

Advanced Infection Prevention and Control (IPC) Training



World Health
Organization

Injection safety and safe injection practices

2018

Module outline

Injection safety

Session 1. The problem of unsafe injections	75 mins
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Session 2. IPC best practices and guidance for safe injections	60 mins
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Session 3. Needle-stick injury prevention	60 mins
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Session 4. Injection safety implementation strategies	60 mins
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Summary of the module

Session 1



The problem of unsafe injections

- Definition and drivers
- Risks associated with unsafe injections
- Magnitude of global burden in low- and high-income countries

Session 2



IPC best practices and guidance for safe injections

- Eliminating unnecessary injections
- Educating patients and communities
- Safety-engineered syringes
- Seven steps to safe injections

Session 3



Needle-stick injury prevention

- When needle-stick injuries occur
- What to do in case of a needle-stick injury
- Importance of posting reminders about needle-stick injuries
- Protecting yourself and your community

Session 4



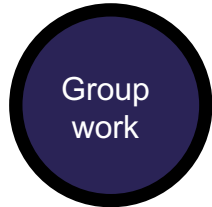
Injection safety implementation strategies

- WHO guidelines on injection safety
- Key features of a national policy
- Advocacy

The symbols explained



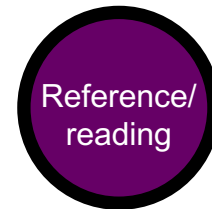
You are encouraged to participate in discussion questions, where you can use your own experience and prior knowledge



You are encouraged to participate in group activities to drill into key topics



Essential content (not to be missed!)



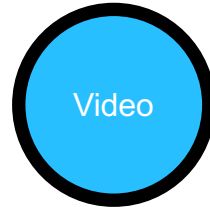
Key reference for consolidating learning



Some suggested answers to activities/group work



In-depth case study applying learning to practice



Video material to supplement learning



Required reading or reflection outside the classroom

Competencies

At the end of this module, the IPC focal point should be able to:

- identify unsafe injection practices;
- carry out an injection safety assessment using WHO guidelines;
- take immediate measures to improve injection practices by pinpointing gaps;
- develop short- and long-term plans to address all aspects of injection safety comprehensively, based on WHO guidelines;
- educate injection prescribers and providers on WHO recommendations for injection safety.

Learning objectives



On completion of this module, the student should be able to:

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

Session 1:

The problem of unsafe injections

What is 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 others.***

Drivers of unsafe injection practices

Prescribers



Providers



Patients

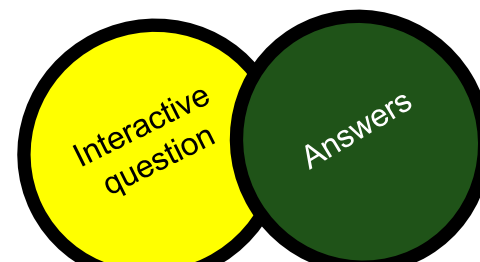


How can an injection be unsafe?

If any of the steps to make an injection safe are not undertaken appropriately.

In particular, if:

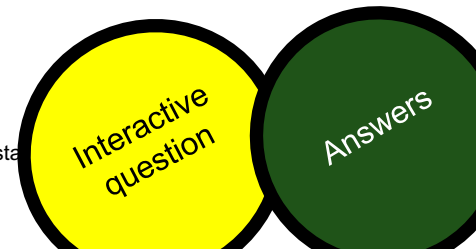
- the injection is given in an environment that is not clean and hygienic;
- the needle or the syringe are used for more than one patient;
- the package is not sterile or new and sealed;
- the vial is used multiple times;
- the skin is not properly disinfected;
- the needle is not disposed of safely;
- an injection is unnecessary and may cause harm (e.g. antibiotics, which can cause resistance);
- the injection is given incorrectly, which can cause damage to the nerve and lead to paralysis of the area.



Why do patients prefer injections?

- Belief that injections are **stronger medication** (Pakistan)
- Belief that injections **work faster** (Romania)
- Belief that **injection pain is a marker of efficacy** (southern African countries)
- Belief that a drug is **more efficient** when entering the body directly (Cambodia, Thailand)
- Belief that injections represent a **more developed technology** (many countries, including high-income ones)

Sources: Reeler AV. Anthropological perspectives on injections: a review. Bull World Health Organ. 2000;78(1):135–143;
Dentinger C, Pasat L, Popa M, Hutin YJ, Mast EE. Injection practices in Romania: progress and challenges. Infect Control Hosp Epidemiol. 2004;25(1):30–35;
Altat A, Fatmi Z, Ajmal A, Hussain T, Qahir H, Agboatwalla M. Determinants of therapeutic injection overuse among communities in Sindh, Pakistan. Ayub Med Coll Abbottabad. 2004;16(3):25–38.

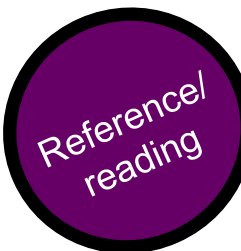


Motivation for overuse of injections among health care workers



- Financial incentives (private health care providers can charge a higher fee if they administer injections)
- Belief in better efficacy of injected drugs
- Ability to observe therapy and compliance with treatment regimens directly

Sources: Reeler AV. Anthropological perspectives on injections: a review. Bull World Health Organ. 2000;78(1):135–143;
Luby SP, Qamruddin K, Shah AA, Omair A, Pahsa O, Khan AJ et al. The relationship between therapeutic injections and high prevalence of hepatitis C infection in Hafizabad, Pakistan. Epidemiol Infect. 1997;119(3):349–356;
Reynolds L, McKee M. Serve the people or close the sale? Profit-driven overuse of injections and infusions in China's market-based healthcare system. Int J Health Plann Manage. 2011;26(4):449–470.



Why is injection equipment reused?

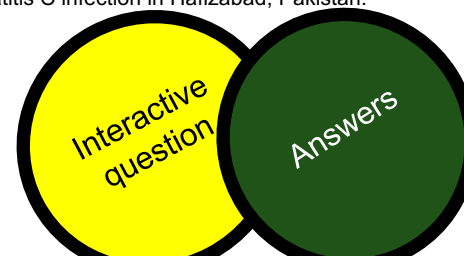
- Lack of awareness or understanding of risks associated with unsafe injections
- Lack of injection equipment and supplies
 - in both public and private settings
- Saving money on syringes and needles
 - mostly related to private settings

Sources: Reeler AV. Anthropological perspectives on injections: a review. Bull World Health Organ. 2000;78(1):135–143;

Luby SP, Qamruddin K, Shah AA, Omair A, Pahsa O, Khan AJ et al. The relationship between therapeutic injections and high prevalence of hepatitis C infection in Hafizabad, Pakistan. Epidemiol Infect. 1997;119(3):349–356;

WHO Western Pacific Region. Patient safety fact sheet (http://www.wpro.who.int/mediacentre/factsheets/fs_201202_patient_safety/en/).

Okwen MP, Ngem BY, Alomba FA, Capo MV, Reid SR, Ewang E. Uncovering high rates of unsafe injection equipment reuse in rural Cameroon: validation of a survey instrument that probes for specific misconceptions. Harm Reduct J. 2011;8:4.



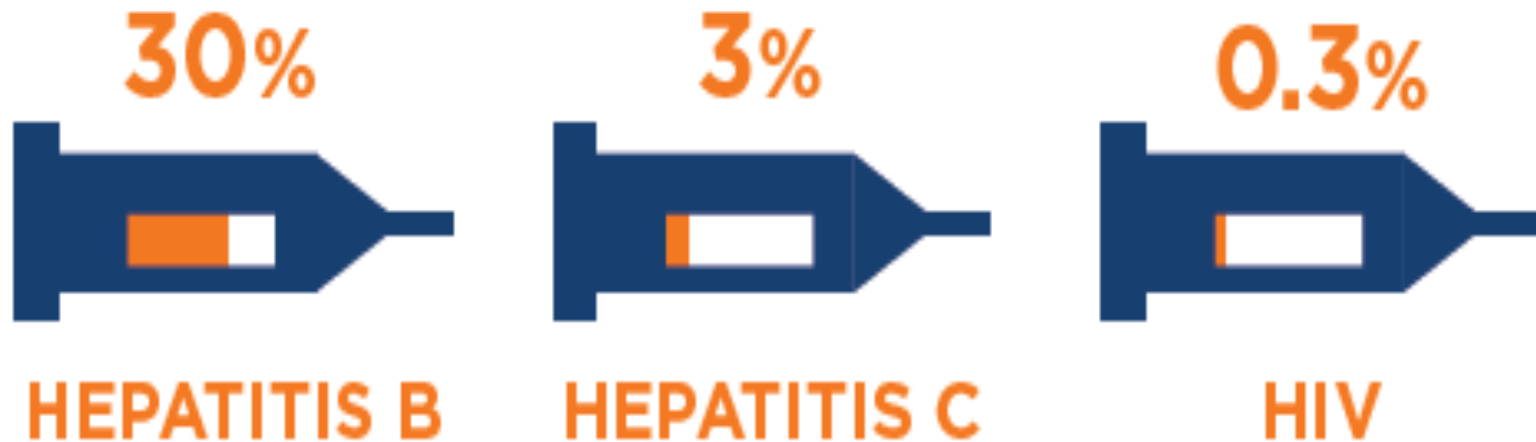
Risks associated with unsafe injection practices

- Bloodborne pathogen transmission
 - hepatitis B virus (HBV) infection
 - hepatitis C virus (HCV) infection
 - HIV
 - viral haemorrhagic fevers
- Abscesses
 - Septic
 - aseptic
- Nerve damage
 - with risk of paralysis
- Other less common diseases
 - such as malaria

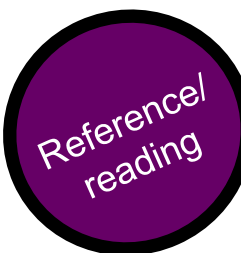


Unsanitary injection preparation area, Pakistan

Risk of HIV, HBV and HCV transmission in health care settings

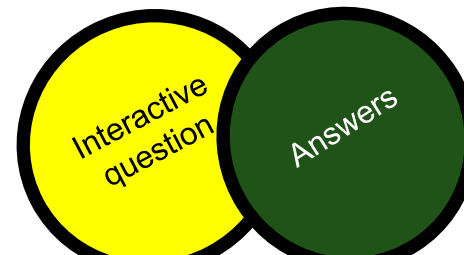


Estimated risk of getting these infections from a contaminated syringe or needle.



