Aerosol Transmissible Diseases

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Introduction

Overview and Course Objectives

The term Aerosol Transmissible Diseases (ATDs) includes a wide range of diseases, all of which share at least one thing in common: they can be transmitted via an airborne route of infection (although for many ATDs, there may be additional routes of infection. The ATD Program was developed to comply with the Aerosol Transmissible Diseases Standard. The ATD Standard was written by Cal/OSHA as a direct result of the experiences involving Severe Acute Respiratory Syndrome (SARS), Avian Influenza, and the Novel Influenza H1N1. The standard was adopted by the Cal/OSHA Board on May 21, 2009 and became effective on August 5, 2009. These airborne pathogens travel on particles emitted from an infected person, such as when the person coughs or sneezes. This course is based on the aerosol transmissible diseases standard.

After successfully completing this course, you will be able to:

- recall the various kinds of aerosol transmissible diseases
- describe the contents of the aerosol transmissible diseases standard
- identify the various modes of transmission for aerosol transmissible diseases
- recognize the signs and symptoms of aerosol transmissible diseases that may require medical evaluation
- recognizing activities that may expose workers to aerosol transmissible pathogens
- explain procedures for controlling the source of aerosol transmissible pathogens
- describe when and how to use respiratory protection
- summarize the procedures for disinfecting and decontaminating equipment, objects, and areas
- list the procedures to follow if an exposure incident occurs
- summarize the importance of a surge plan and the topics covered in surge plan training

Aerosol Transmissible Diseases

Common ATDs

In the Cal/OSHA standard, ATDs are categorized based on whether they require infection isolation or droplet precautions.

ATDs requiring airborne infection isolation include:

- Aerosolizable spore-containing powder or other substance that is capable of causing serious human disease; for example: Anthrax
- Avian influenza viruses (Bird Flu)
- Measles virus
- Monkeypox virus
- Novel or unknown pathogens

- Severe acute respiratory syndrome (SARS)
- Smallpox (variola)/Variola virus
- Tuberculosis (TB)/Mycobacterium tuberculosis
- Varicella disease (chickenpox, shingles) (and)
- Any other disease for which public health guidelines recommend airborne infection isolation

ATDs requiring droplet precautions include:

- Diphtheria/Corynebacterium diphtheriae
- Epiglottitis
- Haemophilus influenzae serotype b (Hib) disease
- Influenza
- Meningitis
- Meningococcal disease
- Mumps (infectious parotitis)
- Mycoplasma pneumonia
- Parvovirus B19 infection
- Pertussis (whooping cough)
- Pharyngitis in infants and young children
- Pneumonia
- Pneumonic plague/Yersinia pestis
- Rubella virus infection (German measles)
- Severe Acute Respiratory Syndrome (SARS)
- Streptococcal disease (group A Streptococcus)
- Viral hemorrhagic (and)
- Any other disease for which public health guidelines recommend droplet precautions

The following are some alarming statistics about Aerosol Transmissible Diseases:

- Tuberculosis (TB) is one of the top 10 causes of death worldwide
- In 2016, 10.4 million people fell ill with TB
- 1.7 million died
    - 0.4 million among people with HIV
    - over 95% of TB deaths occur in low- and middle-income countries (WHO)
- from the first laboratory-confirmed case of Avian Flu through November 21, 2016, the number confirmed human cases of H5N1 reported to WHO stands at 856
    - 452 fatalities
    - 53% fatality rate
- 8,098 people worldwide became sick with SARS during the 2003 outbreak
    - 774 died (WHO)
- According to OSHA, an estimated 5 million workers are required to wear respirators in 1.3 million workplaces throughout the United States

The following Case study is from a news report earlier his year.

CDC reports more flu deaths, record hospitalizations

CDC – February 2, 2018

Federal health officials say at least 16 more children died of the flu over the past week and more states are reporting high levels of illness. In a briefing Friday, the Centers for Disease Control and Prevention said the flu outbreak is responsible for at least 53 child deaths so far this season.

