CDC Training part two

Communicable Disease Prevention

Disease prevention

- Is Inhibiting the development of a disease before it occurs or if it occurs interrupting or
- slowing down the progression of diseases.
- **There are three levels of prevention.**

1. **Primary prevention**
2. **Secondary prevention**
3. **Tertiary prevention**

1. Primary prevention

- **Primary prevention seeks to reduce the frequency of new cases of disease occurring in a population and, thus is most applicable to persons who are in the stage of susceptibility.**

- **It focuses on promoting health, preventing exposure, and disease.**

✓Health promotion: any intervention that promotes a healthier and happier life.

- Interventions that enhance health and the body's ability to resist diseases.

✓Improvement of socioeconomic status; education and vocational training; affordable and adequate housing, clothing and food; old age pension benefits; emotional and social support, relief of stress etc.

✓**Prevention of exposure**: any intervention which prevents the coming in contact between an infectious agent and a susceptible host.

Eg. ***Provision of safe and adequate water***

- ***proper excreta disposal; vector control***

- ***safe environment at home (proper storage of insecticides and medicines), at school and at work***

- ***(proper ventilation, monitoring of harmful substances in factories), on the streets (driver licensing laws)***

✓**Prevention of disease:** This occurs during the latency period between exposure and the biological onset of the disease. Eg. Immunization.

Remember breast feeding is:

- ***Health promotion*:** by providing optimal nutrition for a young child, either as the sole diet up to six months of age, or as a supplement in later age.

- ***Prevention of exposure***: by reducing exposure of the child to contaminated milk.

- ***Prevention of disease after exposure***: by the provision of ant-infective factors, including antibodies, WBCs and others.

2. Secondary prevention

- Secondary prevention attempts to reduce the number of existing cases in a population and, therefore, is most appropriately aimed those in the stage of pre symptomatic disease or the early stage of clinical disease.

- Acted after the biological onset of the disease, but before permanent damage sets in.

- The objective here is to stop or slow the progression of disease so as to prevent or limit permanent damage, through the early detection and treatment of diseases.

3. Tertiary prevention

- **Tries to limit disability and improve functioning following disease or its complications, often through rehabilitation.**
- **Therefore, it is most applicable during the late clinical stage or the stage of outcome.**
- **After permanent damage sets in, the objective of tertiary prevention is to limit the impact of that damage.**
- **The impact can be physical (physical disability), psychological, social (social stigma), and financial.**
- ***Rehabilitation* : is to the retraining of remaining functions for maximum effectiveness, and should be seen in a very broad sense, not simply limited to the physical aspect.**

Principles of communicable disease control

Disease control: Involves all the measures designed to reduce or prevent the incidence, prevalence and consequence of a disease to a level where it cannot be a major public health problem.

- ***The actions may be effected through:***

  - **Attacking the source**
  - **Interrupting the mode of transmission and**
  - **Protecting the host (susceptibility)**

1. Attacking the source

✓Domestic animals as reservoirs

- Immunization e.g. Brucellosis
- Destruction of infected animals e.g. Rabies

✓Wild animals as reservoirs

- Post exposure prophylaxis e.g. Rabies

Human as a reservoirs

✓ ***Isolation*** of infected persons & separation of infected persons from others for the period of communicability.

- Not suitable when:-
- Large proportion are apparently infected, or
- In which maximal infectivity precedes over illness.

Treatment

- **Of cases (clinical) and carriers**
- Mass treatment: **where large proportion are known to have a disease, it is sometimes advisable to treat everybody, without checking whether individuals have disease or not.**

***Quarantine*:-**

✓**The limitation of freedom of movement of apparently healthy persons or animals who have been exposed to a case or infectious disease.**

- ***Cholera, plague, Ebola*** **and** ***yellow fever*** **are the among internationally quarantinable diseases by international agreement.**
- **These diseases are very infectious, so cases shouldn't be referred but seniors must be requested to visit the health center.**

2. **Interrupting transmission**

✓***For Transmission by ingestion:***

- Purification of water
- Pasteurization of milk
- Inspection procedures designed to ensure safe food supply.
- Improve housing conditions

✓**For Transmission by inhalation**

- Chemical disinfections of air
- Improving ventilation

- For transmission by vector or intermediate hosts
  - Vector control measures
  - Environmental manipulation (sanitation)

Measures that reduce host susceptibility

❖ **Immunization**

- Active immunization: when either the altered organism or its products is given to a person to induce production of antibodies
  E.g. BCG
- Passive immunization: provision of ready-made antibodies
  E.g. TAT

✓**Chemoprophylaxis**

✓**use of antibiotics for known contacts to a case.**

E.g. Ciprofloxacin for contacts to a case of M. meningitis

- **Better nutrition: Malnourished children get infections more easily & suffer more severe complications.**

Individual measures against infections

1. **Hand hygiene**
2. **Prevention of food-borne infection**
3. **Prevention of respiratory tract infections**
4. **Prevention against sexually transmitted infections**
5. **Prevention of blood-borne infections**
6. **Protection against insect-borne infections**

- # HAND Washing
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- Hand washing with soap is among the most effective and inexpensive ways to prevent gastrointestinal and respiratory infections.

