Blood Borne Diseases

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Objectives:

1. Identify important blood borne pathogens and how they are spread
2. Discuss the epidemiology of blood borne disease transmission and the potential for HIV, HBV and HCV transmission
3. Identify routes of transmission of blood borne pathogens
4. Discuss the best practices to perform safe blood transfusion
5. Identify potential exposure risks
6. List important safeguards against blood borne pathogen disease

Definition;

- **Blood borne pathogens** are microorganisms such as **viruses** or bacteria that are carried in blood and can cause disease in people.

- e.g. Syphilis, Brucellosis, and most notably **Hepatitis B** (HBV), **Hepatitis C** (HCV) and the **Human Immunodeficiency Virus (HIV**).

Definition;

- **Blood borne disease**, any of a group of diseases caused by pathogens such as viruses or bacteria that are carried in and spread through contact with blood.

Source: www.britannica.com › science › bloodborne-disease

Diseases that are not usually transmitted directly by blood contact,

but rather by insect or other vector, are more usefully classified as *vector-borne disease*, even though the causative agent can be found in blood.

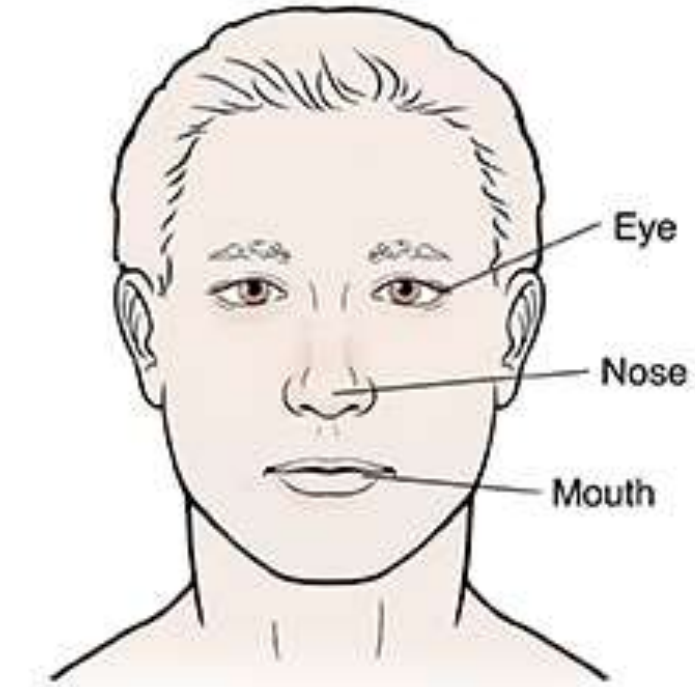
Vector-borne diseases include;

1. West Nile virus,
2. Zika fever and
3. Malaria.

Important blood borne pathogens are:

1. Brucellosis
2. Hepatitis A
3. Hepatitis B
4. Hepatitis C
5. Hepatitis D
6. Hepatitis E
7. Hepatitis G
8. Human Immunodeficiency Virus (HIV)
9. Human T-Lymphotropic Virus 1 (HTLV)
10. Syphilis

Route of spread



Route of spread

- Blood borne pathogens such as HBV and HIV can be transmitted through contact with infected human blood and other potentially infectious body fluids such as:

Routes of spread

1. Saliva (in dental procedures),
2. Cerebrospinal fluid
3. Synovial fluid
4. Pleural fluid
5. Peritoneal fluid
6. Amniotic fluid
7. Semen
8. Vaginal secretions, and
9. Any body fluid that is visibly contaminated with blood.

GET THE POINT

MAKE YOUR INJECTION A SAFE INJECTION

DID YOU KNOW?

An **unsafe injection** could **put you at risk** of getting a life-threatening infection such as:

30%  HEPATITIS B

3%  HEPATITIS C

0.3%  HIV

Estimated risk of getting these infections from a contaminated syringe or needle.

