Infection Control and Prevention: CMS Phases 1&2

2017 Supplemental

The Association for Professionals in Infection Control and Epidemiology

Infection Control and Prevention: CMS Phases 1&2
June 9, 2017
Agenda

Time	Friday, June 9, 2017	Presenter
7:00 AM – 8:00 AM	Registration and Breakfast	
8:00 AM – 8:10 AM	Welcome, Opening Remarks	Sandy Severson, Arizona Hospital and Healthcare Association Geoff Granseth, MPH, CIC, Arizona Department of Health Services
8:10 AM – 9:00 AM	Overview of Long-Term Care (LTC) Background/History of Infection Prevention and Control Programs in LTC Infection Control Plan	Marianne Pavia
9:00 AM – 10:00 AM	The Infection Preventionist (IP)	Marianne Pavia
10:00 AM – 10:15 AM	BREAK	
10:15 AM – 11:15 PM	Infection Prevention Risk Assessment	Marianne Pavia
11:15 AM - 12:15 PM	Infection Prevention and Control Program	Marianne Pavia
12:15 PM – 1:00 PM	Lunch & Presentation Award-winning Antibiotic Stewardship: Early results and Scale-up Plan	Peter P. Patterson MD MBA FACMQ, Arizona Partner, Expert Stewardship Inc.
1:00 PM – 2:00 PM	Antibiotic Stewardship	Marianne Pavia
2:00 PM – 3:00 PM	Isolation Precautions and Outbreaks	Marianne Pavia
3:00 PM – 3:15 PM	BREAK	
3:15 PM – 4:00PM	Occupational Health and New Employee Screening	Marianne Pavia
4:00 PM – 5:00 PM	Surveillance: Guidelines for Developing and Implementing an Effective Program in an LTC facility	Marianne Pavia
5:00 PM – 5:05 PM	Closing	Arizona Department of Health Services (TBD)

The training is made possible by grant funding through the Arizona Department of Health Services and presented by APIC Consulting Services, Inc.

Meet the Speaker

Marianne Pavia, MS, BS, MT (ASCP), CIC, FAPIC is the Director of Infection Prevention, Employee Health and Laboratory Services at St. Mary's Hospital for Children. She received a Bachelor of Science degree from St. John's University and a Master of Science in Human Service Leadership from St. Joseph's College. For 20 years, she worked as a clinical microbiology supervisor at two facilities in New York City.

Ms. Pavia teaches nationally on numerous infection prevention issues. In 2014, she served as an Ebola Trainer and Observer at Bellevue Hospital Center during the admission and care of New York City's first Ebola case. In 2015, she was honored to receive the American Association for Clinical Chemistry Outstanding Speaker award. In 2016, she received a certification in Antimicrobial Stewardship from the New York State Council of Health-System Pharmacists.

Ms. Pavia is an active member of the infection prevention and control community. She was a member of the New York State Department of Health Antimicrobial Workgroup, President of the New York State Association for Professionals in Infection Control and Epidemiology Coordinating Counsel, and is the author of various publications. For her achievements and commitment to infection prevention and control, she received the Fellow of the Association for Professionals in Infection Control and Epidemiology (FAPIC) distinction of honor status in 2016.

Course Objectives

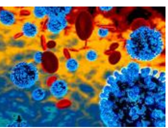
Infection Control and Prevention: CMS Phases 1&2
Arizona Department of Health Services
June 9, 2017

1. Understand infection prevention and control challenges in long-term care, specifically in the following areas: patient health risks, healthcare workers, infectious diseases and outbreaks.

2. Learn how to determine if infection prevention and control programs, policies, and procedures address all newly-required Center for Medicare & Medicaid Services (CMS) elements.

3. Understand and implement the essential elements of an antibiotic stewardship program, including antibiotic use protocols and monitoring system for antibiotic usage.

Infection Prevention in Long-Term Care (LTC) Overview



Marianne Pavia MS, MT(ASCP), CLS, CIC, FAPIC

LTCFs (Long-Term Care Facilities) Characteristics

- 60% are for-profit
- Supply and ratio restrictions to reduce cost/save money
- Less time for patient care
- Decreased environmental cleaning
- Cutting corners for infection prevention

Infections in LTC

- 1 to 3 million serious infections occur every year
- Common infections include urinary tract infection (UTI), diarrheal diseases, respiratory viruses, antibiotic-resistant staph infections
- Infections are a major cause of hospitalization and death

Infections: A Leading Cause of Morbidity and Mortality

- Between 1.6 and 3.8 million infections occur each year in nursing homes with nearly 388,000 deaths attributed to these infections
- Costs associated with infections in nursing homes are significant
  - Estimates range from $673 million to $2 billion annually
- Infections account for 50% of transfers to acute care facility (ACF)
- Strong correlation between low staffing levels and an infection control deficiency citation

CDC: Long-Term Care Facility (LTF)

- Nursing homes, skilled nursing facilities, and assisted living facilities, (collectively known as long-term care facilities, LTCFs)
- Over 4 million Americans are admitted to or reside in nursing homes and skilled nursing facilities each year
- One million persons reside in assisted living facilities

LTCF's Residents

Decreased:

- ❖ Immune function
- ❖ Swallowing/ chewing
- ❖ Skin integrity
- ❖ Mobility
- ❖ Bowel and bladder control

Increased:

- ❖ Age (mean 80+)
- ❖ Acuity
- ❖ Medications
- ❖ Dementia/depression/ apathy

Direct Caregivers LTC

- 1.85 million employees
- Primary para-professions – certification
- Nursing – primarily licensed practical nurses (LPNs)
- Labor shortages/turnover
- Different cultural backgrounds
- Inadequate staffing levels

Residents + HCW= Infections

- Inadequate hygiene - skin breakdown, UTI
- Inadequate time for feeding pneumonia, dehydration, malnutrition
- Improper use of equipment - injuries can lead to pressure areas, skin tears, BBP exposure
- Presenteeism

Common Infections

- UTI
- Respiratory infections (viral vs. bacterial)
- Skin and soft tissue
- Gastrointestinal
- Bacteremia
- Bloodborne viral diseases

Nursing Homes in the Literature

- Lack of compliance with appropriate infection control practices is a major issue in nursing homes
- May 2011's American Journal of Infection Control reports infection control violations in 15% of United States nursing homes
  - Data collected between 2000 and 2007 representing 96% of all nursing homes
  - Based on a panel of roughly 100,000 observations
  - Study examined the deficiency citation for infection control requirements (F-Tag 441)

What Does the Research Tell Us?

- Few peer-reviewed publications examine infection control in LTCF
- No studies have critically evaluated efficacy of infection control programs in LTCF
- Need for increased emphasis and research
- Focus on identifying barriers to implementing infection control best practices in LTCF

(Castle et al.; Mody et al.)

Research Questions

- In which infection prevention domains do nursing homes perform well or need improvement ?
- In which implementation categories are there differences between facilities or units with high or low healthcare-associated infection (HAI) rates?
- What elements of best practice are most lacking in areas of low performance?

(Bradley et al.)

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History of Infection Control

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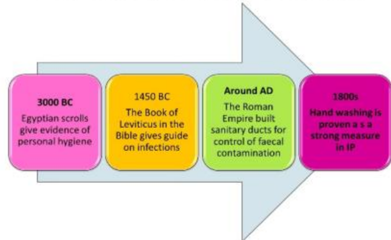
Brief History of Infection Control



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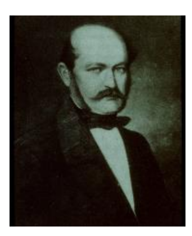
The Father of Hand Hygiene
Ignaz Semmelweis



- Born in Hungary,1818
- Vienna General Hospital delivering babies

Many death of mothers due to childbed fever:

- Now recognize as a bacterial infection of the uterus or genital tract of women after childbirth in the 18th and 19th centuries
  - Affected 6 to 9 women in every 1000 deliveries, killing 2 to 3 of them with peritonitis or septicemia.
  - It was the single most common cause of maternal mortality

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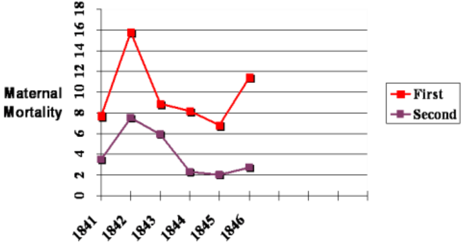
Ignaz Semmelweis: Two Clinics

The First Obstetric Clinic:
- Run by the medical students and consultants
- Worked between the mortuary to the labor wards

The Second Obstetric Clinic:
- Run by the midwives who did not handle dead bodies
- The mortality for the doctors unit was much higher than for the midwives

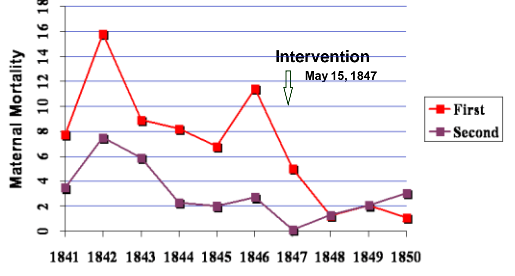
Maternal Mortality Rates, First and Second Obstetrics Clinics, General Hôpital of Vienna, 1841-1846



Intervention May 1847

- Doctors required to clean hands
- Used a chlorinated lime solution upon entering the labor room

Maternal Mortality Rates, First and Second Obstetrics Clinics, General Hospital of Vienna, 1841-1850



Semmelweis IP, 1861

Post Intervention

- The mortality rate dropped to under 2%
- In October, 12 women in a row of beds became ill and 11 died
- Semmelweis modified the washing procedure to require everyone to wash after examining each patient

First Evidence of Relationship Between Hand Hygiene and Healthcare-Associated Infections

Patient Safety

"It may seem a strange principle to enunciate as the very first requirement in a Hospital that it should do the sick no harm".
Florence Nightingale

History: Advances in Surgical Infection Control

Joseph Lister introduced antiseptics in 1867	William Halstead introduced gloves in 1890	Johannes Mikulicz introduced masks in 1897

History of Isolation Precautions

Year	Infection Control Precautions
1877,1910	Separates facilities, Antisepsis and disinfections ... etc
1985	UNIVERSAL PRECAUTIONS (guidelines for protecting healthcare worker because the emergence of HIV & other **bloodborne pathogens**)
1987	BODY SUBSTANCE ISOLATION (focused on protecting patients and health personnel from all moist body fluids **not just blood:** semen, vaginal secretions, wound drainage, sputum, saliva etc
1996	STANDARD PRECAUTIONS:Two level approach: •Standar Precautions which apply to all clients and patients attending healthcare facilities •**Transmission-based Precautions** which apply only to hospitalized patients

History of Precautions

- 1877 First isolation guidelines in US Hospitals
- 1910 Introduction of the cubicle system (multiple bed wards) with "barrier nursing" – gowns, handwashing, disinfection of soiled articles
- 1950 Infectious disease hospitals closed, except TB hospitals
- 1960 Single patient isolation rooms
- 1970 CDC published "Isolation Techniques for Use in Hospitals"

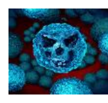
History of Isolation

- 1983 Disease specific isolation introduced
- 1987 Body Substance Isolation (BSI)
- 1991 OSHA Bloodborne Pathogen Standard
- 1996 CDC *Guidelines for Isolation Precautions in Hospitals*
- 2007 CDC *Guidelines for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings*

History: Infection Control Programs

- 1980: SHEA established
- 1981: CDC *Guidelines for Prevention and Control of Nosocomial Infections*
- 1981: CIC established
- 1987: Infection control is one of key JCAHO "critical indicators"
- 1992: HICPAC established
- 1990s: Era of guidelines
- 2000s: Era of QI
- 2006: NNIS → NHSN system
- 2008: CMS and nonpayment for HACs
- 2011: HAIs added to IPPS

Antibiotic Resistance 1950-60



- Staphylococcal resistance to penicillin increased
- 1968: First outbreak of Methicillin-resistant *Staphylococcus aureus* (MRSA) in USA at Boston City Hospital
- Discovery of antimicrobial resistance among organisms
- Many of these resistant pathogens developed in health care settings and caused HAIs
- As a result of this discovery, hospital surveillance was born in the 1960's

Healthcare-Associated Infections 1970s

- Public Health noticed increasing numbers of HAIs
- Resulted increased morbidity, mortality and hospital costs
- Hospitals began expanding infection surveillance and control programs

However, their efficacy was unproven.

- Founded in 1972 by infection control nurses
- Recognized the need for an organized approach to preventing healthcare-associated infections
- In 1973, APIC's first educational conference was held in Toronto in 1973.
  - APIC membership: 650+
- Now more than 15,000 members

Vision: Healthcare without infection

Mission: Create a safer world through prevention of infection

Study on the Efficacy of Nosocomial Infection Control (SENIC 1974)

Infection Control (IC) program needs 3 elements:

1. Epidemiologic surveillance for occurrence of infections
2. Policies and procedures for control infections
3. Trained personnel to do epidemiology and collect surveillance

Omnibus Budget Reconciliation Act 1987

- 1986: Institute of Medicine found that residents of nursing homes were being abused, neglected, and given inadequate care.
- Nursing Home Reform Act is to ensure that residents of nursing homes receive quality care that will result in their achieving or maintaining their "highest practicable" physical, mental, and psychosocial well-being. To secure quality care in nursing homes, the Nursing Home Reform Act requires the provision of certain services to each resident and establishes a Residents' Bill of Rights.

The Nursing Home Reform Act

Specifies what services nursing homes must give residents and establishes standards for these services.

Required services include:

- Periodic assessments for each resident
- A comprehensive care plan for each resident
- Nursing services
- Social services
- Rehabilitation services
- Pharmaceutical services
- Dietary services

CMS Survey Process

Maintain an Infection Control Program that guarantees a safe, sanitary and comfortable environment to help prevent the development and transmission of disease.

New CMS Regulations Key Points

- Develop an Infection Prevention and Control Program (IPC) that includes an Antibiotic Stewardship Program
- Designate at least one Infection Preventionist (IP)

Dates

- Phase 1- November 28, 2016
- Phase 2- November 28, 2017
- Phase 3- November 28, 2019

- Expected to cost $19,000 per facility annually

Phase 1
483.80 Infection control

When and how isolation should be used for a resident, including but not limited to:

- The type and duration of the isolation depending upon the infectious agent or organism involved
- A requirement that the isolation should be the least restrictive possible for the resident under the circumstances

Phase 2

- Facility Assessment at §483.70(e)
- Antibiotic Stewardship

Facility Assessment 483.70(e)

- A system for presenting, identifying, reporting, investigating, and controlling infections and communicable disease for all residents, staff, volunteers, visitors, and other individuals providing service under a contractual agreement that based on the facility assessment

Antibiotic Stewardship Program

- Antibiotic use protocols
- System to monitor antibiotic use

Infection Preventionist (IP)

- Designate one or more individuals as the IP
- IP is responsible for the IPC program
- Has primary training in nursing, medical technology, microbiology, epidemiology or other related field
- Be qualified by education, training, experience, or certification
- Work at least part-time
- Have completed specialized training in IPC

Other Requirements

- IP must be a member and report on a regular basis
- Policies on influenza and pneumococcal vaccination
  - Education provided prior to immunization
  - Influenza offered October 1 to March 31
  - Documentation in the medical record
- Annual review of IPC program

Infection Prevention and Control Program

- Written standard, policies, and procedures
- System of surveillance to identify possible communicable diseases and infections
- When and whom possible incidents are reported
- Standard and transmission based precautions
- When and how isolation is used
- Type and duration of isolation; least restrictive measure
- Employee work restrictions
- Hand hygiene
- Corrective actions taken

The Infection Preventionist

Infection Preventionists (IPs)

- Possess scientific and clinical knowledge, combined with social skills, to engage frontline providers to bring best available evidence-based practice to the patient
- The IP's primary focus and responsibility is infection prevention

Professional Responsibility

- Responsibility to adhere to scientifically accepted principles and practices of infection prevention and control
- Responsibility to monitor those for whom the professional is responsible

Knowledge and Skill Set

Knowledge

- Microbiology
- Epidemiology
- Sterilization
- Medication
- Statistics
- Regulatory requirements

Skills

- Educator
- Consultant
- Data analysis and interpretation
- Project manager

Role of the ICP

- Infection prevention and control expert
- Mentor staff
- Role model
- Resource for staff
- Product evaluator
- Liaison to public health

Role of the ICP

- Liaison in emergency preparedness
- Promote zero tolerance for healthcare-associated infections (HAIs)
- Collect and analyze infection data
- Develop and review policies
- Consult on infection risk assessments, prevention and control strategies

Characteristics

- **Good people skills**

Interview patients, discussions with colleagues, present data

- **Strong critical thinking skills**

Track diseases, recognize patterns, interpret labs, determine best action course

- **Good math skills**

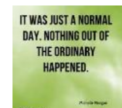
Analyze data, statistics

The Team

- Administration
- Medical director
- CNO
- Frontline staff
- Pharmacy
- Laundry
- Housekeeping
- Maintenance
- Dietary services
- Residents and family
- Dental services, etc.

A Normal Day

- Come look at this rash
- There is a pet duck in the lobby
- A maintenance guy just got bit by a squirrel
- Family wants maggot therapy for a wound
- Lunch, maybe?
- We found a bug in a room and we have it in a bag
- Meetings, lab reviews, surveillance……



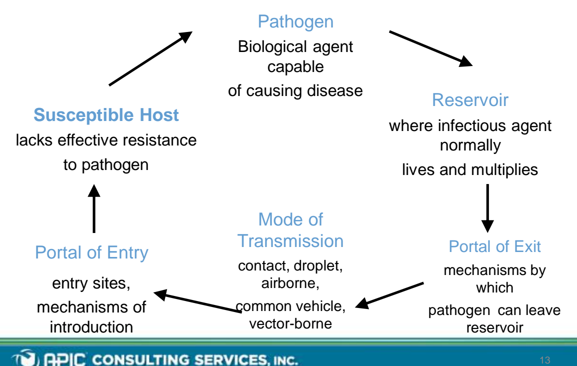
What Do you Do?

- Don't panic.
- Reply, "I'll get back to you".
- Get help from the experts:
  - State DOH
  - Peers
  - Literature
  - Regulatory agencies

Let's Review the Basics

- Hand hygiene
- PPE donning and doffing
- Microbiology
- Clean and dirty
- Spaulding classification

The Chain of Infection



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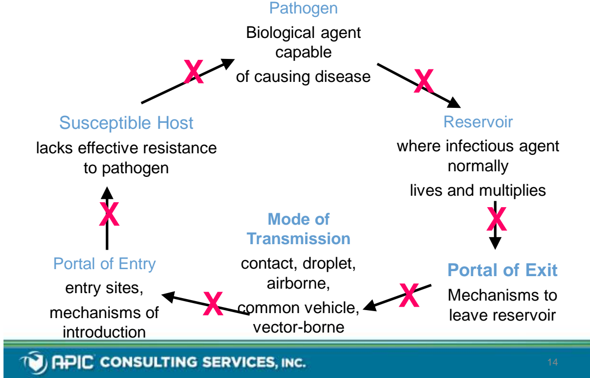
Breaking The Chain of Infection



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Controlling The Route of Transmission By Breaking the Chain of Infection

Basic infection control practices

- Hand hygiene
- Standard precautions
- Transmission - based precautions
- Engineering controls
- Disinfection of patient care equipment
- Work practice controls

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World Health Organization (WHO) Five Moments of Hand Hygiene

- Defines the key moments when health-care workers should perform hand hygiene
- An evidence-based approach designed to be:
  - Easy to learn
  - Logical
  - Applicable in all healthcare setting

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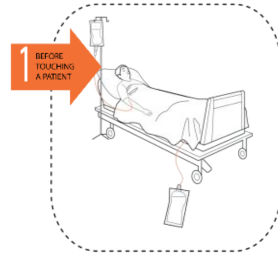
What are the Five Moments of Hygiene?

1. Before touching a patient
2. Before performing a clean/aseptic procedures
3. After body fluid exposure/risk
4. After touching a patient
5. After touching patient surroundings

http://www.who.int/gpsc/tools/Five_moments/en/

Can you identify examples of this moment during your everyday practice of health care?



Situations illustrating direct contact:

- Bathing a resident
- Dressing a resident
- Applying oxygen mask
- Giving therapy
- Taking pulse, blood pressure, chest auscultation, abdominal palpation

http://www.who.int/gpsc/tools/Five_moments/en/

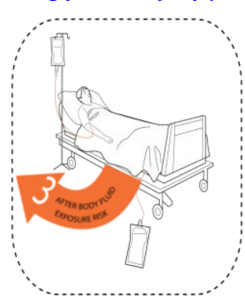
Can you identify some examples of this moment during your everyday practice?

Situations illustrating clean/aseptic procedures:

- Brushing the patient's teeth
- Instilling eye drops
- Skin care, wound dressing, subcutaneous injection
- Catheter insertion, opening a vascular access system or a draining system, secretion aspiration
- Preparation of food, medication, pharmaceutical products, sterile material.

http://www.who.int/gpsc/tools/Five_moments/en/

Can you identify some examples of this moment during your everyday practice?

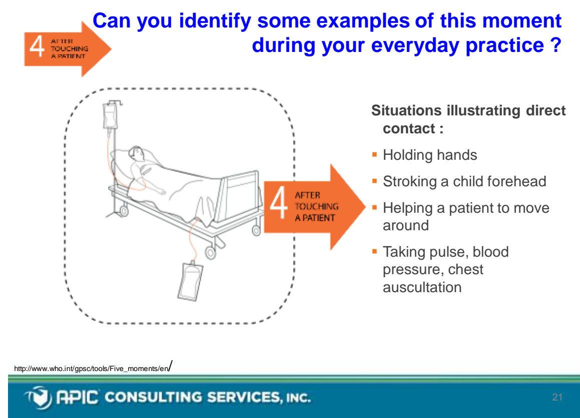


Situations illustrating body fluid exposure risk:

- Drawing and manipulating any fluid sample
- Endotracheal tube insertion and removal
- Clearing up urines, faeces, vomit, handling waste (bandages, napkin, incontinence pads)
- Cleaning of contaminated and visibly soiled material or areas (soiled bed linen lavatories, urinal, bedpan, medical instruments)

http://www.who.int/gpsc/tools/Five_moments/en/

Can you identify some examples of this moment during your everyday practice ?

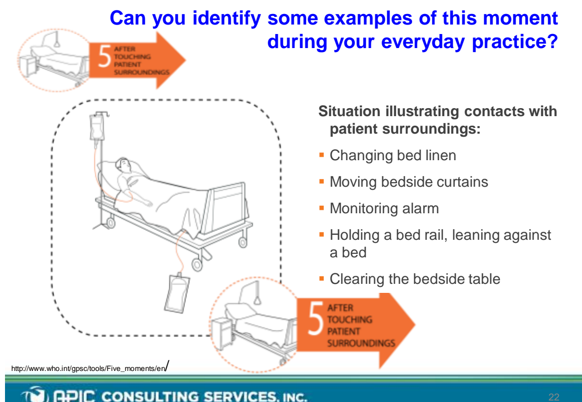


Situations illustrating direct contact :

- Holding hands
- Stroking a child forehead
- Helping a patient to move around
- Taking pulse, blood pressure, chest auscultation

http://www.who.int/gpsc/tools/Five_moments/en/

Can you identify some examples of this moment during your everyday practice?

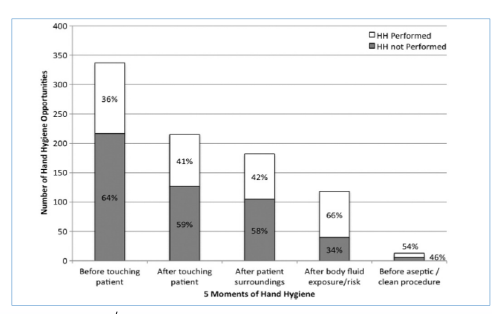


Situation illustrating contacts with patient surroundings:

- Changing bed linen
- Moving bedside curtains
- Monitoring alarm
- Holding a bed rail, leaning against a bed
- Clearing the bedside table

http://www.who.int/gpsc/tools/Five_moments/en/

Adherence with 5 Moments



http://www.who.int/gpsc/tools/Five_moments/en/

Hand Hygiene with Soap and Water

1. Turn on water and adjust the flow and temperature for comfort
2. Wet hands and wrists
3. Apply soap to hands and wrists
4. Scrub your hands for at least 20 seconds
   (Need a timer? Hum the "Happy Birthday" song from beginning to end twice.)

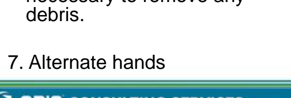
Hand Hygiene with Soap and Water

4. Rub one hand against the other, back of hands, palms and thumbs

5. Work suds between fingers and hands up on the wrists with a circular motion

6. Rub fingertips in palm of hand and run fingernail under nails of other hand if necessary to remove any debris.

7. Alternate hands



Hand Hygiene with Soap and Water

7. Rinse hands well with hands slanted down into sink

8. Dry hands and turn off faucets with towel in hand as a barrier

9. Discard towel

The hand hygiene procedure should take about 1 minute

Hand Hygiene
Alcohol-Based Sanitizer (ABHS)

Procedure:

1. Apply product to the palm of your hand

2. Rub your hand together

3. Cover all surfaces

4. Rub for 20 seconds or until hands are dry

Hand Hygiene
Alcohol-Based Sanitizer (ABHS)

- ABHS are an excellent alternative to washing with soap and water.

- To clean your hands, you should use hand rubbing with an alcohol-based formulation.

- Why?
  - It makes hand hygiene possible right at the point-of-care
  - It is faster
  - It is more effective
  - It is better tolerated, causing less irritation to
  - your skin

Fingernails

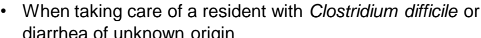
- Natural nails
- No artificial fingernails or extenders
- No chipped nail polish
- ¼ inch beyond fingertip

Hand Hygiene

Hand Hygiene

Remember that hand washing with soap and water is still recommended in certain circumstances such as:

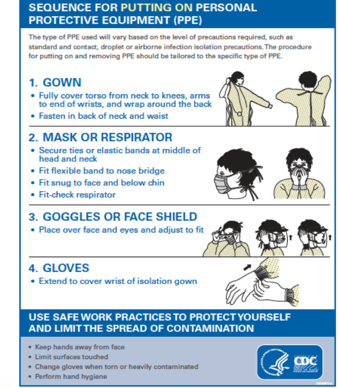
- When your hands are visibly soiled
- Before eating
- After using the bathroom
- When taking care of a resident with *Clostridium difficile* or diarrhea of unknown origin

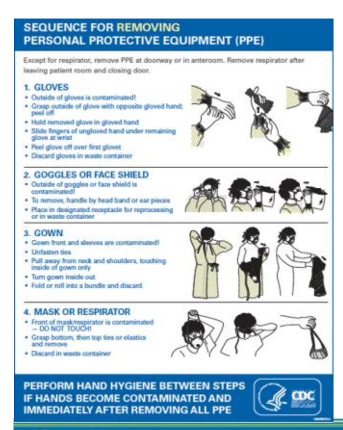


Donning Personal Protective Equipment (PPE)

1. Gown
2. Mask or Respirator
3. Goggles or Face Shield
4. Gloves

Perform competency and return demonstration upon hire and yearly.




SEQUENCE FOR REMOVING PERSONAL PROTECTIVE EQUIPMENT (PPE)

Except for respirator, remove PPE at doorway or in anteroom. Remove respirator after leaving patient room and closing door.

1. GLOVES
- Outside of gloves is contaminated!
- Grasp outside of glove with opposite gloved hand; peel off
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist
- Peel glove off over first glove
- Discard gloves in waste container

2. GOGGLES OR FACE SHIELD
- Outside of goggles or face shield is contaminated!
- To remove, handle by head band or ear pieces
- Place in designated receptacle for reprocessing or in waste container

3. GOWN
- Gown front and sleeves are contaminated!
- Unfasten ties
- Pull away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard

4. MASK OR RESPIRATOR
- Front of mask/respirator is contaminated — DO NOT TOUCH!
- Grasp bottom, then top ties or elastics and remove
- Discard in waste container

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

Doffing PPE

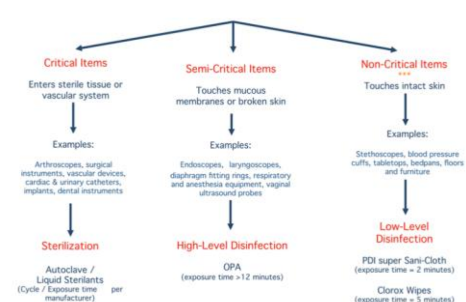
1. Gloves
2. Goggles or Face Shield
3. Gown
4. Mask or Respirator

Perform competency and return demonstration upon hire and yearly.

How to Safely Use PPE

- Keep gloved hands away from face
- Avoid touching or adjusting PPE
- Remove gloves if they become torn; perform hand hygiene before donning new gloves
- Limit surfaces and items touched.

Spaulding Classification



Single- Use

What Goes Where?

CLEAN AND DIRTY CAN NEVER MIX!

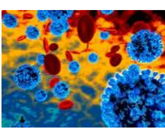
Dirty (examples)

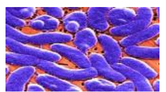
- Waste receptacles
- Patient specimens
- Sharps containers
- Used linen
- Recycling
- Used instruments
- Dirty items should never be in clean storage areas

Clean (examples)

- Sterile packs
- Supplies of PPE
- Linen
- IV pumps/poles (clean)
- Other clean medical equipment and supplies
- Clean items should never be in dirty utility rooms

Microbiology for the Infection Preventionist





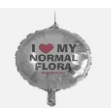
Germ Theory

Microorganisms that cause disease are called **pathogens.**

The diseases they cause are called **infectious diseases.**

The interval from exposure to clinical symptoms is call the **incubation period.**

The interval during which the host can transmit infection is the **infectious or shedding period.**



Normal Flora

- Microbes regularly found at particular regions of the body
- Life-long microorganisms present at certain anatomical sites
- Usually unable to colonize the body for long periods
- The composition of normal flora changes with age, sex, diet, development and environment

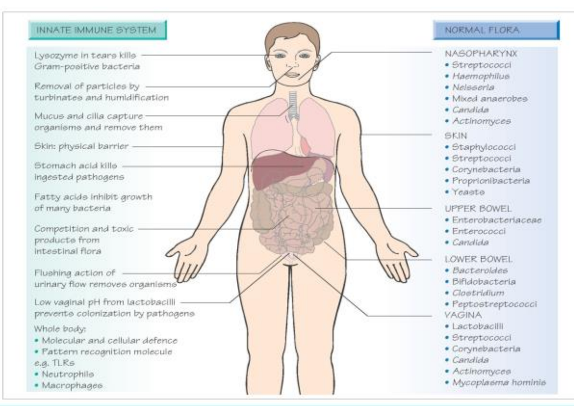


Table 16–5. Bacteria Commonly Found on Healthy Human Body Sites

Body Site	Common / Prominent Bacteria	Irregular Bacteria
Conjunctiva	Staphylococci, Corynebacteria, anaerobic Gram (−) cocci	*S. viridans*, *S. pneumoniae*, Neisseriae, Haemophilus, Enterobacteriaceae
Genitourinary Tract-External Genitalia	Staphylococci, *S. viridans*, Enterococci, Corynebacteria, Enterobacteriaceae, Bacteroides, Fusobacteria, anaerobic Gram (+) cocci	Propionibacteria, anaerobic Gram (−) cocci
Genitourinary Tract-Anterior Urethra	Staphylococci, Enterococci, Neisseriae, Corynebacteria, Bacteroides, Fusobacteria, anaerobic Gram (−) cocci	*S. viridans*, Enterobacteriaceae, Clostridia, Lactobacilli, anaerobic Gram (+) cocci
Genitourinary Tract-Vagina	Staphylococci, *S. viridans*, Enterococci, Neisseriae, Corynebacteria, Lactobacilli, Bifidobacteria, Bacteroides, anaerobic Gram (+) cocci	Clostridia, Fusobacteria
Mouth	Staphylococci, *S. viridans*, Enterococci, *S. pneumoniae*, Neisseriae, Corynebacteria, Haemophilus, Enterobacteriaceae, Actinomyces, Lactobacilli, Bifidobacteria, Fusobacteria, anaerobic Gram (+) cocci, anaerobic Gram (−) cocci	Group A Streptococci, Clostridia, Propionibacteria
Lower Intestine	*S. viridans*, Enterococci, Corynebacteria, Enterobacteriaceae, Clostridia, Lactobacilli, Bifidobacteria, Fusobacteria, anaerobic Gram (+) cocci	Staphylococci, Propionibacteria, Actinomyces
Upper Respiratory Tract	Staphylococci, *S. viridans*, *S. pneumoniae*, Corynebacteria, Haemophilus, Propionibacteria, Actinomyces, Bacteroides, Fusobacteria, anaerobic Gram (+) cocci, anaerobic Gram (−) cocci	Group A Streptococci, Group D Streptococci, Neisseriae, Enterobacteriaceae
Skin	Staphylococci, Corynebacteria, Propionibacteria, anaerobic Gram (+) cocci	*S. viridans*

Overview of
Bacterial infections

Bacterial meningitis
- *Streptococcus pneumoniae*
- *Neisseria meningitidis*
- *Haemophilus influenzae*
- *Streptococcus agalactiae*
- *Listeria monocytogenes*

Otitis media
- *Streptococcus pneumoniae*

Pneumonia
Community-acquired:
- *Streptococcus pneumoniae*
- *Haemophilus influenzae*
- *Staphylococcus aureus*

Atypical:
- *Mycoplasma pneumoniae*
- *Chlamydia pneumoniae*
- *Legionella pneumophila*

Tuberculosis
- *Mycobacterium tuberculosis*

Skin infections
- *Staphylococcus aureus*
- *Streptococcus pyogenes*
- *Pseudomonas aeruginosa*

Eye infections
- *Staphylococcus aureus*
- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*

Sinusitis
- *Streptococcus pneumoniae*
- *Haemophilus influenzae*

Upper respiratory tract infection
- *Streptococcus pyogenes*
- *Haemophilus influenzae*

Gastritis
- *Helicobacter pylori*

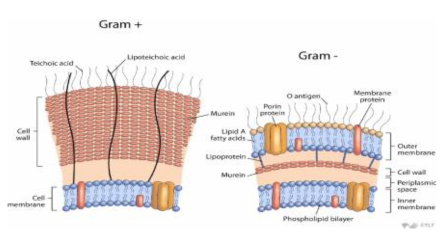
Food poisoning
- *Campylobacter jejuni*
- *Salmonella*
- *Shigella*
- *Clostridium*
- *Staphylococcus aureus*
- *Escherichia coli*

Sexually transmitted diseases
- *Chlamydia trachomatis*
- *Neisseria gonorrhoeae*
- *Treponema pallidum*
- *Ureaplasma urealyticum*
- *Haemophilus ducreyi*

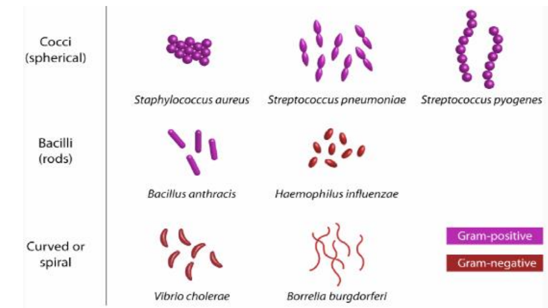
Urinary tract infections
- *Escherichia coli*
- *Other Enterobacteriaceae*
- *Staphylococcus saprophyticus*
- *Pseudomonas aeruginosa*

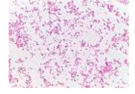
Gram Stain

It Is All About The Cell Wall

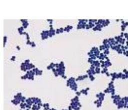


Gram Stain Classification





Importance of Gram Stain



- Preliminary information from direct clinical specimen or culture media
- Identify the presence of bacteria in normally sterile body sites (CSF, blood)
- Screen sputum specimens for acceptable culturing (>10 epithelial cells indicating saliva)
- Useful in guiding initial antimicrobial therapy

Proper Collection

Obtain Good Sample

Blood Culture Bottles

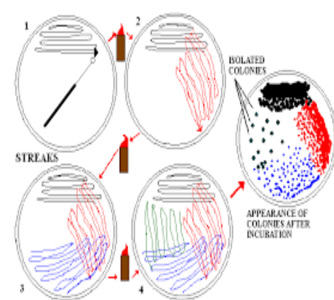
False Positive:
- Inappropriate cleaning of skin
- Palpitating after cleaning

False Negative:
- Less than 10cc of volume per bottle

Growing Microbes
The Five I's

- Inoculation - producing a viable culture
- Isolation - one kind of microbe on media, pure culture
- Incubation - growing microbes under proper conditions
- Inspection - observe the organisms characteristics (colony size, color, smell, hemolysis, gram stain)
- Identification- set biochemicals for specific identification

Inoculation



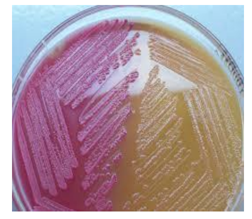
Incubation

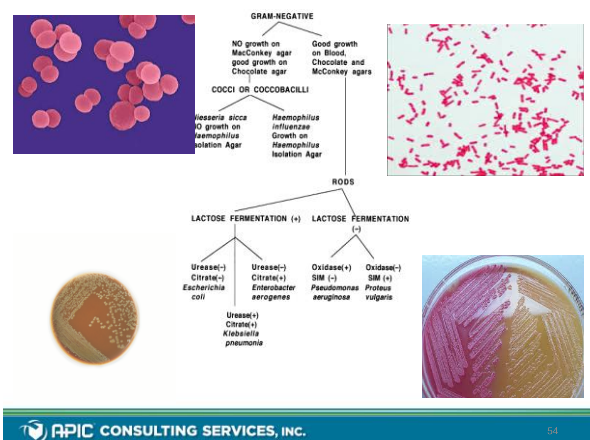
Incubator

- Device used to grow and maintain cultures
- Temperature
- Humidity
- Carbon dioxide (CO_2)
- Oxygen

Isolation and Inspection

Inspection





GRAM POSITIVES

Gram Positive

- Cocci
  - Catalase (+) Staphylococcus
    - Coagulase (+): *S. aureus*
    - Coagulase (-): *S. epidermidis*, *S. saprophyticus*
  - Catalase (-) Streptococcus
    - Alpha: *S. viridans*, *S. pneumo*
    - Beta: *S. pyogenes* (GAS), *S. agalactiae* (GBS)
    - Gamma: Enterococcus, Peptostrep
- Rods: Clostridium, Bacillus, Corynebacterium, Listeria

What is PCR?

- The **polymerase chain reaction** (**PCR**) is a scientific technique in molecular biology to amplify a single or a few copies of a piece of DNA across several orders of magnitude, generating thousands to millions of copies of a particular DNA sequence.
- Developed in 1983 by Kary Mullis; In 1993, Mullis was awarded the Nobel Prize in Chemistry along with Michael Smith for his work on PCR.

Susceptibility Testing

- Used to determine which antimicrobials will inhibit the growth of a pathogen causing an infection

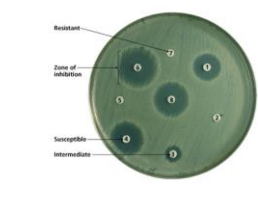
Result of Testing:

- Susceptible - likely to inhibit the pathogenic organism and may be the appropriate chose for treatment
- Intermediate - may be effective at higher doses, more frequent doses, or only in specific body sites where the antimicrobial penetrates to give significant coverage
- Resistant- not effective in inhibiting the growth of the organism and not the appropriate for treatment

Susceptibility Testing Kirby-Bauer

How to perform Kirby- Bauer testing

- The basics are easy: The bacterium is swabbed on the agar and the antibiotic discs are placed on top. The antibiotic diffuses from the disc into the agar in decreasing amounts the further it is away from the disc. If the organism is killed or inhibited by the concentration of the antibiotic, there will be **NO growth** in the immediate area around the disc: This is called the **zone of inhibition** .
- Dr.T.V.Rao MD



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Minimal Inhibitory Concentration (MIC)

- Microbiologist inoculates the organism isolated from the patient into a series of tubes or with progressively lower concentration of the antimicrobial agent.
- After a standardized incubation, the lowest concentration of drug that prevents visible growth of the organism is the MIC.
- The MIC of an antibiotic is a determining factor in choosing or refining patient treatment.

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Susceptibility Testing E-Test

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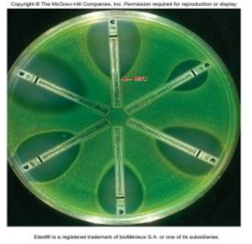

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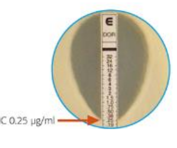

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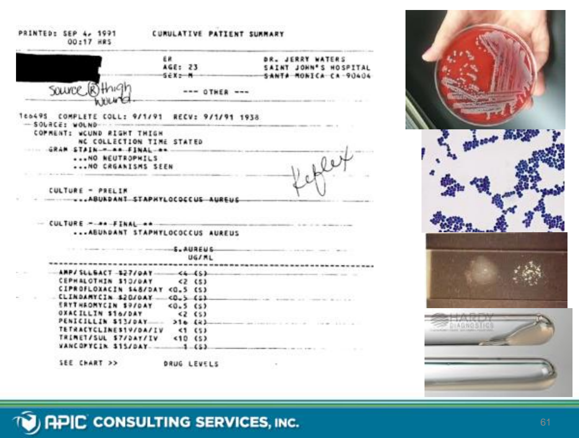

PRINTED: SEP 4, 1991 00:17 HRS   CUMULATIVE PATIENT SUMMARY

ER
AGE: 23
SEX: M

DR. JERRY WATERS
SAINT JOHN'S HOSPITAL
SANTA MONICA CA 90404

Source Ⓡ thigh wound.

