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INFECTION PREVENTION IN LTCF

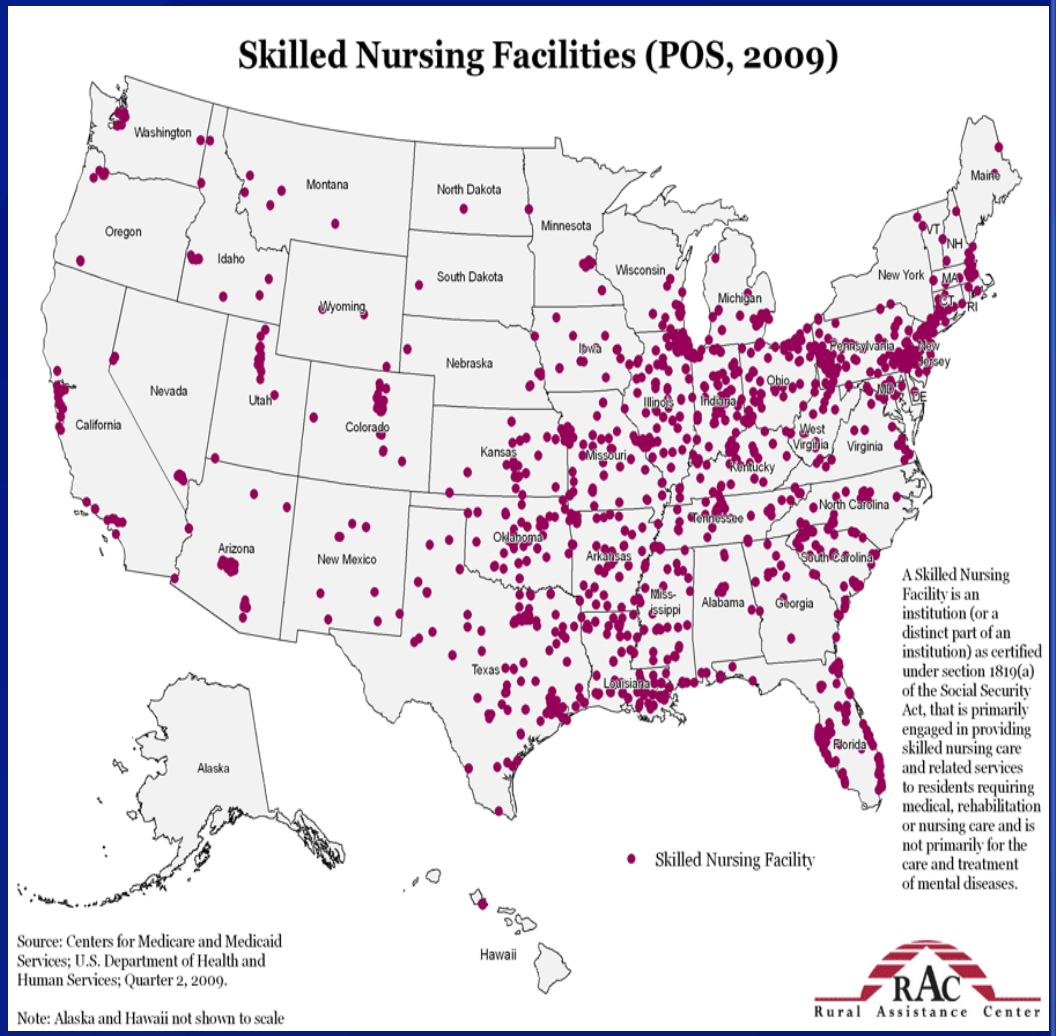
Understanding HAIs in LTC: Scope of the problem

What is a healthcare-associated infection (HAI)?

- An infection acquired during the course of receiving treatment for other conditions *within a healthcare setting*
- Historically, considered hospital-based problems, *nosocomial infections*
  - *Nosocomial* comes from the Greek word *nosokomeion* meaning hospital
    - (*nosos* = disease, *komeo* = to take care of)

Long-term care facilities (LTCFs)

- In 2008, 3.2 million residents received care in the 15,965 certified LTCFs
- Acute care hospitals are the primary source of admissions



