settings.

¹⁰¹ Smith, P, Bennett G, Bradley S, Drinka P, Lautenbach E, Marx J, Mody L, Nicolle L, Stevenson K. SHEA/APIC guideline: infection prevention and control in the long-term care facility, July 2008 *Infection Control and Hospital Epidemiology*. 2008; 29(9): 785-814.

¹⁰² Smith et al. Antibiotic Stewardship Programs in Long-Term Care Facilities *Annals of Long-Term Care: Clinical Care and Aging*. 2011; 19[4]:20-25.

¹⁰³ MARR (Michigan Antibiotic resistance Reduction Coalition). Long-term Care Tool Kit. 12 Steps to Prevent Antimicrobial Resistance Among Long-Term Care Residents. .

¹⁰⁴ GNYHA Antimicrobial Stewardship Project. .

E. State Financial Incentives

Recently, CDC outlined a number of state financial practices intended to support HAI education and surveillance activities within hospitals. Some of these endeavors could be tailored or extended to the long-term care context:

- Nevada used funds from penalties gathered from hospital facilities that fail to comply with various state HAI guidelines to support HAI education and training in hospitals.
- New Hampshire created a hospital fee mechanism to pay for its HAI program, which started in July 2011.
- Washington passed legislation to create a hospital infection control grant account for infection control and surveillance programs.

VII. FEDERAL REGULATORY OVERSIGHT AND PERFORMANCE INCENTIVE PROGRAMS IN NHs/SNFs

A. Federal Regulatory Oversight

The Division of Nursing Homes (DNH) in the Survey and Certification Group at CMS is working on multiple projects as part of its ongoing efforts to reduce the rate of HAIs in NHs. These projects include enhancing the data analysis of both facility deficiency data and the clinical data from the MDS and working with federal partners on studies to assess the practice of HAI prevention at the state level.

A key strength of the CMS Survey and Certification process is that the NH/SNF surveyors have an opportunity to assess the quality of NH/SNF ICP policies and practices on a regular basis. When deficiencies are found in an annual or complaint survey, the surveyor has the authority to cite the NH/SNF for that violation based on the federal regulation (F tag 441) directly related to ICP practices in NHs/SNFs.¹⁰⁵ The DNH continues to monitor trends in this deficiency for increased citation rates and to determine state-to-state variation in citations. Although higher citations may be related to an increased awareness of HAIs in NHs/SNFs, the DNH will monitor this area closely to proactively address HAI-related issues in NHs/SNFs before they become widespread or pose an immediate threat to the residents. The DNH is simultaneously improving its ability to analyze citation data by expanding the analyses to include the qualitative information captured in the surveyor's written documentation supporting a cited deficiency (CMS Form 2567). By looking at these data, the DNH will be able to analyze, among other things, the nature of the citations and the surveyors' sophistication when assessing a facility's infection control practices and procedures.

The DNH will also continue to publicly report on the MDS-based quality measures. The new measures based on the MDS 3.0 were released in 2012 and contain a wealth of information on HAI-related metrics, including UTIs, catheterization and vaccinations. Staff at the DNH will also look at data elements in the MDS related to infections, such as wound infections and MDROs.

¹⁰⁵ For further information see the CMS State Operations Manual,

As part of the DNH's efforts to analyze staffing rates as they relate to NH/SNF care quality, the DNH is examining rates of avoidable hospitalizations from NHs/SNFs for a number of conditions, including sepsis, UTIs, and respiratory infections.

Additionally, the DNH worked with the CDC on a project to identify states' HAI initiatives. This work included an environmental scan of all state survey training coordinators and state HAI coordinators to determine the extent to which states are addressing HAI reduction in NHs/SNFs. This study also included an in-depth analysis of the more advanced state programs for HAI reduction. The end products of this study will provide a baseline for determining states' levels of readiness for addressing HAIs in NHs/SNFs, as well as valuable lessons for successful HAI reduction efforts that could be incorporated into NH/SNF surveyor training.

B. Performance Incentive Programs

Nursing facilities in the U.S. are heavily reliant on two public payers, Medicare and Medicaid, and these revenue streams account for a substantial portion of nursing facilities' operations. Nursing facilities, like other providers, could be responsive to payment incentives and, over time, might restructure care and delivery in response to those incentives. As a result, payment incentives could affect resident outcomes. Further, although there are no direct models to highlight, there are several promising practices that HHS should consider modifying or expanding to reduce HAIs in NHs/SNFs, including:

CMS's Nursing Home Value-Based Purchasing (NHVBP) Demonstration

Under the NHVBP, CMS provided financial incentives to NHs/SNFs that provide high-quality care or demonstrated improvements in care. Participating NHs/SNFs were assessed on various quality measures and then received payments based on performance. Although none of the quality metrics included in the demonstration explicitly focus on HAIs, two (urinary catheters left in the bladder and pressure ulcer incidence) at least indirectly related to HAIs. The NHVBP demonstration also tracked the participating facility's rate of resident transfers for specific conditions, such as UTI, sepsis, and respiratory infections, as an indicator of quality. It is worth exploring whether quality metrics within future NHVBP programs could be expanded to include HAIs of interest based on the results of this demonstration program.

