AEC ISOLATION PRECAUTIONS

Isolation Precaution & Employee Health

Anucha Apisarnthanarak, M.D.

TOPICS

- Isolation Precautions
- Post exposure

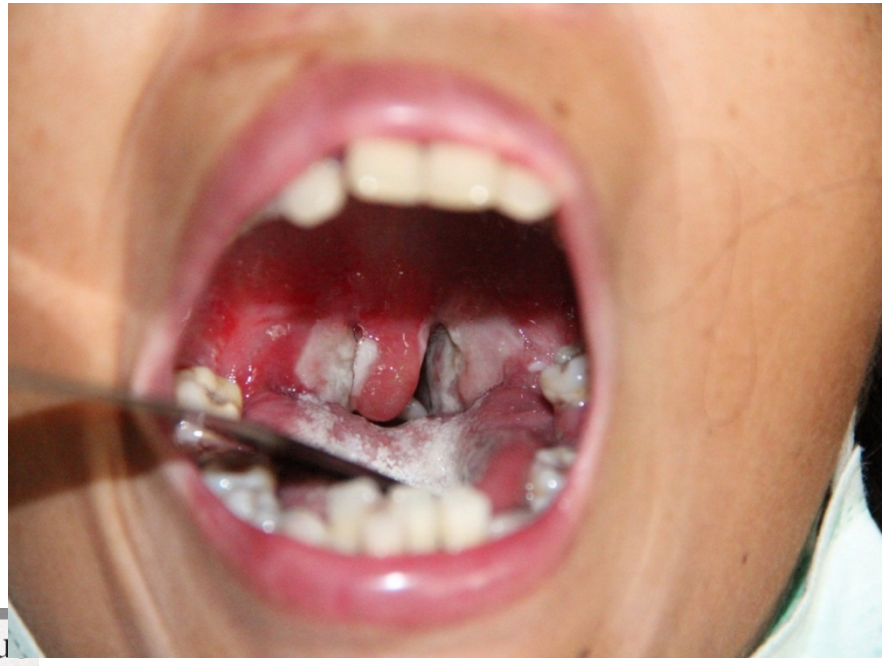
HAIs = Healthcare-associated infections

Control & Prevention Keyed to Modes of Transmission of Infectious Agents

- Contact
  - Direct (body-to-body)
  - Indirect (e.g., Formites/environment, HCWs' hands)
- Large Droplet (>5 µm; travel 3-6 feet)
- Small Droplet (droplet nuclei ≤5 µm; remain airborne)
- Endogenous (auto-inoculation & device-related)
- Common source
- Vetorborne

CASE I

- A 16 year old teenager presented with acute fever, sore throat and difficult swallowing for 3 days
- PE –as shown



Q1:Which of the following is the most appropriate isolation precaution

A. Standard precautions

B. Droplet isolations

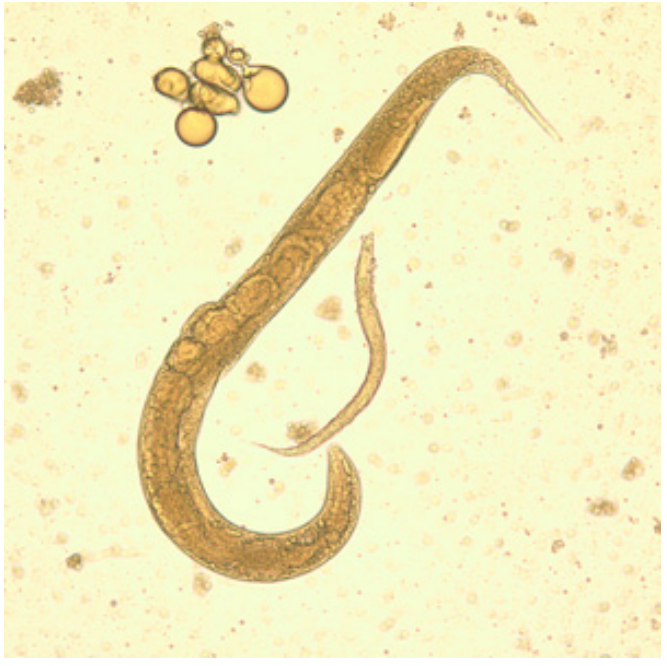
C. Airborne isolation

D. Contact isolation

E. Contact and droplet isolations

CASE II

- A 16 year old Lao patient presenting with pneumonia, diarrhea, sepsis and organisms on gram stain was identified in stool, lung & urine
- Gram-stain



