T-10

Infection Control

Winds of Change OHCA OCAL OCID #OHCA2015

Speaker Information

Diane M. Bonifas BSN, CNE, RN-BC
Director Clinical Campus Support
303 N. Hurstbourne Parkway
Louisville, KY
Diane.Bonifas@trilogyhs.com

Winds of Change OHCA OCAL OCID #OHCA2015

Objectives:

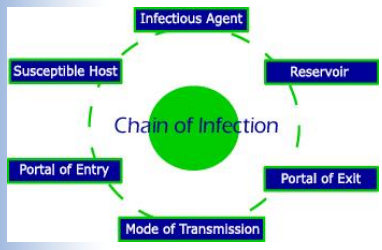
- *2007 CDC isolation guidelines*
  - *Infection Control Program,*
- *Review Federal Regulations, F-441 and F-334*
- *Review MDRO's with discussion on epidemiological important pathogens*
- *Review surveillance techniques to assist identifying infections and potential spread*

Winds of Change OHCA OCAL OCID #OHCA2015

Changes in terminology from the 2007 CDC guidelines

- Nosocomial infection are now referred to as *Healthcare-Associated Infection* (HAI)
  - onset of clinical manifestation occurs >2 calendar days after admission (APIC Implementation Guide)
- New addition to Standard Precautions is *Respiratory Hygiene/Cough Etiquette*
- "*Airborne Precautions*" is changed to "*Airborne Infection Isolation Room (AIIR)"*
- *Protective Environment* has been added to the precautions used to prevent HAI's

Winds of Change OHCA OCAL OCID #OHCA2015



Winds of Change OHCA OCAL OCID #OHCA2015

Standard Precautions

- Hand hygiene
- Safe injection practices
- The proper use of personal protective equipment
- Care of the environment, textiles and laundry
- Resident placement
- Appropriate waste disposal and management

Winds of Change OHCA OCAL OCID #OHCA2015

Standard Precautions

Winds of Change

OHCA OCAL OCID

#OHCA2015

Transmission-Based Precautions

- Contact Precautions
- Droplet Precautions
- Airborne Precautions (in AIIR)

Winds of Change

OHCA OCAL OCID

#OHCA2015

Contact Isolation

- Infection/Condition
  - Draining wound not contained in dressing
  - *C. difficile*
  - Rotovirus
  - CRE
  - Shingles
  - Lice, scabbies

*not inclusive list-information from Appendix A1 CDC isolation guidelines p.93-116

Winds of Change

OHCA OCAL OCID

#OHCA2015

Droplet Isolation

- Infection/Condition
  - Influenza
  - Mumps
  - Pertussis- Whooping Cough

*not inclusive list-information from Appendix A1 CDC isolation guidelines p.93-116

Winds of Change OHCA OCAL OCID #OHCA2015

Airborne Isolation-AIIR

- Infection/Condition
  - Tuberculosis *(M. tuberculosis)*
  - Smallpox
  - SARS
  - Measles- 4 days after onset of rash
  - *not inclusive list-information from Appendix A1 CDC isolation guidelines p.93-116

Winds of Change OHCA OCAL OCID #OHCA2015

Type of Precaution	Type(s) of PPE Required	Resident Placement	Other Considerations
Airborne	Mask or Respirator, Gloves	Private room, Cohorting, Room sharing with limited risk factors	Private AIIR room (active TB)
Contact	Gown, Gloves	Private room, Cohorting, Room sharing with limited risk factors	
Droplet	Mask/Facial Protection, Gloves	Private room, Cohorting, Room sharing with limited risk factors	3-10 ft. distance* for transmission

All Transmission-based Precautions require appropriate hand hygiene practices

Winds of Change OHCA OCAL OCID #OHCA2015

F-441
Infection Control

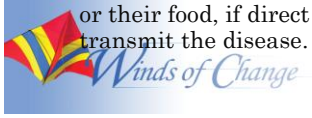
- The facility must establish and maintain an infection control program designed to provide a safe, sanitary, and comfortable environment and to help prevent the development and transmission of disease and infection.
  - ✓ Facility must investigate, control and prevent infections
  - ✓ Procedures for individual residents
  - ✓ Maintains records of incidents and corrective action

OHCA OCAL OCID

#OHCA2015

Preventing Spread of Infection

1) When the infection control program determines that a resident needs isolation to prevent the spread of infection, the facility must isolate the resident
2) The facility must prohibit employees with a communicable disease or infected skin lesions from direct contact with residents or their food, if direct contact will transmit the disease.



OHCA OCAL OCID

#OHCA2015

Preventing Spread of Infection—cont.

3. The facility must require staff to wash their hands after each direct resident contact for which hand washing is indicated by accepted professional practice.
4. Personnel must handle, store, process and transport linens so as to prevent the spread of infection.

Updated 09/30/09

OHCA OCAL OCID

#OHCA2015

Intent of regulation

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

Winds of Change

OHCA OCAL OCID

#OHCA2015

Components of an Infection Prevention and Control Program

- Program Development and Oversight
- Policies and Procedures
- Infection Preventionist
- Surveillance
- Documentation
- Monitoring
- Data Analysis
- Communicable Disease Reporting
- Education
- Antibiotic Review

- http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107ap_pp_guidelines_ltcf.pdf pg. 560

Winds of Change

OHCA OCAL OCID

#OHCA2015

QIS Observations

- Are proper hand-washing techniques observed
- Are gloves worn appropriately and changed between residents
- Staff free of communicable diseases
- Are precautions observed for the disposal of soiled linens, dressings, etc.
- Are linens and laundry handled or transported in manner to prevent spread

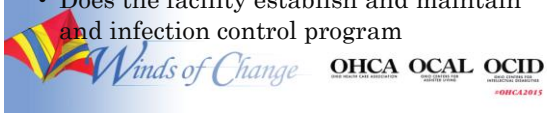
Winds of Change

OHCA OCAL OCID

#OHCA2015

QIS Observation

- Are isolation precautions implemented when it is determined they are needed
- Are all staff practices consistence with current infection control principles and do these practices prevent cross contamination
- Does the facility establish and maintain and infection control program



QIS Questions

- Instructs surveyors to use investigative protocol in F-441
- The facility demonstrates that it uses records of incidents to improve its infection control processes and outcomes by taking corrective action
  - CMS 20054 (11/2010)

Influenza F-334

- Facility must develop policies and procedures regarding Influenza (Oct.1-Mar.31) and Pneumococcal Disease
  - The regulation indicates that receiving vaccinations is essential to the health and well-being of long-term care residents.
  - Intended to decrease the risks of residents acquiring, transmitting, or experiencing complications.

Facts about Influenza Vaccine

- Inactivated influenza vaccine contains noninfectious killed viruses and cannot cause influenza.
- Since there is a delay in developing antibodies after vaccination, the resident may develop influenza if there was exposure prior to receiving the vaccine. Coincidental respiratory disease unrelated to influenza vaccination can occur at any time after vaccination.

Winds of Change OHCA OCAL OCID #OHCA2015

Vaccine Recommendations for Health Care Workers

- Hepatitis B- series of 3 doses
- Influenza vaccine yearly
- MMR
- Varicella vaccine if no history of chicken pox
- Tetanus, diphtheria, pertussis

Winds of Change OHCA OCAL OCID #OHCA2015

Important Organisms

- *C. difficile*
- Norovirus
- MRSA
- ESBL's
- CRE
- Ebola update

Winds of Change OHCA OCAL OCID #OHCA2015

C. difficile

- Gram positive, spore forming, anaerobic bacillus (1978)
- *C. difficile* infection (CDI)occurs when the normal intestinal flora is altered, allowing *C. difficile* to flourish in the intestinal tract and produce a toxin that causes a watery diarrhea.
  - #1 risk exposure to antibiotics
    - Cephalosporins, clindamycin and floroquinolones
  - #2 transmission by fecal-oral route

http://apic.org/Resource_/EliminationGuideForm/59397fc6-3f90-43d1-9325-c8be75d86888/File/2013CDiffFinal.pdf pgs9-10

OHCA OCAL OCID

#OHCA2015

Potential Reasons for Increased CDI Incidence and Severity

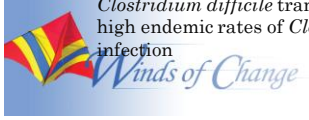
- **Changes in underlying host susceptibility**
- **Changes in antimicrobial prescribing**
- **New strain with increased virulence**
- **Changes in infection control practices**

