Clinical Syndromes and Conditions Warranting Empiric Transmission Based Precautions

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Objectives:

- Recognize the early signs and symptoms of potentially infectious patients when they first present
- Describe when empiric transmission precautions should be utilized
- Recall potential pathogens that patients could present with in your healthcare setting

High Risk Situations

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3 Steps to a Safer Emergency Room

- ❑ IDENTIFY- upon entry
- ❑ ISOLATE - promptly
- ❑ INFORM- a provider quickly

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Communicable Diseases

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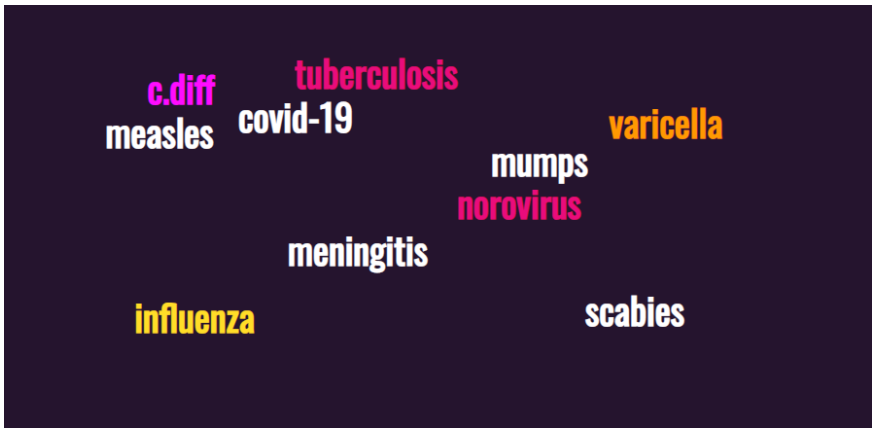
Emergency Room Exposures



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Diagnosis of Skin Conditions

Norwegian crusted scabies **versus** Psoriasis

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Protect Yourself First

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Nurse Empowerment

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Isolation Rooms

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Isolation in the Emergency Room

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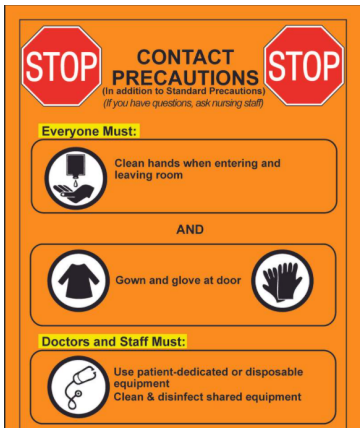
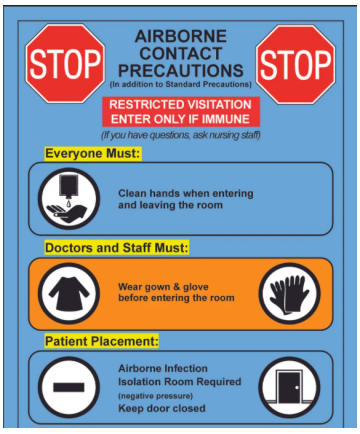
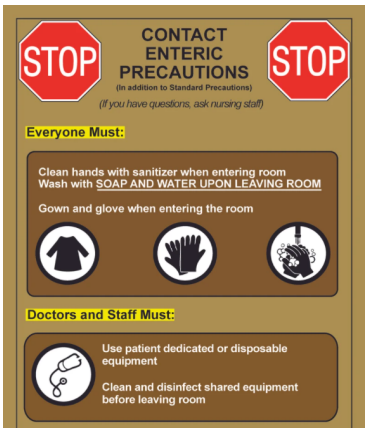
Isolation Signage







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Air Exchanges

TABLE 1. Air changes per hour (ACH) and time required for removal efficiencies of 99% and 99.9% of airborne contaminants*

	Minutes required for removal efficiency†	
ACH	99%	99.9%
2	138	207
4	69	104
6	46	69
12	23	35
15	18	28
20	14	21
50	6	8
400	<1	1

*This table can be used to estimate the time necessary to clear the air of airborne *Mycobacterium tuberculosis* after the source patient leaves the area or when aerosol-producing procedures are complete.
†Time in minutes to reduce the airborne concentration by 99% or 99.9%.