--- OTHER ---

166495 COMPLETE COLL: 9/1/91 RECV: 9/1/91 1938
SOURCE: WOUND
COMMENT: WOUND RIGHT THIGH
NO COLLECTION TIME STATED
GRAM STAIN - ** FINAL **
...NO NEUTROPHILS
...NO ORGANISMS SEEN

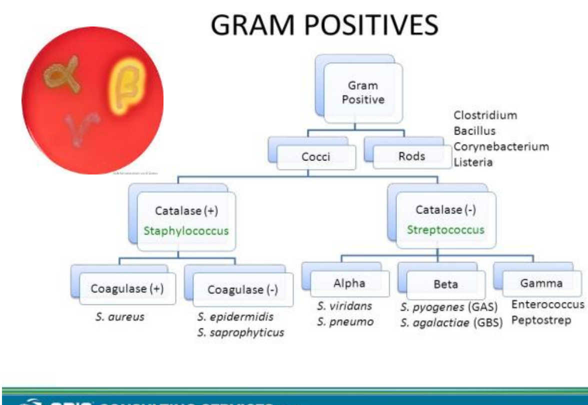
Keflex

CULTURE - PRELIM
...ABUNDANT STAPHYLOCOCCUS AUREUS

CULTURE - ** FINAL **
...ABUNDANT STAPHYLOCOCCUS AUREUS

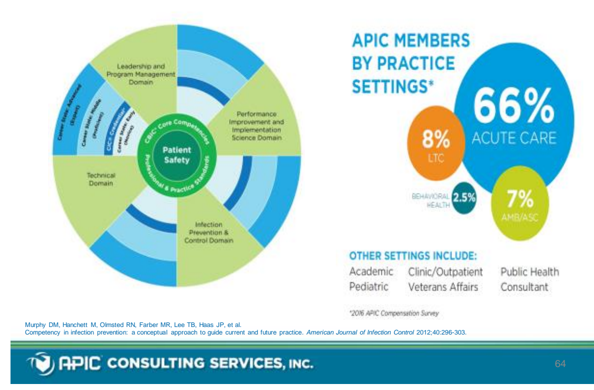
	S. AUREUS UG/ML
AMP/SULBACT $27/DAY	<4 (S)
CEPHALOTHIN $10/DAY	<2 (S)
CIPROFLOXACIN $48/DAY	<0.5 (S)
CLINDAMYCIN $20/DAY	<0.5 (S)
ERYTHROMYCIN $9/DAY	<0.5 (S)
OXACILLIN $16/DAY	<2 (S)
PENICILLIN $13/DAY	>16 (R)
TETRACYCLINE $19/DA/IV	<1 (S)
TRIMET/SUL $7/DAY/IV	<10 (S)
VANCOMYCIN $15/DAY	1 (S)

SEE CHART >>   DRUG LEVELS

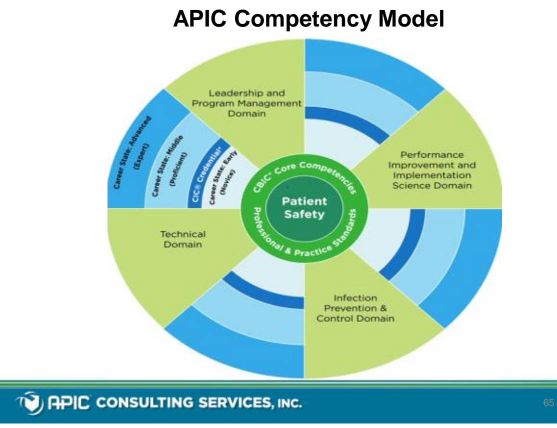


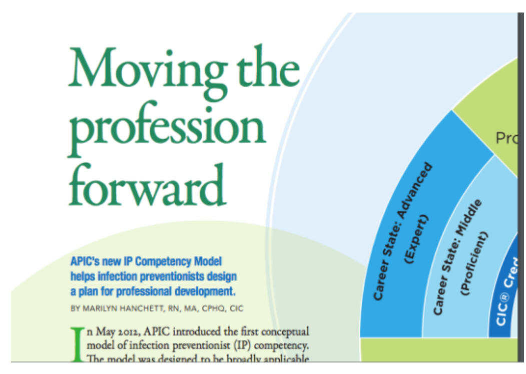
Infection Preventionist Training and Competencies

Competency Model for the IP



APIC Competency Model





Moving the profession forward

APIC's new IP Competency Model helps infection preventionists design a plan for professional development.

BY MARILYN HANCHETT, RN, MA, CPHQ, CIC

In May 2012, APIC introduced the first conceptual model of infection preventionist (IP) competency. The model was designed to be broadly applicable

https://apic.org/Resource_/TinyMceFileManager/epublications/IP_Comp_article_PS1202.pdf

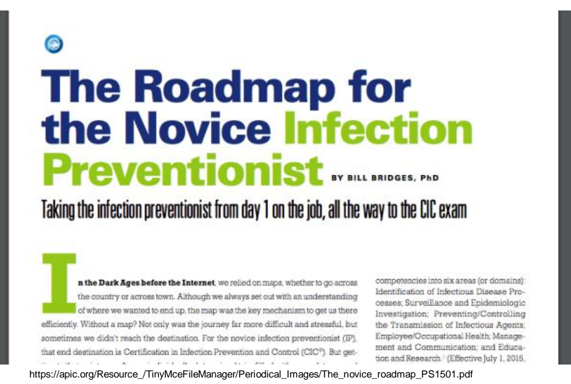
APIC

Competency Self-Assessment and Professional Development Plan
For proficient and advanced infection preventionists.

Rating Scale: 1. Novice knowledge/skills 2. Approaching proficiency 3. Fully proficient 4. Approaching advanced 5. Advanced/expert

Name: ___
Date: ___

Competency categories, integrating both the APIC and CBIC domains	IP practice areas as identified in CBIC practice analysis	Describe how/to what extent these areas are addressed in current IP role (or specify N/A)	Assessment of personal competency in each practice area	Professional development plan to advance competency in the domain
Identification of infectious disease processes (CBIC)	1. Differentiate among colonization, infection and contamination 2. Identify occurrences, reservoirs, incubation periods, periods of communicability, modes of		1 2 3 4 5 1 2 3 4 5	



The Roadmap for the Novice Infection Preventionist

BY BILL BRIDGES, PhD

Taking the infection preventionist from day 1 on the job, all the way to the CIC exam

In the Dark Ages before the Internet, we relied on maps, whether to go across the country or across town. Although we always set out with an understanding of where we wanted to end up, the map was the key mechanism to get us there efficiently. Without a map? Not only was the journey far more difficult and stressful, but sometimes we didn't reach the destination. For the novice infection preventionist (IP), that end destination is Certification in Infection Prevention and Control (CIC®). But get-

competencies into six areas (or domains): Identification of Infectious Disease Processes; Surveillance and Epidemiologic Investigation; Preventing/Controlling the Transmission of Infectious Agents; Employee/Occupational Health; Management and Communication; and Education and Research. (Effective July 1, 2015,

https://apic.org/Resource_/TinyMceFileManager/Periodical_Images/The_novice_roadmap_PS1501.pdf

Benefits of APIC Membership

69

70

Infection Control Program: Risk Assessment

Goal of the Infection Control and Prevention Program

- Reduce risk of acquisition and transmission of healthcare-associated infections (HAIs)
- Design and scope of program is based on risk that organization faces related to acquisition and transmission of infectious disease

What Is A Risk Assessment?

Risk assessment is the first step in a risk management process.

Risk assessment is the determination of the quantitative or qualitative value of risk related to a concrete situation and a recognized threat.

Types of risk assessments:

- Infection control program risk assessment
- Infection control risk assessment (ICRA)
- Focus risk assessments (i.e., hand hygiene)

Purpose of A Risk Assessment

- Risks are reviewed and identified at least annually and whenever significant changes occur.
- Risks are assessed with input from, at a minimum, infection control personnel, medical staff, nursing, and leadership.
- Risks that are identified as acquiring and transmitting infections are prioritized and documented!
- Based on the identified risks, goals are set to minimize the possibility of transmitting infections.
- Objectives, milestones and process measures are developed and implemented to achieve specific goals.

Infection Control Program Risk Assessment

Risk	Probability of Event					Impact (Health, Financial, Legal Regulatory)					Current Prepardness					Score
	Very Likely	Likely	Potential	Rare	Never	Catastrophic Loss (life/limb/ function/$$$)	Serious Loss (Fx, $$$, or Legal)	Risk of Re-Admission or Transfer to High Acuity	Mod. Clinical or $$$ Impact	Minimal Clinical of $$$ Impact	None	Poor	Fair	Good	Very Good	
	4	3	2	1	0	5	4	3	2	1	5	4	3	2	1	
Flu			3					3					2			18
CDI			4					3					4			48
UTI			2					2					5			20

Why Perform An Annual Risk Assessment?

- Helps focus our activities on essential tasks to reducing critical infection control risks

Constant changes to:

- External guidelines and regulations
- Technologies
- Policies and procedures
- Medications and vaccines
- Populations served
- Services provided

Why Perform An Annual Risk Assessment?

- Improves patient safety
- Improves staff safety
- Improves efficacy
- Identifies training issues
- Justifies a need for implementing new interventions
- Avoids adverse events

Improves Efficiency

- Identify current processes not working
- “We’ve always done it that way”
- Helps identify ineffectiveness
- Determines way to improve

Examples:

1. Staff believes that washing with soap and water is more effective than using an ABHS.
2. Staff believes they are required to wash their hands with soap and water after using ABHS ten times.

Training Issues

Missed opportunities for hand hygiene before donning gloves.

Why
- Lacking knowledge
- Behavioral/cultural

Action
- Talk to staff
- Literature review

Strategy
- Educate
- Hand hygiene Champions

Hand Hygiene and Contact Precautions Observations

Staff type*	Type of opportunity	HH performed?	Gown or glove indicated?	Gown/glove used?
Click here to enter text.	Room entry / Room exit / Before resident contact / After resident contact / Before glove / After glove / Other: Click here to enter text.	Alcohol-rub / Hand Wash / No HH done	Gown only / Glove only / Both / No	Gown used / Glove used / Both / Neither
Click here to enter text.	Room entry / Room exit / Before resident contact / After resident contact / Before glove / After glove / Other: Click here to enter text.	Alcohol-rub / Hand Wash / No HH done	Gown only / Glove only / Both / No	Gown used / Glove used / Both / Neither

Justify a Need

- Empower us to approach leadership for increase in resources
- New or increased staffing
- Increased training
- Block beds or increase isolation rooms
- Negative pressure room
- Focuses attention on a need
- Provides a solution to address that need

Performing the Infection Control Risk Assessment

- Gather the leaders
- Select categories to assess
- Identify risks in each category
- Develop methods and be consistent
- Perform the assessment
- Establish priorities

Performing An IPC Risk Assessment

Leaders

Select Categories to Assess

Risk Assessment Cycle

Identify Risks in Each Category
- Local Community
- Organizational
- Societal

Involve Others
- ICC
- Leadership
- Key Staff
- Health Dept

Develop Methods
- Quantitative
- Qualitative

Perform Assessment
- Include Others
- Establish Timelines

Establish Priorities
- TJC / CMS / Other
- Limit Number

Step 1: Gather the Leaders

Include key staff:
- Environmental
- Pharmacy
- Lab
- Nursing
- Medicine
- Quality
- Opinion leaders

Step 2: Select Categories for Risk Assessment

Geographic Location	Natural disasters (Probability) Water services Bioterrorism
Community	Community outbreaks Migratory population Incidence of TB
Organizational Programs	Sub acute Rehab LTC
Equipment and Devices	Scopes Surgical Instruments New Devices
Environmental Issues	Construction Isolation rooms Utilities
Employee	Needlesticks Vaccinations

Step 3: Identify Risks

Identifying Risks for Acquisition and Transmission of Infectious Agents – Select Targets or Groups for Assessment

- External
  - Community-related
  - Disaster-related
  - Regulatory and accreditation requirements
- Internal
  - Patient-related
  - Employee-related
  - Procedure-related
  - Equipment/device-related
  - Environment-related
  - Treatment-related

Step 3: External Risks

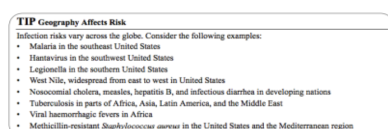
- Natural disasters
  - Tornadoes, floods, hurricanes,
  - Earthquakes

Breakdown of municipal services (i.e., broken water main, strike by sanitation employees)

- Accidents
  - Mass transit (i.e., airplane, train, bus)
  - Fires involving mass casualties
- Intentional acts
  - Bioterrorism
  - “Dirty Bomb”
  - Contamination of food and water supplies

Step 3: External Risks

- Community outbreaks of transmissible infectious diseases
  - Influenza, meningitis
  - May be linked to vaccine-preventable illness in unvaccinated population
  - Work with local or county health departments
  - Know local prevalence
  - Assess risks associated with primary immigrant populations in geographic area



TIP Geography Affects Risk

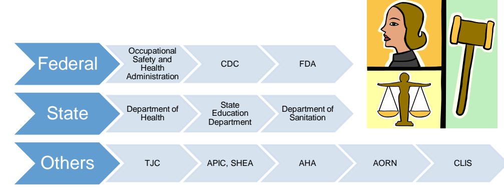
Infection risks vary across the globe. Consider the following examples:

- Malaria in the southeast United States
- Hantavirus in the southwest United States
- Legionella in the southern United States
- West Nile, widespread from east to west in United States
- Nosocomial cholera, measles, hepatitis B, and infectious diarrhea in developing nations
- Tuberculosis in parts of Africa, Asia, Latin America, and the Middle East
- Viral haemorrhagic fevers in Africa
- Methicillin-resistant *Staphylococcus aureus* in the United States and the Mediterranean region

Important Considerations: Possible but not Probable

- Threat to life or health
- Disruption of services
- Loss of function
- Loss of community trust
- Financial impact
- Legal issues
- Regulatory impact
- Standards/requirements

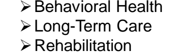
Step 3: External Risks
Regulatory and Accreditation Requirements



Step 3: Internal Risks
The Patient

Demographics of the Patient Population

- Location
- Community
- Population Served
- Age
- Immune status
- Race and ethnicity
- Medical history
- Infections
- ADL- eat, bathe, dress, toilet
- Special needs populations
  - ➢ Behavioral Health
  - ➢ Long-Term Care
  - ➢ Rehabilitation



Step 3: Internal Risks
Employee-Related

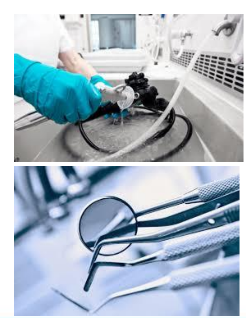
- General poor health
- TST conversions
- Flu vaccination/declination
- Immunocompromised
- Pregnancy
- Presenteeism

Step 3: Internal Risks
Employee-Related Risks

- Personal health habits
- Cultural beliefs regarding disease transmission
- Understanding of disease transmission and prevention
- Degree of compliance with infection prevention techniques, e.g., personal protective equipment, isolation technique
- Inadequate screening for transmissible diseases
- Hand hygiene
- Sharps injuries

Step 3: Internal Risks
Equipment/Device-Related

- Central lines
- Urinary catheters
- Radiology services
- Need for High-level disinfection
  - Laryngoscopes
  - Vaginal and rectal probes
- Need for sterilization
  - Podiatry
  - Dental



Equipment-Related Risks

- Cleaning, disinfection and sterilization processes for equipment
  - Scopes
  - Surgical instruments
  - Prostheses
  - Prepackaged devices
  - Reprocessed single-use devices

Invasive Device-Related Risks Example of Central lines

- Complexity of device
- Skill and experience of user
- Safety features: user dependent or automatic

Procedure-Related Risks

- Degree of invasiveness of procedure performed
- Equipment used
- Knowledge and technical expertise of those performing procedure
- Adequate preparation of patient
- Adherence to recommended prevention techniques

Step 3: Internal Risks Environmental-Related

- Construction
- Limited sink/dispensers
- Limited single rooms
- Limited housekeeping
- Confined spaces
- Joint events:
  - The dining experience
  - The great room
  - Music therapy

Equipment - Related Risks

- Cleaning, Disinfection and Sterilization processes for equipment
  - Scopes
  - Surgical instruments
  - Prostheses
  - Prepackaged devices
  - Reprocessed single-use
  - devices

Step 4: Develop Method

Qualitative Risk Assessment

- Non-numeric scoring system based upon the probability of an event occurring
- Assess risk using **written descriptions**
- Examples: Gap analysis and Strengths, Weakness, Opportunities, Threats (SWOT)

Quantitative Risk Assessment

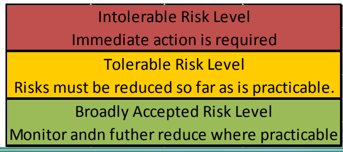
- Numeric scoring system based upon probability of event occurring

Qualitative Risk Assessment

Simple Risk Matrix

		Consequences		
		Minor	Moderate	Major
Likelihood	Likely			
	Possible			
	Unlikely			

Risk Treatment Key



Risk Treatment Key
Intolerable Risk Level Immediate action is required
Tolerable Risk Level Risks must be reduced so far as is practicable.
Broadly Accepted Risk Level Monitor andn futher reduce where practicable

Example 1: Resident with a Multidrug-Resistant Organisms (MDRO)

- Likelihood
  - Likely 66-100%
  - Possible 33-66%
  - Unlikely 0-33%
- Consequences
  - Minor → can be managed without medical treatment
  - Moderate → requires medical treatment
  - Major → transfer to hospital or death

Example 1: Resident with a Multidrug-Resistant Organisms (MDRO)

- Likelihood
  - Likely 66-100%
  - Possible 33-66%
  - Unlikely 0-33%
- Consequences
  - Minor → can be managed without medical treatment
  - Moderate → requires medical treatment
  - Major → transfer to hospital or death

Qualitative Risk Assessment

Simple Risk Matrix

		Consequences		
		Minor	Moderate	Major
Likelihood	Likely			
	Possible		X	
	Unlikely			

Risk Treatment Key

Intolerable Risk Level Immediate action is required
Tolerable Risk Level Risks must be reduced so far as is practicable.
Broadly Accepted Risk Level Monitor andn futher reduce where practicable

Sample GAP Analysis

Area/Topic	Current Status	Desired Status	GAP	Action Plan	Priority
Hand hygiene	Compliance 45%	90%	GAPS identified before care	- Make a leadership priority - Evaluate location of rub - Provide unit specific feedback	High
Needlesticks	Incidence in nurses has increased by 2%	Reduce incidence by 5% from 2009	- New nursing staff - Hurried pace pre vents activation	- Conduct detailed review - Evaluate active safety devices	Medium
Central line-associated bloodstream Infection, CLABSI (PICCs)	1 CLABSI infection last quarter	Zero	Peripherally inserted central catheters (PICCs) are new to staff	- Educate all nurses on care and maintenance	High

Quantitative Risk Assessment

Assign **3 values** to each risk

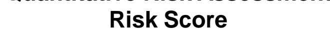
Risk	Specific Issues	Probability	Severity	Risk Reduction Initiatives	Preparedness	Risk Score Range
		High = 3	Life threatenining; major impact on organization = 3		Poor = 3	Possible 1 - 27
		Moderate = 2	Moderate harm to patient or organization = 2		Fair = 2	
		Low = 1	Minimal impact = 1		Good = 1	Actual 1 - 18
		None = 0	None = 0			

- Probability- known risks, historical data, literature
- Impact/severity
- Preparedness- current systems in place

Quantitative Risk Assessment
How to Assign Values

- There are no right or wrong answers
- Allow discussion
- Promote consensus
- Each organization's priorities will be different
- Once decided, be consistent

Quantitative Risk Assessment
Risk Score



- Derived from multiplying the 3 component number
- Group consensus vs. mathematical average

The Infection Prevention Team will revise the risk assessment and the Infection Prevention Committee will review and approve it annually.

Scoring Process
Probability x Severity x Preparedness = Risk Score

The probability of occurrence, multiplied by the severity of the risk, multiplied by the organization's preparedness to deal with the risk = the organization's risk level for each item.

RISK	**Specific Issues**	**Probability** High = 3 Moderate = 2 Low = 1 None = 0	**Severity** Life threatening; major impact on organization = 3 Moderate harm to patient or organization= 2 Minimal impact = 1 None = 0	**Risk Reduction Initiatives**	**Preparedness** Poor = 3 Fair = 2 Good = 1	**RISK SCORE Range:** Poss 1- 27 Actual 1-18
Clostridium difficile *(C.diff)*		3	3	➢ Pt equipment labeling protocol (Patient Ready) ➢ Equipment Cleaning Grid ➢ Participation in community CDI collaborative ➢ Dedicated equipment ➢ PPE compliance monitoring ➢ Hand hygiene compliance audits on selected units & data feedback to units and leadership ➢ ATP testing after cleaning, EVS checklist ➢ Ultraviolet light machines for surface disinfection ➢ C.diff Prevention Plan & Toolkit ➢ Antibiotic stewardship ➢ Bleach cleaning ➢ Early warning communication to prevent clusters ➢ Enhanced protocol for cluster settings. ➢ Limit use of quinolones to treat C.A. pneumonia	2	18

Quantitative Risk Assessment Examples

Score Range 0-3
3= High , 0= Low

Device Associated	Bench mark	High Risk	High Volume	Potential Negative outcome	State or National Initiative	Financial Incentive	Risk Rating
CAUTI							
VAE							
CLABSI							
Procedure							
Total Hip							
Other							
Influenza							
Hand hygiene							

Quantitative Risk Assessment

- Benchmark: VAP (Ventilator-associated Pneumonia) rate is in 90th percentile compared to National Healthcare Safety Network (NHSN) data.

Assessment: Risk score is 3 - VAP is a high outlier compared to NHSN data

- High risk: VAP is associated with significant morbidity and mortality. Internal process measures show poor compliance with hand hygiene and other process measures.

Assessment: Risk Score is 3

- High Volume: Number of cases has risen since last year and ventilator utilization ratio is well above NHSN data.

Assessment: Risk score 3

- Potential negative outcome: Morbidity and mortality reviews demonstrate attributable mortality.

Assessment: Risk score 3

- National Initiative: This is not part of publicly reported data. Currently not associated with CMS measures.

Assessment: risk score 0

- Financial incentives: Excess cost 179,000. Excess length of stay 108 days

Assessment: Risk score 2

Quantitative Risk Assessment Examples

Scoring Example

Score Range 0-3
3= High , 0= Low

Device Associated	Bench mark	High Risk	High Volume	Potential Negative outcome	State or National Initiative	Financial Incentive	Risk Rating
CAUTI	2	1	1	1	0	3	8
VAP	3	3	3	3	0	2	14
CLABSI							
Procedure							
Total Hip							
Other							
Influenza							
Hand hygiene							

Surveillance Data

Surveillance data must be part of the risk assessment.

- *Clostridium difficile* rates
- Methicillin-resistant *Staphylococcus aureus (*MRSA) rates
- Multidrug-Resistant Organisms
- Central line- associated bloodstream infections
- Catheter associated urinary tract infections

Tips and Reminders

- Include both actual and potential risks
- Clearly identify priority ranking. If numerical: identify how points are allocated
- If qualitative: articulate high, medium, low, etc., (How is this determined?)
- Include data from rounds and observations
- Identify potential risks from the literature

Tips and Reminders

The assessment should address 3 questions:

1. What is the probability that a risk event will occur?
2. If it occurs, how severe will it be?
3. What have we done to decrease the risk?

From Risks to Priorities to Plan

Consequences of Not Performing Risk Assessment

- Center for Medicare and Medicaid Services violations
- Joint Commission accreditation problems
- Adverse events for our residents:
  - Greater risks
  - Length illnesses
  - Longer hospital stays
  - Increased antibiotic use
  - Increased acuity needs
  - Death

Questions?

1. Wash or clean your hands before and after you provide care to a patient.
2. Use gloves the right way.
3. Get your shots– including your annual flu shot– and make sure everyone in your family does too.
4. Follow the rules of isolation for the patient's protection, your protection, and everyone else's protection.
5. Follow safe injection practices – remember One needle, One syringe, Only one time.
6. Make patient identification a priority: right drug, right time, right dose.
7. Keep the patient's room and equipment clean.
8. Know when antibiotics are appropriate . . . and when they are NOT.
9. What you wear matters! Make sure your attire does not become a source of infection.
10. Know about the infection preventionist.

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The Infection Prevention and Control (IPC) Program

The Components of an Effective IPC Program

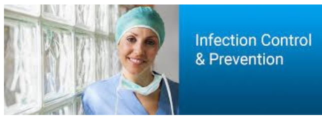
- Have a clinically qualified staff to oversee the program
- Perform a risk assessment
- Develop a written risk based infection prevention and control plan with goals and measureable objectives, strategies and evaluation methods
- Develop a surveillance program
  - Have a system for obtaining, managing, and reporting critical

    data and information
  - Use of surveillance findings in performance assessment and improvement activities

Arias KM, Soule BM, APIC/JCR Infection Prevention and Control Workbook, 2nd Edition 2010

The Components of an Effective IPC Program

- Provide ongoing relevant education and training programs
- Maintain well-trained personnel
- Available resources to support the program
- Integration with emergency preparedness systems in the organization and community
- Collaboration with the health department



Creating the Foundation

The Infection Control Plan should contain 4 components:

1. A description of risks
2. A statement of goals
3. A description of strategies to address the risks
4. A description of how the strategies will be evaluated

Infection Control Program Plan

It is a comprehensive, effective and supported program that is essential for reducing infection risk and increasing safety.

Minimum LTC Assessment Domains

- Hand hygiene compliance
- Environmental control
- Outbreak control

Prevention of:

- Urinary tract infections (UTI)
- Respiratory tract infections
- Gastrointestinal
- Multidrug-resistant organism infections (MDROs)
  - Skin and soft-tissue infections

(Bradley et al.)

Infection Control Plan Template

Administrative
- Authority statement
- Vision/mission statement
- Program goals and objectives
- Program assessment

Personnel Job Description
- Director/assistant director
- Infection control coordinator

Clinical Infection Control Plan
- Surveillance strategy
- Environmental monitoring
- Antibiotic utilization studies

Investigations
- Outbreak management

General Organizational Policies
- Occupational health
- Medical waste
- Post-exposure communicable disease management

Communicable Disease Reporting Education Departmental Policies and Procedures
http://www.infectioncontroltoday.com/articles/2000/12/developing-an-infection-control-program.aspx

The Infection Control Plan

AJIC special communication

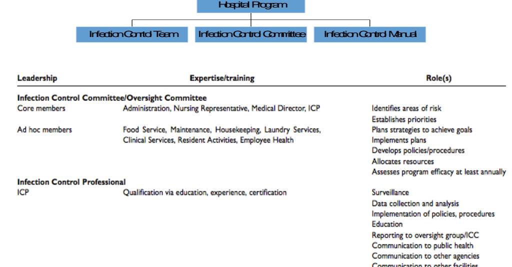
SHEA/APIC Guideline:
Infection prevention and control in the long-term care facility

Philip W. Smith, MD,[a] Gail Bennett, RN, MSN, CIC,[b] Suzanne Bradley, MD,[c] Paul Drinka, MD,[d] Ebbing Lautenbach, MD,[e] James Marx, RN, MS, CIC,[f] Lona Mody, MD,[g] Lindsay Nicolle, MD,[h] and Kurt Stevenson, MD[i]
July 2008

http://www.apic.org/Resource_/TinyMceFileManager/Practice_Guidance/id_APIC-SHEA_GuidelineforICinLTCFs.pdf

The Infection Control (IC) Plan: Administrative

IC Plan: 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

http://www.apic.org/Resource_/TinyMceFileManager/Practice_Guidance/id_APIC-SHEA_GuidelineforICinLTCFs.pdf

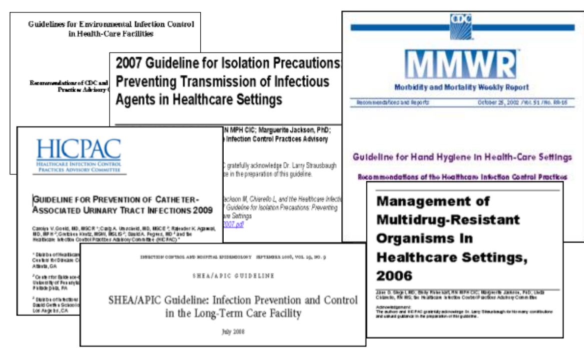
The Infection Control Team

- Has the authority to manage an effective control program
- Reports directly with senior administration.
- Responsible for day-to-day functions of IC program
- Prepares the yearly plan
- Has expertise in IC
- Creative in their job

Infection Control Manual

- Every facility should have an infection prevention manual compiling evidence-based practices for patient care.
- This manual should be developed and updated in a timely manner by the infection control team.
- It is to be reviewed and accepted by infection control committee.

Where Is the Evidence?



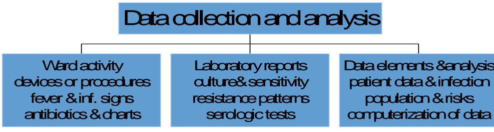
IC Plan: Elements
Polices and Procedures

Policies and procedures

- Standard precautions
- Transmission-based precautions
- Specific Infections-MRSA, Scabies,Tinea
- Employee education
- Hand hygiene
- Central line maintenance

The Infection Control Plan: Clinical

Surveillance Strategies



Surveillance Strategies

- Assessing your population (risk assessment)
- Surveillance definitions (McGeer)
- Methods to collect data (EMR, AM report)
- Outcome measurements (incidence of UTI)
- Dissemination of data
- Performance improvement
- Next year's goals

Surveillance Strategies

IC Plan: Clinical Disease Reporting

Dissemination information to:

- Staff
- Patient and family
- Receiving and transferring institutions
- Public heath authorities

From Risks to Priorities to Plan

IC Plan: Clinical Infection Identification and Outbreak Management

Case definitions

Example: Respiratory viral infections

- Fever above 101°F with one of the following:
  - Chills
  - Headache or eye pain
  - Sore throat
  - Muscle ache
  - New or increased cough

Outbreak Threshold

- One case of influenza
- Three cases of other respiratory viruses

IC Plan: Clinical Monitoring of Practices

- Hand hygiene
- Aspiration precautions
- Pressure ulcer prevention
- Diaper rashes

- Invasive device care and use:
  - Vents
  - Central line
  - Catheters

IC Plan: Clinical Antimicrobial Stewardship

- Committee or team
- Leadership support
- De-escalation of antibiotics
- Antibiotic “time-out”
- Standardization of length of treatments
- Work on “low hanging fruit”

IC Plan: Clinical Health Programs

Residents	Staff
• TB screening • Immunization program • Risk assessments • Aspiration • UTI • Skin care	• TB screening • Immunization program • Risk assessments • Occupational exposures

The Infection Control Plan: General

IC Plan: General Facility Management Issue

- Food preparation/storage
- Laundry collection/cleaning
- Waste collection/disposal
- Housekeeping/cleaning- who cleans what?
- Disinfection/sterilization
- Plumbing/ventilation

IC Plan: Education

- New Employee orientation programs including students and volunteers
- Re-orientation of new employee and volunteers
- Live programs as needed to address specific issues
- One-on-one staff education during isolation rounds/during problem solving activities utilizing verbal and printed material
- Support patient, family and visitor education via:
  - Individual consultation with patients and family
  - Various printed information on infection control related issues

IC Plan: Detect Opportunity for Improvement

- Clinical observation tool
- Pre and post-intervention
- Overall performance of unit/facility/group

(Bradley et al.)

Facilitators for Success

- Supportive/engaged leaders
- Education, checklists, monitoring
- Multidisciplinary teamwork
- Root-cause analysis for adverse infection events
- Administrative partnership with units
- Accessibility of supplies at point of care
- Sharing process outcome data with staff

Practice Barriers Identified

- Unavailability of hand sanitizers
- Antimicrobial monitoring by pharmacy only
- Lack of aspiration prevention strategies
- Routine Foley changing/irrigation
- Physician refusal to remove Foley
- Limited separation of clean/dirty workspace
- Lack of family/resident education

(Bradley et al.)

Organizational Barriers Identified

- Lack of trained infection preventionist (IP)
- IP has multiple roles/campuses
- High acuity, low staffing levels
- Reactive versus proactive response
- Lack of administrative support
- Lack of root-cause analysis (RCA)
- Absence of structured documentation process
- Inadequate communication protocols

(Bradley et al.)

References

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- Castle NG, Wagner LM, Ferguson-Rome JC, et al. Nursing home deficiency citations for infection control. *Am J Infect Control* 2011 May;39(4):263-9.
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Insider Tips

- Every IC plan is different
- No strict rules
- Write what you do
- Set goals
- Celebrate successes
- Make improvements
- Education
- Be creative

Antimicrobial Stewardship

Evolution of Epidemiology Pre-Antibiotic Era

Humoral Theory

Body has 4 humor (fluids)
1. Blood (liver)
2. Yellow bile (spleen)
3. Black bile (gallbladder)
4. Phlegm (brain/lungs)

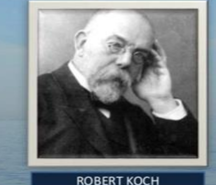
An imbalance of the humors resulted in disease.

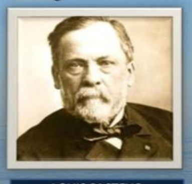
Miasma Theory

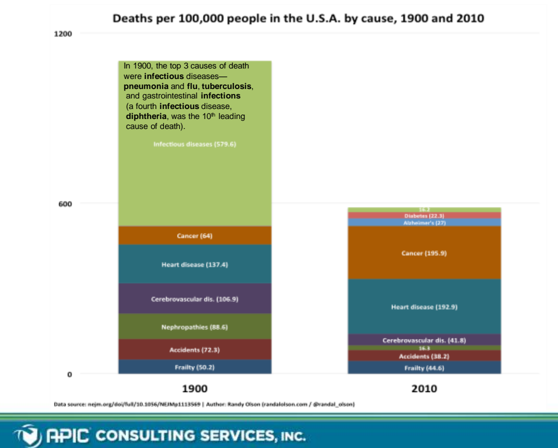
- Miasma is unhealthy smell or vapor
- Disease caused by "bad air"
- Odor arising from decay and filth
- Pre-1850

Germ Theory of Disease 1860

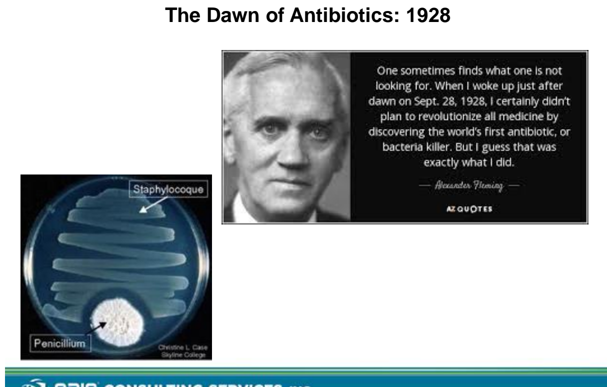
- Proposed by Robert Koch and Louis Pasteur.
- Every human disease is caused by a microbe or germ, which is specific for that disease and one must be able to isolate the microbe from the diseased human being.


ROBERT KOCH

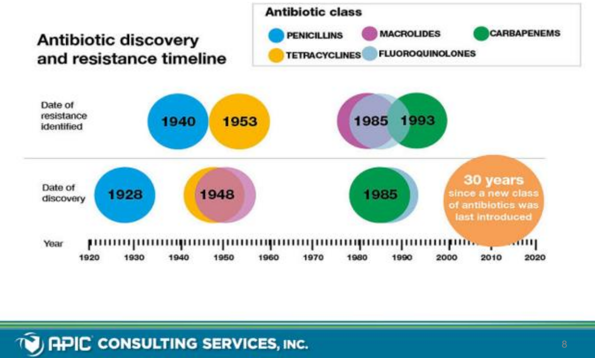

LOUIS PASTEUR



The Dawn of Antibiotics: 1928



Antibiotic Resistance: 1940



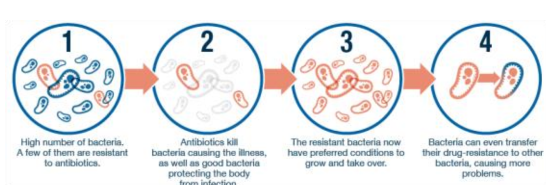
Multidrug-Resistant Organism (MDRO)

- A germ that is resistant to many antibiotics
- Fewer antibiotics work to treat them

Examples of MDROs include:
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant Enterococcus (VRE)
- Carbapenem-resistant Enterobacteriaceae (CRE)
- Candida auris

These germs can cause a variety of illnesses, including:
- Urinary tract infections
- Pneumonia
- Blood infections
- Wound infections

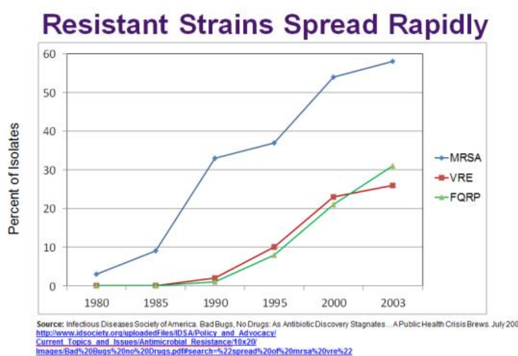
Resistance Cycle



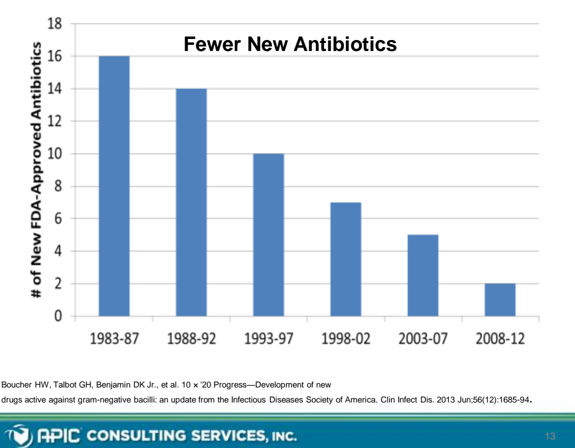
2013: CDC Threat Report

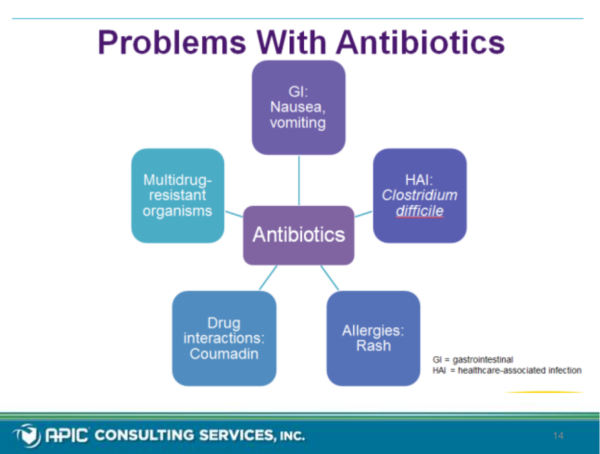
"*Bacteria will inevitably find ways of resisting the antibiotics we develop, which is why aggressive action is needed now to keep new resistance from developing and to prevent the resistance that already exists from spreading".*

http://www.cdc.gov/drugresistance/threat-report-2013/

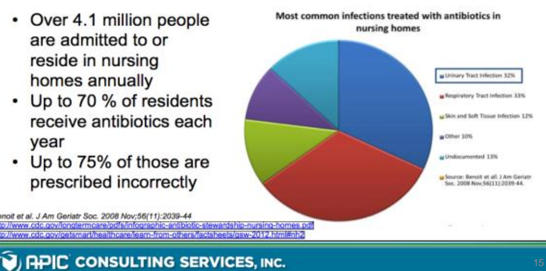


Source: Infectious Diseases Society of America. Bad Bugs, No Drugs: As Antibiotic Discovery Stagnates…A Public Health Crisis Brews. July 2004. http://www.idsociety.org/uploadedFiles/IDSA/Policy_and_Advocacy/Current_Topics_and_Issues/Antimicrobial_Resistance/10x20/Images/Bad%20Bugs%20no%20Drugs.pdf#search=%22spread%20of%20mrsa%20vre%22

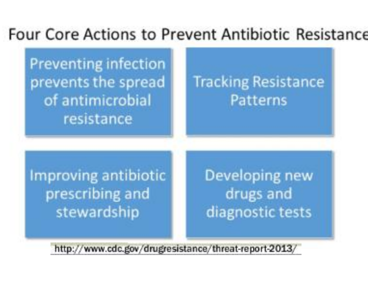




How are antibiotics used in LTCFs?



2013: CDC Threat Report



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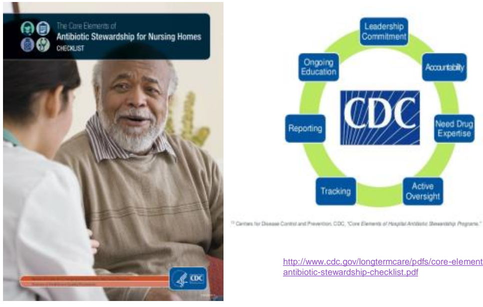
Antimicrobial Stewardship

Strategies to improve the use of **antimicrobial** medications with the goal of:

- Enhancing the healthy outcome of residents
- Minimizing unintended consequences of antimicrobial use, including toxicity and resistance
- Decreasing the spread of infections caused by multidrug-resistant organisms
- Decreasing unnecessary costs

CDC Core Elements of Antibiotic Stewardship for Nursing Homes



http://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship-checklist.pdf

Leadership Commitment

Can your facility demonstrate leadership support for antibiotic stewardship through one or more of the following actions?

- Written statement of leadership support to improve antibiotic use
- Antibiotic stewardship duties included in medical director position description
- Antibiotic stewardship duties included in director of nursing position description
- Leadership monitors whether antibiotic stewardship policies are followed
- Antibiotic use and resistance data is reviewed in quality assurance meetings

Accountability

Has your facility identified leads for antibiotic stewardship activities?