"Hospitalizations are now the highest we've seen," said CDC Acting Director Dr. Anne Schuchat, who called the flu one of the biggest health threats currently facing the U.S. She said the cumulative rate of hospitalizations for serious cases of flu is now even greater than in the previous high season of 2014-15. People age 65 and over have the highest rate of hospitalization for the flu.

One of every 14 visits to doctors and clinics were for symptoms of the flu. That's the highest level since the swine flu pandemic in 2009, the Associated Press noted.

High levels of flu-like illness were reported in 42 states, up from 39 states the previous week, and cases were geographically widespread across every state but Oregon and Hawaii.

She noted that half of the children who've been hospitalized with flu this season did not have underlying medical problems like asthma. Doctors say if a person seemed to be getting better from the flu and then suddenly takes a turn for the worse, that's a sign they need medical attention right away.

"Influenza can be followed by a bacterial infection like pneumonia," Schuchat explained.

That dangerous pattern of getting better then worse was seen the case of 5-year-old Eli Snook. After the Georgia boy tested positive for flu, he was treated with the antiviral drug Tamiflu and antibiotics and seemed to be recovering.

"After he got well from the flu, a few days later, he got sick again," his mother Leota said. Eli was hospitalized and placed in a medically induced coma while doctors performed a CT scan and spinal tap. They discovered the virus had spread to his brain.

"His brain swelled past the point of no return and they told us that he was brain dead," his father Aaron said. Little Eli did not survive.

The ATD Standard

Part 1 Protecting Employees

The Aerosol Transmissible Diseases standard was adopted by Cal/OSHA in May 2009. It aims to protect workers in professions that involve potential exposure to pathogens that cause ATDs. The standard requires covered employers to take steps to protect their employees from ATD infection, including providing the following to employees during work hours at no cost:
Training
Respirators
Medical services
Personal protective equipment (PPE)

In addition to these, the standard also covers a broad range of topics, including:

- scope and application of the standard (e.g., to whom the standard applies)
- definitions of key terms
- an explanation of which requirements apply to referring employers
- the elements required in an ATD Exposure Control Plan
- engineering & work practice controls
- laboratories (and)
- recordkeeping

Furthermore, a number of helpful appendices are included that provide information on:

- what ATDs are covered by the standard (Appendix A)
- an alternate respirator medical evaluation questionnaire (Appendix B)
- seasonal influenza and other vaccinations declination statements (Appendix C1-C2)
- a list of agents with laboratory requirements (Appendix D)
- vaccination recommendations (Appendix E)
- sample screening criteria for non-health care settings (Appendix F) (and)
- fit-test screening (Appendix G)

One of the main key provisions of the ATD standard is a requirement that all covered employees receive training in various areas. Among these required training topics is a provision that covered employees be familiarized with the contents of the ATD Standard.

To comply with the ATD Standard, your employer should provide you with a copy of the standard, and you should read it.

Employees are required to participate in training provided by their employer, and the training should be provided at a level at which the material can be readily understood and in a language the employee is able to understand fully.

Training must be received at least once per year, and whenever:

- a new job duty involving exposure is first assigned
- any change is made that affects the employee's exposure, such as changes to a procedure, engineering or work practice control

Training Tailored to "*Your*" Workplace

In addition to the topics introduced in this course, training should be tailored to the unique demands of your workplace and include a specific look at what particular exposures *you* face in *your* workplace.

Your employer should provide you with an explanation of your workplace's ATD Exposure Control Plan and/or Biosafety Plan, and the means by which you can obtain a copy of the written plan. Your employer should also explain how you can provide input as to its effectiveness.

Part 2 Referring Employers & Modes of Transmission

While the ATD standard applies to employers and employees in a broad range of environments, some employment settings that involve less exposure to ATDs have different requirements.

This subsection of employers is called "referring employers" and includes those employers whose exposure to ATD is limited to operations in which ATD patients are transferred by employees to another facility. Unlike other employers that are covered by the ATD Standard, referring employers can be distinguished from other employers in that **Referring employers do NOT provide any of the following:**

- diagnosis
- treatment
- housing
- isolation
- management of referred cases

Referring employers may include:

- Corrections
- Law enforcement
- Public health providers
- Organizations providing non-medical transport for referred cases

* Referring employers should consult the Cal/OSHA ATD Standard for a detailed explanation of requirements applicable to them.

