



Community Dentistry Third class



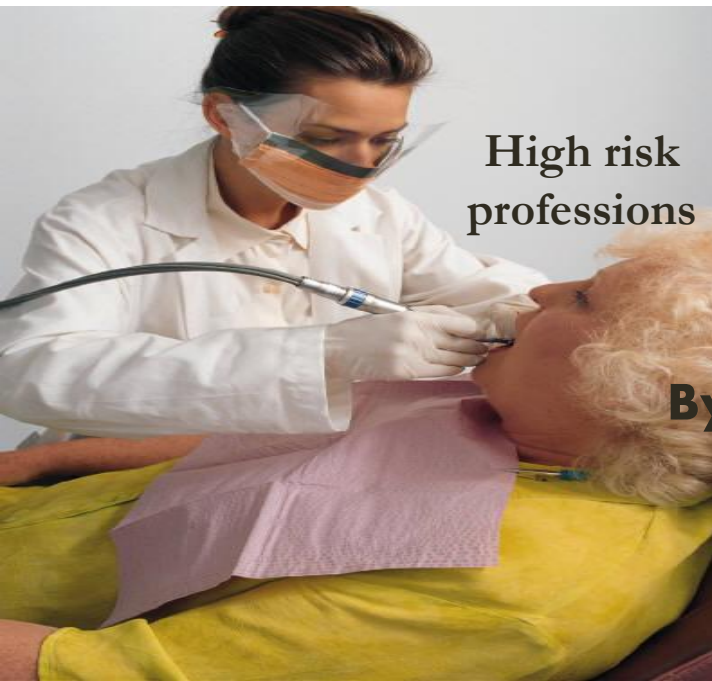
Infection Control in Dental Practice

Part 1

lecture

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High risk
professions

Definition

Infection control – also called “exposure control plan” by OSHA is a required office program that is designed to protect personnel against risk of exposure to infection.

The policy and procedure implemented to control and minimize the dissemination of infections in dental setting.

Objectives of an Infection Control Program

- Reduce the available number of microorganisms
- Interrupt the spread, break the cycle of cross-contamination
- Treat all clients and clinicians as if infected
- Protect from exposure, infection and disease

Infection

- The entry and development or multiplication of an infectious agent in the body man and animals
- An infection may not always result in illness, it may lead to an immune response which may be inapparent or it may manifest as diseases
- **Communicable disease** : Illness due to a specific infectious agent or its toxic products that arises through the transmission of that agent or its products from an infected person, animal or reservoir to susceptible host either directly or indirectly through an intermediate plant or animal host, vector inanimate environment

Mode of disease transmission

1. direct transmission

- I. Direct contact ((touching (chicken pox) , sexual contact AIDS))
- II. Droplet infection (coughing, sneezing, spitting), Ex: COVID 19, common cold, pneumonia
- III. Contact with soil (tetanus,
- IV. Inoculation(bites, contaminated needles)
- V. Trans-placental (HIV, syphilis,

2. Indirect transmission

- I. Vehicle born (water , food , ice ,serum , plasma), Ex: cholera, typhoid,
- II. Vector born(mechanical , biological), malaria, Lyme disease
- III. Air born (measles, TB,
- IV. Fomite which is a none living objects that transmits the diseases. (contaminated vehicle, brushes

- Many objects in dental office are potential source of infection, these are called **vectors**. For examples ; saliva, blood, nasal secretion, hand , hair, clothing , films, x-ray machine, dental instruments.
- Cross infection occurs when these vectors transmit pathogenic organisms from one patient to another or to dental personnel.
- The word infection control dose not mean total prevention of iatrogenic, nosocomial or occupational exposure, but it means to reduce the risk of disease transmission.
- In dentistry, infection can occur due to any of the following:
 1. Salivary contamination:
 2. Contaminated object
 3. Airborne infection

Rout of Infection Transfer

- 1. Percutaneous:** this is a high risk rout. In this, transfer of microbes from saliva and blood can occur through needles and sharp instruments.
- 2. Contact:** this is also high risk transmission. In this, touching or exposing non intact skin to infective oral lesion, infected tissue surface or infected fluids, splash and spatter or infected fluids.
- 3. Inhalation:** this is the moderate risk transmission.
- 4. Through fomites:** it is low risk. It is very rare to touch contaminated inanimate surface in dental room or operation.