World Health Organization

HEPATITIS B AND C IN EUROPE

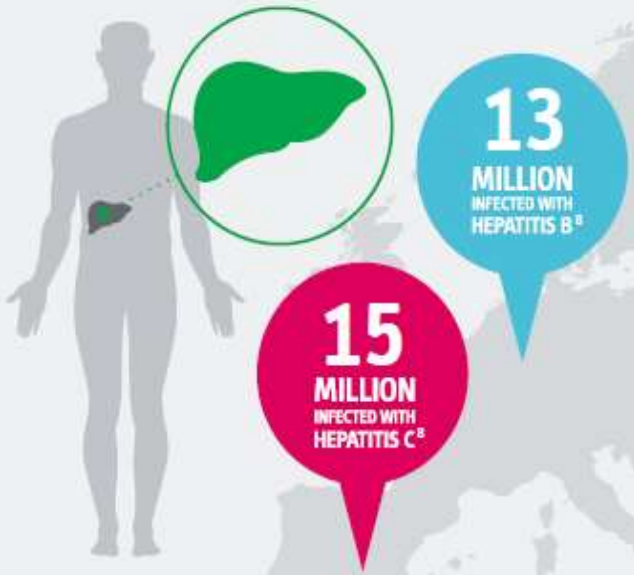
Hepatitis B (HBV) and hepatitis C (HCV) are the most common forms of hepatitis in Europe.

29,000 NEW CASES

29,000 NEW CASES OF HEPATITIS C ARE DIAGNOSED IN THE EU PER YEAR[1]

OVER HALF OF EUROPEAN COUNTRIES LACK NATIONAL STRATEGIES TO ADDRESS VIRAL HEPATITIS B OR C[2]

GLOBALLY, HEPATITIS IS RESPONSIBLE FOR 1 IN EVERY 12 CANCER DEATHS[3]



HBV & HCV MAJOR CAUSES OF:

- CHRONIC LIVER DISEASE
- LIVER CIRRHOSIS
- HEPATOCELLULAR CARCINOMA

96,000 PEOPLE DIE EVERY YEAR

EVERY YEAR IN EU/EEA COUNTRIES, 96,000 PEOPLE DIE FROM HBV AND HCV-RELATED LIVER DISEASE[7]

HBV

THE MOST COMMON TRANSMISSION ROUTE OF HBV IS MOTHER-TO-CHILD TRANSMISSION[4]

HCV

THE MOST COMMON TRANSMISSION ROUTE OF HCV IS THROUGH INJECTING DRUGS[5]

JUST ONE IN FIVE NEWLY INFECTED PEOPLE BECAME AWARE OF THEIR HEPATITIS AT THE TIME OF INFECTION[6]

1. http://prolar.no/prosjekter_1/hepatitt_c/content_2/text_sizedf224-02a6-4d17-8083-fed2cb122eb2/1360151366250/elpa_hepc_booklet2012_final_small.pdf
2. www.easl.eu/medias/PDFs/news/Press%20release%20Hep-CORE%20(EN).pdf
3. www.worldhepatitisalliance.org/sites/default/files/resources/documents/holding_governments_accountable_-_civil_society_survey_report.pdf
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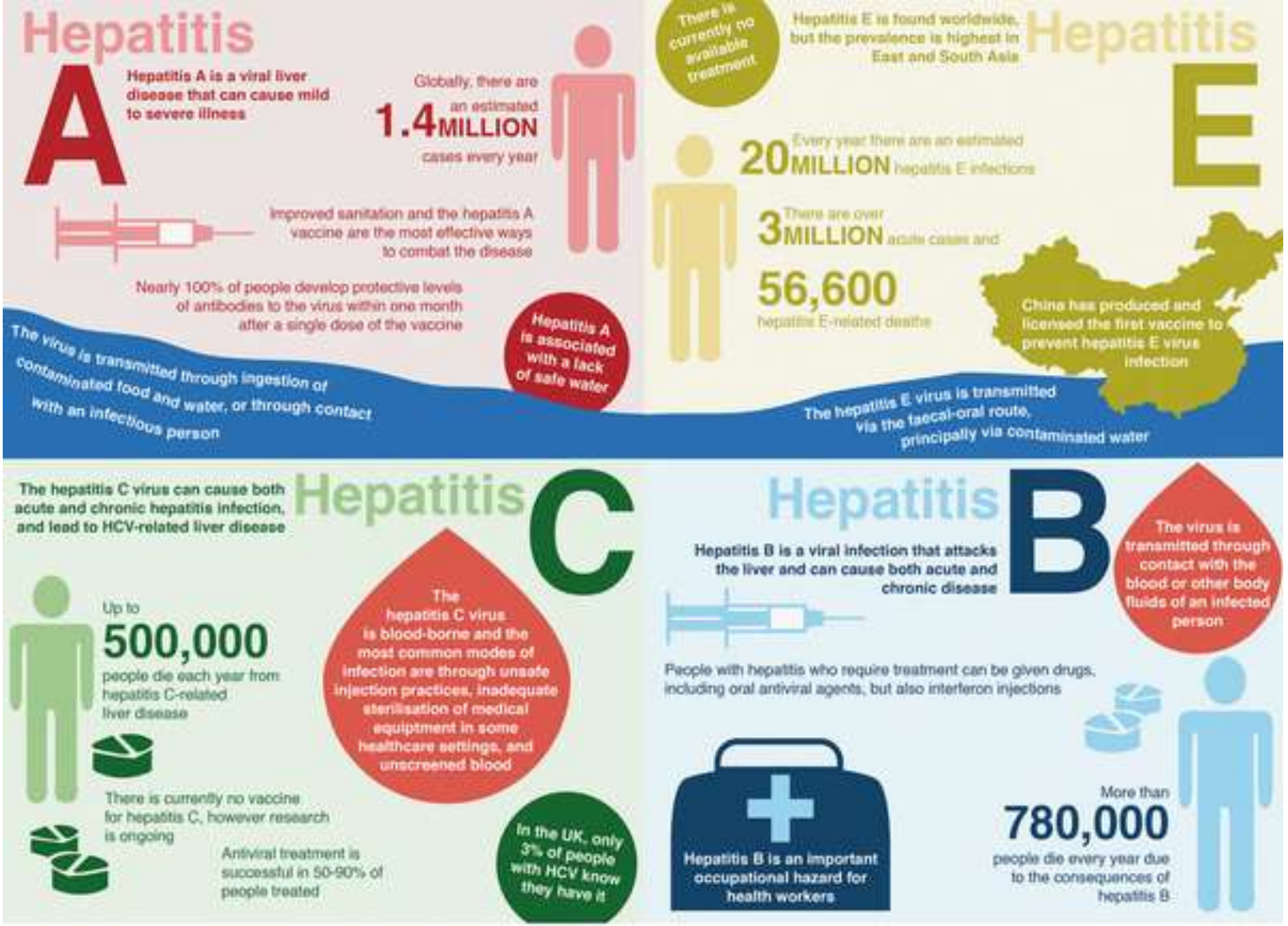