- Empower
  - Medical director
  - Director of nursing
  - Infection preventionist
  - Pharmacist
- Engage
  - Consultant pharmacist
  - Professional partners
  - All clinical staff

nyschp

CERTIFICATE OF ACHIEVEMENT
Marianne Pavia
Has successfully completed 16.5 hours at the Antimicrobial Stewardship Program: The Next Steps For Stewardship: Beyond Basic Workshop

New York State Council of Health-system Pharmacists

March 15-16, 2016

Katie Fontana
NYSCHP CE Administrator

Drug Expertise

Does your facility have access to individual(s) with antibiotic stewardship expertise?

- Internal pharmacist
- Consultant pharmacist
- Partnering with stewardship team at referral hospital
- External infectious disease/stewardship consultant

Gain knowledge!

- Review antibiotic courses for appropriateness of administration and indication
- Review microbiology culture data to assess and guide antibiotic selection
- Ask questions?

TRACKING: MONITORING ANTIBIOTIC PRESCRIBING, USE, AND RESISTANCE

Does your facility monitor one or more measures of antibiotic use?

- Adherence to clinical assessment documentation (signs/symptoms, vital signs, physical exam findings)
- Adherence to prescribing documentation (dose, duration, indication)
- Adherence to facility-specific treatment recommendations
- Performs point prevalence surveys of antibiotic use
- Monitors rates of new antibiotic starts
- Monitors antibiotic days of therapy

Does your facility monitor one or more outcomes of antibiotic use?

- Monitors rates of *C. difficile* infection
- Monitors rates of antibiotic-resistant organisms
- Monitors rates of adverse drug events due to antibiotics

Reporting to Staff

Does your facility provide facility-specific reports on antibiotic use and outcomes with clinical providers and nursing staff?

- Measures of antibiotic use at the facility
- Measures of outcomes related to antibiotic use (i.e., *C. difficile* rates)
- Report of facility antibiotic susceptibility patterns (antibiogram)
- Personalized feedback on antibiotic prescribing practices

Example:

- Huddles
- Unit-based quality council

Education

Does your facility provide educational resources and materials about antibiotic resistance and opportunity for improving antibiotic use?

If yes, indicate which of the following are being tracked…

- Clinical providers (MDs, NPs, PAs, PharmDs)
- Nursing staff (e.g., RNs, LPNs, CNAs)
- Residents and families

Examples:

- Workshops
- Committees- PNT, Safety and Infection Control, Quality

Hot Topics in Antimicrobial Stewardship

- "Antibiotic Time-Out" 48 hours
- De-escalation of treatment
- Antibiogram
- Empiric treatment
- Prophylactic treatment
- Proton Pump Inhibitors and C. *difficile*

Principles of Antibiotic Therapy

Empiric Therapy (85%)

- Infection not well-defined ("best guess")
- Broad spectrum
- Multiple drugs
- More adverse reactions
- More expensive

Directed Therapy (15%)

- Infection well-defined
- Narrow spectrum
- One, seldom two drugs
- Evidence usually stronger
- Less adverse reactions
- Less expensive

Why So Much Empiric Therapy?

Need for prompt therapy with certain infections

- Life or limb threatening infection
- Mortality increases with delay in these cases

Cultures

- Difficult to do to provide microbiologic definition (i.e., pneumonia, sinusitis, cellulitis)
- Negative cultures

Provider beliefs

- Fear of error or missing something
- Not believing culture data available
- "Patient is really sick, they should have 'more' antibiotics"
- Myth of "double coverage" for gram-negatives (e.g., pseudomonas)
- "They got better on drug X, Y, and Z so I will just continue those"

Antibiotic De-escalation

You are taking care of a 72-year old male admitted with severe pneumonia with sepsis. He was appropriately started on *broad-spectrum* antibiotics within 4 hours of his presentation. It is now day 3 on antibiotics. His clinical indicators are improving. As you finish your note and begin to head to your next patient, the clinical pharmacist calls you, "Can we consider changing his antibiotics?"

Your response should be:

A. "Why change now? He's *improving*. Stay the course."
B. "He needs 10 days of antibiotics, as usual. These will do."
C. His cultures are negative. Who knows—he might have *pseudomonas*. Leave 'em be."
D. "Thanks! I appreciate the reminder. What would you recommend?"

When your friendly neighborhood Infectious Disease Consultants recommend antibiotic de-escalation, trust them!

Hot Topics in Antimicrobial Stewardship

Empiric Treatment

– Broad-spectrum, in that they treat both a multitude of either Gram-positive and/or Gram-negative bacteria.

Stop, Look, and Act, Time Out

– Stop, look at the microbiologic data, and if the patient is improving, Act by de-escalating from broad-spectrum antibiotics (cephalosporins and quinolones) to narrow spectrum (such as erythromycin, trimethro-prim), even when the bacterial pathogen is unknown.

De-escalate

– Streamlining of empirical antimicrobial that can more effectively target the causative pathogen, resulting in decreased antimicrobial exposure and substantial cost savings.

The Antibiogram

Antibiogram

- Reports the overall susceptibility profile of a single bacterial isolate to a variety of antibiotics.

Cumulative Antibiogram

- Lists the percentage of isolates susceptible to a variety of antibiotics.
- Includes data from patients receiving care at a particular institution over a defined period of time.
- Used to guide the selection of empiric antibiotic therapy.
- Used to identify the emergence of resistance or to monitor resistance trends over time.

The Antibiogram
CLSI M39-A4: Guidelines

Include only the first isolate of a given species per recording period regardless of:

- Body site
- Antimicrobial susceptibility
- Biochemical variances

Inclusion of multiple isolates from same patient can:

- Over estimate resistance
- Use of more broad spectrum empiric therapy

The Antibiogram
CLSI M39-A4: Guidelines Summary

Include on species with testing data for ≥ 30 isolates per reporting period

If fewer that 30 isolates are available consider:

- Combining species (Shigella spp.)
- Combining data from multiple years

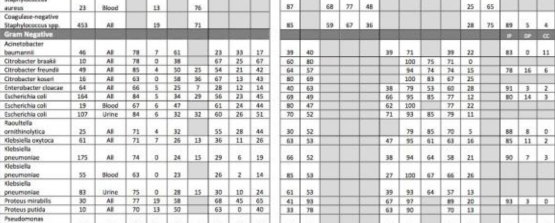
If reporting < 30 isolates include a footnote:

“ ***Please exercise discretion when interpreting the susceptibility of organisms with < 30 isolates”.***

Construction of the Antibiogram

- Percentage of % susceptible
- Footnotes for explanation of data, abbreviations and therapeutic guidance

- Optional information:
  - Dosing information
  - Cost of antimicrobial agent
  - Empiric antibiotics of choice by infection chart



Susceptibilities (% susceptible)	No. Isolates	Sample Type	Amikacin	Ampicillin	Ampicillin/ Sulbactam	Cefazolin	Cefepime	Ceftazidime	Ceftriaxone	Chloramphenicol	Ciprofloxacin	Clindamycin	Cloxacillin	Erythromycin	Gentamicin	Meropenem	Nitrofurantoin	Piperacillin/Tazobactam	Trimethoprim/Sulfamethoxazole	Vancomycin	Patient Location		
Gram Positive																					IP	OP	CC
Staphylococcus aureus	138	All		16		83				94		82	86	68					44	61	83	15	2
Staphylococcus aureus	23	Blood		13		76				87		68	77	48					25	65			
Coagulase-negative Staphylococcus spp.	453	All		19		71				85		59	67	36					28	75	89	5	4
Gram Negative																					IP	OP	CC
Acinetobacter baumannii	46	All	78	7	61		23	33	17	39	40				39	71		39	22		83	0	11
Citrobacter braakii	10	All	78	0	38		67	25	67	60	80					100	75	71	0				
Citrobacter freundii	49	All	85	4	50	25	54	21	42	64	57					94	74	74	15		78	16	6
Citrobacter koseri	16	All	63	0	58	36	67	13	43	80	69					100	83	67	25				
Enterobacter cloacae	64	All	66	5	25	7	28	12	14	40	63				38	79	53	60	28		91	3	2
Escherichia coli	164	All	84	5	34	29	56	23	45	69	49				66	95	85	77	12		80	14	3
Escherichia coli	19	Blood	67	6	47		61	24	44	80	47				62	100		77	22				
Escherichia coli	107	Urine	84	6	32	32	60	26	51	70	52				71	93	85	79	11				
Raoultella ornithinolytica	25	All	71	4	32		55	28	44	30	52					79	85	70	5		88	8	0
Klebsiella oxytoca	61	All	71	7	26	13	36	11	26	63	53				47	95	61	63	16		85	11	2
Klebsiella pneumoniae	175	All	74	0	24	15	29	6	19	66	52				38	94	64	58	21		90	7	3
Klebsiella pneumoniae	55	Blood	63	0	23		26	2	14	85	53				27	100	67	66	26				
Klebsiella pneumoniae	83	Urine	75	0	28	15	30	10	24	61	53				39	93	64	57	13				
Proteus mirabilis	30	All	77	19	58		68	45	65	41	93				67	97		89	20		93	3	0
Proteus putida	10	All	70	13	50		63	0	40	33	78				63	90		70	13				
Pseudomonas aeruginosa	34	All	93	0	16	6	66	18	44	54	81				77	85		73	16		91	9	0

Antimicrobial Stewardship: Where Do We Begin

- There is no "one-size-fits-all" approach.
- Understand the burden of infection in our facility as related to the characteristics of the residents and the capabilities of the facility
- Determine what resources are available or may become available
- Select stewardship strategies that best address the problems while accounting for the resources
- Show off our success (or explain why success was not possible)
- Use your success to secure more resources to address more problem areas

Where Did I Begin?

- CDC Checklist
- Read Dr. Stone's article
- Obtained a report of antimicrobial usage from my EMR
- Started with low hanging fruit

Antimicrobial Stewardship in Long-term Care Facilities

Susan M. Rhee, MD[a,*], Nimalie D. Stone, MD, MS[b]

KEYWORDS

- Long-term care • Antimicrobial stewardship • Antimicrobial resistance • Elderly • Infection prevention

KEY POINTS

- Long-term care facilities (LTCF) house a unique patient population, who are often elderly with several preexisting medical conditions.
- Residents of LTCF are often colonized with multidrug-resistant organisms, and antibiotic stewardship is essential to limit the further emergence of resistance.
- Antimicrobial stewardship is a new but necessary concept in LTCFs.
- Stewardship strategies from acute care settings may be adapted to function with the available resources utilized in LTCFs.

INTRODUCTION

Antimicrobial resistance has been identified as a major public health crisis. National summary data from the Centers for Disease Control and Prevention (CDC) estimate that more than 2 million illnesses are attributable to resistant infections.[1] As a result of increasing prevalence of virulent and drug-resistant organisms, including Clos-

Challenges Addressing Antibiotic Use in LTC

Assessments are made by a surrogate rather than the prescriber

- 67% of antibiotic prescription were ordered by phone discussion

Limited documentation of assessments in the medical record

- 43% of LTC initial antibiotic course was NOT documented in the medical record

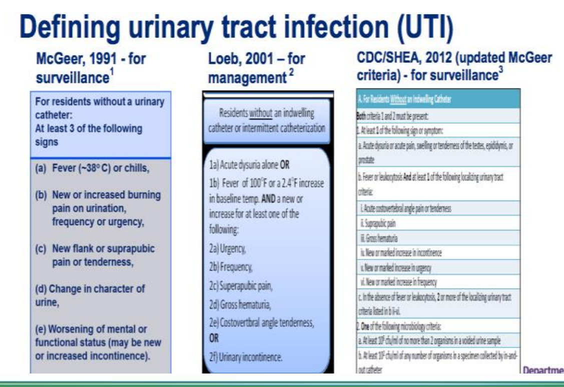
1. Richards et al. J Am Med Dir Assoc 2005;6(2):109-12
Strategies for improving antibiotic use in LTCFs. Nimalie Stone, MD, MS. Webinar 3/5/2014

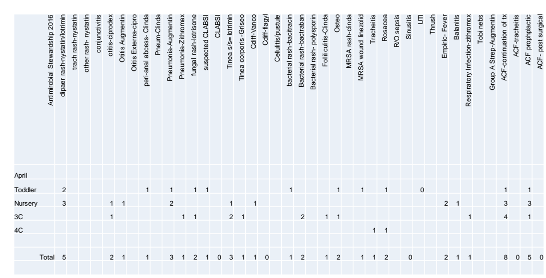
Antimicrobial Stewardship and Infection Management in LTCFs

- The two go hand-in-hand
- Careful antibiotic use is critical in the control of MDROs
- Know the frequency and indication for antibiotic use in your facility
- Develop protocols for communication of concerns
- Ensure documentation of signs/symptoms is complete

Factors Influencing Decisions about Antibiotic Use in LTC

- Quality of the assessment and data available during the decision process
- Staff structure, time of day
- Knowledge, attitude and perception of the clinical provider
- Culture and expectations about antibiotic use at the facility





Antimirobial Stewardship 2016	dipaer rash-nystatin/lotrimin	trach rash-nystatin	other rash- nystatin	conjunctivitis	otitis-ciprodex	Otitis Augmentin	Otitis Externa-cipro	peri-anal abcess- Clinda	Pneum-Clinda	Pneumonia-Augmentin	Pneumonia-Zithromax	fungal rash-lotrisone	suspected CLABSI	CLABSI
April														
Toddler	2							1		1		1	1	
Nursery	3				1	1				2				
3C					1						1	1		
4C														
Total	5				2	1		1		3	1	2	1	0

Antimirobial Stewardship 2016	Tinea s/s= lotrimin	Tinea corporis-Griseo	Cdiff-Vanco	Cdiff-flagyl	Cellulitis/pustule	bacterial rash-bacitracin	Bacterial rash-bactraban	Bacterial rash- polysporin	Follliculitis-Clinda	Osteo	MRSA rash-clinda	MRSA wound linezolid	Tracheitis	Rosacea
April														
Toddler						1				1		1		1
Nursery	1		1											
3C	2	1					2		1	1				
4C													1	1
Total	3	1	1	0		1	2		1	2		1	1	2

Antimirobial Stewardship 2016	R/O sepsis	Sinusitis	UTI	Thrush	Empiric- Fever	Balanitis	Respiratory Infection-zithromox	Tobi nebs	Group A Strep-Augmentin	ACF-continuation of tx	ACF-tracheitis	ACF prophplactic	ACF- post surgical
April													
Toddler			0							1		1	
Nursery					2	1				3		3	
3C							1			4		1	
4C													
Total		0			2	1	1			8	0	5	0

Issues identified and discussed:
Different treatments for similar illness - lotrimine, lotrisone
Different durations for rashes - 1 week, 10 days, 14 days
Skin Cultures: Will topical cultures help direct therapy? Request that skin cultures for bacteria and fungi are sent prior to initiating therapy.

EMR Reports

Rashes	April 2016	May 2016	June 2016	July 2016
Diaper Rashes	5	4	7	3
Other Fungal Rashes (trach, GT)	4	5	6	9
Bacterial Rashes	3	5	6	2
Antimicrobial Usage				
Total Rash Treatments	12	14	19	15
Total Antimicrobial Usage	48	40	43	49
% or Treatment for Rashes	25%	26%	30%	24%

Toddler Fungal Rashes Diaper, GT, Trach

- Six month study - curative and preventative
- Trial wipes that optimizes the natural antimicrobial action of the skin's acidic mantle
- Fungal rashes meeting the hospital definition will be cultured and treated with the wipes per hospital protocol
- If the rash returns, the wipes will be reapplied and continued preventatively

GOALS:

- Less rashes, increasing quality of life for residents
- Less antifungal use

SMH Stewardship Program Tracheitis

Uncommon infectious cause of acute upper airway obstruction

- Need criteria
- Many returns from ACF on Abs for "tracheitis" even if respiratory viral
- PCR panel is positive
- Being treated with Ab that are inappropriate or unnecessary
- Opened discussions with our referring facilities about standardized definition for tracheitis
- Continue to question treatment

Stop/question treatment:

- Tobi nebs- isolated organisms resistant to tobramycin
- Use of ciprodex for prophylactic and treatment of tracheitis
  - Its use may be for the anti-inflammatory effect rather than antibiotic component.
  - Discuss use of dexamethasone component alone

SMH Stewardship Program Conjunctivitis

- Culture for bacterial and viral pathogens
- Clean eye laterally to medially with moistened gauze
- Apply artificial tears to both eyes
- Evaluate the appropriateness of treatment based on clinical status and preliminary microbiology culture reports
- Prescribe ciprofloxacin ophthalmic solution or appropriate antibacterial agent for both eyes for the treatment of bacterial conjunctivitis, as indicated by a significant positive eye culture
- Decide to initiate treatment before the preliminary culture report is received due to worsening of clinical signs and symptoms. If treatment is initiated at ≥ 24 hours from the original culture, re-culture eye before starting antibacterial treatment
- Re-evaluate the effectiveness of treatment within a 48-hour time frame to determine clinical response and document status

Prevalence of Antibiotic Use and Stewardship in Pediatric Long-term Care Facilities (PAUSE)

- Baylor College of Medicine/Children's Hospital of San Antonio (Texas)
- Cedarcrest Center for Children with Disabilities (New Hampshire)
- Center for Discovery (New York)
- Children's Specialized Hospital (New Jersey)
- Elizabeth Seton Pediatric Center (New York)
- Helen Bernardy Center for Medically Fragile Children at Rady Children's Hospital (California)
- Home of the Innocents (Kentucky
- Lifescape/Sanford School of Medicine (South Dakota)
- New England Pediatric Care (Massachusetts)
- Sunshine Children's Home and Rehabilitation Center (New York)

PAUSE

- Point prevalence study
- Data collection on two dates – January and July
- Identify opportunities for antimicrobial stewardship strategies in the pediatric LTC population
- Chart review for indications for use, agents used, and available microbiologic data
- Assess antibiotic use
- Evaluate adherence to established guidelines for the management of common infections in children and opportunities for stewardship interventions

Toddler UVDI Research

- Highest HAI rates, especially respiratory viral infections
- Six month study - preventative
- 10 rooms, divided the unit in half, trial UVDI on 5 rooms, alternating days

Goals:

- less illness, outbreaks, isolation, PPE, antibiotic use, transfers to ACF
- Increase quality of life and patient satisfaction

Outcome:

- 33% decrease in HAIs

Bonus: Embraced by housekeeping!

Proton Pump Inhibitors (PPIs)

- Treatment of gastric acid-related disorders
- Long-term use of PPIs has led to unforeseen adverse effects
- Side effects of PPI use is an association with *Clostridium difficile* infection (CDI)
- PPIs neutralize the gastric juices proven to kill C. *difficile*
- Kaur et al - mice receiving PPI therapy had similar susceptibility to CDI as mice receiving antibiotics
- Randomized trial for PPI or placebo and monitoring patients for CDI would be impractical and unethical

SMH

Many resident on PPIs indefinitely

- C. *difficile* and other long term adverse effects including:
  - Hypergastrinemia
  - hypocalcemia,
  - hypomagnesemia
  - Pneumonia
- 25 residents transitioned from Prilosec to Zantac
- 6 of the 25 were weaned from Zantac

Kaur S, Vaishnavi C, Prasad KK, Ray P, Kochhar R. Comparative role of antibiotic and proton pump inhibitor in experimental Clostridium difficile infection in mice. Microbiol Immunol. 2007;51(12):1209-1214

NYSDOH

Collaborative Kickoff

Part 1: Overview of the Collaboration to Launch Antibiotic Stewardship Programs (CLASP) in LTCFs Project

It was on a short-cut through the hospital kitchens that Albert was first approached by a member of the Antibiotic Resistance.

April 20th & 25th, 2017

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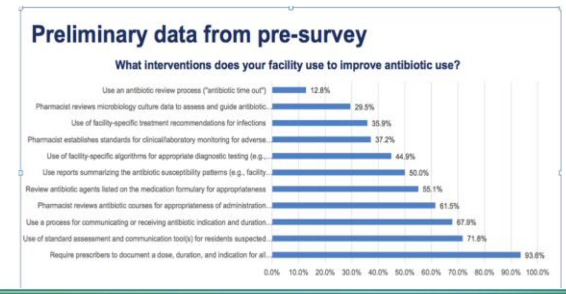
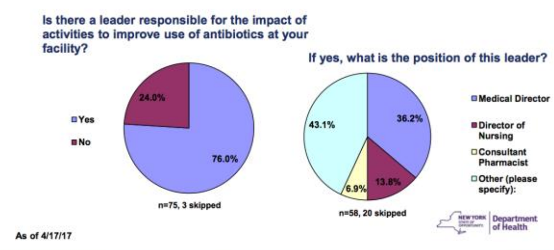
NYSDOH



NYSDOH

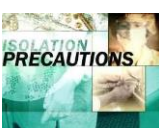


Discussion

1. What are 2 short-term goals for antimicrobial stewardship at your facility.
2. What are 2 long-term goals for antimicrobial stewardship at your facility.
3. List the 3 primary challenges/barriers to implementing and expanding antimicrobial stewardship strategies in your facility.

Questions/Comments

Isolation Precautions

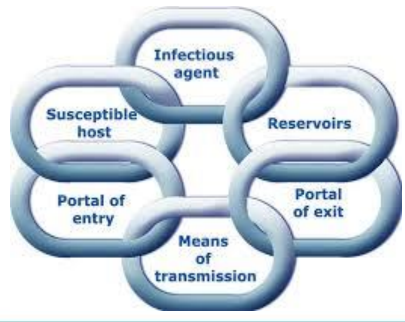


Isolation Precautions

Basic risk reduction strategies:

1. Protect the health of patients, employees, families and visitors of patients
2. Review precautions with each patient and family to promote safety
3. Policies and procedures for precautions apply to **ALL PERSONS** having contact with or providing care to a patient

Breaking the Chain of Infection



Controlling The Route of Transmission By Breaking the Chain of Infection

Basic infection control practices

- Hand hygiene
- Standard precautions
- Transmission - based precautions
- Engineering controls
- Disinfection of patient care 3quipment
- Work practice controls

Fundamentals of Isolation Precautions

- Hand hygiene
- Personal protective equipment (PPE):
  Gloves, Mask, respiratory protection, eye protection, face shields, gowns and protective apparel
- Patient-care equipment and articles
- Linen and laundry
- Routine and terminal cleaning
- Patient placement
- Transport of infected patients

Types of Isolation Precautions

Standard precautions

Transmission-based precautions
- Contact precautions
- Airborne precautions
- Droplet precautions

Standard Precautions

- Use with **ALL** patients to prevent exposure to blood, body fluids, non-intact skin & mucous membranes
- Not just hand hygiene!
- Very underused

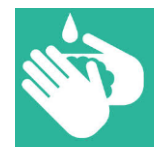
Standard Precaution: Hand Hygiene

Two methods of hand hygiene:
- Soap and water
- Alcohol-based hand sanitizers

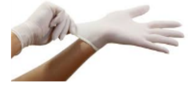
Perform hand hygiene:
- Before and after patient contact
- Before and after donning and doffing gloves or any other PPE item
- After touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn
- After touching anything is the patient's environment

Standard Precautions: Personal Protective Equipment (PPE)

The selection of PPE based on:
- The nature of patient interaction
- The likely mode(s) of transmission



Hand hygiene is always the final step after removing and disposing of PPE



Standard Precautions: Gloves

- CHANGE gloves between patients
- Perform hand hygiene immediately after gloves are removed
- Change gloves when heavily contaminated
- Disposable glove should not be reused
- Work from "clean to dirty"
- Be mindful:
  - Have all sizes available
  - Listen to concerns about allergies

Standard Precautions: Gown

Use when:
1. Splashes or sprays of blood and body fluids are possible
2. Secretions and excretions to skin and working clothes are likely
3. When working clothes has substantial contact with environmental surfaces or patient items

Remember:
1. Do not reuse
2. Select an appropriate gown for the procedure
3. Wear gown properly

Standard Precautions: Mask and Eye Protection

Mask and eye protection should be worn when:

- Splashes or sprays of blood and body fluid, secretions and excretions are likely
- During sterile technique procedure
- Implementing respiratory etiquette

Change/clean between every patient and promptly if heavily contaminated during the procedure.

Standard Precautions: Prevent Exposure to Bloodborne Pathogens

Occupational Safety and Health Administration (OSHA) new hire and annual training requirements:

1. Create a exposure plan and update it annually
2. Located of sharps containers must be assessable
3. Labeling and storage of lab specimens
4. Use of sharp safety devices is mandatory
5. Offer education and vaccination for Hepatitis B
6. Post-exposure follow-up within hours of incident
7. Availability and location of PPE to encourage use
8. Cleaning and disinfection of equipment
9. Separate handling of clean and dirty and storage

OSHA's Bloodborne Pathogens Standard

Bloodborne pathogens are infectious microorganisms present in blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), the virus that causes AIDS. Workers exposed to bloodborne pathogens are at risk for serious or life-threatening illnesses.

Protections Provided by OSHA's Bloodborne Pathogens Standard

All of the requirements of OSHA's Bloodborne Pathogens standard can be found in Title 29 of the Code of Federal Regulations at 29 CFR 1910.1030. The standard's requirements state what employers must do to protect workers who are occupationally exposed to blood or other potentially infectious materials (OPIM), as defined in the stan-

- **Implement the use of universal precautions** (treating all human blood and OPIM as if known to be infectious for bloodborne pathogens).
- **Identify and use engineering controls.** These are devices that isolate or remove the bloodborne pathogens hazard from the workplace. They include sharps disposal containers, self-sheathing needles, and safer medical devices,

https://www.osha.gov/OshDoc/data_BloodborneFacts/bbfact01.pdf

Standard Precautions: Environmental Measures

- Use an Environmental Protection Agency (EPA)-registered disinfectants with HIV or Hep B label claim for:
  - Common use equipment
  - Any surface potentially contaminated with blood or other infectious material
- Clean items before disinfecting
- Clean according to manufacturer's recommendation

Know the contact time!

Who Cleans What?

Patient and Non-Patient Care Areas
SMH Cleaning Schedule
(Attachment 1)

Patient Areas	As needed	After Use	Twice a Day	Daily	When Soiled	Weekly	Biweekly	Monthly	Quarterly	Biannually	Annually
Cleaning and Disinfecting a. High-touch surfaces such as telephone headsets, doorknobs, bed rails, light switches				√ quat							
b. Bathtubs and changing tables 1. Nursing		√ quat									
2. Housekeeper				√ quat							
c. Bedroom furniture including chairs, nightstands, dressers				√ quat							
d. Mattresses and pillows 1.Routine Cleaning- **CNA**	√ quat			√ quat							
2. Terminal cleaning- **Housekeeping**	√ quat										
e. Shelves under cribs 1. Routine Cleaning- **CNA**	√ quat			√ quat							
2. Terminal cleaning- **Housekeeping**	√ quat										

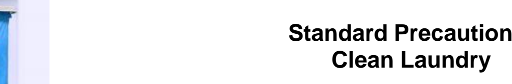
Standard Precautions: Soiled Laundry

Key principles for handling of soiled laundry:

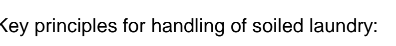
- Handlers use PPE, especially gloves
- Place all soiled linens in laundry bags provided at the point of use
- Avoid contact with your uniform/clothing and surrounding patient care equipment
- Do not shake or place linen directly on the floor
- Do not overfill bags more than 2/3 of capacity

http://health.mo.gov/seniors/nursinghomes/pdf/Infection_Control_Guidelines.pdf

Standard Precautions: Soiled Laundry



Key principles for handling of soiled laundry:

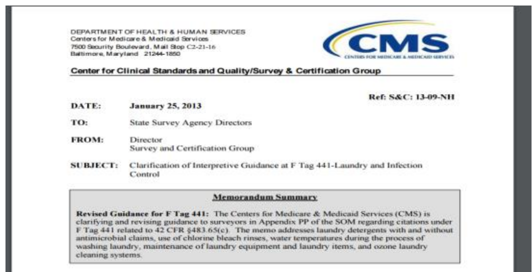


- No double bagging or special labeling required for linen from isolation rooms.
- Place saturated linens in a plastic bag and seal by tying or knotting. This bag should then be placed in an approved laundry bag and closed before transporting
- Obtain agreement that laundry will be hygienically clean and handled to prevent contamination, if laundry services are outsourced

Standard Precautions: Clean Laundry

- Carts used to deliver laundered linen must be clean prior to use
- Linen must be stored in a clean, dry area
- Linen should be covered at all times
- Family and patients should not be have contact with laundry carts

Laundry



DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C2-21-16
Baltimore, Maryland 21244-1850

CMS CENTERS FOR MEDICARE & MEDICAID SERVICES

Center for Clinical Standards and Quality/Survey & Certification Group

Ref: S&C: 13-09-NH

DATE: **January 25, 2013**

TO: State Survey Agency Directors

FROM: Director
Survey and Certification Group

SUBJECT: Clarification of Interpretive Guidance at F Tag 441-Laundry and Infection Control

Memorandum Summary

Revised Guidance for F Tag 441: The Centers for Medicare & Medicaid Services (CMS) is clarifying and revising guidance to surveyors in Appendix PP of the SOM regarding citations under F Tag 441 related to 42 CFR §483.65(c). The memo addresses laundry detergents with and without antimicrobial claims, use of chlorine bleach rinses, water temperatures during the process of washing laundry, maintenance of laundry equipment and laundry items, and ozone laundry cleaning systems.

https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-13-09.pdf

CMS Laundry

- Any detergent for laundry processing
- No requirements for antimicrobial detergents
- No chlorine bleach required for low temperature washing
- Water temperatures:
  - >160°F for 25 minutes
  - Low temp 71-77°F

- No requirements to record temps
- Leave machine opened to dry after use

Standard Precautions 2007 Guidelines for Isolation Precautions

Three elements added to standard precautions:

- Respiratory hygiene/cough etiquette
- Safe injection practices
- Use of masks for insertion of catheters or injection into spinal or epidural areas

Respiratory Hygiene and Cough Etiquette

Three elements include:

1. Educate healthcare workers, patients, and visitors
2. Post signs in appropriate languages
3. Source control measures:
   - Cover the nose/mouth when coughing or sneezing
   - Perform hand hygiene after contact with respiratory secretions and contaminated objects
   - Place a surgical mask on the coughing person when tolerated and appropriate
   - Spatial separation, ideally > 3 feet

Safe Injection Practices

- Large outbreaks of hepatitis B virus (HBV) and hepatitis C (HBC) among patients in the United States, especially in LTC
- Primary breaches
  - Reinsertion of used needles into a multiple-dose vial or solution container (saline bag)
  - Use of a single needle/syringe to administer intravenous medication to multiple patients
  - Blood glucose monitoring

What Type of PPE Would You Wear?

- Suctioning oral secretions?
- Transporting a patient in a wheel chair?
- Responding to an emergency where blood is spurting?
- Drawing blood from a vein?
- Cleaning an incontinent patient with diarrhea?
- Irrigating a wound?
- Taking vital signs?

What Type of PPE Would You Wear?

- **Suctioning oral secretions?**
  - Gloves and mask/goggles or a face shield, gown
- **Transporting a patient in a wheel chair?**
  - Generally none required
- **Responding to an emergency where blood is spurting?**
  - Gloves, fluid-resistant gown, mask/goggles or a face shield
- **Drawing blood from a vein?**
  - Gloves
- **Cleaning an incontinent patient with diarrhea?**
  - Gloves, gown
- **Irrigating a wound?**
  - Gloves, gown, mask/goggles or a face shield
- **Taking vital signs?**
  - Generally none

Choice of Personal Protective Equipment

Based upon reasonably anticipated likelihood of exposure to blood or body fluids:

Underutilization

- Places healthcare workers (HCWs) and patient at unnecessary risk

Overutilization

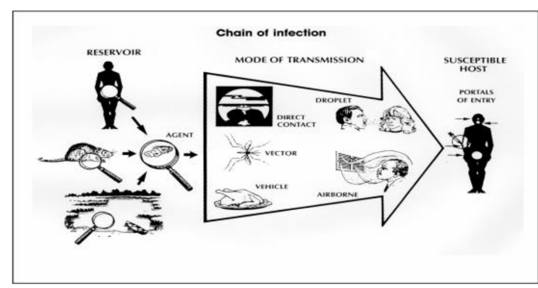
- Waste of resources
- Intimidate patient
- Interfere with care

Definition of Isolation Precautions

Transmission-based precautions are:

- The second tier of basic infection control precautions
- To be used in addition to standard precautions
- For patients who may be infected or colonized with certain infectious agents for which additional precautions are needed to prevent infection transmission

Chain of Infection



Mode of Transmission

Microorganisms may be spread by a single or multiple routes.

- Contact, direct or indirect
- Droplet
- Airborne
- Vector-borne (usually arthropod)
- Common environmental sources or vehicles:
  - Food-borne
  - Waterborne
  - Medications (e.g., contaminated IV fluids)

Transmission-Based Precautions

- Used always in addition to standard precautions
- Applied for patients who are known are suspected with an infectious pathogen

Transmission-based precautions

- Contact precautions
- Airborne precautions
- Droplet precautions

Contact Transmission

Direct-contact

- Direct body surface-to-body surface contact
- Physical transfer of microorganisms between a susceptible host and an infected or colonized person

Indirect-contact

- Contact of a susceptible host with a contaminated intermediate object, such as contaminated instruments, needles, or dressings, or contaminated hands or gloves

Transmission-Based Precautions
Contact Precautions

Infections spread by direct or indirect contact with patients or patient-care environment – VRE, C. *difficile*, MRSA

- – Limit patient movement
- – Use private room or cohort with patients with same infection
- – Wear disposable gown and gloves when entering the patient room
- – Remove and discard used disposable gown and gloves inside the patient room
- – Wash hands immediately after leaving the patient room
- – Clean patient room daily using a hospital disinfectant, with attention to frequently touched surfaces (bed rails, bedside tables, lavatory surfaces, blood pressure cuff, equipment surfaces)
- – Use dedicated equipment, if possible (e.g., stethoscope)

Contact Precautions Signs

Droplet Precautions

- Reduce the risk of transmission by large particle droplets (larger than 5m in size)
- Requires close contact between the source person and the recipient
- Droplets usually travel 3 feet due to:
  - – coughing
  - – sneezing
  - – talking
  - – procedures such as suctioning or bronchoscopy
- Transmission via conjunctivae, nasal mucosa, or mouth
- Influenza, Rubella, Parvovirus B19, H. influenzae, and N. meningitidis

Droplet Precautions

- Use a private/single room, if available
- Cohort with patient with active infection with same microorganism
- Use a mask when entering the room
- Limit movement and transport of the patient
- Use a mask on the patient if movement needed
- Follow respiratory hygiene/cough etiquette
- Keep at least 3 feet between infected patient and visitors

Droplet Precautions Signs

Airborne Transmission

- Small-particle residue {5µm or smaller} of evaporated droplets containing microorganisms
- Suspended in the air for long periods of time
- Dispersed by air currents
- Inhaled by a susceptible host within the same room or over a longer distance

Airborne Precautions

- Tuberculosis, measles, varicella
- Place the patient in an airborne infection isolation room (AIIR)
- Pressure should be monitored with visible indicator
- Use of respiratory protection (e.g., fit tested N95 respirator) or powered air-purifying respirator (PAPR) when entering the room
- Limit movement and transport of the patient. Use a mask on the patient if they need to be moved
- Keep patient room door closed

Airborne Precautions Signs

Preparations for Precautions

- Inform resident, family and visitors about PPE and hand hygiene
- Display appropriate signage
- Review the policy and procedure
- Observe and audit for compliance (donning and doffing of PPE, hand hygiene)
- Supplies available and replenished regularly
- Increased environmental services
  - Garbage pick-up
  - High touch area cleaning

Patient Placement Before Admission

- Be represented on the Admissions Committee
- Perform an individual risk assessment

Determine isolation needs as to:

1. Medical needs
2. History MDROs
3. Secretions, wounds, devices, immune status, immunization history, personal hygiene
4. Psychological risks of depression, anxiety, fear

Transmission-based Precautions: Patient Placement

- If *possible,* place resident in a private room.
- If not possible, resident should be cohorted with another resident with the same organism.
- If neither option is possible, the resident should be placed in a room with another resident who is considered at *low risk* for acquistion of a MDRO.

  Examples include: no wounds, no invasive devices, not immunocomprised

Discontinuation of Precautions

Phase 1
483.80 Infection control

When and how isolation should be used for a resident, *including but not limited to:*

- The type and duration of the isolation depending upon the infectious agent or organism involved
- A requirement that the isolation should be the least restrictive possible for the resident under the circumstances

CDC Guidelines for Isolation Precautions 2007

Use precautions on a case by case basis in LTCFs

5 C's to assess residents need for addition to Standard Precautions

1. Colonized
2. Cognizant
3. Compliant
4. Catheterized (device)
5. Continent/Wound

Discontinuation of Precautions

- Transmission-based precautions maintained for the duration of illness
- It is not necessary to do a test of cure or clearance cultures after treatment complete and resident has no S&S
- S&S resolved, discontinue isolation
- Following resolution of active infection, the resident may remain colonized. Need to monitor, as colonization increases the risk of future infection

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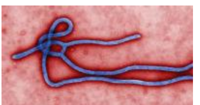
Outbreak Management



What is an Outbreak?

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

Outbreak

- An infection that is highly communicable
- Infections that are 10% higher than the historical rate
- Three or more cases over a specific length of time on the same unit

Why Conduct an Outbreak Investigation?

- Implement control measures
- Address urgency, severity and risk to others
- Training opportunities
- Infection control program considerations
- Research opportunities
- Public or legal concerns

Factors Associated with Outbreaks in Healthcare Facilities

Often multiple contributing factors:

- Breaches in infection control or clinical practices
- Contaminated or defective products or devices
- Infection or colonization in healthcare workers or patients
- Host factors
- Patients in close proximity to each other
- Illnesses circulating in community

Advantages of Outbreak Surveillance

- Rapid detection of an situation that can prevent widespread illness
- Requires immediate reaction
- Well presented outbreak summaries can provide a clear picture of LTCF interventions

Disadvantages of Outbreak Surveillance

Requires an accurate use of case definitions.

Need to be able to implement outbreak plan such as:

- Single rooms
- Cohorting
- Close unit
- Suspend activities
- Prophylaxis
- Limit visitors

Conducting Outbreak Investigations

- Outbreak investigation divided into steps for teaching and explaining
- Real life outbreaks do not usually unfold in linear, orderly, step-by-step manner
- Some steps will occur simultaneously
- Not all steps apply to all outbreaks

Components of an Outbreak Investigation

1. Confirm the diagnosis
2. Verify that an outbreak exists
3. Literature review
4. Assemble an outbreak control team
5. Establish a case definition
6. Implement measure to identify cases
7. Describe cases: who, when, where
8. Develop a hypothesis of causation
9. Define and implement control measures
10. Communicate findings

Uncovering Outbreaks

- Information received from clinical staff
- Routine analysis of infection control surveillance data and data analysis shows an increase above baseline level
- Call from a laboratory or health department

Remember:

- Outbreaks can occur in any healthcare setting
- Onset of symptoms may occur after discharge

Step 1. Confirm the Diagnosis

- Ensure the problem has been diagnosed and that it is really what it is reported to be
- Verify that laboratory results are accurately reported
- Determine if specimens should be saved or submitted to a reference lab

Step 2. Establish Whether an Outbreak Exists?

When should an outbreak be suspected?

- An increase from baseline/background rate in the expected number of healthcare associated infections
- A cluster or group of cases in a given time and place
- An unusual microbe, infection or adverse event is identified

Is It An Outbreak?

Remember that one case can be an outbreak and may require investigation:

- Some are easy:
  1. One case of post-surgical Group A *Streptococcus* infection
  2. One case of healthcare-associated Legionella
  3. One case of healthcare-associated Influenza
- Some are not:
  1. 50% increase in surgical site infections (SSIs) for one quarter
  2. Doubling of Methicillin-resistant *Staphylococcus aureus* (**MRSA**) bloodstream infection (**BSI**) for one month

Step 3. Outbreak Control Team

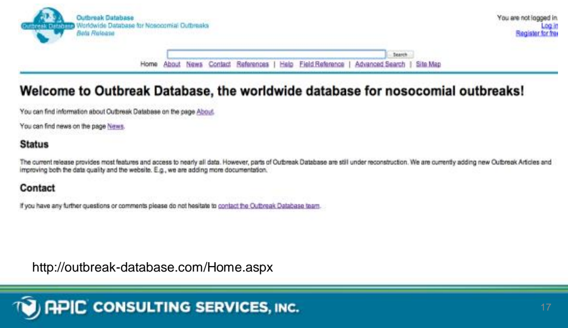
Team may include:

- Infection control staff
- Medical director
- Hospital epidemiologist
- Laboratory staff
- Nurse managers and staff nurses
- Clinical pharmacists
- Environmental services staff
- Public health partners

Step 4. Literature Review

- Review available guidance (CDC, APIC, SHEA, others)
- Infectious disease references
- Public health references
- Journal articles, how others have managed similar outbreaks
- Search engines

Resource



http://outbreak-database.com/Home.aspx

Step 5. Develop and Apply a Case Definition

Case definition:

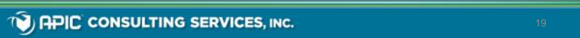
- Needs to be narrow enough to focus on investigative efforts
- Needs to be broad enough to capture a majority of cases
- Consider how rare or common the pathogen or event

Case Definitions

Case definitions may be developed for a specific illness or outbreak.

Case definitions may be defined by a public health agency:

- Centers for Disease Control and Prevention (CDC)
  - Case definitions for infectious conditions under Public Health Surveillance
  - CDC/NHSN surveillance definition of HAIs
- State DOH



http://www.cdc.gov/ncphi/disss/nndss/casedef/case_definitions.htm

Step 6. Implement Measures to Identify New Cases

- Review microbiology lab findings
- Review surveillance data
- Chart reviews
- Communication with clinical staff
- Evaluate reason for transfer to an acute setting
- Implement procedures to detect newly symptomatic patients :
  - Symptom checklist
    - Fever
    - Secretions

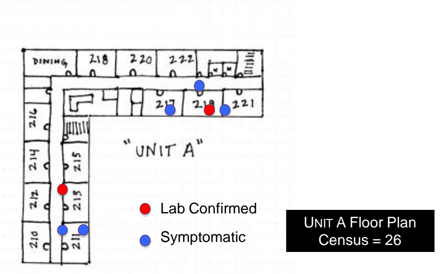
Step 7. Who, When and Where

Who
- Who became ill?