How long can HBV, HCV and HIV survive outside the human body?

- HBV can survive for seven days outside the human body and can cause infection if it enters the body of a person who is not infected.
- HCV can survive for up to three weeks on environmental surfaces at room temperature.
- HIV can survive in dried blood at room temperature for up to three days.



Animated video for patients



UNSAFE INJECTIONS

SPREAD DEADLY DISEASES



IF YOU NEED AN INJECTION,
CHECK THAT IT'S GIVEN
WITH A **NEW SYRINGE
AND NEEDLE** THAT CAN
BE **USED ONCE ONLY.**



**WE ALL HAVE A PART TO PLAY
IN MAKING INJECTIONS SAFE.**

Video

Source:

<https://www.youtube.com/watch?v=3QmvhlG5olw&feature=youtu.be>

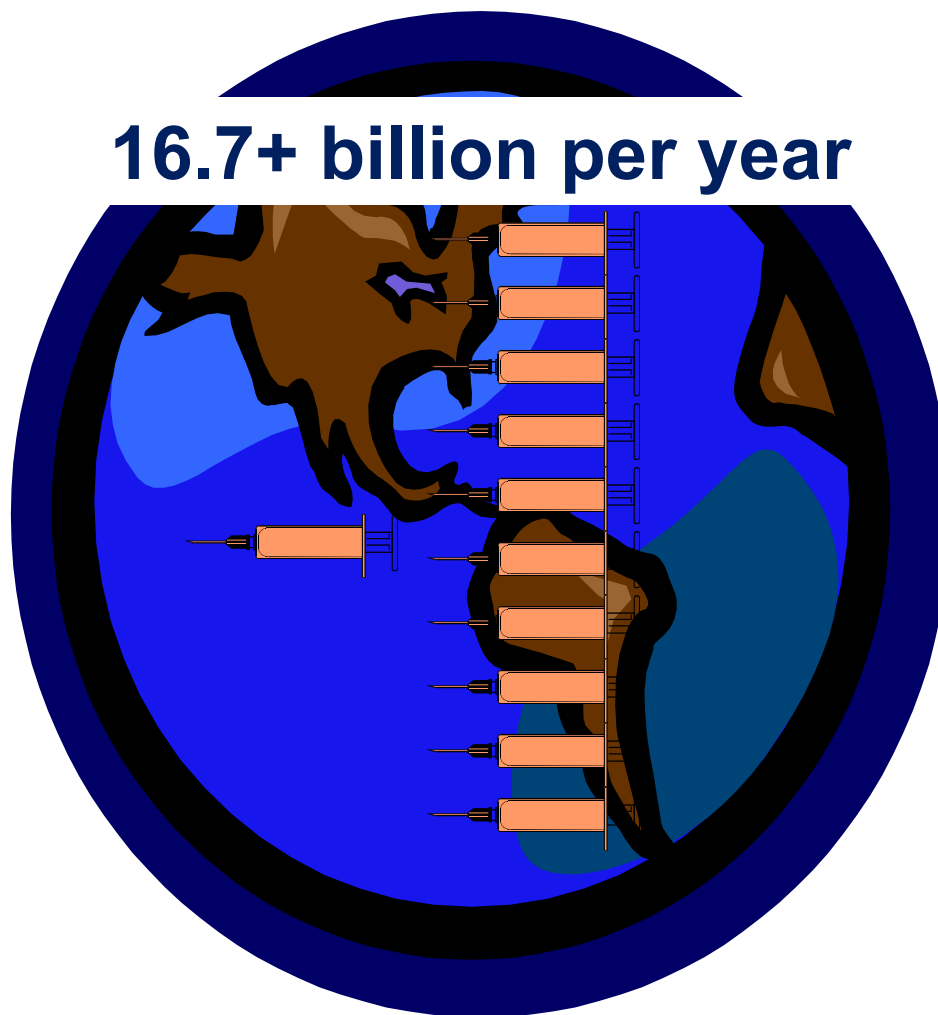
Use of injections worldwide

16.7+ billion per year

Immunization

injections:

5–10%



Therapeutic

injections:

90–95%

Global estimates of unsafe injections, 2000



- 16 billion injections are provided worldwide every year.
- Over 70% of these injections were unnecessary in some regions.
- **Unsafe injections annually cause:**
 - 21 million hepatitis B infections (30% of new cases)
 - 2 million hepatitis C infections (41% of new cases)
 - 260 000 HIV/AIDS infections (9% of new cases).

Sources: Prüss-Ustün A, Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. *Am J Ind Med.* 2005;48(6):482–490;

Hauri AM, Armstrong GL, Hutin YJ. The global burden of disease attributable to contaminated injections given in health care settings. *Int J STD AIDS.* 2004;15(1):7–16.

Global estimates of unsafe injections, 2010



- Proportion of **reuse of injection devices**: 5.5%
- Average number of **injections per person per year**: 2.9
- **Infections through unsafe injection practices**:
 - 1 679 745 hepatitis B infections
 - up to 315 120 hepatitis C infections
 - up to 33 877 HIV infections

OPEN ACCESS Freely available online



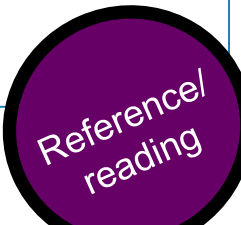
Evolution of the Global Burden of Viral Infections from Unsafe Medical Injections, 2000–2010

Jacques Pépin*, Claire Nour Abou Chakra, Eric Pépin, Vincent Nault, Louis Valiquette

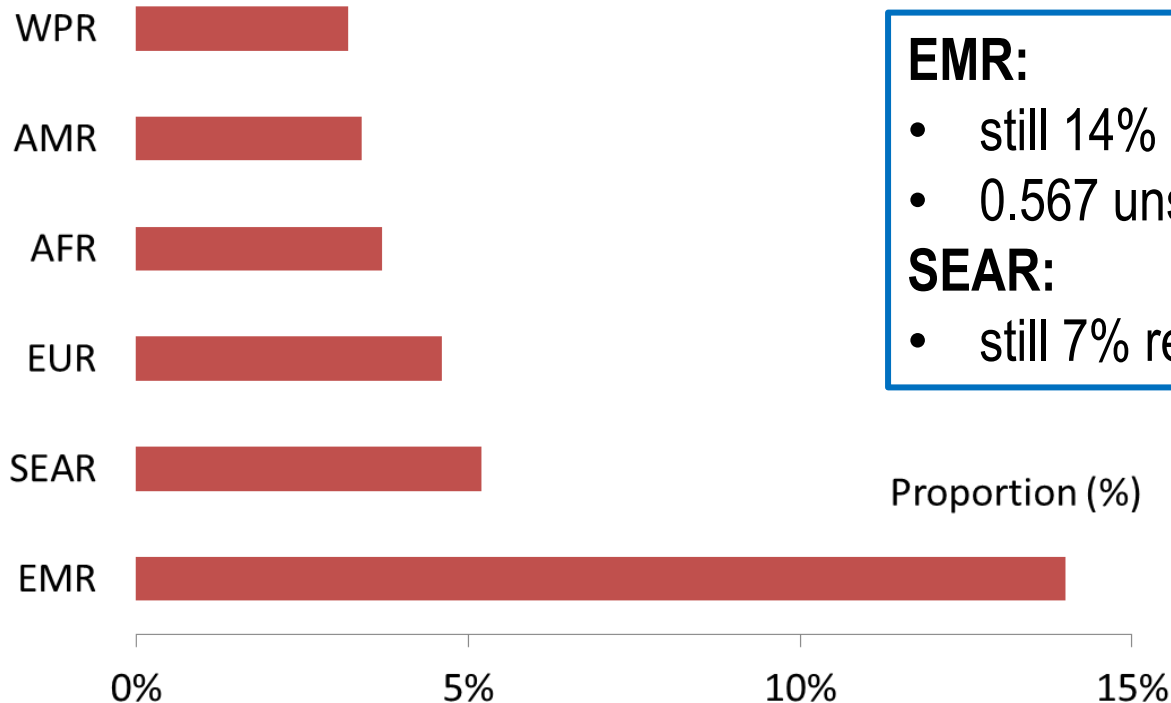


Evolution of the Global Use of Unsafe Medical Injections, 2000–2010

Jacques Pépin*, Claire Nour Abou Chakra, Eric Pépin, Vincent Nault



Proportion of injections given with reused equipment (2010)