Identification of the people at risk and the presence of these infections is achieved by recording and keeping updated medical history. But, this cannot be relied on as:

1. Patient may be unaware that they are infected. 50% of hepatitis B cases are asymptomatic and up to 10% become carriers.
2. Patient may not have understood the diagnosis given to them by their medical practitioner.
3. Patient may be incubating the infection. In (incubation period), which is the period from the exposure to pathogens (entrance) until the appearance of signs and symptoms.
4. Information may be deliberately withheld.

It is therefore safer for HCW to accept that all patients can be infectious.

Need For Protection



Protection From What?

- Blood, (saliva)-borne pathogens.
- Air-borne pathogens.
- pathogens transmitted by skin contact.

Protecting Whom?

- **Protecting:**
 - **Ourselves**
Operator/technician
 - **Patients**
 - **Other patients**
 - **Other staff**
 - **Our families**

Why Is Infection Control Important in Dentistry?

- Both patients and Dental Health Care personnel (DHCP) can be exposed to pathogens.
- Contact with blood, oral and respiratory secretions, and contaminated equipment occurs.
- Proper procedures can prevent transmission of infections among patients and DHCP.

Infectious diseases

- Viral
- Bacterial
- Parasitic

Viral infections

- **HIV (AIDS)**
- **SARS- CoV-2(COVID 19)**
- **Hepatitis Viruses**
- Papilloma viruses (HPV)
- Herpes virus
- Measles, Rubella, Mumps

- Hepatitis **B, C**
- Only vaccination against HIV A & B are available !!
- Risk group include IV drug user, heterosexual with multiple partners, mentally patients and hemodialysis patients
- **So you must Protect Yourself!**

Herpes viruses

- Herpes simplex (HS type 1 & 2)
- Varicella zoster (human HV 3)
- Epstein-Barr virus (human HV 4)
Infectious mononucleosis
- Cytomegalovirus CMV (human HV 5)



HIV and AIDS

most people are not aware of it at the time of infection and it may take 10 years or longer for AIDS to develop.