OHCA OCAL OCID

#OHCA2015

Environmental Cleaning

Consider using an Environmental Protection Agency (EPA)-registered disinfectant with a sporicidal claim for environmental surface disinfection after cleaning in accordance with label instructions; generic sources of hypochlorite (e.g., household chlorine bleach) also may be appropriately diluted and used. (Note: Standard EPA-registered hospital disinfectants are not effective against *Clostridium difficile* spores .) Hypochlorite-based disinfectants may be most effective in preventing *Clostridium difficile* transmission in units with high endemic rates of *Clostridium difficile* infection



OHCA OCAL OCID

#OHCA2015

Testing for *C. difficile*

Check with contracted laboratory services

- Rejection of specimens that are not liquid or soft(take the shape of the container=rejection)
- Testing will be restricted to one specimen in 7 days
  - Note-**diarrhea**, defined as at least **3 unformed or watery stools** in a 24-hour period, some recommend for 1-2 days.
  - It is recommended to **NOT** 'test of cure' inpatients who have responded to therapy

John Hopkins University laboratory website
http://www.mc.vanderbilt.edu/documents/infectioncontrol/files/Oakland%20Presentation%20FINAL%202011.pdf

Winds of Change OHCA OCAL OCID #OHCA2015

Testing for *C. difficile*

- Because *Clostridium difficile*-infected patients continue to shed organism for a number of days following cessation of diarrhea, some institutions routinely continue isolation for either several days beyond symptom resolution or until discharge, depending upon the type of setting and average length of stay.

Winds of Change OHCA OCAL OCID #OHCA2015

Recent Immediate Jeopardizes

- Pertain to *C. difficile* and environmental cleaning
  - Potential for IJ if not preventing the spread of infection

Winds of Change OHCA OCAL OCID #OHCA2015

Norovirus

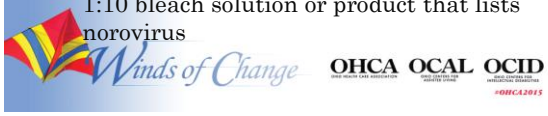
Named after the original strain 'Norwalk virus' which caused an outbreak of gastro-enteritis in a school in Norwalk, Ohio in 1968.

Noroviruses are highly contagious

Analysis suggests that a national increase has occurred in the frequency of acute gastroenteritis outbreaks caused by norovirus

Norovirus

- Average Incubation period 12 – 48 hours
- Transmission- fecal-oral route
- Signs and symptoms
  - Nausea, vomiting, abdominal pain, non-bloody stools
- Duration- 24-60 hours
- Increase environmental cleaning with 1:10 bleach solution or product that lists norovirus



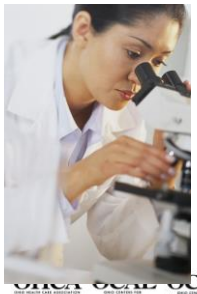
LTC Facilities Predisposed to High Attack Rates

- Shared bathrooms
- Immobile or incontinent residents
- Low infectious dose (<10 viral particles)

✓Control of norovirus outbreaks depend on consistent enforcement of measures such as strict hand hygiene and use of effective environmental disinfectants

MRSA

- Methicillin resistant *Staphylococcus aureus*
- If you have staph on your skin or in your nose but aren't sick, you are said to be "colonized" but not infected with MRSA.



Winds of Change

OHCA OCAL OCID

#OHCA2015

MRSA

- Methicillin-resistant strains of *Staphylococcus aureus* (MRSA) was first recognized in 1961, one year after the antibiotic methicillin was introduced for treating *S. aureus* infections.
- First documented outbreak occurred at a Boston Hospital in 1968

Winds of Change

OHCA OCAL OCID

#OHCA2015

Good News about MRSA

- *In 2010, encouraging results from a CDC study published in the Journal of the American Medical Association showed that invasive (life-threatening) MRSA infections in healthcare settings are declining. Invasive MRSA infections that began in hospitals declined 28% from 2005 through 2008. Decreases in infection rates were even bigger for patients with bloodstream infections. In addition, the study showed a 17% drop in invasive MRSA infections that were diagnosed before hospital admissions (community onset) in people with recent exposures to healthcare settings.*

Winds of Change

OHCA OCAL OCID

#OHCA2015

ESBL's

- Extended-Spectrum Beta-Lactamases-
  - ESBL's are enzymes made by some germs
  - Disease caused by ESBL organisms is no more acute than the disease caused by another bacteria of the same type. However, due to their immunity to some antibiotics, they can be trickier and more difficult to treat

OHCA OCAL OCID

#OHCA2015

ESBL Epidemiology

- Today, 30 –50% of E. coli are resistant to ampicillin and amoxicillin due to a beta-lactamase
- ESBLs have been reported for *E.coli, Klebsiella, Enterobacter, Proteus,Pseudomonas, Salmonella,Serratia*

OHCA OCAL OCID

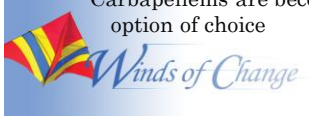
#OHCA2015

ESBL producing organisms are still susceptible to:

Cephamycins:

- –Cefoxitin
- –Cefotetan
- Carbapenems:
- –Meropenem
- –Imipenem

Carbapenems are becoming the therapeutic option of choice



OHCA OCAL OCID

#OHCA2015

New Kid on the Infection Control Block- CRE

- Hospitals and healthcare providers are being alerted to the growing occurrence of CRE infections in the United States and the need for careful infection control measures in healthcare settings to prevent the spread of CRE.

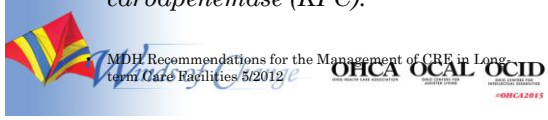
CRE

Carbapenem-resistant *Enterobacteriaceae*

- Carbapenems (ertapenem, imipenem, meropenem, and doripenem) are the last line of defense antibiotics
- Healthy people usually do not CRE infections
- CRE kills almost 50% of patients that have bloodstream infection from them

CRE

- CRE is an emerging threat in healthcare facilities across the continuum of care
- Currently, the most prevalent carbapenemase in the United States is the *Klebsiella pneumoniae carbapenemase (KPC).*



- MDH Recommendations for the Management of CRE in Long-term Care Facilities 5/2012

CRE- CDC Commentary

http://www.medscape.com/viewarticle/762961

- A link to the following Medscape article was sent to you by: Diane Bonifas
- **Stopping Outbreaks of Carbapenem-Resistant Enterobacteriaceae**
  CDC Expert Commentary, 2012-05-02

Winds of Change OHCA OCAL OCID #OHCA2015

Ebola Update

- Two imported cases
- Two locally-acquired cases *within healthcare setting*:
- Except for these two healthcare workers, **no one has been infected with Ebola while in the United States**.
- http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/index.html

Winds of Change OHCA OCAL OCID #OHCA2015

What surveyors will monitor

- In-service education
- Review policy and procedures
- Watch an aseptic dressing change
- Hand-washing
- Glove use
- Use of disinfectants
- Handling of linen

Winds of Change OHCA OCAL OCID #OHCA2015

Infection Control Checklist

- Written infection control policy
- Isolation procedures
- System to monitor and investigate
- Maintain separate record on infections
- Surveillance Data
- Written protocols for hand-washing/hand hygiene
- Immunization record for residents
- Proper use of disinfectants
- Work restrictions for employees

OHCA OCAL OCID

#OHCA2015

Helpful Websites

- http://www.cdc.gov/ncidod/dhqp/guidelines.html
- http://www.cms.hhs.gov/GuidanceforLawsAndRegulations/12_NHs.asp#TopOfPage
- http://www.apic.org//AM/Template.cfm?Section=Home
- http://www.amda.com/
- http://www.cdc.gov/hai/pdfs/cdiff/CDiff-One-Pager.pdf
- http://www.cdc.gov/hai/pdfs/toolkits/CDItoolkit2-29-12.pdf
- http://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf
- http://www.mc.vanderbilt.edu/documents/infectioncontrol/files/Guidance%20for%20Providers%20FINAL%202011.pdf
- http://apic.org/Resource_/EliminationGuideForm/59397fc6-3f90-43d1-9325-e8be75d86888/File/2013CDiffFinal.pdf
- http://www.ohiokepro.com/shopping/default.aspx?keyword=CDI

OHCA OCAL OCID

#OHCA2015

Appendix A:

Preamble The mode(s) and risk of transmission for each specific disease agent included in Appendix A were reviewed. Principle sources consulted for the development of disease-specific recommendations for Appendix A included infectious disease manuals and textbooks [833, 1043, 1044]. The published literature was searched for evidence of person-to-person transmission in healthcare and non-healthcare settings with a focus on reported outbreaks that would assist in developing recommendations for all settings where healthcare is delivered. Criteria used to assign Transmission-Based Precautions categories follow:

- A Transmission-Based Precautions category was assigned if there was strong evidence for person-to-person transmission via droplet, contact, or airborne routes in healthcare or non-healthcare settings and/or if patient factors (e.g., diapered infants, diarrhea, draining wounds) increased the risk of transmission
- Transmission-Based Precautions category assignments reflect the predominant mode(s) of transmission
- If there was no evidence for person-to-person transmission by droplet, contact or airborne routes, Standard Precautions were assigned
- If there was a low risk for person-to-person transmission and no evidence of healthcare-associated transmission, Standard Precautions were assigned
- Standard Precautions were assigned for bloodborne pathogens (e.g., hepatitis B and C viruses, human immunodeficiency virus) as per CDC recommendations for Universal Precautions issued in 1988 [780]. Subsequent experience has confirmed the efficacy of Standard Precautions to prevent exposure to infected blood and body fluid [778, 779, 866].

Additional information relevant to use of precautions was added in the comments column to assist the caregiver in decision-making. Citations were added as needed to support a change in or provide additional evidence for recommendations for a specific disease and for new infectious agents (e.g., SARS-CoV, avian influenza) that have been added to Appendix A. The reader may refer to more detailed discussion concerning modes of transmission and emerging pathogens in the background text and for MDRO control in Appendix B.

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Abscess			
Draining, major	C	DI	No dressing or containment of drainage; until drainage stops or can be contained by dressing
Draining, minor or limited	S		Dressing covers and contains drainage
Acquired human immunodeficiency syndrome (HIV)	S		Post-exposure chemoprophylaxis for some blood exposures [866].
Actinomycosis	S		Not transmitted from person to person
Adenovirus infection (see agent-specific guidance under gastroenteritis, conjuctivitis, pneumonia)			
Amebiasis	S		Person to person transmission is rare. Transmission in settings for the mentally challenged and in a family group has been reported [1045]. Use care when handling diapered infants and mentally challenged persons [1046].
Anthrax	S		Infected patients do not generally pose a transmission risk.
Cutaneous	S		Transmission through non-intact skin contact with draining lesions possible, therefore use Contact Precautions if large amount of uncontained drainage. Handwashing with soap and water preferable to use of waterless alcohol based antiseptics since alcohol does not

[1] Type of Precautions: A, Airborne Precautions; C, Contact; D, Droplet; S, Standard; when A, C, and D are specified, also use S.

† Duration of precautions: CN, until off antimicrobial treatment and culture-negative; DI, duration of illness (with wound lesions, DI means until wounds stop draining); DE, until environment completely decontaminated; U, until time specified in hours (hrs) after initiation of effective therapy; Unknown: criteria for establishing eradication of pathogen has not been determined

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			have sporicidal activity [983].
Pulmonary	S		Not transmitted from person to person
Environmental: aerosolizable spore-containing powder or other substance		DE	Until decontamination of environment complete [203]. Wear respirator (N95 mask or PAPRs), protective clothing; decontaminate persons with powder on them (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5135a3.htm) **Hand hygiene:** Handwashing for 30-60 seconds with soap and water or 2% chlorhexidene gluconate after spore contact (alcohol handrubs inactive against spores [983]. **Post-exposure prophylaxis following environmental exposure**: 60 days of antimicrobials (either doxycycline, ciprofloxacin, or levofloxacin) and post-exposure vaccine under IND
Antibiotic-associated colitis (see *Clostridium difficile*)			
Arthropod-borne viral encephalitides (eastern, western, Venezuelan equine encephalomyelitis; St Louis, California encephalitis; West Nile Virus) and viral fevers (dengue, yellow fever, Colorado tick fever)	S		Not transmitted from person to person except rarely by transfusion, and for West Nile virus by organ transplant, breastmilk or transplacentally [530, 1047]. Install screens in windows and doors in endemic areas Use DEET-containing mosquito repellants and clothing to cover extremities
Ascariasis	S		Not transmitted from person to person
Aspergillosis	S		Contact Precautions and Airborne Precautions if massive soft tissue infection with copious drainage and repeated irrigations required [154].
Avian influenza (see influenza, avian below)			
Babesiosis	S		Not transmitted from person to person except rarely by transfusion,
Blastomycosis, North American, cutaneous or pulmonary	S		Not transmitted from person to person
Botulism	S		Not transmitted from person to person
Bronchiolitis (see respiratory infections in infants and young children)	C	DI	Use mask according to Standard Precautions.

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Brucellosis (undulant, Malta, Mediterranean fever)	S		Not transmitted from person to person except rarely via banked spermatozoa and sexual contact [1048, 1049]. Provid antimicrobial prophylaxis following laboratory exposure [1050].
Campylobacter gastroenteritis (see gastroenteritis)			
Candidiasis, all forms including mucocutaneous	S		
Cat-scratch fever (benign inoculation lymphoreticulosis)	S		Not transmitted from person to person
Cellulitis	S		
Chancroid (soft chancre) (*H. ducreyi*)	S		Transmitted sexually from person to person
Chickenpox (see varicella)			
Chlamydia trachomatis			
Conjunctivitis	S		
Genital (lymphogranuloma venereum)	S		
Pneumonia (infants ≤ 3 mos. of age))	S		
Chlamydia pneumoniae	S		Outbreaks in institutionalized populations reported, rarely [1051, 1052]
Cholera (see gastroenteritis)			
Closed-cavity infection			
Open drain in place; limited or minor drainage	S		Contact Precautions if there is copious uncontained drainage
No drain or closed drainage system in place	S		
Clostridium			
C. botulinum	S		Not transmitted from person to person
C. difficile (see Gastroenteritis, *C. difficile)*	C	DI	
C. perfringens			
Food poisoning	S		Not transmitted from person to person
Gas gangrene	S		Transmission from person to person rare; one outbreak in a surgical setting reported [1053]. Use Contact Precautions if wound drainage is

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			extensive.
Coccidioidomycosis (valley fever)			
Draining lesions	S		Not transmitted from person to person except under extraordinary circumstances because the infectious arthroconidial form of *Coccidioides immitis* is not produced in humans [1054].
Pneumonia	S		Not transmitted from person to person except under extraordinary circumstances, (e.g., inhalation of aerosolized tissue phase endospores during necropsy, transplantation of infected lung) because the infectious arthroconidial form of *Coccidioides immitis* is not produced in humans [1054, 1055].
Colorado tick fever	S		Not transmitted from person to person
Congenital rubella	C	Until 1 yr of age	Standard Precautions if nasopharyngeal and urine cultures repeatedly neg. after 3 mos. of age
Conjunctivitis			
Acute bacterial	S		
Chlamydia	S		
Gonococcal	S		
Acute viral (acute hemorrhagic)	C	DI	Adenovirus most common; enterovirus 70 [1056], Coxsackie virus A24 [1057]) also associated with community outbreaks. Highly contagious; outbreaks in eye clinics, pediatric and neonatal settings, institutional settings reported. Eye clinics should follow Standard Precautions when handling patients with conjunctivitis. Routine use of infection control measures in the handling of instruments and equipment will prevent the occurrence of outbreaks in this and other settings. [460, 814, 1058, 1059 461, 1060]
Corona virus associated with SARS (SARS-CoV) (see severe acute respiratory syndrome)			

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Coxsackie virus disease (see enteroviral infection)			
Creutzfeldt-Jakob disease CJD, vCJD	S		Use disposable instruments or special sterilization/disinfection for surfaces, objects contaminated with neural tissue if CJD or vCJD suspected and has not been R/O; No special burial procedures [1061]
Croup (see respiratory infections in infants and young children)			
Crimean-Congo Fever (see Viral Hemorrhagic Fever)	S		
Cryptococcosis	S		Not transmitted from person to person, except rarely via tissue and corneal transplant [1062, 1063]
Cryptosporidiosis (see gastroenteritis)			
Cysticercosis	S		Not transmitted from person to person
Cytomegalovirus infection, including in neonates and immunosuppressed patients	S		No additional precautions for pregnant HCWs
Decubitus ulcer (see Pressure ulcer)			
Dengue fever	S		Not transmitted from person to person
Diarrhea, acute-infective etiology suspected (see gastroenteritis)			
Diphtheria			
Cutaneous	C	CN	Until 2 cultures taken 24 hrs. apart negative
Pharyngeal	D	CN	Until 2 cultures taken 24 hrs. apart negative
Ebola virus (see viral hemorrhagic fevers)			
Echinococcosis (hydatidosis)	S		Not transmitted from person to person
Echovirus (see enteroviral infection)			
Encephalitis or encephalomyelitis (see specific etiologic agents)			
Endometritis (endomyometritis)	S		
Enterobiasis (pinworm disease, oxyuriasis)	S		
Enterococcus species (see multidrug-resistant organisms if			