www.raconline.org/info_guides/maps

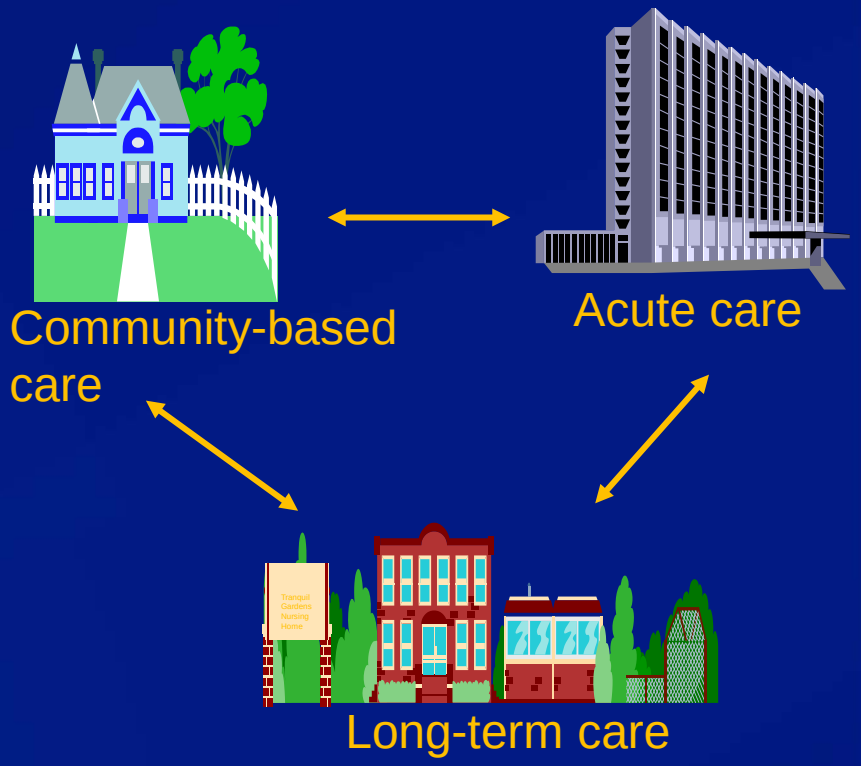
Changing population in LTCFs

- From 1999 to 2008
  - 16% decrease in the number of nursing home beds/ 1000 residents of US population;
  - 10% increase in the number of residents cared for in LTC
  - Increasing proportion of individuals under the age of 65 are receiving care in LTCFs
- May reflect a change in the LTC resident population
  - One theory: post-acute care population is growing while custodial care is shifting to assisted-living or home-based services

Nursing Home Compendium 2009, CMS

Growing complexity in the LTC resident population

- Increasing post-acute care population
  - Growing medical complexity and care needs
  - Increasing exposure to devices, wounds and antibiotics
  - High prevalence of multidrug-resistant organisms
- Dynamic movement across healthcare settings
  - Impacts where healthcare-associated infections manifest



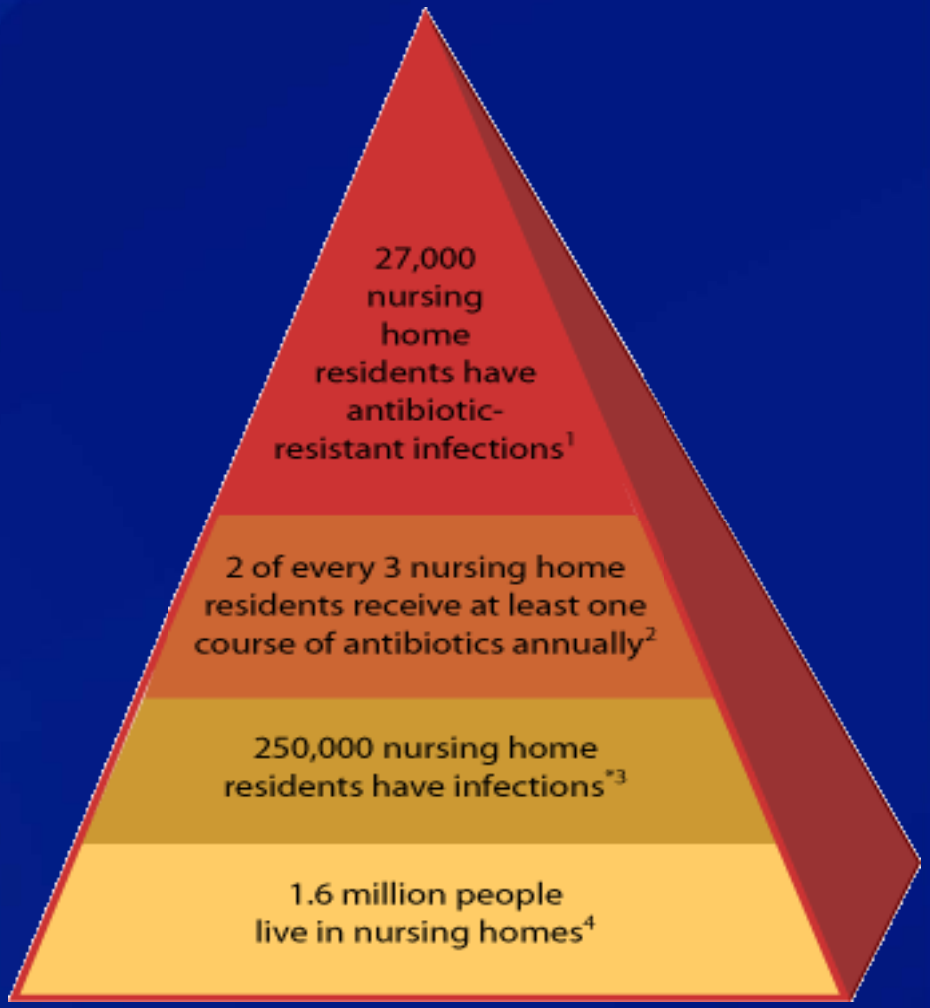
Device use in LTCFs

- In a 2004 survey of ~15,000 LTCFs in US
  - 22% had residents with peripherally-inserted central lines
    - ~40% with capacity to provide infusion therapy or parenteral nutrition
  - 5-10% of residents have urinary catheters
- No clear way to track device utilization or establish norms across facilities

http://www.cdc.gov/nchs/data/nnhsd
Smith, P. et al.ICHE 2008; 29(9): 785-814

Antimicrobial use in LTCFs

- Antimicrobials are the most frequently prescribed drug class
  - Comprise 40% of all prescriptions
  - 50-70% of residents will receive an antimicrobial during the year
- 25-75% of antimicrobial use may be inappropriate



http://www.cdc.gov/DRUGRESISTANCE/healthcare/ltc.htm

Common HAIs in LTCFs

TABLE 1

INCIDENCE OF ENDEMIC INFECTIONS IN LONG-TERM–CARE FACILITIES AND EXTRAPOLATIONS

Type of Infection	Range of Published Rates per 1,000 Resident-Care Days*
Lower respiratory tract infection	0.3-4.7
Symptomatic urinary tract infection	0.19-2.2
Skin and soft-tissue infection†	0.1-2.1
Acute gastroenteritis	0.1-2.5
Bacteremia	0.2-0.36
All infections	1.8-13.5

* From 12 studies cited in reference 1.