When
- When did the symptom onset of cases occur?

Where
- Was there clustering of cases in a location?

Cases by Location

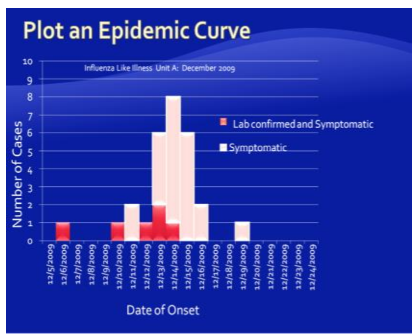


UNIT A Floor Plan
Census = 26

Develop a Line List

Upper Respiratory Infection Line List – December 2009

Case #	Init.	Age	Sex	Unit/ Room	Symp Onset Date	Temp Max	Cough	Sore Thr	Hosp Date	Lab Test Date	Lab Test	Lab Test Reslt
1	AB	76/M	M	A/217A	12/6	102.1	✔	✔	12/6	12/7	FluAB Rapid	NEG
2	RT	43/M	M	A/212B	12/10	101.0	✔		12/6	12/12	FluAB Rapid	NEG
3	GT	66/F	F	A/222B	12/11	100.0	✔	✔				
4	RW	68/F	F	A/223A	12/11	99.0		✔				
5	MS	69/F	F	A/214A	12/12	103.0	✔			12/15	nH1N1	POS
6	WM	54/M	M	A/219C	12/13	99.2	✔					
7	GY	75/F	F	A/219B	12/13	100.0		✔	12/14	12/15	Pending	
8	YM	38/M	M	B/240	12/13	99.9	✔					



Step 8. Develop a Hypothesis

- Clinical syndrome of ill patients
- Common exposures of ill patients
- Pathogens prevalent in your facility
- Diseases circulating in the community
- Laboratory data
- Often requires re-evaluation after new information is obtained

Examples?

Role of the Laboratory

- Identify organism, clusters of organisms, or unusual organisms
- Determining antimicrobial susceptibility patterns
- Determine background occurrence of an organism
- Determine if organisms are related
  - Submit specimens a reference lab for molecular typing

Observe and Review Patient Care Activities

- Use the line list to guide the type and location of observations
- Engage the health care workers in discussion
- Use a collaborative approach to interview

Ask Questions

- Do you always do it that way?
- Have you seen other people do it differently?
- What are the challenges with maintaining good techniques?
- What do you think is causing the outbreak?
- What procedures or medications might I be missing because they are not in the chart or done infrequently?

Step 9. Define/Implement Control Measures

Depending on pathogen, severity, and mode of transmission may include:

- Infection control practice evaluation
- Environmental cleaning evaluation
- Cohorting
- Limiting activities
- Contact tracing
- Treatment/prophylaxis/vaccination
- Surveillance
- Education

Suspected Reservoir of the Pathogen

- In some outbreaks the reservoir of the pathogen must be identified in order to reduce the potential for transmission
- Consider the natural reservoirs of the pathogen:
  - Human reservoirs
  - Environmental reservoirs

Examples?

Step 10. Communicate Findings

- Clinical staff
- Administrators
- Risk managers
- Patient notification
- Public affairs
- Public health partners
- Scientific community

Final Steps

- Determine if outbreak is over
- Continue surveillance for infection
- Determine if control measures implemented for outbreak control can be modified or lifted
- Identify permanent practice changes, areas for program improvement, or policy revision

Conclusions

- Outbreaks remain a major detriment to patient care and patient safety
- Outbreaks can have massive financial and public relations impacts on healthcare facilities
- Outbreaks help us understand and confront emerging challenges in healthcare
- Outbreaks can play an important role in making recommendations that improve overall patient care and provide important opportunities for education

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- Constructing an Epidemic Curve http://www.cdc.gov/globalhealth/FETP/modules/MiniModules/Epidemic_Curve/page06.htm
- Case Definitions http://www.cdc.gov/ncphi/disss/nndss/casedef/case_definitions.htm

Occupational Health and New Employee Screening

Key Concepts Pertaining to Infection Prevention

- New hires should be screened to protect residents and staff from communicable disease.
- Facilities must offer employees recommended vaccines to promote a safe work environment.
- Hand hygiene must be presented as the cornerstone to all infection control interventions.
- Employees need training on the proper use of personal protective equipment to prevent transmission of infection.

Center for Medicare and Medicaid Services (CMS)

- Monitors efforts to prevent needle sticks, sharps injuries, and other employee exposure events.
- Tracks healthcare personnel exposure events, evaluates event data, and develops corrective action plans to reduce the incidence of such events.
- Ensures all personnel are screened for tuberculosis (TB) upon hire and, for those with negative results, determine ongoing TB screening criteria based upon facility/unit risk classification.
- Ensures personnel with TB test conversions are provided with appropriate follow-up (e.g., evaluation and treatment, as needed).

CMS on Occupational Health

- *" The facility must prohibit employees with communicable diseases or infected skin lesion from direct contact with residents or their food, if direct contact will transmit the disease".*
- **Important:**
  1. Direct care givers pose the greatest risk of infection transmission to residents

AND

  2. Direct care givers have the greatest risk of exposure.

Risk Assessment for Employees High Risk

Frequent contact with resident's skin and body fluids:

- RN/LPN/ CNA
- MD/NP/PA
- Rehab staff
- Phlebotomist
- Transporters
- Respiratory therapy
- Environmental workers
- Radiologist
- Laundry workers
- Medical technologist

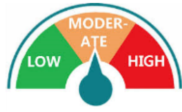
HIGH RISK AREA

Risk Assessment for Employees

Moderate Risk

Frequent contact with resident skin or fluids:

- Social workers
- Dietary
- Security



Low Risk

Unlikely to have contact with residents skin or fluids:

- Plant operations
- Medical records
- Office workers

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Why Vaccinate Healthcare Personnel (HCP)

- HCP are vectors to patients who are most vulnerable to complications and death.
- Vaccination reduces/eliminates the spread of diseases to the HCP from the patients.
- Saves employees and employers money by reducing the need for medical visits, missed days of work, productivity loss and medical errors by HCP working while ill.
- Vaccines are cost-effective and provide a safe environment for employees.

Healthcare Personnel Vaccine Recommendations

Hepatitis B Vaccine

- All HCP with risk for exposure to blood or body fluids should be vaccinated.
- OSHA mandates vaccination be available within 10 days of initial assignment.
- Minimum dosing intervals are 4 weeks between the first and second dose, 8 weeks between the second and third dose, and 16 weeks between the first and third dose.
- Incompletely vaccinated HCP should receive additional dose(s) to complete the vaccine series.
- The vaccine series does not need to be restarted for HCP with an incomplete series; however, minimum dosing intervals should be followed.

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Hepatitis B Vaccine

- HCP lacking documentation of vaccination should be considered unvaccinated or incompletely vaccinated.
- Healthcare institutions are encouraged to seek documentation of "missing" Hep B doses, when feasible, to avoid unnecessary vaccination.
- OSHA mandates that HCP who refuse vaccination sign a declination statement.
- Hep B vaccination can obtain vaccination at a later date at no expense if the HCP is still covered under OSHA's Bloodborne Pathogens Standard.

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10052&p_table=STANDARDS

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Hepatitis B Vaccine

- HCP who have written documentation of a complete series and subsequent post vaccination anti-HBs ≥10 mIU/mL are considered Hepatitis B immune.
- All HCP recently vaccinated or recently completing C vaccination who are at risk for occupational blood or body fluid exposure should undergo hepatitis B surface antibody (anti-HBs) testing.
  - ❖ Anti-HBs testing should be performed 1–2 months after administration of the last dose of the vaccine series
  - ❖ HCP with documentation of a complete ≥3-dose HepB vaccine series but no documentation of anti-HBs ≥10 mIU/mL might undergo anti-HBs testing upon hire
  - ❖ Testing should use a **quantitative** method that allows detection of the protective concentration of anti-HBs (≥10 mIU/mL) (e.g., enzyme-linked immunosorbent assay)

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Hepatitis B Vaccine

- If negative following 6 doses of vaccine, the patient is a non-responder. No further doses of vaccine are recommended.
- HCP who do not respond to vaccine should consider testing for hepatitis B surface antigen (HBsAg) to determine chronic infection
  - ❖ Persons who test positive for HBsAg should receive appropriate counseling and medical management.
  - ❖ Persons who test negative should be considered susceptible to HBV and counseled regarding precautions to prevent HBV and need to obtain hepatitis B immune globulin (HBIG) prophylaxis for any known or probable hepatitis B positive blood.

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HCP with HBV Infection

- HCP who are positive for HBsAg should be counseled how to prevent HBV transmission to others and referred for further evaluation.
- Those who perform exposure-prone procedures should be advised regarding the procedures they can perform safely as per updated CDC recommendations for the management of HBsAg-positive health-care providers and students.
- Chronic hepatitis B infection in itself should not preclude the practice or study of medicine, surgery, dentistry, or allied health professions.

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Hepatitis B Vaccine FAQs

- What if employee provides you with documentation of having completed the series of 3 injections but no titer was drawn after

1. Draw a titer now
2. Offer them another series and then complete a titer 1-2 months after the last dose
3. Draw only a titer if the employee receives an exposure
4. Titers are not recommended after administration of Hepatitis B vaccine

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Hepatitis B Vaccine FAQs

What if employee states that they had the first two dose and brings the appropriate vaccine documentation, but it was over two years ago?

1. Start the series over
2. Give the third dose now and then obtain titer 1-2 months after
3. Note that the third dose is not important
4. Check a titer to see if they are immune

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Tetanus/Diphtheria/Pertussis (TD/Tdap)

- Recommended that all HCP be vaccinated with one dose of Tdap.
- Priority should be given to those HCP who have direct contact with infants aged <12 months.
- All adults who have completed a 3-dose primary series of a tetanus/diphtheria containing vaccine (DTP, DTap, DT, or Td) should receive a tetanus/diphtheria booster every 10 years.
- Td booster is recommended at an interval of 10 years, unless have tetanus prone wound.
- If personnel have not had a Tdap, there is no interval between having a Td and giving a Tdap dose.

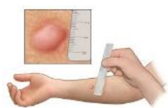
Varicella

Recommended that all HCP be immune to varicella.

Evidence of immunity in HCP includes:

- Documented 2 doses of varicella given at least 28 days apart
- History of varicella disease or herpes zoster based on physician diagnosis or laboratory evidence of immunity

Baseline Testing for *Mycobacterium Tuberculosis*



- If tuberculin skin test (TST) is used for baseline testing, two-step testing is recommended for HCP's whose initial TST results are negative.
- If first-step TST is negative, the second-step TST should be administered 1-3 weeks after the first TST. (A second TST is not needed if the HCP has a documented TST result from any time during the previous 12 months.)

http://www.cdc.gov/tb/publications/guidelines/infectioncontrol.htm

Baseline Testing for M. Tuberculosis

- If either the first-step TST is positive or second-step TST is positive, TB disease should be excluded, and if it is excluded, then the HCP should be evaluated for treatment of Latent tuberculosis infection (LTBI).
- If second test result is not read within 48-72 hours, administer another TST as soon as possible.
- A positive result to the second step of a baseline two-step TST is probably caused by boosting as opposed to recent infection.
- A positive TST reaction as a result of bacille Calmette-Guérin (BCG) wanes after 5 years.

QuantiFERON-TB Gold (QFT-G) Test

- QFT-G measures cell-mediated immune responses to peptides representative of two M. tuberculosis proteins
- These proteins are not present in any BCG vaccine strain
- They are absent from the majority of nontuberculosis mycobacteria

QuantiFERON-TB Gold Test Advantages

- Requires a single patient visit to draw a blood sample
- Results can be available within 24 hours
- Is not subject to reader bias that can occur with TST
- Is not affected by prior BCG vaccination

QuantiFERON-TB Gold Test Disadvantages and Limitations

- Blood samples must be processed within 12 hours after collection while white blood cells are still viable.
- There are limited data on the use of QFT-G in children younger than 17 years of age, among persons recently exposed to *M.* tuberculosis, and in immunocompromised persons.
- Errors in collecting or transporting blood specimens or in running and interpreting the assay can decrease the accuracy of QFT-G.
- Limited data on the use of QFT-G to determine who is at risk for developing TB disease.

Newly Positive TB Test

- HCP should receive one chest x-ray to exclude TB disease.
- HCP's with confirmed infectious disease will be excluded from work and must meet certain criteria before return.
- HCP's receiving treatment for LTBI can return to work immediately.
- If does not take treatment, counsel on the risk of developing TB disease and reporting of any TB symptoms. (10% risk for developing TB disease).

Annual Assessment

Each year the health status of staff must be reassessed.

- Assure freedom from health impairments which pose a potential risk or interfere with performance of duties.
- May be conducted by physical exam or a self-administered medical assessment form.
- If form used, it must be reviewed by appropriately trained personnel.
- If problem indicated on form, employee should have a follow-up exam performed by a medical practitioner.

Management of Communicable Diseases Among Employees

When HCP's present with S/S of a communicable disease, consider the factors below in determining whether they need removal from work:

1. Risk of disease transmission to others
2. Illness that may interfere with their ability to provide quality care
3. Ability to comply with guidelines to prevent transmission

Management of Communicable Diseases Among Employees

HCPs are responsible for reporting:

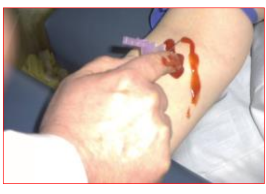
1. Fever
2. Unusual rash
3. Gastrointestinal symptoms
4. Recent onset of unexplained cough or congestion suggesting an acute respiratory infection
5. Sore throat with fever
6. Purulent skin lesions
7. Exudative dermatitis
8. Jaundice
9. Symptoms that suggest active tuberculosis

Occupational Exposure

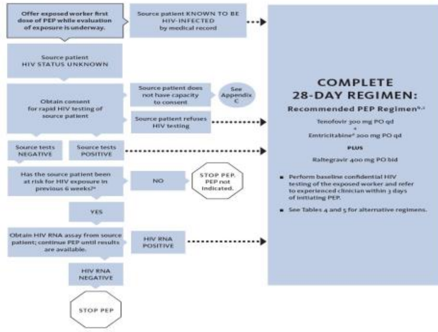
Occurs when blood or body fluid comes into contact with:

Mucous membranes
- Mouth
- Nose
- Eyes

Non-intact skin
- Needlesticks
- Cuts
- Cracks



HIV (Post-Exposure Prophylaxis)
PEP Following Occupational Exposure



Implementing PEP Recommendations

- PEP should be initiated within 2 hours and no later that 36 hours post-exposure.
- HARRT (Highly Active Antiretroviral Therapy) is always recommended for at-risk exposures.
- Confidential baseline HIV antibody testing of the HCW should be obtained at time of exposure.
- Confidential HIV testing of source should be obtained as soon as possible.
- If source patient's HIV test result is negative, HCW should be counseled regarding possibility of a false-negative. PEP should be recommended in situations when a significant exposure has occurred and clinician suspects HIV infection.
- Total of 4 weeks of treatment is recommended.

Table 6: Monitoring Recommendations After Initiation of PEP Regimens Following Occupational Exposure[a]

	Baseline	Week 1	Week 2	Week 3	Week 4	Week 12
Clinic Visit	√	√ Or by telephone	√ Or by telephone	√ Or by telephone	√	
Pregnancy Test	√					
Serum liver enzymes, BUN, creatinine, CBC[b]	√		√		√	
HIV test [c]	√				√	√

[c] Recommended even if PEP is declined.

Table 10: Hepatitis C Post-Exposure Management According to Baseline Test Results

Clinical Scenario	Follow-Up[a]
Source patient is HCV-antibody negative	No further testing or follow-up is necessary for source patient or the exposed worker[b]
Source patient is unavailable or refuses testing	Exposed worker: Follow-up HCV antibody at 3 and 6 months[b]
Source patient is HCV-antibody positive and HCV RNA negative	**Week 4: HCV RNA and liver panel** **Week 12: HCV RNA and liver panel** **Week 24: Liver panel and HCV antibody** **If at any time the serum ALT level is elevated, the clinician should repeat HCV RNA testing to confirm acute HCV infection.** **At any time that exposed workers test positive for HCV RNA, the clinician should refer for medical management and possible treatment by a clinician with experience in treating HCV.**
Source patient is positive for both HCV antibody and HCV RNA *and* Exposed worker is HCV-antibody negative	Source patient: Counsel and manage as chronic hepatitis C regardless of status of exposed worker **See testing above**
Exposed worker tests positive for both HCV antibody and HCV RNA	Counsel and manage as chronic hepatitis C

[b] If at any time the serum ALT level is elevated in the exposed worker, the clinician should test for HCV RNA to assess for acute HCV infection.
[c] A single negative HCV RNA result does not exclude active infection.

Counseling and Education After Exposure

- Describe post-exposure protocol
- Risk of transmission
- Obtain informed consent
- Explain HIV testing
- Prevention of HIV transmission during the post-exposure period.
- Establish follow-up plan
- Federal law requires covered employers to ensure that all medical evaluations and procedures, vaccines and post-exposure prophylaxis are made available to the employee within a reasonable time and place and are made available at no cost to the employee.

Exposure to Pertussis

- Those who have appropriately followed Standard and Droplet Precautions during close contact with cases do not require prophylaxis.
- HCP previously vaccinated with Tdap:
  - ❖ Should receive post-exposure prophylaxis for vaccinated HCP who have unprotected exposure to pertussis.

Bloodborne Pathogen (BBP) Standard

OSHA Compliance Directive 1999

The BBP Standard requires employers to establish written exposure control plans to eliminate or minimize employee exposures to BBPs and the use of engineering and work practice controls.

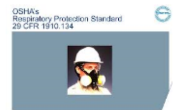
Bloodborne Pathogen Standard

What do I have to do to be in Compliance?

- Update or create a BBP Exposure Control Plan
- Evaluate and implement “safer medical devices” where they are found to be effective
- Continuously monitor the effectiveness of engineering controls
- Update employee training to include training on HCV and the use of “safer medical devices”

Respiratory Protection Standard (1910.134)

- Develop and implement a written respiratory protection program
- Procedure for selecting respirators for use in workplace and proper use
- Determine the employee's ability to use a respirator
- Fit testing
- Monitor use of respirators



General Vaccine Information

- Vaccine Information Statement (VIS)
  http://www.cdc.gov/vaccines/pubs/vis/
- Vaccine Adverse Event Reporting System (VAERS) – www.vaers.hhs.gov
- CDC Healthcare recommendations- www.cdc.gov/vaccines/hcp.htm
  http://www.cdc.gov/vaccines/default.htm
- Guide to Contraindications to Vaccination- www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm

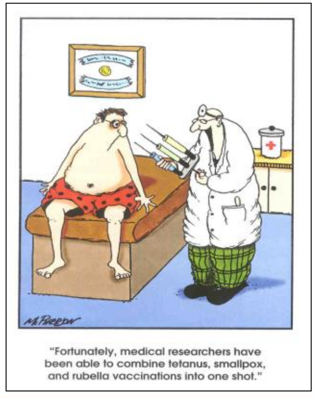
General Vaccine Information

- Excellent resource- www.immunize.org
  http://www.immunize.org/askexperts/
- Vaccines and Pregnancy- http://www.cdc.gov/vaccines/pubs/preg-guide.htm#hepb

Needlestick Safety and Prevention Act (H.R. 5178)

Supports OSHA Bloodborne Pathogen Standard
www.osha.gov/SLTC/bloodbornepathogens/standards.html

NIOSH Alert: Preventing Needlestick Injuries in Health Care Settings
http://www.cdc.gov/niosh/topics/bbp/



"Fortunately, medical researchers have been able to combine tetanus, smallpox, and rubella vaccinations into one shot."

"For cryin' out loud! Would you just take a sick day for once in your life!"

Surveillance

What is Surveillance?

Surveillance is the ongoing, systematic collection, analysis, interpretation and dissemination of data to identify infections and infection risks, to try to reduce morbidity and mortality and to improve resident health status.

Reference: Last JM, ed. *A Dictionary of Epidemiology*. 4th ed. New York: Oxford University Press; 2001:174

Surveillance

- Surveillance is an essential component of an effective infection prevention and control program.
  - Sound epidemiological and statistical principles
  - Use surveillance data to improve the quality of healthcare
- Challenges
  - Changing healthcare delivery system
  - Emerging and reemerging infectious diseases
  - Mandatory reporting requirements

Strong Surveillance Components

- Should be based on sound epidemiological and statistical principles
- Designed in accordance with current recommended practices
- Needs to be able to identify risk factors for infection
  - Adverse events
  - Implement risk-reduction measures
  - Monitor the effectiveness of intervention
- Identify
  - Outbreaks
  - Emerging infectious diseases
  - Antibiotic-resistant organisms
  - Bioterrorist events

Strong Surveillance Components

- Include
  - Infection prevention
  - Performance improvement
  - Patient safety
  - Public health activities
- Mandatory and public reporting requirements
- Surveillance data
  - Reduce the occurrence of infections by using risk factors and implementation of risk-reduction measures and monitoring effectiveness of interventions.

Epidemiology

- Epidemiology is the study of patterns, causes and effects of illness and disease in population and is the science of public health.
- Surveillance is the cornerstone of epidemiology.

Purpose of Surveillance

- Determine baseline and endemic rates of occurrence of a disease or event
- Detect and investigate clusters or outbreaks
- Assess the effectiveness of prevention and control measures
- Monitor the occurrence of adverse outcomes to identify potential risk factors
- Provide information that can be used by an organization to target performance improvement activities
- Measure the efficacy of interventional and performance improvement efforts
- Observe practices, such as hand hygiene and sterilizer performance monitoring, to promote compliance with recommendations and standards
- Detect and report notifiable diseases to the health department

Factor Affecting Surveillance

- Shorter hospital stays
- Aging of the population
- Increased use of invasive procedures and devices
- More acutely ill patients and residents
- Healthcare worker shortage
- Emerging and reemerging infectious diseases
- Threat of bioterrorism
- Mandatory and public reporting
- New diseases emerging
- Antimicrobial resistance
- Mandatory reporting requirements increase
- New surveillance methods are needed to meet the changing environment

Gathering Surveillance

- EMR/charts
- AM report
- Medical sign-outs
- Antimicrobial usage
- Conversations
- Rounding
- ACF transfers

Surveillance Methodology: House-wide/Comprehensive

Advantages

- All infections, all antibiotics, all lab reports
- Get the big picture
- Most likely to detect infectious disease events
- Assist in determining targeted surveillance

Disadvantages

- Challenging and overwhelming
- Large amount of data to collect, analyze, interpret and disseminate
- Need resources

Targeted/Priority Directed Surveillance

- Specific infections, procedures or processes are selected based on risk assessment
- Realization of problem areas that follows house-wide surveillance
- Often requested by regulatory agencies - UTI, CLABSI, C. *difficile*

Process Surveillance

- Look at adherence to steps, techniques, policies and procedures

Examples:
- How and when hand hygiene is performed
- How vascular access devices are inserted and maintained
- How urinary catheter care is provided

Outcome Surveillance

- Provides rates associated with the incidence of prevalence of infections

Examples:
- HAI rates
- Sharp injuries
- Infection or colonization with specific organisms
- When can combined with process surveillance, can provide cause/effect analysis

Retrospective and Prospective Surveillance

Retrospective
- Looking back at what happened in the past
- Data collection and analysis can be done
- Lack of real time information

Prospective
- Gathering data moving forward in real time
- Requires consistent resources for information

Statistics Tips
Denominator

- The denominator must always reflect the population being studied

Examples:
- CAUTIs
- CLABSIs
- Norovirus or Influenza - may be whole house or particular unit

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Example

- An ICP collected the following data for March:

6 CAUTIs
240 patient days
180 catheter days

- How would she calculate the CAUTI rate for March?

- A. (6/240) x 1000
- B. (6/180) x 1000
- C. (180/240) x 1000
- D. 240/180) x 1000

Incidence Rate

- Basic formula for all types of rates:
- X/Y x K
- X = The numerator, the number of times the **new** event occurred
- Y = The denominator, which must reflect the same population that the numerator was taken in the same time period
- K = a constant used to transform the number to a quantity that can be compared. Usually 1000 is used as it transforms number to at least one number to the left of the decimal point.

Attack Rate

- Special type of incidence rate
- It is a proportion
- Proportions of persons at risk who become infected over a period of time or exposure
- A measure of the risk of probability of becoming a case
- It is usually expressed as a percentage

Attack Rate

Fifteen people were infected with Salmonella at a outdoor picnic in June where 75 people ate egg salad sandwiches. What was the attack rate among those who ate the egg salad?

A. 15 percent
B. 0.20 percent
C. 18 percent
D. 20 percent

Prevalence Rate

- The proportion of all persons on a population with a particular disease at a particular point in time (point prevalence) or
- Over a specific time period (period prevalence)
- Equals the number of existing cases of a disease at a point in time divided by the population at risk multiplied by a constant (k)
- K can be 100, 1000, 10,000

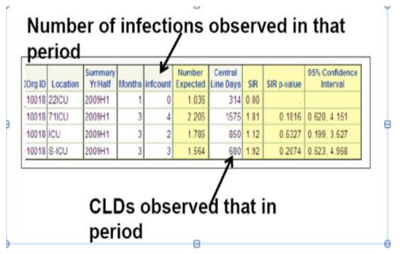
Prevalence versus Incidence Rate

- Prevalence is a snap shot
- It is the number of **all** cases of disease existing in a population at a point in time
- Prevalence is **ALL** cases where incidence is **NEW** cases
- Attack rate is the proportion of those exposed who became ill

Example

- All of the 72 patients in a chronic hemodialysis center were tested for Hepatitis C virus (HCV). Eight of the patients were identified as HCV positive. Three of those eight were known positive cases.
- What is the incidence rate?
- What is the prevalence rate?

Standardized Infection Ratio (SIR) Interpretation



Org ID	Location	Summary Yr/Half	Months	infcount	Number Expected	Central Line Days	SIR	SIR p-value	95% Confidence Interval
10018	22ICU	2009H1	1	0	1.036	314	0.00		
10018	71ICU	2009H1	3	4	2.205	1575	1.81	0.1816	0.620, 4.151
10018	ICU	2009H1	3	2	1.785	850	1.12	0.5327	0.199, 3.527
10018	S-ICU	2009H1	3	3	1.564	680	1.92	0.2074	0.523, 4.958

SIR Interpretation

- A SIR of **1.0** means the observed number of infections is equal to the number of expected infections.
- A SIR **above 1.0** means that the infection rate is higher than that found in the "standard population." For HAI reports, the standard population comes from data reported by the hundreds of U.S. hospitals that use the NHSN system. The difference above 1.0 is the percentage by which the infection rate exceeds that of the standard population.
- A SIR **below 1.0** means the infection rate is lower than that of the standard population. The difference below 1.0 is the percentage by which the infection rate is lower than that experienced by the standard population

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Statistical Significance

- If the P-value is less than .05 then your rates are different than the national average
- If the confidence level does not overlap 1, then your rates are different than the national average.

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SIR: Interpretive Guidance

SIR less than 1

- Fewer infections than what have been predicted
- Infections that have been prevented since the baseline
- One minus the SIR = percent reduction
- SIR is .75, minus 1, equals a 25% reduction in infections

SIR greater than 1

- More infections than would have been predicted
- Infections have increased since the baseline
- SIR minus 1= percent increase
- SIR is 1.50, 1.5-1= a 50 percent increase in infections

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Surveillance Definitions McGreer 1991

McGeer 1991

- First surveillance definitions for LTCFs
- Provided standardization guidance
- Adapted from ACF definitions (CDC and National Nosocomial Infections Surveillance, NNIS)

Problems

- Widely used, not validated
- More evidence-based literature available
- Improved diagnostic tools (lab, X-ray)
- Changing patient population (LTAC, Rehab, Peds)

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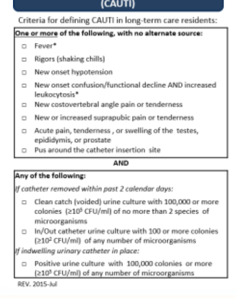
Revised McGeer Criteria 2012

- Increased the specificity of the criteria
- Provided explicit definitions:
  - Fever
  - Acute confusion
  - Altered mental status
  - Acute functional decline
- Attempted to harmonize definitions used in ACF and LTCF
  - Using >2 days in the facility to define an HAI

Revised McGeer Criteria

- Many changes to UTIs and Respiratory Tract
- Original McGeer did not include a positive urine culture to the definition
- Influenza criteria was modified to track cases outside of flu season
- Criteria for GI infections were unchanged but specific criteria added for norovirus and *C. difficile*
- NHSN criteria for SSI were added

CAUTI Criteria - Definitions Pocket Cards



Catheter-associated Urinary Tract Infection (CAUTI)

Criteria for defining CAUTI in long-term care residents:

One or more of the following, with no alternate source:

- ☐ Fever*
- ☐ Rigors (shaking chills)
- ☐ New onset hypotension
- ☐ New onset confusion/functional decline AND increased leukocytosis*
- ☐ New costovertebral angle pain or tenderness
- ☐ New or increased suprapubic pain or tenderness
- ☐ Acute pain, tenderness , or swelling of the testes, epididymis, or prostate
- ☐ Pus around the catheter insertion site

AND

Any of the following:

If catheter removed within past 2 calendar days:

- ☐ Clean catch (voided) urine culture with 100,000 or more colonies (≥10^5 CFU/ml) of no more than 2 species of microorganisms
- ☐ In/Out catheter urine culture with 100 or more colonies (≥10^2 CFU/ml) of any number of microorganisms

If indwelling urinary catheter in place:

- ☐ Positive urine culture with 100,000 colonies or more (≥10^5 CFU/ml) of any number of microorganisms

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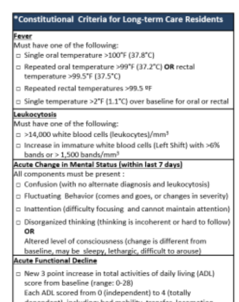


***Constitutional Criteria for Long-term Care Residents**

Fever
Must have one of the following:

- ☐ Single oral temperature >100°F (37.8°C)
- ☐ Repeated oral temperature >99°F (37.2°C) **OR** rectal temperature >99.5°F (37.5°C)
- ☐ Repeated rectal temperatures >99.5 ºF
- ☐ Single temperature >2°F (1.1°C) over baseline for oral or rectal

Leukocytosis
Must have one of the following:

- ☐ >14,000 white blood cells (leukocytes)/mm³
- ☐ Increase in immature white blood cells (Left Shift) with >6% bands or > 1,500 bands/mm³

Acute Change in Mental Status (within last 7 days)
All components must be present :

- ☐ Confusion (with no alternate diagnosis and leukocytosis)
- ☐ Fluctuating Behavior (comes and goes, or changes in severity)
- ☐ Inattention (difficulty focusing and cannot maintain attention)
- ☐ Disorganized thinking (thinking is incoherent or hard to follow) **OR** Altered level of consciousness (change is different from baseline, may be sleepy, lethargic, difficult to arouse)

Acute Functional Decline

- ☐ New 3 point increase in total activities of daily living (ADL) score from baseline (range: 0-28) Each ADL scored from 0 (independent) to 4 (totally dependent), including: bed mobility, transfer, locomotion within facility, dressing, toilet use, personal hygiene and eating

Fever

Single oral temperature <u>greater than</u> 100°F

OR

Repeated oral temperatures <u>greater than</u> 99°F

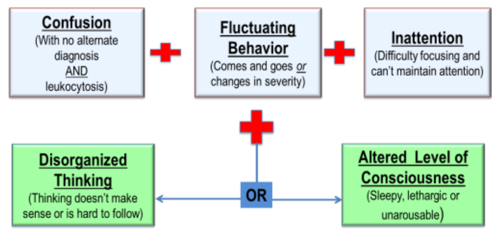
OR

Repeated rectal temperatures <u>greater than</u> 99.5°F

OR

Single temperature <u>greater than</u> 2°F over baseline for either oral or rectal

New Onset of Confusion



Has the resident had an acute change in their mental status over the last 7 days?

Step 1: New Onset Functional Decline

Observe each Activity of Daily Living (ADL) for most dependent episode in last 7 days:

ADL

- Dressing
- Personal Hygiene
- Eating
- Transfer
- Bed mobility
- Toilet use
- Walk in room /corridor
- Locomotion on/off unit
- ***Bathing**

Functional Level

0 Independent
1 *Supervision
2 Limited assistance
**Physical help limited to transfer*
3 Extensive assistance
**Physical help in part of bathing*
4 *Total dependence

** = Levels that are used to determine bathing level of assistance*

Step 2: New Onset Functional Decline

Did activity occur 3 or more times in a 7-day period?

Assistance	Explanation	Score
Independent	No help or staff oversight any time	0
Supervision	Needs oversight, encouragement , cueing	1
Limited Assistance	Resident highly involved in activity Staff provide guided maneuvering of limbs or other non-weight bearing assistance	2
Extensive Assistance	Resident involved in activity Staff provide weight bearing support	3
Total Dependence	Full staff performance every time during entire 7 day period	4

Step 3: New Onset Functional Decline

Monitor for NEW 3-point increase in total ADLs from BASELINE

ADL	Baseline	Code	Now	Code
Bed Mobility	Independent	0	Supervision	1
Transfer	Supervision	1	Limited assist	2
Walk in room/ corridor	Supervision	1	Limited assist	2
Locomotion on/off unit	Supervision	1	Limited assist	2
Dressing	Supervision	1	Limited assist	2
Eating	Independent	0	Independent	0
Toilet use	Supervision	1	Limited assist	2
Personal hygiene	Supervision	1	Limited assist	2
Bathing	Supervision	1	Help with transfer	2
Total ADL score		**7**		**15**

? Understanding ADL

Which scenario fits the decline in activities of daily living (ADL) criteria? (Choose one.)

a) A resident, who was independent with bed mobility, transfers and locomotion last week, now needs extensive assistance with all 3 ADLs with no apparent cause.

b) A resident who required supervision for eating, personal hygiene and toilet use now needs limited assistance with toilet use.

Leukocytosis

White Blood Cell (WBC) Differential

Normal values

WBC ($x10^3$)	Bands %	Neut/segs %	Eos %	Baso %	Lymph %	Mono %
5-10	3-6	50-62	0-3	0-1	25-40	3-7

Shift to the left

WBC ($x10^3$)	Bands %	Neut/segs %	Eos %	Baso %	Lymph %	Mono %
15	**10**	**65**	1	1	20	3

Source: eHow. What is a shift to the left in blood testing? Table by WC Lockwood (replicated for 508 compliance) Accessed from http://www.ehow.com/about_5172200_shift-left-blood-testing_.html on 04/03/15.

Leukocytosis is an elevation in the total white blood cell (WBC) count found in the complete blood count (CBC) and differential blood test.

- Neutrophilia
  - >14,000 leukocytes

OR

- Elevation in immature WBC (bands)
  - Left shift (>6% bands or ≥1,500 bands/mm^3)

Understanding Changes in Mental Status

Which of the residents below has a change in mental status that fits the confusion criteria? (Choose one)

a) A resident who is usually able to follow instructions has been unable to focus on activities of daily living or pay attention to instructions for the last couple of days and has a WBC count of more than 10,000 leukocytes.

b) A resident suddenly has fluctuating difficulty paying attention and is not making sense during conversation, and has a WBC of greater than 14,000 leukocytes

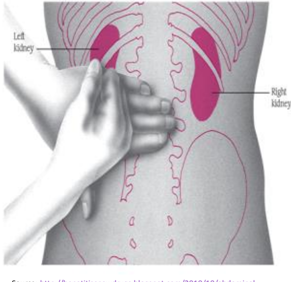
Suprapubic Pain or Costovertebral Angle Pain

New onset of:

- Suprapubic pain

OR

- Costovertebral angle pain or tenderness



Source: http://hepatitiscnewdrugs.blogspot.com/2010/10/abdominal-pain-rightleft-upper-quadrant.html

Question 3: Could Something Else Cause These Signs and Symptoms?

The signs and symptoms just described are

only indicative of a CAUTI ***if*** there are no other

explanations for the signs and symptoms.

What Lab Tests Indicate a CAUTI?

If a urinary catheter *is* in place:

- Positive urine culture with 100,000 colonies or more (10^5 CFU/ml) of any number of microorganisms indicates a CAUTI.

If a urinary catheter *is not* in place, but was removed in the past 2 days:

- Voided urine culture with 100,000 or more colonies (10^5 CFU/ml) of no more than 2 species of microorganisms.

OR

- Positive culture with 100 or more colonies (10^2 CFU/ml) of any number of microorganisms from a straight in/out catheter specimen.

? CAUTI or Not?

Is the following an example of a CAUTI or a non-catheter symptomatic UTI?

Day 1: The resident has an indwelling urinary catheter inserted in the LTC facility for a bladder outlet obstruction.

Day 2: The indwelling urinary catheter remains in place.

Day 3: The resident's indwelling urinary catheter remains in place. The resident has a single oral temp of 100.2ºF. A urine culture is collected from an indwelling catheter specimen.

Day 4: The indwelling urinary catheter remains in place. No symptoms are documented.

Day 5: The urine culture is positive for *Staphylococcus aureus* 100,000 CFU/ml.

? Criteria for CAUTI

Which of the following criteria would confirm a CAUTI? (Select all that apply.)

a) The resident's oral temperature is 100.2 ºF and the indwelling catheter specimen is positive for *E. coli* 100,000 CFU (10^5).

b) The resident has purulent discharge around the suprapubic catheter and the catheter specimen is positive for *E. coli* 100,000 CFU (10^5).

c) The resident has a fluctuating change in mental status, and a voided specimen positive for *E. coli* 100 CFU (10^2) four days after the indwelling catheter was removed.

d) The resident has multiple oral temps of 99.2 ºF, chills, sweating and the indwelling catheter specimen is positive for *E. coli* 100,000 CFU (10^5).

Dissemination of Surveillance

Internal Reporting

- Clinical team
- Administration
- Environmental services
- Admissions
- Volunteers
- Safety and infection control committee

External Reporting

- Local/county DOH
- State DOH
- CDC

Additional Resources

Antimicrobial Stewardship in Long-term Care Facilities

Susan M. Rhee, MD[a,*], Nimalie D. Stone, MD, MS[b]

KEYWORDS

• Long-term care • Antimicrobial stewardship • Antimicrobial resistance • Elderly
• Infection prevention

KEY POINTS

- Long-term care facilities (LTCF) house a unique patient population, who are often elderly with several preexisting medical conditions.
- Residents of LTCF are often colonized with multidrug-resistant organisms, and antibiotic stewardship is essential to limit the further emergence of resistance.
- Antimicrobial stewardship is a new but necessary concept in LTCFs.
- Stewardship strategies from acute care settings may be adapted to function with the available resources utilized in LTCFs.

INTRODUCTION

Antimicrobial resistance has been identified as a major public health crisis. National summary data from the Centers for Disease Control and Prevention (CDC) estimate that more than 2 million illnesses are attributable to resistant infections.[1] As a result of increasing prevalence of virulent and drug-resistant organisms, including *Clostridium difficile*, methicillin-resistant *Staphylococcus aureus* (MRSA), and drug-resistant gram-negative organisms, there has been a call for the implementation of antimicrobial stewardship programs (ASPs) across the health care spectrum.[2] ASP refers to the development of programs that addresses the "appropriate selection, dosing, route, and duration of antimicrobial therapy". Guidelines for the development of stewardship programs generally target stewardship activities in the acute care setting.[3] The success of stewardship programs in the hospital setting has been described, with reductions in the rate of *C. difficile* infection, antibiotic usage, and improved pharmacy expenditures.[4–6] Implementation of similar programs in

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long-term care facilities (LTCF) has been limited, despite the heavy use of antibiotics and high prevalence of resistant organisms in these settings.[7] To add to an already complicated picture, the population in the United States continues to age, with an estimated 21% of the population in 2040 consisting of adults 65 years of age and older.[8] As increased usage of LTCFs looms, the burden of inappropriate usage of antimicrobials in this health care setting will also increase in the absence of appropriate guidance.

THE BURDEN OF INFECTION IN LTCF

There are more than 15,000 nursing homes in the United States, with an estimated 1.5 million residents.[9] Previous epidemiologic studies have reported an infection prevalence rate of 5.3%, based on a single-day survey, and infection incidence rates ranging from 3.6 to 5.2/1000 resident days.[10–12] The most commonly reported infections in nursing homes are urinary tract infections (UTIs), lower respiratory tract infections, including pneumonia, skin and soft tissue infections, and gastroenteritis. Infections are among the most frequent causes of transfer to acute care hospitals, and 30-day hospital readmissions from LTCF are associated with increased mortality in this population.[13–16]

The burden of multidrug-resistant organisms has also been identified as a key issue in this population, often a consequence of the overuse of antibiotics.[17] There is a higher incidence of invasive MRSA in adults greater than or equal to 65 years old, as compared with their younger counterparts.[18] Surveillance of various facilities has shown high prevalence of both colonization and infection with resistant organisms such as MRSA and multidrug-resistant gram-negative pathogens.[19–21] Among LTCF residents, infections with antibiotic-resistant organisms are associated with more severe infection, hospitalization, increased risk of death, and increased cost of care.[22–24] With a growing population of residents transferring between hospitals and LTCFs, the risk for resistance to emerge and spread within LTCFs has increased. In a study assessing movement of patients between health care settings, more than 50% of individuals identified with a carbapenem-resistant organism during a hospitalization were discharged to post-acute care facilities such as LTCFs.[25] Failure to control spread of resistance in LTCFs can also affect surrounding hospitals. An MRSA outbreak in one LTCF led to increasing prevalence of this organism in several adjacent California hospitals.[26]

The antimicrobial overuse in LTCF exposes residents to the potential and realized harm that is caused by antibiotics, such as *C. difficile* infection.[27–29] In a study of nursing homes in Rhode Island, 72% of patients received an antibiotic that was inappropriate according to established guidelines, with 67% receiving antibiotic therapy longer than the recommended duration, with a resultant increased incidence of *C. difficile* infection. In the geriatric population, it has already been shown that antimicrobials are one of the most commonly prescribed medications, with a significant associated adverse drug event risk.[29]

CHALLENGES WITH ANTIMICROBIAL USE IN LTCF

ASPs in LTCFs have to address the unique challenges in identifying and managing infections in this population. The prevalence of asymptomatic bacteriuria (ASB) ranges from 23% to 50% in noncatheterized LTCF residents, to 100% among those with long-term urinary catheters, and ASB in the older adult is accompanied by pyuria in more than 90% of cases.[30] However, symptomatic UTIs in LTCF residents may present atypically. A study assessing the clinical signs and symptoms of older adults (older than 75 years) with bacteremic UTIs found that 10/37 (27%) did not mount a fever greater than 37.9°C, and 48.6% failed to report any localizing urinary tract symptoms (eg,

dysuria, urgency, or frequency).[31] Given the unreliable clinical assessment for infections in LTCF residents and the diagnostic challenges in differentiating ASB from infection, suspected UTIs account for 30% to 60% of antibiotic prescriptions in LTCFs.[32,33]

Adding to the challenge of diagnosing infections in LTCF is having clinical providers located off-site, and making management decisions based on the assessments communicated by front-line staff. The use of surrogate assessments and the lack of access to provider follow-up likely drive antibiotic use and frequent hospital transfers. Many facilities have limited diagnostic testing (eg, laboratory or radiology) available, with services contracted to off-site facilities leading to delays in obtaining specimens, processing, and reporting results back to providers.