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
epidemiologically significant or vancomycin resistant)			
Enterocolitis, *C. difficile* (see *C. difficile,* gastroenteritis)			
Enteroviral infections (i.e., Group A and B Coxsackie viruses and Echo viruses) (excludes polio virus)	S		Use Contact Precautions for diapered or incontinent children for duration of illness and to control institutional outbreaks
Epiglottitis, due to *Haemophilus influenzae* type b	D	U 24 hrs	See specific disease agents for epiglottitis due to other etiologies)
Epstein-Barr virus infection, including infectious mononucleosis	S		
Erythema infectiosum (also see Parvovirus B19)			
Escherichia coli gastroenteritis (see gastroenteritis)			
Food poisoning			
Botulism	S		Not transmitted from person to person
C. perfringens or welchii	S		Not transmitted from person to person
Staphylococcal	S		Not transmitted from person to person
Furunculosis, staphylococcal	S		Contact if drainage not controlled. Follow institutional policies if MRSA
Infants and young children	C	DI	
Gangrene (gas gangrene)	S		Not transmitted from person to person
Gastroenteritis	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks for gastroenteritis caused by all of the agents below
Adenovirus	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Campylobacter species	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Cholera *(Vibrio cholerae)*	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
C. difficile	C	DI	Discontinue antibiotics if appropriate. Do not share electronic thermometers [853, 854]; ensure consistent environmental cleaning and

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			disinfection. Hypochlorite solutions may be required for cleaning if transmission continues [847]. Handwashing with soap and water preferred because of the absence of sporicidal activity of alcohol in waterless antiseptic handrubs [983].
Cryptosporidium species	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
E. coli			
Enteropathogenic O157:H7 and other shiga toxin-producing Strains	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Other species	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Giardia lamblia	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Noroviruses	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks. Persons who clean areas heavily contaminated with feces or vomitus may benefit from wearing masks since virus can be aerosolized from these body substances [142, 147 148]; ensure consistent environmental cleaning and disinfection with focus on restrooms even when apparently unsoiled [273, 1064]). Hypochlorite solutions may be required when there is continued transmission [290-292]. Alcohol is less active, but there is no evidence that alcohol antiseptic handrubs are not effective for hand decontamination [294]. Cohorting of affected patients to separate airspaces and toilet facilities may help interrupt transmission during outbreaks.
Rotavirus	C	DI	Ensure consistent environmental cleaning and disinfection and frequent removal of soiled diapers. Prolonged shedding may occur in

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			both immunocompetent and immunocompromised children and the elderly [932, 933].
Salmonella species (including *S. typhi*)	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Shigella species (Bacillary dysentery)	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Vibrio parahaemolyticus	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Viral (if not covered elsewhere)	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
Yersinia enterocolitica	S		Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks
German measles (see rubella; see congenital rubella)			
Giardiasis (see gastroenteritis)			
Gonococcal ophthalmia neonatorum (gonorrheal ophthalmia, acute conjunctivitis of newborn)	S		
Gonorrhea	S		
Granuloma inguinale (Donovanosis, granuloma venereum)	S		
Guillain-Barré' syndrome	S		Not an infectious condition
Haemophilus influenzae (see disease-specific recommendations)			
Hand, foot, and mouth disease (see enteroviral infection)			
Hansen's Disease (see Leprosy)			
Hantavirus pulmonary syndrome	S		Not transmitted from person to person
Helicobacter pylori	S		
Hepatitis, viral			
Type A	S		Provide hepatitis A vaccine post-exposure as recommended [1065]
Diapered or incontinent patients	C		Maintain Contact Precautions in infants and children <3 years of age

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			for duration of hospitalization; for children 3-14 yrs. of age for 2 weeks after onset of symptoms; >14 yrs. of age for 1 week after onset of symptoms [833, 1066, 1067].
Type B-HBsAg positive; acute or chronic	S		See specific recommendations for care of patients in hemodialysis centers [778]
Type C and other unspecified non-A, non-B	S		See specific recommendations for care of patients in hemodialysis centers [778]
Type D (seen only with hepatitis B)	S		
Type E	S		Use Contact Precautions for diapered or incontinent individuals for the duration of illness [1068]
Type G	S		
Herpangina (see enteroviral infection)			
Hookworm	S		
Herpes simplex (*Herpesvirus hominis*)			
Encephalitis	S		
Mucocutaneous, disseminated or primary, severe	C	Until lesions dry and crusted	
Mucocutaneous, recurrent (skin, oral, genital)	S		
Neonatal	C	Until lesions dry and crusted	Also, for asymptomatic, exposed infants delivered vaginally or by C-section and if mother has active infection and membranes have been ruptured for more than 4 to 6 hrs until infant surface cultures obtained at 24-36 hrs. of age negative after 48 hrs incubation [1069, 1070]
Herpes zoster (varicella-zoster) (shingles)			
Disseminated disease in any patient Localized disease in immunocompromised patient until disseminated infection ruled out	A,C	DI	Susceptible HCWs should not enter room if immune caregivers are available; no recommendation for protection of immune HCWs; no recommendation for type of protection, i.e. surgical mask or respirator; for susceptible HCWs.

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Localized in patient with intact immune system with lesions that can be contained/covered	S	DI	Susceptible HCWs should not provide direct patient care when other immune caregivers are available.
Histoplasmosis	S		Not transmitted from person to person
Human immunodeficiency virus (HIV)	S		Post-exposure chemoprophylaxis for some blood exposures [866].
Human metapneumovirus	C	DI	HAI reported [1071], but route of transmission not established [823]. Assumed to be Contact transmission as for RSV since the viruses are closely related and have similar clinical manifestations and epidemiology. Wear masks according to Standard Precautions..
Impetigo	C	U 24 hrs	
Infectious mononucleosis	S		
Influenza			
Human (seasonal influenza)			See www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm for current seasonal influenza guidance.
Avian (e.g., H5N1, H7, H9 strains))			See www.cdc.gov/flu/avian/professional/infect-control.htm for current avian influenza guidance.
Pandemic influenza (also a human influenza virus)	D	5 days from onset of symptoms	See http://www.pandemicflu.gov for current pandemic influenza guidance.
Kawasaki syndrome	S		Not an infectious condition
Lassa fever (see viral hemorrhagic fevers)			

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Legionnaires' disease	S		Not transmitted from person to person
Leprosy	S		
Leptospirosis	S		Not transmitted from person to person
Lice			http://www.cdc.gov/ncidod/dpd/parasites/lice/default.htm
Head (pediculosis)	C	U 24 hrs	
Body	S		Transmitted person to person through infested clothing. Wear gown and gloves when removing clothing; bag and wash clothes according to CDC guidance above
Pubic	S		Transmitted person to person through sexual contact
Listeriosis (listeria monocytogenes)	S		Person-to-person transmission rare; cross-transmission in neonatal settings reported [1072, 1073 1074, 1075]
Lyme disease	S		Not transmitted from person to person
Lymphocytic choriomeningitis	S		Not transmitted from person to person
Lymphogranuloma venereum	S		
Malaria	S		Not transmitted from person to person except through transfusion rarely and through a failure to follow Standard Precautions during patient care [1076-1079]. Install screens in windows and doors in endemic areas. Use DEET-containing mosquito repellants and clothing to cover extremities
Marburg virus disease (see viral hemorrhagic fevers)			
Measles (rubeola)	A	4 days after onset of rash; DI in immune compromised	Susceptible HCWs should not enter room if immune care providers are available; no recommendation for face protection for immune HCW; no recommendation for type of face protection for susceptible HCWs, i.e., mask or respirator [1027, 1028]. For exposed susceptibles, post-exposure vaccine within 72 hrs. or immune globulin within 6 days when available [17, 1032, 1034]. Place exposed susceptible patients on Airborne Precautions and exclude susceptible healthcare personnel

