

A microscopic view of several red blood cells, which are biconcave discs, floating in a red, slightly blurred background. The cells are rendered in a realistic, textured style with a reddish-pink hue.

Blood Borne Diseases

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Learning objectives

1. List the important blood borne disease in Pakistan
2. Discuss the global burden of blood borne disease and compare it with Pakistan
3. Describe important blood borne pathogens
4. Explain the evidence based public health practices to reduce transmission of blood borne infectious disease
5. Explain the evidence based best practices and procedures for safe blood transfusion and prevention of needle stick injury

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Definition

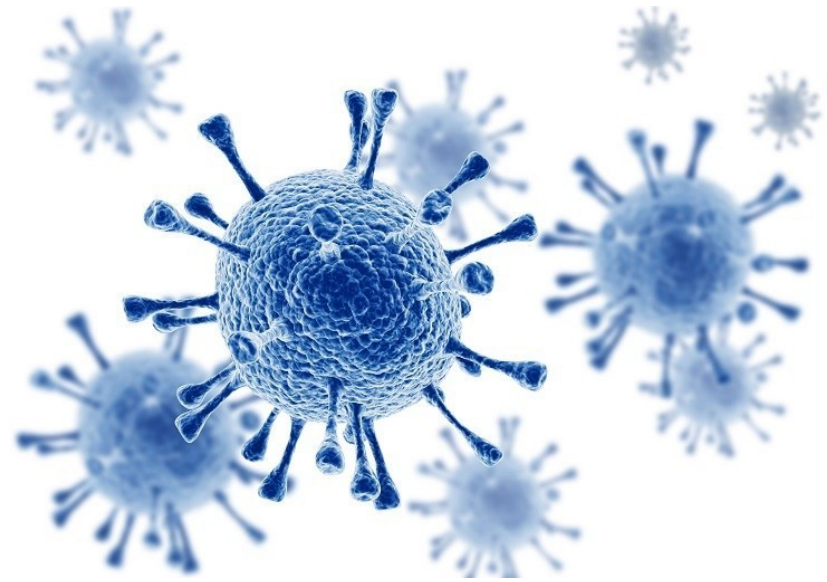
- **Blood borne disease**, are a group of diseases caused by pathogens such as viruses or bacteria that are carried in and spread through contact with blood and other body fluids such as semen, vaginal secretions, amniotic fluid and in some cases saliva.