Strausbaugh LJ. Infect Control Hosp Epidemiol 2000;21:674-679

Burden of HAIs in US LTCFs

- Estimated 1-7 million infections annually
  - Account for 30-50% of hospital transfers
- Results in >1 billion $ in additional health costs annually
- Rate of deaths from infections ranges from 0.04 to 0.71 per 1000 resident-days
  - >100,000 deaths/year

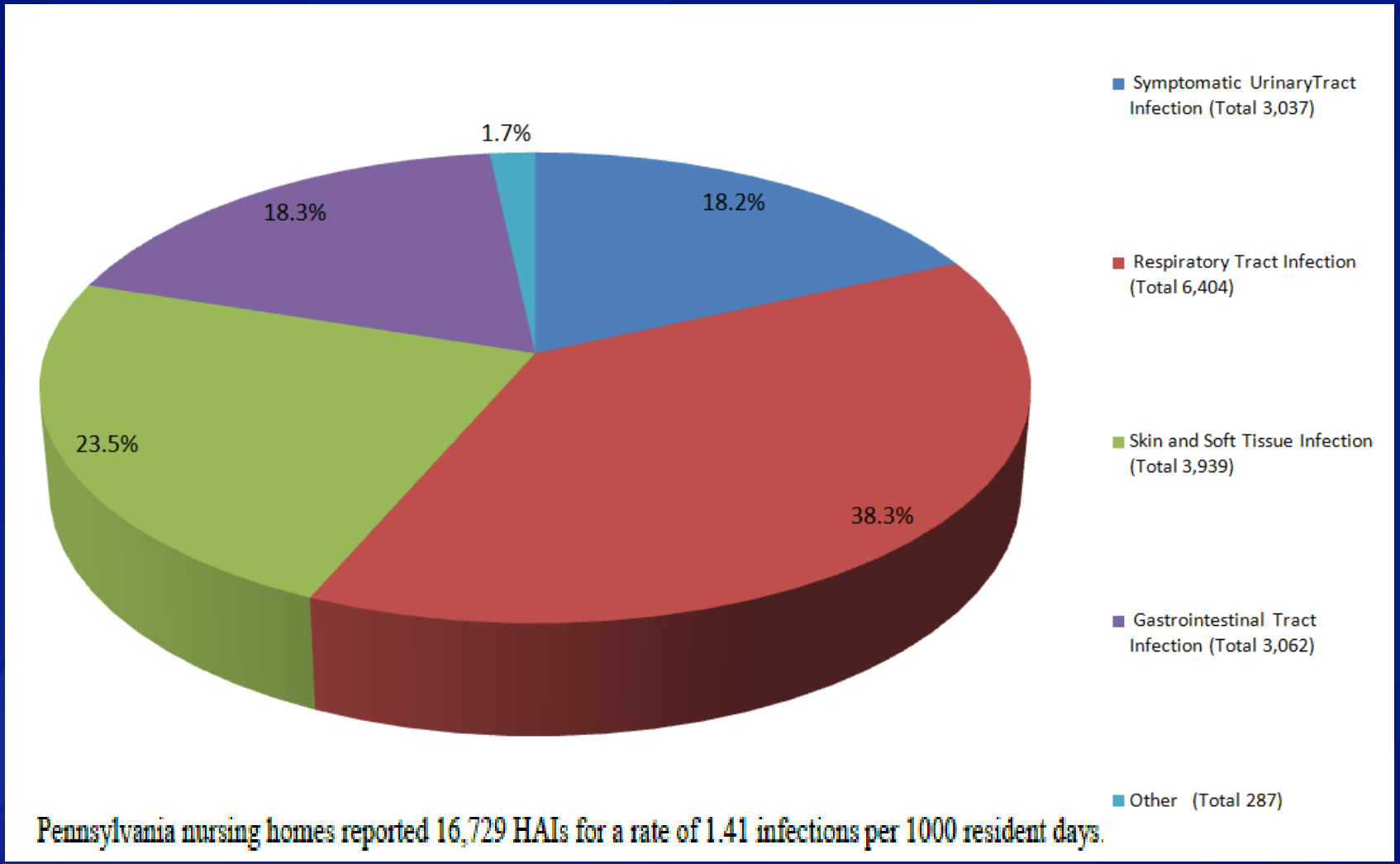
Smith, P. et al. ICHE 2008; 29(9): 785-814

VA NHAI point prevalence study

- 575 residents with HAI/10,939 residents
- 24.6% of residents had at least one indwelling device
  - 36% urinary catheters
  - 18% PEG tubes
  - 11.5% PICC lines
- 613 infections
  - 29% symptomatic UTI
  - 18% skin/soft tissue
  - 8% pneumonia
  - 8% GI tract
- Residents with devices carried 2.8-fold higher risk of an infection

Tsan L et al. AJIC 2010;38:461-6

PA state reporting of HAIs in LTC



Pennsylvania nursing homes reported 16,729 HAIs for a rate of 1.41 infections per 1000 resident days.

http://patientsafetyauthority.org/PatientSafetyAuthority/Pages/AnnualReports.aspx

Diabetes care and Infection risk

- From 1995 to 2004, the estimated number of nursing home residents with DM increased from 16% to almost 25%

Transmission of Hepatitis B Virus Among Persons Undergoing Blood Glucose Monitoring in Long-Term–Care Facilities — Mississippi, North Carolina, and Los Angeles County, California, 2003–2004

Regular monitoring of blood glucose levels is an important component of routine diabetes care (*1*). Capillary blood is typically sampled with the use of a fingerstick device and tested with a portable glucometer. Because of outbreaks of hepatitis B virus (HBV) infections associated with glucose monitoring, CDC and the Food and Drug Administration (FDA) have recommended since 1990 that fingerstick devices be restricted to individual use (*2,3*). This report describes three recent outbreaks of HBV infection among residents in long-term–care (LTC) facilities that were attributed to shared devices and other