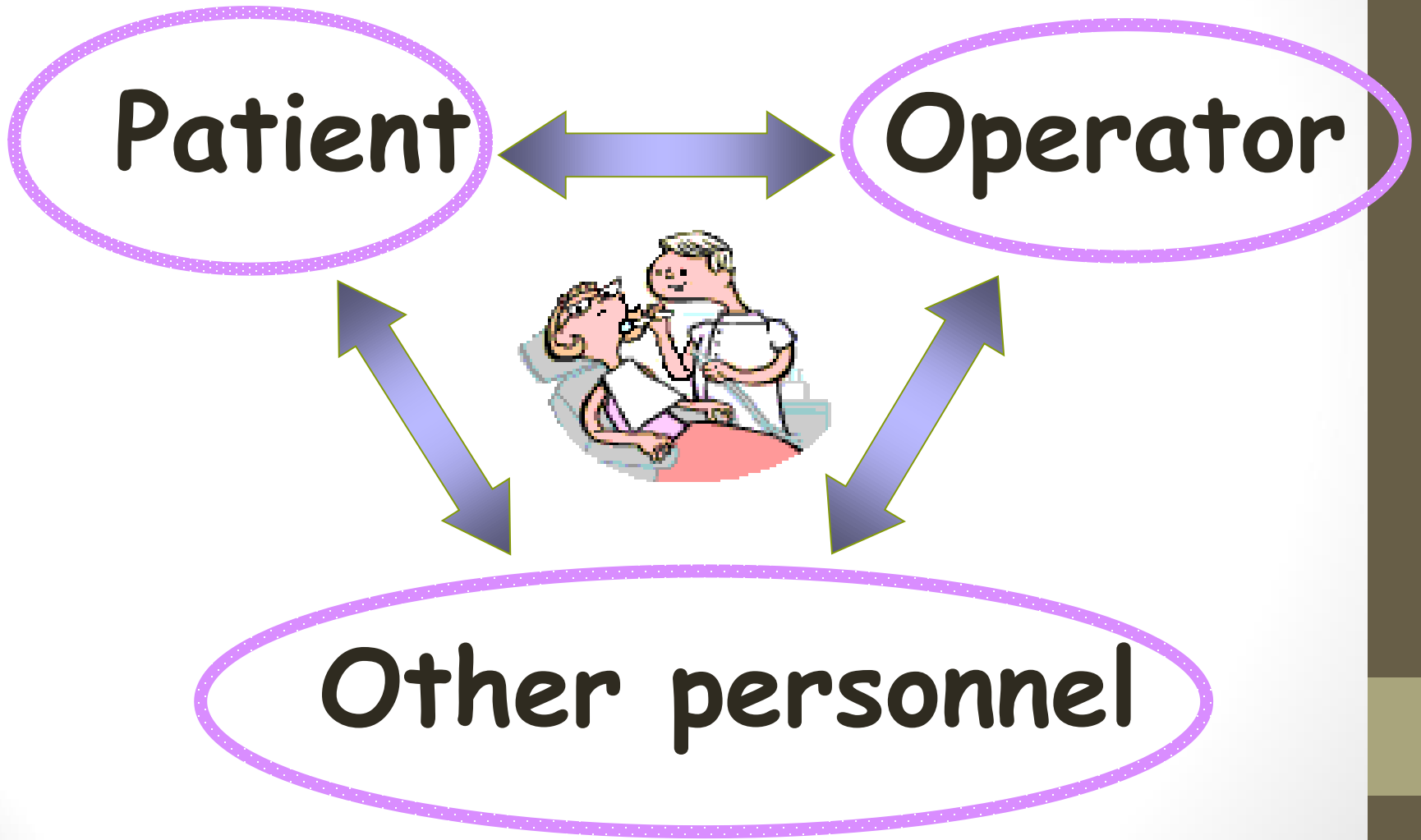
COVID 19

- New emerging pandemic viral infection, SARS-Cov 2 virus is the causative agent. Transmitted from person to person , mainly by air droplet during coughing or sneezing, or by touching contaminated surfaces.
- Incubation period 1-14 days
- Cause mainly respiratory symptoms ranging from mild to sever and even fatal disease.
- Dental heath professions are of a very high risk of getting this infection if they not follow the guidelines of prevention control.