Today

We will cover

- HIV
- Syphilis
- Safe needle practices
- Safe blood transfusion practices

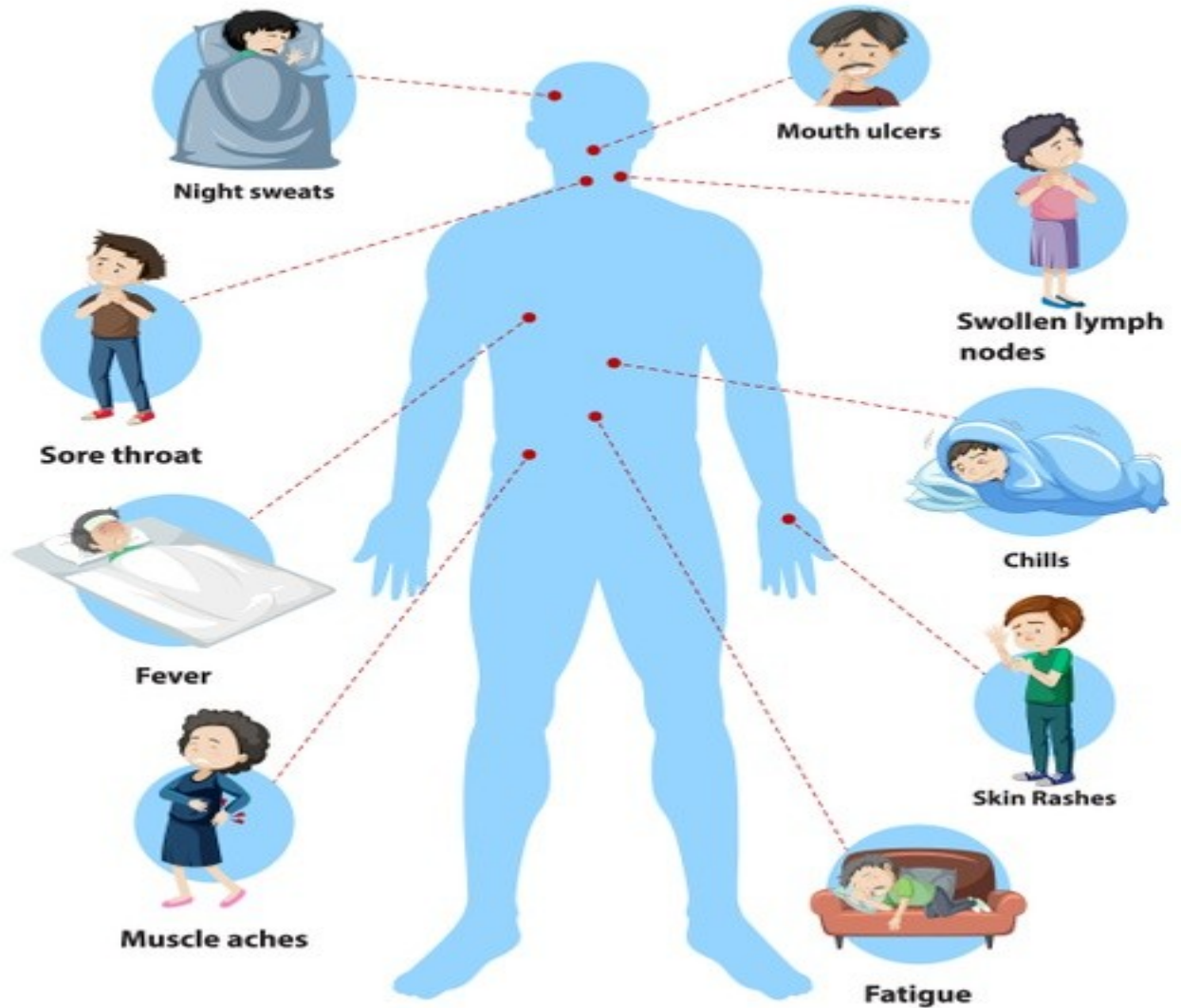
HIV



- **HIV** stands for human immunodeficiency virus. It weakens a person's immune system by destroying important cells that fight disease and infection. There is currently no effective cure for **HIV**. But with proper medical care, **HIV** can be controlled.

- The virus destroys and impairs the function of immune cells, infected individuals gradually become immunodeficient. Immune function is typically measured by CD4 cell count
- Immunodeficiency results in increased susceptibility to a wide range of infections, cancers and other diseases that people with healthy immune systems can fight off
- The most advanced stage of HIV infection is acquired immunodeficiency syndrome (AIDS), which can take many years to develop if not treated, depending on the individual.
- AIDS is defined by the development of certain cancers, infections or other severe long term clinical manifestations

HIV – SYMPTOMS



Transmission

- HIV can be transmitted via the exchange of a variety of body fluids from infected people, such as blood, breast milk, semen and vaginal secretions.
- HIV can also be transmitted from a mother to her child during pregnancy and delivery.
- Individuals cannot become infected through ordinary day-to-day contact such as kissing, hugging, shaking hands, or sharing personal objects, food or water
- It is important to note that people with HIV who are taking ART and are virally suppressed do not transmit HIV to their sexual partners. Early access to ART and support to remain on treatment is therefore critical not only to improve the health of people with HIV but also to prevent HIV transmission.

Risk factors

Behaviors and conditions that put individuals at greater risk of contracting HIV include:

- Having unprotected anal or vaginal sex
- Having another sexually transmitted infection (STI) such as syphilis, herpes, chlamydia, gonorrhoea and bacterial vaginosis
- Sharing contaminated needles, syringes and other injecting equipment and drug solutions when injecting drugs
- Receiving unsafe injections, blood transfusions and tissue transplantation, and medical procedures that involve unsterile cutting or piercing and
- Experiencing accidental needle stick injuries, including among health workers

Key facts

- HIV continues to be a major global public health issue, having claimed almost 33 million lives so far.
- However, with increasing access to effective HIV prevention, diagnosis, treatment and care, including for opportunistic infections, HIV infection has become a manageable chronic health condition, enabling people living with HIV to lead long and healthy lives
- There were an estimated 38.0 million people living with HIV at the end of 2019.

Achievements so far

As a result of concerted international efforts

- Coverage of services has been steadily increasing. In 2019, 68% of adults and 53% of children living with HIV globally were receiving lifelong antiretroviral therapy (ART)
- A great majority (85%) of pregnant and breastfeeding women living with HIV also received ART, which not only protects their health, but also ensures prevention of HIV transmission to their newborns.
- By June 2020, 26 million people were accessing antiretroviral therapy, marking a 2.4% increase from an estimate of 25.4 million at the end of 2019.
- Nevertheless, between 2000 and 2019, new HIV infections fell by 39% and HIV-related deaths fell by 51%, with 15.3 million lives saved due to ART.

This achievement was the result of great efforts by national HIV program supported by civil society and international development partners. But success has been variable by region, country and population

Sustainable development goals with AIDS

- The 2018 Super-Fast-Track targets for reducing new paediatric HIV infections to 40 000 was not achieved.
- Even prior to the COVID-19 pandemic, reduction of new infections and deaths had plateaued; global 90/90/90 targets for 2020 are at risk of being missed unless rapid action is taken
- To reach the new proposed global 95/95/95 targets, we will need to redouble our efforts to avoid the worst-case scenario of a half million excess deaths in Sub Saharan Africa, increasing HIV infections due to HIV service disruptions during COVID-19, and the slowing public health response to HIV.

