

# Advanced Infection Prevention and Control Training

## Injection safety and safe injection practices: student handbook

### Introduction

Welcome to the “Injection safety and safe injection practices” module. This advanced module is part of a broader infection prevention and control (IPC) training package targeting individuals and teams in IPC who work or intend to work as IPC focal points. It is designed to support implementation of the WHO guideline on the use of safety-engineered syringes for intramuscular, intradermal and subcutaneous injections in health care settings<sup>1</sup> at the national and health care facility levels, as part of a multifaceted approach to capacity-building.<sup>2</sup>

### Target audience

This training module is designed for individuals and teams who aim to acquire specific competencies in IPC and who work or intend to work as an IPC focal point at the national, subnational or health facility level. Trainees are expected to possess at least basic experience and competence in IPC. They could include IPC professionals, IPC hospital teams, facility administrators, hospital epidemiologists, microbiologists and other relevant health care professionals, among others. The package complements a basic training package intended for all front-line health care workers.

### Objectives of the module

The module aims to equip the IPC focal point to:

1. describe the reasons and factors behind unnecessary and unsafe injection practices;
2. explain the risks associated with unsafe injection practices and key epidemiological data of the infections caused by them;
3. list the key WHO recommendations for injection safety;
4. understand the mechanisms of safety-engineered syringes;
5. list the seven steps to safe injections;
6. explain how to collect, handle and dispose of needles and other sharps safely;
7. give details of needle-stick injuries and associated prevention strategies;
8. describe multimodal strategies to implement injection safety.

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<sup>1</sup> WHO guideline on the use of safety-engineered syringes for intramuscular, intradermal and subcutaneous injections in health care settings. Geneva: World Health Organization; 2016 ([http://www.who.int/infection-prevention/publications/is\\_guidelines/en/](http://www.who.int/infection-prevention/publications/is_guidelines/en/), accessed 15 April 2018).

<sup>2</sup> Injection safety tools and resources. In: World Health Organization [website]. Geneva: World Health Organization; 2018 (<http://www.who.int/infection-prevention/tools/injections/en/>, accessed 15 April 2018).

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## Purpose and content of the student handbook

This module comprises a blend of PowerPoint presentations, videos and group work (including case studies and interactive question-and-answer sessions). The student handbook contains supplementary information to support learning, handouts that will be referred to during the training, reflective reading for homework and group work instructions. Together with the PowerPoint slides it will form a valuable resource for students.

The table below sets out the module's sessions and lists the associated resources contained within the handbook.

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<b>1. The problem of unsafe injections</b>	• Handout 1. Anthropological perspective on injections: a review, Reeler AV	4
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## Handout 1. Anthropological perspectives on injections: a review

AV Reeler, Bulletin of the World Health Organization, 2000;78(1):135–143.

This handout summarizes the Reeler article on the reasons behind the demand for injections by consumers and the administration of unnecessary or unsafe injections by different types of provider.

The popularity of injections in developing countries has been described in qualitative studies. There are three drivers of unsafe and unnecessary injections: the prescriber, the provider and the patient.

Injections are provided by trained and untrained providers, yet in many cultures injections are seen as the outstanding symbol of biomedicine. The action of filling a syringe and penetrating the body is often perceived as a powerful technology. In many parts of the world patients present at appointments to get injections because, for example, they think that they are unwell and that getting a vitamin B complex injection will make them feel better.

In many developing countries, patients in rural, periurban and urban slum settings consider a treatment incomplete when an injection is not administered. There is a difference of opinion about this, however: the prescriber or provider may say that patients demand injections, while patients often report that they leave the choice of treatment to the better judgement of the prescriber. In each setting, injections are linked to a specific meaning and interpretation depending on the local medical traditions and ideas about contamination, causes of diseases, perceptions of providers and local responses and behaviours of practitioners.

While most useful injections are given in hospitals, health centres, clinics and dispensaries by trained doctors, nurses, midwives and paramedics, on many occasions injections are not given safely or the person administering the injection is not a trained health worker. Lack of knowledge or sometimes a shortage of equipment leads to reuse of injection equipment and causes transmission of life-threatening illnesses such as hepatitis B, hepatitis C and HIV. Injections are often demanded by patients for high fever, malaria or severe coughs – conditions which can easily be treated by oral medications.

The most dangerous aspect of injections is reuse of injection equipment, which has the potential to transmit infections. Many private practitioners prescribe injections because they charge extra money for a prescription containing an injection, and there is often an additional charge for giving the injection. In private settings equipment is often reused to save money, while in public sector health centres it is often reused when there is shortage of syringe supplies.

A substantial reduction in the number of unnecessary injections may not be easily attainable; however, it may be useful to aim to reduce unsafe administration.

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## **Handout 2. Serve the people or close the sale? Profit-driven overuse of injections and infusions in China's market-based healthcare system**

L Reynolds and M McKee, *International Journal of Health Planning and Management*, 2011;26(4):449–470.

This handout summarizes the Reynolds and McKee article on the reasons for over-prescription of injections and infusions in China.