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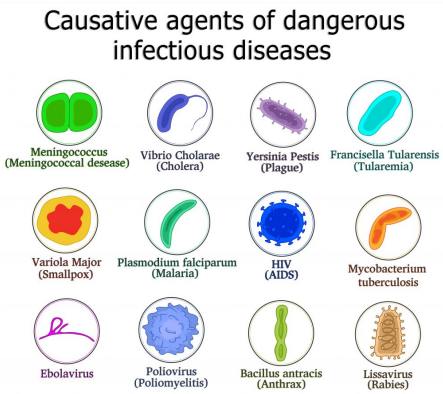
Nurse Education



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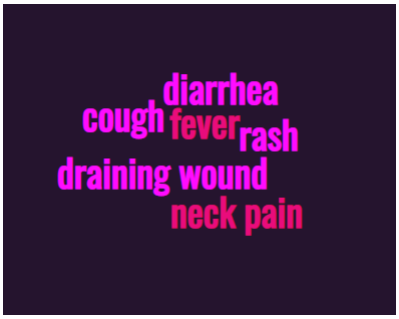
Recognize the early signs and symptoms of potentially infectious diseases



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Empiric Isolation

Clinical Syndromes or Conditions Warranting Empiric Transmission-Based Precautions in Addition to Standard Precautions
Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007)
Appendix A: Table 2
Transmission Precautions | Appendix A | Isolation Precautions | Guidelines Library | Infection Control | CDC

Disease	Clinical Syndrome or Condition†	Potential Pathogens‡	Empiric Precautions (Always Includes Standard Precautions)
Diarrhea	Acute diarrhea with a likely infectious cause in an incontinent or diapered patient	Enteric pathogens§	Contact Precautions (pediatrics and adult)
Meningitis	Meningitis	*Neisseria meningitidis*	Droplet Precautions for first 24 hours of antimicrobial therapy; mask and face protection for intubation
Meningitis	Meningitis	Enteroviruses	Contact Precautions for infants and children
Meningitis	Meningitis	*M. tuberculosis*	Airborne Precautions if pulmonary infiltrate Airborne Precautions plus Contact Precautions if potentially infectious draining body fluid present
Rash or Exanthems, Generalized, Etiology Unknown	Petechial/ecchymotic with fever (general)	*Neisseria meningitides*	Droplet Precautions for first 24 hours of antimicrobial therapy

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Empiric Isolation

Rash or Exanthems, Generalized, Etiology Unknown	Petechial/ecchymotic with fever (general) • If positive history of travel to an area with an ongoing outbreak of VHF in the 10 days before onset of fever	Ebola, Lassa, Marburg viruses	Droplet Precautions plus Contact Precautions, with face/eye protection, emphasizing safety sharps and barrier precautions when blood exposure likely. Use N95 or higher respiratory protection when aerosol-generating procedure performed. Ebola Virus Disease for Healthcare Workers [2014] ⚠ **Update:** Recommendations for healthcare workers can be found at Ebola For Clinicians.
Rash or Exanthems, Generalized, Etiology Unknown	Vesicular	Varicella-zoster, *herpes simplex*, variola (smallpox), vaccinia viruses	Airborne plus Contact Precautions; Contact Precautions only if Herpes simplex, localized zoster in an immunocompetent host or vaccinia viruses most likely
Rash or Exanthems, Generalized, Etiology Unknown	Maculopapular with cough, coryza and fever	Rubeola (measles) virus	Airborne Precautions
Respiratory Infections	Cough/fever/upper lobe pulmonary infiltrate in an HIV-negative patient or a patient at low risk for human immunodeficiency virus (HIV) infection	*M. tuberculosis*, Respiratory viruses, *S. pneumoniae, S. aureus* (MSSA or MRSA)	Airborne Precautions plus Contact precautions