Interventions will need to focus on the populations left-behind:

- Key population groups and their sexual partners accounted for over 62% of all new HIV infections globally among the age group 15-49 years in 2019.

WHO defines key populations as people in populations who are at increased HIV risk in all countries and regions. Key populations include:

- Men who have sex with men
- People who inject drugs
- People in prisons and other closed settings
- Sex workers and their clients
- And transgender people

- Increased HIV vulnerability is often associated with legal and social factors, which increases exposure to risk situations and creates barriers to accessing effective, quality and affordable HIV prevention, testing and treatment services.
- Prioritising key populations in the HIV response with appropriate interventions would have the biggest impact on the epidemic and reduce new infections.
- Over two thirds of all people living with HIV live in the WHO African Region (25.7 million). While HIV is prevalent among the general population in this region, an increasing number of new infections occur among key population groups.

Diagnosis & Cure

Through **rapid diagnostic tests** that can provide same-day results. **HIV self-tests** are increasingly available and provide an effective and acceptable alternative way to increase access to people who are not reached for HIV testing through facility-based services.

There is no cure for HIV infection. However, effective prevention interventions are available:

- Preventing mother-to-child-transmission,
- Male and female condom use,
- Harm reduction interventions,
- Pre-exposure prophylaxis,
- Post exposure prophylaxis,
- Voluntary medical male circumcision (VMMC) and

Antiretroviral drugs (ARVs) which can control the virus and help prevent onward transmission to other people. Neither a cure nor a vaccine is available to treat and protect all people currently living with or at risk of HIV.

Prevention

Individuals can reduce the risk of HIV infection by limiting exposure to risk factors. Key approaches for HIV prevention, which are often used in combination, are listed below.

Male and female condom use

- Correct and consistent use of male and female condoms during vaginal or anal penetration can protect against the spread of STIs, including HIV. Evidence shows that male latex condoms when used consistently have an 85% or greater protective effect against HIV and other STIs.

Harm reduction for people who inject and use drugs

- People who inject drugs can take precautions against becoming infected with HIV by using sterile injecting equipment (including needles and syringes) for each injection, and not sharing drug-using equipment and drug solutions.

Prevention

Testing and counseling for HIV and STIs

- Testing for HIV and other STIs is strongly advised for all people exposed to any of the risk factors.
- Additionally, WHO recommends voluntary assisted partner notification approaches, in which people with HIV receive support to inform their partners either on their own, or with the help of health care providers.
- Program that offer support for testing people in social networks can also be an effective and acceptable approach for some populations.

Testing and counseling, linkages to tuberculosis (TB) care

- TB is the most common illness among people living with HIV. Fatal if undetected or untreated, TB is the leading cause of death among people with HIV, responsible for nearly 1 in 3 HIV-associated deaths.
- Early detection of TB and prompt linkage to TB treatment and ART can prevent these deaths.
- TB screening should be offered routinely at HIV care services, and routine HIV testing should be offered to all patients with presumptive and diagnosed TB.

Elimination of mother-to-child transmission of HIV

- The transmission of HIV from an HIV-positive mother to her child during pregnancy, labour, delivery or breastfeeding is called **vertical or mother-to-child transmission (MTCT)**. In the absence of any interventions during these stages, rates of HIV transmission from mother-to-child can be between 15% and 45%. The risk of MTCT can almost be eliminated if both the mother and her baby are provided with ARV drugs as early as possible in pregnancy and during the period of breastfeeding.
- WHO recommends **lifelong ART** for all people living with HIV, regardless of their CD4 count and the clinical stage of disease; this includes pregnant and breastfeeding women.
- A growing number of countries and territories are achieving very low rates of MTCT, with some formally validated for elimination of MTCT of HIV as a public health problem.
- Several countries with a high burden of HIV infection are also progressing along the path to elimination.

Treatment

- HIV can be **suppressed by treatment regimens** composed by a combination of 3 or more ARV drugs. Current ART does not cure HIV infection but highly suppresses viral replication within a person's body and allows an individual's immune system recovery to strengthen and regain the capacity to fight off infections
- Since 2016, WHO recommended **that all people living with HIV be provided with lifelong ART**, including children, adolescents and adults, and pregnant and breastfeeding women, regardless of clinical status or CD4 cell count
- By June 2020, 185 countries had already adopted this **'treat all'** recommendation, covering 99% of all people living with HIV globally
-
- In addition to 'treat all', WHO also recommend a **rapid ART initiation** to all people living with HIV, including offer ART on the same day of diagnosis among those who are ready to start treatment.