Injections and infusions are used widely in China's health care system. Many patients and other providers believe that injections are therapeutic; however, irrational prescription is also a result of the health system remuneration structure.

This research was conducted in Guizhou, a relatively poor province in southern China. It was based on semi-structured interviews with prescribers, patients and key informants, as well as focus-group discussions. Prescribers were village doctors, township hospital staff, provincial hospital staff and other local medical system personnel. Patients were from rural and urban areas. Key informants included village elders, nongovernmental organization health workers and others. Focus-group discussions were conducted with Centers for Disease Control and Prevention officials, village doctors and university students.

Prescribers were asked "what are the benefits and disadvantages of each kind of treatment for the patient and for you?" Injected medication was preferred because of its speed of action, demand from patients and the large volume of fluid available to carry medication. Some doctors explicitly noted that administration of injections and infusions visibly demonstrates professional skills – an important factor in building a successful practice. Injectable antibiotics are expensive, and prescribing them is profitable. Many patients reported self-medicating instead of, or in addition to, seeking treatment from a health worker. Further, if symptoms persist after over-the-counter remedies have been taken, the sufferer is likely to seek injectable treatment from a health worker, often justifying this as "because pills have failed".

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## **Handout 3. Public health guidelines for the management of occupational exposure to hepatitis B, hepatitis C and HIV**

Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report, June 29, 2001/50(RR11);1–42.

This handout summarizes the risk of transmission of hepatitis B, hepatitis C and HIV through reuse of injection equipment or needle-stick injury (needle-stick injury is explained in session 3).

Hepatitis C virus (HCV) is not transmitted efficiently through occupational exposure to blood; however, in cases of reuse of injection equipment – most commonly the syringe – between multiple patients, the chances of transmission increase. Data are limited, however, on survival of HCV in the environment. In contrast to hepatitis B virus (HBV), the epidemiological data for HCV suggest that environmental contamination with blood containing HCV is not a significant risk for transmission in health care settings, with the possible exception of the haemodialysis setting, where HCV transmission related to environmental contamination and poor infection-control practices has been implicated.

HBV is a comparatively stronger virus. It has been demonstrated to survive in dried blood at room temperature on environmental surfaces for at least one week. This means that if a syringe and needle is used on a person with HBV infection and is later used on another patient, the chances of transmission are high. The risk of HBV infection is primarily related to the degree of contact with blood in the workplace and to the hepatitis B e antigen (HBeAg) status of the source person.

The risk of HIV transmission from unsafe therapeutic injections is comparatively low but it still exists. The risk increases if the syringe is used in a vein or an artery. It also varies according to whether the patient on whom the syringe was used the previous time had a higher titre of HIV in the blood. Use of hollow-bore needles further creates a higher chance of HIV transmission.

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## Handout 4. Evolution of the global burden of viral infections from unsafe medical injections, 2000–2010

J Pépin, CN Abou Chakra, E Pépin, V Nault, L Valiquette, PLoS ONE, 2014;9(6):e99677.

This handout summarizes the Pépin et al. article on the progress made from 2000 to 2010 in reducing the burden of viral infections transmitted through unsafe injections.

### Background

In 2000 WHO estimated that, in developing and transitional countries, unsafe injections accounted for 5%, 32% and 40% of new infections with HIV, hepatitis B virus (HBV) and hepatitis C virus (HCV), respectively. Safe injection campaigns were organized worldwide. This study sought to measure progress in reducing transmission of these viruses through unsafe injections over the subsequent decade.

### Methods

A mass action model was updated to recalculate the number of injection-related HIV, HCV and HBV infections acquired in 2000 and provide estimates for 2010. Data on the annual number of unsafe injections were updated. HIV prevalence in various regions in 2000 and 2010 was calculated from UNAIDS data. The ratio of HIV prevalence in health care settings compared to the general population was estimated from a literature review. Improved regional estimates of the prevalence of HCV seropositivity, hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) antigenemia were used for 2000 and 2010. For HIV and HCV, revised estimates of the probability of transmission per episode of unsafe injection were used, with low and high values allowing sensitivity analyses.

### Results

Despite 13% population growth, there were reductions of 87% and 83% in the absolute numbers of HIV and HCV infections, respectively, transmitted through injections. For HBV, the reduction was more marked (91%) owing to the additional impact of vaccination. While injection-related cases had accounted for 4.6–9.1% of newly acquired HIV infections in 2000, this proportion decreased to 0.7–1.3% in 2010, when unsafe injections caused between 16 939 and 33 877 HIV infections, between 157 592 and 315 120 HCV infections and 1 679 745 HBV infections.

### Conclusion

From 2000 to 2010, substantial progress was made in reducing the burden of HIV, HCV and HBV infections transmitted through injections. In some regions, their elimination might become a reasonable public health goal.