EMR:

- still 14% reuse overall
- 0.567 unsafe injections per capita

SEAR:

- still 7% reuse in some countries

AFR: African Region; AMR: Region of the Americas; EMR: Eastern Mediterranean Region; EUR: European Region; SEAR: South-East Asia Region; WPR: Western Pacific Region

Examples from low- and middle-income countries



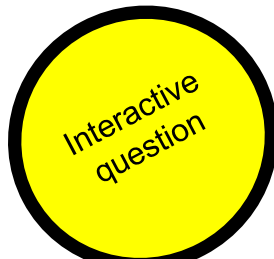
Country	Source	Findings
Cameroon	Okwen MP, Ngem BY, Alomba FA, Capo MV, Reid SR, Ewang E. Uncovering high rates of unsafe injection equipment reuse in rural Cameroon: validation of a survey instrument that probes for specific misconceptions. Harm Reduct J. 2011;8:4.	- The study compared survey data against records of purchases. - Of 98 health workers in two districts, 69 were interviewed to assess injection safety. 44% reported reuse of injection equipment due to shortage of supply.
Egypt	Kandeel AM, Talaat M, Afifi SA, El-Sayed NM, Abdel Fadeel MA, Hajjeh RA et al. Case control study to identify risk factors for acute hepatitis C virus infection in Egypt. BMC Infect Dis. 2012;12:294.	- The case control study investigated risk factors for HCV. - HCV cases (86 patients) were more likely (odds ratio (OR) 23.1, CI 4.7–153) to have received an injection with a reused syringe.
Kenya	Kimani D, Kamau R, Ssempijja V, Robinson K, Oluoch T, Njeru M et al. Medical Injection Use Among Adults and Adolescents Aged 15 to 64 Years in Kenya: Results From a National Survey. J Acquir Immune Defic Syndr. 2014;66:S57–S65	- National data from the Kenya AIDS Indicator Survey 2012 were reviewed. - Data regarding medical injections were collected from participants aged 16–64 years. - Men who had received ≥1 injection in the past 12 months had OR 3.2 of being HIV positive.
India	Patel DA, Gupta PA, Kinariwala DM, Shah HS, Trivedi GR, Vegad MM. An investigation of an outbreak of viral hepatitis B in Modasa town, Gujarat, India. J Glob Infect Dis. 2012;4(1):55–59.	- The study examined the 2009 hepatitis B outbreak in Gujrat. - Of 856 patients screened, 77.5% tested HBV. 40% had a history of receiving injections in the last six months. - Mother-to-child transmission was also identified as a risk in children aged 0–13 years.
Cambodia	Vun MC, Galang RR, Fujita M, Killam W, Gokhale R, Pitman J et al. Cluster of HIV Infections Attributed to Unsafe Injection Practices – Cambodia, December 1, 2014–February 28, 2015. MMWR. 2016;65(6):142–145.	- In a rural community of 8893 people in Battambang province, 242 cases of HIV were reported from December 2014 to February 2015. - Investigation revealed medical injections and infusions as the most likely mode of transmission.

Examples from high-income countries

Country	Source	Findings
United States of America	Taylor L, Greeley R, Dinitz-Sklar J, Mazur N, Swanson J, Wolick J et al. Injection Safety and Vaccine Administration Errors at an Employee Influenza Vaccination Clinic — New Jersey, 2015. MMWR. 2015;64(49):1363–1364.	- The study described reuse of syringes on 67 people for flu vaccines in 2015 in New Jersey by an experienced nurse in a flu immunization clinic. - On three multidose vials, two syringes were used multiple times after wiping with alcohol. - A new needle was used on every person. - The incident resulted in a lengthy investigation and follow-up.
South Korea	Jung S, Kim BG, Kwon D, Park JH, Youn SK, Jeon S et al. An outbreak of joint and cutaneous infections caused by non-tuberculous mycobacteria after corticosteroid injection. Int J Infect Dis. 2015;36:62–69.	- A retrospective case control study in 2012 investigated risk factors of an outbreak of joint and cutaneous infections among patients injected at a single clinic in South Korea. 61 cases of septic arthritis identified were linked with inappropriate preparation of injections and site of injections. - Alcohol swab was prepared using boiled tap water.
France	Germain JM, Carbonne A, Thiers V, Gros H, Chastan S, Bouvet E et al. Patient-to-patient transmission of hepatitis C virus through the use of multidose vials during general anesthesia. Infect Control Hosp Epidemiol. 2005;26(9):789–792.	- In 2001 in Western France an outbreak of hepatitis C was investigated in a private surgery care clinic. - Four HCV negative patients with no history or exposure to risks were found HCV positive. - The investigation revealed that same syringe and needles were used from two different vials from the index patient.

Discussion

1. What are the reasons for unnecessary and unsafe injections in your health care setting?
2. Can you give an example of when you observed breaks in injection safety?
3. What did you do when it happened?



Interactive
question

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 ≥ 2 blood transfusions, ≥ 3 hospitalizations, dental treatment and > 5 injections among women. Among women, ≥ 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), ≥ 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.



Group work 1

- Work in groups of 5–7 people. 30 minutes total.
- Please read the summary of the paper by Janjua et al.
- In your groups answer the questions as per the student handbook:
 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?

Suggested readings

[Reeler AV](#). Anthropological perspective on injections: a review. [Bull World Health Organ](#). 2000;78(1):135-43.

[Pépin J](#), [Abou Chakra CN](#), [Pépin E](#), [Nault V](#). Evolution of the global use of unsafe medical injections, 2000-2010. [PLoS One](#). 2013 Dec 4;8(12):e80948. doi: 10.1371/journal.pone.0080948. eCollection 2013.

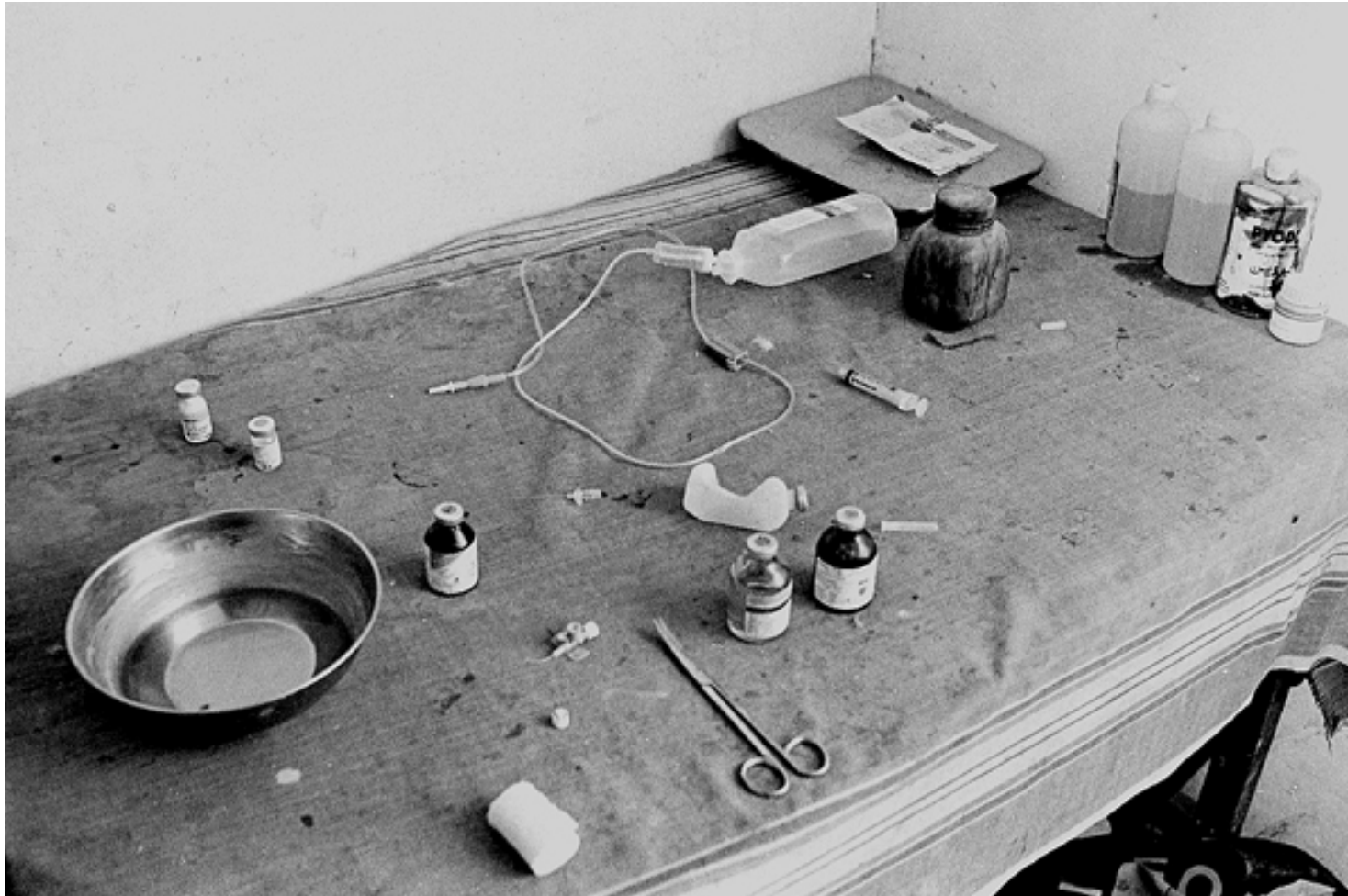
Janjua NZ, Butt ZA, Mahmood B, Altaf A. Towards safe injection practices for prevention of hepatitis C transmission in South Asia: Challenges and progress. *World J Gastroenterol* 2016; 22(25): 5837-5852.



