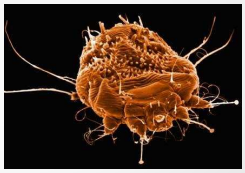
Common Infectious Diseases

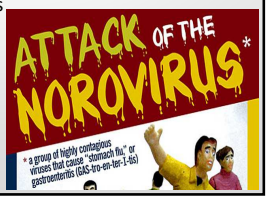
Common Infectious Diseases

Infection Prevention & Control
Boot Camp For Long-Term Care Facility
Infection Preventionists

Infectious Diseases



- Legionella
- Scabies
- Norovirus
- Influenza



Legionella

Common Infectious Diseases

Legionella[1] (Legionnaire's Disease)

- Legionellosis is a respiratory disease caused by the Legionella bacteria-*Legionella pneumophila*
  - First recognized in 1976 after pneumonia outbreak in Philadelphia at an American Legion convention
- When this bacteria causes a serious type of pneumonia it is referred to as Legionnaire's Disease
- This bacteria can cause a less serious infection called Pontiac fever
  - This infection is similar to a mild case of the flu

[1] CDC. Legionella. www.cdc.gov/legionella/about

Common Source of Bacteria[1]

- Legionella causes between 8,000 and 18,000 cases of community-acquired pneumonias requiring hospitalization each year[2]
  - 250 cases of Legionellosis are reported each year in California
- Legionella is a common bacteria found naturally in freshwater environments, like lakes and streams
- It can become a health concern when it grows and spreads in human-made water systems like hot tubs, hot water tanks and heaters, cooling towers, decorative fountains, and large plumbing systems
- Bacterium grows best in warm water

[2] CDPH.Legionellosis. https://www.cdph.ca.gov/HEALTHINFO/DISCONTD/Pages/Legionellosis.aspx

Transmission

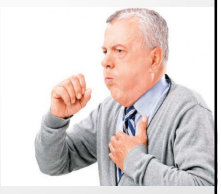
- Not transmitted person to person
- Contaminated water, where Legionella bacterium has multiplied, can be spread in droplets small enough for people to breathe in.
- The mist containing small droplets of water is the source of transmission

Common Infectious Diseases

People at Risk

- Most healthy people do not get sick after exposure to Legionella
- Residents at risk for development of Legionella symptoms are:
  - People over 50
  - Current or former smokers
  - Chronic lung disease residents
  - Those with weakened immune systems
  - People who take immuno-suppressant drugs (or drugs which weaken the immune system

Symptoms



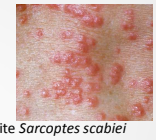
- Pneumonia symptoms are:
  - Cough
  - Shortness of breath
  - Fever
  - Muscle aches
  - Headaches
  - Other possible symptoms: diarrhea, nausea, and confusion
- Symptoms can begin 2-10 days after exposure (may be as long as 2 weeks)

Diagnosis and Treatment

- Diagnostic tests:
  - Urine antigen test
  - Sputum culture
  - Blood test for legionella antibodies
- Treatment: Antibiotics
- Is this reportable to Public Health? YES!
- How many cases are considered an outbreak? One

Common Infectious Diseases

Scabies[1,2]

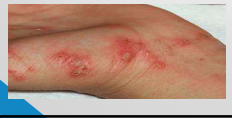


- Parasitic disease (infestation) of the skin caused by the mite *Sarcoptes scabiei*
- Transmitted from one person to another by direct contact with the skin of an infested person, or items that have been in contact with infested person
- Incubation period 4-6 weeks (or 48 hours if previously infested)
- Infested person will complain of pruritis, which intensifies at night
  - Rash characterized by red, raised bumps (papules)
  - Rash may appear as burrows with short wavy lines of red skin
  - Itching is due to a hypersensitivity (or allergic reaction) to the mites, eggs and feces embedded in the skin
- Skin lesions may occur on hands, finger webs, wrists, elbows, folds of armpits, back, buttocks, waistline, lower abdomen, female breasts or male genitals
  - In adults the scalp and face are rarely involved