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## Handout 5. Educational leaflet and health card for patients and communities

The **educational leaflet** developed for patients and communities talks about making safe injection choices, the consequences of unsafe injections and why prevention is the best medicine. It educates patients to ask their prescribers about the need for an injection and to say that they would prefer oral medicines. It is available to download as “Guide for safe medical treatment” from: <http://www.who.int/infection-prevention/tools/injections/communications/en/>

The **patient health card**, developed in the format of a postcard, highlights three things to ask a health care provider before having an injection: whether there is a need for an injection; whether the syringe is new and opened from a new packet; and whether it is a smart syringe that can only be used once. The card should be placed in patient waiting areas and could also be distributed within communities. It is available to download as “Postcard for patient waiting areas; can also be distributed in community based events” from: <http://www.who.int/infection-prevention/tools/injections/communications/en/>





# MAKE SMART INJECTION CHOICES

## SAFE INJECTIONS FOR PATIENTS AND COMMUNITIES



For Patient Associations



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# SAFE INJECTION CHOICES MATTER



Patient associations can help save lives by communicating with patients and communities to help them avoid the risk of acquiring potentially deadly infections from unsafe injections and supporting and advocating for safe injection programmes.

Safe injections are important to protect human health and treat diseases, but many injections around the world **put lives at risk** and cause 1.67 million hepatitis B infections,

more than 315 000 hepatitis C infections and almost 34 000 human immunodeficiency virus (HIV) infections every year.

In some countries up to 70% of injections are unnecessary and/or could be replaced by medications available in an oral form whenever possible, as these are just as effective.

## **Patient associations can help empower patients to make smart injection choices**

Patient associations are in the best position to communicate with patients and their families, and disseminate information and education about the dangers of unsafe injections and safe injection practices, enabling patients to make smart injection choices for themselves, and their families.

## **People can ask their health care provider for alternatives**

An injection is not always the best or most effective treatment. Patients should be aware that if they are prescribed an injection, they can ask their health care provider if the medicine they need is available in oral form, and let them know if they would prefer this method of treatment.

# HOW CAN AN INJECTION BE UNSAFE?

## UNSAFE INJECTION PRACTICES

If a patient is injected with a syringe that has been used on another person there is a real risk they may get an infection.

The global burden of unsafe injection practices is caused by avoidable situations and practices including:

- ❌ Overuse of injections for illnesses for which oral medications are available and are recommended as first line treatment.
- ❌ Lack of clean work spaces.
- ❌ Re-use of syringes and needles, and other injection equipment.
- ❌ Unsafe collection and management of used injection.



## SAFETY FIRST

When injections are required, the World Health Organization recommends safety-engineered syringes for both immunization and therapeutic use; these syringes are those which have mechanisms preventing re-use of the device and/or protecting health care workers from injuries from a needle. Hundreds of thousands of people could be protected from infections acquired through unsafe injections by using syringes that cannot be used more than once.

# STRATEGIES FOR SUCCESS

## WORKING TOGETHER

Education and information provided and endorsed by patient associations will empower people to make smart injection choices.

Once they have been informed and empowered patients can play an important role in ensuring their own safety by:

- ✓ Asking if there is an oral alternative available, or if an injection is needed.
- ✓ Making sure the syringe and needle are taken from a new, sealed and undamaged package.
- ✓ Checking that the health care provider giving the injection follows safe hygiene standards.



In addition to education and information, patient associations can also:

- ✓ Help people by offering a number of support tools on making safe injection choices, and or signposting them to WHO materials.
- ✓ Provide a forum for people to meet each other, share experiences about safe injection choices and provide on-going support for patients and their families.
- ✓ Represent patient views on issues surrounding safe injections, to help shape the current and future health care environment by making their collective voices heard.
- ✓ Help the industry to understand patients' needs to guide them in developing new injection equipment and providing patient support.
- ✓ Provide insights for health care professionals on patients' needs when receiving injections to help them support their patients.

For further information and access to educational materials please visit:

[www.who.int/infection-prevention](http://www.who.int/infection-prevention)



## AVOID UNSAFE INJECTIONS BY MAKING SMART INJECTION CHOICES...



[www.who.int/infection-prevention](http://www.who.int/infection-prevention)



MAKE SMART INJECTION CHOICES

## UNSAFE INJECTIONS SPREAD DISEASE

### 3 THINGS TO ASK YOUR HEALTH CARE PROVIDER BEFORE HAVING AN INJECTION

- 1 Ask your health care provider if you really need an injection and whether your illness can be treated with medicines taken by mouth.
- 2 Ask your injection provider to open a new syringe in front of you.
- 3 Ask your injection provider to use a smart syringe as they can be used once only.



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## Handout 6. Infographic on injection safety and poster promoting oral medicines

These two information, education and communication materials are specifically developed for patients and communities. They are designed to raise awareness about injection safety and the importance of oral medicines.

The (illustration-based) **infographic** is available to download from:  
<http://www.who.int/infection-prevention/tools/injections/communications/en/>

It describes in easy-to-understand language, with illustrations:

- the risks of getting a life-threatening illness from unsafe injections
- what makes an injection unsafe
- how to identify whether the patient really needs the injection
- the responsibilities of health care workers.