Treatment

Current HIV treatment guidelines

- It includes **new ARV options** with better tolerability, higher efficacy, and lower rates of treatment discontinuation when compared with previous recommended medicines.
- In 2019, WHO recommended the use of dolutegravir-based or low-dose efavirenz **for first-line therapy**. DTG should also be used in **2nd line therapy**, if not used in 1st line and darunavir/ritonavir is recommended as the anchor drug in **third- line or an alternative option** second-line therapy.
- By June 2020, transition to dolutegravir had been implemented in 100 low- and middle-income countries and is expected to improve the durability of the treatment and the quality of care for people living with HIV.
- Despite improvements, limited options remain for infants and young children. For this reason, WHO and partners are coordinating efforts to enable a faster and more effective development and introduction of age-appropriate paediatric formulations of new ARV drugs.

Patients with advanced disease

- 1/3 of people living with HIV present to care with advanced disease, usually with severe clinical symptoms, low CD4 cell counts, and at high risk of developing serious illness and death.
- To reduce this risk, WHO recommends that these individuals receive a “**package of care**” that includes screening tests and drug prophylaxis for the most common serious infections that can cause severe morbidity and death, such as TB and cryptococcal meningitis, in addition to rapid ART initiation.

WHO Response

The Sixty-Ninth World Health Assembly endorsed a **new “Global health sector strategy on HIV for 2016–2021”**. The strategy includes five strategic directions that guide priority actions by countries and by WHO over six years.

The strategic directions are:

1. Information for focused action (know your epidemic and response)
2. Interventions for impact (covering the range of services needed)
3. Delivering for equity (covering the populations in need of services)
4. Financing for sustainability (covering the costs of services)
5. Innovation for acceleration (looking towards the future).

Syphilis



- **Syphilis** is a bacterial infection usually spread by sexual contact. **Syphilis** is a sexually transmitted infection caused by the bacterium *Treponema pallidum*, subspecies *pallidum*
- The disease starts as a painless sore — typically on genitals, rectum or mouth. **Syphilis** spreads from person to person via skin or mucous membrane contact with these sores.

Transmission

- Syphilis is transmitted primarily by sexual contact or during [pregnancy](#) from a mother to her baby; the spirochete is able to pass through intact mucous membranes or compromised skin.
- It is thus transmissible by [kissing](#) near a lesion, as well as [oral](#), [vaginal](#), and [anal sex](#).
- Approximately 30% to 60% of those exposed to primary or secondary syphilis will get the disease.
- Its [infectivity](#) is exemplified by the fact that an individual [inoculated](#) with only 57 organisms has a 50% chance of being infected.
- Most new cases in the United States (60%) occur in men who have sex with men; and in this population 20% of syphilis cases were due to oral sex alone.
- Syphilis can be transmitted by [blood products](#), but the risk is low due to screening of [donated blood](#) in many countries.
- The risk of transmission from [sharing needles](#) appears to be limited
- It is not generally possible to contract syphilis through toilet seats, daily activities, hot tubs, or sharing eating utensils or clothing. This is mainly because the bacteria die very quickly outside of the body, making transmission by [objects](#) extremely difficult.

Stages of syphilis

Syphilis is divided into three stages

- 1. Primary syphilis** generally has a sore or sores at the original site of infection. These sores usually occur on or around the genitals, around the anus or in the rectum, or in or around the mouth. These sores are usually (but not always) firm, round, and painless
- 2. Secondary syphilis** include skin rash, swollen lymph nodes, and fever. The signs and symptoms of primary and secondary syphilis can be mild, and they might not be noticed. During the **latent stage**, there are no signs or symptoms
- 3. Tertiary syphilis** is associated with severe medical problems. A doctor can usually diagnose tertiary syphilis with the help of multiple tests. It can affect the heart, brain, and other organs of the body

Primary syphilis (chancre)

The **chancre** is firm and painless, and it oozes fluid that contains **syphilis** bacteria.

Sometimes, lymph nodes near the ulcer become enlarged, but remain painless.

The **chancre** of **primary syphilis** usually heals after one to five weeks, although the person remains infected. At this stage, **syphilis** is highly contagious.



