

Infectious disease control in the workplace

Controlling the spread of infectious disease requires the right combination of education and preventative measures.

Introduction

An infectious disease, sometimes referred to as "contagious" or "communicable," spreads from person to person by various routes and is caused by pathogens (i.e., germs or "bugs"). Preventing the spread of infectious diseases requires basic infection-control procedures, including appropriate hand washing technique, personal hygiene and keeping the workplace clean. Educating employees on these basic practices and other information on transmission and common prevention measures can have a huge impact on your ability to control infectious diseases in the workplace.

Employees can be exposed to communicable diseases at work, home, recreational facilities, health clubs and while traveling. Business travel, and in particular global travel, can increase workers' potential exposure to infections, if they are not immunized properly. Multiple exposures may occur as these travelers return to the workplace, possibly exposing associates to communicable diseases. Contractors and temporary agency workers can expose on-site employees to various communicable diseases, too.

Best practices for preventing infectious disease

Best practices for preventing infectious disease exposure include the following:

- Written policies and procedures for infection control
- Employee screening, vaccination, and education
- Communication and follow up with the physician regarding the employee's clearance to work
- Absence Management program that allows sending a sick employee home, encouraging the employee to stay at home while feeling ill, and seeking medical attention
- Good housekeeping including cleaning/disinfecting contaminated work areas with an EPA- approved detergent/disinfectant

- Properly managing an occupational exposure.

These prevention techniques should minimize your workers' compensation and liability exposures. Aside from these prevention techniques, effective controls include early recognition of symptoms, prompt diagnosis and adequate isolation or treatment. Another exposure to consider besides workers compensation and liability is business interruption. Business continuity planning can help mitigate this exposure.

Screening and vaccinations

Information about infectious disease, including for employees exposed to the childhood infections (e.g., mumps, measles, rubella, chickenpox, bacterial meningitis) can be found at the website of the Center for Disease Control (CDC) Web site: <http://www.cdc.gov/ncidod/diseases/children/diseases.htm>.

Employee travelers should be aware of CDC's routine, recommended and required travel vaccines. By knowing these ahead of time (some vaccinations are needed months prior to travel), travelers can work directly with their primary care physician to determine which should be given. The specific website used to determine which travel vaccines fall within these three categories is <http://www.cdc.gov/travel/vaccinat.htm#aware>

Special considerations must be contemplated for women who are pregnant or breastfeeding and need certain vaccinations. The Web site with this particular information is <http://www.cdc.gov/travel/yellowBookCh9-PregnancyTraveling.aspx>

The main website, which is very detailed and informative, is <http://www.cdc.gov/travel/>

From the above website, clicking on "Vaccinations" will provide important information regarding vaccinations.

Contract language between the employer and contractors or temporary agency workers should include assurance that any workers sent to the employer facility have been screened and received appropriate vaccinations. =

Employee education

Employees should be educated on the various types of communicable diseases: airborne and contact.

Airborne diseases

TB (Tuberculosis), SARS (Severe Acute Respiratory Syndrome), Meningitis, Chickenpox, Measles, Smallpox, Influenza (flu), etc. are transmitted primarily from airborne droplets from an infected person's cough, sneeze, or spit, which can then be inhaled by others. Controls include effective hand washing; covering mouth and nose when coughing or sneezing; no sharing of food, drink, eating utensils, makeup; ensuring vaccines are up to date; and quarantine when contagious.

Contact diseases

Hepatitis A virus (HAV), Dysentery, Salmonellosis, E. Coli, Typhoid Fever and Methicillin - Resistant Staphylococcus Aureus (MRSA) are spread primarily by person-to-person contact, generally from an infected person's feces, urine, nasal discharge or infected skin, directly or indirectly from contaminated food, drinking water, someone else's hands or objects. These diseases are spread more easily where there are poor sanitary conditions or poor personal hygiene is practiced. Hand washing and personal hygiene are critical. There is a vaccination available against HAV.

MRSA: Methicillin-Resistant Staphylococcus Aureus (MRSA) is also known as Oxacillin-Resistant Staphylococcus Aureus (ORSA), Multiple-Resistant Staphylococcus Aureus, CA-MRSA (community-associated MRSA) and HA-MRSA (hospital-associated MRSA). MRSA is a variation of the common bacteria, staphylococcus aureus.