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			from duty from day 5 after first exposure to day 21 after last exposure, regardless of post-exposure vaccine [17].
Melioidosis, all forms	S		Not transmitted from person to person
Meningitis			
Aseptic (nonbacterial or viral; also see enteroviral infections)	S		Contact for infants and young children
Bacterial, gram-negative enteric, in neonates	S		
Fungal	S		
Haemophilus influenzae, type b known or suspected	D	U 24 hrs	
Listeria monocytogenes (See Listeriosis)	S		
Neisseria meningitidis (meningococcal) known or suspected	D	U 24 hrs	See meningococcal disease below
Streptococcus pneumoniae	S		
M. tuberculosis	S		Concurrent, active pulmonary disease or draining cutaneous lesions may necessitate addition of Contact and/or Airborne Precautions; For children, airborne precautions until active tuberculosis ruled out in visiting family members (see tuberculosis below) [42]
Other diagnosed bacterial	S		
Meningococcal disease: sepsis, pneumonia, meningitis	D	U 24 hrs	Postexposure chemoprophylaxis for household contacts, HCWs exposed to respiratory secretions; postexposure vaccine only to control outbreaks [15, 17].
Molluscum contagiosum	S		
Monkeypox	A,C	A-Until monkeypox confirmed and smallpox excluded C-Until lesions crusted	Use See www.cdc.gov/ncidod/monkeypox for most current recommendations. Transmission in hospital settings unlikely [269]. Pre- and post-exposure smallpox vaccine recommended for exposed HCWs

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Mucormycosis	S		
Multidrug-resistant organisms (MDROs), infection or colonization (e.g., MRSA, VRE, VISA/VRSA, ESBLs, resistant *S. pneumoniae*)	S/C		MDROs judged by the infection control program, based on local, state, regional, or national recommendations, to be of clinical and epidemiologic significance. Contact Precautions recommended in settings with evidence of ongoing transmission, acute care settings with increased risk for transmission or wounds that cannot be contained by dressings. See recommendations for management options in Management of Multidrug-Resistant Organisms In Healthcare Settings, 2006 [870]. Contact state health department for guidance regarding new or emerging MDRO.
Mumps (infectious parotitis)	D	U 9 days	After onset of swelling; susceptible HCWs should not provide care if immune caregivers are available. Note: (Recent assessment of outbreaks in healthy 18-24 year olds has indicated that salivary viral shedding occurred early in the course of illness and that 5 days of isolation after onset of parotitis may be appropriate in community settings; however the implications for healthcare personnel and high-risk patient populations remain to be clarified.)
Mycobacteria, nontuberculosis (atypical)			Not transmitted person-to-person
Pulmonary	S		
Wound	S		
Mycoplasma pneumonia	D	DI	
Necrotizing enterocolitis	S		Contact Precautions when cases clustered temporally [1080-1083].
Nocardiosis, draining lesions, or other presentations	S		Not transmitted person-to-person
Norovirus (see gastroenteritis)			
Norwalk agent gastroenteritis (see gastroenteritis)			
Orf	S		

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Parainfluenza virus infection, respiratory in infants and young children	C	DI	Viral shedding may be prolonged in immunosuppressed patients [1009, 1010]. Reliability of antigen testing to determine when to remove patients with prolonged hospitalizations from Contact Precautions uncertain.
Parvovirus B19 (Erythema infectiosum)	D		Maintain precautions for duration of hospitalization when chronic disease occurs in an immunocompromised patient. For patients with transient aplastic crisis or red-cell crisis, maintain precautions for 7 days. Duration of precautions for immunosuppressed patients with persistently positive PCR not defined, but transmission has occurred [929].
Pediculosis (lice)	C	U 24 hrs after treatment	
Pertussis (whooping cough)	D	U 5 days	Single patient room preferred. Cohorting an option. Post-exposure chemoprophylaxis for household contacts and HCWs with prolonged exposure to respiratory secretions [863]. Recommendations for Tdap vaccine in adults under development.
Pinworm infection (Enterobiasis)	S		
Plague *(Yersinia pestis)*			
Bubonic	S		
Pneumonic	D	U 48 hrs	Antimicrobial prophylaxis for exposed HCW [207].
Pneumonia			
Adenovirus	D, C	DI	Outbreaks in pediatric and institutional settings reported [376, 1084-1086]. In immunocompromised hosts, extend duration of Droplet and Contact Precautions due to prolonged shedding of virus [931]
Bacterial not listed elsewhere (including gram-negative bacterial)	S		
B. cepacia in patients with CF, including respiratory tract colonization	C	Unknown	Avoid exposure to other persons with CF; private room preferred. Criteria for D/C precautions not established. See CF Foundation guideline [20]

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
B. cepacia in patients without CF(see Multidrug-resistant organisms)			
Chlamydia	S		
Fungal	S		
Haemophilus influenzae, type b			
Adults	S		
Infants and children	D	U 24 hrs	
Legionella spp.	S		
Meningococcal	D	U 24 hrs	See meningococcal disease above
Multidrug-resistant bacterial (see multidrug-resistant organisms)			
Mycoplasma (primary atypical pneumonia)	D	DI	
Pneumococcal pneumonia	S		Use Droplet Precautions if evidence of transmission within a patient care unit or facility [196-198, 1087]
Pneumocystis jiroveci (*Pneumocystis carinii*)	S		Avoid placement in the same room with an immunocompromised patient.
Staphylococcus aureus	S		For MRSA, see MDROs
Streptococcus, group A			
Adults	D	U 24 hrs	See streptococcal disease (group A streptococcus) below Contact precautions if skin lesions present
Infants and young children	D	U 24 hrs	Contact Precautions if skin lesions present
Varicella-zoster (See Varicella-Zoster)			
Viral			
Adults	S		
Infants and young children (see respiratory infectious disease, acute, or specific viral agent)			
Poliomyelitis	C	DI	
Pressure ulcer (decubitus ulcer, pressure sore) infected			

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Major	C	DI	If no dressing or containment of drainage; until drainage stops or can be contained by dressing
Minor or limited	S		If dressing covers and contains drainage
Prion disease (See Creutzfeld-Jacob Disease)			
Psittacosis (ornithosis) (*Chlamydia psittaci)*	S		Not transmitted from person to person
Q fever	S		
Rabies	S		Person to person transmission rare; transmission via corneal, tissue and organ transplants has been reported [539, 1088]. If patient has bitten another individual or saliva has contaminated an open wound or mucous membrane, wash exposed area thoroughly and administer postexposure prophylaxis. [1089]
Rat-bite fever (*Streptobacillus moniliformis* disease, *Spirillum minus* disease)	S		Not transmitted from person to person
Relapsing fever	S		Not transmitted from person to person
Resistant bacterial infection or colonization (see multidrug-resistant organisms)			
Respiratory infectious disease, acute (if not covered elsewhere)			
Adults	S		
Infants and young children	C	DI	Also see syndromes or conditions listed in Table 2
Respiratory syncytial virus infection, in infants, young children and immunocompromised adults	C	DI	Wear mask according to Standard Precautions [24] CB [116, 117]. In immunocompromised patients, extend the duration of Contact Precautions due to prolonged shedding [928]). Reliability of antigen testing to determine when to remove patients with prolonged hospitalizations from Contact Precautions uncertain.
Reye's syndrome	S		Not an infectious condition
Rheumatic fever	S		Not an infectious condition
Rhinovirus	D	DI	Droplet most important route of transmission [104 1090]. Outbreaks have

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			occurred in NICUs and LTCFs [413, 1091, 1092]. Add Contact Precautions if copious moist secretions and close contact likely to occur (e.g., young infants) [111, 833].
Rickettsial fevers, tickborne (Rocky Mountain spotted fever, tickborne typhus fever)	S		Not transmitted from person to person except through transfusion, rarely
Rickettsialpox (vesicular rickettsiosis)	S		Not transmitted from person to person
Ringworm (dermatophytosis, dermatomycosis, tinea)	S		Rarely, outbreaks have occurred in healthcare settings, (e.g., NICU [1093], rehabilitation hospital [1094]. Use Contact Precautions for outbreak.
Ritter's disease (staphylococcal scalded skin syndrome)	C	DI	See staphylococcal disease, scalded skin syndrome below
Rocky Mountain spotted fever	S		Not transmitted from person to person except through transfusion, rarely
Roseola infantum (exanthem subitum; caused by HHV-6)	S		
Rotavirus infection (see gastroenteritis)			
Rubella (German measles) (also see congenital rubella)	D	U 7 days after onset of rash	Susceptible HCWs should not enter room if immune caregivers are available. No recommendation for wearing face protection (e.g., a surgical mask) if immune. Pregnant women who are not immune should not care for these patients [17, 33]. Administer vaccine within three days of exposure to non-pregnant susceptible individuals. Place exposed susceptible patients on Droplet Precautions; exclude susceptible healthcare personnel from duty from day 5 after first exposure to day 21 after last exposure, regardless of post-exposure vaccine.
Rubeola (see measles)			
Salmonellosis (see gastroenteritis)			
Scabies	C	U 24	
Scalded skin syndrome, staphylococcal	C	DI	See staphylococcal disease, scalded skin syndrome below)
Schistosomiasis (bilharziasis)	S		