Actas Dermosifiliogr. 2011;102:545-6



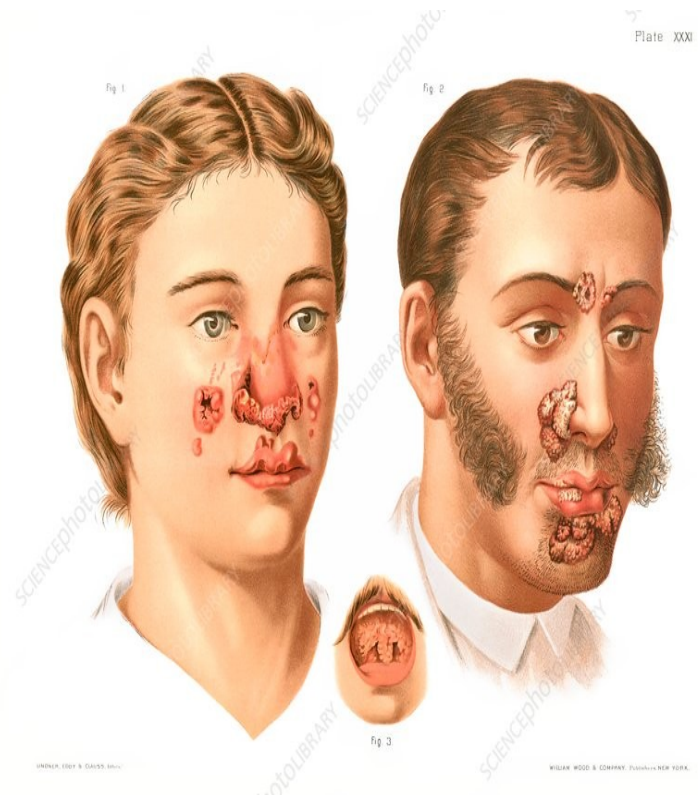
Secondary syphilis

It is characterized by a rash that appears from 2 to 8 weeks after the chancre develops and sometimes before it heals. Other symptoms may also occur, which means that the infection has spread throughout the body. A person is highly contagious during the **secondary** stage.



Tertiary syphilis

About 15% to 30% of people infected with **syphilis** who don't get treatment will develop complications known as late (**tertiary**) **syphilis**. In the late stage, the disease may damage brain, nerves, eyes, heart, blood vessels, liver, bones and joints.



Epidemiology

- Syphilis was very common in Europe during the 18th and 19th centuries.
- In the developed world during the early 20th century, infections declined rapidly with the widespread use of [antibiotics](#), until the 1980s and 1990s
- Since 2000, rates of syphilis have been increasing in the US, Canada, the UK, Australia and Europe, primarily among men who have sex with men
- Rates of syphilis among US women have remained stable during this time, while rates among UK women have increased, but at a rate less than that of men
- Increased rates among heterosexuals have occurred in China and Russia since the 1990s

Epidemiology

- In 2015, about 45.4 million people were infected with syphilis, with six million new cases.
- During 2015, it caused about 107,000 deaths, down from 202,000 in 1990.
- Rates of infection have increased since the turn of the millennium in many countries, often in combination with [human immunodeficiency virus](#) (HIV).
- This is believed to be partly due to increased [promiscuity](#), [prostitution](#), decreasing use of condoms and unsafe sexual practices among [men who have sex with men](#)

- If left untreated, it has a mortality rate of 8% to 58%, with a greater death rate among males.
- The symptoms of syphilis have become less severe over the 19th and 20th centuries, in part due to widespread availability of effective treatment, and partly due to [virulence](#) of the bacteria.
- With early treatment, few complications result.
- Syphilis increases the risk of HIV transmission by two to five times, and coinfection is common (30–60% in some urban centers).
- In 2015, [Cuba](#) became the first country to eliminate mother-to-child transmission of syphilis.

Diagnosis

- Syphilis is difficult to diagnose clinically during early infection.
- Confirmation is either via blood tests or direct visual inspection using dark field microscopy.
- Blood tests are more commonly used, as they are easier to perform.
- Diagnostic tests are unable to distinguish between the stages of the disease

Treatment

- The preferred treatment at all stages is penicillin. A single intramuscular injection of long acting **Benzathine penicillin G** (2.4 million units administered intramuscularly) will cure a person who has primary, secondary or early latent syphilis
- Three doses of long acting Benzathine penicillin G (2.4 million units administered intramuscularly) at weekly intervals is recommended for individuals with late latent syphilis or latent syphilis of unknown duration.
- Treatment will kill the syphilis bacterium and prevent further damage, but it will not repair damage already done.

Overall

There is a need to;

- Develop a national strategy for the prevention and control of sexually transmitted infections
- Antenatal screening approaches effective in preventing MTCT of HIV, HBV, syphilis and rubella in vulnerable populations