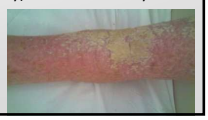
[1] Scabies Prevention and Control Guidelines Acute and Sub-acute Care Facilities. July 2009 (3). http://dh.lacounty.gov/ard/diseases/scabies.htm
[2] Management of Scabies Outbreaks in California Health Care Facilities. CDPH March 2008. http://www.cdph.ca.gov/ccb/dcdc/dcdcdisease/Documents/MemoforScabiesOutbreaks.pdf

Different Forms of Scabies[1,2]

- Typical Scabies
  - Residents with typical scabies usually only have 10-15 live adult female mites on the body at any given time
  - Scrapings are often times negative in the newly infested resident (this does not necessarily rule out scabies)



- Atypical (crusted) or Norwegian scabies
  - Resident with atypical scabies may have hundreds to thousands of mites on the body
  - More prevalent in institutionalized, debilitated, or immuno-compromised residents
  - Presents as hyper-kerototic skin lesions with crusting and scaling
  - Skin scrapings for atypical scabies (if done properly) will almost always be positive

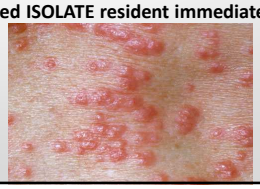


Scabies[1,2] (continued)

- Difficult to diagnose because rash may mimic other dermatologic conditions
  - Rule out eczema, psoriasis, drug reaction, folliculitis, impetigo, contact dermatitis, or insect bites
- Excoriated skin may get infected due to resident scratching intensely
  - At times may complicate getting accurate diagnosis of scabies
- May be difficult to diagnose scabies in elderly due to their skin being dry and scaly and the resident having other dermatological skin conditions

Scabies[1,2] (continued)

- If scabies is suspected, a skin scraping should be done to confirm diagnosis
  - A negative result does not necessarily rule out scabies
- An exposed person is potentially immediately infectious to others, even in the absence of symptoms[1]
- **If scabies is suspected ISOLATE resident immediately! (contact isolation)**



Report[1,2] Outbreak

- What is an outbreak of scabies?
  - One case of **confirmed** scabies with 2 or more rashes suspected to be scabies
  - Two or more suspected cases of scabies
  - One case of suspected or confirmed case of Atypical scabies (Norwegian)
- Report to local public health district

Management of Typical Scabies[1,2]

- Contact Isolation
- Isolation for scabies to continue for 24 hours after application of scabicide (reapply to buttocks if resident is incontinent at night)
  - For typical scabies, isolation does not need to be restarted for second treatment, if ordered an additional time for the same infestation
  - When treating roommate prophylactically, this roommate does not require isolation
    - Only residents with rashes suspected and/or confirmed to be scabies
- Notify physician and roommate's physician
- Start a line listing of cases

Management of Typical Scabies[1,2] (continued)

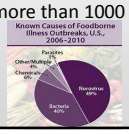
- Permethrin 5% (Elimite) to be applied to scabies resident and left on for 8-12 hours and then washed off as directed
  - Perform risk assessment of who may have been exposed to source case and offer treatment (include, staff and visitors)
- Wash all clothes and linen worn and used by resident for past 4 days
- Discard items such as hairbrushes and combs
- Items that cannot be washed or disinfected, bag for 5-7 days
- Vacuum carpets in residents room
- Cut nails of resident
- Once Permethrin is washed off, change bed linens again
- Continue to do skin assessments of residents and staff for 6 weeks
- Rash may persist for up to 2 weeks after treatment
  - Topical ointment may be considered to alleviate discomfort along with oral anti-itching medication

Management of Atypical Scabies[1,2]

- In addition to Permethrin, physician may consider giving Ivermectin (by mouth)
- Isolation for atypical scabies to be continued until you get 3 negative skin scrapings, performed one week apart

Norovirus[3]