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Severe acute respiratory syndrome (SARS)	A, D,C	DI plus 10 days after resolution of fever, provided respiratory symptoms are absent or improving	Airborne Precautions preferred; D if AIIR unavailable. N95 or higher respiratory protection; surgical mask if N95 unavailable; eye protection (goggles, face shield); aerosol-generating procedures and "supershedders" highest risk for transmission via small droplet nuclei and large droplets [93, 94, 96]. Vigilant environmental disinfection (see www.cdc.gov/ncidod/sars)
Shigellosis (see gastroenteritis)			
Smallpox (variola; see vaccinia for management of vaccinated persons)	A,C	DI	Until all scabs have crusted and separated (3-4 weeks). Non-vaccinated HCWs should not provide care when immune HCWs are available; N95 or higher respiratory protection for susceptible and successfully vaccinated individuals; postexposure vaccine within 4 days of exposure protective [108, 129, 1038-1040]
Sporotrichosis	S		
Spirillum minor disease (rat-bite fever)	S		Not transmitted from person to person
Staphylococcal disease (*S aureus*)			
Skin, wound, or burn			
Major	C	DI	No dressing or dressing does not contain drainage adequately
Minor or limited	S		Dressing covers and contains drainage adequately
Enterocolitis	S		Use Contact Precautions for diapered or incontinent children for duration of illness
Multidrug-resistant (see multidrug-resistant organisms)			
Pneumonia	S		
Scalded skin syndrome	C	DI	Consider healthcare personnel as potential source of nursery, NICU outbreak [1095]
Toxic shock syndrome	S		
Streptobacillus moniliformis disease (rat-bite fever)	S		Not transmitted from person to person

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Streptococcal disease (group A streptococcus)			
Skin, wound, or burn			
Major	C,D	U 24 hrs	No dressing or dressing does not contain drainage adequately
Minor or limited	S		Dressing covers and contains drainage adequately
Endometritis (puerperal sepsis)	S		
Pharyngitis in infants and young children	D	U 24 hrs	
Pneumonia	D	U 24 hrs	
Scarlet fever in infants and young children	D	U 24 hrs	
Serious invasive disease	D	U24 hrs	Outbreaks of serious invasive disease have occurred secondary to transmission among patients and healthcare personnel [162, 972, 1096-1098] Contact Precautions for draining wound as above; follow rec. for antimicrobial prophylaxis in selected conditions [160].
Streptococcal disease (group B streptococcus), neonatal	S		
Streptococcal disease (not group A or B) unless covered elsewhere	S		
Multidrug-resistant (see multidrug-resistant organisms)			
Strongyloidiasis	S		
Syphilis			
Latent (tertiary) and seropositivity without lesions	S		
Skin and mucous membrane, including congenital, primary, Secondary	S		
Tapeworm disease			
Hymenolepis nana	S		Not transmitted from person to person
Taenia solium (pork)	S		
Other	S		
Tetanus	S		Not transmitted from person to person
Tinea (e.g., dermatophytosis, dermatomycosis, ringworm)	S		Rare episodes of person-to-person transmission

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Toxoplasmosis	S		Transmission from person to person is rare; vertical transmission from mother to child, transmission through organs and blood transfusion rare
Toxic shock syndrome (staphylococcal disease, streptococcal disease)	S		Droplet Precautions for the first 24 hours after implementation of antibiotic therapy if Group A streptococcus is a likely etiology
Trachoma, acute	S		
Transmissible spongiform encephalopathy (see Creutzfeld-Jacob disease, CJD, vCJD)			
Trench mouth (Vincent's angina)	S		
Trichinosis	S		
Trichomoniasis	S		
Trichuriasis (whipworm disease)	S		
Tuberculosis *(M. tuberculosis)*			
Extrapulmonary, draining lesion)	A,C		Discontinue precautions only when patient is improving clinically, and drainage has ceased or there are three consecutive negative cultures of continued drainage [1025, 1026]. Examine for evidence of active pulmonary tuberculosis.
Extrapulmonary, no draining lesion, meningitis	S		Examine for evidence of pulmonary tuberculosis. For infants and children, use Airborne Precautions until active pulmonary tuberculosis in visiting family members ruled out [42]
Pulmonary or laryngeal disease, confirmed	A		Discontinue precautions only when patient on effective therapy is improving clinically and has three consecutive sputum smears negative for acid-fast bacilli collected on separate days(MMWR 2005; 54: RR-17 http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr5417a1_e) [12].
Pulmonary or laryngeal disease, suspected	A		Discontinue precautions only when the likelihood of infectious TB

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
			disease is deemed negligible, and either 1) there is another diagnosis that explains the clinical syndrome or 2) the results of three sputum smears for AFB are negative. Each of the three sputum specimens should be collected 8-24 hours apart, and at least one should be an early morning specimen
Skin-test positive with no evidence of current active disease	S		
Tularemia			
Draining lesion	S		Not transmitted from person to person
Pulmonary	S		Not transmitted from person to person
Typhoid (*Salmonella typhi*) fever (see gastroenteritis)			
Typhus			
Rickettsia prowazekii (Epidemic or Louse-borne typhus)	S		Transmitted from person to person through close personal or clothing contact
Rickettsia typhi	S		Not transmitted from person to person
Urinary tract infection (including pyelonephritis), with or without urinary catheter	S		
Vaccinia (vaccination site, adverse events following vaccination) *			Only vaccinated HCWs have contact with active vaccination sites and care for persons with adverse vaccinia events; if unvaccinated, only HCWs without contraindications to vaccine may provide care.
Vaccination site care (including autoinoculated areas)	S		Vaccination recommended for vaccinators; for newly vaccinated HCWs: semi-permeable dressing over gauze until scab separates, with dressing change as fluid accumulates, ~3-5 days; gloves, hand hygiene for dressing change; vaccinated HCW or HCW without contraindication to vaccine for dressing changes [205, 221, 225]
Eczema vaccinatum	C	Until lesions dry and crusted, scabs separated	For contact with virus-containing lesions and exudative material
Fetal vaccinia	C		
Generalized vaccinia	C		

APPENDIX A[1]

TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS

Infection/Condition	Precautions		
	Type *	Duration †	Comments
Progressive vaccinia	C		
Postvaccinia encephalitis	S		
Blepharitis or conjunctivitis	S/C		Use Contact Precautions if there is copious drainage
Iritis or keratitis	S		
Vaccinia-associated erythema multiforme (Stevens Johnson Syndrome)	S		Not an infectious condition
Secondary bacterial infection (e.g., S. aureus, group A beta hemolytic streptococcus	S/C		Follow organism-specific (strep, staph most frequent) recommendations and consider magnitude of drainage
Varicella Zoster	A,C	Until lesions dry and crusted	Susceptible HCWs should not enter room if immune caregivers are available; no recommendation for face protection of immune HCWs; no recommendation for type of protection, i.e. surgical mask or respirator for susceptible HCWs. In immunocompromised host with varicella pneumonia, prolong duration of precautions for duration of illness. Post-exposure prophylaxis: provide post-exposure vaccine ASAP but within 120 hours; for susceptible exposed persons for whom vaccine is contraindicated (immunocompromised persons, pregnant women, newborns whose mother's varicella onset is ≤5days before delivery or within 48 hrs after delivery) provide VZIG, when available, within 96 hours; if unavailable, use IVIG, Use Airborne Precautions for exposed susceptible persons and exclude exposed susceptible healthcare workers beginning 8 days after first exposure until 21 days after last exposure or 28 if received VZIG, regardless of postexposure vaccination.[1036]
Variola (see smallpox)			
Vibrio parahaemolyticus (see gastroenteritis)			
Vincent's angina (trench mouth)	S		
Viral hemorrhagic fevers	S, D, C	DI	Single-patient room preferred. Emphasize: 1) use of sharps safety

McGeer Criteria for Long Term Care Surveillance Definitions for Infections Updated 2012

Article on a review of the updated McGreer Criteria for Infections in LTC Facilities.
The updated criteria can be found at http://www.jstor.org/stable/10.1086/667743
Review of the Updated McGreer Criteria for Infections

Michelle Stober, RN, BSN
Director of Interim Services, Pathway Health Services

In October 2012, the Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGreer Criteria was released. This position paper was first released in 1991, and since has not been updated. This criterion was determined by an expert consensus panel based on a structured review of research and evidenced-based literature. The criteria that define infections were systematically reviewed and have resulted in changes of the original consensus definitions also known as the McGreer Criteria.