Staphylococcus aureus, often referred to simply as "staph," are bacteria commonly carried on the skin or in the nose of healthy people. MRSA is a type of staph that is resistant to antibiotics. It is a biological agent responsible

for difficult-to-treat infections in humans. Staph bacteria are one of the most common causes of skin infection in the United States and are a common cause of pneumonia, surgical wound infections and bloodstream infections. MRSA was discovered in 1961 in the UK. It is now found worldwide. Most staph and MRSA infections are treatable with antibiotics.

HA – MRSA: These are staph infections, including MRSA, frequently seen in hospital and healthcare facilities (such as nursing homes and dialysis centers). In hospitals, patients with open wounds and weakened immune systems are at greater risk for infection than the general public. If the hospital staff does not follow proper sanitary procedures, they can inadvertently transfer bacterial colonies from patient to patient. These healthcare-associated staph infections include surgical wound infections, urinary tract infections, bloodstream infections, and pneumonia.

CA-MRSA: These are staph and MRSA infections that are acquired by persons who have not been recently (within the past year) hospitalized nor had a medical procedure (such as dialysis, surgery, and catheters). Staph or MRSA infections in the community usually emerge as a cause of skin infections, such as pimples and boils, and occur in otherwise healthy adults and children. CA-MRSA often results in abscess formation that requires incision and drainage. According to the CDC, CA-MRSA skin infections are found most commonly among athletes, military recruits, children, Pacific Islanders, Alaskan Natives, Native Americans, men who have sex with men and prisoners.

Factors that have been associated with the spread of MRSA skin infections include close skin-to-skin contact, openings in the skin such as cuts or abrasions, contaminated items and surfaces, crowded living conditions and poor hygiene.

[Preventing staph and MRSA skin infections](#)

Best practices to prevent the Staph and MRSA skin infections include the following:

Good hygiene practice:

- Keep your hands clean by washing thoroughly with soap and water or using an alcohol-based hand sanitizer.
- Keep cuts and scrapes clean and covered with a bandage until healed.
- Avoid contact with other people's wounds or bandages.
- Avoid sharing personal items such as towels or razors.
- Use a barrier (e.g., clothing or a towel) between your skin and shared health club or other equipment; and wiping surfaces of equipment before and after use.

Patient education:

Clinicians should educate patients or their care-takers, and when possible, household members, on methods to limit further spread of infection in their household and among other close contacts.

Patients that cannot maintain adequate hygiene and keep wounds covered with clean, dry bandages should be excluded from activities where close contact with other individuals occurs, such as daycare or athletic practice, until their wounds are healed.

Employees should see their healthcare provider if they think their infection is not getting better.

Follow the physician instructions. If you are given an antibiotic, take all of the doses, even if the infection is getting better, unless your doctor tells you to stop taking it. Do not share antibiotics with other people or save unfinished antibiotics to use at another time.

Bloodborne diseases

Bloodborne diseases such as Hepatitis B (HBV), Hepatitis C (HCV), Hepatitis D (HDV), and Human Immunodeficiency Virus (HIV) are acquired from close contact with an infected person's body fluids. Some examples include administering first aid, sharing needles, unprotected sexual contact, blood transfusions (rarely), tattooing or piercing. Prevention for the bloodborne diseases includes effective hand washing, engaging in safe behaviors and assuring equipment, instruments and medical supplies are sterile.

HBV: There is a vaccination for Hepatitis B (HBV). It is offered most often via three intramuscular injections over a six-month period. However, immunization can break down if the patient doesn't receive the three-shot series in a timely manner. The Advisory Committee on Immunization Practices (ACIP) has released updated guidelines for adult vaccination. These guidelines include updated recommendations to increase hepatitis B vaccination of adults at risk for HBV infection (i.e., heterosexuals with multiple sex partners, injection-drug users, men who have sex with men and sex partners of persons with chronic HBV infection).

Depending on the extent of occupational exposure to blood and other bodily fluids (that may have blood in them), some employers must offer and pay for this HBV vaccination for select employees (typically healthcare, housekeeping/laundry, or rendering first aid as a primary job assignment). Employees have the option to decline the vaccination series. If they do decline, there is a requirement for them to sign a declination form.

HBV is much more transmissible than HIV. The CDC reports that HBV can survive at least seven days in dried blood on environmental surfaces or contaminated needles and instruments. However, there needs to be a route of entry (broken skin, mucous membranes). HBV does not penetrate intact skin.

HCV: There is no vaccination to prevent Hepatitis C (HCV). Prevention includes safe behaviors, not sharing personal care items that might have blood on them (i.e., razor, toothbrush), saying no to IV drug use (certainly no sharing of needles), assuring sterilization of instruments used for tattooing and piercing as well as medical supplies and equipment.