- **This should always be done**
  - **before and after meals,**
  - **after visits to the toilet and after direct contact with wounds, blood, nasal discharge and other body fluids (own and others),**
  - **after direct contact with animals and after spending time in crowded conditions**
  - **– especially during seasons with much respiratory tract or gastrointestinal infections.**

  - Liquid, antibacterialsoap is preferable.
  - Rings and jewellery should be removed before hand washing.

Policy

- Disease/infection prevention

POLICY

- to ensure that its employees are able to perform their duties in a safe and effective manner. b/ce
  - The safe performance of daily operations can be threatened by life-endangering communicable diseases.
- to provide employees how minimize potential exposure
- increasing employee understanding of the nature, risks, and routes of transmission of the diseases.

DEFINITIONS of common term

- ***Airborne:*** When infectious agents can be carried by dust or droplet nuclei suspended in air and transmitted to new hosts.
  - Airborne particles can settle on surfaces but can also be easily moved by wind currents and can be blown over great distances.
- This is in contrast to **droplet spread** where the droplets are too heavy to maintain in the air and quickly fall to the ground.
  - Examples of airborne diseases include anthrax, chicken pox, and measles

- ***Bacteria:*** Single-celled microorganisms that can cause diseases and are treated with antibacterial medications.
  - Some examples of diseases caused by bacteria include cholera, tuberculosis, syphilis, gonorrhea, and tetanus.

- ***Bloodborne:*** When infectious agents can be transmitted by blood. Needle sticks and other sharps-related injuries may expose officers to blood-borne pathogens.
  - Examples of bloodborne diseases include AIDS, hepatitis B, and hepatitis C.

- ***Bodily Fluids:*** Any liquid secretions of the body such as blood, semen, vaginal fluids, saliva or mucus, urine, diarrhea, vomit, and sweat.

- ***Communicable Disease****:* An illness caused by an infectious agent or its toxins that occurs through the direct or indirect transmission of the infectious agent or its products from an infected individual or via an **animal, vector, or the inanimate environment to a susceptible animal or human host.**

- ***Contaminated:*** Presence or reasonably anticipated presence of potentially infectious materials on an item or surface.

- ***Decontamination:*** The process of removing or neutralizing a hazard from the environment, property, or life form

- ***Direct Transmission:*** Transmission of an infectious agent to a host by direct contact (such as skin-to-skin contact, kissing, sexual intercourse) or via droplets.

- ***Droplets Spread****:* The direct spread of an infectious agent through relatively large, short-range aerosols produced by sneezing, coughing, and talking.

  - Spread can occur over a few feet, but droplets will quickly fall to the ground because they are too large to be carried on air particles.
  - **Examples of diseases transmitted by droplet spread include the common cold, the flu, measles, SARS, COVID-19, etc.**

- ***Exposure:*** Subjection to an infectious disease.

- ***Exposure incident:*** A specific eye, mouth, or other mucous membrane, non intact skin, or piercing through the skin (through events such as needle sticks, human bites, cuts, or abrasions) contact with blood or other potentially infectious materials.

- ***Indirect Transmission:*** Transmission of an infectious agent to a host through suspended air particles, inanimate objects (vehicles), or animate intermediaries (vectors)

- ***Vehicles:*** Inanimate objects that indirectly transmit infectious agents by carrying or providing a suitable environment for them.
  - Examples include food, water, and biological fluids.

- ***Vectors:*** Animate intermediaries between infectious agents and potential hosts.
  - Some examples include flies, worms, mosquitoes, rats, bats, and ticks.

- ***Incubation Period:*** The time between exposure to a pathogen and the development of the first symptoms of a disease.

- ***Pathogen:*** A bacterium, virus, or other microorganism that can cause disease in its host.
- ***Symptoms:*** The combination of bodily expressions that indicate the existence of a disorder or disease.

- ***Virus:*** A non-living, infectious agent that can multiply in living host cells such as animal, plant, fungi, or bacteria cells.
  - Some examples of diseases caused by viruses include smallpox, the flu, COVID-19, and hepatitis.