Some notable changes in the criteria are the addition of definitions of constitutional criteria (Table 2.) in residents of long term care facilities. The decision was made to use these criteria to maintain consistency across different infection guidelines.

This Constitutional Criteria includes:

- Fever
- Leukocytosis
- Acute change in mental status from baseline (CAM criteria also found in MDS 3.0)
- Acute functional decline in activities of daily living (ADLs)
    - A new 3-point increase in total activities of daily living (ADL) score (range, 0-28) from baseline, based on the following 7 ADL items, each scored from 0 (independent) to 4 (total dependence) Bed mobility, Transfer, Locomotion within LTCF, Dressing, Toilet use, Personal hygiene, Eating

The definition of fever was changed from a temperature greater than 100.4 degrees Fahrenheit and is consistent with the 2008 Infectious Disease of America (IDSA) guideline for evaluating fever and infection in older adults residing in long term care facilities (LTCFs):

1. A single oral temperature greater than37.8°C(100°F) or
2. Repeated oral temperatures greater than37.2°C(99°F)orrectaltemperaturesgreaterthan37.5°C (99.5°F)or
3. A single temperature greater than 1.1°C(2°F) over baseline from any site.

Attention should be paid the new surveillance definitions, especially for respiratory tract infection and urinary tract infections. The following are key changes to be aware of:

Respiratory Tract Infection

When reviewing for potential respiratory infection, it is important that other conditions are ruled out such as congestive heart failure, pulmonary embolism, atelectasis, etc..

- Removal of seasonal restrictions for influenza-like illness
- Pneumonia and lower respiratory tract infections- at least one respiratory symptom, and at least one constitutional criteria, along with radiographic findings to define pneumonia. This should facilitate the surveillance into three categories including radiography results, respiratory signs or symptoms and constitutional criteria.
- For lower respiratory tract infection oxygen saturation of <94% or <3% from baseline was added.

McGeer Criteria for Long Term Care Surveillance Definitions for Infections Updated 2012

Urinary Tract Infections (UTI's)

For Urinary Tract Infections without a catheter the new definitions differ substantially from the original guidelines. The definitions take into account the low probability of UTI in residents without catheters if symptoms are not present as well as they now take into account the need for a urine culture for microbiologic confirmation.

- Change in character of urine was removed
- Urine culture is now needed for diagnosis

New Criteria for UTI without a Catheter: (Both criteria 1 and 2 must be present)

Criteria 1

At least one of the following sign or symptom criteria:

a. Acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate

b. Fever or leukocytosis (See Constitutional Criteria Table) **and at least one** of the following localizing urinary tract subcriteria:

i. Acute costovertebral angle pain or tenderness
ii. Suprapubic pain
iii. Gross hematuria
iv. New or marked increase in incontinence
v. New or marked increase in urgency
vi. New or marked increase in frequency

c. In the absence of fever or leukocystosis, **then 2 or more** of the following subcriteria:

i. Suprapubic pain
ii. Gross hematuria
iii. New or marked increase in incontinence
iv. New or marked increase in urgency
v. New or marked increase in frequency

Criteria 2

a. At least 105 cfu/mL of no more than 2 species of microorganisms in a voided urine sample
b. At least 102 cfu/mL of any number of organisms in a specimen collected by in-and-out catheter

With the new change in surveillance guidelines, it is not only important that we train our staff but that we look at how to operationalize infection prevention strategies.

Operational strategies for consideration:

UTI's:

- Educate staff on criteria for urinary tract infections
- Provide training on pericare and catheter care
- Encourage hydration
- Obtain baseline vital signs
- Obtain protocols to notify MD with change in condition
- Review medications

- Perform through assessment of urinary incontinence
- Provide training on pain assessment and management
- Referrals as needed to urology for chronic urinary tract infections

Respiratory Tract Infections

- Obtain a complete respiratory baseline during admission including lung sounds, observation of breathing and color as well as oxygen saturation ratings.

Source: Infection Control and Hospital Epidemiology Vol.33, No.10(October2012), pp. 965-977

If you want more detail to compare the old guidelines to the new guidelines, please see the table on the next page. The items in red are new, and the items that are struck thru have been removed.
(Shared with permission from Pathway Health Services)

McGeer Criteria for Long Term Care Surveillance Definitions for Infections Updated 2012

Type of Infection (✓)	Infection/Site	Criteria (symptoms must be new or increased)	Conditions/Comments
☐ Respiratory Tract	☐ Common cold syndrome ☐ Or Pharyngitis	MUST HAVE at least 2 of the following: ☐ Runny nose or sneezing ☐ Stuffy nose (nasal congestion) ☐ Sore throat or hoarseness or difficulty swallowing ☐ Dry cough ☐ Swollen or tender glands in neck (cervical lymphadenopathy)	Fever may or may not be present. Symptoms must be new and not attributable to allergies.
	☐ Influenza-like illness Did resident receive influenza vaccine for this flu season? ☐ YES ☐ NO	MUST HAVE: ☐Fever (≥ 100˚F taken at any site) AND MUST HAVE: at least 3 of the following: ☐ chills ☐ malaise or loss of appetite ☐ headache or eye pain ☐sore throat ☐ Mylagia/body aches ☐ New or increased dry cough	If criteria for influenza-like illness and another upper or lower RTI are met at the same time, only the diagnosis of influenza-like illness should be recorded. Because of increasing uncertainty surrounding the timing of the start of influenza season, the peak of influenza activity, and the length of the season, "seasonality" is no longer a criterion to define influenza-like illness.
	☐ Pneumonia	MUST HAVE: ☐ Chest x-ray demonstrating pneumonia, probable pneumonia or new infiltrate. AND MUST HAVE at least 1 of the following ☐ New or increased cough ☐ 02 sat<94% or < 3% baseline ☐ pleuritic chest pain ☐ fever (see CC table 2) ☐ New or increased sputum production ☐ New or changed lung exam abnormalities ☐ respiratory rate (>25/minute) ☐ MUST HAVE ≥1: Constitutional Criteria (Fever, ADL, Mental change)	For both pneumonia and lower RTI, the presence of underlying conditions that could mimic the presentation of a RTI (eg, congestive heart failure or interstitial lung diseases) should be excluded by a review of clinical records and an assessment of presenting symptoms and signs.
	☐ Lower respiratory tract infection (bronchitis, tracheobronchitis)	MUST HAVE at least 3 of the following: 1. ☐ CXR not performed or negative results for pneumonia or new infiltrate 2. At least 2 of respiratory subcriteria above in pneumonia 3. At least 1 of the constitutional criteria (Table 2)	NOTE: This diagnosis can be made only if NO Chest x-ray was done OR if a CXR fails to confirm diagnosis of pneumonia. For both pneumonia and lower RTI, the presence of underlying conditions that could mimic the presentation of a RTI (e.g. congestive heart failure or interstitial lung diseases) should be excluded by a review of clinical records and assessment of s/sx
☐ Urinary Tract Infection	☐ UTI in resident WITHOUT catheter (any previous catheter must have been D/C'd at least 48 hrs before symptoms began)	**Criteria 1 and 2 MUST be present** **Both criteria must be present:** **1. At least 1 of the following sub criteria:** ☐ Acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate ☐ Fever or leukocytosis *(See Constitutional Criteria Table)* **AND** **At least 1 of the following subcriteria:** ○ Acute costovertebral angle pain or tenderness ○ Suprapubic pain ○ Gross hematuria ○ New or marked increase in incontinence ○ New or marked increase in urgency ○ New or marked increase in frequency ***In the absence of fever or leukocytosis*, then 2 or**	UTI should be diagnosed when there are localizing genitourinary signs and symptoms and a positive urine culture result. A diagnosis of UTI can be made without localizing symptoms if a blood culture isolate is the same as the organism isolated from the urine and there is no alternate site of infection. In the absence of a clear alternate source of infection, fever or rigors with a positive urine culture result in the non-catheterized resident or acute confusion in the catheterized resident will often be treated as UTI. However, evidence suggests that most of these episodes are likely not due to infection of a urinary source. Urine specimens for culture should be processed as soon as possible, preferably within 1–2 h. If urine specimens cannot be processed within 30 min of collection, they should be refrigerated. Refrigerated specimens should be cultured within