Droplet transmission occurs when infectious droplets enter the nose, mouth, or eye – for instance, by touching a contaminated surface and then rubbing an eye. There are two types of

droplets; large and small. Larger droplets are more likely to cause infection than smaller ones; however, smaller droplets have a greater range of infection.

For large droplet transmission to cause infection, a person must be in relatively close contact with an infected person because larger droplets do not remain suspended in the air and generally travel only short distances. The distance for droplet transmission generally ranges up to three feet, but some experts suggest a range of six to ten feet to be safe. Common sources of large droplet infection include coughing and sneezing.

Aerosolized droplet nuclei, that are smaller than five microns, may remain in the air longer than larger droplets, increasing the range and length of time during which people can be exposed. Diseases spread by airborne transmission include measles and tuberculosis.

Infections like influenza or the common cold can be passed either through respiratory secretions, or by touch contact from mucus membranes.

Performing certain procedures on persons with ATDs can generate small infectious aerosols. These include various medical procedures, such as endotracheal intubation, open suctioning, nebulizer treatment, and bronchoscopy. Anyone in the vicinity of individuals with ATDs undergoing such procedures needs to wear appropriate respiratory protection.

ATDs can also cause infection through direct contact with an infected individual or indirect contact via an object or article contaminated by the individual. To guard against infection through this mode of transmission, it is important to:

practice frequent hand washing

disinfect any rooms an infected individual has been in

avoid close contact with any ATD-infected individuals (if possible)

disinfect any article he or she has touched or has been in proximity to

Signs & Symptoms of ATDs

TB & SARS

A broad range of diseases can be considered ATDs. Each one has its own signs and symptoms to indicate infection. Learning to identify these symptoms in infected individuals is an important step in keeping the workplace safe.

This lesson describes some of the signs and symptoms that accompany infection by the most common ATDs.

Tuberculosis (TB) is an illness that must be taken seriously. It was once the leading cause of death in the U.S. and is the most common ATD cited.

In 2016, 10.4 million people fell ill with TB, and 1.7 million died from the disease (WHO).

The bacteria that cause TB, *Mycobacterium tuberculosis*, usually attack the lungs, but they can attack any part of the body such as the kidney, spine, and brain. If not treated properly, TB disease can be fatal.

Not everyone infected with TB bacteria becomes sick. A person who shows no signs of TB illness is said to have a latent TB infection, while a symptomatic person has active TB disease. People with a latent infection may not feel sick or show any signs of being infected by TB bacteria, and, although they usually test positive, they can test negative for latent TB infection. An individual with a latent TB infection cannot infect others unless the TB bacteria become active and multiply in the body, at which point the person will become sick.

If TB infection (latent or active) is suspected, a skin or blood test will be required, followed by a chest X-ray and/or sputum smear. Employees working in environments in which they are exposed to ATDs should be tested for TB on an annual basis, at minimum.

Symptoms of Active TB infection include

Chronic cough, lasting at least 3 weeks

Night sweats

Fever

Fatigue

Loss of appetite

Weight loss

Hemoptysis

Chest pain

Severe acute respiratory syndrome (SARS) is a viral respiratory illness that spread rapidly around the world in 2003, beginning in Asia and transmitted to individuals in more than two dozen countries. It reached nearly every continent before the outbreak could be contained.

It is believed that the SARS virus follows a droplet transmission pattern, spreading when an infected person coughs, sneezes, or contaminates a surface or object by touching it with infectious droplets. Because of the rapid spread of the virus, it is also suspected that the SARS virus might spread more broadly through the air or by other ways that are not now known.

SARS Symptoms come in two stages.

Stage 1 symptoms:

- high fever (temperature greater than 100.4°F
- malaise
- headache
- body aches
- mild respiratory symptoms
- diarrhea

Stage 2 Symptoms (2 – 7 days later):

- dry cough
- pneumonia

Influenza

Influenza viruses, the viruses behind the common flu, are the most common of all ATDs. They are spread primarily through airborne droplets transmitted to others by an infected individual by coughing or sneezing or by contact with a contaminated surface.