BOX 1. Recommended practices for preventing patient-to-patient transmission of hepatitis viruses from diabetes-care procedures in long-term–care settings

Diabetes-care procedures and techniques

- Prepare medications such as insulin in a centralized medication area; multidose insulin vials should be assigned to individual patients and labeled appropriately.
- Never reuse needles, syringes, or lancets.
- Restrict use of fingerstick capillary blood sampling devices to individual patients.
- Consider using single-use lancets that permanently retract upon puncture.
- Dispose of used fingerstick devices and lancets at the point of use in approved sharps containers.
- Assign separate glucometers to individual patients. If a glucometer used for one patient must be reused for another patient, the device must be cleaned and disinfected. Glucometers and other environmental surfaces

Zhang X, et al. J Am Geriatr Soc 2010. 58:724–730
MMWR 2005 54 (9): 220-223

Emergence of Epidemic C difficile clone: NAP1/BI/027 strain

- CDI rates in the US have tripled between 2000-2005
- Severity of infections and mortality have also been much higher than historic CDI

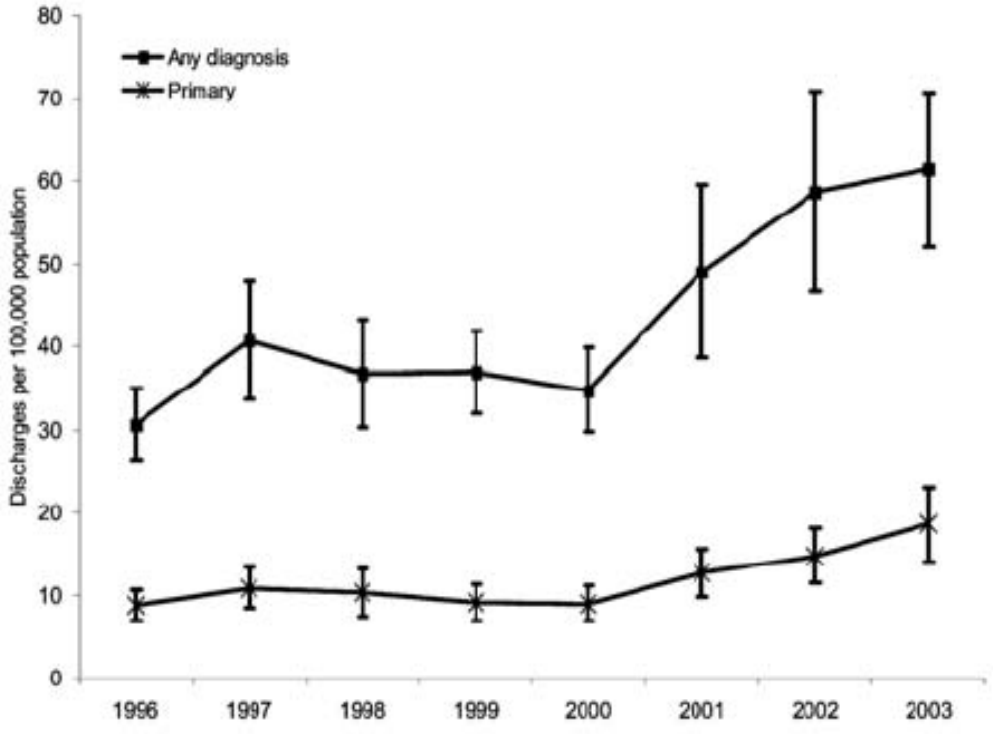
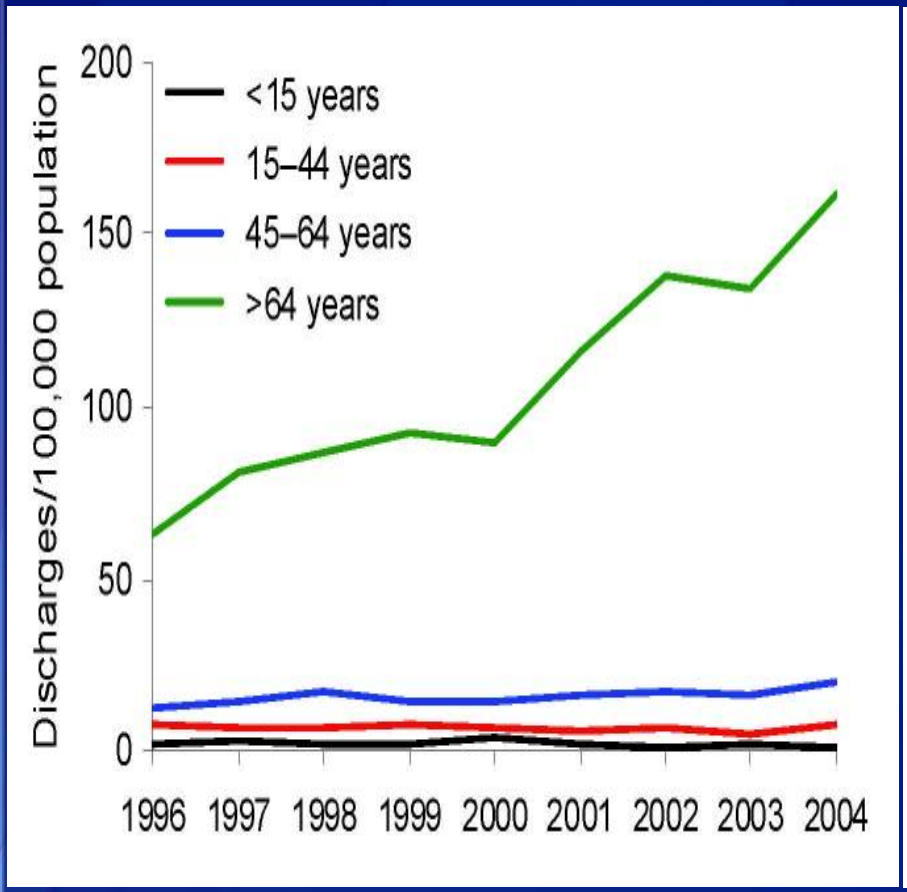
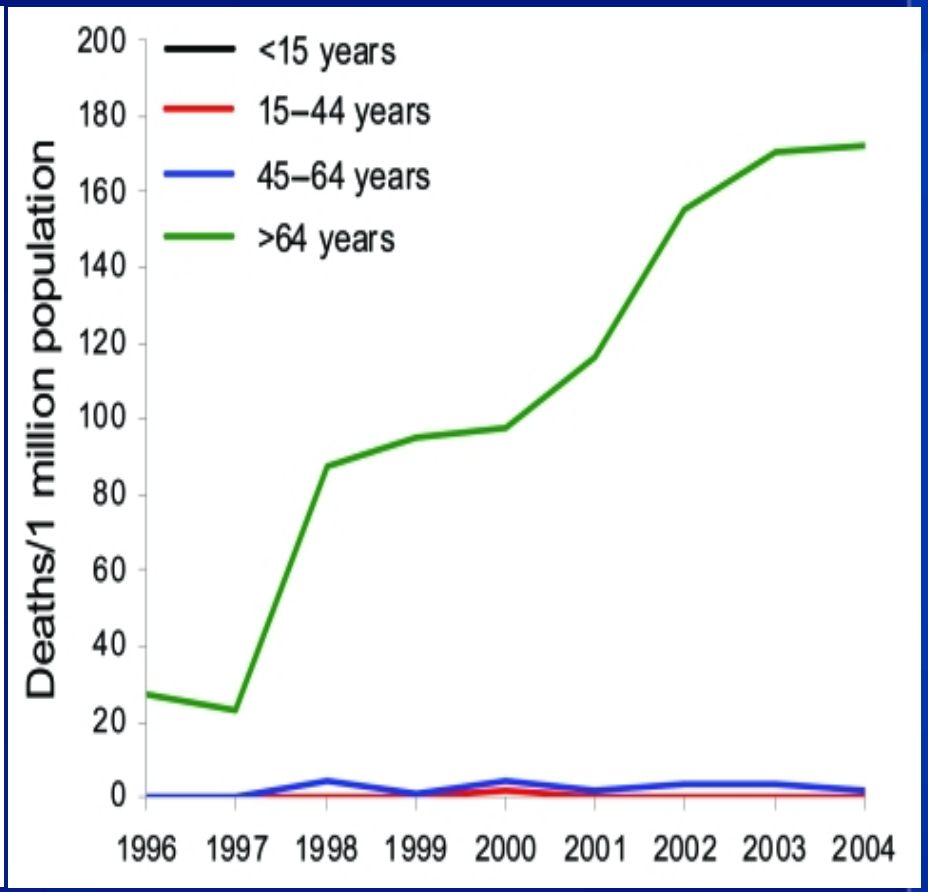