PATTERNS OF ANTIMICROBIAL USE IN LTCF

Antimicrobials, specifically antibiotics, are among the most frequently prescribed medications in LTCFs and have the second highest rate of adverse drug events following antipsychotic medications.[34,35] In a study of antimicrobial use in 73 nursing homes, the pooled mean rate was 4.8 antimicrobial courses/1000 resident days (range 0.4–23.5).[32] Other studies have shown that 47% to 79% of LTCF residents are exposed to at least one antibiotic course over a 12-month period.[7,36] Factors accounting for the facility-level variability in antimicrobial use may include provider prescribing habits, types of resident services provided within the facility (eg, custodial LTCF vs post-acute skilled), and resident case-mix index.[37–39] Estimates on the amount of inappropriate antimicrobial use in LTCFs vary widely, from 25% to 75%, depending on how appropriateness is defined.[34,40]

To guide health care practitioners in the rational assessment of infections in this vulnerable population, clinical guidelines have been published, which outline the evaluation for residents suspected of having an infection.[41] Minimum criteria that should be present before initiating antimicrobial therapy, known as the “Loeb criteria”, have also been proposed to improve antimicrobial use (**Box 1**).[42] Surveillance definitions for infections in LTCFs, referred to as the “McGeer criteria”, have also been published to support infection surveillance activities in LTCF (**Box 2**).[43,44] However, despite the creation of these guidance documents to assist clinicians with the diagnosis and management of common infections, the implementation of these guidelines remains a challenge. One study showed that only 12.7% of prescriptions were adherent to the Loeb criteria within 12 nursing home evaluations.[36] A cluster, randomized controlled trial, which operationalized diagnostic and therapeutic algorithms based on the Loeb criteria for the management of UTI in 24 nursing homes, found a 31% reduction in antimicrobial use for UTI among intervention homes compared with controls.[33] However, despite a reduction in antibiotic use for UTI, the overall antibiotic consumption did not differ between the 2 groups, suggesting that use may have shifted to other indications. Continued inappropriate treatment of infections that do not meet clinical criteria has been attributed to the perception of the need to treat, despite the lack of objective evidence.[45]

IMPLEMENTING ANTIMICROBIAL STEWARDSHIP INTERVENTIONS IN LTCFS

ASP refers to the development of programs that addresses the “appropriate selection, dosing, route, and duration of antimicrobial therapy”.[3,46,47] Recently, CDC outlined core elements for hospital antibiotic stewardship program that can be tailored to the infrastructure and capacity of different sized facilities, including LTCFs. The core elements emphasized leadership commitment, accountability for improving antibiotic use, need for drug expertise, implementing action through targeted policies and

Box 1
Loeb minimum criteria for the initiation of antibiotics in long-term care facility residents

Skin and Soft Tissue Infections
- New or increasing purulent drainage and/or ≥2 of the following:
  - Fever
    - Temperature >37.9°C (100°F) or
    - Increase of 1.5°C (2.4°F) from baseline temperature
  - Redness
  - Tenderness
  - Warmth
  - New or increasing swelling of the affected site

Respiratory infections
- In residents with temperature >38.9°C (102°F), ≥1 of the following:
  - Respiratory rate >25 breaths/min
  - Productive cough
- In residents with temperature >37.9°C (100°F), but ≤38.9°C (102°F)
  - Cough and ≥1 of the following:
    - Pulse >100 beats/min
    - Delirium
    - Rigors
    - Respiratory rate >25
- In afebrile residents with chronic obstructive pulmonary disease and age >65 years old
  - New or increased cough with purulent sputum production
- In afebrile residents without chronic obstructive pulmonary disease
  - New cough with purulent sputum production and ≥1 of the following:
    - Respiratory rate >25
    - Delirium

Urinary Tract Infections
- Without indwelling urinary catheters
  - Acute dysuria or
  - Fever (>37.9°C [100°F]) and ≥1 of the following:
    - New or worsening urgency
    - Frequency
    - Suprapubic pain
    - Gross hematuria
    - Costovertebral angle tenderness
    - Urinary incontinence
- With chronic indwelling urinary catheter
  - ≥1 of the following
    - Fever (>37.9°C [100°F])

New costovertebral angle tenderness

Rigors

New onset delirium

Fever without obvious focus of infection

Fever (>37.9°C [100°F]) and ≥1 of the following

New onset of delirium

Rigors

Data from Loeb M, Bentley D, Bradley S, et al. Development of minimum criteria for the initiation of antibiotics in residents of long-term-care facilities: results of a consensus conference. Infect Control Hosp Epidemiol 2001;22:120–4.

Box 2
Definitions included in the McGeer and Revised McGeer criteria

Respiratory tract infections

Common cold syndromes/pharyngitis

Influenzalike illness

Pneumonia

Other lower respiratory tract infections

Urinary tract infections

Eye, ear, nose, and mouth infections

Conjunctivitis

Ear infection

Mouth/perioral infections

Sinusitis

Skin infections

Cellulitis/soft tissue/wound infections

Fungal skin infections

Herpes simplex, herpes zoster infections

Scabies

Gastrointestinal tract illnesses

Gastroenteritis

Norovirus

Clostridium difficile infection

Systemic infections

Primary bloodstream infections

Unexplained febrile episodes

Data from McGeer A, Campbell B, Emori TG, et al. Definitions of infection for surveillance in long-term care facilities. Am J Infect Cont 1991;19(1):1–7; and Stone ND, Ashraf M, Calder J, et al. Surveillance definitions of infections in longterm care facilities: revisiting the McGeer criteria. Infect Control Hosp Epidemiol 2012;33(10):965–77.

guidelines, tracking and reporting to staff on prescribing and resistance, and offering education.[48] Recommendations for infection prevention and control in the LTCF setting include using ASP as part of the ongoing infection prevention program.[40,49]

The staffing structure within LTCFs may be considerably different from acute care facilities, with the largest proportion of in-person staffing consisting of nursing, with variable models of physician presence. Although some facilities maintain their own internal physician staffing models, many have physicians who are off site and unable to interact with LTCF residents on a daily basis, leading to dependence on nursing staff, often nursing assistants, for the initial recognition of signs and symptoms suggestive of infection. As the request for diagnostic testing and antimicrobial prescriptions are often called in by the physician before having the opportunity to examine the patient, education about diagnostic criteria and appropriate culture techniques need to occur at all levels of staffing. Identifying key participants and ASP champions is essential to initiating change within an institution. At a minimum, consider engaging the following nursing home personnel in the implementation of any stewardship activities: administrative leadership, clinical leadership including the medical director and the director of nursing services, the infection prevention and control coordinator, the consultant pharmacist, as well as representatives from the medical and nursing staff. Although including an infectious disease (ID) specialist would be ideal, including any physician with an interest in antimicrobial stewardship may be a more practical approach, especially in areas where ID specialists are not readily available. Senior level nursing may be able to provide the front-line support in assuring adherence to guidelines for initial diagnostic procedures, whereas post-prescription review of antibiotic therapy may be performed by a physician or pharmacist if available.

Management Strategies

A baseline evaluation of the quantity of antimicrobials prescribed expressed as days of therapy per 1000 patient days, to allow for interfacility comparison, should be conducted. Further evaluation into the use of specific agents and their indications should occur to determine which stewardship interventions are most necessary.

Existing guidelines for antimicrobial use developed by IDSA and SHEA should be tailored to meet local needs. Any guideline needs to be supplemented with education to ensure proper dissemination and use. Materials and methods to initiate an antimicrobial stewardship program may include

- Sessions with the ASP team and the providers of care, to educate on a more personal basis, which may provide an avenue for prescribers to directly ask questions.
- Antibiotic dosing guidelines to be created based on a facility's formulary, which would be readily available to prescribers, with information on drug interactions as part of the guidelines, given the frequency of polypharmacy in this population.
- Educational modules for nursing assistants and nursing staff on the criteria for initiation of antimicrobial usage.
- Educational modules for residents and family members, given that there can be pressure applied to the prescriber to give an inappropriate antimicrobial, when one is not indicated, due to external pressure exerted.
- Diagnostic and treatment guidelines can be adapted from currently published sources on common infectious problems, such as pneumonia, UTIs, and skin and soft tissue infections, and made available to all pertinent care-giving staff.
- Guidelines and educational modules focusing on preventable problems that also lead to infection may also be a part of an LTCF stewardship program; for example, following best practices for infection control, prevention of pressure

ulcer formation, and aspiration prevention will avoid the infectious complications that often follow.

By engaging several different educational strategies, important and applicable guideline information can be disseminated in a fairly easy manner, although retention of the material requires repeated education campaigns.

PREPRESCRIPTION AUTHORIZATION

With preprescription authorization, physicians contact a stewardship team before prescribing select antimicrobials. Preprescription authorization ensures that patients receive the most appropriate empiric antimicrobial therapy and reduces the number of unnecessary antimicrobial starts. Unfortunately, it can be resource intensive in real time and may lead to delays in the initiation of therapy. This may be particularly true in LTCF where clinicians are often off site.

POST-PRESCRIPTION REVIEW WITH FEEDBACK

Post-prescription review with feedback entails a review of antimicrobials prescribed at some time point after more clinical and microbiology laboratory information is available. Although it usually occurs at 48 to 72 hours, it can occur at any time period and still proves valuable even if it occurs once or twice a week because of limited resources. As there is greater flexibility in the timing of interventions with post-prescription review and feedback, this may be more feasible in LTCFs. Feedback likely requires phone calls or secure e-mails to providers as notes left in charts are unlikely to be seen in a timely manner.

SUCCESSFUL ANTIMICROBIAL STEWARDSHIP INTERVENTIONS IN LTCFS

Although still relatively new in LTCF settings, the impact of such an ASP has already demonstrated positive results. The implementation of such programs led to a 30% decrease in systemic antibiotic usage, both in oral and intravenous medications, in addition to a decrease in the rate of positive *C. difficile* tests, in one institution.[50] Although this study used an ID service, simply distributing appropriate educational material targeting the most common infections in LTCFs has shown to improve antibiotic usage, as demonstrated by Monette and colleagues[51]; a 20% decrease in prescriptions that were not adherent to guidelines was seen in the group of prescribers who were given the educational material, as opposed to control.

Areas of Future Needed Work

- Robust studies examining the efficacy of various programs and how they fit into individual facility types with differing resources.
- Attention to the issues of transmission between the LTCFs and the acute care facilities serving the same community.
- Increased implementation of the nationally available guidelines in LTCFs.

SUMMARY

The selection pressure resulting from the overuse of antibiotics is a significant driver of adverse events in the LTCF setting. In addition, as patients move back and forth between acute care and long-term care, the burden of multidrug resistance and frequent infections is shared across the health care spectrum. By adapting stewardship principles that have

already been shown to be effective in the acute care setting to LTCFs, an impact can be made on the health of the overall population and in this vulnerable population.

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Moving the profession forward

APIC's new IP Competency Model helps infection preventionists design a plan for professional development.

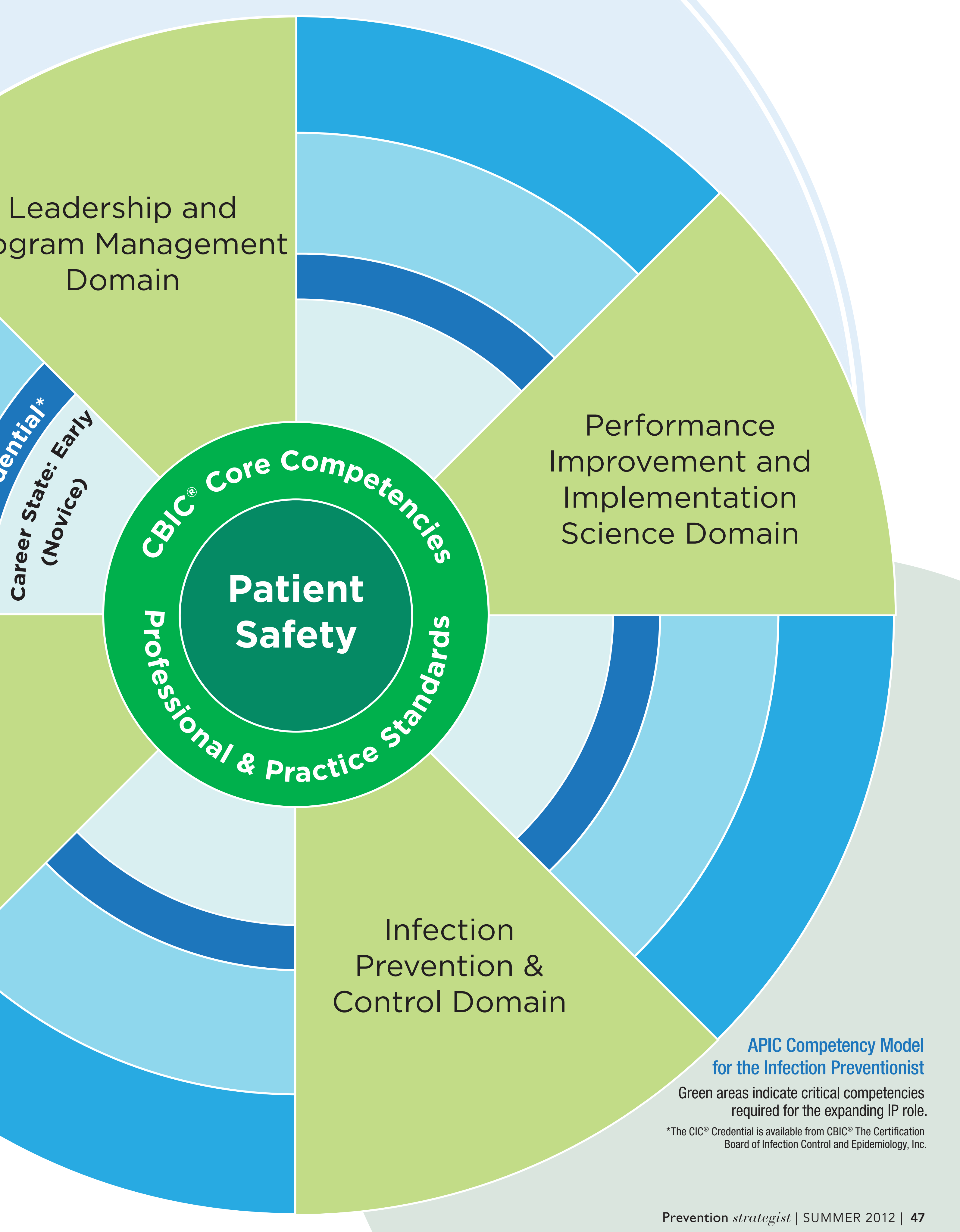
BY MARILYN HANCHETT, RN, MA, CPHQ, CIC

In May 2012, APIC introduced the first conceptual model of infection preventionist (IP) competency. The model was designed to be broadly applicable across both practice settings and career stages. The foundational elements are centrally positioned to reinforce the significance of patient safety, professional standards, and the Certification Board of Infection Control and Epidemiology (CBIC) core competencies.

While these elements remain essential throughout the IP's career, the model also looks to the competencies necessary to support future knowledge and skills. Four specific, future-oriented domains radiate outward from the center and include: (1) technical, (2) leadership and program management, (3) infection prevention and control, and (4) performance improvement/implementation science.

It is important to recognize that the core competencies and the future-oriented domains are not mutually exclusive. In fact, they are complementary. Depending on the specific topic, content areas may overlap. For a complete description of the model and its interpretation, see the May 2012 *American Journal of Infection Control* article titled "Competency in infection prevention: A conceptual approach to guide current and future practice."

To demonstrate how this model can be used to help direct the IP's professional development, it has been applied to examples representing each of the three career stages. Each example has been color coded to reflect how the model pertains to the individual scenario described. A recommended professional development plan is offered to help the individual achieve his or her goals.

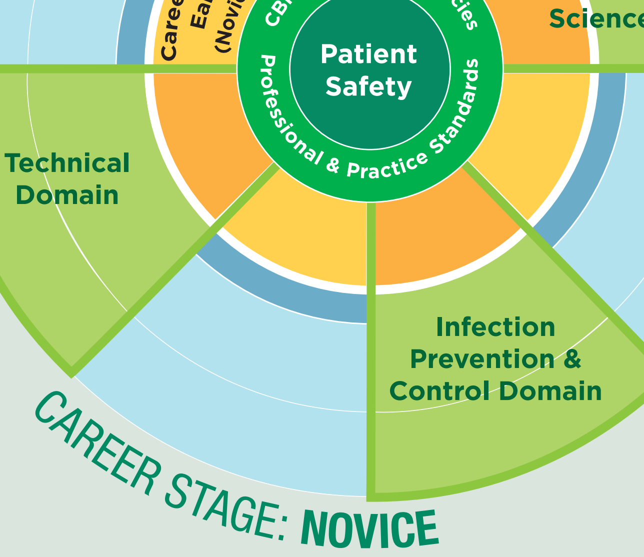


APIC Competency Model for the Infection Preventionist

Green areas indicate critical competencies required for the expanding IP role.

*The CIC® Credential is available from CBIC® The Certification Board of Infection Control and Epidemiology, Inc.

The early stage IP (novice)



CAREER STAGE: **NOVICE**

Kathy is a registered nurse (RN) and worked in the intensive care unit (ICU) in her community hospital for three years before joining the Infection Prevention department. She is one of two full-time IPs and has been in her role for 18 months. She is confident about her clinical skills related to patient care, device management, and key prevention strategies such as antibiotic utilization, hand hygiene, and contact precautions. Her undergraduate degree is in nursing.

She has completed initial National Healthcare Safety Network (NHSN) training. She attends the hospital's monthly Infection Control Committee meetings, gives introductory presentations to the hospital's orientees, and participates in rounds led by the safety officer. Kathy's self-assessment of her infection prevention skills indicates that, although she has a strong nursing background, she is in the early career stage as an IP. She has read about the Certification Board of Infection Control and Epidemiology examination but is unsure if she is ready to take that step.

Kathy is married, has two children, and stays very busy. Due to family demands, she is not considering graduate education at this time but expects to do so in the future. She enjoys infection prevention and wants to advance in the field. But with multiple demands on her time every day, it is imperative that she focus on activities that will expedite achieving her professional goals in a practical, achievable way.

Kathy's professional development plan

- **Plan and prepare to earn the certification in infection prevention and control (CIC®) credential.** She should investigate preparatory resources available at both the national and local levels. Many APIC chapters sponsor study groups and other informal peer-to-peer support programs.
- **Focus on epidemiology and surveillance to expand her existing clinical skills.** For clinicians transitioning into infection prevention, these are topics that usually require focused attention.
- **Transfer RN leadership skills to the IP role** by volunteering to lead project teams, serve on committees or other stakeholder groups addressing infection prevention related issues.
- **Expand her internal network;** include departments such as EVS, Quality, Risk and others.
- **Attend APIC's EPI® 101 and 201 programs to obtain baseline education.**
- **Participate in APIC programs and events.** Kathy should attend as many local APIC chapter activities as her schedule permits. She should also attend the APIC Annual Conference, as it offers many beginner-level sessions to meet her learning needs.

Goal

If Kathy follows the professional development plan described above and integrates it with the performance measures specific to her employment, she can expect to transition from novice to the early phase of a proficient IP within the next one to two years. Completion of the certification process will be essential to making this career transition.

(proficient)

The mid-career IP

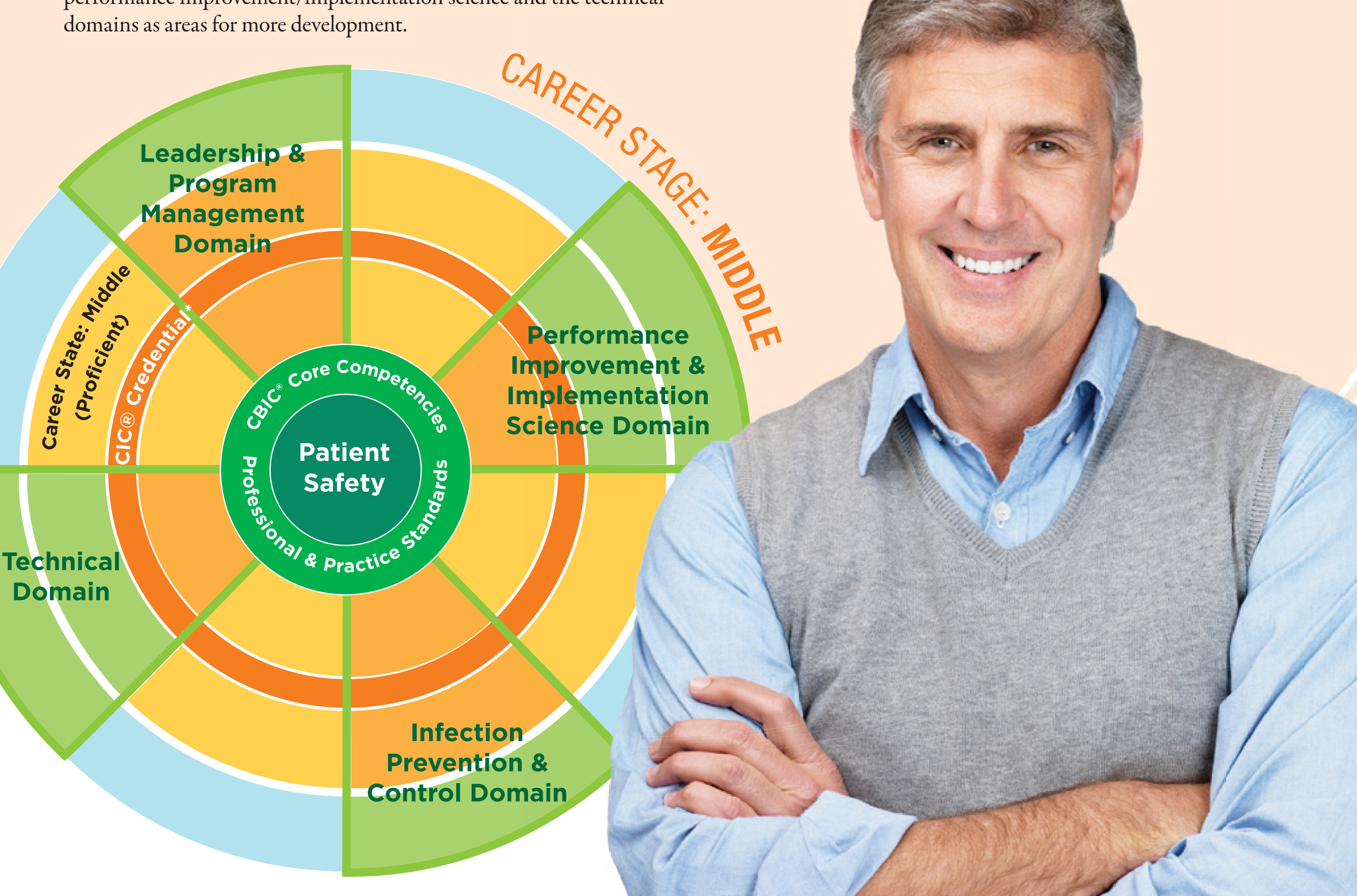
John worked in the microbiology laboratory at his hospital for five years. During that time, he participated in the hospital's infection control program and became interested in epidemiology. After several years of collaboration with the hospital's epidemiologist, John was encouraged to apply for the infection prevention manager position when it was vacated due to a retirement.

John now manages the infection prevention team. The team includes two other full-time IPs and a part-time data analyst. The team is responsible for the hospital, the outpatient areas, and a nearby ambulatory surgical center. One year ago, the hospital implemented a new electronic surveillance system. While John and his team appreciate the efficiencies gained by the software, senior directors remain skeptical regarding the return on such a significant investment. It was recently suggested that the use of the new software could justify reducing John's staff.

John's primary educational background is in microbiology and epidemiology. He is highly skilled in biostatistics. John also understands the principles of patient care and has obtained his certification in infection prevention and control (CIC®) credential. However, his background did not prepare him for the business challenges he now faces as a front-line manager. At this point in his career, he still feels unsure of how to respond to the increasing managerial demands. When John used the IP Competency Model to evaluate his progress, he identified performance improvement/implementation science and the technical domains as areas for more development.

John's professional development plan

- **Consider graduate-level courses that include a business component.** If that is not feasible, complete business courses focused on skill building (e.g., budgeting and finance, persuasion and negotiation, presenting and defending proposals). Business courses are available from a wide range of providers, including online and through community colleges.
- **Network with other IP managers.** IPs who manage similar departments can offer valuable advice and insight into the challenges John faces.
- **In the technical domain, make proficiency in using the new surveillance software a priority.** See if ongoing training/support is available from the vendor and participate in any user groups it sponsors. Look for additional opportunities to expand e-surveillance capabilities.
- **Learn to use performance improvement tools to support IP program justification.** Use APIC resources on "making the case for infection prevention" to integrate these skills and better prepare for management discussions.



- **Attend the APIC Annual Conference to access additional learning opportunities and to expand his national network.** The annual conference offers content-rich sessions on not only core competencies, but also in the four areas targeted in the model for future professional development.

Goal

Within the next 12 to 18 months, John will balance his competencies across the various areas described in the model and, in doing so, will demonstrate the ability to successfully use essential business skills to support his role. Within two years, John will be fully proficient as a mid-career IP.

(expert)

The advanced IP

Leanne has worked in the field of infection prevention for 20 years. She has maintained CIC®. She has participated in state and regional work groups, presented posters and abstracts at APIC meetings, and served on several APIC national committees. She has been president of her local chapter twice. She is a frequently requested keynote speaker at many regional meetings where her infection prevention expertise is widely recognized and respected.

At this time, Leanne is no longer working as the sole practitioner for a local hospital. Instead, she is teaching undergraduate courses part time at a local college and doing some occasional consulting for industry. She remains active in her APIC chapter.

While Leanne recognizes that the IP role in her former institution was highly valued, it was rarely included in senior management discussions and decision making. For this reason, as Leanne looks to a new career direction, she wonders if a lack of director-level experience will be a drawback. In addition, the hospital was just beginning to move forward with implementing electronic medical records at the time of her departure. She had been an important advocate for including e-surveillance in this process, but she has limited personal experience with any of the current software packages available to IPs.

Leanne is eager for new career opportunities but wants to make sure she remains up to date and competitive. She wants to maintain her clinical credibility and leverage her excellent reputation as a hospital-based IP in new ways. She has no plans to retire any time soon.

Leanne's professional development plan

- **Advance competency in the technical domain through learning and other engagement opportunities offered by APIC and other healthcare organizations.** Attend sessions at the APIC Annual Conference that focus on e-surveillance and other emerging technologies; interact with technology vendors in the exhibit hall to discover additional professional development options.

- **Consider serving on the APIC Board of Directors.** Leanne's previous experience qualifies her for a national role and this would offer new opportunities to strengthen her leadership competencies.
- **Focus on building consulting skills and network with IPs who have established successful consulting firms.**
- **Evaluate the feasibility of developing and offering independent seminars, workshops, or other educational offerings beyond the courses already included in the college curriculum.** While this presents greater financial risk to Leanne, there is also great opportunity to innovate and showcase her unique skills to a wider audience.

Goal

Within the next two years, Leanne will have successfully redirected her career. Her prior reputation as an IP expert will now include expanded content areas in which she can showcase her advanced knowledge and skills.

Conclusion

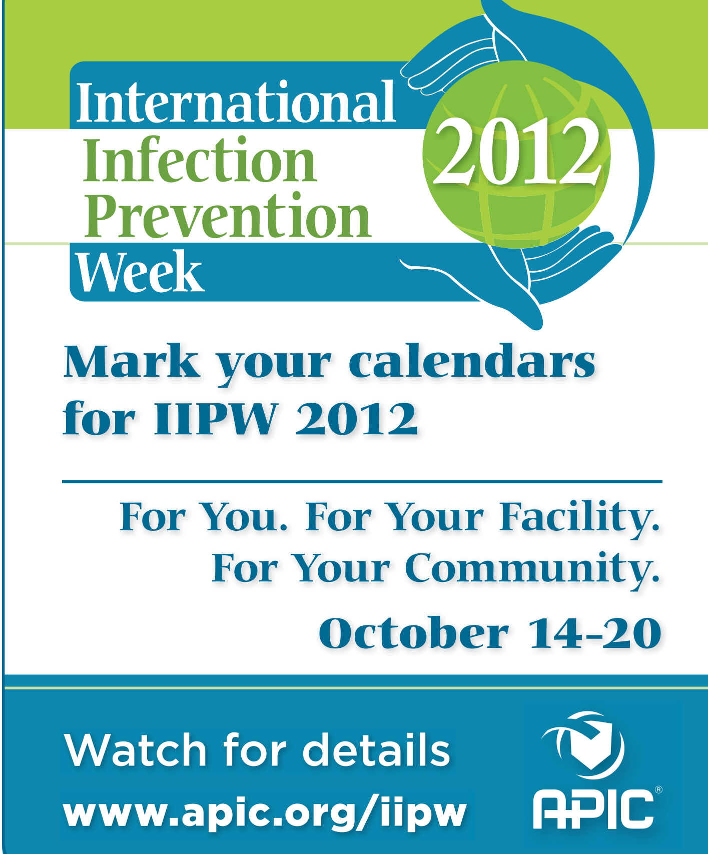
APIC views competency as a self-defined and self-assessed process. Competency is not defined by specific time requirements, but acknowledges that experience is important. In order to prepare IPs for current workplace demands, and to help them meet the complex challenges ahead, a systematic approach, presented by the association in its conceptual model, offers a general plan to help all IPs achieve their individual career goals while simultaneously advancing the profession. IPs are encouraged to use the model to conduct their own self assessments and to optimally utilize the association's extensive educational resources to prepare for the future.

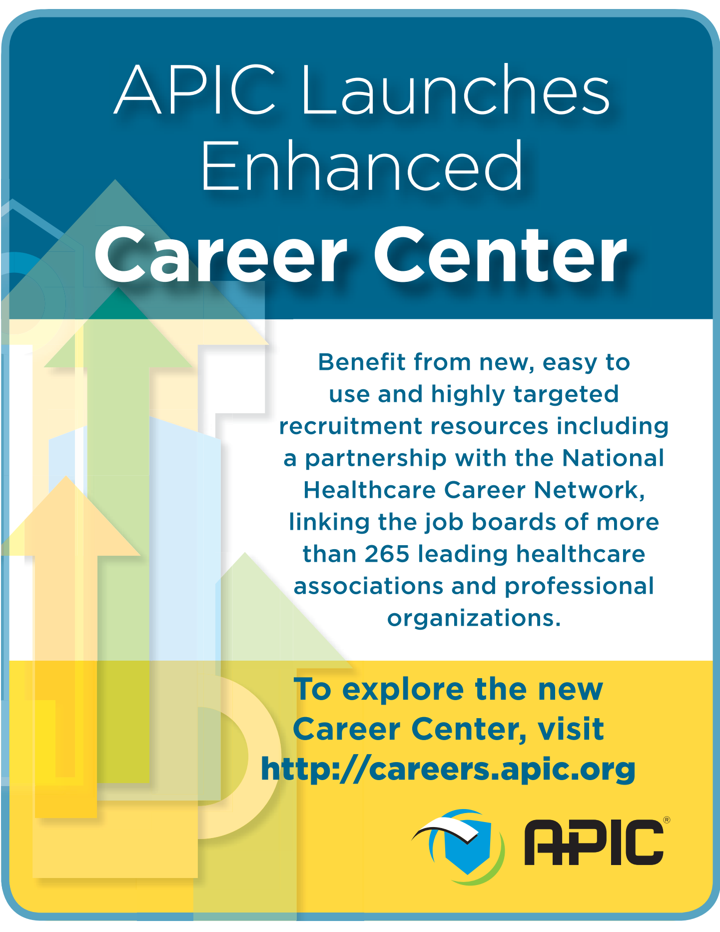
Marilyn Hanchett, RN, MA, CPHQ, CIC, is APIC senior director of Research and Clinical Innovation.

Learn more about the IP Competency Model

› Read the May 2012 *American Journal of Infection Control* article titled "Competency in infection prevention: A conceptual approach to guide current and future practice."

› Attend the APIC 2012 Annual Conference session titled "A Long and Winding Road: Meeting Current Challenges, Preparing for Future Demands: APIC Introduces a Model of IP Competency" on Tuesday, June 5, 3-4 p.m. (www.apic.org/ac2012)





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

Section 1. Facility Demographics	
Facility Name (for health department use only)	Click here to enter text.
NHSN Facility Organization ID (for health department use only)	Click here to enter text.
State-assigned Unique ID	Click here to enter text.
Date of Assessment	Click here to enter a date.
Type of Assessment	☐ On-site ☐ Other (specify): Click here to enter text.
Rationale for Assessment (Select all that apply)	☐ Outbreak ☐ Input from accrediting organization or state survey agency ☐ NHSN data (if available) ☐ Collaborative (specify partner[s]): Click here to enter text.) ☐ Other (specify): Click here to enter text.
Is the facility licensed by the state?	☐ Yes ☐ No
Is the facility certified by the Centers for Medicare & Medicaid Services (CMS)	☐ Yes ☐ No
Facility type	☐ Nursing home ☐ Intermediate care facility ☐ Assisted living facility ☐ Other (specify): Click here to enter text.
Number of licensed beds	Click here to enter text.
Total staff hours per week dedicated to infection prevention and control activities	Click here to enter text.
Is the facility affiliated with a hospital?	☐ Yes (specify – for health department use only): Click here to enter text. ☐ No

Section 2: Infection Control Program and Infrastructure

I. Infection Control Program and Infrastructure		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
A. The facility has specified a person (e.g., staff, consultant) who is responsible for coordinating the IC program.	○ Yes ○ No	Click here to enter text.
B. The person responsible for coordinating the infection prevention program has received training in IC *Examples of training may include: Successful completion of initial and/or recertification exams developed by the Certification Board for Infection Control & Epidemiology; Participation in infection control courses organized by the state or recognized professional societies (e.g., APIC, SHEA).*	○ Yes ○ No	Click here to enter text.
C. The facility has a process for reviewing infection surveillance data and infection prevention activities (e.g., presentation at QA committee).	○ Yes ○ No	Click here to enter text.
D. Written infection control policies and procedures are available and **based on** evidence-based guidelines (e.g., CDC/HICPAC), regulations (F-441), or standards. *Note: Policies and procedures should be tailored to the facility and extend beyond OSHA bloodborne pathogen training or the CMS State Operations Manual*	○ Yes ○ No	Click here to enter text.
E. Written infection control policies and procedures are reviewed at least annually or according to state or federal requirements, and updated if appropriate.	○ Yes ○ No	Click here to enter text.
F. The facility has a written plan for emergency preparedness (e.g., pandemic influenza or natural disaster).	○ Yes ○ No	Click here to enter text.

II. Healthcare Personnel and Resident Safety		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
Healthcare Personnel		
A. The facility has work-exclusion policies concerning avoiding contact with residents when personnel have potentially transmissible conditions which do not penalize with loss of wages, benefits, or job status.	○ Yes ○ No	Click here to enter text.
B. The facility educates personnel on prompt reporting of signs/symptoms of a potentially transmissible illness to a supervisor	○ Yes ○ No	Click here to enter text.
C. The facility conducts baseline Tuberculosis (TB) screening for all new personnel	○ Yes ○ No	Click here to enter text.

II. Healthcare Personnel and Resident Safety, continued		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
D. The facility has a policy to assess healthcare personnel risk for TB (based on regional, community data) and requires periodic (at least annual) TB screening if indicated.	O Yes O No	Click here to enter text.
E. The facility offers Hepatitis B vaccination to all personnel who may be exposed to blood or body fluids as part of their job duties	O Yes O No	Click here to enter text.
F. The facility offers all personnel influenza vaccination annually.	O Yes O No	Click here to enter text.
G. The facility maintains written records of personnel influenza vaccination from the most recent influenza season.	O Yes O No	Click here to enter text.
H. The facility has an exposure control plan which addresses potential hazards posed by specific services provided by the facility (e.g., blood-borne pathogens). *Note: A model template, which includes a guide for creating an exposure control plan that meets the requirements of the OSHA Bloodborne Pathogens Standard is available at:* https://www.osha.gov/Publications/osha3186.pdf	O Yes O No	Click here to enter text.
I. All personnel receive training and competency validation on managing a blood-borne pathogen exposure at the time of employment. *Note: An exposure incident refers to a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an individual's duties.*	O Yes O No	Click here to enter text.
J. All personnel received training and competency validation on managing a potential blood-borne pathogen exposure within the past 12 months.	O Yes O No	Click here to enter text.
Resident Safety		
A. The facility currently has a written policy for to assess risk for TB (based on regional, community data) and provide screening to residents on admission.	O Yes O No	Click here to enter text.
B. The facility documents resident immunization status for pneumococcal vaccination at time of admission.	O Yes O No	Click here to enter text.
C. The facility offers annual influenza vaccination to residents.	O Yes O No	Click here to enter text.

III. Surveillance and Disease Reporting

Elements to be assessed	Assessment	Notes/Areas for Improvement
Surveillance		
A. The facility has written intake procedures to identify potentially infectious persons at the time of admission. *Examples: Documenting recent antibiotic use, and history of infections or colonization with C. difficile or antibiotic-resistant organisms*	○ Yes ○ No	Click here to enter text.
B. The facility has system for notification of infection prevention coordinator when antibiotic-resistant organisms or *C. difficile* are reported by clinical laboratory.	○ Yes ○ No	Click here to enter text.
C. The facility has a written surveillance plan outlining the activities for monitoring/tracking infections occurring in residents of the facility.	○ Yes ○ No	Click here to enter text.
D. The facility has system to follow-up on clinical information, (e.g., laboratory, procedure results and diagnoses), when residents are transferred to acute care hospitals for management of suspected infections, including sepsis. *Note: Receiving discharge records at the time of re-admission is not sufficient to answer "yes"*	○ Yes ○ No	Click here to enter text.
Disease Reporting		
A. 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.	○ Yes ○ No	Click here to enter text.
B. The facility has a current list of diseases reportable to public health authorities.	○ Yes ○ No	Click here to enter text.
C. The facility can provide point(s) of contact at the local or state health department for assistance with outbreak response.	○ Yes ○ No	Click here to enter text.

IV. Hand Hygiene

Elements to be assessed	Assessment	Notes/Areas for Improvement
A. Hand hygiene policies promote preferential use of alcohol-based hand rub (ABHR) over soap and water in most clinical situations. *Note: Soap and water should be used when hands are visibly soiled (e.g., blood, body fluids) and is also preferred after caring for a patient with known or suspected C. difficile or norovirus during an outbreak or if rates of C. difficile infection in the facility are persistently high.*	○ Yes ○ No	Click here to enter text.

IV. Hand Hygiene, continued

Elements to be assessed	Assessment	Notes/Areas for Improvement
B. All personnel receive training and competency validation on HH at the time of employment.	○ Yes ○ No	Click here to enter text.
C. All personnel received training and competency validation on HH within the past 12 months.	○ Yes ○ No	Click here to enter text.
D. The facility routinely audits (monitors and documents) adherence to HH *Note: If yes, facility should describe auditing process and provide documentation of audits*	○ Yes ○ No	Click here to enter text.
E. The facility provides feedback to personnel regarding their HH performance. *Note: If yes, facility should describe feedback process and provide documentation of feedback reports*	○ Yes ○ No	Click here to enter text.
F. Supplies necessary for adherence to HH (e.g., soap, water, paper towels, alcohol-based hand rub) are readily accessible in resident care areas (i.e., nursing units, resident rooms, therapy rooms).	○ Yes ○ No	Click here to enter text.

V. Personal Protective Equipment (PPE)

Elements to be assessed	Assessment	Notes/Areas for Improvement
A. The facility has a policy on Standard Precautions which includes selection and use of PPE (e.g., indications, donning/doffing procedures).	○ Yes ○ No	Click here to enter text.
B. The facility has a policy on Transmission-based Precautions that includes the clinical conditions for which specific PPE should be used (e.g., *C. difficile,* Influenza).	○ Yes ○ No	Click here to enter text.
C. Appropriate personnel receive job-specific training and competency validation on proper use of PPE at the time of employment.	○ Yes ○ No	Click here to enter text.
D. Appropriate personnel received job-specific training and competency validation on proper use of PPE within the past 12 months.	○ Yes ○ No	Click here to enter text.
E. The facility routinely audits (monitors and documents) adherence to PPE use (e.g., adherence when indicated, donning/doffing). *Note: If yes, facility should describe auditing process and provide documentation of audits*	○ Yes ○ No	Click here to enter text.
F. The facility provides feedback to personnel regarding their PPE use. *Note: If yes, facility should describe feedback process and provide documentation of feedback reports*	○ Yes ○ No	Click here to enter text.
G. Supplies necessary for adherence to proper PPE use (e.g., gloves, gowns, masks) are readily accessible in resident care areas (i.e., nursing units, therapy rooms).	○ Yes ○ No	Click here to enter text.