Symptoms of the flu usually appear within one to three days after a person is exposed to the virus. A person can be shedding the virus up to 24 hours before they feel sick.

Symptoms of influenza infection include:

Fever

Fatigue

Malaise

Headache

Sore throat

Muscle soreness

Nasal congestion

Nonproductive cough

Avian influenza, commonly known as "avian flu" or "bird flu", is caused by type A flu viruses that normally only occur in birds. Most cases of bird flu infection in humans have occurred because of contact with infected poultry or surfaces contaminated by secretions or excretions from infected birds. Other means of transmission include: the virus becoming airborne and landing on exposed surfaces of the mouth, nose, eyes, or being inhaled into the lungs.

The symptoms of avian influenza infection can range widely, depending on which virus caused the infection. Typically, the symptoms are similar to those of seasonal influenza. Laboratory tests may be needed to determine whether influenza symptoms are due to avian influenza.

Symptoms may include:

Fever

Diarrhea

Coughing

Sore throat

Pneumonia

Muscle aches

Eye infections

Severe respiratory diseases

Other severe and life-threatening complications

Novel influenza A (H1N1) is a new flu virus of swine origin that was first detected in Mexico and the U.S. in 2009. H1N1 has demonstrated a high rate of infection, many of which have been more severe than seasonal influenza. One reason for this phenomenon may be due to it being a new virus, as most people do not have enough or any immunity to prevent infection.

The incubation period for the H1N1 Virus is estimated to range from 1-4 days with an average of 2 days. Influenza virus contagion begins the day before symptoms develop and can last for 5-7 days. Some people may be contagious for longer periods, particularly young children and people with low immune systems. The virus is most contagious while body temperatures are highest.

H1N1 symptoms can appear similar to seasonal influenza, and similarly can range from mild to severe. Symptoms may include:

fever

cough

sore throat

body aches

headache

chills

fatigue

diarrhea

vomiting

pneumonia

respiratory complications

Over-the-counter cold and flu medications used according to the package instructions may help lessen some symptoms such as cough and congestion, but it must be recognized that these medications will not lessen how infectious a person is. CDC recommends the use of Tamiflu (oseltamivir phosphate) or Relenza (zanamivir) as part of the treatment and/or reduction of severity of infection with swine influenza viruses.

Identifying Workplace Exposures

Exposure Control Plan

Learning how to identify activities that can lead to ATD exposures is best learned directly in the workplace you are in. Every workplace may have tasks, methods, and operations that could result in different exposures to employees. As mentioned earlier, one of the requirements of the ATD standard is that training include a specific look at what particular exposures you face in your workplace.

One way to learn of the exposures and precautions in your workplace is to become familiar with the Exposure Control Plan used. Your employer should provide you with a copy and explanation of their Plan.

An **Exposure Control Plan** should list:

- all job classifications in which employees may be exposed to ATDs
- all high hazard procedures performed in the workplace or while on duty, and the job classifications and operations of exposed employees
- all assignments or tasks requiring personal protective equipment and/or respiratory protection

For each potential exposure, the Plan should list the specific methods used in the workplace for minimizing employees' exposure to ATDs.

Some general guidelines can help identify certain kinds of operations in the workplace that can lead to exposure to ATDs. Operations that may lead to exposure include:

- Medical procedures (for example endotracheal intubation)
- Transporting ATD-infected individuals (for instance by law enforcement)
- Caring for ATD-infected individuals in hospice
- Working in homeless shelters

- Working in laboratories (and)
- Performing maintenance on air ventilation systems

Essentially, any area presently or previously frequented by individuals infected by known or unknown diseases can be considered a potential source of contamination.

Reducing Infections

Safety Recommendations

A priority of utmost importance in any workplace is protecting employees from sickness. In order to do that, a comprehensive strategy for reducing employees' exposures to infectious pathogens is paramount. This impetus is at the core of the Exposure Control Plan.