Figure 1. National estimates of US short-stay hospital discharges with *Clostridium difficile* listed as primary or as any diagnosis. Isobars represent 95% confidence intervals.

McDonald LC et al. Emerg Infect Dis. 2006 12(3): 409–15

Disproportionate impact of epidemic CDI in the elderly





Lyytikainen et al. Emerg Infect Dis. 2009. 15(5): 761–765

Understanding HAIs in LTC: Regulatory expectations for IC programs

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

IC program regulations for LTC

CMS Manual System
Pub. 100-07 State Operations
Provider Certification

Department of Health & Human Services (DHHS)
Centers for Medicare & Medicaid Services (CMS)

Transmittal 51

Date: July 17, 2009

SUBJECT: Revisions to Appendix PP – "Interpretive Guidelines for Long-Term Care Facilities," Tag F441"

§483.65 Infection Control

The facility must establish and maintain an Infection Control Program designed to provide a safe, sanitary and comfortable environment and to help prevent the development and transmission of disease and infection.

- Collapsed F441, F442, F443, F444, F445 into a single tag
- Expanded from 8 pages in 1995 to 38 pages and including an investigative protocol
- Incorporates/references many CDC guidelines for IC in healthcare settings

CMS Manual System, Pub 100-07, Transmittal 51 "Interpretive Guidelines for Long-Term Care Facilities, Tag F441", 7-2009

Interpretive Guidance from CMS

INTENT: (F441) 42CFR 483.65 Infection Control

The intent of this regulation is to assure that the facility develops, implements, and maintains an Infection Prevention and Control Program in order to prevent, recognize, and control, to the extent possible, the onset and spread of infection within the facility. The program will:

