Infection Control Infrastructure

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1

Why Do We Need a Comprehensive Infection Prevention and Control Program?

- A 91 year old woman developed cough and sputum production over a period of 8 months in a nursing home in Arkansas.
- 80 individuals were exposed and developed latent TB with exposure involving 2 nursing home and a hospital.
- A nursing home employee, a hospital employee, a NH resident and a visitor developed symptomatic TB.

Table 1. Tuberculosis Contact Investigation in Nursing Home A

Classification	Total n	Previous TST +	TST −	TST Conversions	Tuberculosis Cases
		n (%)			
Employee	127	11 (9)	116 (91)	33 (28)	1 (1)
Resident	98	17 (17)	81 (83)	23 (28)	1 (1)

TST = tuberculin skin test; + = positive; − = negative.

Table 2. Tuberculosis Contact Investigation in Nursing Home B

Classification	Total n	Previous TST +	TST −	TST Conversions	Tuberculosis Cases
		n (%)			
Employee	30	4 (13)	26 (87)	1 (4)	0
Resident	19	2 (11)	17 (89)	1 (6)	1

TST = tuberculin skin test; + = positive; − = negative.

Table 3. Tuberculosis Contact Investigation in the Local Hospital

Classification	Total n	TST Conversions n (%)	Tuberculosis Cases n
Exposed	178	14 (8)	1
Not exposed	33	1 (3)	0

TST = tuberculin skin test.

Ijaz K et. al. J Am Geriatr Soc. 2002 Jul;50(7):1213-8.

2

IPC Programs in Nursing Homes Before New CMS Regulations and COVID-19 Pandemic

	Total N = 922	IC citation n = 320	No IC citation n = 602	*P* value
Infection control program characteristic				
IP received training in infection control	359 (38.9)	115 (35.9)	244 (40.5)	.17
IP certified in infection control	25 (2.7)	7 (0.8)	18 (1.9)	.48
Frequency of infection control committee meetings				
Biweekly/weekly/monthly	556 (61.2)	215 (67.8)	341 (57.6)	<.01
Quarterly	245 (27.0)	65 (20.5)	180 (30.4)	
Annually/not regularly/other	108 (11.8)	37 (11.7)	71 (12.0)	
Involved in an infection prevention collaborative	292 (32.2)	104 (33.3)	188 (31.5)	.58
Implemented electronic health records	445 (49.4)	158 (50.3)	287 (48.9)	0.68
Three or more IPs in the previous 3 years	349 (40.7)	132 (45.4)	217 (38.3)	0.05
Three or more DONs in the previous 3 years	348 (41.7)	121 (43.5)	227 (40.8)	0.44
Three or more administrators in the previous 3 years	317 (37.9)	113 (40.2)	204 (36.7)	0.32

Note. Data presented as n (%) unless otherwise noted. IC = infection control; IP = infection preventionist; DON = director of nursing.

Stone P et al. Inquiry. 2018 Jan-Dec; 55

3

Basic Components of Infection Prevention and Control Program in Nebraska Nursing Homes Before New CMS Regulations and COVID-19 pandemic

Infection Control Basic Infrastructure	Yes	No
The facility has specified a person who is responsible for coordination the IC program	93%	7%
The person responsible for coordinating the infection prevention program has received training in IC	60%	40%
The facility has a process for reviewing infection surveillance data and infection prevention activities	87%	13%
Written infection control policies and procedures are available and based on evidence-based guidelines, regulations or standards	90%	10%
Written infection control policies and procedures are reviewed at least annually or according to state or federal requirements, and updated if appropriate	70%	30%
The facility has a written plan for emergency preparedness	83%	17%

4

Nursing Home Infection Control Program Elements

Table 2
Infection control program: Elements

Elements	Components
Surveillance	Using surveillance infection definitions: • Loeb minimum criteria • CDC/NHSN criteria Calculating infection rates
Outbreak management	Disease specific (influenza, tuberculosis, viral gastroenteritis, scabies)
Implementation of routine infection control policies and procedures	Hand hygiene Isolation precautions MDROs Device care
Communication with management	Sharing information and obtaining support for changes in policies and procedures
Disease reporting	Information transfer during care transitions Reporting to public health authorities
Antibiotic stewardship	Review of antimicrobial usage
Resident health programs	Immunizations Tuberculin testing Hand hygiene Oral care
Employee health programs	Immunizations Occupational exposure to infectious organisms
Facility management	Food preparation Laundry services Infectious waste collection and disposal Housekeeping (cleaning, disinfection)

Abbreviations: CDC/NHSN, Centers for Disease Control/National Healthcare Safety Network; MDROs, multidrug-resistant organisms.