Bacterial Infections

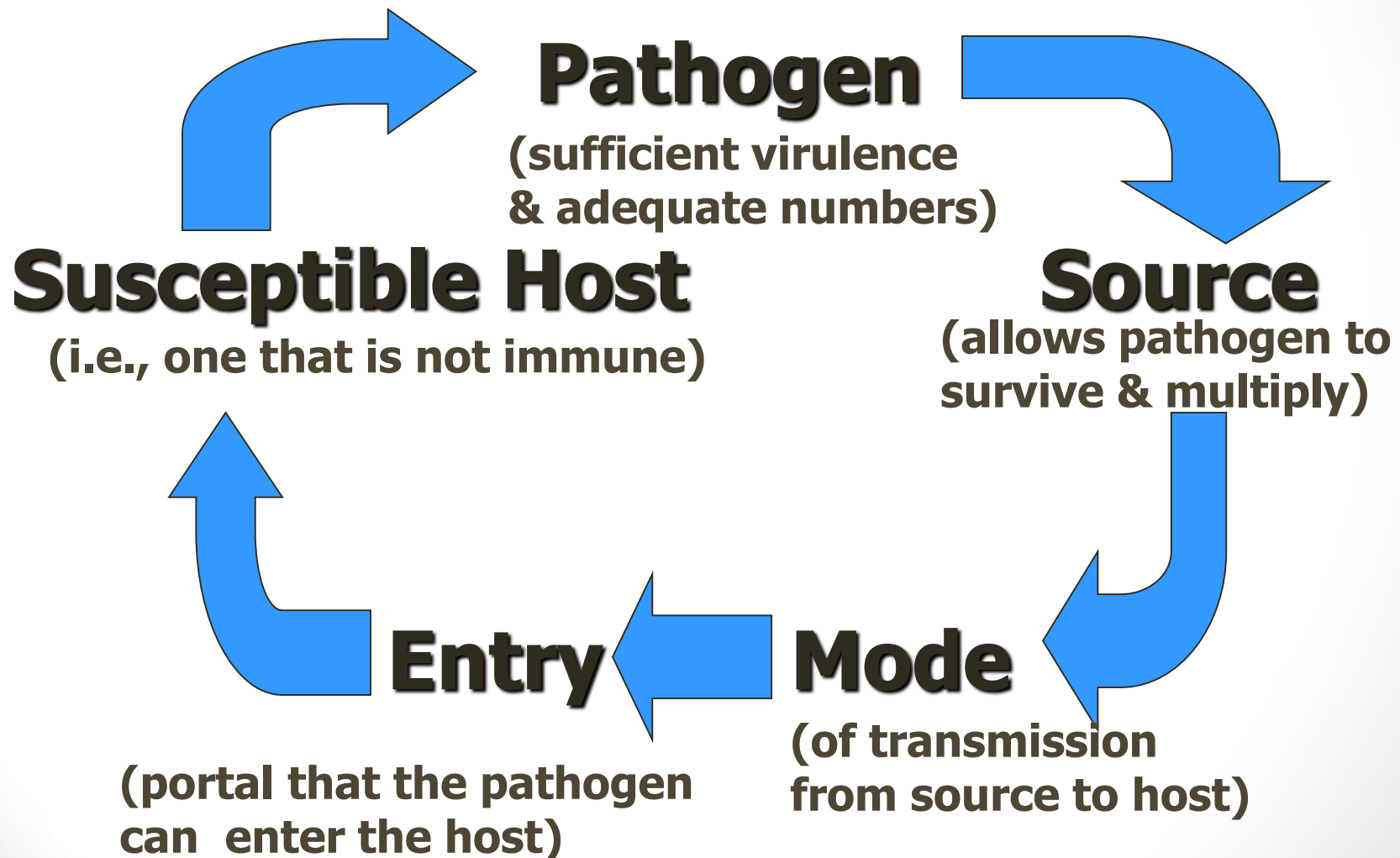
- Tuberculosis (TB)
- Legionnaire's disease
(Infected aerosols!)
- Syphilis
- Upper respiratory tract infections

Cross-Infection



CHAIN OF INFECTION

- All links must be connected for infection to take place



Susceptible Host

- Elderly
- Infants
- Immunocompromised
- ANYONE!