Q2:Which of the following is the most appropriate isolation precaution

A. Standard precautions

B. Droplet isolations

C. Airborne isolation

D. Contact isolation

E. Contact and droplet isolations

Q2.1:Which of the following is the most appropriate isolation precaution for PCP among renal transplant patient

A. Standard precautions

B. Droplet isolations

C. Airborne isolation

D. Contact isolation

E. Contact and droplet isolations

Q2.2: Which of the following is the most appropriate isolation precaution for patient with rabies

A. Standard precautions

B. Droplet isolations

C. Airborne isolation

D. Contact isolation

E. Contact and droplet isolations

Q2.3:Which of the following is the most appropriate isolation precaution for patient with necrotizing fasciitis with inadequately covered wound

A. Standard precautions

B. Droplet isolations

C. Airborne isolation

D. Contact isolation

E. Contact and droplet isolations

Q2.4:Which of the following is the most appropriate isolation precaution for patient with parainfluenza virus

A. Standard precautions

B. Droplet isolations

C. Airborne isolation

D. Contact isolation

E. Contact and droplet isolations

#3 You admit a patient with sepsis and a history of decubitus ulcer infection by methicillin-resistant S.aureus, vancomycin-resistant Enterococci, and carbapenem-resistant K.pneumoniae.

The appropriate patient care order is :

A. Standard precautions

B. Droplet precautions

C. Contact precautions

D. Airborne precautions

E. Contact and airborne precautions

#4 How long do you isolate patient with VRE?

A. Till Negative 1 VRE active surveillance sample

B. Till Negative 2 VRE active surveillance sample

C. Till Negative 3 VRE active surveillance sample

D. Isolate for the whole duration of hospital stay

2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

Jane D. Siegel, MD; Emily Rhinehart, RN MPH CIC; Marguerite Jackson, PhD; Linda Chiarello, RN MS; the Healthcare Infection Control Practices Advisory Committee

Other EIDs

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]
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

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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	

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			
Respiratory infections, particularly bronchiolitis and pneumonia, in infants and young children	Respiratory syncytial virus, parainfluenza virus, adenovirus, influenza virus, Human metapneumovirus	Contact plus Droplet Precautions; Droplet Precautions may be discontinued when adenovirus and influenza have been ruled out	

Transplantation. 2009 Aug 15;88(3):380-5. doi: 10.1097/TP.0b013e3181aed389.

Outbreak of Pneumocystis jiroveci pneumonia in renal transplant recipients: P. jiroveci is contagious to the susceptible host.

Yazaki H[1], Goto N, Uchida K, Kobayashi T, Gatanaga H, Oka S.
Author information

Abstract

BACKGROUND:

Prophylaxis against Pneumocystis jiroveci pneumonia (PCP) is only recommended during some periods after renal transplantation. Recent advances in immunosuppressive therapy have considerably reduced acute rejection. However, the reported PCP outbreaks are increasing in renal transplant recipients.

METHODS:

Only three sporadic PCP cases had occurred since 1976 in our Renal Transplant Unit until the index case in July 2004. A PCP outbreak of 27 cases occurred mainly in the outpatient clinic within 1 year, followed by six additional cases during the next 3 years. Molecular analysis of P. jiroveci and surveys of reservoir were performed.