Montoya A et al. Clin Geriatr Med 32 (2016) 585–607

Prevention of outbreaks and HAIs

Respiratory Protection Program

COVID-19
MDROs (ESBL organisms, CP-CRE, *C auris* etc.)

Symptoms screening, Universal masking

Performing risk assessments and getting support to mitigate risks

Implementing all core elements including actions to improve antibiotic use

Water Management Plan
Air flow/ ventilation

5

CDC Infection Control Assessment and Response Tool for LTCF

Infection Prevention and Control Assessment Tool for Long-term Care Facilities

This tool is intended to assist in the assessment of infection control programs and practices in nursing homes and other long-term care facilities. If feasible, direct observations of infection control practices are encouraged. To facilitate the assessment, health departments are encouraged to share this tool with facilities in advance of their visit.

Overview

Section 1: Facility Demographics

Section 2: Infection Control Program and Infrastructure

Section 3: Direct Observation of Facility Practices (optional)

Section 4: Infection Control Guidelines and Other Resources

Infection Control Domains for Gap Assessment

I. Infection Control Program and Infrastructure
II. Healthcare Personnel and Resident Safety
III. Surveillance and Disease Reporting
IV. Hand Hygiene
V. Personal Protective Equipment (PPE)
VI. Respiratory/ Cough Etiquette
VII. Antibiotic Stewardship
VIII. Injection safety and Point of Care Testing
IX. Environmental Cleaning

https://www.cdc.gov/infectioncontrol/pdf/icar/ltcf.pdf

6

Presence or Absence of Surveillance and Disease Reporting Components In Nebraska LTCF Before New CMS Regulations and COVID-19 pandemic

Surveillance and Disease Reporting	Yes	No
The facility has written intake procedures to identify potentially infectious persons at the time of admission	60%	40%
The facility has system for notification of infection prevention coordinator when antibiotic-resistant organisms or C. difficile are reported by clinical laboratory	80%	20%
The facility has a written surveillance plan outlining the activities for monitoring/tracking infections occurring in residents of the facility	63%	37%
The facility has system to follow-up on clinical information when residents are transferred to acute care hospitals for management of suspected infections, including sepsis	80%	20%
The facility has a written plan for outbreak response which includes a definition, procedures for surveillance and containment, and a list of syndromes or pathogens for which monitoring is performed	53%	47%
The facility has a current list of diseases reportable to public authorities	57%	43%
The facility can provide point(s) of contact at the local or state health department for assistance with outbreak response	90%	10%

7

Surveillance Definitions of Infections in LTCF

Published in final edited form as:
Infect Control Hosp Epidemiol. 2012 October ; 33(10): 965–977. doi:10.1086/667743.

Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria

Nimalie D. Stone, MD[1], Muhammad S. Ashraf, MD[2], Jennifer Calder, PhD[3], Christopher J. Crnich, MD[4], Kent Crossley, MD[5], Paul J. Drinka, MD[6], Carolyn V. Gould, MD[1], Manisha Juthani-Mehta, MD[7], Ebbing Lautenbach, MD[8], Mark Loeb, MD[9], Taranisia MacCannell, PhD[1], Preeti N. Malani, MD[10,11], Lona Mody, MD[10,11], Joseph M. Mylotte, MD[12], Lindsay E. Nicolle, MD[13], Mary-Claire Roghmann, MD[14], Steven J. Schweon, MSN[15], Andrew E. Simor,

Outcome Surveillance: Surveillance performed to identify suspected or confirmed infection