Session 2:

IPC best practices and guidance for safe injections

Is this the making of a safe injection?



Interactive
question

Eliminating unnecessary injections



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

Eliminating unnecessary injections contd.

- Eliminating unnecessary injections should be a high priority for preventing infections associated with unsafe injections.
- Injections should only be prescribed and administered **when medically indicated**.
 - If a medication is prescribed, consider the method of administration.
 - Ask yourself: is an injection really needed, or is there an oral alternative?



Educational leaflet for patients and communities

MAKING SMART INJECTION CHOICES:

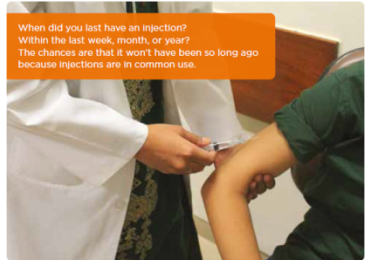
YOUR GUIDE TO SAFE MEDICAL TREATMENT

for patients and communities



MAKING SAFE INJECTION CHOICES

When did you last have an injection?
Within the last week, month, or year?
The chances are that it won't have been so long ago because injections are in common use.



In many cases, injections can be replaced by medicines you take by mouth, which are much safer for you, and just as effective. It is important to make smart injection choices for yourself, and your children.

INJECTIONS SHOULD BE SAFE

Injections can be an effective treatment for many illnesses and diseases. Unsafe injections administered by health care providers may put you at risk of contracting a dangerous infection, such as hepatitis B, hepatitis C or human immunodeficiency virus (HIV).



HOW CAN AN INJECTION BE UNSAFE?

If a syringe or the needle has been re-used and contaminated with infected blood, it can spread infections from one person to another. If you are injected with a syringe that has been used on another person there is a real risk you may become infected.

THE CONSEQUENCES OF UNSAFE INJECTIONS

- **HEPATITIS B** Around 240 million people in the world have hepatitis B, and 8-16 million of these infections are caused by unsafe injections.
- **HEPATITIS C** Unsafe injections are one of the most common causes of hepatitis C. As many as 130-150 million people globally are infected with this virus, which is a major cause of chronic liver disease.
- **HIV** Almost 78 million people have been infected with HIV since the beginning of the epidemic. Although sexual transmission is the most common way to contract HIV, it can also be spread through re-use of syringes and needles.



SYMPTOMS OF ACUTE HEPATITIS:

- Yellowing of the skin and eyes (jaundice)
- Dark urine
- Extreme tiredness
- Nausea, vomiting and stomach pain

PREVENTION IS THE BEST MEDICINE

✓ MEDICINES TAKEN BY MOUTH ARE SAFE, AND THEY WORK

- If you are prescribed an injection, ask your health care provider if the medicine you need is available to be taken by mouth.

✓ MAKE SMART INJECTION CHOICES

- Making smart injection choices will significantly reduce or rule out your risk of infection.
- If you have to have an injection, make sure you see that the syringe and needle are taken from a new, sealed and undamaged package.
- Make sure every injection you are given follows safe hygiene standards.

Ask your health care provider for alternatives. Always say you prefer oral medications if they are available.



For further information please visit: http://www.who.int/injection_safety/en/



Postcard for patients and communities



www.who.int/infection-prevention



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.

Animated video for patients and communities

INJECTIONS



UNSAFE INJECTIONS

SPREAD DEADLY DISEASES

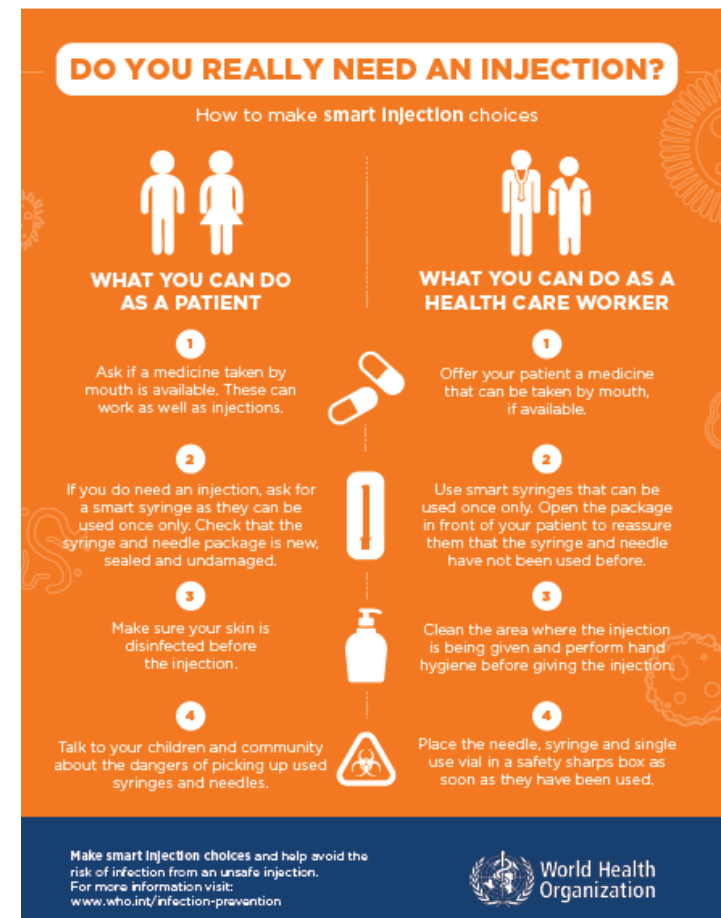


IF YOU NEED AN INJECTION
CHECK THAT IT'S GIVEN
WITH A **NEW SYRINGE
AND NEEDLE** THAT CAN
BE **USED ONCE ONLY.**



THE WORLD HEALTH ORGANIZATION
ESTIMATES ABOUT **16 BILLION INJECTIONS**
ARE GIVEN EACH YEAR WORLDWIDE

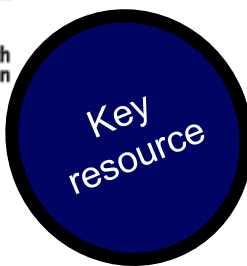
Educational infographics for patients and communities



Key resource

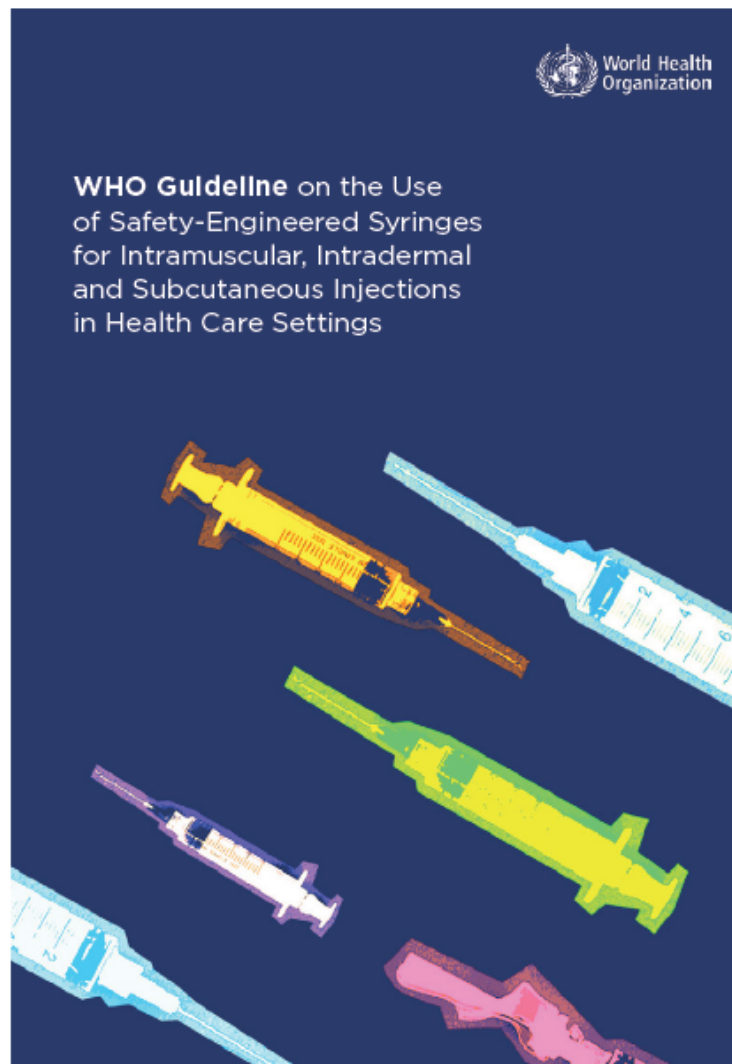
Source: http://www.who.int/infection-prevention/tools/injections/IS_infographic_leaflet.pdf?ua=1