So far

Reducing transmission of blood borne diseases

Primary Prevention

Raising Awareness/
Counseling

Screening of blood
products

Hygiene/
Disinfection

Reduction of
viral exposure

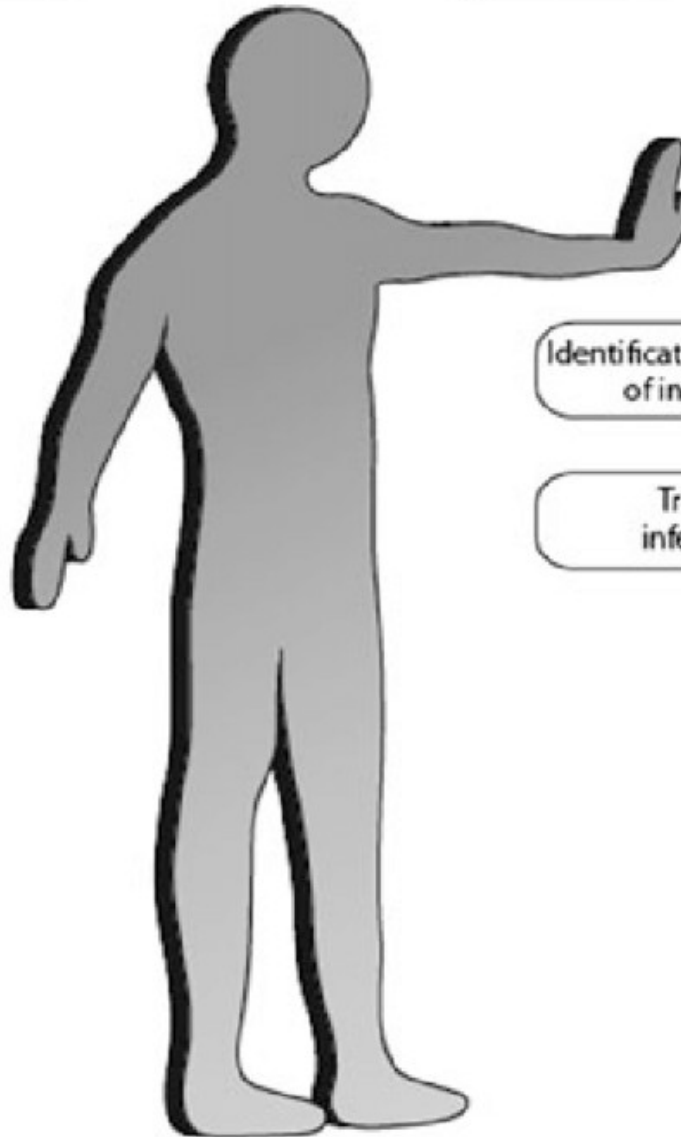
Pre-/Postexposure
Prophylaxes

Vaccination

Secondary Prevention

Identification and counseling
of infected people

Treatment of
infected people





Prevention of Needle Stick Injury



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.



Aim of a safe injection



A safe injection does not:

- Harm the recipient,
- Does not expose the provider to any avoidable risk, and
- Does not result in any waste that is dangerous for other people.

WHO guidelines to safe injection practices



MAKE SMART INJECTION CHOICES

BEST INJECTION PRACTICES GUIDELINES

A safe injection does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous for other people.



**World Health
Organization**

1. USE STERILE INJECTION EQUIPMENT
2. PRACTICE HAND HYGIENE
3. PREVENT ACCESS TO USED NEEDLES
4. PREVENT NEEDLE-STICK INJURIES TO THE PROVIDER

USE STERILE INJECTION EQUIPMENT

1

Always use a sterile syringe and needle from new, undamaged packaging.



For each injection, and to reconstitute each unit of medication.

Prevent contamination of the vials:

Wipe the access diaphragm (septum) with 70% alcohol (isopropyl alcohol or ethanol) on a swab or cotton wool ball before piercing the vial, and allow to air dry.



Pierce the septum with a sterile needle every time it is used.



Select pop-open ampoules whenever possible.



If using an ampoule that requires a metal file to open, protect fingers with a clean barrier (e.g. small gauze pad) when opening.



Use single dose vials every time it is possible. If you have a multi-dose vial, you must take more care to avoid contamination.



NEVER leave a needle in the stopper of the vial.

Prevent contamination of injection equipment and medication.



Always follow product specific recommendations for use, storage and handling.



Prepare each injection in a clean, designated area.



DO NOT use any medications with visible contamination or breaches of integrity (e.g. cracks, leaks).



DO NOT use a needle or syringe if the package has been punctured, torn or exposed to moisture.



Discard a needle that has touched any non-sterile surface.

USE WHO-RECOMMENDED SYRINGES

WHO recommends syringes with re-use prevention (RUP) features for all injections. RUP syringes with a sharps injury protection (SIP) feature are highly recommended wherever possible.

2

PRACTICE HAND HYGIENE

Practice hand hygiene before a clean procedure and after exposure to blood/bodily fluid and after each patient contact.

The use of gloves does not negate the need for hand hygiene.



Gloves are not needed for injections. Single-use gloves may be indicated if excessive bleeding is anticipated.

Wash or disinfect hands before preparing injection material and giving injections.

Avoid giving injections if skin integrity is compromised by local infection or other skin condition (e.g. weeping dermatitis).

Cover any small cuts.

Disinfect skin, using the following steps:

- 1** Apply a 60-70% alcohol-based solution (isopropyl alcohol or ethanol) on a single use swab or cotton wool ball.
- 2** **DO NOT** use methanol or methyl-alcohol as these are not safe for human use.
- 3** Wipe the area from the centre of the injection site working outwards, without going over the same area.
- 4** Apply the solution for 30 seconds then allow it to dry completely.
- 5** **DO NOT** use cotton balls stored wet in a multi-use container.



PREVENT ACCESS TO USED NEEDLES

Seal sharps containers and store in a secure area in preparation for transport and final disposal.



After closing and sealing sharps containers, secure and dispose of as soon as possible. Do not open, empty, re-use, or sell.