VI. Respiratory Hygiene/Cough Etiquette		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
A. The facility has signs posted at entrances with instructions to individuals with symptoms of respiratory infection to: cover their mouth/nose when coughing or sneezing, use and dispose of tissues, and perform hand hygiene after contact with respiratory secretions?	O Yes O No	Click here to enter text.
B. The facility provides resources for performing hand hygiene near the entrance and in common areas.	O Yes O No	Click here to enter text.
C. The facility offers facemasks to coughing residents and other symptomatic persons upon entry to the facility.	O Yes O No	Click here to enter text.
D. The facility educates family and visitors to notify staff and take appropriate precautions if they are having symptoms of respiratory infection during their visit?	O Yes O No	Click here to enter text.
E. All personnel receive education on the importance of infection prevention measures to contain respiratory secretions to prevent the spread of respiratory pathogens	O Yes O No	Click here to enter text.

VII. Antibiotic Stewardship		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
A. The facility can demonstrate leadership support for efforts to improve antibiotic use (antibiotic stewardship).	O Yes O No	Click here to enter text.
B. The facility has identified individuals accountable for leading antibiotic stewardship activities	O Yes O No	Click here to enter text.
C. The facility has access to individuals with antibiotic prescribing expertise (e.g. ID trained physician or pharmacist).	O Yes O No	Click here to enter text.
D. The facility has written policies on antibiotic prescribing.	O Yes O No	Click here to enter text.
E. The facility has implemented practices in place to improve antibiotic use.	O Yes O No	Click here to enter text.
F. The facility has a report summarizing antibiotic use from pharmacy data created within last 6 months. *Note: Report could include number of new starts, types of drugs prescribed, number of days of antibiotic treatment) from the pharmacy on a regular basis*	O Yes O No	Click here to enter text.
G. The facility has a report summarizing antibiotic resistance (i.e., antibiogram) from the laboratory created within the past 24 months.	O Yes O No	Click here to enter text.
H. The facility provides clinical prescribers with feedback about their antibiotic prescribing practices. *Note: If yes, facility should provide documentation of feedback reports*	O Yes O No	Click here to enter text.

VII. Antibiotic Stewardship, continued		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
I. The facility has provided training on antibiotic use (stewardship) to all nursing staff within the last 12 months.	○ Yes ○ No	Click here to enter text.
J. The facility has provided training on antibiotic use (stewardship) to all clinical providers with prescribing privileges within the last 12 months.	○ Yes ○ No	Click here to enter text.

VIII. Injection Safety and Point of Care Testing		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
A. The facility has a policy on injection safety which includes protocols for performing finger sticks and point of care testing (e.g., assisted blood glucose monitoring, or AMBG).	○ Yes ○ No	Click here to enter text.
B. Personnel who perform point of care testing (e.g., AMBG) receive training and competency validation on injection safety procedures at time of employment. *Note: If point of care tests are performed by contract personnel, facility should verify that training is provided by contracting company*	○ Yes ○ No	Click here to enter text.
C. Personnel who perform point of care testing (e.g., AMBG) receive training and competency validation on injection safety procedures within the past 12 months. *Note: If point of care tests are performed by contract personnel, facility should verify that training is provided by contracting company*	○ Yes ○ No	Click here to enter text.
D. The facility routinely audits (monitors and documents) adherence to injection safety procedures during point of care testing (e.g., AMBG). *Note: If yes, facility should describe auditing process and provide documentation of audits*	○ Yes ○ No	Click here to enter text.
E. The facility provides feedback to personnel regarding their adherence to injection safety procedures during point of care testing (e.g., AMBG). *Note: If yes, facility should describe feedback process and provide documentation of feedback reports*	○ Yes ○ No	Click here to enter text.
F. Supplies necessary for adherence to safe injection practices (e.g., single-use, auto-disabling lancets, sharps containers) are readily accessible in resident care areas (i.e., nursing units).	○ Yes ○ No	Click here to enter text.
G. The facility has policies and procedures to track personnel access to controlled substances to prevent narcotics theft/drug diversion.	○ Yes ○ No	Click here to enter text.

IX. Environmental Cleaning

Elements to be assessed	Assessment	Notes/Areas for Improvement
A. The facility has written cleaning/disinfection policies which include routine and terminal cleaning and disinfection of resident rooms.	O Yes O No	Click here to enter text.
B. The facility has written cleaning/disinfection policies which include routine and terminal cleaning and disinfection of rooms of residents on contact precautions (e.g., *C. difficile)*.	O Yes O No	Click here to enter text.
C. The facility has written cleaning/disinfection policies which include cleaning and disinfection of high-touch surfaces in common areas.	O Yes O No	Click here to enter text.
D. The facility cleaning/disinfection policies include handling of equipment shared among residents (e.g., blood pressure cuffs, rehab therapy equipment, etc.).	O Yes O No	Click here to enter text.
E. Facility has policies and procedures to ensure that reusable medical devices (e.g., blood glucose meters, wound care equipment, podiatry equipment, and dental equipment) are cleaned and reprocessed appropriately prior to use on another patient. *Note: If external consultants (e.g., wound care nurses, dentists or podiatrists) provide services in the facility, the facility must verify these providers have adequate supplies and space to follow appropriate cleaning/disinfection (reprocessing) procedures to prevent transmission of infectious agents* *Note: Select <u>not applicable</u> for the following:* *1. All medical devices are single use only or dedicated to individual residents* *2. No procedures involving medical devices are performed in the facility by staff or external consultants* *3. External consultants providing services which involve medical devices have adequate supplies that no devices are shared on-site and all reprocessing is performed off-site*	O Yes O No O Not Applicable	Click here to enter text.
F. Appropriate personnel receive job-specific training and competency validation on cleaning and disinfection procedures at the time of employment. *Note: If environmental services are performed by contract personnel, facility should verify that training is provided by contracting company*	O Yes O No	Click here to enter text.

IX. Environmental Cleaning, continued		
Elements to be assessed	**Assessment**	**Notes/Areas for Improvement**
G. Appropriate personnel received job-specific training and competency validation on cleaning and disinfection procedures within the past 12 months. *Note: If environmental services are performed by contract personnel, facility should verify that training is provided by contracting company*	O Yes O No	Click here to enter text.
H. The facility routinely audits (monitors and documents) quality of cleaning and disinfection procedures. *Note: If yes, facility should describe auditing process and provide documentation of audits*	O Yes O No	Click here to enter text.
I. The facility provides feedback to personnel regarding the quality of cleaning and disinfection procedures. *Note: If yes, facility should describe feedback process and provide documentation of feedback reports*	O Yes O No	Click here to enter text.
J. Supplies necessary for appropriate cleaning and disinfection procedures (e.g., EPA-registered, including products labeled as effective against *C. difficile* and Norovirus) are available. *Note: If environmental services are performed by contract personnel, facility should verify that appropriate EPA-registered products are provided by contracting company*	O Yes O No	Click here to enter text.

Section 3: Direct Observation of Facility Practices (optional)

Certain infection control lapses (e.g., reuse of syringes on more than one patient or to access a medication container that is used for subsequent patients; reuse of lancets) can result in bloodborne pathogen transmission and should be halted immediately. Identification of such lapses warrants appropriate notification and testing of potentially affected patients.

Point of Care Testing Observations (e.g., assisted blood glucose monitoring)					
HH performed	**Clean gloves worn**	**Single use, lancet used?[1]**	**Testing meter[2]**	**Gloves removed[3]**	**HH performed[3]**
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No
○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Dedicated to resident, cleaned/disinfected before storing ○ Cleaned/disinfected before next resident	○ Yes ○ No	○ Yes ○ No

Notes: [1]*Lancet holder devices (e.g., lancing penlets) are not suitable for multi-patient use.*
[2] *If the manufacturer does not provide instructions for cleaning and disinfection, then the testing meter should not be used for >1 patient.*
[3]*Gloves should be changed and HH performed before assisting the next resident with POCT.*

Hand Hygiene and Contact Precautions Observations				
Staff type*	**Type of opportunity**	**HH performed?**	**Gown or glove indicated?**	**Gown/glove used?**
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither
Click here to enter text.	○ Room entry ○ Room exit ○ Before resident contact ○ After resident contact ○ Before glove ○ After glove ○ Other: Click here to enter text.	○ Alcohol-rub ○ Hand Wash ○ No HH done	○ Gown only ○ Glove only ○ Both ○ No	○ Gown used ○ Glove used ○ Both ○ Neither

***Staff key: MD= Physician, PA= Physician assist., NP= Advanced practice nurse, RN=Registered nurse, LPN=Licensed practice nurse, CNA=Certified nurse aide or assist., REHAB= Rehabilitation staff (e.g. physical, occupational, speech), DIET=Dietary staff, EVS=Environmental services or housekeeping staff, SW = Social worker, UNK = Unknown/unable to determine**

Indwelling Urinary Catheter (IUC) Maintenance Observations (i.e., Foley)											
Indication assessed regularly [1]	Indication appropriate [2]	HH before handling IUC	Clean gloves donned before handling IUC	Bag < 2/3 full	Bag below bladder	Unobstructed flow	Device secured properly	Bag emptied properly [3]	Specimen collected properly [4]	Gloves Removed after handling IUC	HH after handling IUC
○ Yes ○ No ○ NA*	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA

**NA = Not assessed*

[1] On-going need for IUC is assessed for appropriateness and indication is documented in medical records per facility policy

[2] See: https://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf Table 2A for list of appropriate indications for IUC and more information regarding appropriate maintenance

[3] Clean container is used to catch urine and spigot does not come into contact with container; Additional PPE (e.g., face shields, gown) should be worn per facility policy to prevent body fluid exposure

[4] HH is performed and clean gloves worn to manipulate IUC sample collection port, port is cleaned with alcohol prior to access, specimen is collected using blunt syringe, leur lock syringe, or 10 cc syringe; specimen not obtained from the collection bag

Comments: Click here to enter text.

Central Venous Catheter (CVC) Maintenance Observations

NOTE: May be referred to as Central Line and includes PICC line

Indication appropriate [1]	CVC maintenance performed regularly [2]	Dressing clean, dry and intact	Dressing dated [3]	HH performed before handling CVC	Clean gloves donned before handling CVC	CVC connected and disconnected aseptically	CVC hub scrubbed [4]	CVC hub allowed to dry	Unused CVC ports are capped	CVC accessed with sterile devices only	Gloves removed after handling CVC	HH after handling CVC
○ Yes ○ No ○ NA*	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA

**NA = Not assessed*

[1] Refer to http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf for recommendations on CVC maintenance (e.g., appropriate indications)

[2] Appropriate maintenance should include documentation of the following in the medical record: date and site of insertion, assessment of on-going need for CVC, and frequency of dressing changes and replacement of system components (e.g., catheter tubing, connectors) per facility policy

[3] Dressing should be labeled with date changed and be within timeframe for routine dressing changes per facility policy

[4] Procedure for "Scrub the Hub": Hub is handled aseptically (i.e., ensuring hub does not touch anything non-sterile) while port cap is removed and discarded; Appropriate antiseptic pad (e.g., 70% alcohol, chlorohexidine) is used to scrub end and sides (threads) of hub thoroughly applying friction for 10 to 15 seconds; Catheter line is disinfected several centimeters toward resident's body using same antiseptic pad to apply friction; Hub is left open "uncapped" shortest time possible. See http://www.cdc.gov/dialysis/PDFs/collaborative/Hemodialysis-Central-Venous-Catheter-STH-Protocol.pdf and http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf for further guidance

Comments: Click here to enter text.

Wound Dressing Change Observations

All supplies are gathered before dressing change [1]	HH performed before dressing change	Clean gloves donned before dressing change [2]	Multi-dose wound care meds are used appropriately [3]	Dressing change performed in manner to prevent cross-contamination [4]	Gloves removed after dressing change completed	HH performed after dressing change completed	Reusable equipment cleaned and/or disinfected appropriately [5]	Clean, unused supplies discarded or dedicated to one resident	Wound care performed /assessed regularly [6]	Wound care supply cart is clean [7]
○ Yes ○ No ○ NA*	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA
○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA	○ Yes ○ No ○ NA

**NA = Not assessed*

[1] Dedicated wound dressing change supplies and equipment should be gathered and accessible on a clean surface at resident's bedside before starting procedure

[2] Additional PPE (e.g., face mask/face shield, gown) should be worn to prevent body fluids exposure per facility policy

[3] Multi-dose wound care medications (e.g., ointments, creams) should be dedicated to a single resident whenever possible or a small amount of medication should be aliquoted into clean container for single-resident use; Meds should be stored properly in centralized location and never enter a resident treatment area

[4] Gloves should be changed and HH performed when moving from dirty to clean wound care activities (e.g., after removal of soiled dressings, before handling clean supplies); Debridement or irrigation should be performed in a way to minimize cross-contamination of surrounding surfaces from aerosolized irrigation solution; All soiled dressing supplies should be discarded immediately

[5] In addition to reusable medical equipment, any surface in the resident's immediate care area contaminated during a dressing change should be cleaned and disinfected; Any visible blood or body fluid should be removed first with a wet, soapy cloth then disinfected with an EPA-registered disinfectant per manufacturer instructions and facility policy; Surfaces/equipment should be visibly saturated with solution and allowed to dry for proper disinfection before reuse

[6] Wound care documentation should include wound characteristics (e.g., size, stage), dressing assessment (e.g., clean, dry), and date and frequency of dressing changes; Wound care is documented in medical records per facility policy

[7] Wound care supply cart should never enter the resident's immediate care area nor be accessed while wearing gloves or without performing HH first. These are important to preventing cross-contamination of clean supplies and reiterates the importance of collecting all supplies prior to beginning wound care.

Comments: Click here to enter text.

Section 4: Infection Control Guidelines and Other Resources

- **General Infection Prevention**

  - ☐ CDC Infection Prevention Resources for Long-term Care: http://www.cdc.gov/longtermcare
  - ☐ CDC/HICPAC Guidelines and recommendations: http://www.cdc.gov/HAI/prevent/prevent_pubs.html
  - ☐ CMS State Operations Manual, Appendix PP, Released Nov 2014 (IC Guidance on pages 182-220): https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/Downloads/R127SOMA.PDF

- **Healthcare Personnel Safety**

  - ☐ Guideline for Infection Control in Healthcare Personnel: http://www.cdc.gov/hicpac/pdf/InfectControl98.pdf
  - ☐ Immunization of HealthCare Personnel: http://www.cdc.gov/vaccines/adults/rec-vac/hcw.html
  - ☐ CDC Influenza Vaccination Tool-kit for Long-term Care Employers: http://www.cdc.gov/flu/toolkit/long-term-care/index.htm
  - ☐ Occupational Safety & Health Administration (OSHA) Bloodborne Pathogen and Needlestick Prevention Standard: https://www.osha.gov/SLTC/bloodbornepathogens/index.html

- **Hand Hygiene**

  - ☐ Guideline for Hand Hygiene in Healthcare Settings: http://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf
  - ☐ Hand Hygiene in Healthcare Settings: http://www.cdc.gov/handhygiene

    Examples of Hand Hygiene Auditing Tools:

    - ☐ Measuring Hand Hygiene Adherence: Overcoming the Challenges: http://www.jointcommission.org/assets/1/18/hh_monograph.pdf
    - ☐ iScrub: http://compepi.cs.uiowa.edu/index.php/Research/IScrub

- **Personal Protective Equipment**

  - ☐ 2007 Guidelines for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings: http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html
  - ☐ Management of Multi-Drug Resistant Organisms in Healthcare Settings, 2006: http://www.cdc.gov/hicpac/pdf/guidelines/MDROGuideline2006.pdf
  - ☐ Guidance for the Selection and Use of Personal Protective Equipment in Healthcare Settings: http://www.cdc.gov/HAI/prevent/ppe.html
  - ☐ CDC Sequence for Donning and Removing Personal Protective Equipment: http://www.cdc.gov/hai/pdfs/ppe/PPE-Sequence.pdf

- **Respiratory Hygiene/Cough Etiquette**
  - ☐ 2007 Guidelines for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings: http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html
  - ☐ Respiratory Hygiene and Cough Etiquette in Healthcare Settings: http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm
  - ☐ Recommendations for preventing the spread of influenza: http://www.cdc.gov/flu/professionals/infectioncontrol/
- **Antimicrobial stewardship**
  - ☐ CDC Implementation Resources for Antibiotic Stewardship: http://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
- **Safe Injection and Point of Care Testing Practices**
  - ☐ 2007 Guidelines for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings: http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html
  - ☐ CDC Injection Safety Web Materials: http://www.cdc.gov/injectionsafety
  - ☐ CDC training video and related Safe Injection Practices Campaign materials: http://oneandonlycampaign.org
  - ☐ Infection Prevention during Blood Glucose Monitoring and Insulin Administration: http://www.cdc.gov/injectionsafety/blood-glucose-monitoring.html
  - ☐ Frequently Asked Questions (FAQs) regarding Assisted Blood Glucose Monitoring and Insulin Administration: http://www.cdc.gov/injectionsafety/providers/blood-glucose-monitoring_faqs.html
- **Environmental Infection Control**
  - ☐ Guidelines for Environmental Infection Control in Healthcare Facilities: http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_HCF_03.pdf
  - ☐ EPA Listing of disinfectant products with sporicidal activity against *C. difficile*: https://www.epa.gov/sites/production/files/2016-06/documents/list_k_clostridium.pdf
  - ☐ Options for Evaluating Environmental Infection Control: http://www.cdc.gov/HAI/toolkits/Evaluating-Environmental-Cleaning.html
- **Resources to assist with evaluation and response to breaches in infection control**
  - ☐ Patel PR, Srinivasan A, Perz JF. Developing a broader approach to management of infection control breaches in health care settings. Am J Infect Control. 2008 Dec; 36(10); 685-90 http://www.ajicjournal.org/article/S0196-6553(08)00683-4/abstract
  - ☐ Steps for Evaluating an Infection Control Breach: http://www.cdc.gov/hai/outbreaks/steps_for_eval_IC_breach.html
  - ☐ Patient Notification Toolkit: http://www.cdc.gov/injectionsafety/pntoolkit/index.html

Assessment Summary

Click to update summary tables | Spell Check | Create new file with summary tables

I. Infection Control Program and Infrastructure
Notes/Recommendations: Click here to enter text.

II. Healthcare Personnel and Resident Safety
Notes/Recommendations: Click here to enter text.

III. Surveillance and Disease Reporting
Notes/Recommendations: Click here to enter text.

IV. Hand Hygiene
Notes/Recommendations: Click here to enter text.

V. Personal Protective Equipment (PPE)
Notes/Recommendations: Click here to enter text.

VI. Respiratory/ Cough Etiquette
Notes/Recommendations: Click here to enter text.

VII. Antibiotic Stewardship
Notes/Recommendations: Click here to enter text.

VIII. Injection safety and Point of Care Testing
Notes/Recommendations: Click here to enter text.

IX. Environmental Cleaning

Notes/Recommendations: Click here to enter text.

Follow Up Activities:
☐ Repeat on-site assessment planned (date: Click here to enter a date.)
☐ Repeat remote (phone/email) assessment planned (date: Click here to enter a date.)
☐ Other (specify): Click here to enter text.

Other Comments:
Click here to enter text.

Click to hide/collapse summary tables that are unchecked below
(Please allow one minute to complete)

☐ IC Program and Infrastructure ☐ HCP Safety
☐ Surveillance/Reporting ☐ Hand Hygiene ☐ PPE
☐ Respiratory Etiquette ☐ Antibiotic Stewardship
☐ Injection Safety/POC Testing ☐ Environmental Cleaning

The Core Elements of

Antibiotic Stewardship for Nursing Homes

CHECKLIST

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

DEPARTMENT OF HEALTH & HUMAN SERVICES·USA
CDC

CS273578-A

Checklist for Core Elements of Antibiotic Stewardship in Nursing Homes

The following checklist is a companion to the Core Elements of Antibiotic Stewardship in Nursing Homes. The CDC recommends that all nursing homes take steps to implement antibiotic stewardship activities. Before getting started, use this checklist as a baseline assessment of policies and practices which are in place. Then use the checklist to review progress in expanding stewardship activities on a regular basis (e.g., annually). Over time, implement activities for each element in a step-wise fashion.

LEADERSHIP SUPPORT	ESTABLISHED AT FACILITY	
1. Can your facility demonstrate leadership support for antibiotic stewardship through one or more of the following actions? If yes, indicate which of the following are in place (select all that apply) ❑ Written statement of leadership support to improve antibiotic use ❑ Antibiotic stewardship duties included in medical director position description ❑ Antibiotic stewardship duties included in director of nursing position description ❑ Leadership monitors whether antibiotic stewardship policies are followed ❑ Antibiotic use and resistance data is reviewed in quality assurance meetings	❑ Yes	❑ No
ACCOUNTABILITY		
2. Has your facility identified a lead(s) for antibiotic stewardship activities? If yes, indicate who is accountable for stewardship activities (select all that apply) ❑ Medical director ❑ Director or assistant director of nursing services ❑ Consultant pharmacist ❑ Other:________________________________	❑ Yes	❑ No
DRUG EXPERTISE		
3. Does your facility have access to individual(s) with antibiotic stewardship expertise? If yes, indicate who is accountable for stewardship activities (select all that apply) ❑ Consultant pharmacy has staff trained/is experienced in antibiotic stewardship ❑ Partnering with stewardship team at referral hospital ❑ External infectious disease/stewardship consultant ❑ Other:________________________________	❑ Yes	❑ No
ACTIONS TO IMPROVE USE		
4. Does your facility have policies to improve antibiotic prescribing/use? If yes, indicate which policies are in place (select all that apply) ❑ Requires prescribers to document a dose, duration, and indication for all antibiotic prescriptions ❑ Developed facility-specific algorithm for assessing residents ❑ Developed facility-specific algorithms for appropriate diagnostic testing (e.g., obtaining cultures) for specific infections ❑ Developed facility-specific treatment recommendations for infections ❑ Reviews antibiotic agents listed on the medication formulary ❑ Other:________________________________	❑ Yes	❑ No

5. Has your facility implemented practices to improve antibiotic use? ❑ Yes ❑ No

If yes, indicate which practices are in place (select all that apply)

- ❑ Utilizes a standard assessment and communication tool for residents suspected of having an infection
- ❑ Implemented process for communicating or receiving antibiotic use information when residents are transferred to/from other healthcare facilities
- ❑ Developed reports summarizing the antibiotic susceptibility patterns (e.g., facility antibiogram)
- ❑ Implemented an antibiotic review process/"antibiotic time out"
- ❑ Implemented an infection specific intervention to improve antibiotic use
  Indicate for which condition(s):___________________________________

6. Does your consultant pharmacist support antibiotic stewardship activities? ❑ Yes ❑ No

If yes, indicate activities performed by the consultant pharmacist (select all that apply)

- ❑ Reviews antibiotic courses for appropriateness of administration and/or indication
- ❑ Establishes standards for clinical/laboratory monitoring for adverse drug events from antibiotic use
- ❑ Reviews microbiology culture data to assess and guide antibiotic selection

TRACKING: MONITORING ANTIBIOTIC PRESCRIBING, USE, AND RESISTANCE

7. Does your facility monitor one or more measures of antibiotic use? ❑ Yes ❑ No

If yes, indicate which of the following are being tracked (select all that apply)

- ❑ Adherence to clinical assessment documentation (signs/symptoms, vital signs, physical exam findings)
- ❑ Adherence to prescribing documentation (dose, duration, indication)
- ❑ Adherence to facility-specific treatment recommendations
- ❑ Performs point prevalence surveys of antibiotic use
- ❑ Monitors rates of new antibiotic starts/1,000 resident-days
- ❑ Monitors antibiotic days of therapy/1,000 resident-days
- ❑ Other:____

8. Does your facility monitor one or more outcomes of antibiotic use? ❑ Yes ❑ No

If yes, indicate which of the following are being tracked (select all that apply)

- ❑ Monitors rates of *C. difficile* infection
- ❑ Monitors rates of antibiotic-resistant organisms
- ❑ Monitors rates of adverse drug events due to antibiotics
- ❑ Other:____

REPORTING INFORMATION TO STAFF ON IMPROVING ANTIBIOTIC USE AND RESISTANCE

9. Does your facility provide facility-specific reports on antibiotic use and outcomes with clinical providers and nursing staff? ❑ Yes ❑ No

If yes, indicate which of the following are being tracked (select all that apply)

- ❑ Measures of antibiotic use at the facility
- ❑ Measures of outcomes related to antibiotic use (i.e., *C. difficile* rates)
- ❑ Report of facility antibiotic susceptibility patterns (within last 18 months)
- ❑ Personalized feedback on antibiotic prescribing practices (to clinical providers)
- ❑ Other:____

EDUCATION

10. Does your facility provide educational resources and materials about antibiotic resistance and opportunity for improving antibiotic use? ❑ Yes ❑ No

If yes, indicate which of the following are being tracked (select all that apply)

- ❑ Clinical providers (e.g., MDs, NPs, PAs, PharmDs)
- ❑ Nursing staff (e.g., RNs, LPNs, CNAs)
- ❑ Residents and families
- ❑ Other:____

Infection Control Risk Assessment
Matrix of Precautions for Construction & Renovation

Step One:

Using the following table, *identify* the Type of Construction Project Activity (Type A-D)

TYPE A	**Inspection and Non-Invasive Activities**. Includes, but is not limited to: ▪ removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet ▪ painting (but not sanding) ▪ wallcovering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
TYPE B	**Small scale, short duration activities which create minimal dust** Includes, but is not limited to: ▪ installation of telephone and computer cabling ▪ access to chase spaces ▪ cutting of walls or ceiling where dust migration can be controlled.
TYPE C	**Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies** Includes, but is not limited to: ▪ sanding of walls for painting or wall covering ▪ removal of floorcoverings, ceiling tiles and casework ▪ new wall construction ▪ minor duct work or electrical work above ceilings ▪ major cabling activities ▪ any activity which cannot be completed within a single workshift.
TYPE D	**Major demolition and construction projects** Includes, but is not limited to: ▪ activities which require consecutive work shifts ▪ requires heavy demolition or removal of a complete cabling system ▪ new construction.

Step 1____

Steps 1-3 Adapted with permission V Kennedy, B Barnard, St Luke Episcopal Hospital, Houston TX; C Fine, CA
Steps 4-14 Adapted with permission Fairview University Medical Center, Minneapolis MN
Forms modified and provided courtesy of J Bartley, ECSI Inc ,Beverly Hills MI 2002

Step Two:

Using the following table, ***identify* the Patient Risk Groups** that will be affected.
If more than one risk group will be affected, select the higher risk group:

Low Risk	Medium Risk	High Risk	Highest Risk
▪ Office areas	▪ Cardiology ▪ Echocardiography ▪ Endoscopy ▪ Nuclear Medicine ▪ Physical Therapy ▪ Radiology/MRI ▪ Respiratory Therapy	▪ CCU ▪ Emergency Room ▪ Labor & Delivery ▪ Laboratories (specimen) ▪ Newborn Nursery ▪ Outpatient Surgery ▪ Pediatrics ▪ Pharmacy ▪ Post Anesthesia Care Unit ▪ Surgical Units	▪ Any area caring for immunocompromised patients ▪ Burn Unit ▪ Cardiac Cath Lab ▪ Central Sterile Supply ▪ Intensive Care Units ▪ Medical Unit ▪ Negative pressure isolation rooms ▪ Oncology ▪ Operating rooms including C-section rooms

Step 2____

Step Three: Match the

Patient Risk Group (***Low, Medium, High, Highest***) with the planned **…**
Construction Project Type (***A, B, C, D***) on the following matrix, to find the **…**
Class of Precautions (***I, II, III or IV***) or level of infection control activities required.

Class I-IV or Color-Coded Precautions are delineated on the following page.

IC Matrix - Class of Precautions: Construction Project by Patient Risk

Construction Project Type

Patient Risk Group	TYPE A	TYPE B	TYPE C	TYPE D
LOW Risk Group	I	II	II	III/IV
MEDIUM Risk Group	I	II	III	IV
HIGH Risk Group	I	II	III/IV	IV
HIGHEST Risk Group	II	III/IV	III/IV	IV

Note: Infection Control approval will be required when the Construction Activity and Risk Level indicate that **Class III** or **Class IV** control procedures are necessary.

Step 3____

Description of Required Infection Control Precautions by Class

	During Construction Project	Upon Completion of Project
CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection	1. Clean work area upon completion of task.
CLASS II	1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Place dust mat at entrance and exit of work area 6. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being perfomed.
CLASS III	1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Contain construction waste before transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape covering unless solid lid.	1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. 2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed.
CLASS IV	1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Seal holes, pipes, conduits, and punctures appropriately. 5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site. 6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area. 7. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department.	1. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction. 2. Contain construction waste before transport in tightly covered containers. 3. Cover transport receptacles or carts. Tape covering unless solid lid 4. Vacuum work area with HEPA filtered vacuums. 5. Wet mop area with disinfectant. 6. Remove isolation of HVAC system in areas where work is being performed.

Step 4. **Identify the areas surrounding the project area, assessing potential impact**

Unit Below	Unit Above	Lateral	Lateral	Behind	Front
Risk Group	Risk Group	Risk Group	Risk Group	Risk Group	Risk Group

Step 5. **Identify specific site of activity eg, patient rooms, medication room, etc.**

____

Step 6. **Identify issues related to: ventilation, plumbing, electrical in terms of the occurrence of probable outages**.

____

Step 7. **Identify containment measures, using prior assessment. What types of barriers? (Eg, solids wall barriers); Will HEPA filtration be required?**

____

(Note: Renovation/construction area shall be isolated from the occupied areas during construction and shall be negative with respect to surrounding areas)

Step 8. **Consider potential risk of water damage. Is there a risk due to compromising structural integrity? (eg, wall, ceiling, roof)**

Step 9. **Work hours: Can or will the work be done during non-patient care hours?**

Step 10. **Do plans allow for adequate number of isolation/negative airflow rooms?**

Step 11. **Do the plans allow for the required number & type of handwashing sinks?**

Step 12. **Does the infection control staff agree with the minimum number of sinks for this project?**
(Verify against AIA Guidelines for types and area)

Step 13. **Does the infection control staff agree with the plans relative to clean and soiled utility rooms?**

Step 14. **Plan to discuss the following containment issues with the project team. Eg, traffic flow, housekeeping, debris removal (how and when),**

____
____
____

Appendix: Identify and communicate the responsibility for project monitoring that includes infection control concerns and risks. The ICRA may be modified throughout the project. Revisions must be communicated to the Project Manager.

Steps 1-3 Adapted with permission V Kennedy, B Barnard, St Luke Episcopal Hospital, Houston TX ; C Fine, CA
Steps 4-14 Adapted with permission Fairview University Medical Center, Minneapolis MN
Forms modified and provided courtesy of J Bartley, ECSI Inc Beverly Hills MI 2002

Infection Control Construction Permit

	Permit No:
Location of Construction:	Project Start Date:
Project Coordinator:	Estimated Duration:
Contractor Performing Work	Permit Expiration Date:
Supervisor:	Telephone:

YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Low Risk
		TYPE B: Small scale, short duration, moderate to high levels			GROUP 2: Medium Risk
		TYPE C: Activity generates moderate to high levels of dust, requires greater 1 work shift for completion			GROUP 3: Medium/High Risk
		TYPE D: Major duration and construction activities Requiring consecutive work shifts			GROUP 4: Highest Risk

Class	Requirements	
CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection.	3. Minor Demolition for Remodeling
CLASS II	1. Provides active means to prevent air-borne dust from dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Wipe surfaces with disinfectant.	6. Contain construction waste before transport in tightly covered containers. 7. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 8. Place dust mat at entrance and exit of work area. 9. Remove or isolate HVAC system in areas where work is being performed.
CLASS III **Date** **Initial**	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Env. Services Dept.	6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with disinfectant 8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 9. Contain construction waste before transport in tightly covered containers. 10. Cover transport receptacles or carts. Tape covering. 11. Remove or isolate HVAC system in areas where work is being performed/
Class IV **Date** **Initial**	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Seal holes, pipes, conduits, and punctures appropriately. 6. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.	7. All personnel entering work site are required to wear shoe covers 8. Do not remove barriers from work area until completed project is thoroughly cleaned by the Environmental Service Dept. 9. Vacuum work area with HEPA filtered vacuums. 10. Wet mop with disinfectant. 11. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 12. Contain construction waste before transport in tightly covered containers. 13. Cover transport receptacles or carts. Tape covering. 14. Remove or isolate HVAC system in areas where is being done.

Additional Requirements:

___________ Date Initials	______________ Exceptions/Additions to this permit Date Initials are noted by attached memoranda
Permit Request By:	Permit Authorized By:
Date:	Date:

Competency Self-Assessment and Professional Development Plan

For proficient and advanced infection preventionists.

Rating Scale: 1. Novice knowledge/skills 2. Approaching proficiency 3. Fully proficient 4. Approaching advanced 5. Advanced/expert

Name: ___________________________________

Date: ___________________________________

Competency categories, integrating both the APIC and CBIC domains	IP practice areas as identified in CBIC practice analysis	Describe how/to what extent these areas are addressed in current IP role (or specify N/A)	Assessment of personal competency in each practice area	Professional development plan to advance competency in the domain
Identification of infectious disease processes (CBIC)	1. Differentiate among colonization, infection and contamination 2. Identify occurrences, reservoirs, incubation periods, periods of communicability, modes of transmission, signs and symptoms, and susceptibility associated with the disease process 3. Interpret results of diagnostic/lab reports 4. Recognize limitations and advantages of types of tests used to diagnose infectious processes 5. Recognize epidemiologically significant organisms for immediate review and investigation 6. Differentiate among prophylactic, empiric, and therapeutic uses of antimicrobials 7. Identify indications for microbiologic monitoring		1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5	
Surveillance and epidemiologic investigation (CBIC)	1.Design of surveillance systems 2. Collection and compilation of surveillance data 3. Outbreak investigation		1 2 3 4 5 1 2 3 4 5 1 2 3 4 5	
Future-oriented domain (APIC): Technical	Example: electronic surveillance systems, access to/use of electronic databases/electronic data warehouse (EDW), other related applications, algorithmic detection and reporting processes, clinical	If no prior experience, ask: How do I anticipate practicing in the next three to five years? What new knowledge/skills will be required?		

Competency Self-Assessment and Professional Development Plan
For proficient and advanced infection preventionists.

Rating Scale: 1. Novice knowledge/skills 2. Approaching proficiency 3. Fully proficient 4. Approaching advanced 5. Advanced/expert

	decision support, infection prevention within the electronic health record			
Preventing/controlling the transmission of infectious agents (CBIC)	1. Develop and review infection prevention and control policies and procedures 2. Collaborate with public health agencies in planning community responses to biologic agents 3. Identify and implement infection prevention and control strategies according to specific topics: • Hand hygiene • Cleaning, disinfection and sterilization • Specific direct and indirect care settings • Therapeutic and diagnostic procedures and devices • Product/equipment recall procedures • Use of solation/barrier precautions when indicated • Patient placement, transfer, discharge • Environmental hazards • Use of patient care products and medical equipment • Patient immunization programs • Construction and renovation • Influx of patients with communicable diseases		1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5	
Future-oriented domain (APIC): Infection prevention and control	Examples: ability to apply and use surveillance data and reports, advanced statistical methods and tools, including application of the standard infection ratio, risk assessment, hazard vulnerability analysis, use and evaluation of emerging	**If no prior experience, ask: How do I anticipate practicing in the next three to five years? What new knowledge/skills will be required?**		

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Competency Self-Assessment and Professional Development Plan

For proficient and advanced infection preventionists.

Rating Scale: 1. Novice knowledge/skills 2. Approaching proficiency 3. Fully proficient 4. Approaching advanced 5. Advanced/expert

	prevention practices for patient care, diagnostic methods, participation in antimicrobial stewardship programs			
Management and communication (leadership) (CBIC)	1.Planning 2.Communication and feedback 3.Quality/performance improvement and patient safety		1 2 3 4 5 1 2 3 4 5 1 2 3 4 5	
Future-oriented domain (APIC): Leadership and program management	Examples: leads integration of prevention activities within and across departments, high level negotiation skills, financial/value analysis of programs and related projects, relationship management, ability to influence and persuade up to and including executive level, team and consensus building within and across stakeholder groups	**If no prior experience, ask: How do I anticipate practicing in the next three to five years? What new knowledge/skills will be required?**		
Education and research (CBIC)	1.Education 2. Research		1 2 3 4 5 1 2 3 4 5	
Future-oriented domain (APIC): Performance Improvement and Implementation Science	Examples: leads performance improvement (PI) teams for institution/system, develops interprofessional competencies, applies translational research methods, uses advanced PI tools/methods, focus on reliability and sustainability	**If no prior experience, ask: How do I anticipate practicing in the next three to five years? What new knowledge/skills will be required?**		
Employee/occupational health (CBIC)	1.Review and/or develop screening and immunization programs 2.Proivde counseling, follow-		1 2 3 4 5	

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	up, work restriction recommendations related to communicable diseases or following exposures 3.Assist with analysis and trending of occupational exposure incidents and information exchange between occupational health and infection prevention and control departments		1 2 3 4 5 1 2 3 4 5	

Assumptions:

- Once CBIC certification has ben achieved, competency is highly individualized and technically complex. It is driven by multiple factors, including educational opportunities, practice setting, and personal interests. Because competency is highly personalized and develops across the career span, no infection preventionist (IP) is expected to be “advanced” in most/all areas at any particular time. The goal is to identify areas for individual improvement so that professional development becomes a lifelong endeavor.
- The core competencies identified by CBIC and the future oriented domains added by APIC are complementary and not mutually exclusive categories. By integrating them into one comprehensive self-assessment, the IP will be better prepared to address both immediate and evolving professional demands.
- Core competencies as identified by CBIC remain relevant across the career span but their implementation evolves as proficiency increases. Therefore, assessment of core competencies for proficient and advanced IPs focuses on how these skills are applied and the extent to which the IP is able to utilize them to foster program development and to assist others in their prevention efforts.
- The future-oriented domains described by APIC build on the core competencies. The content may at times appear to overlap. However, the future oriented domains attempt to identify those skills not yet included in the CBIC practice analysis but which, based on observation and professional consensus, are expected to be essential for IP practice in the next three to five years.

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Risk Assessment for Infection and Prevention

Chapter 1 – Performing a Risk Assessment

Risk: The One Constant in Health Care

Any time human beings participate in a complex process with multiple inputs and outputs, risks abound. Health care is no exception. Despite medical breakthroughs and an ever-expanding knowledge base, the spread of infection remains one of the greatest risks in health care today. Health care–associated infections (HAIs) combined with related issues such as emerging infectious diseases, pandemics, and the threat of bioterrorism all combine to make infection prevention and control (IPC) a top priority in organizations across the spectrum of care.

Each year, nearly 2 million Americans contract an infection while they are in the hospital being treated for another condition or illness. An estimated 99,000 of these patients die as a result.[1] The problem extends beyond geographic boundaries. A World Health Organization (WHO) sampling of 55 hospitals in 14 countries showed hospitals in the Eastern Mediterranean and South-East Asia regions reported high frequencies of HAIs.[2] In Mexico, a one-day survey in 254 adult intensive care units (ICUs) found that 23% of the patients developed HAIs.[3] As many as 10% of patients admitted to modern hospitals and 15% to 40% of those admitted to critical care units in developed countries will acquire one or more infections.[4] Infections result in increased lengths of stay, longer recovery times, and increased treatment costs, but HAIs represent more than just numbers. The human dimension of this public health crisis is that people suffer needlessly, experience diminished quality of life, and, sometimes, must contend with lasting damage.

If 30% to 35% of most HAIs are preventable,[5] then why are urinary tract infections, surgical site infections, pneumonia, and bloodstream infections so common?[1] The answer is not as simple as patients are weak or already sick, or that microorganisms have become resistant to drugs. Those are significant factors—but so are issues such as hand hygiene, effective cleaning and disinfection of equipment and the areas where patients receive care, appropriate staffing, and use of personal protective equipment (PPE). This is the crux: Halting infections requires identifying and tackling risks on many fronts. Yet, a recent survey of hospitals found that nearly 87% of those organizations were not following recommended guidelines to prevent many of the most common HAIs.[6]

The broad scope of this problem means that infection prevention programs are complex by their very natures and must involve staff in virtually every department and service of an organization. This requires that everyone in an organization work together to protect patients. In addition, practices that can lead to infection are diverse, each with its own set of issues. In order to take on these issues effectively, a high-caliber IPC risk assessment is crucial. Organizations must identify infection risks in order to put plans, processes, procedures, and programs in place to address, eliminate, or counteract the effects of these risks. The risk-assessment process involves determining the potential risks or negative consequences of an action or situation, evaluating the extent of those risks, and deciding whether to accept, mitigate, or avoid those risks. That is the very focus of this book—mitigating infection prevention and control risk points based on extrinsic risk factors such as geography, intrinsic risk factors such as antibiotic resistance, patient-related risks such as age, staff-related issues such as hand hygiene compliance, environmental risk factors, and so forth.

Performing risk assessments in health care is important for many reasons, including strengthening patient and staff safety, improving efficiency, identifying training issues, developing hypotheses, justifying needs, and avoiding adverse events such as sentinel events. The following sections provide an overview of Joint Commission risk-assessment activities and take a brief look at the reasons to perform risk assessments. Sidebar 1-1 on page 34 discusses the five most prevalent infection control challenges that your organization may encounter during your risk assessment.

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The Joint Commission Guidelines

HAIs are a critically important issue for patient safety and quality of care. The Joint Commission accredits more than 17,000 health care organizations and programs, and HAIs are a significant and daily risk in all of the care settings encompassed in this group. For this reason, The Joint Commission makes infection prevention and control a component of both its accreditation standards and its National Patient Safety Goals requirements.