8

Process Surveillance

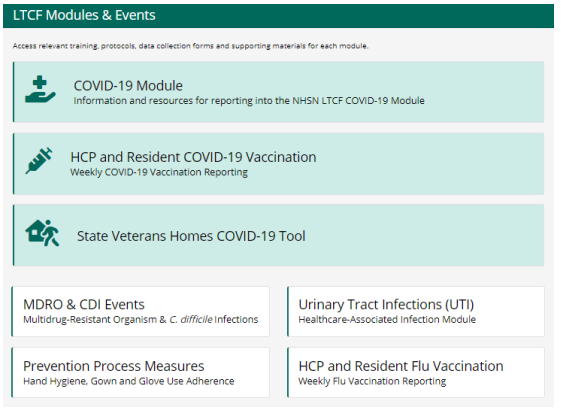
Review of practices by staff directly related to resident care:

- Hand hygiene
- Appropriate use of personal protective equipment (e.g., gowns, gloves, facemask)
- Appropriate use of transmission-based precaution according to clinical scenario
- Injection safety
- Point-of-care testing (e.g., during assisted blood glucose monitoring);
- Implementation of infection control practices for resident (e.g. urinary catheter care, wound care, injection/IV care, fecal/urinary incontinence care, skin care, respiratory care, dialysis care, and other invasive treatments)
- Bloodborne pathogen exposure management
- Cleaning and disinfection products and procedures for environmental surfaces and equipment
- Handling, storing, processing, and transporting linens so as to prevent the spread of infection.

https://www.cms.gov/medicare/provider-enrollment-and-certification/guidanceforlawsandregulations/downloads/appendix-pp-state-operations-manual.pdf

9

Surveillance: NHSN LTCF Component



https://www.cdc.gov/nhsn/ltc/index.html

10

Feedback and Reporting

- Feedback after surveillance is important
- Define how the data will be used and shared with appropriate individuals (e.g., staff, medical director, director of nursing, quality assessment and assurance committee-QAA),
- Intervene to make sure that staff minimize spread of the infection or disease (e.g., require revision of staff education and competency assessment).
- Identify how reports will be provided to staff and/or prescribing practitioners in order to revise and/or re-evaluate medical interventions related to the infection rates and outcomes.

11

Outbreak

Simple definition for a disease outbreak is:

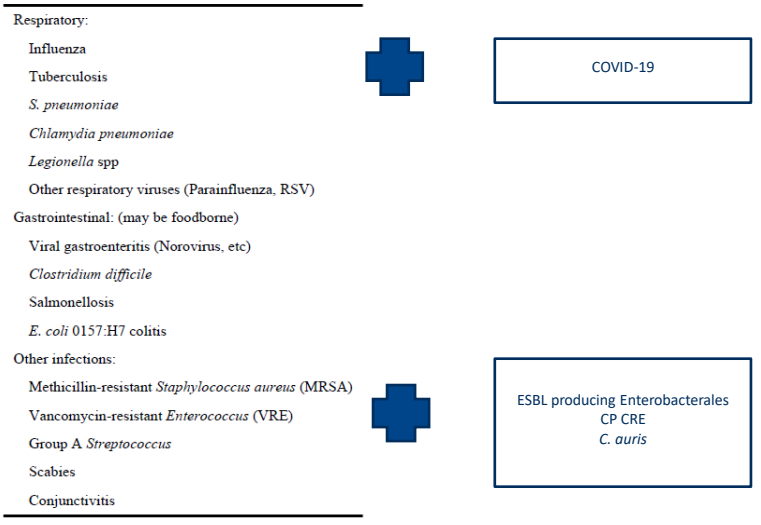
"An increase in the incidence of a disease above what is normally expected"

It can present in following ways:

- May occur explosively with many clinical cases appearing within a short interval (like a few days)
- May involve clustering of few cases over a prolonged period of time (like over several months)

12

Common Long-Term Care Facility Epidemics



Smith et al. Infect Control Hosp Epidemiol. 2008 Sep;29(9):785-814

13

Identifying and Preventing Outbreaks

Identification

- Surveillance
- Educating staff to report any unusual case, lab results, or patterns

Preventive Strategies:

- Systems in place for early detection and management/ isolation of infectious patients/residents at initial point of entry to the facility and during the stay
- Adhering to vaccination guidelines/recommendation
- Compliance with hand hygiene, standard and transmission-based precautions
- Effective environmental cleaning and disinfection
- Following recommendations for disease screening where applicable (like tuberculosis)
- Educating staff not to report for work when ill and making sure they do not get penalized for not reporting to work in that scenario
- Having a system in place to have inter or intra facility communication to alert for infection status and possible need for isolation