HDV: Hepatitis D (HDV) can be acquired either as a co-infection (occurs simultaneously) with HBV or as a superinfection in persons with existing chronic HBV infection. HBV vaccine is an excellent preventative measure. There is also a post-exposure prophylaxis that can be administered. Education is another preventative measure.

HIV: There is no vaccine available to prevent infection with Human Immunodeficiency Virus (HIV). The risk of HIV infection for international travelers is generally low. Factors to consider in assessing risk include the extent of direct contact with blood or other potentially infectious secretions and the extent of sexual contact with potentially infected persons. In addition, the blood supply in developing countries might not be adequately screened.

Vector-borne diseases occur when an infected vector (mosquitoes, ticks) bites a susceptible host. Worldwide, these types of diseases are of special concern in tropical countries where malaria is endemic. In the United States, West Nile Encephalitis and Eastern Equine Encephalitis (EEE) are transmitted by mosquitoes, and Lyme Disease and Rocky Mountain Spotted Fever are transmitted by ticks.

Emerging infectious diseases

Avian Flu: Avian influenza is an infection caused by avian (bird) influenza (flu) viruses. These influenza viruses occur naturally among birds. Bird flu is very contagious among birds and can make some domesticated birds, including chickens, ducks, and turkeys, very sick and kill them. One particular type, called avian influenza A (H5N1), has caused infections in birds and in humans.

Almost all human cases of bird flu involved handling or close contact with infected poultry. As of May 7, 2007, the CDC reports, "While there has been some human-to-human spread of H5N1, it has been limited, inefficient and unsustained."

In April 2007, the U.S. Food and Drug Administration (FDA) approved the first vaccine for humans against the avian influenza virus (H5N1). This vaccine could be widely used if the current H5N1 avian virus were to develop the capability to efficiently spread from human to human.

Although isolation and quarantine planning may not be sufficient to prevent or stop an influenza pandemic, they can be helpful in slowing the spread of infection in people. Additionally, strong education and awareness efforts can influence people to change their behaviors, such as avoiding large gatherings, frequent hand washing, better personal hygiene and other measures to reduce of risk.

A good website for learning about efforts for pandemic mitigation is
<http://www.pandemicflu.gov/plan/community/mitigation.html>

Background on germs (pathogens)

Germs are microbes that may cause disease. A microbe is a tiny living organism that can only be seen with a microscope. Although some microbes can make you sick or may even kill you, most are harmless, and some are even extremely helpful. Microbes can be found virtually anywhere: in air, water, plants, animals and humans.

There are four major types of germs:

Bacteria

Some bacteria are good and help keep one in balance. Illnesses caused by bacteria are sore throats, ear infections, cavities, and pneumonia. Some examples of bacteria and the problems that result include the following:

- E. Coli from under cooked hamburger
- Streptococcus causes strep throat from touch or through the air
- Lyme disease from the bite of an infected deer tick

Viruses

Viruses depend upon a host to survive, grow, and reproduce. Viruses cannot live outside of other living cells. Viruses cause chicken pox, measles, flu, and many other diseases.

Fungi

Fungi are multi-celled plant-like organisms. Unlike other plants, fungi are not able to produce their own food from soil, water and air. Instead, fungi get their nutrition from plants, food and animals. Fungi thrive in warm, damp environments. An example of something caused by fungi is athlete's foot.

Protozoa

Protozoa are one-celled organisms like bacteria. Protozoa love moisture and often spread diseases through contaminated water. Some protozoa cause intestinal infections.

How germs (pathogens) are spread

There are several main routes of transmission of germ spread from an infected person's body to others: airborne, contact and vector-borne.

Airborne: Airborne routes include coughing, sneezing, talking, and spitting release small and large-particle droplets containing germs or dust particles containing pathogen agent. The particle remains suspended in the air for a long period of time (e.g., TB, Measles, Mumps, Chickenpox, Smallpox, SARS, and Avian Flu). The germs may become inhaled by or deposited on a susceptible host within the same room or over a longer distance from the source, depending on environmental factors (ventilation system, fan use).

Contact: An infected worker can spread infection through direct or indirect contact (Salmonellosi, Hepatitis B, C, D, HIV, and Typhoid Fever). Direct contact transmission involves skin-to-skin contact and contact with body fluids, including blood. With skin-to-skin contact, the transfer of some pathogens can occur through touch or by sharing personal items, clothing or objects. Contact with body fluids is through pathogens in saliva, urine, feces or blood, which can be passed to another person's body via cuts, abrasions or through the mucus membranes of the mouth and eyes.