Manage sharps waste in an efficient, safe and environmentally friendly way.



Protect people from exposure to used injection equipment. If incineration is selected for final disposal of sharps waste, use high temperature incinerators (more than 1 000 degrees) with filters.

4 PREVENT NEEDLE-STICK INJURIES TO THE PROVIDER

Prevent the possibility of sudden patient movement during and after injection.

Avoid recapping and other hand manipulations of needles.



If recapping is necessary, use a single-handed scoop technique.

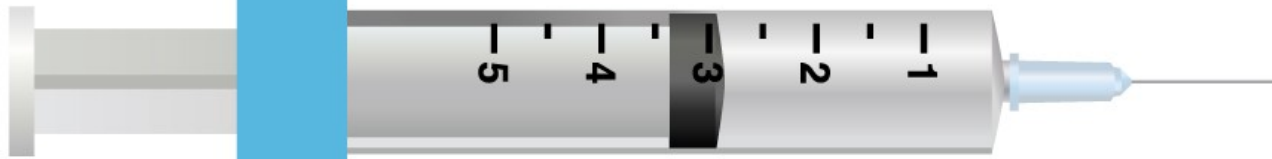
Discard used syringes as a single unit in a sharps container immediately.



Collect used syringes and needles at the point of use in an enclosed sharps container that is puncture and leak proof, and seal before completely full.



**ONE NEEDLE,
ONE SYRINGE,
ONLY ONE TIME.**



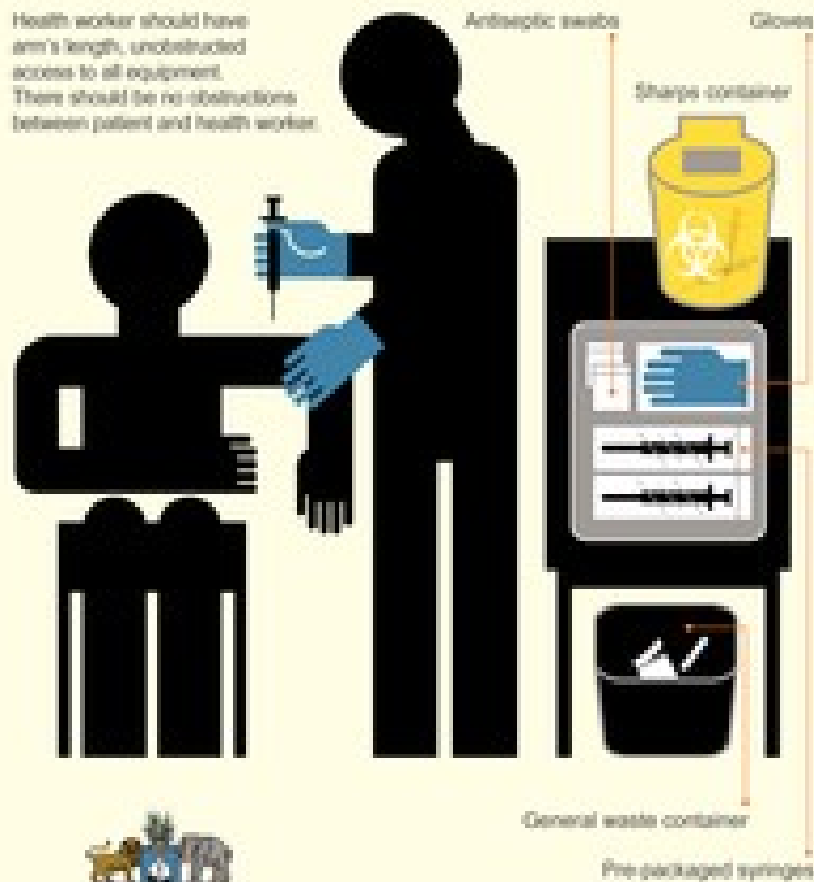
Safe Injection Practices Coalition

www.ONEandONLYcampaign.org

Injection Safety

PROPER
INJECTION

Health worker should have arm's length, unobstructed access to all equipment. There should be no obstructions between patient and health worker.