- First recognized as pathogenic cause of gastroenteritis in 1968 in Norwalk, Ohio (first outbreak)
- Officially renamed in 2002 as "norovirus" by the International Committee on Taxonomy of Viruses
- Now considered the most common cause of epidemic "nonbacterial" gastroenteritis in the world.
- 19-21 million cases reported annually
- 56,000-71,000 hospitalizations
- CDC reports more than 1000 outbreaks in LTC each year

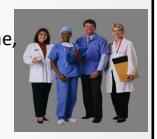


[3] CDC. About Norovirus. https://www.cdc.gov/norovirus/about/index.html

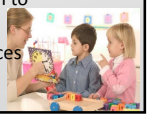
Norovirus[3]

- Norovirus is a highly contagious disease caused by a virus
- Transmitted from an infected person, contaminated food or water
- This virus causes an inflammation of the stomach or intestines or both and is referred to as acute gastroenteritis
- Characterized by symptoms of diarrhea, nausea and vomiting and abdominal pain which can develop 12-48 hours after exposure

Norovirus[3] (continued)

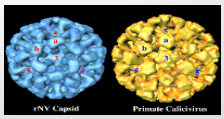


- Other possible symptoms: fever, headache, body aches
- Dehydration can occur
- Norovirus is found in the stool
  - Transmission can occur by touching items contaminated with the virus and not washing hands with soap and water after caring for a resident with this condition
  - This virus aerosolizes when cleaning up vomitus or stool-wear mask in addition to gloves and gown
- This virus can spread quickly in closed spaces like nursing homes or day care centers, restaurants, or cruise ships



Incubation, Infectious Dose, Duration & Communicability[3]

- Incubation Period
  - 12-48 hours (median 33)
- Infectious Dose
  - It takes as few as 18 virus particles in stool or vomit to cause infection
- Duration
  - 12-72 hours
- Communicable
  - From onset through 72 hours after recovery
- No long-lasting immunity after having a case of norovirus; people of all ages can be affected

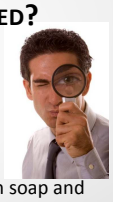


Common Infectious Diseases

Norovirus in LTCF

- Usually spread person to person
- "Stomach flu" likely to be norovirus
  - When rapid onset of symptoms and many effected, likely to be norovirus
- Occurs year round with peak activity in winter months
- Will effect residents and staff

What Should You Do When Norovirus is Suspected?



- Key Infection Control Activities
  - Have high level of suspicion
  - Surveillance to detect new cases rapidly
  - Contact Isolation
  - Increase and improve hand hygiene with soap and water
  - Cancel group activities (including dining in groups)
  - Cohort residents & staff
  - Hydration program
  - Increase environmental cleaning & disinfection (bleach)

McGeer's Criteria for Norovirus

- Norovirus requires both criteria 1 and 2 to be present:
  - 1. At least one of the following gastrointestinal sub-criteria
    - 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 of vomiting in a 24-hour period
  - 2. A stool specimen for which norovirus is positively detected by electron microscopy, enzyme immuno-assay, or molecular diagnostic testing such as a PCR test

Common Infectious Diseases

Kaplan's Criteria

- For defining an outbreak (before lab confirmation)
  - Vomiting in 50% of affected people
  - Median incubation period 24-48 hours
  - Median duration of illness 12-60 hours
  - No bacterial pathogen identified in stool

Infection Control Recommendations

- Residents to remain in isolation until 48 hours after last episode of diarrhea without use of anti-diarrheal medication[4]
  - Consider longer periods of isolation for those residents who are medically complex (based on your judgment)
  - Affected HCW to stay off of work until 24 hours after last episode of diarrhea without use of medication[4]
  - HCW recently recovering from norovirus may be best to care for symptomatic residents
- Avoid giving Lomotil (consider Pepto Bismol)
- Give anti-emetics to control vomiting

[4] MacCannell T, Umscheid CA, Agarwal RK, et al. Guideline for the prevention and control of norovirus gastroenteritis outbreaks in healthcare settings. CDC, DHQP, 2011. http://www.cdc.gov/hicpac/pdf/norovirus/norovirus-guideline-2011.pdf