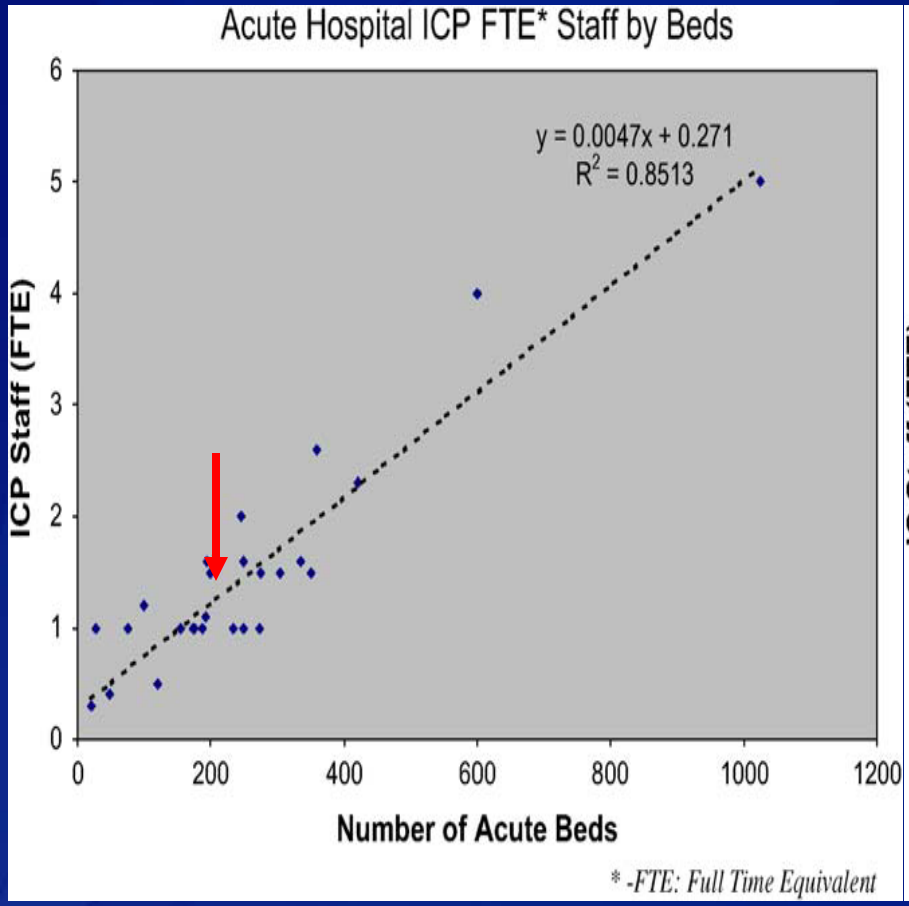
- *Perform surveillance and investigation to prevent, to the extent possible, the onset and the spread of infection;*
- *Prevent and control outbreaks and cross-contamination using transmission-based precautions in addition to standard precautions;*
- *Use records of infection incidents to improve its infection control processes and outcomes by taking corrective actions, as indicated;*
- *Implement hand hygiene (hand washing) practices consistent with accepted standards of practice, to reduce the spread of infections and prevent cross-contamination; and*
- *Properly store, handle, process, and transport linens to minimize contamination.*

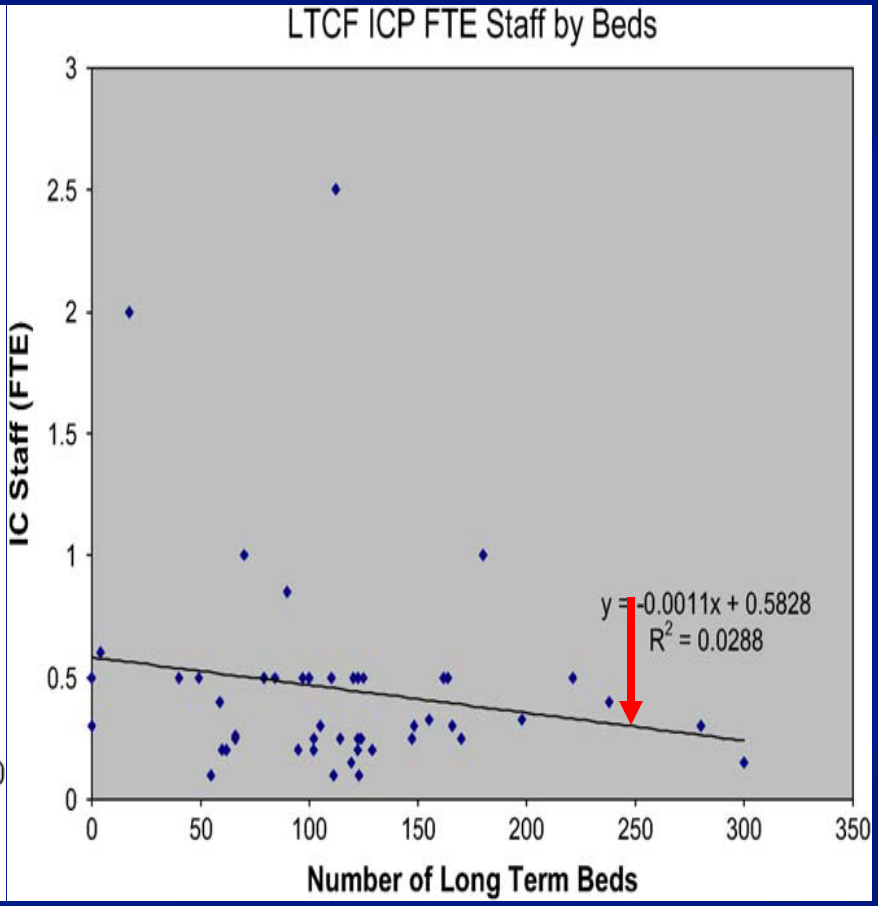
CMS Manual System, Pub 100-07, Transmittal 51 "Interpretive Guidelines for Long-Term Care Facilities, Tag F441", 7-2009

Ideal IC program components

- Dedicated / trained infection control personnel
  - Administrative and medical staff support
- Infection surveillance plan
  - Ability to detect both endemic infections and outbreaks
  - Ability to track over time and assess impact of prevention efforts
  - Ability to relate to clinical practices such as antibiotic utilization
- Policies/practices to manage transmission of infections
  - Staff training/education, staff resources
  - Means to assess adherence to policies