Sharps Safety

PROPER
DISPOSAL



Deposit syringes with needle down


Do not detach or recap



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

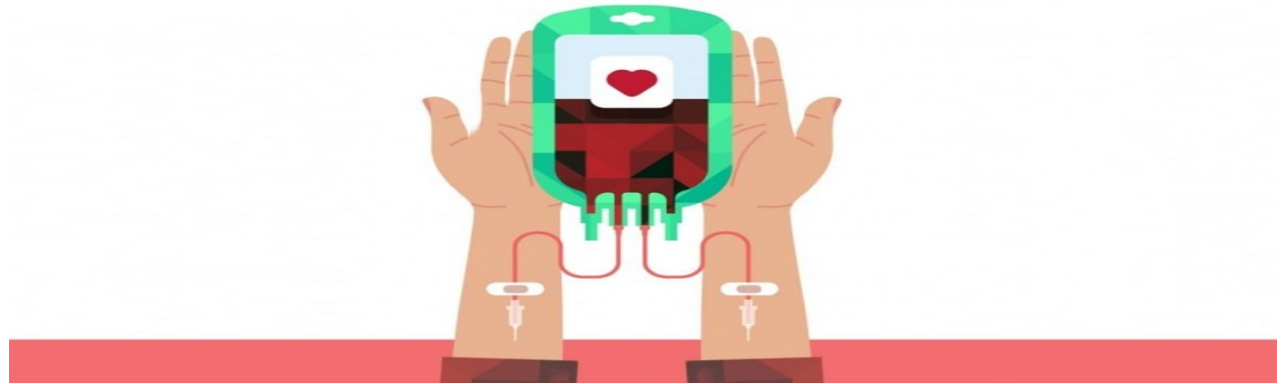
A growing risk to patient safety.



Safe blood transfusion Practices

**18.5 million units of blood
are donated every year**

- However, this is not sufficient to meet the global need many patients requiring a transfusion do not have timely access to safe blood. Blood cannot be stored indefinitely, meaning there is a constant need for donations.
- Maintaining safe and effective procedures around the collection, storage and use of donated blood is essential.
- Collectively called **haemovigilance**, these procedures cover the entire blood transfusion chain and are used to standardize the use of blood in healthcare.



Strategies to Make Blood Transfusion Safe:

- At some stage of life, due to any mishap, blood transfusion becomes unavoidable. The only thing you can do is to make it safe. For safe blood transfusion following steps should be done.

Strategies are:

1. Careful selection of donors or building a panel of regular, voluntary, non – remunerated donors
2. Direct screening of the blood to analyze the presence of infectious agents or markers produced by them
3. Removal of specific components of blood thought to harbor infectious agents, for example, by the filtration of blood to remove white blood cells
4. Physical or chemical inactivation of any contaminating agent or microorganism that may be present: for example by heat treatment of 5 % albumin during production
5. Proper and complete sterilization or one-time use of utensils and instruments involved in blood transfusion

National blood policy and organization

Blood transfusion saves lives and improves health, but many patients requiring transfusion do not have timely access to safe blood. Providing safe and adequate blood should be an integral part of every country's national health care policy and infrastructure.

- WHO recommends that all activities related to blood collection, testing, processing, storage and distribution be coordinated at the national level through effective organization and integrated blood supply networks.
- The national blood system should be governed by national blood policy and legislative framework to promote uniform implementation of standards and consistency in the quality and safety of blood and blood products.

Situation in Pakistan

- Reforms in blood safety systems were initiated in Pakistan in 2008 from the platform of the National AIDS control program with technical support funded by the **German agency for international cooperation (GIZ)**, part of the GIZ health sector support program, with financial cooperation funded by KfW, the German development bank.

Situation in Pakistan

- In 2010 blood safety was taken out of the confines of the AIDS program
- Establishment of a National Blood Transfusion Program was done to ensure safe blood transfusions all over the country.
- Other measures of the reform process included the formulation of a national blood policy and strategic framework.

Activities done

WHO provided support to the **National and provincial blood transfusion program** in Pakistan in the development of national policies, strategies and standards, and conducting capacity-building and training, in addition to:

- Strengthening blood screening systems to prevent transmission of infections through blood transfusion;
- Conducting national assessment of blood screening system in Pakistan;
- Developing first national testing strategy for transfusion transmitted infections;
- Conducting training on quality assurance in blood banking based on WHO training module;
- Procuring blood screening kits worth US\$ 8.4 million from USAID;
- Conducting training workshops on national testing strategy for TTIs; implementation of national quality control guidelines; clinical use of blood and haemovigilance;
- Strengthening blood transfusion regulation systems;
- Participating in WHO regional blood transfusion activities

Overall objective of the project were

- To provide safe, efficacious and quality assured blood to the citizens of Pakistan
- The program has improved blood transfusion services in Pakistan by strengthening its organizational and physical structure in line with WHO blood safety recommendations
- At the federal level, the Program performs the role of a central coordinating body to oversee
 - Policy planning,
 - Provide strategic guidelines,
 - Set standards,
 - Monitor and evaluate program,
 - Liaise with development partners and
 - Report on international commitments and above all
 - Ensure smooth and seamless implementation of the project all over the country

Achievements so far:

Since 2010 the national blood safety system reforms have included:

- The development of an SOP manual
- National standards
- Clinical use of blood guidelines
- National quality control guideline

The Financial Cooperation component of the project has developed the new infrastructure which consists of

- Constructing and equipping a network of regional blood centres
- Renovating and refurbishing existing hospital blood banks.

Development of 10 regional blood centres and Up-grading 60 existing hospital-based blood banks in the first phase was completed in 2016.

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



OSHA standards

(Occupational Safety and Health Administration)



OSHA standards for blood borne 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 patient's 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.

References

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