The risk assessment is the cornerstone upon which an organization's IPC program is built (see Figure 1-1 on page 35). Although organizations conduct a risk assessment to meet Joint Commission and Joint Commission International requirements, many reasons beyond accreditation should motivate organizations to perform this process.

Using Risk Assessments to Improve Patient and Staff Safety

One of the most important reasons to conduct a risk assessment is to identify, mitigate, and resolve threats to patient and staff safety, thus improving safety across organizations. Every risk assessment affects patient and staff safety in some way. The ways in which a risk assessment improves patient and staff safety depend on the type of risk assessment and whether it can directly or indirectly protect patients and staff. For example, an infection risk assessment can help protect patients from the most common types of infection in your organization—from MDROs to ventilator–associated pneumonia. A safety risk assessment that involves a process, such as storing sharps at the bedside, can eliminate a possible patient or workplace injury. A medical equipment risk assessment may reveal that use of a particular device is related to increased infection rates and could result in patient harm if not addressed.

TIP Components of a Comprehensive IPC Program

Effective IPC requires an integrated, responsive program that is characterized by collaboration between disciplines, services, and settings throughout a health care organization. The design and scope of an IPC program should be based on the level of risk that an organization faces related to the acquisition and transmission of infectious disease. The ultimate goal of an IPC program is to reduce the risk of acquisition and transmission of infection. To meet this goal, The Joint Commission and JCI accreditation standards require several concrete actions. The actions are spelled out in accreditation standards detailed in Chapter 2 (not included).

Using Risk Assessments to Improve Efficiency

Just because organizations have processes in place does not mean that those processes are efficient. Many times organizations engage in activities in a particular way just because they have always done them that way. By conducting risk assessments, organizations can identify processes that are inefficient and ineffective and determine potential ways to improve efficiency, accuracy, and appropriateness.

Using Risk Assessments to Identify Training Issues

Risk assessments can also be used as valuable training tools because they identify hazards, build awareness about potentially negative situations, and suggest resolutions to those situations. For example, the IPC risk assessment can be used to discuss specific issues within the organization or within particular units or areas, building awareness about potential problems and the programs that are in place to reduce risks.

Organizations also use risk assessments to guide their education programs, because they show areas where further education is needed to achieve safe delivery of care. For example, the infection prevention and control risk assessment may identify the need for further staff training on hand hygiene or on protocols, such as elevating the head of the bed for patients on ventilators. Such an assessment could identify gaps in staff knowledge and areas that need improvement.

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Sidebar 1-1: Five Most Prevalent Infection Prevention and Control Challenges

What are the five most prevalent infection control challenges facing health care organizations? Consider the following challenges identified by an international infection control expert and how these ideas fit into current infection control strategies at your organization:

Antibiotic Resistance and Multidrug-Resistant Organisms
Antibiotic resistance and spread of multidrug-resistant organisms (MDROs) have been increasing: Some organisms have developed more toxic strains (*Clostridium difficile*, for example), and others (methicillin-resistant *Staphylococcus aureus* [MRSA], for example) have emerged as serious community pathogens, beyond their prevalence in acute care settings. The science, recommendations, and preferences for controlling these MDROs vary.

Public Reporting of Infection Rates and Selected Infections and Organisms
The rising interest in and requirements for transparency of infection control data and regulations for reporting of infection rates are causing organizations to look carefully at their processes for data collection, validation, and analysis. Requirements for what is to be reported and how this should occur vary widely. Infection prevention and control professionals are working to develop enhanced systems to meet the requirements.

Accomplishing the Expanded Functions of Infection Prevention
The infection prevention and control professional's role has expanded to include patient safety, emergency management, more risk management, and other responsibilities, but frequently a corresponding increase in resources to support these requirements has not occurred.

The Movement to Target Zero Infections
Infection prevention and control professionals have always worked to achieve the lowest level of infection possible. Recent research has demonstrated that it is possible to reduce infections in much greater measure than previously thought possible. Infection prevention and control professionals are working diligently in collaboratives or in single organizations or systems to improve patient safety with reduced infection rates.

Increasing Visibility and Requirements for Infection Prevention Programs
Infection prevention and control has become more visible in recent years. Consumers are more knowledgeable, and influential consumer advocate groups have emerged; technology has made information more available; legislators are creating more requirements; accrediting organizations are developing more directive standards and recommendations; payers are eliminating payment for some infections; and the media's interest has driven change.

Source: Joint Commission Resources: Ask the expert. *The Joint Commission Perspectives on Patient Safety* 8:4-5, Jul. 2008.

Using Risk Assessments to Develop Hypotheses
Risk assessments also can be used to evaluate questions or situations in which no clear answer is apparent. Typically, the actions of health care organizations are guided by regulations, best practices, lessons learned, and so forth; however, situations may occur in which no such tools exist. A risk assessment can help probe for information about a question or situation and identify potential solutions. It can help organizations make an educated guess and at least start down the road toward a solution.

Consider this example: A nurse calls a safety manager to ask if the ICU can store sterile unused needles or sharps at the bedside. This sounds like a bad idea because of all the traffic in the ICU; however, no Joint Commission standards or other regulations state that nurses cannot store sharps at the bedside. In addition, no best practice

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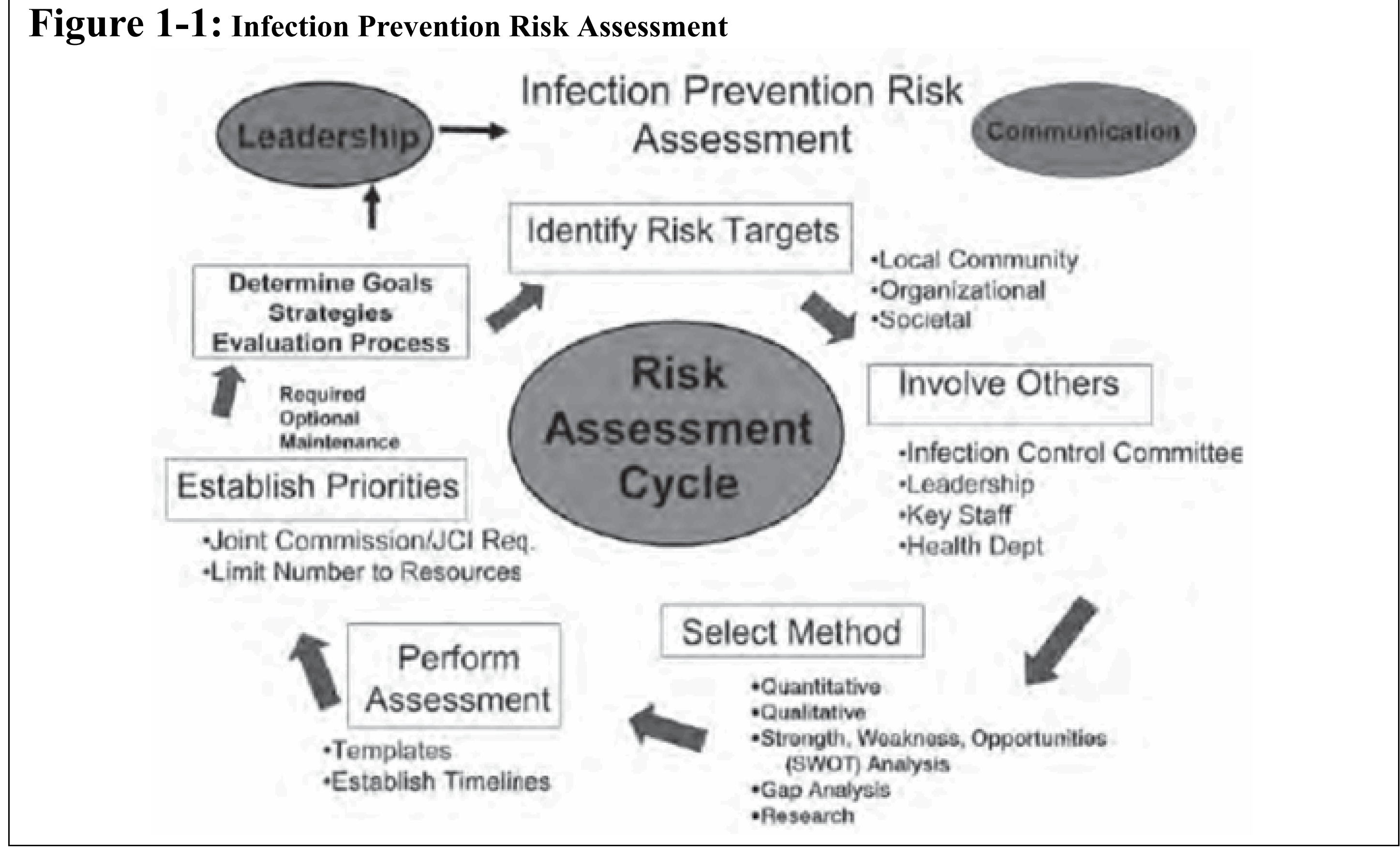
Figure 1-1: **Infection Prevention Risk Assessment**



TIP **Questions for IPC Risk Assessment**

- Has the organization performed an infection control risk assessment?
- Have key staff participated?
- Is there a consistent template?
- Are priorities clear?
- Is leadership supportive?
- Have the results been distributed?

Source: Soule B: A Risk-Based Approach to Infection Prevention: Creating an Infection Prevention and Control Plan. In Soule B, Arias K (eds.): *The API/JCR Infection Prevention and Control Workbook*. Oakbrook Terrace, IL: The Joint Commission, 2010.

information is available on the concept, and the organization has not dealt with this issue before. So, the safety manager conducts a risk assessment to ascertain the potential risks associated with storing sharps at the bedside and also the potential benefits to staff.

After weighing the pros and cons, the safety manager decides to allow the storage of sharps at the bedside but determines the issue will need to be closely monitored. If any incidents occur because a patient, child, or visitor accesses these unsecured sharps, this process will change immediately. All parties agree. The safety manager assigns a representative from the ICU to attend the monthly safety committee meetings to report the status. The organization documents the process through the minutes of the safety committee. Every month the ICU nurse manager reports to the safety committee to discuss how the process is going. By using a proactive risk-assessment process, the organization is able to address a question confidently, knowing that all the positives and negatives associated with that question have been considered.

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TIP Geography Affects Risk

Infection risks vary across the globe. Consider the following examples:

- Malaria in the southeast United States
- Hantavirus in the southwest United States
- Legionella in the southern United States
- West Nile, widespread from east to west in United States
- Nosocomial cholera, measles, hepatitis B, and infectious diarrhea in developing nations
- Tuberculosis in parts of Africa, Asia, Latin America, and the Middle East
- Viral haemorrhagic fevers in Africa
- Methicillin-resistant *Staphylococcus aureus* in the United States and the Mediterranean region

Using Risk Assessments to Justify a Need

Almost all organizations must contend with limited resources. The risk assessment process can help the IPC department demonstrate to leadership why new staff, increased training, space for isolation rooms, and so forth are needed and the potential consequences of not addressing such requests. Risk assessments focus attention on a need and its consequences and provide a clear solution to address that need.

The Consequences of Not Performing Risk Assessments

Ultimately, if organizations do not perform risk assessments adequately, the inaction can lead to serious consequences. For example, organizations that do not properly manage infection risks may face Centers for Medicare & Medicaid Services (CMS) violations; Joint Commission and JCl accreditation problems; adverse and sentinel events; and, for U.S. hospitals, nonpayment for hospital-acquired conditions (HACs) such as surgical site infections (SSIs).

Failing to address infection risks can have other more immediate effects for individual patients. For example, a patient who needs a central line and acquires a health care-associated bloodstream infection via the central line would, at least, require a longer period of treatment with antibiotics, possibly within the hospital, and, at worst, might die of the infection or other causes exacerbated by the infection. In the case of *Clostridium difficile*–associated diarrhea, a reasonably healthy person hit by this disease might be forced to stay a bit longer in the hospital; however, an elderly person might require prolonged nursing home care and may never regain his or her previous state of health. Infections such as ventilator-associated pneumonia (VAP) are serious whenever they occur, and mortality is high.

TIP Geography Affects Risk

Performing risk assessments is important for many reasons, including the following:

- Improving patient safety
- Improving staff safety
- Improving efficiency
- Identifying staff training issues
- Developing hypotheses for anticipating potential risks
- Justifying a need for implementing new infection prevention and control activities or continuing current activities
- Avoiding potentially adverse events

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Joint Commission and JCI Requirements

Through the standards, The Joint Commission requires organizations to conduct a variety of different risk assessments.* The Joint Commission and JCl both require performing a risk assessment for infection. The Joint Commission standard, which is discussed in detail in Chapter 2 (not included), states that "the organization identifies risks for acquiring and transmitting infections." JCI has a similar requirement that states, "The organization designs and implements a comprehensive program to reduce the risks of health care-associated infections in patients and health care workers."

Risk assessments generally begin with an analysis of risks that are obvious to the IPC team and organization leadership. The team should remember to consider events that might occur but are not fully known or understood. Examples of such events include an influenza pandemic or an outbreak of an infection of unknown etiology. Review the current literature to learn about new science, studies, and outbreaks that should be considered as potential risks to the organization. Scientific literature and reports from agencies such as the Centers for Disease Control (CDC), the WHO, state departments of health, ministries of health, and international agencies can alert organizations to future risk scenarios.

Documentation Required for Risk Assessment

Joint Commission and JCI standards require that organizations document their risk assessment, but do not specify any particular type of documentation that organizations must use. Risk assessments can be documented through established forms or spreadsheets that organizations create, like those often used in the hazard vulnerability analysis (HVA) process to identify potential emergencies and their effects. Or the assessments can be as simple as drawing a line down the middle of a piece of paper and listing the pros of a project or process on one side and the cons on the other.

Documentation can be very useful in the risk-assessment process because it helps establish the steps involved in the process and records the results in a consistent manner (see Figure 1-2, page 17 [not included]). Documentation also helps maintain consistency in the risk-assessment process, so that every time a particular type of risk assessment is conducted, this is done the same way. Documentation also can be used to illustrate an organization's work on an issue. For example, if a surveyor is assessing compliance during an on-site survey and sees a questionable activity, such as storing sharps at the bedside, the organization can prove to the surveyor it conducted a proactive risk assessment and considered the possible hazards associated with the issue. By providing the documentation, the organization can show its work and help the surveyor understand the organization's approach.

* The Joint Commission standards referenced in this book are 2010 accreditation standards and are subject to change. Please reference your current accreditation manual. Joint Commission International Standards were excerpted from *Joint Commission International Accreditation Standards for Hospitals*, *4th Edition.*

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Chapter 3 – Using the Risk Assessment to Set Goals and Develop the Infection Prevention and Control Plan

Using the Risk Assessment

Conducting a risk assessment is a crucial task for health care organizations, but identifying risks, compiling them into an assessment, tucking the assessment into a binder, and declaring the job "done" is not the point of the process. The risk assessment should serve as the basis for developing written goals and measurable objectives for the infection control program. In other words, the assessment is the foundation of every organization's infection prevention plan. This chapter provides information about Joint Commission and JCI requirements related to setting goals to minimize the possibility of transmitting infections. It gives specific guidance on developing an infection prevention and control plan.

Setting the Goals

The Joint Commission's Infection Prevention and Control (IC) standards require organizations to use the risk assessment process to set goals for a comprehensive infection control plan. Specifically, Standard IC.01.04.01 states, "Based on the identified risks, the [organization] sets goals to minimize the possibility of transmitting infections."

The standard includes these elements of performance:
The organization's written infection prevention and control goals include the following (EPs 1-5):

1. Addressing its prioritized risks.
2. Limiting unprotected exposure to pathogens.
3. Limiting the transmission of infections associated with procedures.
4. Limiting the transmission of infections associated with the use of medical equipment, devices, and supplies.
5. Improving compliance with hand hygiene guidelines

Joint Commission International (JCI) accreditation standards also require organizations to establish goals for their infection prevention and control program. Standard PCI.5 requires organizations to "design and implement a comprehensive program to reduce the risks of health care-associated infections in patients and health care workers." Measurable Element 6 of that standard states: "Risk reduction goals and measurable objectives are established and regularly reviewed." International organizations should use their risk assessment to guide the program and set appropriate goals.

When determining the goals, organizations may want to look at the mission statement for the year as a starting point. The Joint Commission standard's five elements of performance (EPs) also describe the minimum goals that organizations should incorporate into the plan. As discussed in Chapter 2 (not included), prioritizing risks as part of the assessment process is important to determine where to focus infection prevention and control (IPC) resources. The emphasis should be on using resources wisely to address the risks that have the most serious potential for harm. By linking goals to the highest priorities identified in the risk assessment, an organization is moving from knowing about potential problems to working to prevent them. For example, if the organization identifies the incidence of Vancomycin-resistant *enterococci* (VRE) as a significant risk, staff should set a goal to reduce the incidence and take action to meet that goal. The main focus for each goal is a measurable objective, an action plan, and an evaluation process to determine if the objective has been met. Sidebar 3-1 on page 40 provides a list of organizations that offer best practices and guidelines that may be used when setting goals and developing the IPC plan.

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* The Joint Commission standards referenced in this book are 2010 accreditation standards and are subject to change. Please reference your current accreditation manual. Joint Commission International Standards were excerpted from *Joint Commission International Accreditation Standards for Hospitals*, *4th Edition.*

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Limiting Unprotected Exposure to Pathogens

After addressing prioritized risks, the second part of the ICP goal-setting process should include limiting unprotected exposure to pathogens. This EP refers to the strategies organizations use to protect patients, residents, staff, visitors, and others from contact with potentially infectious organisms. The use of personal protective equipment (PPE) falls into this category. PPE provides a physical barrier to reduce the risk of transmitting pathogens, to prevent exposure to potentially infectious material, and to reduce cross-contamination during patient care activities. PPE includes gloves to protect hands, gowns to protect clothing and skin, surgical masks to protect the mouth and nose, respirators to protect the respiratory tract from airborne pathogens, goggles to protect the eyes, and face shields to protect the eyes, mouth, and nose.[1] Staff should not have to search for PPE; leaders should ensure through the goal-setting process that PPE is readily and easily available in an organization. Leaders should also work with infection prevention and control personnel to make sure the right types of PPE are being used for infection prevention and control. Isolation, engineering controls for tuberculosis (TB) and other infections, barriers during construction, safety hoods in the laboratory, and special preparation areas in the pharmacy for mixing intravenous fluids also would be appropriate topics or issues within the goal-setting process. In addition, use of aseptic technique and hand hygiene fall within this category.

Other measures designed to limit exposure to pathogens include the following: Airborne infection isolation rooms: Also called negative pressure isolation rooms, these are patient-care rooms designed for one patient that are used to isolate individuals who may have an airborne infectious disease.[2]

Waterborne pathogens precautions: Organizations should take steps to ensure their facility's water supply does not become contaminated, including water in cooling towers, domestic hot and cold water systems, and aerosolizing water systems. For example, health care organizations report 600 to 1,300 water-related *Legionella pneumophila* infections every year. Water systems must be properly designed, installed, and maintained. The Joint Commission recommends organizations work with design professionals who adhere to American Society of Heating, Refrigerating, and Air-Conditioning Engineers and American Institute of Architects guidelines. Organizations should also follow the CDC'S *Guidelines for Environmental Infection Control in Health Care*.[2]

Bloodborne pathogens precautions: PPE, discussed above, is a key method of preventing exposure to bloodborne pathogens. Organizations should be aware of and adhere to U.S. Occupational Safety and Health Administration Standards (OSHA) related to bloodborne pathogens. Among other precautions, OSHA requires that frontline health care workers be involved in selecting devices that have engineered sharps safety protection and that all available safety devices be used unless there is a patient or employee safety issue associated with the device. The CDC offers resources on some ways organizations can prevent exposure to bloodborne pathogens here: http://www.cdc.gov/ncidod/dhqp/bp.html.[9]

Limiting Transmission of Infections Associated with Procedures

Minimizing the risk of transmitting infections associated with procedures is a crucial component of the goal-setting process. This includes procedures used to diagnose, improve, or maintain health.

Invasive procedures such as surgery, for example, carry significant infection risks. Risks for surgical site infections (SSIs) vary according to factors such as the following:

- Health of the patient
- Duration of the procedure
- State of the wound (clean or dirty)

For example, a healthy patient having clean hernia repairs has a relatively low risk for SSI, as compared to a trauma patient requiring bowel surgery.

Surgical site infections (SSIs) are among the most frequently occurring types of HAIs, globally, according to the World Health Organization (WHO). Surgical site infections have been shown to compose up to 20% of all of healthcare-associated infections.

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Sidebar 3-1: Use Best Practices, Guidelines

Health care organizations should consider best practices and guidelines for combating infections. Following is a list of organizations that provide resources:

U.S. Government Accountability Office
The U.S. Government Accountability Office (GAO) has issued a series of reports on HAIs. An October 2008 report addressed state reporting programs and individual hospital initiatives to reduce these deadly infections, and a report released in April 2008 urged the U.S. Department of Health and Human Services (HHS) to establish greater consistency and compatibility of the data gathered on HAIs. In the latter report on necessary leadership, GAO recommended that HHS prioritize the large number of CDC-recommended practices in order to promote greater implementation.

A Compendium of Strategies to Prevent Health Care-Associated Infections in Acute Care Hospitals
The compendium, issued in October 2008, provides practical, science-based strategies to prevent six health care–associated infections. These six HAIs are catheter-associated bloodstream infections, catheter-associated urinary tract infections, *Clostridium difficile*, MRSA, surgical site infections, and ventilator-associated pneumonia (VAP).

The compendium was produced by SHEA and the Infectious Diseases Society of America (IDSA), in partnership with the American Hospital Association (AHA), APIC, and The Joint Commission. Publication of the compendium was an important component in the development of The Joint Commission's National Patient Safety Goal on HAIs, which includes MDROs, central line-associated bloodstream infections, and surgical site infections.[1] The strategies, which have also received the support or endorsement of 29 other health care and safety-related organizations, will be updated by infection control experts at SHEA and IDSA as science evolves.

These strategies are science-based and offer practical steps for all levels of health care personnel, especially those working directly with patients in acute care hospitals, to prevent infections. The compendium includes numerous guidelines that have addressed infection control for many years; it also includes information on newer research to identify the best scientific strategies to prevent HAIs. The strategies are presented in a concise format for the six HAIs, they are implementation focused, and they prioritize recommendations based on the strength of evidence, the consensus of a multidisciplinary panel of experts, and the intensity of resources required for implementation. Also included are recommended performance measures for internal quality improvement efforts. Recommendations contained in the compendium are prioritized into two categories:

1. Minimum basic practices that should be adopted by all acute care hospitals
2. Special approaches for use in locations and/or populations within the hospitals when infections are not controlled using basic practices

Although the compendium is based on previous recommendations and current research, it represents an improvement over previous documents for several reasons.

First, compendium recommendations are written in a much clearer and more concise manner than previous guidelines; the information is not new, but the presentation of the information is unique. "In developing these strategies, we looked at all existing HAI guidelines and literature to create recommendations that are understandable, easy-to-use, and stress accountability," said David Classen, IDSA spokesperson and coauthor of the compendium.[1] Second, the compendium not only offers best practices for hospitals to follow in their fight against HAIs, but it also provides hospitals with advice on which approaches not to pursue. In addition, although it represents a compilation of current research and evidence-based recommendations, it is

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Sidebar 3-1: Use Best Practices, Guidelines (continued)

distinguished from previous guidelines because it presents practical recommendations using an implementation-focused format. As the compendium's lead author and SHEA spokesperson, Dr. Deborah S. Yoke, states, "Healthcare providers' goal is to offer the best and safest patient care possible. Not all HAIs are preventable, but it is imperative that we implement practices that we know are effective to prevent as many of these infections as possible."[1] Lastly, the compendium takes a two-tiered approach by recommending special approaches when first-line basic strategies are not successful in lowering infection rates.

The Association of periOperative Registered Nurses

The Association of periOperative Registered Nurses (AORN) is a national association committed to improving patient safety in the surgical setting. AORN is the premier resource for perioperative nurses, advancing the profession and the professional with valuable guidance as well as networking and resource-sharing opportunities. AORN promotes safe patient care and is recognized as an authority for safe operating room practices and a definitive source for information and guiding principles that support day-to-day perioperative nursing practice.

The Association of periOperative Registered Nurses (AORN) mission is to promote safety and optimal outcomes for patients undergoing operative and other invasive procedures by providing practice support and professional development opportunities to perioperative nurses. AORN collaborates with professional and regulatory organizations, industry leaders, and other health care partners who support the mission. Annually, AORN publishes its Perioperative Standards and Recommended Practices on the following topics:

- Hand Hygiene
- Electrosurgery
- Minimally Invasive Surgery
- Environment of Care
- Transfer of Patient Care Information
- Standards of Perioperative Nursing

Association for the Advancement of Medical Instrumentation

The Association for the Advancement of Medical Instrumentation (AAMI), a nonprofit organization founded in 1967, is an alliance of nearly 6,000 members from around the world dedicated to increasing the understanding and beneficial use of medical instrumentation through standards and educational programs.

The AAMI standards program consists of over 100 technical committees and working groups that produce Standards, Recommended Practices, and Technical Information Reports for medical devices. Standards and Recommended Practices represent a national consensus and many have been approved by the American National Standards Institute (ANSI) as American National Standards. AAMI also administers a number of international technical committees of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), as well as U.S. Technical Advisory Groups (TAGs).

Reference:

1. The Joint Commission: New tool in the tight against health care–associated infections. *Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals*. http://www.jcrinc.com/New-Tool-in-the-Fight-Against-Health-Care-Associated-Infections/ (accessed Feb. 1, 2010).

With approximately 27 million surgical procedures performed in the United States each year,[3] the number of SSIs are also on the rise, with patients "opened up" for surgery exposed to risks that bacteria will be introduced into the blood, tissues, and organs.[4] An estimated 290,000 patients acquire SSIs each year, accounting for 14% to 16% of all health care-acquired infections.[3,4,6]

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To comply with the Joint Commission EP, goals and related policies and procedures to limit the risk of transmitting infections should be established for all surgical care service areas, including preoperative, perioperative, and postoperative settings. This EP recognizes that settings where invasive procedures are performed require constant vigilance from the IPC team to ensure that effective policies and practices are being carried out. These settings can include, but are not limited to the following:

- Interventional radiology
- Endoscopy and bronchoscopy settings
- Chemotherapy
- Anesthesia
- Dialysis

Goals Related to Infections Associated with Equipment, Devices, Supplies

The use of medical equipment, devices, and supplies is also part of the infection prevention and control goal-setting process and a specific EP. This includes safe use of medical devices such as IV needles and tubing, bronchoscopes, and ventilators; storage of supplies; reuse of single-use devices; managing equipment and sterile supplies, and so forth. The goals and associated policies related to cleanliness, disinfection, sterilization, storage, and transport of equipment, sterile supplies, and single-use devices should be reviewed and approved by the IPC committee. Compliance with infection prevention practices should be monitored as delegated by the organization.

Goals Related to Improving Hand Hygiene Compliance

Improving compliance with hand hygiene guidelines is the final EP for this standard; this is also a National Patient Safety Goal requirement for all accredited organizations. The JCI standard that addresses hand hygiene does so in concert with other important precautions. Standard PCI.9 states, “Gloves, masks, eye protection, other protective equipment, soap, and disinfectants are available and used correctly when required.” The measurable elements include provisions related to hand hygiene and other IPC precautions, including the following:

1. The organization identifies those situations for which gloves and/or masks or eye protection are required.
2. Gloves and/or masks or eye protection are correctly used in those situations.
3. The organization identifies those situations for which hand washing and hand disinfection or surface disinfecting procedures are required.
4. Handwashing and hand disinfection procedures are used correctly in those areas.
5. The organization has adopted hand hygiene guidelines from an authoritative source.

International organizations also should comply with International Patient Safety Goal 5, Measurable Elements 2 and 3, which require organizations to adopt or adapt currently published and generally accepted hand hygiene guidelines, and implement an effective hand hygiene program.

Hand hygiene cannot be overestimated as an infection prevention and control measure. Goals and objectives related to hand hygiene can include a specified increase in hand hygiene compliance, improved hand hygiene technique, and improved accessibility to hand hygiene products. Strategies to improve hand hygiene compliance are discussed in Chapter 6.[6] (not included)

Including Objectives to Make Goals Measurable

As discussed at the beginning of this chapter, goals are the general, non-measurable statements that establish intent, direction, and board parameters for the desired achievements of an infection control program.[7] By adding objectives to goals, organizations move beyond communicating intent to incorporating specific numeric targets and timeframes or outcomes. For example, a hospital might set a goal that the IPC program will reduce catheter-related bloodstream infections. This goal becomes an objective by stating that the such infections in the medical intensive care unit (MICU) will be reduced by 30% from the previous year’s incidence rate and by a certain date.

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The following are examples of goals and objectives [8,9]:

Goal: Reduce VAP in MICU
Objective: Reduce VAP by 50% or more—from 1.4/1,000 ventilator days to 0.7/1,000 ventilator days in the medical MICU by June 2011. Achieve zero VAPs for minimum of 3 months by January 2011 in MICU. Perform daily assessment of need for ventilators documented for 98% MICU ventilated patients by January 2011.

Goal: Decrease sharps injuries in employees
Objective: Reduce needlestick injuries in direct care and support staff by at least 60% from current rate within six months. Reduce scalpel injuries in surgical staff by 80% from current rate with implementation of pass zone by June 2011.

Goal: Increase immunizations in organization
Objective: Identify and immunize at least 90% of eligible patients with pneumococcal vaccine by December 2011. Immunize 100% eligible staff in organization with influenza vaccine within six months of initiating a mandatory flu vaccine program.

Goal: Increase hand hygiene compliance
Objective: Achieve at least 95% compliance with hand hygiene policy on at least 80% of nursing units by October 2011.

Goal: Reduce transmission of infectious disease in the organization
Objective: Achieve at least 98% compliance with contact isolation policy for patients with MRSA and *Clostridium difficile* on all patient care units during 2011.

Goal: Prevent infection
Objective: Achieve a rate of at least 95% notifications to IPC before any construction, renovation, or alteration in facility for all appropriate (per policy) construction projects by March 2011.

Goal: Maintain consistent cleaning of reusable patient equipment in the intensive care units
Objective: Achieve at least 98% notification with appropriate cleaning procedures for reusable direct care patient equipment during patient stay and at discharge in the MICU, SICU, and NICU during 2011.

Goal: Prepare for the response to an influx or risk of influx of infectious patients
Objective: Meet at least 90% of Hospital Emergency Incident Command System (HEICS) plan requirements related to infectious patients during at least three drills in 2011. Goals and measurable objectives establish targets for performance improvement activities and allow the IPC program to evaluate progress and success or failure in these efforts. The established goals and objectives are then used to develop an infection prevention and control plan. IC.03.01.01requires organizations to evaluate goals; creating measurable objectives facilitates such an evaluation.

Developing and Assessing an Infection Prevention and Control Plan

Although The Joint Commission and JCI both require organizations to have an infection prevention and control program that takes into account their identified infection risks, many still do not have comprehensive or effective plans. For example, some organizations may focus excessively on hand hygiene, while others may view IPC as a static process and fail to take into account new risks.

The risk assessment and goal-setting processes required as part of accreditation are designed to give organizations the information needed to create a dynamic IPC plan that allows for a rapid response to changes and demands in the environment, such as emerging infectious diseases, new requirements for mandatory reporting of HAI information, new services, and construction projects. Figure 3-1, on page 44 shows this annual process.

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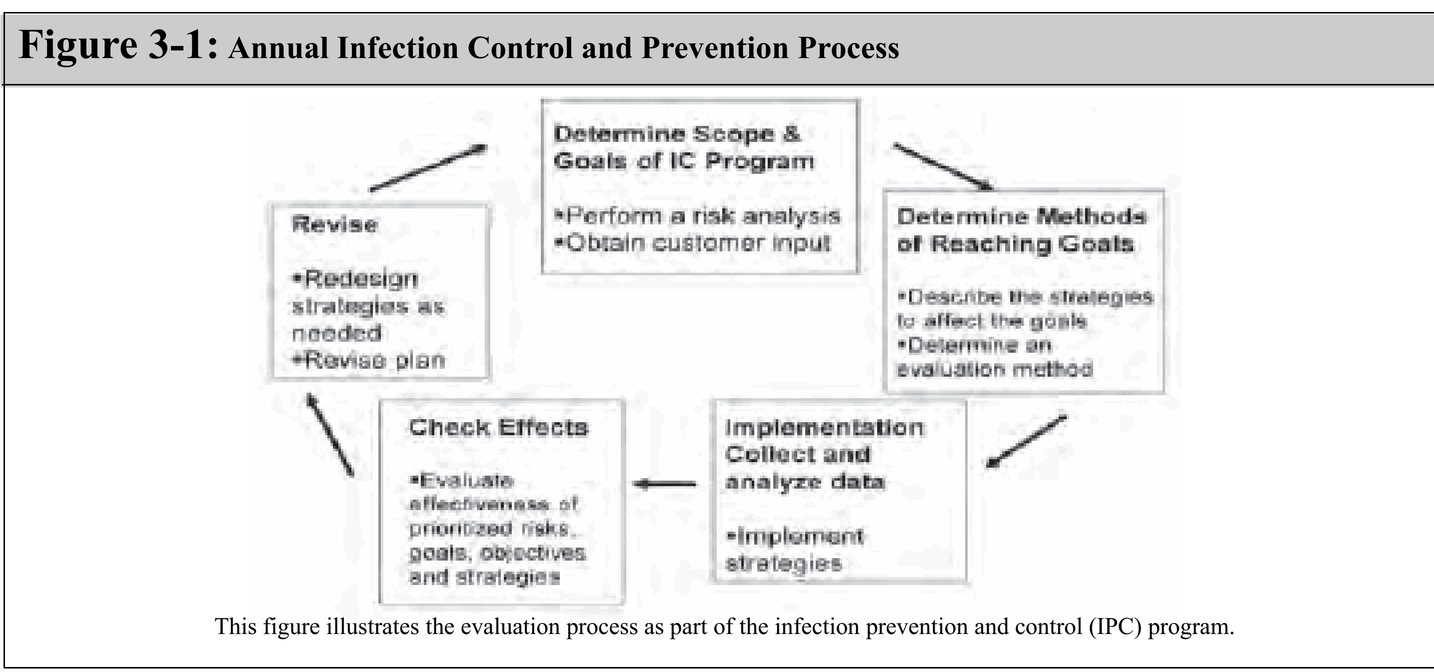
Organizations should also make sure that the IPC plan has an appropriate scope, covering not just patients but all individuals who interact with the organization. This includes associates, physicians, students, contract workers, volunteers, and others throughout the organization.

TIP Creating the Foundation

Every IPC plan should have a description of risks, a statement of goals, a description of strategies to address risks, and a description of how these strategies will be evaluated. These four components form the backbone of an organization's IPC plan and represent a continuous process improvement approach to managing infection risks. If any one of these components is missing, the organization will have put itself at risk for infection-related problems.

Using a multidisciplinary approach, the team developing an IPC plan should address issues such as the following:
- Effective management of the IPC program
- Infection risks and prevention and control strategies
- Evaluation process
- Occupational health
- Emergency planning
- Communication
- Applicable requirements of government, accrediting, and other organizations
- Leadership support and resources allocated

Figure 3-1: Annual Infection Control and Prevention Process



This figure illustrates the evaluation process as part of the infection prevention and control (IPC) program.

The concise plan should identify priorities and needs, set goals and objectives, list strategies to meet identified goals, and set out an evaluation process. The plan's background section—including mission, demographics, reporting structure, and so forth—is likely to stay relatively stable from year to year unless there are significant changes in the program.The action plan, with risk assessment priorities, goals, objectives, and so forth, is the area more likely to change during annual reviews. The plan may include or append narratives, policies and procedures, protocols, practice guidelines, clinical paths, care maps, or other relevant documents. Table 3-1, on page 45 offers content suggestions to consider when developing an IPC plan. Sidebar 3-2 on page 47 offer tips for writing the IPC plan.

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Table 3-1. **Suggested Content for an IPC Program Plan***

Background Information	• Information About the Organization Mission/Vision/Structure/ Processes of the IPC • Scope of Services • Staffing and Credentials • Decision Authority for IPC (Authority Statement) • Integration of IPC with Patient Safety and Performance Improvement • Committee Functions and Responsibilities • Education of Staff, Patients, and IPC Team • Consultation Services • Role in Emergency Preparedness and Management • Public Health Partnerships • Relationship with Occupational Health/Employee Health Regulatory Compliance • Specific Patient Care or Environmental Issues • Other Special Issues
Action Plan	• Risk Assessment Priorities • Goals and Objectives • Action Plans • Evaluation Methods • Responsible Persons
Supportive Documents	• Surveillance Plan • Outbreak Investigation • Education Plan • Key Procedures and Policies • Care Plans • Decision Algorithms
Other	• Research Activities • Performance Improvement Activities • Key Resources • Budget

Source: Barbara M. Soule, RN, MPA, CIC.

* Also see the sample IPC plan found in Appendix (not included), and in the online extras for this book at http://www.jcrinc.com/RAHS10/Extras.

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Joint Commission Standard IC.01.0501 requires organizations to have an infection prevention and control plan. Organizations accredited by Joint Commission International (JCI) also are required to establish priorities and activities to prevent and reduce the incidence of HAIs in standards PCI.3 and PCI.5. The IPC plan should have the following two sections:

- Background information about the program and services offered by the IPC department
- Annual action plan

The "background" part of the IPC plan establishes the foundation for the work that will be carried out throughout the organization. For example, the plan should include a mission or purpose as well as a vision. This might be a statement such as, "The infection prevention and control program minimizes risk of infection to promote a high quality of care, safety, and well-being in patients, staff, and visitors." Background information in the plan may include the following:

- Structure of the program: staff and roles, committees, authority of designated individuals, and so forth
- Scope of services: staff education and training, surveillance and outbreak investigation, provision of PPE and hygiene products, and so forth
- Use of scientific knowledge, practice guidelines, laws and regulations, and so forth

The second part of the IPC plan provides everyone in the organization with the details of what will be accomplished that year. This includes the goals, objectives, and evaluation process.

Sidebar 3-2: Writing an IPC Plan

To get started on writing the IPC plan, consider the following tips:

- Develop an outline and create a table of contents for the written IPC plan
- Identify the local, state, and federal regulations and other requirements (i.e., accreditation standards and IPC standards and guidelines) that are applicable to the specific health care setting
- Perform a risk assessment
- Establish and prioritize goals and develop measurable objectives
- Develop strategies to meet the IPC program's goals and objectives
- Establish mechanisms for evaluating the effectiveness of the IPC program
- Set up a system to be notified of any new services or procedures
- Develop a timeline and assign responsibility for periodically reviewing the plan
- Ask for review and comments from key personnel and revise, as needed
- Network with infection professionals who practice in similar health care settings to obtain and share information needed to develop and maintain the IPC program

Source: Soule B.M., Arias K.M. (eds): *The APIC/JCR Infection Control Workbook*, 2nd ed. Oakbrook Terrace, IL: Joint Commission Resources, 2010.

The following sections discuss Joint Commission and JCI standards related to developing an IPC plan. Sidebar 3-3 on page 49 addresses the need for strong leadership support for the IPC plan and activities. (See Table 3-2 on page 47 for an example of risks and possible solutions.)

Use of Evidence-Based Guidelines or Expert Consensus

Organizations should use evidence-based national guidelines or, in the absence of such guidelines, expert consensus when developing IPC activities. The Joint Commission and JCI both require organizations to use the most current scientific evidence and expert consensus thinking to update the IPC plan and program, which includes patient care, maintenance of the environment, staff safety, and so forth. These requirements can be found in Joint Commission Standard IC.01.05.01,EP 1, and JCI Standard PCI.3.

Written Description of Activities

The Joint Commission and JCI require that the organization's infection prevention and control plan include a written description of the activities, including surveillance, to minimize, reduce, or eliminate the risk of infection. By documenting activities, organizations make clear how the program's resources will be allocated and used. Putting the planned activities into writing also helps to emphasize the importance of the activities

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Table 3-2. **IPC Risks and Possible Solutions**

IPC Risk	Possible Solution
Health care-associated infection outbreak	Have a response plan in place that involves immediate response, education, and data monitoring
No risk assessment or risk priorities in the IPC plan	Work with a multidisciplinary team to identify risks, considering the organization's geographic location, community environment, patient populations, and services provided, as well as relevant surveillance data.
IPC plan does not reflect priorities	Revise plan to take into consideration identified risks. These priorities should be posted where IPC staff can easily see them. They should also be reviewed regularly.
No measurable objectives or evaluation of objectives for the IPC plan	Work with a multidisciplinary group to establish goals that reflect the organization's priorities. Data collection should allow for measuring how the organization meets these goals.
Lack of communication and collaboration between departments about IC issues	Establish IPC as an organizationwide program. Leadership from all aspects of an organization should be involved in IPC activities. If possible, IPC professionals should sit on committees throughout the organization.
Minimal data collection	Collect data that help identify risks, respond to issues, determine the effectiveness of IPC initiatives, and meet with local, state, and federal regulations.
Inadequate resources allocated to the IPC program	Dedicate sufficient resources to the IPC program. Using creative staffing solutions, such as hiring contract employees, may help with this issue.

Source: Joint Commission Resources: Part I: Assessing and addressing infection control risks: How does your organization measure up? *The Joint Commission: The Source*. 4:1-10, Sep. 2006.

and maintains focus for leadership and staff. To ensure that this written document can be used as intended, the plan should be written in a simple style that is understandable and accessible to the infection preventionists and other staff who will carry out the activities. Likewise, the JCI standard requires organizations to regularly review its risk-reduction goals and measurable objectives.

Each organization must design a surveillance program that takes into account its unique characteristics, populations, services, risks, and requirements. For example, surveillance activities in ambulatory settings that do not perform invasive procedures are focused on processes or practices such as the percentage of eligible patients who receive immunizations, compliance rates for hand hygiene, and assessment of environmental cleanliness. A hospital, for example, focuses surveillance on outcomes of care such as HAIs.