Indirect contact transmission involves contaminated objects, food or water supplies by the pathogens in a person's feces or urine.

Vector-borne: Germs can spread through the bites of mosquitoes, ticks or animals (e.g., West Nile Encephalitis, Malaria, and Lyme disease).

Preventing the spread of germs (pathogens)

Here are some basic controls to prevent the spread of communicable diseases:

- Stay at home if you are feeling sick and make an appointment with a healthcare provider.
- Wash hands well and often but especially before eating and after visiting the bathroom. Use plenty of soap and warm water. One should spend at least 20-25 seconds washing their hands. After drying hands, use a paper towel to turn off the faucet and open the door (so clean hands stay clean). If soap and running water are not available, alcohol-based gel can be used. However, as soon as possible, use soap and running water as described earlier. See the following website:
<http://www.bt.cdc.gov/disasters/hurricanes/katrina/pdf/cleanhandshandoutcards.pdf>
- Unbroken skin is intact and healthy. Skin is a major barrier to pathogens. Any cuts or abrasions should be cleaned and covered with a bandage.
- Make sure food is well cooked; do not eat pink meat.
- Do not drink water that has been untreated.
- Wash fresh fruits and vegetables BEFORE eating them.
- Use appropriate clothing (long sleeve shirts and long pants) and insect repellent if in the woods or are out at dawn and dusk, to minimize insect bites. One should especially be careful of mosquitoes (West Nile Virus) and deer ticks (Lyme Disease).
- Stay away from wild animals. Many creatures, such as bats, raccoons and squirrels, can carry diseases, so keep a safe distance from wild animals. Be especially wary of nocturnal animals (i.e., opossum) that you see out during the day.
- Do not share personal items: towels, clothing, razors, shavers, toothbrushes and other personal items.
- Avoid sexual encounters with persons who are infected with HIV, whose HIV infection status is unknown, and those at high risk for HIV infection (intravenous drug users, prostitutes, and other persons with multiple sexual partners).
- Use universal precautions if in contact with another person's blood or other bodily fluid (i.e., prior to administering first aid). According to the concept of Universal Precautions, all human blood and certain human body fluids should be treated as if known to be infectious for HIV, HBV, HCV, and other bloodborne pathogens. Therefore, using disposable sterile gloves and possibly other protective gear (gown, face mask) may be in order.
- Unless absolutely certain that the equipment being used is sterile, skin-damaging procedures such as ear or other body piercing, tattooing and acupuncture should be avoided.

Developing countries may have inadequate standards of care, which may lead to the spread of blood-borne infections. Travel packs are available from chemists and travel clinics, containing sterile equipment for use in an emergency. These kits should be supplied with a certificate showing contents and the reason for its purchase.

Developing countries may have only basic blood transfusion services. In addition, much of the blood donated is unscreened. Both of which may result in the spread of blood-borne infections.

Travelers with insulin-dependent diabetes, hemophilia, or other conditions in which routine or frequent injections are necessary should be advised to carry a supply of syringes, needles, and disinfectant swabs (i.e., alcohol wipes) sufficient to last their entire stay. Before traveling, such persons should consider requesting documentation of the medical necessity for traveling with these items.

Emergency contact information should be obtained from all traveling employees. If possible, contact information should be provided to the traveling employee for emergency assistance while staying in the traveled country.

Review and execute social distancing strategies to reduce contact between people for pandemic mitigation.

Occupational exposure

If an employee is exposed to blood or body fluids, he or she should:

- Flush the area with running water.
- Wash the area with plenty of warm water and soap.
- Report incident to the appropriate staff member.
- Record the incident.
- Seek medical advice.

Conclusion

Control of infectious disease requires proactive planning and employee screening, conscientious communication with healthcare providers and employee education, sound absence management and good housekeeping practices including cleaning/disinfecting of potentially contaminated areas with an EPA approved detergent/disinfectant. Careful attention to these areas will help minimize the spread of infectious diseases within the workplace.

References

National Center For Infectious Diseases:

<http://www.cdc.gov>

<http://www.cdc.gov/ncidod/dhqp/ar.html>

Yale University, Office Of Environmental Health and Safety, Occupational Health and Safety Section:

<http://www.yale.edu>

Fairfield University, School of Nursing:

<http://www.fairfield.edu/x722.html>

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