Pathogen

- Bacteria
- Virus
- Fungi
- Parasite

Portal of Entry

- Mouth
- Nose
- Eyes
- Cuts in skin

Reservoir

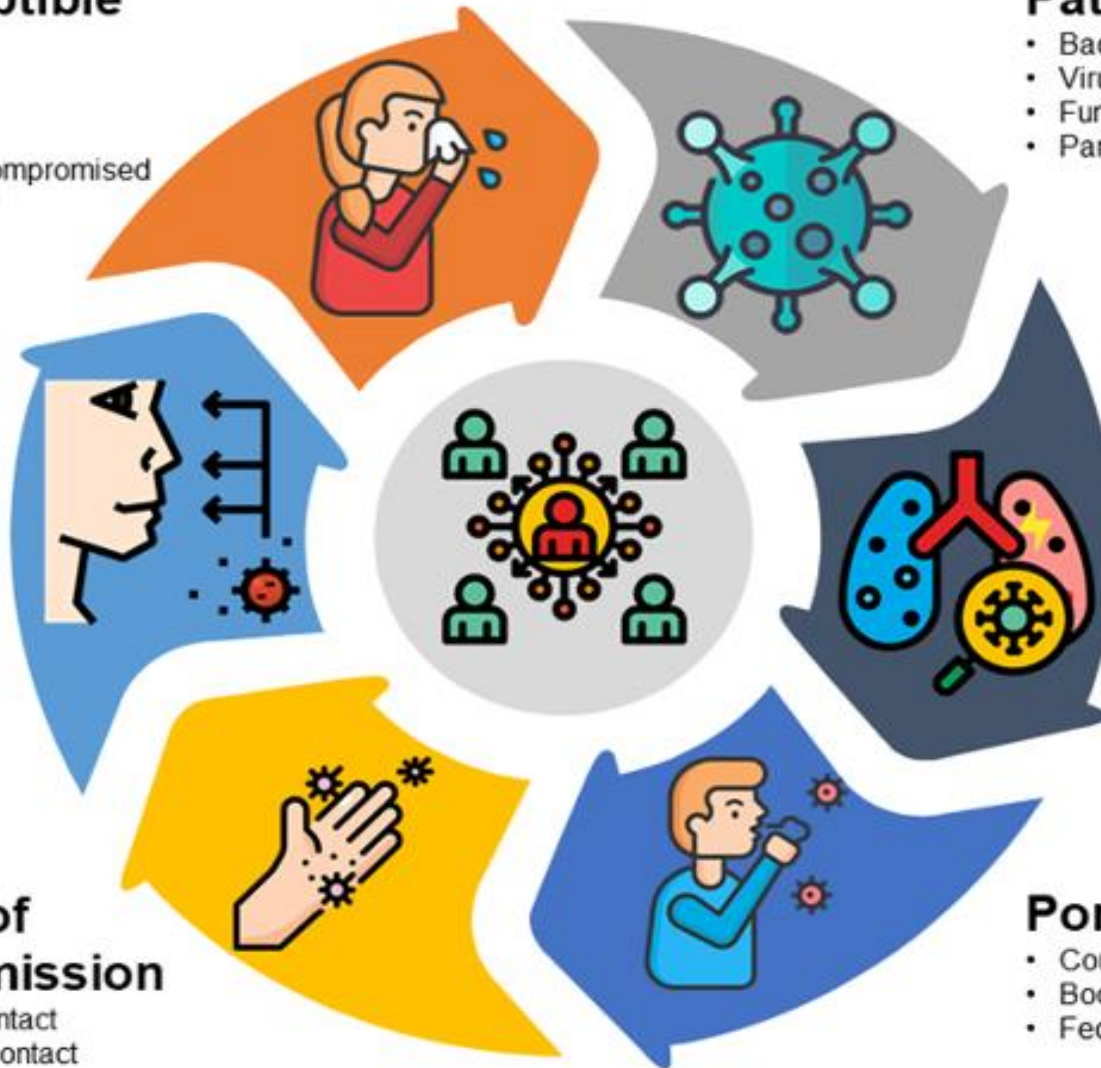
- People
- Animals
- Soil
- Food
- Water

Mode of Transmission

- Direct Contact
- Indirect Contact
- Vectors

Portal of Exit

- Coughing/Sneezing
- Bodily Secretions
- Feces



Whose Responsibility?

- **Health authorities** must draw their own detailed local guidelines to prevent spread of Covid 19, Hepatitis and AIDS viruses.
- **All employers** have a **legal obligation** to ensure that all their employees are appropriately trained and proficient in the procedures necessary for working safety.