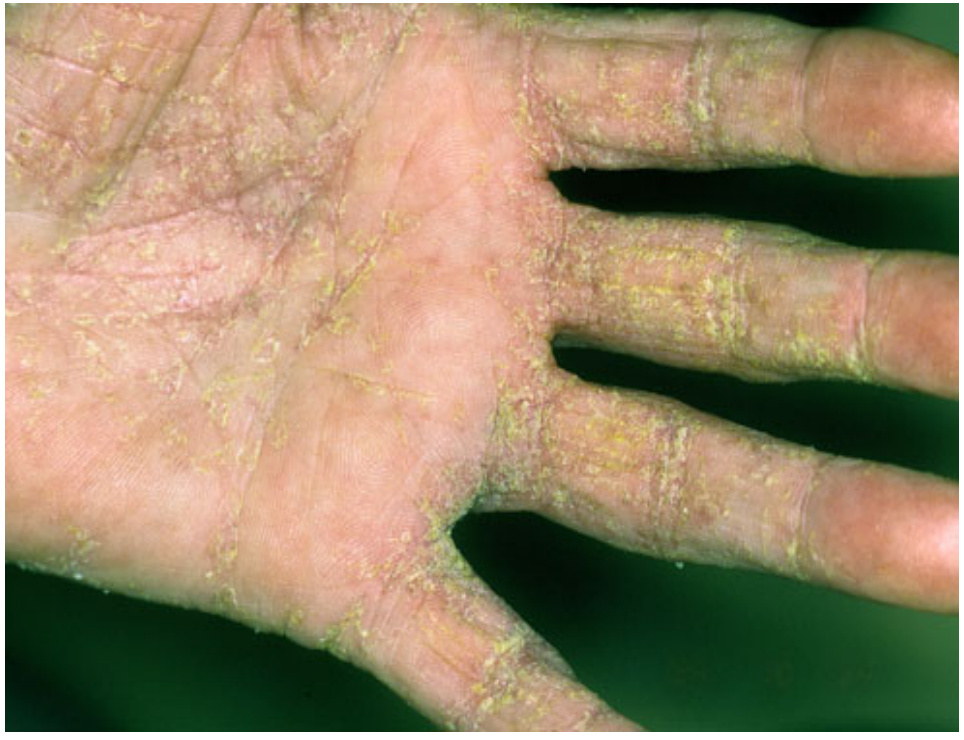
RESULTS:

Molecular analysis documented that all cases were caused by the same strain. Among 27 cases of the outbreak, human-to-human transmissions were traceable in 22 cases based on dates of outpatient clinic visits and in four cases during hospitalization. Based on the confirmed cases, airborne transmission was suspected with an estimated median PCP incubation period of 53 days (range 7-188 days). Surveys for reservoir of P. jiroveci identified asymptomatic carriers and environmental contamination. Some sporadic cases might be caused by reservoirs. Among the 33 cases, none had received PCP prophylaxis, 22 cases had PCP over 12 months, and six cases over 10 years after renal transplantation.

CONCLUSION:

On documentation of a PCP case, we recommend PCP prophylaxis for a maximum period of 6 months (upper limit of incubation period) in all renal transplant recipients including those on regular maintenance immunosuppressive therapy.

What should you wear when seeing this patient with itching skin lesion?



- A) Glove
- B) Glove & gown
- C) Glove & gown & surgical mask
- D) Glove & gown & respirator
- E) No PPE need; hand washing is adequate

Isolation Categories are Based on Modes of Transmission

	Hand Hygiene	Private Room	Gloves	Grown	Mask	Eye Protection
Standard	Yes	PRN	PRN	PRN	PRN	PRN
Droplet	Yes	Yes*	PRN	PRN	W/in 3 ft	PRN
Contact	Yes	Yes*	Yes	Yes	PRN	PRN
Airborne	Yes	All	PRN	PRN	N95	PRN

*When possible; cohorl if not possible. Aviod rooming with immunosuppressed or high risk patients. AII = Airborne Infection Isolation: negative pressure with no air recirculation (unless HEPA-filtered); 6-12 ACH.