Broader Application of the Hospital-Acquired Condition–Present on Admission Policy (HAC-POA) Policy

In 2007-2008, CMS launched the HAC-POA policy, which was applied to IPPS hospitals. This system could prove instructive when contemplating strategies for financially incentivizing HAI reductions in nursing facilities. CMS is examining the broader implementation of the HAC-POA system across settings that serve Medicare beneficiaries, including nursing facilities. States that adjust nursing facility payment rates based on case mix might have payment systems that lend themselves to a HAC-POA-type policy more easily (because more granular data are collected). In any case, more research would be needed to determine how or whether a HAC-POA policy would work in nursing facilities.

Improving Care Quality for Nursing Facility Residents

The CMS Medicare-Medicaid Coordination Office recently announced an effort to improve care for nursing facility residents. Although the program was launched only recently, interventions funded through this effort may directly or indirectly influence HAI prevalence in nursing facilities.

Pay for Performance

At the national level, beginning in 2012, CMS will track and impose financial penalties on hospitals with higher-than-average rates of readmission for particular conditions, some of which may align with HAI definitions. Some states have initiated a variety of pay-for-performance strategies in NHs/SNFs. For example, in Georgia, under the Nursing Home Quality Initiative, all NHs/SNFs are evaluated along a host of quality metrics, including prevalence of pressure ulcers among residents.

CMS's NH Quality Assessment and Performance Improvement Program

The Affordable Care Act requires all NHs to have a QAPI program in place by 2013. The program should effectively and continuously reevaluate the quality of the care each NH provides and quickly remedy any identified problems. CMS has embarked on a multiyear effort to provide the best tools and resources to help NHs implement their QAPI programs by undertaking three initiatives:

- **QAPI Tools and Resources:** In collaboration with CMS contractors, CMS is identifying and designing effective QAPI tools, templates, and resources for nursing homes.
- **Technical Assistance (TA):** CMS contractors will test QAPI tools, resources, and approaches to providing TA in a multiyear demonstration project with a small group of nursing homes. These tools and resources will be made available to all NHs following testing.
- **The Nursing Home Quality Improvement Questionnaire:** A questionnaire was designed to identify the quality systems and processes NHs currently have in place and to assess the extent to which these systems and processes function to help NHs recognize and address quality issues. CMS and its contractors will use this information to help refine the QAPI components.

NHs may find that enrolling in NHSN and other HAI prevention efforts offers a means of demonstrating their commitment to quality improvement, and HAI reduction initiatives can be built into a NH's QAPI plan.

VIII. COMMUNICATIONS AND OUTREACH TO THE LONG-TERM CARE COMMUNITY

A. Overview

The primary objective of the Communication Strategies Plan is to reduce HAIs in LTCFs by:

- Disseminating key messages about practices to prevent HAIs in long-term care residents
- Increasing knowledge and awareness of these key prevention practices among providers, consumers, and the general public

To prevent and reduce HAIs in LTCFs, key messages need to reach a variety of target audiences. HHS has implemented a number of ongoing quality- and health care-related initiatives, including the National Quality Strategy, Partnership for Patients, and the National Prevention Strategy

Recommended actions in this section purposefully integrate messages across other HHS campaigns (and campaigns in which HHS is a partner) as appropriate.

- Existing campaigns that may provide opportunities for joint use of resources and messaging
- Target audiences
- A variety of methods for educating and communicating with these audiences

The messaging for the overall campaign should be appropriate to the level of the audience and use the principles of risk communication and social marketing. If used by HHS, all messages should have the appropriate level of agency clearance. Other messaging should be developed by HHS and be part of the public domain for shared use by professional groups and audiences. Regardless of the audience and communication technique, all involved HHS partners should focus on the same key messages to ensure consistency and produce an easily accessible and understood format for the respective target audience.

Consistent with the Outreach Plan for Phase One of the HAI Action Plan, the methods to target prevention of HAI in LTCFs will use various channels of communications and state-of-the-art best practices, including:

- Raising awareness of the importance of addressing HAIs in unique LTCFs
- Empowering consumers with the tools and knowledge to be effective self-advocates for HAI prevention
- Helping health care professionals focus their attention on preventive steps (including relevant CDC evidence-based guidelines) that will yield the greatest benefits
- Sharing the overall progress of the nation in reducing national rates of HAIs in LTCFs
- Promoting and sustaining heightened national attention to HAIs within the long-term care provider community by highlighting the HAI Action Plan and the progress that will be realized through the fulfillment of the plan
- Reshaping the social norms that affect HAIs so that HHS prevention measures become standard practice for both long-term care providers and consumers

For years, DNH has been analyzing a data file that links the resident-level MDS assessments with Medicare inpatient claims data to determine the rate of avoidable hospitalizations (including hospitalizations for UTIs and sepsis) as an outcome associated with understaffing. The Medicare Payment Advisory Commission has analyzed a similar file for its annual report to Congress on 30-day readmissions from SNFs. Key among the advantages of resident-level linked files is that there is no additional burden on providers.