EXAMPLE common communicable diseases

- ***Acquired Immunodeficiency Syndrome (AIDS)*:** AIDS is caused by the advance stages of infection of the human immunodeficiency virus (HIV).

- HIV destroys the cells in the immune system, allowing for secondary infections easier access to the body.

- This disease can be transmitted through unprotected sexual encounters and contaminated blood or breast milk.

- Symptoms of HIV infection vary depending on the phase of virus infection; they can range from a fever to chills to joint pain and a variety of other symptoms.

- ***Hepatitis A, B, & C*:** Hepatitis is an inflammation of the liver. It can be caused by a number of substances and different types of viruses.
- **Hepatitis A** can spread from person to person or through contaminated food or water.
- **Hepatitis B and C** are examples of **blood borne** diseases that can also be transmitted through other infected bodily fluids such as semen or saliva.

- Hepatitis B is more infectious and prevalent than AIDS.
  - Its symptoms may include jaundice (yellowing of skin and eyes), vomiting, fever, and generally feeling weak.
  - It can result in liver failure, liver damage, and liver cancer.

- **Hepatitis C** is contracted in a similar way but is more insidious, as chronic conditions like cirrhosis are more likely to develop.

  - The individual may be unaware that they have hepatitis.

  - It may be discovered as an incidental finding when liver function tests are checked. If this is not treated, it may result in long-term severe liver damage.

- ***Coronavirus Disease 2019 (COVID-19):*** COVID-19 is a respiratory disease caused by a contagious virus known as SARS-CoV-2.

- This virus is part of a family of viruses known as coronaviruses that cause a range of respiratory illnesses such as the common cold, SARS, and MERS.

- Much like influenza, COVID-19 is thought to spread mainly by “person-to-person” contact via respiratory droplets.

  - Common symptoms include fever, tiredness, dry cough, and difficulty breathing. The disease can lead to a variety of results ranging from mild symptoms to death.

- ***Cholera*:** Cholera is an acute, diarrheal illness caused by the bacteria ***Vibrio cholerae*.**
  - Symptoms are typically mild or nonexistent; however, when severe symptoms emerge, diarrhea, vomiting, and leg cramps can occur that may lead to dehydration and shock.
  - This is an example of a communicable disease that is transmitted through vehicles such as contaminated water or food.
- ***Malaria*:** Malaria is a serious communicable disease caused by a parasite found in mosquitoes.
  - Symptoms include high fevers, shaking chills, and flu-like illness.
  - This is an example of a disease that is blood borne and transmitted indirectly by a vector (the mosquito).
  - This blood borne transmission mainly occurs when a mosquito bites an infected individual and later, when taking blood from another individual, injects a mix of the infected blood and saliva into a new person.
  - The transmission can also occur through blood transfusions, organ transplants, shared contaminated needles or syringes, and potentially during childbirth. Malaria is most commonly seen in sub-Saharan Africa and South Asia

- ***Tuberculous (TB)*:** TB is a communicable disease caused by a bacterium called *Mycobacterium tuberculosis.*

- The disease commonly targets the lungs but can attack any part of the human body.

- Symptoms can include a prolonged bad cough, chest pain, and coughing up blood.

- TB is an example of an airborne disease where the bacteria can be put into the air through coughing or speaking.

- **PROCEDURES A. Communicable Disease Prevention**

- 1. In order to minimize potential exposure to communicable diseases, officers shall assume that all persons could be potential carriers, even if no symptoms are visibly present.

- 2. Disposable gloves shall be worn when handling any persons, clothing, or equipment suspected of carrying a communicable disease that can be transmitted through contact, including through bodily fluids.

- 3. Masks, protective eyewear, and coveralls shall be worn where bodily fluids, droplets, or pathogens on surfaces may be splashed onto the officer. a.

- In the case of transmission via droplets or airborne diseases, putting masks on prior to engagement with a contaminated person or area is advised.

- 4. Plastic mouthpieces or other authorized barrier resuscitation devices shall be used whenever an officer performs CPR or respiratory resuscitation.

- 5. All sharp instruments such as knives, scalpels, and needles shall be handled with extraordinary care, and should be considered potentially infectious.

- a. Gloves specifically designed to resist needle sticks, cuts, and abrasions shall be worn when searching for or handling sharp instruments.
  - (Note: Standard leather gloves should not be worn.
  - If they become contaminated, they must be disposed of in accordance with all applicable laws pertaining to the disposal of biohazardous waste.)