Small droplets travel as a cloud through the air

Droplet generation. A flash photo of a human sneeza, showing the expulsion of droplets that may be laden with infectious pathogens. Sneezing can produce as many as 40 000 droplets of 0.5-12 µm. These particlet can be expelled at a velocity of 100 m/s. reaching distances of several meters. Smaller droplets with less mass are less influenced by gravity, and can be transported as a' cloud' over greater distances by air flows. Larger droplets with more mass are more strongly influenced by gravity and less so by air flows, and move more 'ballistically' falling to the ground more quickly. Reproduced with the kind pemission of Prof. Andrew David hazy, School of Photographic Arts and Sciences. Rochester Institute of Technology. Rochester NY, USA.

Large droplets travel balistically through the air

Tang JW et al, J hosp Infect 2006;64:100-14.

Isolation Precautions – Examples of Indications

- Standard – All patients
- Droplet – Bacterial meningitis, pertussis, mumps, seasonal influenza
- Contact – Multidrug resistant bacteria, infectious diarrhea, chickenpox
- Airborne – Tuberculosis, chickenpox, measles

Consider off isolation when:

- VRE: Negative 3 VRE active surveillance culture isolates taken 1 week apart
- Meningococcemia: 24 hours after appropriate ATB initiated
- CDAD: Until no diarrhea
- TB: 3 negative induced sputum for TB or 1 negative BAL for TB
- Diphtheria: Until 2 cultures negative (taken 24 hours apart)

Other EIDs

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Pneumonia	D	U 24 hrs	
Scarlet fever in infants and young children	D	U 24 hrs	

#5 Which potential bioterrorism agent is communicable person-to-person by airborne spread (droplet nuclei) ?

A. Anthrax

B. Botulism

C. Tularemia

D. Viral Hemorrhagic Fever

E. Q Fever

CDC Category A Bioterrorism Agent Infection Control

Disease	Patient Isolation	Laboratory Containment
Smallpox	AII & CP	Y
Plague	AII & CP	Y
Viral Hemorrhagic Fever	AII & CP	Y
Anthrax	SP	N
Botulism	SP	N
Tularemia	SP	Y

AII = Airborne Infection Isolation, CP = Contact Precautions, DP = Droplet Precautions, SP = Standard Precautions.

EMPLOYEE HEALTH

#7 Who should received post-exposure prophylaxis for pertussis unprotected exposure?

A. All immunocompromised patients who expose to pertussis regardless of duration after exposure
B. All patients who expose to pertussis regardless of duration after exposure
C. Immunocompromised patients who expose to pertussis within 3 weeks after exposure
D. All patients who expose to pertussis within 3 weeks after exposure
E. Vaccination post-exposure is adequate

#8 Emergency Department (ED) staff who cared the prior day for a patient with fever and headache have heard that the patient has meningococcal meningitis. You are asked which of the following ED personnel should receive post-exposure prophylaxis:

A. Intern who did the lumbar puncture
B. Nurse who tool the patient's initial vital signs
C. Transporter who brought patient from ED to in-patient ward
D. Intern, nurse, & transporter
E. None of them

Healthcare Worker Post Exposure Prophylaxis (PEP)

Pathogen Or Disease	Mode of Transmission	High-risk HCW	PEP	Modifying Factors
HIV	Percutaneous, splash (risk 0.3%)	Seronegative	0,2 or 3 ARVs for 4 week; serologic follow-up for 6 months	Shap type, puncture depth, contaminating fluid, patient, VL & treatment, duration after exposure (24-36h or longer); pregnancy
Hepatitis C	Percutaneous (risk 3%)	Seronegative	Pre-emptive therapy vs watchful waiting	Serologic follow-up
Hepatitis B	Percutaneous (risk 30%)	Seronegative	HBIG & vaccine	Duration after exposure (24-45h)

Healthcare Worker PEP (continued)