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Empiric Isolation

Respiratory Infections	Cough/fever/pulmonary infiltrate in any lung location in an HIV-infected patient or a patient at high risk for HIV infection	*M. tuberculosis*, Respiratory viruses, *S. pneumoniae, S. aureus* (MSSA or MRSA)	Airborne Precautions plus Contact Precautions Use eye/face protection if aerosol-generating procedure performed or contact with respiratory secretions anticipated. If tuberculosis is unlikely and there are no AIIRs and/or respirators available, use Droplet Precautions instead of Airborne Precautions Tuberculosis more likely in HIV-infected individual than in HIV negative individual
Respiratory Infections	Cough/fever/pulmonary infiltrate in any lung location in a patient with a history of recent travel (10-21 days) to countries with active outbreaks of SARS, avian influenza	*M. tuberculosis*, severe acute respiratory syndrome virus (SARS-CoV), avian influenza	Airborne plus Contact Precautions plus eye protection. If SARS and tuberculosis unlikely, use Droplet Precautions instead of Airborne Precautions.
Respiratory Infections	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
Skin or Wound Infection	Abscess or draining wound that cannot be covered	*Staphylococcus aureus* (MSSA or MRSA), group A streptococcus	Contact Precautions Add Droplet Precautions for the first 24 hours of appropriate antimicrobial therapy if invasive Group A streptococcal disease is suspected

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When empiric transmission precautions should be utilized

Upon first assessment – Triage area

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Primary complaint

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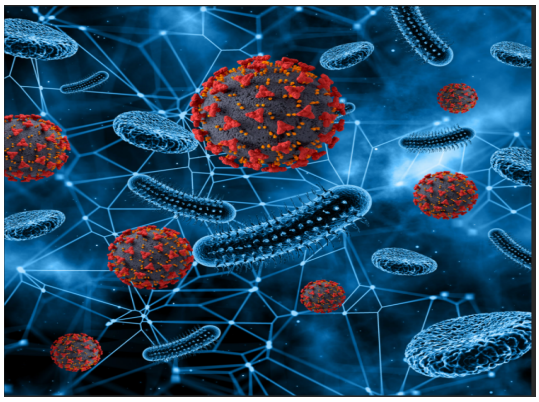
Increased Awareness of Infectious Signs and Symptoms



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CDC's Isolation Recommendations

Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007). Last updated July 2019.

Appendix A: Type and Duration of Precautions Recommended for Selected Infections and Conditions. Page 96 of 206

Isolation Precautions | Guidelines Library | Infection Control | CDC

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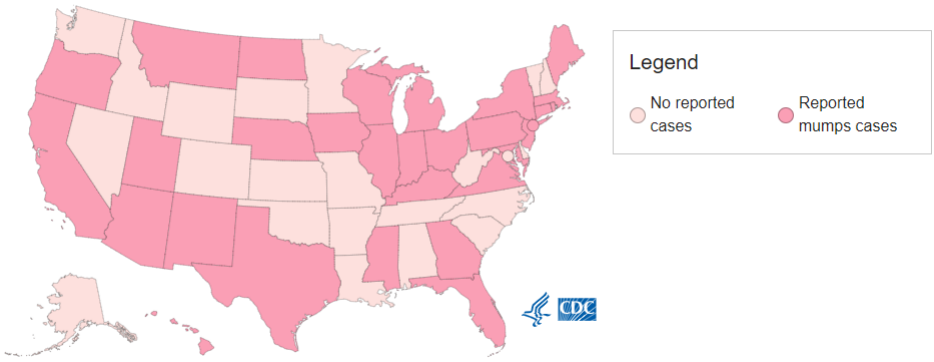
Reported US Mumps Cases by Jurisdiction and Year*
Reported Mumps Cases-2021



As of December 1, 2021, a total of 139 mumps cases were reported by 30 jurisdictions.*

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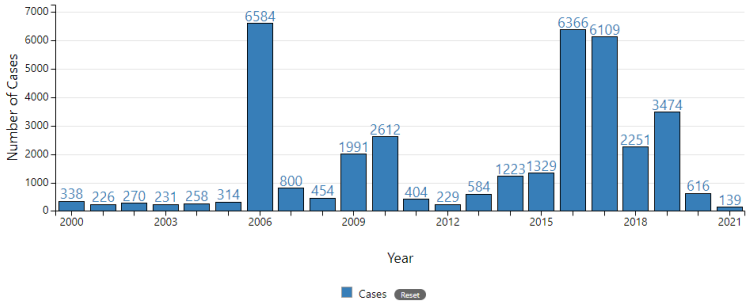
Incidence of Mumps