The **poster promoting oral medicines** is available to download from:  
<http://www.who.int/infection-prevention/tools/injections/communications/en/>

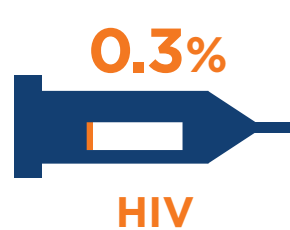
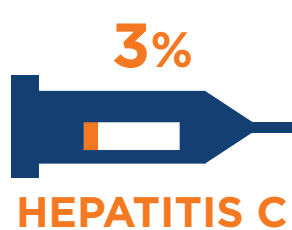
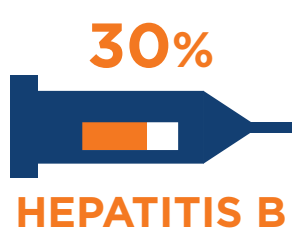
It educates patients and communities about the importance of oral medicines (in patients' language: "medicines taken by mouth").

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:



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

## WHAT MAKES AN INJECTION UNSAFE?

**1** **Re-use of syringes and needles,** and other injection equipment.

**2** **Overuse of injections** for illnesses where medicines by mouth are available and recommended.

**3** **Lack of clean work spaces and hands.**

**4** **Unsafe collection and disposal** of used injection equipment.

## WHO IS AT RISK?



**PATIENTS**  
who receive unsafe injections.



**CHILDREN IN THE COMMUNITY**  
who play near areas where syringes and needles have been thrown away.



**HEALTH CARE WORKERS**  
who get injured by used needles.

## DO YOU REALLY NEED AN INJECTION?

How to make **smart injection** choices



**WHAT YOU CAN DO AS A PATIENT**

**1**

Ask if a medicine taken by mouth is available. These can work as well as injections.

**2**

If you do need an injection, ask for a smart syringe as they can be used once only. Check that the syringe and needle package is new, sealed and undamaged.

**3**

Make sure your skin is disinfected before the injection.

**4**

Talk to your children and community about the dangers of picking up used syringes and needles.



**WHAT YOU CAN DO AS A HEALTH CARE WORKER**

**1**

Offer your patient a medicine that can be taken by mouth, if available.

**2**

Use smart syringes that can be used once only. Open the package in front of your patient to reassure them that the syringe and needle have not been used before.

**3**

Clean the area where the injection is being given and perform hand hygiene before giving the injection.

**4**

Place the needle, syringe and single use vial in a safety sharps box as soon as they have been used.

**Make smart injection choices** and help avoid the risk of infection from an unsafe injection. For more information visit: [www.who.int/infection-prevention](http://www.who.int/infection-prevention)



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# AVOID UNNECESSARY INJECTIONS

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**Medicines taken by mouth  
are safe and they work.**

Ask your health care provider if the best medicine for your treatment is available in tablet form.

Don't ask for an injection unless you need one.





# AVOID UNNECESSARY INJECTIONS

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**Medicines taken by mouth  
are safe and they work.**

Ask your health care provider if the best medicine for your treatment is available in tablet form.

Don't ask for an injection unless you need one.

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## Handout 7. WHO guideline on the use of safety-engineered syringes for intramuscular, intradermal and subcutaneous injections in health care settings

The guideline is available to download from: [http://www.who.int/infection-prevention/publications/is\\_guidelines/en/](http://www.who.int/infection-prevention/publications/is_guidelines/en/)

WHO recommends that all countries should transition by 2020 to the exclusive use of WHO prequalified (or equivalent) safety-engineered injection devices, including auto-disable (AD) and reuse prevention (RUP) syringes and sharps injury protection (SIP) devices for therapeutic injections, and develop related national policies to bring about a smooth transition.

**The guideline** was developed to:

- reduce reuse of injection equipment
- avoid needle-stick injuries
- avoid overuse of injections and unsafe handling of sharps.

Implementers have to ensure rational use of injectable drugs and sufficient supplies of injection equipment.

**Key elements** of the guideline are:

- descriptions of safety-engineered injection devices known as AD and RUP syringes, which are specifically designed to block syringes from being reused – these also exist with SIP mechanisms to prevent needle-stick injuries to health care workers and the community;
- recommendations for transition to the exclusive use of WHO prequalified AD/RUP/SIP devices for therapeutic injections in all countries and for development of related national policies;
- a recommendation to develop standards for rational use and supply of standard disposable syringes for specific procedures and settings where they remain necessary;
- requests to donor agencies and development partners to fund procurement of safety-engineered injection devices in all projects including injectable medications and to finance appropriate quantities of safety-engineered injection devices,

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single-dose diluents and safety boxes and the cost of sharps waste management, as well as health care workers' training;

- a request to international and local manufacturers to switch to safety-engineered injection devices production as soon as possible and to seek WHO prequalification for their products;
- a recommendation for countries to develop and put in place a strategy for implementing their national policies, based on WHO-recommended key components.