- b. Officers shall not place their hands in areas where sharp instruments might be hidden. An initial visual search of the area shall be conducted, using a flashlight where necessary.
  - The suspect shall also be asked to remove such objects from their person.
- c. Needles shall not be recapped, bent, broken, removed from a disposable syringe, or otherwise manipulated by hand.
  - Needles shall be placed in a puncture-resistant container when being collected for evidentiary or disposal purposes.
- 6. Officers shall not smoke, eat, drink, bite nails, or apply cosmetics near potentially contaminated areas or people.

- 7. Evidence contaminated with a communicable disease shall be dried, double-bagged in plastic bags, and marked to identify potential or known communicable disease contamination.

- 8. Human bites are very serious. Because of the bacteria in the human mouth, there is a high risk of infection.
  - Injuries obtained from teeth on the hand or fist are equivalent to human bites and can be potentially serious.
  - The most important thing is to wash the wound with soap and water—then seek medical evaluation.
- 9. In the case of a communicable disease that is airborne or transmitted through droplets, limiting exposure to a suspected infected person(s) and their surrounding surfaces altogether unless absolutely necessary is highly recommended.
  - Using call centers to screen individuals with applicable questions is one potential way to keep officers informed of the type of personal protective equipment (PPE) and amount of exposure that is considered safe.

- **Transport and Custody**
- 1. Depending on the particular situation officer discretion may be used in arresting or otherwise physically handling any person who may have a communicable disease, taking into account the availability of PPE for the officer and the severity of the offense.

- 2. In cases of suspected airborne diseases or diseases transmitted via droplets, suspect movement should be restricted. The number of officers in contact with the suspect should also be limited whenever possible.

- 3. Officers shall not put their fingers in or near any person's mouth.

- 4. Individuals that are potentially infected or have bodily fluids on their persons shall be transported in separate vehicles from other individuals after appropriate medical evaluation or treatment by paramedics or other qualified medical personnel.
  - The individual shall be required to wear suitable protective covering if they are bleeding or emitting bodily fluids, where reasonable or possible.
- 5. Officers shall notify relevant support personnel during a transfer of custody when the suspect has bodily fluids present on their person.

- 6. Suspects taken into custody with a potential communicable disease or bodily fluids on their persons shall be placed directly in the designated holding area for processing and should change into uncontaminated clothing.
  - Where reasonable or possible, the holding area shall be posted with an Isolated Area—Do Not Enter sign.

- 7. In the case of transmission via droplets or airborne diseases, suspects should be provided masks (if possible) and instructed to follow proper hygiene etiquette such as coughing into elbows.
  - Personnel might not need to wear a mask or respirator during transport if the patient is wearing a mask

- 8. Officers shall document on the appropriate arrest or incident form when a suspect taken into custody has bodily fluids on their person.

- **Disinfection**
- 1. Any unprotected skin surfaces that come into contact with bodily fluids or an infected individual shall be immediately and thoroughly washed with soap and warm water.
  - Alcohol-based hand cleaning solutions or antiseptic towelettes shall be used where soap and water are unavailable.
  - a. Hand lotion shall be applied after disinfection to prevent chapping and to seal cracks and cuts on the skin.
  - b. All open cuts and abrasions shall be covered with waterproof bandages before the employee reports for duty.
- 2. Employees shall remove clothing that has been contaminated with bodily fluids as soon as practical.
  - Any skin area that has come into contact with this clothing shall then be cleansed in the prescribed fashion.
  - Contaminated clothing shall be handled carefully and laundered separately. Note: Lightly contaminated clothing shall not be laundered at home.
  - The department shall make arrangements with a local health care facility or fire department that has laundry machines and procedures in place for the cleaning of contaminated clothing.
  - Grossly contaminated clothing shall be disposed of in accordance with all applicable laws pertaining to the disposal of biohazard waste.

- 3. Disinfection procedures shall be followed whenever bodily fluids are spilled, or an individual has bodily fluids on their person or is suspected to have a communicable disease is transported in a departmental vehicle.

  - a. A supervisor shall be notified, and the vehicle taken to the service center as soon as possible.
  - b. Affected vehicles shall be designated by the posting of an Infectious Disease Contamination sign upon arrival at the service center and while awaiting decontamination.
  - c. All organic matter shall be removed with an absorbent cloth before disinfectant is applied to the area.
  - d. The affected area should be cleansed with a hospital-grade disinfectant. Employees shall not hose or flood the affected area.
- 4. Non-disposable equipment and areas upon which bodily fluids or a communicable disease has come into contact with shall be disinfected as follows:

- a. All bodily fluids shall first be removed with absorbent materials.
  - b. The area shall be cleansed with a hospital-grade disinfectant.

- 5. All disposable equipment, cleaning materials, or evidence contaminated with bodily fluids shall be bagged and disposed of in compliance with current state or federal provisions for disposal of biologically hazardous waste material.