Poster promoting oral medicines



To reduce:

- reuse of injection equipment
- accidental needle-stick injuries
- overuse of injections
- unsafe sharps waste



Safety-engineered injection devices

To ensure:



- rational use of injectable drugs
- sufficient supply availability

Key resource

New policy
2015

Exclusive use by
2020

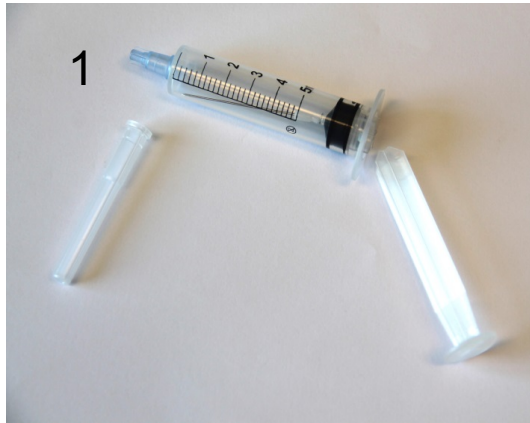
2015 WHO policy: key elements

- Recommendations for transition to **auto-disable (AD)**, **reuse prevention (RUP)** or **sharps injury protection (SIP)** devices for both immunizations and therapeutic injections
- Recommendation to develop standards for rational use and supply of standard disposable syringes where they remain necessary
- Call to partners to fund procurement of safety engineered injection devices in all projects
- Call to industry to switch to "safe" syringes
- Call to countries to develop national policies and implementation strategies, with a special focus on curative settings



Key resource

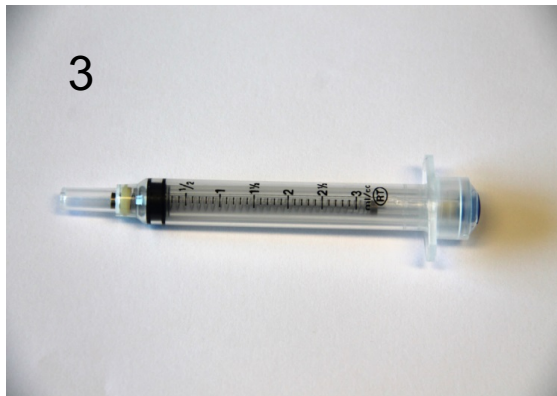
Safety-engineered syringes for therapeutic injections



RUP and SIP



RUP and SIP



RUP and SIP

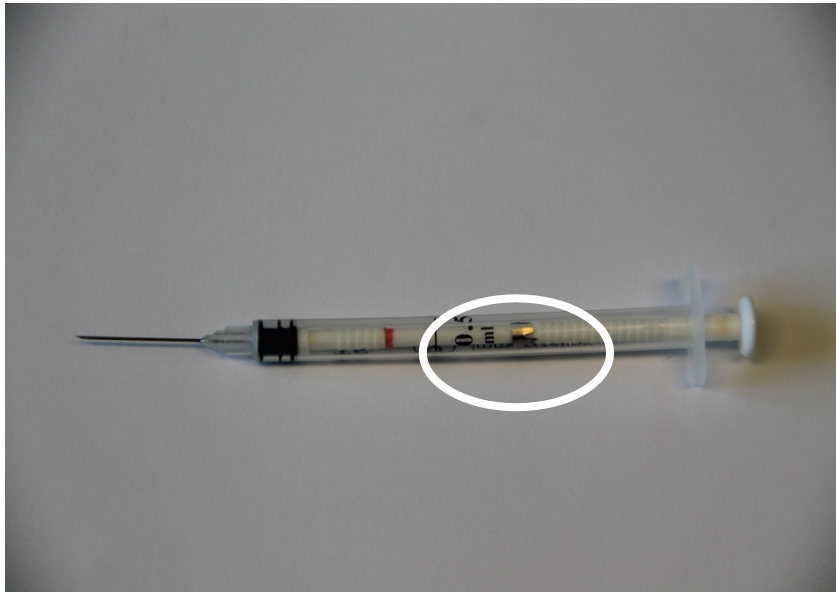


SIP



RUP

Safety-engineered syringes for immunization injections: auto-disabled syringes



The seven steps to safe injections

1 Clean work space	
2 Hand hygiene	
3 Sterile safety-engineered syringe	
4 Sterile vial of medication and diluent	
5 Skin cleaning	
6 Appropriate collection of sharps	
7 Appropriate waste management	



Best injection practices guidelines



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.



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.

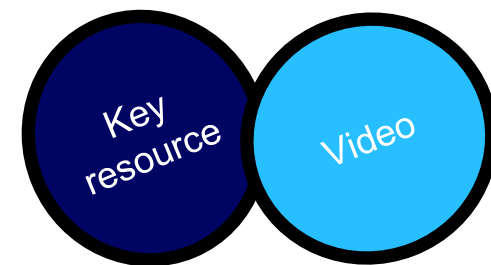


Collect used syringes and needles at the point of use in an enclosed sharps container that is puncture and leak proof, and seal before completely full.

How to give a safe injection – an educational video for health care workers



Source: https://www.youtube.com/watch?time_continue=15&v=nzv4wkQkqQo



Step 1: clean work space

A clean work space or workstation is necessary to avoid contamination and allow safe injection preparations.



Nursing stations in South Asia

Step 2: hand hygiene

Always perform hand hygiene:

- before preparing injection material, before giving an injection, and after giving an injection.

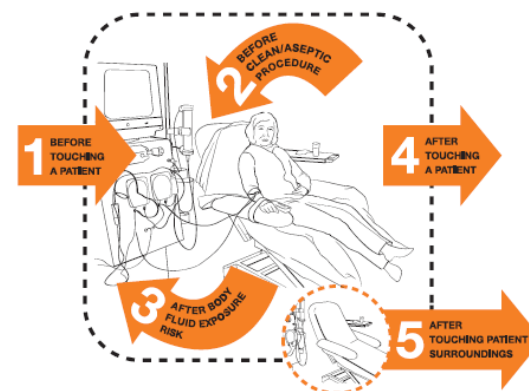
Your 5 Moments for Hand Hygiene



Your Moments for Hand Hygiene Vaccination Campaign



Your 5 Moments for Hand Hygiene Haemodialysis in ambulation care



- Also, avoid giving injections if skin integrity is compromised by local infection of another skin condition (e.g. weeping dermatitis).

See also: WHO's *Hand hygiene in outpatient and home-based care and long-term care facilities* (2012): <http://www.who.int/infection-prevention/tools/hand-hygiene/en/>

Key
resource

Hand hygiene contd.

5 moments for hand hygiene

1 Before patient contact	When? Clean your hands before touching a patient when approaching him or her Why? To protect the patient against harmful germs
2 Before an aseptic task	When? Clean your hands immediately before any aseptic task Why? To protect the patient against harmful germs, including the patient's own germs, entering his or her body
3 After body fluid exposure risk	When? Clean your hands immediately after an exposure to body fluids Why? To protect yourself and the health care environment from harmful patient germs
4 After patient contact	When? Clean your hands after touching a patient and his or her immediate surroundings when leaving Why? To protect yourself and the health care environment from harmful patient germs
5 After touching patient's surroundings	When? Clean your hands after touching any object in the patient's surroundings, when leaving – even if the patient has not been touched Why? To protect yourself and the health care environment from harmful patient germs

Hand hygiene and glove use

- **The use of gloves does not replace the need to clean your hands!**
- **You should remove gloves to perform hand hygiene, when an indication occurs while wearing gloves.**
- **You should wear gloves only when indicated (see the pyramid in the Hand hygiene: why, how and when brochure and in the Glove use information leaflet) – otherwise they become a major risk for germ transmission.**

**STERILE
GLOVES
INDICATED**

Any surgical procedure;
vaginal delivery; invasive
radiological procedures;
performing vascular access
and procedures (central lines);
preparing total parental nutrition
and chemotherapeutic agents.

**EXAMINATION GLOVES
INDICATED IN CLINICAL SITUATIONS**

*Potential for touching blood, body fluids, secretions,
excretions and items visibly soiled by body fluids.*

DIRECT PATIENT EXPOSURE: Contact with blood; contact with
mucous membrane and with non-intact skin; potential presence of
highly infectious and dangerous organism; epidemic or emergency
situations; IV insertion and removal; drawing blood; discontinuation
of venous line; pelvic and vaginal examination; suctioning non-closed
systems of endotracheal tubes.