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## Handout 8. The seven steps to safe injections and best injection practices guidelines

The **seven steps** to safe injections must be followed by all health workers to ensure injection safety within their settings. These are:

1. a clean work space
2. hand hygiene
3. a sterile, safety-engineered syringe
4. a sterile vial of medication and diluent
5. skin cleaning
6. appropriate collection of sharps
7. appropriate waste management

Further information can be found in the video “How to give a safe injection”, which is available at: <http://www.who.int/infection-prevention/tools/injections/training-education/en/>.

The **best injection practices guidelines** are available to download from: <http://www.who.int/infection-prevention/tools/injections/communications/en/>

They provide details on adhering to principles of injection safety in a succinct manner, ensuring that the injection is safe for the patient and the health care worker.



# 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.

### USE STERILE INJECTION EQUIPMENT

**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.**



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## 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.

## 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.



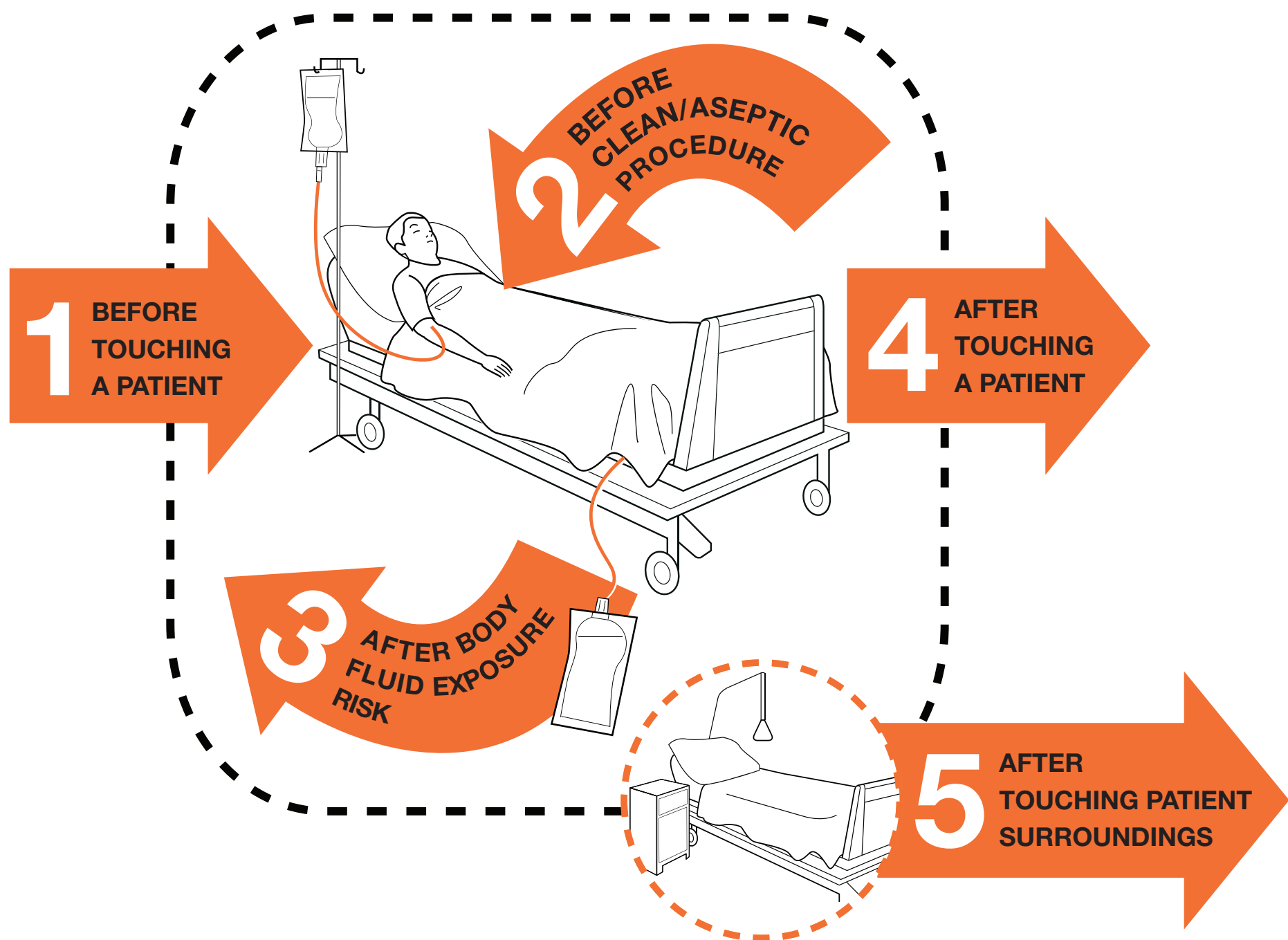
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## Handout 9. Hand hygiene: your 5 moments for hand hygiene

The hand hygiene poster is available to download from: <http://www.who.int/infection-prevention/tools/hand-hygiene/en/>