Because this system places no additional burden on providers, it can be used in parallel with other surveillance systems, such as NHSN. Although NHSN will be an important tool for tracking the occurrence of all HAIs in NHs, CMS will be able to use this system to analyze claims and clinical data and identify HAIs that result in hospitalization. These efforts will align with other HHS initiatives to reduce readmissions and HACs, which include HAIs.

These data files need to be updated to link the data from the new MDS (Version 3.0). The DNH currently is working on the development of these datasets to continue refining NH/SNF staffing measures. Such files could provide this group and other stakeholders with a key tool for assessing the burden of HAIs in long-term care, allowing them to identify the most severe HAIs that require hospitalizations.

Additional insight may come from a small number of demonstration projects housed in the CMS Innovation Center and in collaboration with the CMS Medicare-Medicaid Coordination Office. The demonstration projects seek to implement interventions that reduce avoidable hospitalizations among long term care residents. Results from the projects are anticipated in late 2016.

Table 11. Summary of Recommendations

Subject Area		Recommendation
Research Gaps	1.1	Obtain more recent HAI incidence data for priority HAIs.
Data Sources and Measurements	2.1	Encourage HAI infection surveillance and reporting to NHSN as the industry norm. NHSN data collection and transfer should concurrently support surveillance and monitoring, quality measurement and reporting, and compliance monitoring.
	2.2	Consider integration of the AHRQ Common Formats project to encourage NHs to adopt and use health IT that complies with standards accepted by the Office of the National Coordinator for Health Information Technology.
	2.3	Place <i>prevention</i> as the highest priority for the UTI, CAUTI and CDI measurement set. Development of measures of catheter and antibiotic utilization should be encouraged in certified nursing facilities in a manner that is well aligned with the acute hospital to enable system-level measurement.
	2.4	Consider <i>transitional care</i> measures consistent with other current health system priorities, which may encourage patient- and episode-centered care and discourage cost-shifting. Measures of hospital admissions, readmissions, ED visits, and observation stays may be feasible to develop using ICD-9-CM and ICD-10-CM codes.
	2.5	Ensure that inclusion of additional measures is parsimonious and tailored to the quality improvement priorities of specific sites of care.

Subject Area		Recommendation
	2.6	Construct a data collection system that can support multiple components for assessing the quality of health care delivery, including disease surveillance, effectiveness of prevention and control activities, quality improvement, public reporting, and financial incentive determinations in long-term care.
HAI Prevention Promising Practices in LTCFs	3.1	Evaluate the use and success of the collaborative approach within regions or states to implement and perform HAI surveillance in NHs/SNFs. Use this information to determine how NH/SNF collaboratives should be designed, structured, and implemented to ensure they achieve their goals.
	3.2	Determine the feasibility of using a HAC policy in NHs/SNFs, and identify which HACs or HAIs are most relevant for NH/SNF providers.
	3.2	Consider implementing an assessment of current resources dedicated to antibiotic stewardship programs within NHs/SNFs, which may allow for a better understanding of such programs in the long-term care setting.
	3.2.1	Establish pilot or demonstration projects that evaluate the implementation of the antibiotic stewardship programs (e.g., MARR Tool Kit) and their impact on antibiotic use practices in LTCFs.
	3.2.2	Identify the best methods to implement and sustain antibiotic stewardship programs within LTCFs.
	3.3	Conduct additional research to determine barriers to implementation of staff influenza vaccine programs and causes for low vaccine uptake among long-term care staff. A pilot project could be conducted to evaluate the feasibility of collecting the relevant data to monitor and systematically report influenza vaccine coverage rates for LTCF staff.
	3.4	Consider exploration of the role and feasibility of including HAI-specific metrics in future NHVBP demonstrations
Communications	4.1	A knowledge and training gap may exist in rural areas, where primary care physicians often serve as medical directors of LTCFs without any formal training or background in geriatrics. Some rural health providers may not be connected to formal geriatric training programs or NH/SNF/long-term care associations but can be targeted through various education networks under HRSA. Some state health departments (including licensing bodies and public networks) and state HAI coordinators under the American Recovery and Reinvestment Act also may distribute materials and disseminate messages from the HAI strategy and could be focused on rural providers.
	4.2	Consider making a special effort to coordinate with the annual flu vaccine campaign, established to highlight the importance of continuing influenza vaccination. The HAI/long-term care work could focus especially on efforts to encourage long-term care staff as well as consumers and their caregivers and visitors to protect NH/SNF residents by getting immunized.
	4.3	Develop free clinical education materials, perhaps as phone apps, that assess clinicians' knowledge and connect them with Web-based training.
	4.4	Offer campaign outreach materials, royalty-free, to an array of audiences, including manufacturers of equipment and goods used in long-term care, to aid in increasing the availability of all outreach materials.



“This course was developed from the public domain document: National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination (2013) - U.S. Department of Health and Human Services.”