- **Every** member of the dental/medical staff has a **legal and moral duty** to ensure that all necessary steps are taken to **prevent cross-infection** to protect the patient, colleagues and themselves

Bloodborne Pathogens

Preventing Transmission of Bloodborne Pathogens

Bloodborne viruses such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV)

- Are transmissible in health care settings
- Can produce chronic infection
- Are often carried by persons unaware of their infection

Average Risk of Bloodborne Virus Transmission after Needlestick

Source

Risk

HBV

HBsAg⁺ and HBeAg⁺

22.0%-31.0% clinical hepatitis; 37%-62% serological evidence of HBV infection

HBsAg⁺ and HBeAg⁻

1.0%-6.0% clinical hepatitis; 23%-37% serological evidence of HBV infection

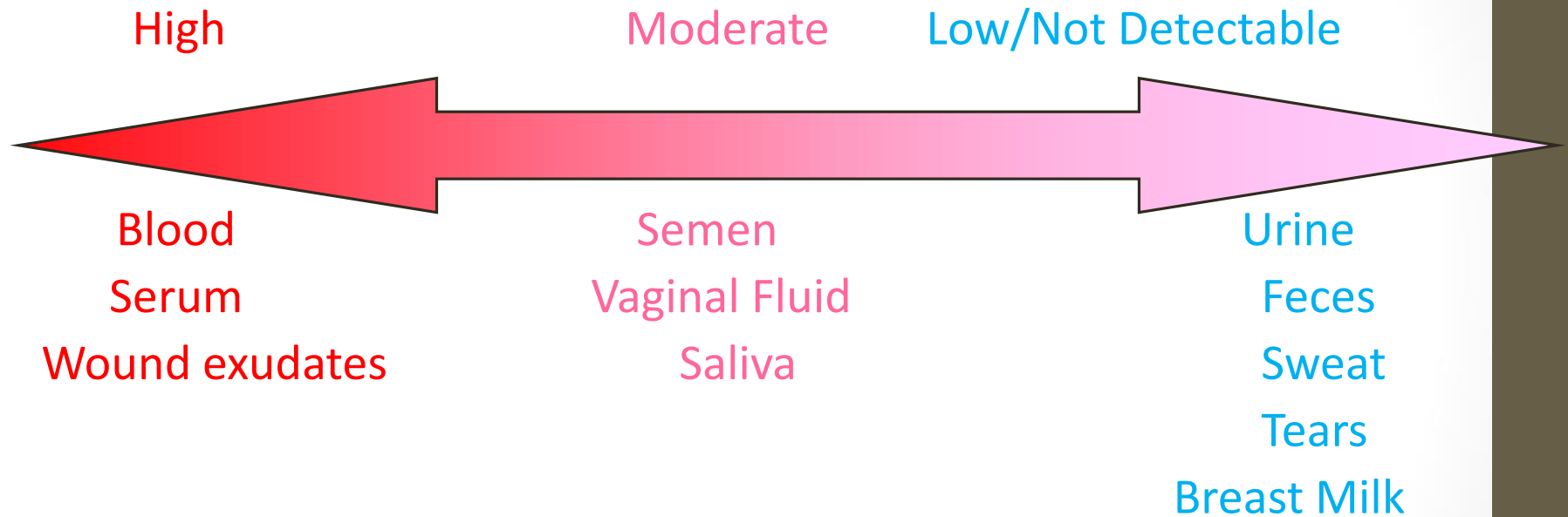
HCV

1.8% (0%-7% range)

HIV

0.3% (0.2%-0.5% range)

Concentration of HBV in Body Fluids



Hepatitis B Vaccine

- ◆ Vaccinate all DHCP who are at risk of exposure to blood
- ◆ Provide access to qualified health care professionals for administration and follow-up testing
- ◆ Test for anti-HBs 1 to 2 months after 3rd dose

Risk Factors for HIV Transmission after Percutaneous Exposure to HIV-Infected Blood

CDC Case-Control Study

- Deep injury
- Visible blood on device
- Needle placed in artery or vein
- Terminal illness in source patient

Source: Cardo, et al., *N England J Medicine* 1997;337:1485-90.

Characteristics of Percutaneous Injuries Among DHCP

- Reported frequency among general dentists has declined
- Caused by burs, syringe needles, other sharps
- Occur outside the patient's mouth
- Involve small amounts of blood
- Among oral surgeons, occur more frequently during fracture reductions and procedures involving wire



• THANK YOU