A comprehensive strategy for reducing infections will include recommendations for taking appropriate measures of protection, such as by:

- Wearing respiratory protection
- Decontaminating ATD patient areas
- Decontaminating ventilation ducts and airways
- Keeping ATD-infected individuals in isolation rooms
- Maintaining a safe distance from ATD-infected individuals

The risk of ATD infection can be reduced through a combination of actions. No single action will provide complete protection, but an approach combining the following steps can help decrease the likelihood of transmission. These recommended actions include:

Get vaccinated

Wash hands frequently

Avoid touching your eyes, nose and mouth

Avoid close contact with infected persons

Cover your mouth and nose with a tissue when coughing or sneezing

Stay home and minimize contact with others if you show any symptoms of ATD

Get a medical evaluation after any significant exposure or when symptoms show

Engineering and work practice controls are the first line of defense against ATDs. The goal of engineering controls is to "engineer out" any unnecessary exposure to ATDs.

ATD-infected persons must be provided with supplies that help prevent transmission, including:

- tissues
- a mask (and)
- supplies for hand washing

If providing these supplies is not possible, the individual should be placed in an area where he or she will not come into contact with employees who are not wearing respiratory protection.

It is extremely important to have good respiratory hygiene and cough etiquette to avoid ATD exposures. In order to do this you should always:

- Post visual alerts at entrance to facility
- Cover your mouth/nose when coughing or sneezing
- Use tissues and dispose after use
- Wash hands after contacting contaminated materials
- Provide supplies
    - tissues, no-touch receptacles, hand soap, and disposable towels for employees and in waiting areas for visitors
- Offer masks to coughing persons as needed
    - during periods of heightened risk
- Encourage coughing persons to sit at least three feet away from others
- Wear surgical or procedure mask when close contact with potentially infected patients is necessary

Another strategy for reducing infections is move to more secure locations. Facilities that are not equipped to handle ATD-infected individuals (e.g., non-healthcare facilities) should transfer such persons to hospitals or other appropriate facilities as quickly as possible. According to the ATD standard, ATD-infected individuals should be transferred to other facilities within a 5-hour window after the ATD case has been confirmed. However, that time limit is not applicable if the following criteria apply:

- the local health officer has been contacted
- no isolation room is available within the jurisdiction
- attempts have been made to contact other establishments outside of the jurisdiction
- all of the local health officer's recommendations have been applied as possible
- all employees entering an area occupied by an ATD-infected individual have appropriate PPE

In addition, the standard requires that each of the above steps be documented every 24 hours.

An ATD-infected individual does not need to be transferred if:

- transferring is considered harmful to the individual, in the opinion of the physician responsible for treating the patient
- isolation rooms cannot be provided to individuals with unknown or new ATDs

Airborne infection isolation rooms must conform to certain requirements according to the ATD standard, including:

- the construction of hospital isolation rooms
- maintaining negative pressure throughout the room with 12 or more air changes every hour (ACH)
- outdoor ventilation comprising at least six or more ACH
- using smoke trails (or other methods) to visually confirm the negative pressure
- inspecting and maintaining filters at least once per year and whenever serviced
- the construction and use of ventilation systems
- air exhaust from isolation rooms
- keeping doors and windows closed (unless windows are needed to maintain negative pressure)
- ventilating unused isolation rooms

Medical services are another means of preventing and treating ATD infections. Employers are required by the ATD standard to provide medical services to their employees.

These requisite medical services include:

Vaccinations

Tests and evaluations

Medical procedures

Assessment for latent tuberculosis infection

Follow-up

Medical services are confidential and individual names are not revealed in test results or in any paperwork concerning exposures.

Respiratory Protection

Overview

Respiratory protection is critical in workplace environments where ATD exposure is possible. Respiratory protection is one of the most important lines of defense available to employees exposed to ATD-infected individuals. In addition to the topics covered in this course, training should be provided that is tailored to the unique needs and exposures of your workplace.

Before wearing any respiratory protection, employees should receive a medical evaluation. Part of this evaluation consists of fit testing the kind of respirator that will be worn. Either a quantitative or a qualitative test can be performed. The procedures for performing the test are outlined in CCR Title 8 Section 5144.