Infection Control Recommendations

- Hand Hygiene
  - Best method during an outbreak is soap and water
  - Instruct staff and visitors to avoid ABHR

- Contact Isolation
  - Gloves & gown for anyone who enters room
  - **Mask needed for those cleaning emesis or feces**

Other Considerations

- Restrict non-essential visitors
- Post sign on entrance doors indicating an outbreak of norovirus in your facility
- Consider limiting transfers unless receiving facility is able to maintain Contact Isolation
- Notify receiving facilities and HCW prior to transfer
- You may have to consider closure to new admissions/transfers
  - Depends on facility leadership and risk assessment
  - May depend on Public Health guidance

Other Considerations (continued)

- Disposable dietary trays **are not necessary**
- Double bagging of linen **not required** unless bag is visibly soiled on the outside of bag.
- All linen handled the same ---as if infected!
- Change privacy curtains when soiled and upon resident discharge or when isolation discontinued.
- Avoid use of upholstered furniture and carpets
  - Clean soilage from environmental surfaces immediately
  - Steam clean upon discharge

Reporting

- Internal
  - Infection Preventionist
  - DON, Medical Director, Administrator
  - Facility staff: admitting, rehabilitation department environmental services, dietary, linen services
- External
  - Local Public Health Department
  - Local district Licensing & Certification office

[1] http://www.cdc.gov/norovirus/index.html

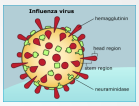
Common Infectious Diseases

CDC Norovirus guidelines

CDPH NOROVIRUS RECOMMENDATIONS

- CDC guidelines for prevention and control of Norovirus in LTCFs
  http:/www.cdc.gov/hicpac/pdf/norovirus/Norovirus:Guideline-2011.pdf
- CDC Norovirus PreventionToolkit
  http:/www.cdc.gov/HAI/organisms/norovirus.html
- CDPH Recommendations for Prevention & Control of Norovirus in LTCFs
  http:/www.cdph.ca.gov/certlic/facilities/Documents/LNC-AFL-06-32-Attach-1.pdf
- General information on norovirus
  http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm

Influenza[6]



- Influenza, also known as the "flu" is a viral infection that can be caused by a number of different influenza strains
- The flu affects the lungs, throat, nose and other parts of the body
- Unlike the common cold, the flu comes on suddenly, can make people very sick for a week or longer, and can require hospitalization
- Influenza is a single-stranded RNA virus of the orthomyxovirus family
- Basic antigen types are A,B, C are determined by the nuclear material

[6] http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/flu.pdf

Influenza[7]

- Influenza is the 8th leading cause of death in the U.S. CDC/National Center for Health Statistics. Deaths and Mortality 2009
- Approximately 3,000-49,000 influenza-associated deaths occur during each flu season and 200,000 people are hospitalized in U.S.
- World Health Organization (WHO) reports annual outbreaks throughout the world result in 3-5 million severe cases and between 250,000 and 500,000 deaths[8]
- 80-90% of flu related deaths are in persons >65
- Approximately >$173 million in-patient Medicare dollars spent on influenza

[7] CDC. Clinical Signs and Symptoms of Influenza. http://www.cdc.gov/flu/professionals/acip/clinical.html
[8] Flu Overview, Incidence and Prevalence of Influenza. Health Communities. http://www.healthcommunities.com/influenza/overview-of-flu.shtml

Common Infectious Diseases

Transmission[7]

- Spread from person to person via respiratory droplets when an infected person coughs or sneezes
- Can also be transmitted by touching a virus-contaminated surface
- Adults shed the infectious influenza virus 1-2 days **before** any symptoms appear
- Typical incubation period is 1-4 days
- Most healthy adults may be able to infect others beginning 1 day before symptoms develop and up to 5-7 days after becoming sick

Vaccination

- Vaccination is the most effective way to prevent influenza
- Vaccination is most effective in younger, healthier people
  - 70-90% effective in healthy persons <65 years of age (those who develop immunity)
- Patients at highest risk, like the elderly in LTC, are least likely to develop an adequate response to the vaccine
  - 30-40% effective among frail elderly persons