Reduced infection control resources in LTC vs. Acute care



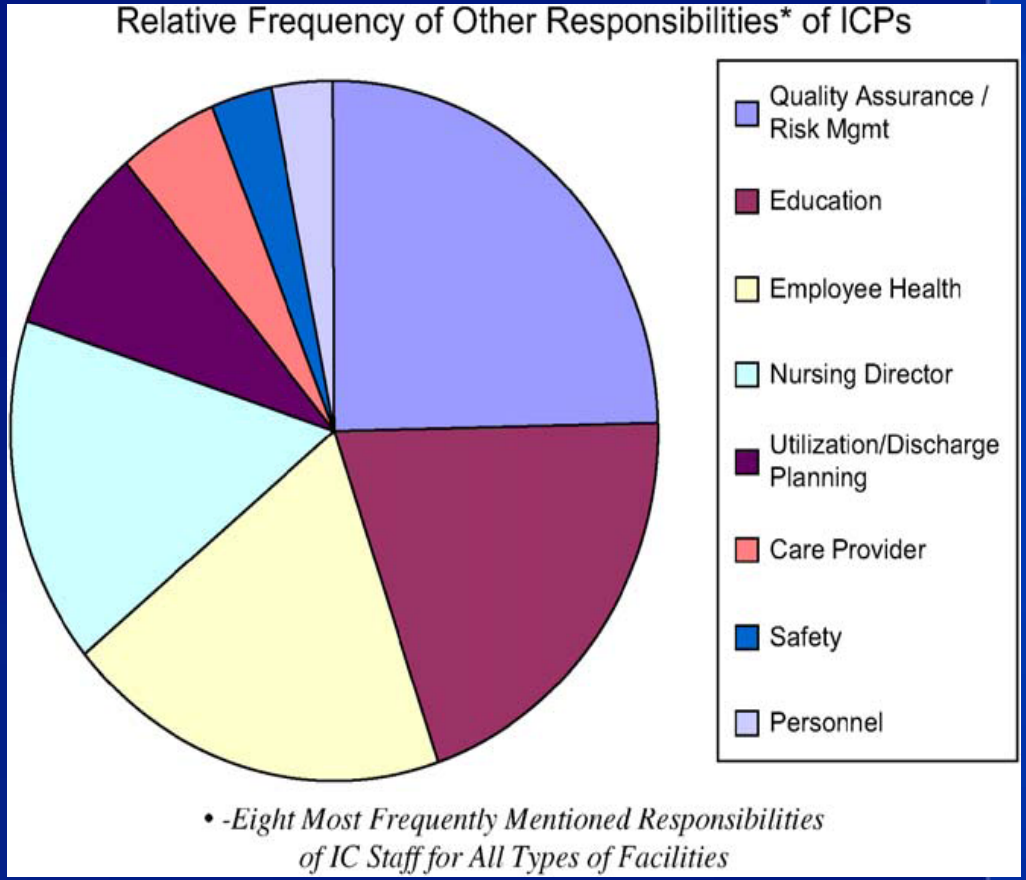


Average 0.4 FTE for 250 bed LTCF vs. 1.2 FTE in similarly sized acute care facility

Roup, BJ.et al. AJIC 2006; 34:122-27

Limited IC coordinator time

- Lack formal training in infection control
  - Less than 10% are CIC certified, compared with >95% in acute care
- Multiple responsibilities outside of infection control duties



Smith, P. et al. ICHE 2008; 29(9): 785-814
Roup, BJ.et al. AJIC 2006; 34:122-27

Challenges to diagnosing infections in LTC

- Frail population
  - Low baseline functional status, limited ability to communicate
  - Atypical manifestations of infections
  - Hard to differentiate colonization from true infection
- Rotating caregivers
  - Limited access to RNs in most facilities
  - On-site physician assessments infrequent
  - Diagnosis and management plan initiated via phone/fax
- Limited access to diagnostics
  - Radiologic and microbiology data often not available

Challenges to preventing transmission of infections in LTC

- Culture change movement to create “home-like” environment for residents
  - Balancing resident needs for socialization with risk of transmission within common living areas
  - Implementation of isolation precautions often modified or time limited given residential living
- Limited resources for maintaining staff outreach and education
  - Annual turnover from 40-190% in LTCFs[1]
  - Challenging to engage part-time medical staff in facility-wide policies/initiatives

Bostick JE JAMDA 2006;7:366-76

Take Home Points

- There is national recognition of the importance preventing HAIs in the LTC setting
- Risk factors in the growing post-acute population will increase the incidence of HAIs and the challenges of multidrug-resistance
- Revising F441 has heightened awareness and attention on IC programs nationally
- LTCFs have many resource challenges to overcome to meet the goals of infection prevention

Key Infection Prevention Strategies: Overview of State HAI plans

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

Building state infrastructure for HAI prevention

- Congressionally mandated State HAI Plans
  - States were required to have a formal HAI prevention plans
  - Linked to CDC's Prevention Block Grant funding to state health depts.
- $40M to State HAI activities from CDC through American Reinvestment & Recovery Act
  - 1 year into state plans which were developed and implemented in 49 states, DC, and Puerto Rico
  - Plans promote enhancing infection surveillance and establishing HAI prevention initiatives

LTC Needs Assessment

- CDC developed tool to assess current state of IC program resources and activities in LTCFs.
- Primary domains about the IC program
  - Personnel resources
  - Policies/ specific activities
  - Sufficiency of program resources
- To be completed by the primary person responsible for coordinating day-to-day infection prevention and control activities for the facility
- Has been adapted into web-based survey tool by several states

HAI Collaborative Survey

Page Safety Tools

HAI Collaborative Survey

Facility Infection Control (IC) Program

Personnel Involved in IC Implementation

8. How many full-time employees (FTEs) are currently dedicated to your facility's infection control program?

9. What is the highest level of professional training of the individual primarily responsible for the infection control program in your facility?