Fit testing must be performed at least once annually and:

- before wearing a respirator
- before a respirator is worn that is of a new size, style, model, or make
- whenever a physical change occurs that may affect the fit of the respirator
    - facial scarring, significant weight gain or loss, dental changes, cosmetic surgery
- if the fit of the respirator is unacceptable

Fit tests must also be repeated periodically, because people are not always aware of facial changes that may have affected the fit of the respirator. Generally, Cal/OSHA regulations require that fit-tests be repeated annually. The aerosol transmissible disease regulation permits employers to lengthen this interval to every two years for employees who are not exposed to high hazard procedures, such as bronchoscopies.

A respirator will not protect you if it does not fit, and if it is not worn properly. In addition to fit-testing, it is important for you to be aware of the size, make, model and style of respirator that fits you, and to understand and practice how to put the respirator on and take it off. It is particularly important to properly place the straps, and in some models, to adjust the straps and adjust the nosepiece, so that it forms a snug seal on your face. During your annual training, you will be shown how to use a respirator.

The following criteria can provide guidance when deciding what kind of respirator to use:

The respirator must provide adequate protection, with a minimum effectiveness equivalent to that of N95 filtering facepiece respirators.

The respirator must be approved by the National Institute for Occupational Safety & Health (NIOSH) for the purposes being used.

After Sept 1, 2010, powered air purifying respirators (PAPR) equipped with High Efficiency Particulate Air (HEPA) filters must be used by employees with high hazard job responsibilities.

Paramedics and other emergency responders may wear P100 respirators instead of PAPRs.

A filtering facepiece respirator, such as the N95, is different from facemasks commonly worn in health care or dental settings. A comparison of the two shows that facemasks should not be considered adequate protection for ATDs.

You should always read and heed all instructions provided by the manufacturer on use, maintenance, cleaning, care and warnings regarding a respirator's limitations. You are

responsible for maintaining your assigned respirator and should never use another person's respirator.

Respirators must be worn in a number of situations, including:

- whenever entering an isolation room
- while performing procedures on a patient
- when performing maintenance tasks on potentially infected air systems
- in places an ATD-infected individual is or has been, or in the individual's residence
- while performing decontamination tasks
- when transporting an individual in a vehicle or facility

Respirators do not need to be worn:

- if the respirator interferes with safe vehicle operation, such as in a helicopter
- by law enforcement or corrections officers when transporting an ATD-infected individual and certain conditions are met
    - passenger compartment is separated by a sealed barrier

Respirators that are designed for reuse, such as the PAPR, need to be cleaned and disinfected regularly. Respirators issued for the exclusive use of one worker should be cleaned after each day's use (or more often if necessary). Respirators used by more than one worker should be cleaned and disinfected thoroughly after each use. In general, the cleaning procedure involves the following steps:

- disassemble the respirator
- wash the face piece and breathing hoses in cleaner and sanitizer solution mixed in warm water (120 - 140°F)
- rinse completely and dry in a clean area

Respirators should be stored in a convenient, readily accessible area that is kept clean and sanitary. They should be stored in a container that will keep them clean. The respirators should be protected against extreme temperatures, excessive moisture, and prolonged exposure to direct sunlight.

Every employee should know where respirators are kept in their workplace.

Although respirators are an important line of defense against ATDs, they do have limitations, including:

RESPIRATOR EFFECTIVENESS

Data on the effectiveness of respirators in protecting from influenza is limited.

INADEQUATE PROTECTION

The most respirators (e.g., N95, P100, PAPR) used to protect from ATDs do not provide adequate protection from additional hazards, like exposure to gaseous chemicals or oxygen-deficient environments (< 19.5% oxygen).

CHILDREN OR INDIVIDUALS WITH FACIAL HAIR

Because respirators need to provide a tight seal for full effectiveness, they are not recommended for children or individuals with facial hair. Children also may have difficulty breathing when wearing a respirator.

FIT TESTING

Without appropriate fit-testing and fit-checks prior to wearing, respirators may do little more than provide a false sense of security.