Vaccination[9]

- Vaccines available for influenza season 2016-17: A/California/7/2009 (H1N1-like virus) A/Switzerland 2013 (H3N2-like virus), B/Phuket/2013-like virus
  - Inactivated Influenza Vaccine-**quadrivalent**, standard dose
    - For quadrivalent add B/Brisbane/2008-like virus
  - Inactivated Influenza Vaccine, **trivalent**, standard dose
  - Inactivated Influenza Vaccine, trivalent, **high dose** (for ages 65 and over)
  - Flu-mist not recommended for this flu season

[9] Grohskopf LA, Sokolow LZ, Broder KR, et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices-United States, 2016-17 Influenza Season. http://www.cdc.gov/mmwr/volumes/66/rr/rr6602e1.html.

Common Infectious Diseases

Why Do I Need a Flu Shot Each Year?

- Influenza season can start as early as October and last through April
- In more than 80% of flu seasons since 1976, peak influenza activity has not occurred until January or later
- Each year the, the flu vaccine contains 3 flu strains-2 A strains and 1 B strain
  - These strains mutate each year and change from year to year (called antigenic drift) therefore requiring re-vaccination each year
  - After vaccination, your body produces infection-fighting antibodies against the 3 flu strains in the vaccine

[7] CDC. Flu Virus Antigenic Drift. National Institute of Allergy and Infectious Diseases. http://www.niaid.nih.gov/topic-s/flu/research/basic/pages/antigenic-drift/illustration.aspx

Incubation and Transmission[7,9]

- Incubation period is 2 days with a range of 1-4 days
- Severity of illness depends on prior experience or exposure with related variants
- Complications of influenza:
  - Pneumonia (secondary bacterial or primary viral)
  - Myocarditis
  - Reye's Syndrome

Diagnosis

- Rapid influenza test- fast but less sensitive than PCR (15 minutes)
- Polymerase-chain reaction test (PCR)-sensitive and fast turn-around time (20 minutes)
- Serology-antibody detection-not recommended for routine patient diagnosis

[9] CDC. Rapid diagnostic testing for influenza: Information for clinical laboratory directors. http://www.cdc.gov/flu/professionals/diagnosis/rapidtests.htm

Common Infectious Diseases

Influenza Symptoms[7]

- Abrupt onset of constitutional and respiratory signs and symptoms:
  - Fever (100°F)
  - Myalgia
  - headache and malaise
  - Non productive cough
  - Sore throat
  - Rhinitis

- Uncomplicated influenza usually resolves after 3-7 days after becoming sick
- Complicated influenza can cause primary viral pneumonia, sinusitis or otitis media
- Can also contribute to coinfections with other viral or bacterial pathogens

Treatment

- Start antiviral medication within 48-72 hours
  - Oseltamivir (Tamiflu) or zanamivir (Relenza)-best when taken soon after symptoms are noticed
  - Considering offering to others who have been in contact with confirmed case
  - If you have not received the flu vaccine yet, consider getting it
- Bed rest
- Fluids
- Anti-febrile medication
- Be ware of complications and treat appropriately

[12] Mayo Clinic. Influenza treatment and drugs. http://www.mayoclinic.org/diseases-conditions/flu/basics/treatment/con-20035101

Prevention and Management[9]

- Vaccination
- Education
- Hand Hygiene
- Respiratory etiquette
- Absenteeism for employees
  - Healthcare workers are recommended to stay home until they are free of symptoms and a fever for 24 hours without the use of anti-pyretic medications
- Droplet isolation
  - Cohort residents and staff
- Report to local public health department (one confirmed case is reportable)

Resources

- http://www.cdc.gov/flu/professionals/acip/clinical.html
- http://www.cdc.gov/mmwr/volumes/65/rr/rr6505a1.htm
- http://www.niaid.nih.gov/topics/flu/research/basic/pages/antigenicdriftillustration.aspx
- http://cdc.gov/flu/professionals/diagnosis/rapidlab.htm
- http://www.mayoclinic.org/diseases-conditions/flu/basics/treatment/con-20035101