There is no nationally or internationally standardized method for identifying, collecting, managing, analyzing, and reporting data on infections, but the CDC's NHSN surveillance methodology and criteria are used by a variety of health care organizations and settings worldwide.[10] Surveillance definitions have been established for hospital,10 dialysis unit,10 long term care,[11] and home health care and home hospice settings.[12]

Evaluation of the IPC Plan

The Joint Commission standard that requires organizations to have an IPC plan includes an EP that the plan must contain a written description of the process for evaluating the goals and objectives that have been set out. Likewise, the JCI standard requires organizations to regularly review its risk-reduction goals and measurable objectives. This provides a mechanism to guide the evaluation process and encourages organizations to regularly

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reevaluate the plan. The evaluation process should be determined by the IPC committee, patient safety committee, and organization leadership and should be aligned with organizational performance evaluation methods.

The idea behind an evaluation of the IPC plan is to determine which activities of the program are effective and which activities should be changed to improve outcomes. Organizations should ask themselves: Have our interventions been correct? Have they been effective? Do we need to reevaluate and determine whether different interventions would be more appropriate? Does the risk analysis need to be conducted again? The following strategies offer guidance for answering these questions[13]:

- **Evaluate whether changes need to be made to the IPC program by consulting sources such as the CDC, WHO, international agencies, and other stakeholders regarding emerging diseases.** As previously discussed, organizations must conduct an evaluation of the IPC program at least annually and/or whenever risks change significantly and should use expert consensus or guidelines to develop interventions. For example, if a state experiences a whooping cough outbreak in the winter or an uptick in a pathogen such as measles, new guidelines and information from studies should be incorporated into organizational plans, policies, and procedures.
- **Reevaluate the effectiveness of the IPC plan if/when the scope of the organization's services changes.** When an organization changes the scope of its services, introducing new services or new sites of care, the organization should consider whether there are new infection risks. For example, if an organization adds a wing to provide cardiac care, a Level III neonatal intensive care unit, or a Level I high-risk trauma center, the organization may need to make adjustments to IPC protocols to protect patients in the new areas.
- **Use data collection and analysis to analyze the effectiveness of the IPC program.** For example, external comparisons (with other organizations) can be done against national benchmarks or published studies, and internal measurement (comparing the organization's performance over time) can also be conducted. Many organizations use some kind of statistical analysis tool for these purposes. Commonly used tools include run charts and control charts that permit statistical analysis of data points over time.
- **Open communication about IPC should be welcomed so that valuable feedback about the effectiveness of the plan and program can be obtained.** Organizations should ensure that staff feel comfortable voicing their concerns about infection control. This feedback can be gathered through tools such as surveys, focus groups, discussions, and hotlines. Whichever method is chosen should be easy for staff members to use.

TIP Resources for an IPC Program

Among the physical—as opposed to human—resources that should be allocated for an infection prevention and control program are systems to access information, laboratory support, equipment, and supplies. Access to information includes access to clinical/health records, employee health records, admission logs, incident reports, lab records, pharmacy records, treatment plans, performance improvement data, and systems that will assist with the collection, analysis, and reporting of necessary data. Equipment may include computers and printers needed for data management, while supplies may be alcohol-based hand rubs and personal protective equipment such as gowns, masks, gloves, and goggles.[1]

Reference:

1. Joint Commission Resources: Developing an organizationwide infection control program. *The Joint Commission: The Source*. 3:5, May 2005.

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Sidebar 3-3: Joint Commission Leadership Standards and Infection Control

What goes into effective leadership at a health care organization? The answer is not so simple, because leaders must manage a diverse and, at times, complex set of responsibilities. But the bottom line is that leaders are responsible for all aspects of care provided to patients. This makes infection control a leadership responsibility.

The Joint Commission Leadership standards provide a framework for effective leadership by identifying and defining various leadership groups and their responsibilities. Standards address the key issues of leadership structure, leadership relationships, culture and system performance expectations, and operations. An organizations culture, systems, and leadership structure and relationships all come together to drive and shape operations.

Establishing a culture that is focused on preventing infections is one of many responsibilities that leaders must meet. As with other initiatives, the key factors in success include the following:

- A culture that fosters safety as a priority for everyone who works in the organization
- The planning and provision of services that meet the needs of patients
- The availability of resources—human, financial, and physical—for providing care
- The existence of competent staff and other care providers
- Ongoing evaluation of and improvement in performance

Specifically, Joint Commission leadership standards relate to infection control in the following ways[1]:

- **Leaders create and maintain a culture of safety and quality throughout the organization.** Since preventing infections is one of the key strategies for promoting safe, high-quality care for patients or residents, in both the inpatient and outpatient settings, it is important for leadership and the IPC program team to collaborate to establish this culture and safe environment. Infection preventionists (IPs) should take a proactive approach to keeping leaders apprised of the status of the IPC program goals and objectives, any significant changes, sentinel events, clusters or outbreaks, and other issues. Communication with leaders is also important. Leaders should know about the successes of the program, such as reductions in infection rates, new strategies that have proven effective, and the financial implications of preventing infections.
- **The organization uses data and information to guide decisions and to understand variation in the performance of processes supporting quality and safety.** This standard implies that the IPC program will supply the leaders with valid and reliable information to use in making care decisions. The data may come from internal surveillance information, the literature, or regulatory agencies. IPs must take a hands-on approach to providing leaders with important and timely information.
- **The organization communicates information related to safety and quality to those who need it, including staff, licensed independent practitioners, patients, families and external interested parties.** One of the responsibilities of the IPC team is to have a communication strategy to share IPC information with the leaders, medical and clinical staff, support teams, and patients and families. This may be in the form of a written newsletter, eNews, educational programs, podcasts, webcasts, videos, or personal conversations. The role of the organizational leaders is to support the communication systems and provide the resources to get the important information to all people who need it.

Reference:
1. Soule B.: Infection Control and Leadership. Joint Commission Resources. http://www.jcrinc.com/infection-control-and-leadership/ (accessed Feb. 28, 2010).

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Summary Reports

A good method to use for evaluating the IPC plan is a summary report. Organizations that already have an annual infection control committee or annual department report may use this as the evaluation. Or, the evaluation can be performed collaboratively by individuals, a group of stakeholders, or a committee.

Although each evaluation process and report format will be somewhat different, depending on the needs and nature of the organization and its programs, the evaluation report should consist of the following components[8]:

- A description of organizational changes that influence the scope of the IPC program.
- A review of each objective of the IPC program linked to the program's scope and goals. Include activities performed to meet the goal and data that show how measurable objectives are being achieved.
  - Data may be presented in a table or a graph. Include any infection control data that are presented in the institution's quality dashboard.
  - Objectives that cannot be evaluated on the basis of data can be evaluated using qualitative methods, as with employee or patient feedback. For example, if one objective is to educate staff on a particular topic, a pre-education and post-education evaluation of knowledge about the topic can be performed and described.
- A summary of any important issues or activity that was not part of a specific objective. These may become part of next year's objectives. Examples include biological disaster and construction activities, investigation of practices at a new facility, special assigned projects, and so forth.
- A description of the challenges that occurred over the year and the actions implemented. This information will influence planning for the coming year.

TIP Common Approaches in Successful Intervention Programs

Infection prevention and control programs that achieve great success in reducing risks have common approaches. Successful interventions include the following aspects[1]:

- Team driven, staff empowered
- Commitment from administration
- Involvement of practice leaders as champions
- Uniform policies and procedures that include evidence-based practices
- Supplies facilitating safe and evidence-based practice
- Education and competency verification
- Monitoring of practice and outcomes via surveillance
- Communication, including outcome feedback to staff
- Evaluation of interventions and continuous improvement
- Hardwiring of intervention into "culture" to maintain the gain
- Celebration of success!

Reference:
1. Soule B.M., Arias, K.M.: T*he APIC/JCAHO Infection Control Workbook, 2nd Ed.* Oakbrook Terrace, IL: Joint Commission Resources, 2010, p. 71.

A Plan That Produces Desired Results

Creating and sustaining a dynamic and comprehensive IPC program is an ongoing process. Infection risks must be identified and addressed through goals, with activities evaluated to determine effectiveness. Only then can real progress be made in achieving the goal of minimizing the possibility of transmitting infections.

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Although Chapter 3 has focused on the components necessary to create a successful IPC plan, considering the reasons organizations struggle is worthwhile. Infection prevention and control programs may not produce desired results for three common reasons[14]:

- **Lack of knowledge** (staff do not know how to perform the task correctly, or they do not understand the policy or process or why it is important).
- **Inadequate system support**, such as lack of equipment or supplies or barriers to getting or using the equipment or supplies (staff members know how to do the task, but the equipment or supplies do not support the task or are unavailable or do not work) or other barriers in the system preventing the desired behavior.
- **Lack of motivation or management reinforcement** to perform the task correctly (staff members know how, and equipment or supplies are appropriate, but they still do the task incorrectly).

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3. Centers for Disease Control and Prevention: Surgical Site Infections: Frequently Asked Questions. http://www.cdc.gov/NCIDOD/DHQP/FAQ_SSI.html#B (accessed Jan. 26, 2010).
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5. Centers for Disease Control and Prevention: Surgical Site Infections: Data & Statistics. http://www.cdc.gov/ncidod/dhqp/dpac_ssi_data.html (accessed Jan. 26, 2010).
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10. Centers for Disease Control and Prevention: National Healthcare Safety Network (NHSN). http://www.cdc.gov/nhsn/index.html (accessed Jan. 28, 2010).
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12. APIC-HICPAC: Surveillance Definitions for Home Health and Home Hospice Infections. www.APIC.org (accessed Feb. 1, 2010).
13. Joint Commission Resources: How well does your organization’s infection control program work? *The Joint Commission: The Source* 4:1–11, Mar. 2006.
14. Soule B.M., Memish Z. (eds.): *Best Practices in Infection Control: An International Handbook*. Oakbrook Terrace, IL: Joint Commission Resources, 2007.

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OSHA® FactSheet

OSHA's Bloodborne Pathogens Standard

Bloodborne pathogens are infectious microorganisms present in blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), the virus that causes AIDS. Workers exposed to bloodborne pathogens are at risk for serious or life-threatening illnesses.

Protections Provided by OSHA's Bloodborne Pathogens Standard

All of the requirements of OSHA's Bloodborne Pathogens standard can be found in Title 29 of the Code of Federal Regulations at 29 CFR 1910.1030. The standard's requirements state what employers must do to protect workers who are occupationally exposed to blood or other potentially infectious materials (OPIM), as defined in the standard. That is, the standard protects workers who can reasonably be anticipated to come into contact with blood or OPIM as a result of doing their job duties.

In general, the standard requires employers to:

- **Establish an exposure control plan.** This is a written plan to eliminate or minimize occupational exposures. The employer must prepare an exposure determination that contains a list of job classifications in which all workers have occupational exposure and a list of job classifications in which some workers have occupational exposure, along with a list of the tasks and procedures performed by those workers that result in their exposure.
- **Employers must update the plan annually** to reflect changes in tasks, procedures, and positions that affect occupational exposure, and also technological changes that eliminate or reduce occupational exposure. In addition, employers must annually document in the plan that they have considered and begun using appropriate, commercially-available effective safer medical devices designed to eliminate or minimize occupational exposure. Employers must also document that they have solicited input from frontline workers in identifying, evaluating, and selecting effective engineering and work practice controls.
- **Implement the use of universal precautions** (treating all human blood and OPIM as if known to be infectious for bloodborne pathogens).
- **Identify and use engineering controls.** These are devices that isolate or remove the bloodborne pathogens hazard from the workplace. They include sharps disposal containers, self-sheathing needles, and safer medical devices, such as sharps with engineered sharps-injury protection and needleless systems.
- **Identify and ensure the use of work practice controls.** These are practices that reduce the possibility of exposure by changing the way a task is performed, such as appropriate practices for handling and disposing of contaminated sharps, handling specimens, handling laundry, and cleaning contaminated surfaces and items.
- **Provide personal protective equipment (PPE), such as gloves, gowns, eye protection, and masks.** Employers must clean, repair, and replace this equipment as needed. Provision, maintenance, repair and replacement are at no cost to the worker.
- **Make available hepatitis B vaccinations to all workers with occupational exposure.** This vaccination must be offered after the worker has received the required bloodborne pathogens training and within 10 days of initial assignment to a job with occupational exposure.
- **Make available post-exposure evaluation and follow-up to any occupationally exposed worker who experiences an exposure incident.** An exposure incident is a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or OPIM. This evaluation and follow-up must be at no cost to the worker and includes documenting the route(s) of exposure and the circumstances

under which the exposure incident occurred; identifying and testing the source individual for HBV and HIV infectivity, if the source individual consents or the law does not require consent; collecting and testing the exposed worker's blood, if the worker consents; offering post-exposure prophylaxis; offering counseling; and evaluating reported illnesses. The healthcare professional will provide a limited written opinion to the employer and all diagnoses must remain confidential.

- **Use labels and signs to communicate hazards.** Warning labels must be affixed to containers of regulated waste; containers of contaminated reusable sharps; refrigerators and freezers containing blood or OPIM; other containers used to store, transport, or ship blood or OPIM; contaminated equipment that is being shipped or serviced; and bags or containers of contaminated laundry, except as provided in the standard. Facilities may use red bags or red containers instead of labels. In HIV and HBV research laboratories and production facilities, signs must be posted at all access doors when OPIM or infected animals are present in the work area or containment module.
- **Provide information and training to workers.** Employers must ensure that their workers receive regular training that covers all elements of the standard including, but not limited to: information on bloodborne pathogens and diseases, methods used to control occupational exposure, hepatitis B vaccine, and medical evaluation and post-exposure follow-up procedures. Employers must offer this training on initial assignment, at least annually thereafter, and when new or modified tasks or procedures affect a worker's occupational exposure. Also, HIV and HBV laboratory and production facility workers must receive specialized initial training, in addition to the training provided to all workers with occupational exposure. Workers must have the opportunity to ask the trainer questions. Also, training must be presented at an educational level and in a language that workers understand.
- **Maintain worker medical and training records.** The employer also must maintain a sharps injury log, unless it is exempt under Part 1904 -- Recording and Reporting Occupational Injuries and Illnesses, in Title 29 of the Code of Federal Regulations.

Additional Information

For more information, go to OSHA's Bloodborne Pathogens and Needlestick Prevention Safety and Health Topics web page at: https://www.osha.gov/SLTC/bloodbornepathogens/index.html.

To file a complaint by phone, report an emergency, or get OSHA advice, assistance, or products, contact your nearest OSHA office under the "U.S. Department of Labor" listing in your phone book, or call us toll-free at **(800) 321-OSHA (6742).**

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; the teletypewriter (TTY) number is (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

DSG 1/2011

DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C2-21-16
Baltimore, Maryland 21244-1850

Center for Clinical Standards and Quality/Survey & Certification Group

Ref: S&C: 13-09-NH

DATE: **January 25, 2013**

TO: State Survey Agency Directors

FROM: Director
Survey and Certification Group

SUBJECT: Clarification of Interpretive Guidance at F Tag 441-Laundry and Infection Control

Memorandum Summary

Revised Guidance for F Tag 441: The Centers for Medicare & Medicaid Services (CMS) is clarifying and revising guidance to surveyors in Appendix PP of the SOM regarding citations under F Tag 441 related to 42 CFR §483.65(c). The memo addresses laundry detergents with and without antimicrobial claims, use of chlorine bleach rinses, water temperatures during the process of washing laundry, maintenance of laundry equipment and laundry items, and ozone laundry cleaning systems.

A. Background

Currently, the requirements for Skilled Nursing Facilities (SNFs) and Nursing Facilities (NFs) at 42 CFR §483.65(c) Infection Control, Linens, state that “personnel must handle, store, process, and transport linens so as to prevent the spread of infection.”

Current interpretive guidance does not address recent changes in manufacturer’s technology for laundry equipment and cleaning agents. There have been many questions related to infection control and laundry processing. In the process of responding to some of these questions, the CMS has identified a need to update the related interpretive guidance.

B. Interpretive Guidance, 42 CFR §483.65(c)

In consultation with the Centers for Disease Control and Prevention (CDC), the CMS is updating surveyor guidance to address improvements in technology utilized in laundry processing. Specifically, the CMS is updating the existing interpretive guidance:

"Detergent and water physically remove many microorganisms from linen through dilution during the wash cycle. An effective way to destroy microorganisms in laundry items is through hot water washing at temperatures above 160 degrees F (71 degrees C) for 25 minutes. Alternatively, low temperature washing at 71 to 77 degrees F (22-25 degrees C) plus a 125-part-per-million (ppm) chlorine bleach rinse has been found to be effective and comparable to high temperature wash cycles."

The CMS is also adding guidance on maintenance of laundry equipment and laundry items and ozone laundry cleaning systems. These updates in interpretive guidance complement other guidance within the SOM under "Handling Linens to Prevent and Control Infection Transmission."

C. Procedures 42 CFR §483.65(c)

Laundry detergents. Advances in technology allow modern-day detergents to be much more effective in removing soil and reducing the presence of microbes than those used in the past when much of the research on laundry processing was first conducted. The CMS in collaboration with the CDC has determined that facilities may use any detergent designated for laundry in laundry processing. Further, laundry detergents used within nursing facilities are not required to have stated anti-microbial claims. Facilities should closely follow manufacturer's instructions for laundry detergents used. The CMS does not endorse any specific laundry detergent or product.

Water temperatures and chlorine bleach rinses. Laundry processing conducted within facilities typically occurs in a low water temperature environment. Many laundry items are composed of materials that cannot withstand a chlorine bleach rinse and remain intact. The chlorine bleach rinse is not required for all laundry items processed in low temperature washing environments due to the availability of modern laundry detergents that are able to produce hygienically clean laundry without the presence of chlorine bleach (The Association for the Advancement of Medical Instrumentation defines the term "hygienically clean" as "free of pathogens in sufficient numbers to cause human illness."). However, the chlorine bleach rinse may still be used for laundry items composed of materials such as cottons. Hot water washing at temperatures greater than 160 degrees F for 25 minutes and low temperature washing at 71 to 77 degrees F (22-25 degrees C) with a 125-part-per-million (ppm) chlorine bleach rinse remain effective ways to process laundry. If a facility chooses to process laundry using a hot water temperature environment, the temperature maintained for 25 minutes should be 160 degrees Fahrenheit.

Maintenance of equipment and laundry items. Facilities are not required to maintain a record of water temperatures during laundry processing cycles. The CDC recommends leaving washing machines open to air when not in use to allow the machine to dry completely and to prevent growth of microorganisms in wet, potentially warm environments. Facilities are required to follow manufacturer's instructions for all materials involved in laundry processing (e.g., washing machines; dryers; any laundry detergents, rinse aids, or other additives employed during the

laundry process). Facilities should also follow manufacturer's instructions for clothing, linens, and other laundry items to determine the appropriate methods to use to produce a hygienically clean product. Facilities should also consider a resident's individual needs (e.g., allergies) when selecting methods for processing laundry. Facilities should have written policies & procedures which should include training for staff who will handle linens and laundry.

Ozone cleaning systems. Ozone laundry cleaning systems are relatively new. The CMS in collaboration with the CDC has determined that ozone cleaning systems are acceptable methods of processing laundry. This method also requires closely following manufacturer's instructions. Facilities opting to utilize an ozone laundry cleaning system will need to obtain an initial agreement between the laundry service and facility that stipulates the laundry will be hygienically clean and handled to prevent recontamination from dust and dirt during loading and transport. This is not an endorsement of ozone cleaning systems.

Please direct any additional questions or concerns regarding F Tag 441 related to handling linens to prevent and control infection transmission to Jemima Drake via phone at 410-786-1526 or email at jemima.drake@cms.hhs.gov.

Effective Date: Immediately. This information should be communicated with all survey and certification staff, their managers and the State/Regional Office training coordinators within 30 days of this memorandum.

/s/
Thomas E. Hamilton

Attachment- Advance Copy of SOM Guidance

cc: Survey and Certification Regional Office Management

CMS Manual System

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

Pub. 100-07 State Operations Provider Certification

Transmittal ADVANCE COPY | **Date: Month XX ---2013**

SUBJECT: **Revisions to Appendix PP – "Interpretive Guidelines for Long-Term Care Facilities F tag 441 Infection Control,"**

I. SUMMARY OF CHANGES: This instruction updates the guidance at F tag 441, Infection Control, Handling Linens to Prevent and Control Infection Transmission.

NEW/REVISED MATERIAL - EFFECTIVE DATE*: Upon Issuance
IMPLEMENTATION DATE: Upon Issuance

Disclaimer for manual changes only: The revision date and transmittal number apply to the red italicized material only. Any other material was previously published and remains unchanged. However, if this revision contains a table of contents, you will receive the new/revised information only, and not the entire table of contents.

II. CHANGES IN MANUAL INSTRUCTIONS: (*N/A if manual not updated.*)
(R = REVISED, N = NEW, D = DELETED) – (*Only One Per Row.*)

R/N/D	CHAPTER/SECTION/SUBSECTION/TITLE
R	Appendix PP/F tag 441

III. FUNDING: No additional funding will be provided by CMS; contractor activities are to be carried out within their operating budgets.

IV. ATTACHMENTS:

	Business Requirements
X	Manual Instruction
	Confidential Requirements
	One-Time Notification
	One-Time Notification -Confidential
	Recurring Update Notification

***Unless otherwise specified, the effective date is the date of service.**

ADVANCE COPY

F441

Rev.

HANDLING LINENS TO PREVENT AND CONTROL INFECTION TRANSMISSION

It is important that all potentially contaminated linen be handled with appropriate measures to prevent cross-transmission. If the facility handles all used linen as potentially contaminated (i.e., using standard precautions), no additional separating or special labeling of the linen is recommended. No special precautions (i.e., double bagging) or categorizing is recommended for linen originating in isolation rooms. Double bagging of linen is only recommended if the outside of the bag is visibly contaminated or is observed to be wet through to the outside of the bag. Alternatively, leak-resistant bags are recommended for liens contaminated with blood or body substances. If standard precautions for contaminated linens are not used, then some identification with labels, color coding or other alternatives means of communication is important.

For the routine handling of contaminated laundry, minimum agitation is recommended, to avoid the contamination of air, surfaces, and persons. The risk of environmental contamination may be reduced by having personnel bag or contain contaminated linen at the point of use, and not sorting or pre-rinsing in resident care areas.

It is important that laundry areas have hand washing facilities and products, as well as appropriate Personal Protective Equipment (PPE) (i.e., gloves and gowns) available for workers to wear while sorting linens. Laundry equipment should be used and maintained according to the manufacturer's instructions to prevent microbial contamination of the system. It is recommended that damp linen is not left in machines overnight.

AAMI (Association for the Advancement of Medical Instrumentation) defines the term "hygienically clean" as "free of pathogens in sufficient numbers to cause human illness." Detergent and water physically remove many microorganisms from the linen through dilution during the wash cycle. *Advances in technology allow modern-day detergents to be much more effective in removing soil and reducing the presence of microbes than those used in the past when much of the research on laundry processing was first conducted. Facilities may use any detergent designated for laundry in laundry processing. Further, laundry detergents used within nursing facilities are not required to have stated anti-microbial claims. Facilities should closely follow manufacturer's instructions for laundry detergents used.*

Laundry processing conducted within facilities typically occurs in a low water temperature environment. Many laundry items are composed of materials that cannot withstand a chlorine bleach rinse and remain intact. A chlorine bleach rinse is not required for all laundry items

processed in low temperature washing environments due to the availability of modern laundry detergents that are able to produce hygienically clean laundry without the presence of chlorine bleach. However, a chlorine bleach rinse may still be used for laundry items composed of materials such as cottons. Hot water washing at temperatures greater than 160 degrees F for 25 minutes and low temperature washing at 71 to 77 degrees F (22-25 degrees C) with a 125-part-per-million (ppm) chlorine bleach rinse remain effective ways to process laundry.[101] If a facility chooses to process laundry using a hot water temperature environment, the temperature maintained for 25 minutes should be at or above 160 degrees Fahrenheit (71ºC).[100]

Facilities are not required to maintain a record of water temperatures during laundry processing cycles. The CDC recommends leaving washing machines open to air when not in use to allow the machine to dry completely and to prevent growth of microorganisms in wet, potentially warm environments. Facilities are required to follow manufacturer's instructions for all materials involved in laundry processing (e.g., washing machines; dryers; any laundry detergents, rinse aids, or other additives employed during the laundry process). Facilities should also follow manufacturer's instructions for clothing, linens, and other laundry items to determine the appropriate methods to use to produce a hygienically clean product. Facilities should also consider a resident's individual needs (e.g., allergies) when selecting methods for processing laundry. The CMS, in collaboration with the CDC, has also determined that ozone cleaning systems are acceptable methods of processing laundry. Ozone cleaning systems also should be used per manufacturer's instructions.

If laundry chutes are used, it is recommended that they are properly designed and maintained so as to minimize dispersion of aerosols from contaminated laundry (e.g., no loose items in the chute and bags are closed before tossing into the chute).

If linen is sent off to a professional laundry, the facility should obtain an initial agreement between the laundry service and facility that stipulates the laundry will be hygienically clean and handled to prevent recontamination from dust and dirt during loading and transport. *For example, an ozone laundry cleaning system is a method which may require a professional laundry service. The facility will need to obtain such an agreement in this instance. Whether laundry processing is completed within the facility or outside the facility, facilities should have written policies & procedures which should include training for staff who will handle linens and laundry.*

Standard mattresses and pillows can become contaminated with body substances during resident care if the integrity of the covers of these items is compromised. A mattress cover is generally a fitted, protective material, the purpose of which is to prevent the mattress from becoming contaminated with body fluids and substances. A linen sheet placed on the mattress is not considered a mattress cover. Patches for tears and holes in mattress covers do not provide an impermeable surface over the mattress. Therefore it is recommended that mattress covers with tears or holes be replaced. It is recommended that moisture resistant mattress covers be cleansed and disinfected between residents with an EPA approved germicidal detergent to help prevent the spread of infections, and fabric mattress covers should be laundered between residents. Pillow covers and washable pillows should be laundered in a hot water laundry cycle between residents or when they become contaminated with body substances. Discarding mattresses if

fluids have penetrated into the mattress fabric and washing pillows and pillow covers in a hot-water laundry cycle will also reduce the risk of indirect contact with infectious agents.[102]

[100] *Sehulster, L.M., Chinn, R.Y.W., Arduino, M.J., Carpenter, J., Donlan, R., Ashford, D., Besser, R., Fields, B., McNeil, M.M., Whitney, C., Wong, S., Juranek, D., and Cleveland, J. (2003). Guidelines for environmental infection control in health-care facilities. Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Pp.139. Accessed December 10, 2008 from http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf*

[101]*Sehulster, L.M., Chinn, R.Y.W., Arduino, M.J., Carpenter, J., Donlan, R., Ashford, D., Besser, R., Fields, B., McNeil, M.M., Whitney, C., Wong, S., Juranek, D., and Cleveland, J. (2003). Guidelines for environmental infection control in health-care facilities. Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Pp. 139. Accessed December 10, 2008 from http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf*

[102]*Sehulster, L.M., Chinn, R.Y.W., Arduino, M.J., Carpenter, J., Donlan, R., Ashford, D., Besser, R., Fields, B., McNeil, M.M., Whitney, C., Wong, S., Juranek, D., and Cleveland, J. (2003). Guidelines for environmental infection control in health-care facilities. Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Pp. 140. Accessed December 10, 2008 from http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf*

The Roadmap for the Novice Infection Preventionist

BY BILL BRIDGES, PhD

Taking the infection preventionist from day 1 on the job, all the way to the CIC exam

In the Dark Ages before the Internet, we relied on maps, whether to go across the country or across town. Although we always set out with an understanding of where we wanted to end up, the map was the key mechanism to get us there efficiently. Without a map? Not only was the journey far more difficult and stressful, but sometimes we didn't reach the destination. For the novice infection preventionist (IP), that end destination is Certification in Infection Prevention and Control (CIC®). But getting to that point was often an individually determined trip, filled with more detours and stress than was needed—until now.

The Roadmap for the Novice Infection Preventionist (also known as the Novice Roadmap) establishes a clear path from day one on the job all the way to taking the CIC exam. Although it's still an arduous journey, at least now there is a map to guide IPs along the way.

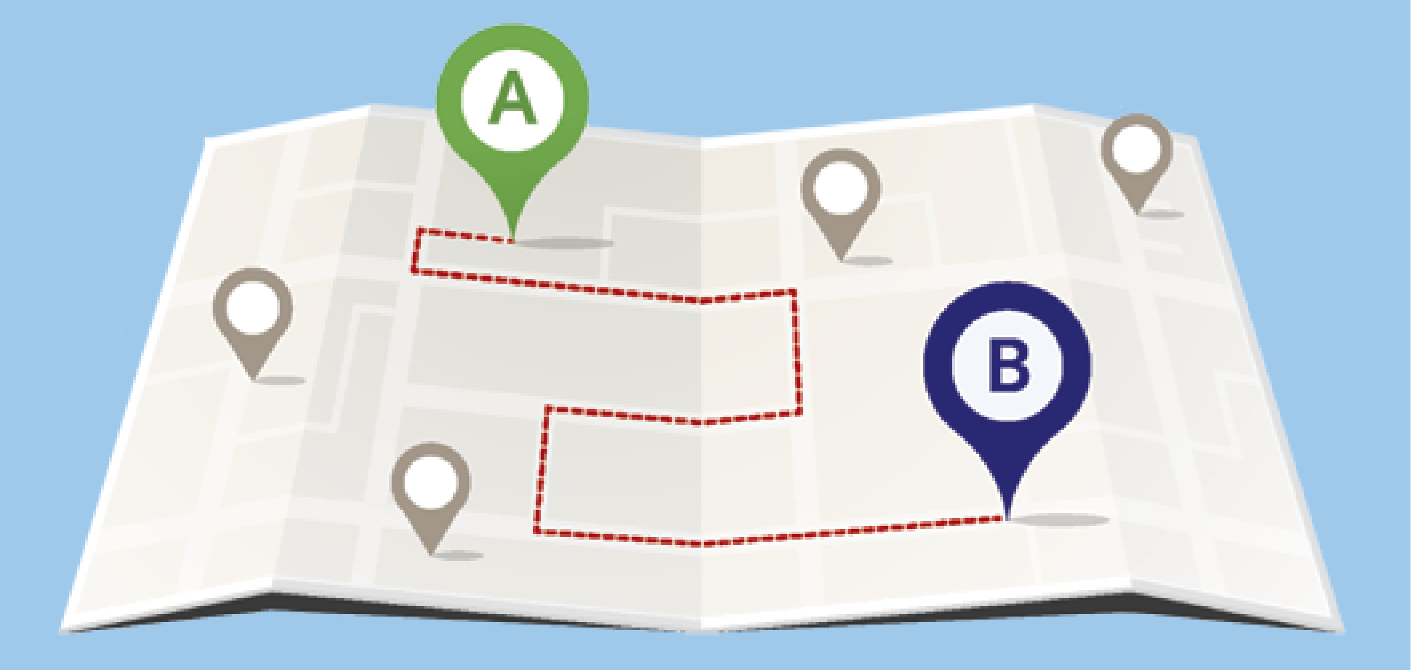
DEVELOPING THE ROADMAP

The Novice Roadmap is the culmination of nearly two years of work by the APIC Education Committee. In October 2013, the committee discussed ways to piece together the educational resources that APIC offers. The difficulty, as the committee saw, was that IPs don't have an agreed-upon developmental path. As a result, the training that a novice receives varies incredibly, depending on many factors. If a novice is fortunate enough to have a mentor or works with a well-organized, experienced senior IP, then he or she will receive at least some kind of training. But even then, the training received will depend on the background of the mentor. A mentor who is strong in microbiology will naturally emphasize that field. Similarly, one who has a background in infectious diseases will emphasize that. If the novice has no one to provide even that amount of help, then the situation is even worse, as the burden of cobbling together an education falls on the individual.

Thus, the Education Committee hit on the idea of creating a standardized curriculum, which resulted in the Novice Roadmap. The committee brainstormed a list of knowledge, skills, and abilities that a novice would need, then divided all those items into "stages" of a novice's career: year 1, year 2, then year 3 until the IP takes the CIC exam. But although the list was robust, it was incomplete. The committee then shifted to seeing the Roadmap in terms of its destination: CIC certification.

The Certification Board in Infection Control and Epidemiology (CBIC), Inc., administrator of the CIC certification system, maintains a list of competencies that an IP should achieve (these same competencies are at the core of APIC's IP Competency Model).[1] CBIC divides the competencies into six areas (or domains): Identification of Infectious Disease Processes; Surveillance and Epidemiologic Investigation; Preventing/Controlling the Transmission of Infectious Agents; Employee/Occupational Health; Management and Communication; and Education and Research.[1] (Effective July 1, 2015, Environment of Care and Cleaning, Sterilization, Disinfection, and Asepsis will be added to the six existing domains; however, these domains do not reflect new examination content. CBIC's 2014 practice analysis survey results noted that these two areas were weighted with sufficient importance to be identified as separate domains). Each area contains between 11 and 22 individual objectives that are all potential items to appear on the exam (e.g., under the Infectious Disease Processes category is the objective "Differentiate among colonization, infection, and contamination").

The Education Committee saw those objectives as landmarks or "mile markers," all of which needed to appear somewhere on the map. The committee also created another category of proficiency: Professional Development, to address important elements not covered by the CBIC list (e.g., developing a personal library of infection prevention resources). Since that initial meeting, tasks have been added, refined, categorized, and re-categorized until now, when the Novice Roadmap has finally been made available to APIC members.



STRUCTURE OF THE ROADMAP

The Roadmap has three parts:

1. **Introduction and Frequently Asked Questions (FAQs).** In the first section, users will find an introduction to using the Roadmap, as well as the most commonly asked questions about how to use it.

As with the entire Roadmap, the FAQ section is fluid. As APIC Education receives feedback and hears of other questions, the FAQs will be expanded.

2. **Roadmap, broken down by CBIC competency area.** This section divides all the tasks, knowledge, and skills into the CBIC competency areas (APIC core competencies), plus the Professional Development area. Each row in a competency area has a series of related tasks that the novice IP needs to complete. Because the tasks build on previously gained knowledge and abilities, it's important to go through each row from left to right, completing each box before moving to the next.

3. **Roadmap, broken down by stage.** This view enables users to see all the tasks that he or she should complete in a given time frame. Seeing things this way helps the user (whether the novice IP or the person training him or her) allocate training time and resources.

But, although the Roadmap's basic structure will likely remain unchanged, the rest is flexible. The Roadmap is a living document. Although the Education Committee feels confident with the content at this point, it also recognizes that it will need to make adjustments as people use it. Whenever the CBIC competencies change, the committee will be updating the Roadmap. APIC will adjust the Roadmap based on the needs of the members.

HOW WILL IT HELP?

"We wanted to make a tool that would help the new IP who works alone," says Kit Reed, Education Committee chair. "All too often, the new IP goes into the job with little or no training and is expected immediately to do surveillance, create an infection prevention and control program, serve on numerous committees, and also do a thousand other things. It's no wonder a lot of them quit."

From APIC member surveys and other information sources, it does seem that novice IPs are often thrown into the job and then have to piece together enough information to survive the first few years. The determined ones learn enough information and gain skills to pass the CIC exam and remain in the field. An alarming number of these new IPs reach a breaking point in their first three to four years on the job and quit.

The Roadmap alleviates that stress by prioritizing what needs to be learned and when. Additionally, trainers can use the Roadmap when training a new IP, as it both provides

What is the Novice Roadmap?

Identification of Infectious Disease Processes

Stage 1: Days 1 - 60	**Stage 2:** Days 61 - 120	**Stage 3:** Days 121- End of Year 1	**Stage 4:** Beginning of year 2 - Passing the CIC Exam

Learn infectious disease processes:
• Describe how to interpret diagnostic/laboratory reports
• Know the following terms associated with the infectious disease process
  • Define colonization, infection, and contamination
  • Geographic distribution
  • Reservoirs
  • Incubation periods
  • Periods of communicability
  • Modes of transmission
  • Signs and symptoms
  • Susceptibility
	Understand the basics characteristics of microbiology/ virology:
	• Bacteria
	• Fungi
	• Parasites
	• Viruses
	Differentiate normal flora versus pathogenic flora by site:
	• Respiratory tract
	• Genitourinary tract
	• Gastrointestinal tract
	• Skin, eye, ear
	• Bone and joints
	• Blood
	• Central nervous system
		Determine methods of antimicrobial susceptibility testing at your facility (e.g., minimum inhibitory concentration versus disc diffusion)
		• Differentiate among prophylactic, empiric, and therapeutic uses of antimicrobials
			Recognize limitations and advantages of the types of tests used to diagnose infectious processes

Identify epidemiologically significant infectious diseases that require immediate review and investigation (Check with state health department for complete list): • Tuberculosis • *Neisseria meningitidis* • Influenza • Measles • Pertussis • Varicella • Mumps	**Continue to learn about important infectious diseases, such as:** • Viral Hepatitis • HIV/AIDS • MERS - Coronavirus • Norovirus		

Stage 1: Days 1 - 60

Task/skill	Track
Become familiar with APIC: • Join local APIC chapter • Browse APIC website • Complete your APIC member profile • Find a mentor (Connect with Membership services team)	PD
Subscribe to APIC IP Talk & other lists as appropriate	PD
Introduce yourself to facility personnel with whom you will interact: • Lab/microbiologist • Employee health • Infectious disease physicians	PD
Assess your IT (information technology) needs: • What software programs do you have/need? • What training do you need for those programs? • What access/passwords do you need? • Learn your facility's electronic medical records system	PD

Learn infectious disease processes:
• Describe how to interpret diagnostic/laboratory reports
• Know the following terms associated with the infectious disease process:
  • Define colonization, infection, and contamination
  • Geographic distribution
  • Reservoirs
  • Incubation periods
  • Periods of communicability
  • Modes of transmission
  • Signs and symptoms
  • Susceptibility
	ID

Identify epidemiologically significant infectious diseases that require immediate review and investigation (check with state health department for complete list) • Tuberculosis • *Neisseria meningitidis* • Influenza • Measles • Pertussis • Varicella • Mumps	ID
Learn about multidrug-resistant organisms (MDRO) identification and infection prevention implications, for example: • Methicillin-resistant *Staphylococcus aureus* (MRSA), • Vancomycin-resistant Enterococcus (VRE), • Multidrug-resistant Gram-negative rods [extended spectrum beta lactams ESBL, carbapenem-Resistant Enterobacteriaceae (CRE), *Acinetobacter baumannii*, etc.]	ID

a structure and a common language for trainer and trainee. APIC Board of Directors member, Gail Fraine, used a draft version of the Roadmap when orienting a new IP. She said, "The APIC Novice Roadmap provided a structure of specific elements defining the basic foundation of infection prevention as well as necessary skills and knowledge expectations. It also provided a plan for future growth and development of the infection preventionist."

WHAT DOES THE ROADMAP NOT DO?

Having said that, following the Roadmap doesn't guarantee that the novice will pass the CIC exam. However, going through all the boxes on the Roadmap and in the order in which they're written will give the novice the time to learn and reinforce that learning before being tested. More importantly, although it outlines what the novice will need to know and do, it will still be the novice's responsibility to go through all the boxes and learn the information and gain the skills.

FUTURE OF THE ROADMAP

As of now, the Roadmap is much like maps before the Internet: flat, static, up to the user to follow it. The future looks very different.

Interactive and customizable. The Roadmap will become much more like Google maps and other mapping applications and will "learn" what the APIC member has learned through APIC class activities, self-declared training, or from prior experience, and will adjust the route accordingly. Thus, if a member says that he or she has learned everything about microbiology, then the individual's Roadmap and education suggestions will be adjusted to remove microbiology topics or resources.

Testable. Before a novice can check off achievement of a box on the Roadmap, he or she will be able to test the skills or knowledge gained in that box by answering some test questions. Of course, this won't apply to tasks that are specific to the individual's facility or to most items in the professional development track.

Linkage to badges and certificates. As users move through the Roadmap, they will earn badges of achievement (for example, finishing all tasks in Stage 1) and certificates (for example, finishing all tasks related to Microbiology). The badges and certificates will be a fun way for the novice to show progress. (It's important to note, though, that these are not certifications. The only certification related to infection prevention is the CIC.)

Linked to a revised professional development track for the IP. This year, APIC's Professional Development Committee (PDC) will announce the specifics of the Advanced Designation Program, which will create a system for APIC's most experienced IPs to achieve the highest level on the APIC Competency Model. Once that's complete, the PDC will then develop the Roadmap for the Proficient IP, which will build on skills and knowledge gained from the Novice Roadmap and prepare those in the middle band of the APIC Competency Model to eventually gain Advanced status.

Linked to learning resources. By December 31, 2017, APIC will offer education, in one form or another, for every box on the Roadmap. Plans are moving forward now to develop a range of educational resources. In the future, the novice will be able to interact with his or her individual Roadmap, then find something, whether in a face-to-face class, an online class, a webinar, the APIC Annual Conference, or a variety of other delivery methods, to meet his or her needs.

CONCLUSION

Ultimately, the Novice Roadmap is only a map. It's still up to the individual novice IP to do all the work. But, even with that caveat, its potential impact is huge.

"We want to sustain the profession by offering succession tools like the Novice Roadmap that can help not only those who are training novice infection preventionists, but also novice infection preventionists who work through the Roadmap alone," says Lela Luper, Education Committee vice chair. "The goal is to provide a tool that might alleviate frustration as well as deter novices from wanting to choose an alternate profession."

Both Lela Luper and Kit Reed will speak about the Novice Roadmap in an education session at the APIC 2015 Annual Conference in Nashville, June 27–29.

Bill Bridges, PhD, is APIC senior director of education.

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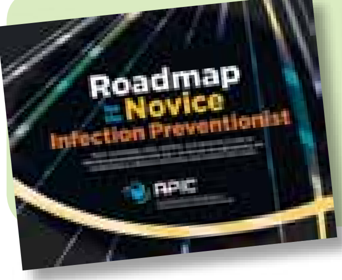

The Roadmap for the Novice Infection Preventionist is included with this issue of *Prevention Strategist*. You may also access it online. Visit apic.org/roadmap to download this resource. Member login is required.

The Education Committee welcomes member feedback on the roadmap so we can continue to meet member needs. Email education@apic.org with your feedback.