INDIRECT PATIENT EXPOSURE: Emptying emesis basins; handling/cleaning
instruments; handling waste; cleaning up spills of body fluids.

GLOVES NOT INDICATED (except for CONTACT precautions)

No potential for exposure to blood or body fluids, or contaminated environment

DIRECT PATIENT EXPOSURE: Taking blood pressure, temperature and pulse; performing SC
and IM injections; bathing and dressing the patient; transporting patient; caring for eyes and ears
(without secretions); any vascular line manipulation in absence of blood leakage.

INDIRECT PATIENT EXPOSURE: Using the telephone; writing in the patient chart; giving oral medications;
distributing or collecting patient dietary trays; removing and replacing linen for patient bed; placing non-invasive
ventilation equipment and oxygen cannula; moving patient furniture.

Key
resource

Use of gloves and injections



WHO Best Practices for Injections and Related Procedures Toolkit.

[Show details](#)

[Contents](#) ☒

Search this book

Annex A Indications for glove use in health care

Key elements	Indications	Precautions
Glove use 	Wear non-sterile, well-fitting, single-use gloves: • when handling potentially infectious materials or when coming into contact with contaminated items and surfaces • when there is a likelihood of coming into direct contact with a patient's blood or other potentially infectious materials (e.g. body fluids, moist body substances and saliva [in dental procedures]), mucous membranes and nonintact skin	When undertaking injections, DO NOT use gloves: • for routine intradermal, subcutaneous and intramuscular injections • if the health worker's skin is intact • if the patient's skin is intact. 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.

Key
resource

Step 3: sterile injection equipment

- WHO recommends syringes with RUP features for all injections.
- RUP syringes with a sharps injury protection feature are highly recommended wherever possible.
- Reuse of syringes and needles is a violation of patient safety.
- Always use a new syringe and a needle from a new and sealed package.



**USE STERILE
EQUIPMENT**

Using sterile injection equipment

Discard the needle or syringe if the package has been punctured, torn, damaged or moisture found inside.

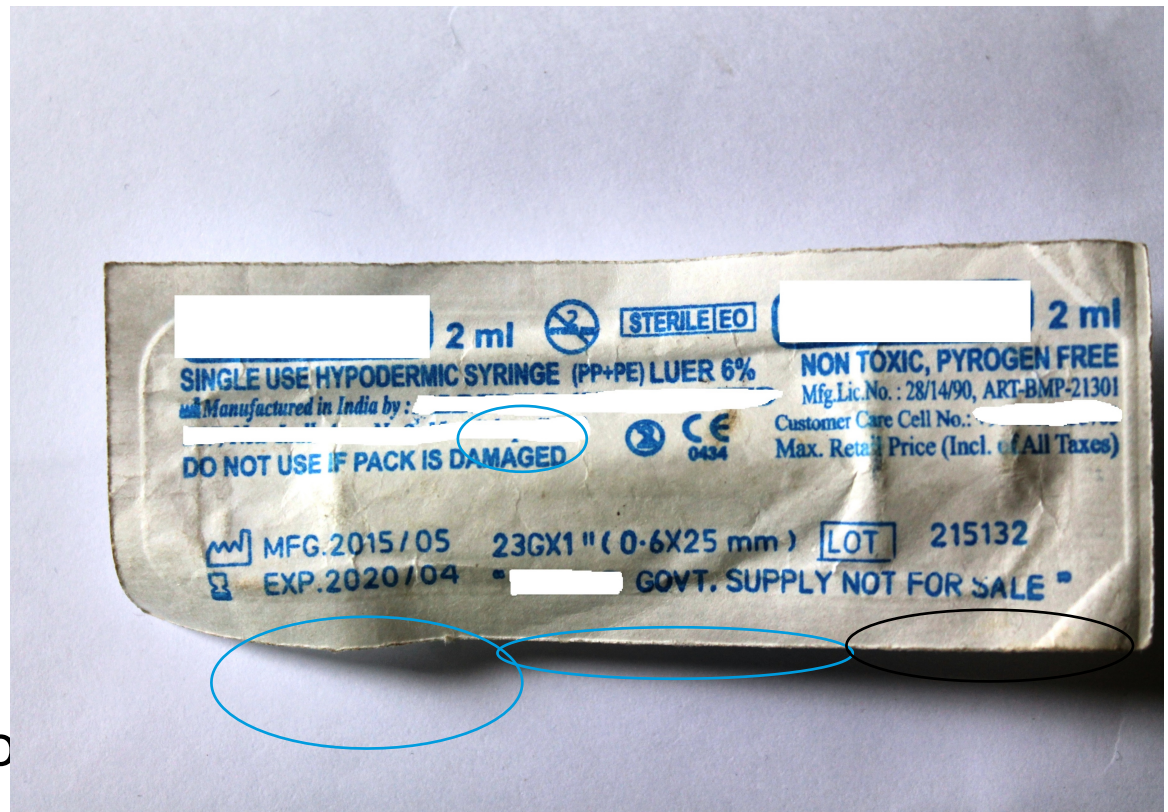
- Punctures, tears and damage constitute breaks in sterile packaging.
- Breaks in a sealed package can lead to contamination.



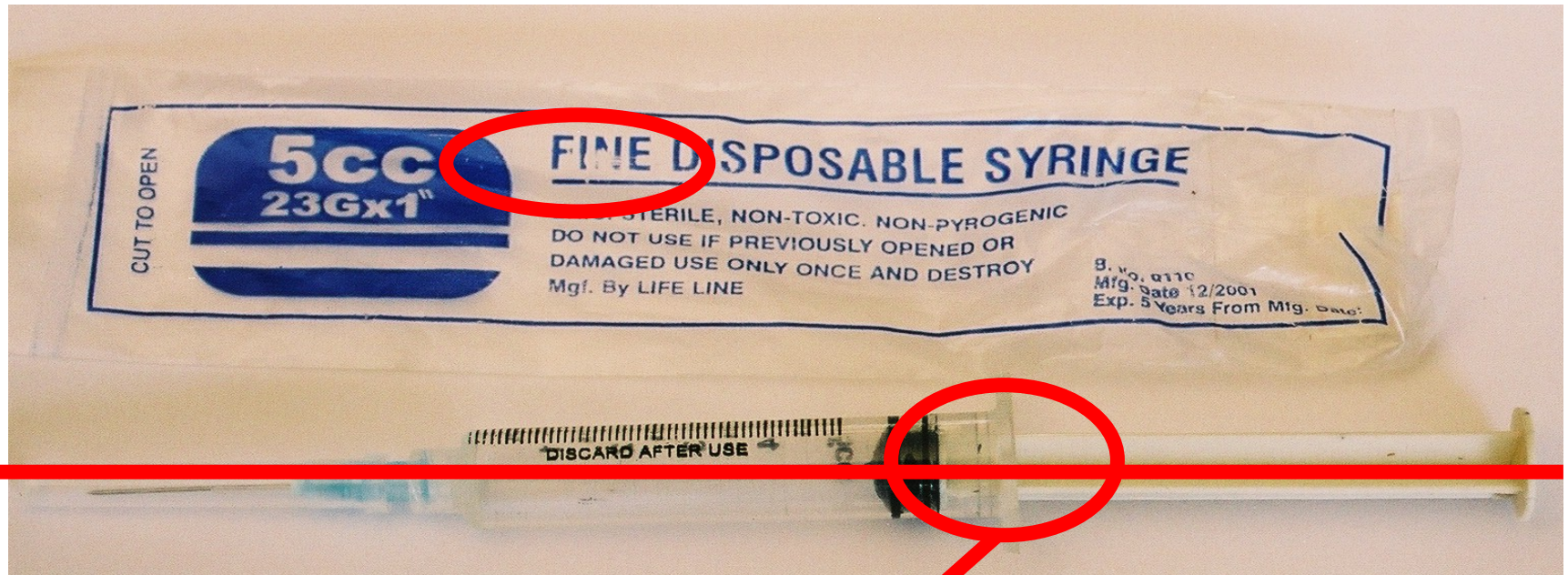
Inspect the packaging

A visual inspection of packaging provides ample detail:

- type of syringe
- volume
- needle size
- lot number
- expiry date
- method of sterilization
- type of packaging



Repackaged? Substandard syringe?



Step 4: sterile vial of medication and diluent

Use single-dose rather than multidose vials

- Many outbreaks have been associated with use of multidose medication vials
- Preservatives are effective but do not eradicate microbial contamination in multidose vials



Frequent use of multidose vials in North Asia

Safe injection practice and vial usage



- A literature review of infection control practices assessed the contribution of single-dose vials independently for infection.
- It reviewed 60 reports from between 1997 and 2011.
- There was good evidence that contamination of multidose or single-dose vials can contribute to infection.

Preventing contamination – vial usage

- Always pierce the septum of the vial with a sterile needle.
- Avoid leaving the needle in the stopper.
 - A needle left in the septum of a multidose vial is a door open to contamination.
 - This practice, associated with reuse of injection equipment on another or even the same patient, leads to cross-infection.



How multidose vials can be used

- Multidose vials should be dedicated to a single patient whenever possible.
- If a multidose vial is found in a patient treatment area, it should be dedicated for single-patient use only.
- A treatment area could be an operating or procedure room.