- CNA
- LPN
- RN
- MD
- No FTEs are dedicated to infection control
- Other (please specify)

10. How long has this individual been in that position at your facility? (# of years)

11. How many years of experience does he/she have doing infection control-related work? (# of years)

HAI Collaborative Survey

Specific Program Activity

The following questions ask about specific infection control program activities currently used or in place at your facility. Please complete each question as appropriate at this point in time.

21. Infection Surveillance

For each statement below, please select a YES or NO response as appropriate:

	Yes	No
a. Our facility uses standard definitions (such as McGeer criteria or CDC NHSN definitions) to determine if a resident has an infection.	○	○
b. Our facility uses new antibiotic prescriptions (starts) to determine if a resident has an infection.	○	○
c. Our facility reviews provider notes to determine if a resident has an infection.	○	○
d. Our facility maintains a list of residents with healthcare-associated infections in a log book.	○	○
e. Our facility keeps a record of healthcare-associated infections in an electronic spreadsheet or database.	○	○
f. Our facility performs house-wide surveillance of infections among our residents.	○	○
g. Our facility performs targeted surveillance for specific infections among our residents.	○	○
h. Our facility tracks rates of infection over time to identify trends – (e.g., monthly rate, quarterly rate, annual rate).	○	○
i. Our facility creates summary reports (e.g., trends) of healthcare-associated infections.	○	○
j. Our facility reports rates of specific infections (e.g., # UTIs/1000 resident days/month).	○	○
k. Our facility reports rates of infections by device days (e.g., # UTIs/1000 urinary catheter days/month).	○	○
l. Our facility shares infection surveillance data with facility Board members	○	○

HAI Collaborative Survey

Multidrug-resistant Organisms (MDROs) Management

The next series of questions are about the way your facility handles Multidrug-resitant Organisms (MDRO's)

30. Multidrug-resistant Organisms (MDROs) Management
For each statement below, please select a YES or NO response as appropriate:

	Yes	No
a. Our facility has a mechanism to identify, at admission, residents previously infected or colonized with MDROs (e.g., MRSA, VRE, C. difficile).	○	○
b. Our facility performs MRSA surveillance testing (culture or PCR) on new resident admissions for the purpose of detecting MRSA colonization (active surveillance).	○	○
c. Our facility has policies that specifically address the implementation of Isolation Precautions that are used in addition to Standard Precautions for residents infected or colonized with MDROs (e.g., MRSA, VRE, C. difficile).	○	○
d. Our facility has policies that specifically address the discontinuation of Isolation Precautions that are used in addition to Standard Precautions for residents infected or colonized with MDROs (e.g., MRSA, VRE, C. difficile).	○	○
e. Our facility has a process for communicating with other facilities about residents with colonization/infection with MDROs at the time of transfer.	○	○
f. Our facility has a strategy for identifying appropriate roommate selection for residents admitted with an MDRO who cannot be placed in a private room.	○	○
g. Our facility places residents with suspected C. difficile infection on Contact Precautions.	○	○
h. Our facility places residents with active C. difficile infection on Contact Precautions.	○	○
i. Our facility places all residents with active C. difficile infection into private rooms.	○	○

State program for LTC education: Georgia

- Collaboration to develop a LTC IC training curriculum for providers and surveyors
  - Partnership among GA Healthcare Facility Regulation Div., GA Div. Public Health, GA Quality Improvement Organization and CDC
  - Course will be open to IC staff from all LTCFs across the state, local public health personnel and state surveyors

- Improved communication and resource sharing among state health divisions and the QIO
- Generated interest and opportunity for infection control education for the state NH surveyors
- Expanded state surveyor access and knowledge of IC resources from public health

State program for LTC education: Nevada

- Adapted the infection control worksheet into an educational tool for use in LTC
  - Voluntary participation; offered to every LTCF in the state
  - Completely independent from annual survey
- Program components
  - Performed IC assessments (walk-through)
  - Provided onsite feedback, resources and written recommendations based on findings
  - Conducted follow-up visits to evaluate if changes had been implemented

State program for LTC education: Nevada (cont.)

- Currently evaluating program impact via post-assessment survey
  - Piloted program evaluation via phone interview with 9 facilities
  - Currently soliciting feedback from all LTCFs via web-based survey
- Preliminary feedback very positive
  - Facility staff appreciated the additional education and resources provided
  - Has increased communication between facilities and state

F. Lincer, Promising Practice proposal, AHFSA 2010

State programs for infection prevention in LTC

- Florida
  - Decreasing catheter-associated UTI rates in participating acute care and LTCFs
- Indiana / Illinois
  - Reducing C. difficile infections among participating acute care and LTCFs
- Vermont
  - State-wide reduction of multidrug-resistant organisms

Vermont MDRO Prevention Collaborative

- Partnership among VT Dept Health, Vermont Program for Quality in Healthcare and CDC
- Acute care and LTCFs partnered into “healthcare clusters” to facilitate communication and shared resources
- Kick-off meeting included:
  - Breakout time for “clusters” interact and get to know each other
  - Breakouts for each setting to promote discussion and identify strategies for prevention implementation

Take Home Points

- LTC must prioritize infection control to meet the changing needs of our population
  - Allocating IC resources and engaging front line staff are critical to the success of any program
- State partners are an excellent source of support for HAI prevention work in LTC
- Take advantage of opportunities to participate in state HAI prevention programs and give LTC a voice at the table

Key Infection Prevention Strategies: Opportunities in Connecticut

Future Opportunities

- Intervention studies to reduce modifiable risk factors among nursing home residents
  - Pneumonia reduction in disabled nursing home elders → enhanced oral care protocol to prevent pneumonia
  - Cranberry capsules for prevention of bacteriuria and UTI