Reported Mumps Cases by Year — United States, 2000-2021*



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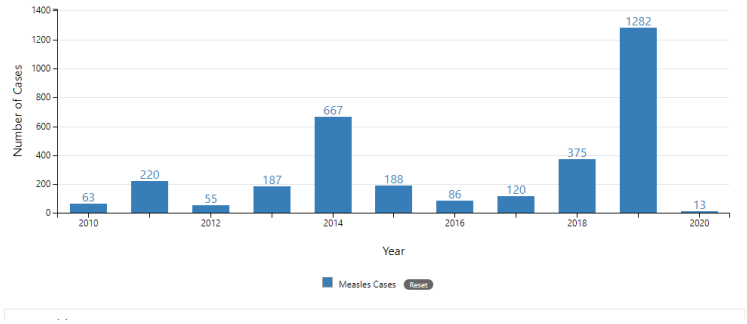
Measles cases in 2021
As of December 1, 2021, a total of 49 measles cases were reported by 5 jurisdictions in the United States. *

Number of measles cases reported by year

2010-2020* (as of December 31, 2020)



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Top 10 Countries with Global Measles Outbreaks*

Rank	Country	Number of Cases
1	Nigeria	5,378
2	Pakistan	3,779
3	Somalia	3,049
4	India**	2,939
5	Democratic Republic of the Congo	2,164
6	Yemen	1,765
7	Côte d'Ivoire	1,053
8	Sudan	817
9	Ethiopia	765
10	United Republic of Tanzania	761

Provisional data based on monthly data reported to WHO (Geneva) as of early December 2021. Data covers May 2021 – October 2021.

** Countries with highest number of cases for the period*

Global Measles

***WHO classifies all suspected measles cases reported from India as measles clinically compatible if a specimen was not collected as per the algorithm for classification of suspected measles in the WHO VPD Surveillance Standards. Thus numbers might be different between what WHO reports and what India reports.*

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Reduce Occupational Health Exposures to Airborne and Droplet Transmitted Diseases: An Improvement Project in a Northern Californian Emergency Room

Abstract

Background: Preventing respiratory infectious disease exposures is a performance improvement project to reduce the incidence of occupational health exposures among health care workers. This project encouraged registered nurses to quickly identify and isolate potentially infectious patients in the emergency room, to prevent exposures to airborne and droplet transmitted communicable diseases, including meningitis, tuberculosis, and measles.

Methods: This pre- and postintervention model implemented a quasi-experimental designed project in the emergency room (ER). The Centers for Disease Control's empiric transmission-based isolation precautions were implemented to prevent occupational health exposures. Eighty registered nurses (RN's) received education on the new intervention. The assumption of this project was, the new process will decrease occupational health exposures.

Results: Eight ER RNs reported an occupational health exposure, preintervention in quarter 2 of 2019, compared to zero occupational health exposures, postintervention in quarter 3 of 2019. A χ^2 independence test was used to determine if the categorical variables of the capstone intervention and disease exposure were related in the same RN population. An association between the capstone intervention and disease exposure was observed, X^2 (1) = 8.421, P = .004, indicating the result is statistically significant.

Conclusions: The preventing respiratory infectious disease exposures project effectively reduced occupational health exposures to airborne and droplet transmitted diseases in the emergency room by 100%. These results should encourage Infection Preventionists to adapt the Centers for Disease Control's empiric transmission isolation precautions in their emergency rooms and urgent cares to prevent airborne and droplet transmitted disease exposures.

Cole J, Gambone J, Barnard E. P.R.I.D.E.-preventing respiratory infectious disease exposures: An improvement project in a Northern Californian emergency room. Am J Infect Control. 2021 Feb;49(2):174-178. doi: 10.1016/j.ajic.2020.07.030. Epub 2020 Aug 6. PMID: 32768437; PMCID: PMC7406469

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Data tables

Table 1
Exposures by quarter-2019

			Exposed	Not exposed	Total
Quarter	q2	Count	8	72	80
		% within quarter	10.0%	90.0%	100.0%
	q3	Count	0	80	80
		% within quarter	0.0%	100.0%	100.0%

Table 2
χ^2 test nursing exposures in the ER between quarters 2 and 3

		Asymptotic significance	
	Value	Df	(2-sided)
Pearson χ^2	8.421[a]	1	0.004
No of valid cases	160		

Cole J, Gambone J, Barnard E. P.R.I.D.E.-preventing respiratory infectious disease exposures: An improvement project in a Northern Californian emergency room. Am J Infect Control. 2021 Feb;49(2):174-178. doi: 10.1016/j.ajic.2020.07.030. Epub 2020 Aug 6. PMID: 32768437; PMCID: PMC7406469