- **Supplies**

- 1. Supervisors shall maintain the control and the proper storage in a convenient location of adequate infectious disease control and personal protective equipment (PPE) supplies for their units.

- Protective gloves, disinfecting materials, and other first-aid supplies shall be made readily available at all times.

- 2. Supervisors are responsible for the dissemination of the communicable disease control and PPE supplies.

- 3. Where reasonably possible, all departmental vehicles shall be continuously stocked with the following communicable-disease control supplies:
  - • Clean coveralls in appropriate sizes
  - • Disposable gloves and gloves specifically designed to resist needle sticks, cuts, and abrasions
  - • Puncture-resistant containers and sealable plastic bags
  - • Barrier resuscitation equipment
  - • Goggles

- Masks appropriate for a variety of transmission methods such as air and droplet
- • Hospital-grade disinfectant
- • Disposable towelettes or waterless disinfection solutions (70 percent isopropyl alcohol)
- • Waterproof bandages
- • Absorbent cleaning materials
- • ‘Isolation Area—Do Not Enter’ signs
- 4. Employees who use the supplies carried in police vehicles shall ensure they are replaced.
- 5. Employees shall keep disposable gloves in their possession while on either motor or foot patrol.

Standard precautions

Infection control precautions in care settings

Standard precautions

- It is not always possible to identify persons who may spread infection to others

- therefore standard precautions to prevent the spread of infection must be followed in health care settings at all times

- In addition, for persons with r**espiratory infections, droplet precautions may be** recommended
- those with diarrhea and/or vomiting enteric precautions should be followed

Hand washing

- Hand washing is the single most important part of infection control.

- Soiled hands should be washed with soap and water.
- If soap and water is not available, alcohol gel or rub can be used.

  - **Hands should be washed before contact with patients, after any activity that contaminates the hands (removal of protective clothing and gloves, using the toilet) and before handling food.**

  - **Nails should be kept short, rings should not be worn, artificial nails should be avoided and cuts and abrasions should be covered with a waterproof dressing**.

- Adequate hand washing facilities must be available in all patient areas.

- Liquid soap dispensers, paper hand towels and foot-operated waste bins should be provided

Infection control standard precautions in health care

- ✓• Hand hygiene: hand washing 40–60 seconds with soap and water or use of an alcohol hand rub or gel.
- ✓Cover wounds or skin lesions with waterproof dressings.

- ✓• Appropriate use of gloves, gowns, aprons and facial protection (eyes, nose and mouth).
- ✓• Prevention and management of needle stick injuries, injuries from other sharp instruments and blood splash incidents.

- ✓• Respiratory hygiene and cough etiquette.
- ✓• Safe disposal of contaminated waste.
- ✓• Managing spillages of blood and body fluids.
- ✓• Safe collection and transport of specimens.

- ✓• Decontaminating equipment including cleaning, disinfection and sterilisation.
- ✓• Maintaining a clean clinical environment.
- ✓• Safe management of used linen.
- ✓• Place patients with infections in appropriate accommodation.

Droplet precautions when managing respiratory infections

- **Wear a medical mask** if working within approximately m of the patient or upon entering the room/cubicle of a patient.

- When performing aerosol-generating procedures (chest physiotherapy, nebulization)

    - wear a particulate respirator
    - perform procedures in an adequately ventilated room and
    - limit other persons in the room only to those required for the patient’s care.

Enteric precautions when managing diarrhea and vomiting

- • Patients should normally use a flush toilet for the disposal of excretions and soiled materials.

- Attendants should wear disposable plastic gloves and wash hands thoroughly.

- • Faecal material on soiled clothing and bed linen should be flushed into the toilet bowl.
- Linen should then be washed in washing machine on a ‘hot’ cycle. Soaking in disinfectant before washing is not necessary.

- Use of disinfectants is important in schools, nursery schools and residential institutions.

- Toilet seats, flush handles, wash-hand basin taps and toilet door handles should be cleaned daily and after use with a bleach-based household cleaner, diluted according to manufacturer’s

- Alcohol-based wipes may be used on seats and other hard surfaces.
- Bedpans and urinals should be emptied into the toilet bowl, washed with a disinfectant and rinsed.

- • Patients and careers should be advised about personal hygiene and the hygienic preparation and serving of food.

- Children and adults in jobs likely to spread infection (e.g. food handlers) should stay away from work or school for 48 hours after the diarrhea has stopped.

- In the NL, workers can resume work as soon as diarrhea has stopped.
- Day care is not regarded as a job likely to spread infection. Most important criterion is if a worker can adequately comply to hygienic precautions.

Thank you//