# Your 5 Moments for Hand Hygiene




1	BEFORE TOUCHING A PATIENT	WHEN?	Clean your hands before touching a patient when approaching him/her.
		WHY?	To protect the patient against harmful germs carried on your hands.
2	BEFORE CLEAN/ASEPTIC PROCEDURE	WHEN?	Clean your hands immediately before performing a clean/aseptic procedure.
		WHY?	To protect the patient against harmful germs, including the patient's own, from entering his/her body.
3	AFTER BODY FLUID EXPOSURE RISK	WHEN?	Clean your hands immediately after an exposure risk to body fluids (and after glove removal).
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
4	AFTER TOUCHING A PATIENT	WHEN?	Clean your hands after touching a patient and her/his immediate surroundings, when leaving the patient's side.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
5	AFTER TOUCHING PATIENT SURROUNDINGS	WHEN?	Clean your hands after touching any object or furniture in the patient's immediate surroundings, when leaving – even if the patient has not been touched.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.

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## Handout 10. Use of gloves and injections

### Annex A Indications for glove use in health care

Key elements	Indications	Precautions
<p>Glove use</p> 	<p>Wear <u>non-sterile</u>, well-fitting, single-use gloves:</p> <ul style="list-style-type: none"> <li>when handling potentially infectious materials or when coming into contact with contaminated items and surfaces</li> <li>when there is a likelihood of coming into direct contact with a patient's blood or <u>other potentially infectious materials</u> (e.g. body fluids, moist body substances and saliva [in dental procedures]), mucous membranes and nonintact skin</li> <li>when performing venepuncture or venous access injections, because of the potential for blood exposure at the puncture site</li> <li>if the health worker's skin is NOT intact (e.g. through eczema, or cracked or dry skin)</li> <li>if the patient's skin is NOT intact (e.g. through eczema, burns or skin infections).</li> </ul> <p>Change gloves:</p> <ul style="list-style-type: none"> <li>between tasks and procedures on the same patient, and after contact with material that may contain a high concentration of microorganisms</li> <li>during a procedure if gloves become visibly soiled, torn or punctured</li> <li>after contact with each patient.</li> </ul> <p>After treatment is complete, and before leaving areas of patient-care activity:</p> <ul style="list-style-type: none"> <li>remove gloves promptly and discard</li> <li>perform <u>hand hygiene</u> immediately after removing and discarding gloves.</li> </ul> <p>Gloves DO NOT replace the need for <u>hand hygiene</u>. Wear <u>sterile</u> gloves ONLY for procedures where an <u>aseptic technique</u> is required (e.g. <u>intravascular</u> infusion and devices).</p>	<p>When undertaking injections, DO NOT use gloves:</p> <ul style="list-style-type: none"> <li>for routine intradermal, subcutaneous and intramuscular injections</li> <li>if the health worker's skin is intact</li> <li>if the patient's skin is intact.</li> </ul> <p>Natural rubber latex allergy is a serious and life threatening condition that affects 8-12% of regular users of natural rubber latex gloves. Health workers and patients with an allergy to natural rubber latex must NOT come into contact with any latex products. Health workers with an allergy should use gloves made from synthetic material.</p> <p>Health workers must NOT:</p> <ul style="list-style-type: none"> <li>wash or decontaminate gloves for reuse</li> <li>wear gloves <ul style="list-style-type: none"> <li>away from the bedside or laboratory bench</li> <li>at nursing stations to handle phones or charts</li> <li>to handle clean linen</li> <li>to clean equipment or patient-care supplies</li> <li>in hallways or elevators.</li> </ul> </li> </ul> <p>Gloves DO NOT provide protection against <u>needle-stick</u> or other puncture wounds caused by <u>sharp</u> objects. Needles, scalpels and other sharps should be handled with extreme caution.</p>

Source: Annex A: indications for glove use in health care. In: WHO best practices for injections and related procedures toolkit. Geneva: World Health Organization; 2010 ([http://www.who.int/infection-prevention/publications/best-practices\\_toolkit/en/](http://www.who.int/infection-prevention/publications/best-practices_toolkit/en/), accessed 11 May 2010).

# Advanced Infection Prevention and Control Training

## Handout 11. Skin preparation for different types of injection

There is a need to be clear about the requirements for patient skin preparation before giving different types of injection.

- For intradermal and subcutaneous injections soap and water is sufficient.
- For intramuscular injections the evidence is lacking, so soap and water and 60–70% alcohol should be used.
- For immunization injections, soap and water is sufficient.
- For venous access 60–70% alcohol is required.