Preventing contamination – ampoule usage

Select “pop open” ampoules rather than ampoules that require use of a metal file.

- Ampoules that require a metal file can break more easily and lead to laceration of fingers.
- Bleeding lacerations can lead to contamination of injectable substances.



Preventing contamination – protecting fingers

- Protect fingers with a clean barrier (e.g. a small gauze pad) when opening ampoules.
- A clean barrier may protect fingers from ampoule breaks.



Step 5: skin cleaning

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



Skin preparation for different types of injection

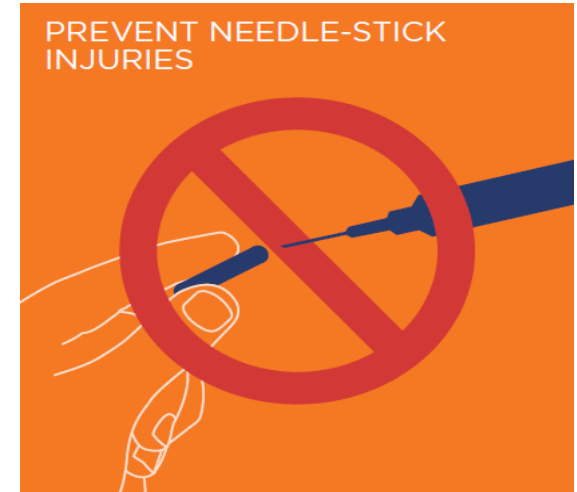
Skin preparation and disinfection		
Type of injection	Soap and water	60–70% alcohol (isopropyl alcohol or ethanol)
Intradermal	Yes	No
Subcutaneous	Yes	No
Intramuscular	Yes ^a	Yes ^a
Immunization	Yes	No
Venous access	No	Yes

^a Unresolved issue because there is a lack of evidence on the need to disinfect the skin before intramuscular injections

Step 6: appropriate collection of sharps

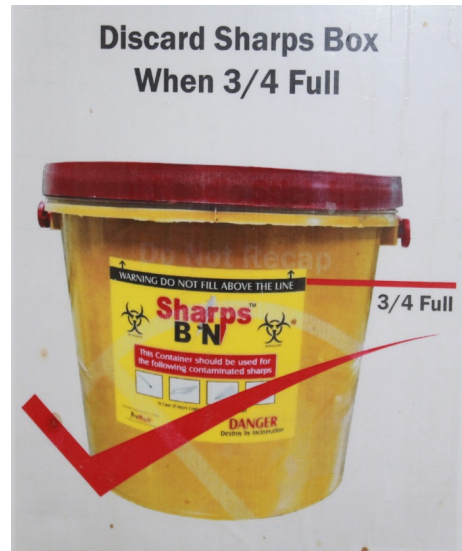


- **Never recap needles.**
- **Place uncapped syringes and needles directly into sharps containers immediately after use.**
- **Sharps containers should be accessible, at every point of care and always within arm's reach.**



Sharps containers/safety boxes

- Never fill a safety box more than three quarters full.
- Once full, seal shut.
- Store in a safe and secure place until it is ready for final disposal.



A safety box must be closed when it is three quarters full

Educational poster for communities – needles and syringes are not toys



Source: http://www.who.int/infection-prevention/tools/injections/IS_syringes-are-not-toys-poster.pdf?ua=1



Seal sharps containers for transport to a secure area



Once closed and sealed do not open, empty or reuse sharps containers.

- Presence of sharps outside sharps containers leads to needle-stick injuries.
- Opening, emptying or reusing sharps containers leads to needle-stick injuries.
- In some countries, used syringes have a value and they can be reprocessed and repackaged, leading to infection among patients.
- A 2003 study found plastic dealers ready to sell used syringes to investigators after washing them.

Step 7: appropriate waste management



- Many health care facilities in low- and middle-income countries have contaminated sharps in their surroundings.
- Sharps in the environment expose the community to needle-stick injuries.
- In many settings children start to pick up and play with sharps, as they are dumped in community waste sites.

Selection of treatment technologies



- Treatment options should comply with national and international standards.
- Depending on local conditions and logistical approaches, the following options can be considered:
 - environmental and safety factors
 - waste characteristics and quantity
 - technology capabilities and requirements
 - cost considerations
 - operations and maintenance requirements.

Technology options

Steam-based treatment

- Used to decontaminate (disinfect/sterilize) infectious and sharp waste by subjecting it to moist heat and steam for a defined period of time, depending on the size and load of the content

Burning

- A dry oxidation process that reduces waste volume and weight – because it releases a wide variety of pollutants, it requires flue gas treatment to minimize pollutants such as sulfur oxide and heavy metals

Chemical treatment

- Infectious waste decontamination using chemicals

Technology options contd.

Autoclaving

- Using a metal vessel designed to withstand high-pressure steam, which is introduced into and removed from the vessel – after treatment waste is considered nonhazardous and can be disposed of accordingly
- Requires electricity between 220 and 400 volts

Microwave technologies

- Microwave energy produces moist heat and steam
- Requires electricity between 230 and 400 volts

Incinerators

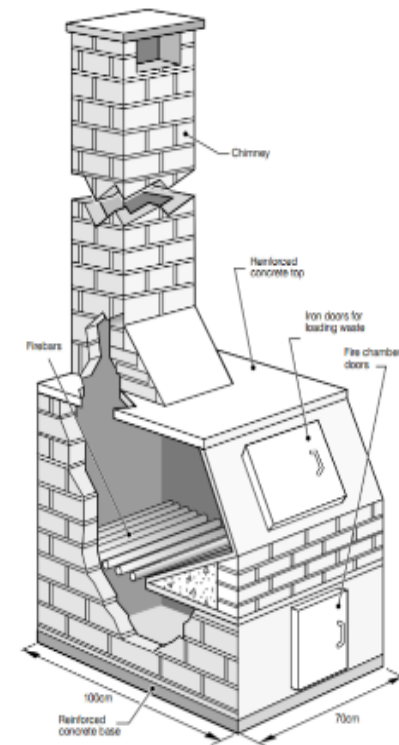
Dual chamber without flue gas treatment

- Primary chamber burns at or above 850°C
- Secondary chamber has burners that burn at 1100–1200°C
- Requires electricity between 220 and 400 volts or fuel for generator

Incinerators contd.

Single chamber without flue gas treatment

- Drum and brick and designed to meet immediate need
- Can work on wood, coconut shells etc.



A useful website

<http://medwastetech.info/>

To search the database for local suppliers, users should follow the four steps listed.



The alternatives database is a web tool, developed by the [Health Care Without Harm Global Team](#), to help staff responsible for procuring healthcare waste treatment

1-Select country

2-Select technology

3-Calculate approx capacity

Select Country

Select Technology

Select Capacity kg/h

Advanced Treatment System

Designed for healthcare waste

Q Search

4-Hit search

Key
resource

In summary

- Unsafe injections, including unnecessary injections, are a global problem.
- Reuse of syringes and needles is a risk factor in transmitting bloodborne infections.
- Contamination (unsafe use of vials or preparing injections in unsanitary areas) is also a major risk.
- Following the seven steps to preparing and giving an injection can reduce the risk to patients and health workers.
- WHO's key recommendation to use safety-engineered syringes for therapeutic injections should be adopted.

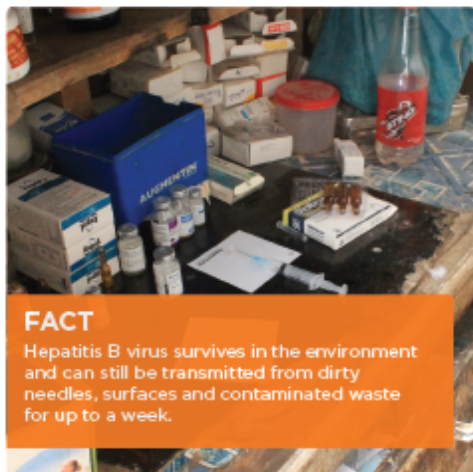
Key resources summarizing the seven steps

PROVIDING SAFE INJECTIONS

HEALTH WORKERS MUST ENSURE EVERY INJECTION IS SAFE

Unsafe injections are driving the spread of deadly infectious diseases among patients, health workers and communities including hepatitis B, C and HIV.

Health workers can significantly reduce or eliminate infections associated with injections and needle-stick injuries. **By following the simple steps summarized in this leaflet every time you give an injection you will protect yourself, your patients and your community.**



FACT

Hepatitis B virus survives in the environment and can still be transmitted from dirty needles, surfaces and contaminated waste for up to a week.

SAFE INJECTION OVERVIEW



A safe injection does not harm the recipient, does not expose the provider to risk and does not result in waste that is dangerous to others. When giving an injection, always:

- ✓ Ensure patients are protected each and every time they receive a medical injection
 - Injections must always be administered in a clean and hygienic environment
 - Re-use of syringes and needles is a violation of patient safety.
- ✓ Only give injections when they are truly needed.
- ✓ Provide all medical injections with safety engineered syringes.
- ✓ Use a new needle and syringe for each patient.
- ✓ Use a single-dose vial every time.
- ✓ Dispose of used needles and syringes responsibly.