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Data tables

Table 3
Cramer's V value

		Value	Approximate significance
Nominal by Nominal	Phi	0.229	0.004
	Cramer's V	0.229	0.004
No of valid cases		160	

Table 4
Airborne or droplet disease exposure distribution by quarter

			Meningitis	Mumps	No exposure	Total
Quarter	q2	Count	4	4	72	80
		% within quarter	5.0%	5.0%	90.0%	100.0%
	q3	Count	0	0	80	80
		% within quarter	0.0%	0.0%	100.0%	100.0%

Cole J, Gambone J, Barnard E. P.R.I.D.E.-preventing respiratory infectious disease exposures: An improvement project in a Northern Californian emergency room. Am J Infect Control. 2021 Feb;49(2):174-178. doi: 10.1016/j.ajic.2020.07.030. Epub 2020 Aug 6. PMID: 32768437; PMCID: PMC7406469

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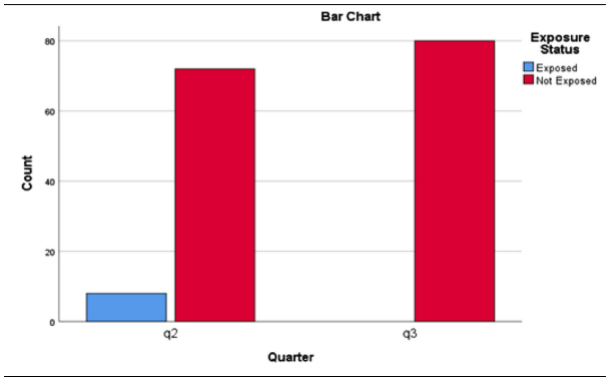
Data-Bar Chart

Table 5
Number of RN's exposed per quarter



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Case Scenario

Pre-intervention

39 year old male presents to the ER. Chief Complaint c/c of fatigue and facial/neck swelling. Patient reports recent exposure to a positive Mumps case. The patient remains unmasked And advised to wait in the general waiting area. Droplet isolation is ordered after being seen by the ER physician after 1 hour has passed.

Post-intervention

The patient advised to wear a mask upon Identification of symptoms and report of exposure to a known Mumps case. The patient is placed in Droplet isolation Immediately.

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Case Scenario

Pre-intervention

Unvaccinated 3 year old female with generalized Rash- etiology unknown. Seen by triage nurse and Advised to wait in the general ER waiting area. Patient is seen by the ER physician 90 minutes Later and placed in Airborne Isolation to r/o Measles.

Post-intervention

Patient is seen by triage nurse and is stable. Patient and parent are advised to wear a Surgical mask and wait in their vehicle. An airborne isolation room is identified and the patient and parent are escorted to the room For physician assessment.

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Conclusion

- The specific aim of this teleclass is to improve the ER RN's ability to identify and isolate infectious patients promptly.
- This change in practice can assist in preventing disease transmission and protecting the health of HCW's and other hospitalized patients

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References

CDC. (2015). Clinical Syndromes or Conditions Warranting Empiric Transmission-Based Precautions in Addition to Standard Precautions. https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/transmission-precautions.html

CDC. (2021). Mumps | Cases and Outbreaks | CDC

CDC. (2021). Global Measles Outbreaks (cdc.gov)

CDC. (2016). Identify, Isolate, Inform: Emergency Department Evaluation and Management for Patients Under Investigation (PUIs) for Ebola Virus Disease (EVD) | Emergency Services | Clinicians | Ebola (Ebola Virus Disease) | CDC

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February 10, 2022	RETHINKING SOLUTIONS FOR PUBLIC HEALTH PROBLEMS: A HOLISTIC ONE HEALTH SOCIAL SCIENCE (OHSS) SYSTEMS APPROACH Speaker: **Dr. Laura C. Streichert**, One Health Commission, Switzerland
February 17, 2022	ASSESSING THE CLINICAL ACCURACY OF A HAND HYGIENE SYSTEM Speaker: **Dr. Marco Bo Hansen**, Copenhagen University Hospital, Denmark
March 3, 2022	*(FREE Teleclass … Denver Russell Memorial Teleclass Lecture)* BENEFITS AND POTENTIAL UNINTENDED CONSEQUENCES OF ROUTINE CHLORHEXIDINE BATHING IN HEALTHCARE FACILITIES Speaker: **Prof. Mary Hayden**, Rush University Medical Center, Chicago

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