14

Infection Control Policy And Procedure

Written policy and procedures have to be in place for:

- Surveillance and Disease Reporting components as discussed above (describing what will be done, when it will be done and how will it be done)
- How to deal with outbreaks
- Hand Hygiene
- How to use standard precautions
- How and When to use transmission based precautions and for how long (and address issues of precautions when private rooms are or are not available and how limitation of movement of highly infectious resident will be accomplished)
- Use of personal protective equipment (Describe which one will be used for which clinical conditions and who will be using PPE under what circumstances)
- Respiratory hygiene/Cough Etiquette
- Education and competency assessment

AND

15

Infection Control Policy And Procedure

Written Policy and Procedure should also be in placed for:

Resident Care Activities

- Include issues related to use and care of urinary catheters, peripheral and central intravenous catheter, blood glucose monitoring, preparation administration and care for medications by injection or any other specific procedures that facility performed

Environmental Cleaning and Disinfection

- Address high touch surfaces in resident room and common areas and discharge cleaning along with privacy curtain cleaning
- Resident care equipment
- Include handling of equipment shared among residents (e.g., blood pressure cuffs, rehab therapy equipment, etc.).
- Delineation of accountability: "Who Cleans What"

Occupational Health

- Address reporting of staff illness, prohibiting contact with resident or their food when they have communicable illness, monitoring and evaluating clusters of infection among staff
- Risk assessment for TB and screening based on risk assessment and state regulations
- Exposure Plan for blood and body fluid exposure

16

Presence of Healthcare Personnel and Resident Safety Components in IPCP in Nebraska LTCF Before New CMS Regulations and COVID-19 pandemic

Healthcare Personnel and Resident Safety	Yes	No
The facility has an exposure control plan which addresses potential hazards posed by specific services provided by the facility	87%	13%
All personnel receive training and competency validation on managing a blood-borne pathogen exposure at the time of employment	80%	20%
All personnel received training and competency validation on managing a potential blood-borne pathogen exposure within the past 12 months	67%	33%
The facility currently has a written policy to assess risk for TB and provide screening to residents on admission	77%	23%
The facility documents resident immunization status for pneumococcal vaccination at time of admission	100%	0%
The facility offers annual influenza vaccination to residents	100%	0%
The facility has an exposure control plan which addresses potential hazards posed by specific services provided by the facility	87%	13%

17

Facility Assessment

Facility Assessment (Risk Assessment):

- Is required to determine what resources are necessary to care for the residents competently during both day-to-day operations and emergencies
- Review at least annually or more often if need arises (like any factor considered in previous assessment changed)
- The facility assessment must address or include a facility-based and community-based risk assessment
- The results of the facility assessment must be used, in part, to establish and update the IPCP, its policies and/or protocols

18

System of Recording IPCP Incidents

- CMS final rule requires facility to develop and implement a system for recording incidents identified under the facility's IPCP
- The facility's system should include defining, identifying, analyzing, and reporting incidents related to failures in infection control practices to the director of nursing, medical director, and the QAA committee
- Also calls for corrective actions taken by the facility based on the investigation of the incidents.
- Monitoring for the effectiveness of its implemented changes; and
- Methods for feedback to appropriate individuals involved in the failed practices

19

Additional Areas of Focus

- Antimicrobial Stewardship
- Infection Control Risk Assessment for construction
- Food Preparation
- Infectious Waste Management and Disposal
- Immunizations
- Staff/ Resident/ Family Education
- Laundry Services (develop and follow practices on handling, storing, processing, and transporting laundry)

20

Reporting Structure of IPCP

As per 2016 CMS final rule:

- The facility must designate one or more individual(s) as the infection preventionist(s) who are responsible for the facility's IPCP.
- The IP must:
  - (1) Have primary professional training in nursing, medical technology, microbiology, epidemiology, or other related field;
  - (2) Be qualified by education, training, experience or certification;
  - (3) Work at least part-time at the facility; and
  - (4) Have completed specialized training in infection prevention and control.
- IP must be a member of the facility's quality assessment and assurance committee and report to the committee on the IPCP on a regular basis.
- Number of hours required for IP activities toward IPCP will depend on facility risk assessment