RISK TAKING

Using a respirator may make the wearer feel safe and more prone to take risks he or she might not otherwise take (e.g., being in proximity to infected individuals rather than maintaining a safe distance).

BREATHING CONDITIONS

Individuals with chronic respiratory, cardiac, or other conditions that make it harder to breathe may have difficulty breathing through a respirator.

FLAMMABLE

Some respirators may be flammable. Caution is needed around heat sources (Never smoke when wearing a respirator).

SKIN IRRITATION

Some wearers can feel skin irritation from respirators.

ALLERGIC REACTIONS

Some models are not latex-free, causing a reaction in those allergic to latex.

BODILY FLUID PROTECTION

Some models do not protect from bodily fluids (e.g., spit, blood, etc.).

Disinfection & Decontamination

Keeping Areas Sanitary

Keeping areas sanitary involves the following:

One

Throw away tissues and other disposable items used by the sick person. Wash your hands after touching used tissues and similar waste.

Two

Keep surfaces (especially bedside tables, surfaces in the bathroom, and toys for children) clean by wiping them down with a household disinfectant according to directions on the product label.

Three

Wash linens immediately after use. Those belonging to infected individuals do not need to be cleaned separately, but these items should not be shared without washing thoroughly first. Household laundry soap may be used. Tumble dry on a hot setting. Avoid "hugging" laundry prior to washing it to prevent contaminating yourself. Clean your hands with soap and water or alcohol-based hand sanitizer immediately after handling dirty laundry.

Four

Wash eating utensils and dishes in a dishwasher or by hand with water and soap.

Five

Sanitize airway ducts, ventilation, and any passageways through which air can travel from an infected area (e.g., isolation room) to other areas.

Six

In some areas additional precautions may be used to make infection less probable. For instance, in some healthcare settings a method of decontamination using ultraviolet light is used. Called upper room germicidal ultraviolet (UV) air disinfection, it can be used to reduce the chance of airborne pathogen transmission. To avoid acute eye and skin injury, staff and workers should not look at the tubes in UV fixtures.

Vaccinations

Overview

For employees exposed to ATDs, vaccinations are critical. However, no measure of precautions can guarantee immunity from infection. Even if an employee wears the appropriate respiratory protection whenever necessary and abides by all the prescribed precautions, aerosolized pathogens may still cause infection if the employee has no immunity to the disease. In such a case, one exposure may already be too late.

Employees must be vaccinated within 10 days of receiving their job assignment and after training is provided (unless certain exceptions apply, such as the employee already has immunity). A list of other recommended vaccines is provided in the ATD standard, Appendix E.

Among other vaccines, all exposed employees must be provided the option to receive influenza vaccinations.

All requisite vaccinations should be provided free of charge to employees who are exposed to that corresponding pathogen as a result of their work duties.

If an employee declines to receive a vaccination, he or she must sign a statement (See Appendix C1 in the ATD standard). The vaccination can still be requested at a later date.

NOTE: According to the ATD standard, employees should be provided with "information on the vaccines made available by the employer, including information on their efficacy, safety, and method of administration."

Certain groups of people are considered more susceptible to ATD infection and are at higher risk for severe illness from infection. Vaccinations are highly encouraged for individuals in these groups, and they should not be brought into areas where infection is possible. These high-risk groups include the following:

- children younger than 5 years old
- persons aged 65 years or older
- children and adolescents (younger than 18 years) who are receiving long-term aspirin therapy and who might be at risk for experiencing Reye syndrome after influenza virus infection
- pregnant women
- adults and children who have asthma, chronic pulmonary, cardiovascular, hepatic, hematological, neurologic, neuromuscular, or metabolic disorders such as diabetes
- adults and children who have immunosuppression (including immunosuppression caused by medications or by HIV)
- residents of nursing homes and other chronic-care facilities

Post-Exposure Care

Overview

If at any time, you feel sick, or have any of the symptoms mentioned earlier indicating potential ATD infection, you should seek a medical evaluation. Certain procedures should be followed to make sure the illness is identified, controlled, and reported.