Pathogen Or Disease	Mode of Transmission	High-risk HCW	PEP	Modifying Factors
Parvovirus B19	Droplet, contact	Scronegative and pregnant, HIV, or hemoglobin pathy	No PEP	Exclude pregnant HCW from patient care
N. Meningitdis	Droplet	Close contact	Ciprofloxacin, rifampin, ceftriaxone, or azithromycin (or sulfa if S)	Duration& proximity of contact
Tuberculosis	Airborne, rarely Contact or droplet	PPD-negative	INH (or rifampin if PPD conversion)	PPD results (baseline and 12 weeks PE)

Healthcare Worker PEP (continued)

Pathogen Or Disease	Mode of Transmission	High-risk HCW	PEP	Modifying Factors
Hepatitis A	Fecal-oral	Seronegative	Vaccine; IG	Duration after exposure (14 days)
VZV	Contact, airborne	Negative VZV history or scronegative and immunocom-promised or pregnant	VZIG or acyclovir; VZA vaccine (Furlough day 10-21 PE;10-28 if VZIG used)	Duration of and after exposure (within 96h)
Pertussis	Droplet, contact	Seronegative or waned immunity	Macrolide	Duration after exposure (3 weeks)

Diphtheria Control Measures

Control measures

Since toxigenic diphtheria strain infections occur rarely in the United States, please consult with the NYSDOH Bureau of Immunization as soon as possible after the report of any suspect, probable, or confirmed case.

Patient

- Impose strict respiratory and droplet isolation until at least 2 cultures are negative, collected 24 hours after antibiotic therapy is completed.
- All suspected cases should be treated with diphtheria antitoxin without waiting for culture confirmation.
  - Diphtheria antitoxin is currently available only through the CDC.
  - Contact the NYSDOH Bureau of Immunization for assistance with arranging transport of antitoxin.
- Initiate early presumptive antibiotic treatment of suspected cases with erythromycin or penicillin.
- A 14-day course of antibiotics (erythromycin or penicillin) is necessary to eradicate carriage of *C. diphtheriae* regardless of the use of treatment with antitoxin.

Respiratory contacts

- Identify close contacts, especially household members and other persons directly exposed to oral secretions of the patient.

Diphtheria Control Measure

- Culture all close contacts, regardless of their immunization status. Ideally, culture should be from both throat and nasal swabs.
- Based on culture results, treat any carrier with antibiotics. A repeat culture to ensure eradication of the organism must be performed.
- All contacts should receive erythromycin or penicillin antibiotic prophylaxis.
- Treat any contact presumptively at the first sign of illness.
- Unimmunized contacts should start a course of vaccine and be closely monitored for symptoms of diphtheria for 7 days.
- Inadequately immunized contacts should receive an age-appropriate diphtheria vaccine dose and continue according to schedule. See current vaccine schedules at: http://www.cdc.gov/vaccines/recs/schedules/default.htm.
- If > 5 years have elapsed since administration of diphtheria-containing vaccine, a booster dose should be given. The Tdap vaccine is preferred for adolescents and adults.

Cutaneous contacts

- Give diphtheria vaccine booster if > 10 years have elapsed from last dose.
  - The Tdap vaccine is preferred for adolescents and adults.
- If toxigenic, close contacts should be monitored for respiratory symptoms for about 7 days (not required for non-toxigenic *C. diphtheria*).
- HCP involved in wound care, changing of linens, etc. should be encouraged to have a diphtheria vaccination every 10 years (not mandatory).

Thank You!

#6 Routine environmental cleaning with a detergent-disinfectant (a phenolic or quanternary ammonium product) is least likely to interrupt transmission of:

A. Methicillin-resistant staphylococci

B. Vancomycin-resistant enterococci

C. Acinetobacter

D. Clostridium difficile

E. Norovirus

Environmental Contamination Implicated as a Source of Some Nosocomial Pathogens

Bacteria: C. difficile, VRE, MRSA, Acinetobacter, P. aeruginosa

Virus: Norovirus, HBV, HCV

Fungi: Aspergillus, Mucor, Rhizopus

Adapter from Hota et al, Clin Infect Dis 2004; 39(8):1182-9