21

IPCP Infrastructure Outline

Table 2. Long-term care facility infection control program: structure

Leadership	Expertise/training	Role(s)
Infection Control Committee/Oversight Committee		
Core members	Administration, Nursing Representative, Medical Director, ICP	Identifies areas of risk Establishes priorities
Ad hoc members	Food Service, Maintenance, Housekeeping, Laundry Services, Clinical Services, Resident Activities, Employee Health	Plans strategies to achieve goals Implements plans Develops policies/procedures Allocates resources Assesses program efficacy at least annually
Infection Control Professional		
ICP	Qualification via education, experience, certification	Surveillance Data collection and analysis Implementation of policies, procedures Education Reporting to oversight group/ICC Communication to public health Communication to other agencies Communication to other facilities

Smith et al. Infect Control Hosp Epidemiol. 2008 Sep;29(9):785-814

22

Table 2. Infection prevention and control activities for long term care

Am J Infect Control 2004;32:2-6.)

Activity	ICP time (in days)
Surveillance	
♦ Need simple, effective system using standard definitions	
♦ Use Canadian consensus surveillance criteria	182
♦ Focus on high morbidity/mortality infections	
♦ Consults	
♦ Problem solving	
♦ Continuous quality improvement	
Antimicrobial Use	
♦ Issues include: inappropriate use of antimicrobials; colonization vs. infection,	
♦ Who will monitor use of antimicrobials in LTC facilities?	
♦ Need external expert resource (1 day/month)	
Outbreak management	
♦ Early detection of outbreaks (e.g., gastroenteric and influenza-like)	28
♦ Rapid action to control (e.g., antivirals, cohorting, etc.)	
♦ Liaison with Public Health	
Education	
♦ Self	28
♦ Staff	
♦ Families and visitors	
♦ Product selection	
Policies and procedures (for resident care as well as dietary, laundry, housekeeping). Includes committee work.	70
♦ Development (2 days/month)	
♦ Implementation (4 days/month)	
Occupational health	
♦ Tuberculosis screening	18.9
♦ Work restrictions during outbreaks	
♦ Vaccination programs including influenza vaccine—essential adjunct to resident immunization program	
Resident health programs	
♦ Admission tuberculosis screening program	14
♦ Influenza and pneumococcal vaccine programs	
Laboratory resources	
♦ Serology	
♦ Virology	
♦ Molecular epidemiology	
Infectious Disease Physician (4 hours/month)	
Epidemiologist	
Secretarial Support (including data entry) (0.5 FTE)	
Personal computer	
♦ Internet access	
♦ Appropriate software	

1 IP FTE / 150 to 250 beds
ESTIMATED in 2004
MORE FTE NEEDED NOW

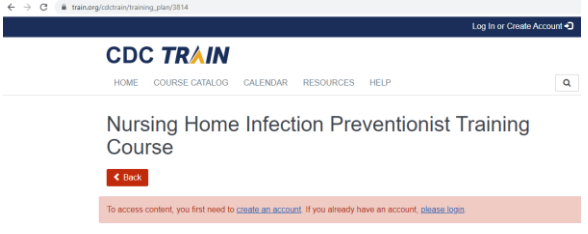
23

CDC Recommendations on IP FTE

Infection Prevention and Control Program

Assign One or More Individuals with Training in Infection Control to Provide On-Site Management of the IPC Program

- This should be a full-time role for at least one person in facilities that have more than 100 residents or that provide on-site ventilator or hemodialysis services. Smaller facilities should consider staffing the IPC program based on the resident population and facility service needs identified in the IPC risk assessment.
- CDC has created an online training course that can orient individuals to this role in nursing homes.



https://www.cdc.gov/covid/hcp/infection-control/index.html
https://www.train.org/cdctrain/training_plan/3814

24

Conclusions

- There are several domains of Infection Control and Prevention program with Surveillance requiring the most amount of time followed by policy and procedure development
- Surveillance need to be followed by feedback and reporting and where needed corrective actions have to be implemented and progress measured and documented.
- IPs need to be aware of the available resources that can help them do their job efficiently
- Risk assessment is important in establishing priorities and adequately assigning resources towards those priorities including dedicated IP time towards IPCP activities.