		more of the following subcriteria: ○ Suprapubic pain ○ Gross hematuria ○ New or marked increase in incontinence ○ New or marked increase in urgency ○ New or marked increase in frequency **AND** **2. 1 of the following subcriteria:** ☐ At least 10^5 cfu/mL of no more than 2 species of microorganisms in a voided urine sample ☐ At least 10^2 cfu/mL of any number of organisms in a specimen collected by in-and-out catheter	24 h.
	☐ UTI in resident WITH catheter (if symptoms begin within 48 hrs after discontinuing a catheter, count it as related to catheter)	**Both criteria must be present:** **At least 1 of the following subcriteria:** ☐ Fever, rigors, or new-onset hypotension, with no alternate site of infection ☐ Either acute change in mental status or acute functional decline, with no alternate site of infection ☐ New-onset suprapubic pain or costovertebral angle pain or tenderness ☐ Purulent discharge from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis, or prostate **AND** **Must have:** Urinary catheter specimen culture with at least 10^5 cfu/mL of any organism(s)	UTI should be diagnosed when there are localizing genitourinary signs and symptoms and a positive urine culture result. A diagnosis of UTI can be made without localizing symptoms if a blood culture isolate is the same as the organism isolated from the urine and there is no alternate site of infection. In the absence of a clear alternate source of infection, fever or rigors with a positive urine culture result in the non-catheterized resident or acute confusion in the catheterized resident will often be treated as UTI. However, evidence suggests that most of these episodes are likely not due to infection of a urinary source. Recent catheter trauma, catheter obstruction, or new-onset hematuria are useful localizing signs that are consistent with UTI but are not necessary for diagnosis. **Urinary catheter specimens for culture should be collected following replacement of the catheter (if current catheter in place for >14 days).**
☐ **Gastrointestinal**	❒ Gastroenteritis		Care must be taken to exclude noninfectious causes of symptoms. For instance, new medications may cause diarrhea, nausea, or vomiting; initiation of new enteral feeding may be associated with diarrhea; and nausea or vomiting may be associated with gallbladder disease.
☐ **Gastrointestinal Tract**		**At least 1 criteria must be present:** ▪ Diarrhea: 3 or more liquid or watery stools above what is normal for the resident within a 24-hour period ▪ Vomiting: 2 or more episodes in a 24-hour period **OR** **Both of the following subcriteria:** ☐ A stool specimen testing positive for a pathogen (eg, *Salmonella, Shigella, Escherichia coli* O157 : H7, *Campylobacter* species, rotavirus) ☐ **At least one of the following subcriteria:** ○ Nausea ○ Vomiting ○ Abdominal pain or tenderness ○ Diarrhea	Presence of new GI symptoms in a single resident may prompt enhanced surveillance for additional cases. In the presence of an outbreak, stool specimens should be sent to confirm the presence of norovirus or other pathogens (e.g., rotavirus or *E. coli* O157 : H7)

	☐ Norovirus Gastro-enteritis	**Both criteria must be present:** **At least 1 of the following subcriteria:** ☐ Diarrhea: 3 or more liquid or watery stools above what is normal for the resident within a 24-hour period ☐ Vomiting: 2 or more episodes in a 24-hour period **AND** **Must have:** A stool specimen for which norovirus is positively detected by electron microscopy, enzyme immunoassay, or molecular diagnostic testing such as polymerase chain reaction (PCR)	In the absence of laboratory confirmation, an outbreak (2 or more cases occurring in a long-term care facility [LTCF]) of acute gastroenteritis due to norovirus infection may be assumed to be present if all of the following criteria are present ("Kaplan Criteria"): (a) vomiting in more than half of affected persons; (b) a mean (or median) incubation period of 24-48 hours; (c) a mean (or median) duration of illness of 12-60 hours; and (d) no bacterial pathogen is identified in stool culture.
	❒Clostridium difficile infection	**Both criteria must be present:** **At least 1 of the following subcriteria:** ☐ Diarrhea: 3 or more liquid or watery stools above what is normal for the resident within a 24-hour period ☐ Presence of toxic megacolon (abnormal dilatation of the large bowel, documented radiologically)	A "primary episode" of *C. difficile* infection is defined as one that has occurred without any previous history of *C. difficile* infection or that has occurred >8weeks after the onset of a previous episode of *C. difficile* infection.
		AND **At least 1 of the following subcriteria:** ☐ A stool sample yields a positive laboratory test result for *C. difficile* toxin A or B, or a toxin producing *C. difficile* organism is identified from a stool sample culture or by a molecular diagnostic test such as PCR ☐ Pseudomembranous colitis is identified during endoscopic examination or surgery or in histopathologic examination of a biopsy specimen	A "recurrent episode" of *C. difficile* infection is defined as an episode of *C. difficile* infection that occurs 8 weeks or sooner after the onset of a previous episode, provided that the symptoms from the earlier (previous) episode have resolved. Individuals previously infected with *C. difficile* may continue to remain colonized even after symptoms resolve. In the setting of an outbreak of GI infection, individuals could have positive test results for presence of *C. difficile* toxin because of ongoing colonization and also be coinfected with another pathogen. It is important that other surveillance criteria be used to differentiate infections in this situation.
☐ **Skin** **NOTE: Assure that personnel wear gloves for contact with rash or skin lesions and perform hand**	☐ Cellulitis/soft tissue/wound	**At least 1 criteria must be present:** ☐ Pus present at a wound, skin, or soft tissue site ☐ New or increasing presence of at least 4 of the following subcriteria: ○ Heat at the affected site ○ Redness at the affected site ○ Swelling at the affected site ○ Tenderness of pain at the affected site ○ Serous drainage at the affected site One (1) Constitutional Criteria (see Table 2)	Presence of organisms cultured from the surface (eg, superficial swab sample) of a wound is not sufficient evidence that the wound is infected. More than 1 resident with streptococcal skin infection from the same serogroup (eg, A, B, C, G) in a long-term care facility (LTCF) may indicate an outbreak.

	☐ Scabies	**Both criteria must be present:** ☐ A maculopapular and/or itching **AND** **At least 1 of the following subcriteria:** ☐ Physician diagnosis ☐ Laboratory confirmation (scraping or biopsy) ☐ Epidemiologic linkage to a case of scabies with laboratory confirmation	An epidemiologic linkage to a case can be considered if there is evidence of geographic proximity in the facility, temporal relationship to the onset of symptoms, or evidence of common source of exposure (ie, shared caregiver). Care must be taken to rule out rashes due to skin irritation, allergic reactions, eczema, and other noninfectious skin conditions.

Table 2: Definitions for Constitutional Criteria in Residents of Long-Term Care Facilities (LTCFs)

Fever	**1.** Single oral temperature >100°F OR **2.** Repeated oral temperatures >99°F OR **3.** Single temperature >2°F over baseline from any site (oral, tympanic, axillary)
Leukocytosis	**1.** Neutrophilia (>14,000 leukocytes/mm^3) OR **2.** Left shift (>6% bands or ≥1,500 bands/mm^3)
Acute change in mental status from baseline	**All criteria must be present:** **1. Acute onset** (Evidence of acute change in resident's mental status from baseline) **2. Fluctuating course** (Behavior fluctuating: eg, coming and going or changing in severity during the assessment) **3. Inattention** (Resident has difficulty focusing attention: eg, unable to keep track of discussion or easily distracted) **4. Either disorganized thinking or altered level of consciousness** a. **Disorganized thinking** (Resident's thinking is incoherent: eg, rambling conversation, unclear flow of ideas, unpredictable switches in subject) OR b. **Altered level of consciousness** (Resident's level of consciousness is described as different from baseline: eg, hyperalert, sleepy, drowsy, difficult to arouse, nonresponsive)
Acute functional decline	**1. A new 3-point increase in total activities of daily living (ADL) score (range, 0-28) from baseline, based on the following 7 ADL items, each scored from 0 (independent) to 4 (total dependence)** **Bed mobility, Transfer, Locomotion within LTCF, Dressing, Toilet use, Personal hygiene Eating**