The WHO toolkit for injection-related procedures is available to download from:  
[http://www.who.int/infection-prevention/publications/best-practices\\_toolkit/en/](http://www.who.int/infection-prevention/publications/best-practices_toolkit/en/)

# Advanced Infection Prevention and Control Training

## Skin preparation for different types of injections



Skin preparation and disinfection		
Type of injection	Soap and water	60-70% alcohol (isopropyl alcohol or ethanol)
Intradermal	Yes	No
Subcutaneous	Yes	No
Intramuscular	<u>Yes<sup>a</sup></u>	<u>Yes<sup>a</sup></u>
Immunization	Yes	No
Venous access	No	Yes

<sup>a</sup> **Unresolved issue because there is lack of evidence on the need to disinfect the skin before intramuscular injections**

Source: WHO best practices for injections and related procedure toolkit 2010

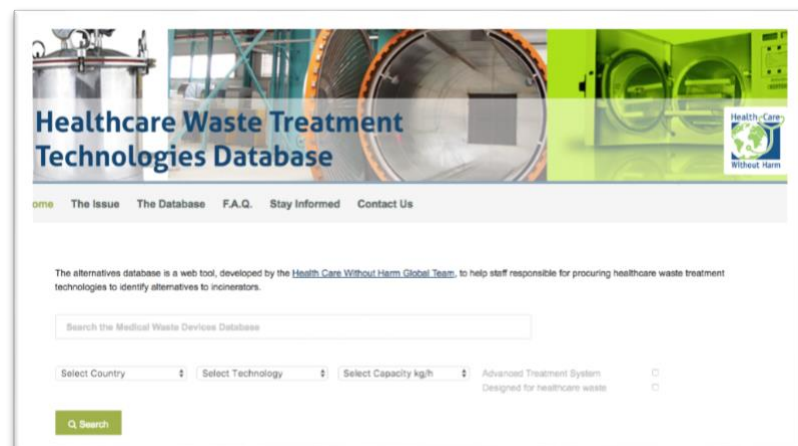
# Advanced Infection Prevention and Control Training

## Handout 12. Health care waste management

The waste produced in the course of health care activities, from contaminated needles to syringes, can cause infection and injury. Inadequate management is likely to have serious public health consequences and adverse effects on the environment. Health care waste and sharps management is a key component of injection safety.

The website <http://medwastetech.info/> provides useful information on health care waste treatment options for many countries of the world. To search the database for local suppliers, users should follow these four steps:

1. select the country
2. select the technology
3. calculate the approximate capacity
4. hit search.



WHO guidelines on safe health care waste management are available to download from: [http://www.who.int/water\\_sanitation\\_health/publications/safe-management-of-waste-summary/en/](http://www.who.int/water_sanitation_health/publications/safe-management-of-waste-summary/en/)



# Advanced Infection Prevention and Control Training

## Handout 13. Preventing needle-stick injuries

The leaflet for health care workers on needle-stick injury prevention is available to download from:  
<http://www.who.int/infection-prevention/tools/injections/training-education/en/>

It provides information about types of needle that can cause a needle-stick injury, when a needle-stick injury can occur and what to do if it happens.



# MAKE SMART INJECTION CHOICES

PREVENT NEEDLE-STICK  
INJURIES



World Health  
Organization

# MAKING SAFE INJECTION CHOICES

## WHAT KINDS OF NEEDLES USUALLY CAUSE NEEDLE-STICK INJURIES?

- Hypodermic needles
- Blood collection needles
- Suture needles
- Needles used in intravenous delivery systems

## WHEN NEEDLE-STICK INJURIES OCCUR

**Needle-stick injuries are most often associated with the following activities:**



Sudden patient movement during the injection



Recapping needles



Transferring body fluid between containers



Failing to dispose of used needles properly in a puncture-proof safety box



## IF YOU GET A NEEDLE-STICK INJURY:

**Take the following actions immediately:**

- Wash the wound with soap and water.
- Inform your supervisor and follow the needle-stick injury reporting mechanism of your health facility.
- Identify the source patient, who should be tested for HIV, hepatitis B, and hepatitis C infections.
  - Tests should be carried out after patient consent.
- Get tested for HIV, hepatitis B, and hepatitis C infections.
- Read WHO Best Practices for Injections and Related Procedures Toolkit: [www.who.int/entity/infection-prevention/tools/injections/9789241599252](http://www.who.int/entity/infection-prevention/tools/injections/9789241599252)

**NEEDLE-STICK INJURIES EXPOSE YOU TO A NUMBER OF BLOODBORNE PATHOGENS THAT CAN CAUSE SERIOUS OR EVEN FATAL INFECTIONS.**



# GUIDANCE ON PROTECTION

## HOW CAN I PROTECT MYSELF?

**Preventing needle-stick injuries is the best way to protect yourself:**



- ✓ Use safety syringes with a sharps injury protection (SIP) feature as recommended by WHO.
- ✓ WHO recommends that health care workers and others who may be exposed to blood and blood products through their work should be vaccinated against hepatitis B.
- ✓ Plan safe handling and disposal of needles before using them, e.g. make sure there is a safety box at arm's reach when you give an injection.
- ✓ If you have to transport the safety box to another room or to a disposal site, carry it carefully holding it at the top, above the level of the needles.
- ✗ **Never re-cap needles.**  
Place them uncapped into a sharps container immediately.
- ✗ **Never open a safety box.**  
Store in a safe and secure place until it is ready for final disposal.
- ✗ **Never fill a safety box more than three-quarters full.**