In the event of an exposure, it is important that:

the exposure is reported

any other personnel who may have been exposed are identified within 72 hours of the report to the local health officer

these identified individuals are notified of possible exposure without delay (time frame must not exceed 96 hours of becoming aware of possible exposure)

preventive treatment (prophylaxis) be provided promptly, if needed

the exposed employee be isolated and/or removed from duty, if needed (as recommended by a physician or licensed public health care provider)

all exposed employees receive medical evaluation

all exposed employees receive a copy of their medical evaluation within 15 days of completion

In addition to the steps outlined above, employees can take steps to take care of themselves and prevent their condition from deteriorating or spreading to others.

Self-care involves the following:

getting plenty of rest

isolating yourself, if possible (Stay a minimum of 3 feet and a preferred distance of 6 feet away from others.)

drinking lots of fluids

avoiding alcohol and tobacco

starting antiviral medications (if prescribed) within 48 hours of the first symptoms

taking over-the-counter (OTC) medications (if advised) to relieve the symptoms

Remember that the ATD will remain contagious, even while taking OTC or antiviral medications.

The Surge Plan

Surge Training

By virtue of being transmitted via an airborne route, any ATD has the potential to spread quickly to others who are not immunized or adequately protected from the pathogen.

In a workplace or healthcare setting where people are in close contact or in large groups at times, transmission can occur with ease. The worst-case scenario is an outbreak that threatens to get out of control. For this reason, employees need to be prepared to contain any ATD illness and should provide training to manage outbreaks or surges.

Training to prepare for outbreaks and other emergencies should be conducted regularly. The training should be specific to the needs and potential exposures present in your workplace. The ATD standard requires that such training cover certain topics, such as:

- what duties employees need to perform
- receiving and treating patients
- isolating patients
- handling specimens, including specimens from persons who may have been contaminated as the result of a release of a biological agent
- accessing supplies needed for the response, including personal protective equipment and respirators
- decontamination facilities and procedures
- how to coordinate with emergency response personnel from other agencies

Conclusion

Summary

This course has aimed to familiarize you with the Cal/OSHA ATD standard. By now, you should be familiar with topics such as the modes of transmission of ATDs, signs and symptoms of ATDs, identifying workplace exposures, and strategies to reduce infections.

References

You can review any of the previous lessons by clicking on the Table of Contents links in the blue menu panel before taking the test.

(Mar 18, 2018). *Tuberculosis (TB)* https://www.cdc.gov/tb/

(Mar 18, 2018). *Guideline for Disinfection and Sterilization in Healthcare Facilities (2008)* https://www.cdc.gov/infectioncontrol/guidelines/disinfection/updates.html

(Feb 2, 2018) CDC reports more flu deaths, record hospitalizations https://www.cbsnews.com/news/flu-season-cdc-reports-more-deaths-record-hospitalizations/

(Mar 18, 2018). Subchapter 7. General Industry Safety Orders, Group 16. Control of Hazardous Substances, Article 109. Hazardous Substances and Processes. Section 5199. Aerosol Transmissible Diseases. http://www.dir.ca.gov/title8/5199.HTML

(Jan 29, 2009). *Clinical Signs and Symptoms of Influenza*. http://www.cdc.gov/FLU/PROFESSIONALS/acip/clinical.htm.

(May 27, 2009). *Interim Recommendations for Facemask and Respirator Use to Reduce Novel Influenza A (H1N1) Virus Transmission.* http://www.cdc.gov/h1n1flu/masks.htm.

(June 5, 2009). *H1N1 Flu (Swine Flu).* http://www.cdc.gov/h1n1flu/.

(Mar 18, 2005). *Severe acute respiratory syndrome (SARS).* https://www.cdc.gov/sars/

National Institute for Occupational Safety & Health (NIOSH). (March 2009). *Environmental Control for Tuberculosis: Basic Upper-Room Ultraviolet Germicidal Irradiation Guidelines for Healthcare Settings*. DHHS (NIOSH) Publication No. 2009-105.

U.S. Department of Labor (DOL/OSHA). *Guidance for Protecting Employees Against Avian Flu.* https://www.osha.gov/OshDoc/data_AvianFlu/avian_flu_guidance_english.pdf

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