https://twitter.com/Hep_Alliance/status/497289822013095936

Epidemiology of blood borne disease transmission

- Exposures to blood and other body fluids occur across a wide variety of occupations.
- Health care workers, emergency response and public safety personnel, and other workers can be exposed to blood through needlestick and other sharps injuries, mucous membrane, and skin exposures.

Potential Exposure Risks

HBV and HIV are most commonly transmitted through:

1. Sexual contact sharing of hypodermic needles
2. From mothers to their babies at/before birth
3. Accidental puncture from contaminated needles, broken glass, or other sharps
4. Contact between broken or damaged skin and infected body fluids
5. Contact between mucous membranes and infected body fluids
6. Accidental puncture from contaminated needles and other sharps can result in transmission of bloodborne pathogens.

Important safeguards against blood borne pathogen disease

- It is important to know the ways exposure and transmission are most likely to occur in your particular situation, be it
- providing first aid to a student in the classroom,
- handling blood samples in the laboratory, or
- cleaning up blood from a hallway.

OSHA standards

(Occupational Safety and Health Administration)

OSHA standards for bloodborne pathogens (BBP, 29 CFR 1910.1030) & personal protective equipment (PPE, 29 CFR 1910 Subpart I)

- It require employers to protect workers from occupational exposure to infectious agents.
- It applies when workers have occupational exposure to human blood or other potentially infectious materials (OPIM),
- and requires the use of universal precautions to prevent contact with these materials.

1. **Universal precautions (UP),**
2. **Standard precautions (SP),**
3. **Transmission-based precautions (TBP)**

- **Universal precautions (UP)**, (1980s)
- It is an approach to infection control in which all human blood and certain human body fluids are treated as if they are known to be infectious.

- Although the BBP standard incorporates UP, the infection control community no longer uses UP on its own.

Standard precautions (SP), (introduced in 1996)

- It added additional infection prevention elements to UP in order to protect healthcare workers not only from pathogens in human blood and certain other body fluids, but also pathogens present in body fluids to which UP does not apply.

- SP is applied to all patients even when they are not known or suspected to be infectious.

Standard precautions (SP), (introduced in 1996)

SP includes:

1. Hand hygiene;
2. The use of certain types of PPE based on anticipated exposure;
3. Safe injection practices; and
4. Safe management of contaminated equipment and other items in the patient environment.