**AVOID GIVING  
INJECTIONS FOR HEALTH  
CONDITIONS WHERE  
ORAL FORMULATIONS  
ARE AVAILABLE AS THE  
FIRST-LINE TREATMENT.**

# PREVENTION IS THE BEST MEDICINE

## HOW CAN I PROTECT OTHERS?

- Ensure that all staff in your area are educated on the risks of needle-stick injuries and given appropriate training. This is especially important for housekeeping staff or sanitation workers who do not have medical or nursing training.
- Take time to explain risks, especially if you observe risky or dangerous procedures or behaviours among your colleagues.
- Ensure waste is disposed of properly within the facility. It is your responsibility to ensure no infected waste reaches the community, where these items can be attractive to children to play with.  
For further information please visit: [www.who.int/infection-prevention](http://www.who.int/infection-prevention)



# Advanced Infection Prevention and Control Training

## Group work 1

### Instructions

- Work in groups of 5–7 people – a facilitator will join each group.
- First, read the abstract below of a paper by Janjua et al.
- In your groups answer the questions presented at the end.

### **Health care risk factors among women and personal behaviors among men explain the high prevalence of hepatitis C virus infection in Karachi, Pakistan.**

NZ Janjua, HB Hamza, M Islam, SFA Tirmizi, A Siddiqui, W Jafri, S Hamid, Journal of Viral Hepatitis, 2010;17(5):317–326.

### Summary

To estimate the prevalence and identify factors associated with hepatitis C virus (HCV) infection among men and women in Karachi, Pakistan. We conducted a cross - sectional study of adult men and women in a peri - urban community of Karachi (Jam Kandah). Households were selected through systematic sampling from within all villages in the study area. All available adults within each household were interviewed about potential HCV risk factors. A blood specimen was collected to test for anti - HCV antibodies by enzyme immunoassay. We used generalized estimating equations while accounting for correlation of responses within villages to identify the factors associated with HCV infection.

Of 1997 participants, 476 (23.8%) were anti - HCV positive. Overall, HCV infection was significantly associated with increasing age, ethnicity, and having received  $\geq 2$  blood transfusions,  $\geq 3$  hospitalizations, dental treatment and  $> 5$  injections among women. Among women,  $\geq 2$  blood transfusions [adjusted odds ratio (aOR) = 2.32],  $> 5$  injections during the past 6 months (aORs = 1.47), dental treatment (aOR = 1.31) and increasing age (aOR = 1.49), while among men, extramarital sexual intercourse (aOR = 2.77), at least once a week shave from barber (aOR = 5.04),  $\geq 3$  hospitalizations (aOR = 2.50) and increasing age (aOR = 1.28) were associated with HCV infection.

A very high prevalence of HCV was found in the study population. Among women, unsafe health care practices, while among men extramarital sex, shaving from a barber and hospitalizations were associated with HCV infection. Efforts are needed to improve the safety of medical procedures to reduce the transmission of HCV in Pakistan.

# Advanced Infection Prevention and Control Training

## Questions

1. What were the significant risks identified in the study?
2. Why was increasing age identified as a risk?
3. What kind of intervention or interventions could be designed if this were the community and area you were assigned to work with?
4. Do you see any role for safety-engineered syringes in this scenario?

# Advanced Infection Prevention and Control Training

## Group work 2

### Instructions

- Work in groups of 5–7 people – a facilitator will join each group.
- First, read the scenario below.
- In your groups answer the questions presented at the end.

### Scenario

Amanda was working late in the afternoon and her shift was about to finish when her colleague informed her that she was having difficulty collecting a blood sample from a patient. Amanda took the sample successfully and, after taking the needle out and keeping pressure on the patient's hand to stop the bleeding, she tried to reach the sharps box, which was behind her. In doing so, she was stuck by another needle in the sharps box.

Amanda thought that the needle had been exposed to the environment for some time and it seemed dry, so there was limited risk of acquiring an infection. She therefore refused post-exposure prophylaxis for HIV. At a subsequent follow-up, however, she found out that she had contracted hepatitis C virus and HIV.

### Questions

1. What factors contributed to the exposure?
2. Would it have been possible to prevent this exposure?
3. Would it have been possible to use a safety-engineered syringe to prevent the needle-stick injury? If yes, what type of syringe?
4. What kind of practice at work could have prevented this needle-stick injury?

# Advanced Infection Prevention and Control Training

## Group work 3

### Instructions

- Work in groups of 5–7 people – a facilitator will join each group.
- In your groups discuss and develop a strategy to implement the WHO policy and injection safety best practices learned so far, at both:
  - national level (group 1) and
  - health care facility level (group 2).

### Questions

1. What strategy would you use to implement the WHO policy recommendations and injection safety best practices learned so far, both at the national level and in a health care facility?
2. Who are the key players involved in supporting such a strategy?
3. Who is the target audience for such a strategy?
4. What resources are needed for successful implementation of such a strategy?