- **Transmission-based precautions (TBP)** for contact-, droplet-, and airborne-transmissible diseases augment SP with additional controls to interrupt the route(s) of transmission that may not be completely interrupted using SP alone.
- The different types of TBP are applied based on what is known or suspected about a patient's infection.

Worker protections against occupational exposure to infectious diseases

Comparing the universal precautions of OSHA's Bloodborne Pathogens standard to the standard precautions and the transmission-based precautions used by healthcare practitioners for infection control

OSHA standards for bloodborne pathogens (BBP, 29 CFR 1910.1030) and personal protective equipment (PPE, 29 CFR 1910 Subpart I) require employers to protect workers from occupational exposure to infectious agents. The BBP standard applies when workers have occupational exposure to human blood or other potentially infectious materials (OPIM), as defined in paragraphs (a) and (b) of the BBP standard, and requires the use of universal precautions to prevent contact with these materials.[1] Adhering to standard and transmission-based precautions in healthcare settings is recommended by Centers for Disease Control and Prevention (CDC), and protects workers from a wider range of infectious disease hazards than the BBP standard.

Employers and workers should be familiar with several key approaches to infection control, including universal precautions, standard precautions and transmission-based precautions.

- **Universal precautions (UP)**, originally recommended by the CDC in the 1980s, was introduced as an approach to infection control to protect workers from HIV, HBV, and other bloodborne pathogens in human blood and certain other body fluids, regardless of a patients' infection

Preventing Unsafe Injection Practices

Preventing Unsafe Injection Practices

Several outbreaks have been reported from different countries.

The primary breaches in infection control practice that contributed to these outbreaks were

- 1) reinsertion of used needles into a multiple-dose vial or solution container (e.g., saline bag) and
- 2) use of a single needle/syringe to administer intravenous medication to multiple patients.
- preparation of medications in the same workspace where used needle/syringes were dismantled

Preventing Unsafe Injection Practices

These could have been prevented by adherence to basic principles of aseptic technique for the preparation and administration of parenteral medications. which include:

- The use of a sterile, single-use, disposable needle and syringe for each injection given and
- Prevention of contamination of injection equipment and medication.

Preventing Unsafe Injection Practices

Recommendations

IV.H. Safe injection practices The following recommendations apply to the use of needles, cannulas that replace needles, and, where applicable intravenous delivery systems

- **IV.H.1.** Use aseptic technique to avoid contamination of sterile injection equipment.
- **IV.H.2.** Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed. Needles, cannulae and syringes are sterile, single-use items; they should not be reused for another patient nor to access a medication or solution that might be used for a subsequent patient.

Preventing Unsafe Injection Practices

- **IV.H.3.** Use fluid infusion and administration sets (i.e., intravenous bags, tubing and connectors) for one patient only and dispose appropriately after use. Consider a syringe or needle/cannula contaminated once it has been used to enter or connect to a patient's intravenous infusion bag or administration.
- **IV.H.4.** Use single-dose vials for parenteral medications whenever possible.
- **IV.H.5.** Do not administer medications from single-dose vials or ampules to multiple patients or combine leftover contents for later use.
- **IV.H.6.** If multidose vials must be used, both the needle or cannula and syringe used to access the multidose vial must be sterile.

Preventing Unsafe Injection Practices

- **IV.H.7.** Do not keep multidose vials in the immediate patient treatment area and store in accordance with the manufacturer's recommendations; discard if sterility is compromised or questionable.
- **IV.H.8.** Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients.
- **IV.I.** Infection control practices for special lumbar puncture procedures Wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e., during myelograms, lumbar puncture and spinal or epidural anesthesia.

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

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Injection Safety

Injected medicines are commonly used in healthcare settings for the prevention, diagnosis, and treatment of various illnesses. Unsafe injection practices put patients and healthcare providers at risk of infectious and non-infectious adverse events and have been associated with a wide variety of procedures and settings. This harm is preventable. Safe injection practices are part of Standard Precautions and are aimed at maintaining basic levels of patient safety and provider protections. As defined by the World Health Organization, a safe injection does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for the community. Visit the page on CDC's role in safe

Drug Diversion

A growing risk to patient safety.

Injection Safety

PROPER INJECTION

Sharps Safety

PROPER DISPOSAL

SCMS

Best practices to perform safe blood transfusion

- Screening of blood products for Hep, AIDs etc.
- Proper patient identification
- Patient information
- Appropriate use of blood components
- Compliance with clinical guidelines

References:

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