MAKE SMART INJECTION CHOICES

INJECTION PROVIDERS' GUIDE FOR SAFE INJECTIONS



All photos
©WHO/Arshad Ali

Key resources summarizing the seven steps contd.

MAKE SMART INJECTION CHOICES

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



USE STERILE EQUIPMENT

Re-use of syringes and needles is a violation of patient safety.

- **Always** use a syringe and needle from a new and sealed package.
- Check packaging carefully before opening – **discard** the syringe and needle if the packaging has been damaged or is moist inside.



PREVENT NEEDLE-STICK INJURIES

- Use syringes with a sharps injury protection (SIP) feature to prevent needle-stick injuries.
- Take precautions to make sure your patient does not move during and after the injection.
- Collect used syringes and needles in a safety box immediately after use.
- Never bend the needle.
- Do not re-cap the needle.



PREVENT CONTAMINATION

Prepare each injection in a clean, hygienic area where there is low risk of blood or body fluid contamination and low risk of splashing, e.g. from a tap/sink.

- ✓ Before undertaking this clean procedure, perform hand hygiene (WHO hand hygiene Moment 2).
- ✓ Use single-use vials. If you have no option but using a multi-dose vial, you must take more care to avoid contamination.
- ✓ Open only one vial at a time.
- ✓ Keep one vial for each patient and store with the patient's name on the vial in a separate treatment or medication room.
- ✗ DON'T store multi-dose vials in the open ward.
- ✓ Pierce the septum of a multi-dose vial with a new, sterile needle.
- ✗ Never leave a needle in place in the stopper of a multi-dose vial.
- ✓ Use 'pop-open' ampoules. If you use an ampoule that requires a metal file to open, protect your fingers with a small gauze pad.
- ✓ Inspect and discard medications which are visibly contaminated or damaged. Always follow the instructions for use, storage and handling.
- ✓ Discard a needle that has touched any non-sterile surface (especially your fingers!).



OTHER IMPORTANT TIPS

- Clean hands between injections; this is WHO hand hygiene Moment 3, "after body fluid exposure/risk."
- You do not usually need to wear gloves to give injections. However they should be used if you anticipate excessive bleeding.
- Remember most injections can be avoided by giving the first-line oral medicines instead.



PROTECT YOUR COMMUNITY - MANAGE WASTE SAFELY

- Close and seal the safety box when three-quarters full.
- To prevent re-use, store the safety boxes in a secure area until they can be taken for final disposal.

Key resource

Key resources summarizing the seven steps contd.



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.





Key resources summarizing the seven steps contd.



MAKE SMART INJECTION CHOICES

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.

 World Health Organization



Suggested reading

[Dentinger C](#), [Pasat L](#), [Popa M](#), [Hutin YJ](#), [Mast EE](#). Injection practices in Romania: progress and challenges. [Infect Control Hosp Epidemiol](#). 2004 Jan;25(1):30-5.

CDC guidelines regarding safe practices for medical injections:

<https://www.cdc.gov/injectionsafety/PDF/FAQs-Safe-Practices-for-Medical-Injections.pdf>

Session 3:



Needle-stick injury prevention

Needle-stick injuries in low-income countries



Country	Source	Findings
Iran	Amini M, Behzadnia MJ, Saboori F, Bahadori M, Ravangard R. Needle-stick injuries among healthcare workers in a teaching hospital. Trauma Mon. 2015;20(4):e18829.	• This cross-sectional study in a teaching hospital in Tehran in 2013 collected data from 344 health workers. • Only 50.2% of injuries had been reported; 67.8% of respondents had experienced a needle-stick injury. • Of all the injuries, 71.1% were due to injections.
India	Jaybhave DR, Dahire PL, Nagaonkar AS, Vedpathak VL, Deo DS, Kawalkar UG. Needle stick injuries among health care workers in tertiary care hospital of rural India. Int J Med Sci Public Health. 2014;3(1) 49-52.	• A study in a tertiary care hospital in rural India collected data on needle-stick injuries from 220 nurses and doctors in 2012. • 49% reported experiencing a needle-stick injury, but only 31.2% reported to the system.
Nigeria	Isara AR, Oguzie KE, Okpogoro OE. Prevalence of needlestick injuries among healthcare workers in the accident and emergency department of a teaching hospital in Nigeria. Ann Med Health Sci Res. 2015 Nov-Dec;5(6):392-6. doi: 10.4103/2141-9248.177973.	• This cross-sectional study was conducted among 122 health workers in Nigeria in 2014. • 51% reported experiencing a needle-stick injury in the past 12 months and 62% did not report it.

Types of needle that cause needle-stick injuries

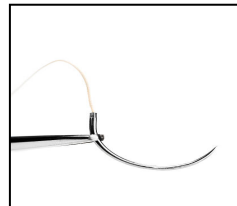
- Hypodermic needles



- Blood collection needles



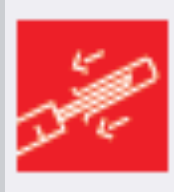
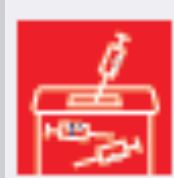
- Suture needles



- Needles used in intravenous delivery systems



When needle-stick injuries occur

Sudden patient movement during the injection	
Recapping the needles	
Transferring body fluids between containers	
Failing to dispose of used needles properly in a puncture-proof safety box	

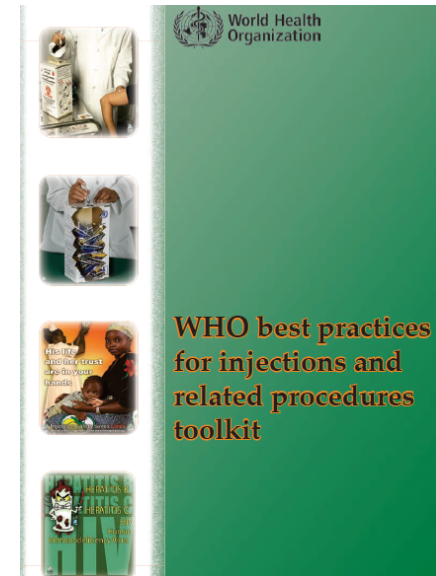
If you get a needle-stick injury

Take the following actions immediately.

1. Wash the wound with soap and water.
2. Inform your supervisor and follow the needle-stick injury reporting mechanism of your health facility.
3. Identify the source patient, who should be tested for HIV, hepatitis B and hepatitis C infections.

Note: tests should be carried out after patient counselling and consent.

4. Be tested for HIV, hepatitis B and hepatitis C infections.
5. Read *WHO best practices for injections and related procedures toolkit*.



Exposure to HBV and management



- Risk of HBV infection is related to the degree of contact with blood and the hepatitis B e antigen (HBeAg) status of the source patient. HBeAg is an indicator of high infectivity.
- Studies have shown that among health care workers who sustained injuries with blood containing HBV, the risk of developing clinical hepatitis if the blood was both hepatitis B surface antigen (HBsAg) and HBeAg positive was 22% to 31%.
- The risk of developing clinical hepatitis from a needle contaminated with HBsAg positive and HBeAg negative blood was 1% to 6%.

Follow-up for HBV exposure

- Post-exposure prophylaxis (PEP) for HBV is based on hepatitis B vaccine, either alone or combined with hepatitis B immune globulin (HBIG).
- Among nonvaccinated health care workers, the initial dose of vaccine must be administered soon after exposure.

Source of exposure	Unvaccinated or incomplete (< 3 doses)	Vaccinated (3 or more doses)
Unknown or hepatitis B positive	• Initiate and complete vaccination • Give HBIG (where available)	No PEP
Negative	Initiate and complete vaccination	No PEP

Efficacy of HBV PEP

Regimen	Prevention of HBV infection
Multiple doses (two) of HBIG alone when 1 st dose initiated within 1 week	70–75%
Hepatitis B vaccine series alone	70–75%
Combination of HBIG and vaccine series	85–95%

Sources:

- Beasley RP, Hwang LY, Stevens CE, Hsieh FJ, Wang KY, Sun TS et al. Efficacy of hepatitis B immune globulin for prevention of perinatal transmission of the hepatitis B virus carrier state: final report of a randomized double-blind, placebo-controlled trial. *Hepatology*. 1983;3:135–141.
- Grady GF, Lee VA, Prince AM, Gitnick GL, Fawaz KA, Vyas GN et al. Hepatitis B immune globulin for accidental exposures among medical personnel: final report of a multicenter controlled trial. *J Infect Dis*. 1978;138:625–638.
- Hepatitis B immune globulin 1 (human). Research Triangle Park, NC: Grifols Therapeutics Inc; 2012.
- Prince AM, Szmuness W, Mann MK, Vyas GN, Grady GF, Shapiro FL et al. Hepatitis B "immune" globulin: effectiveness in prevention of dialysis-associated hepatitis. *N Engl J Med*. 1975;293(21):1063–1067.
- Seeff LB, Zimmerman HJ, Wright EC, Finkelstein JD, Garcia-Pont P, Greenlee HB et al. A randomized, double blind controlled trial of the efficacy of immune serum globulin for the prevention of post-transfusion hepatitis: a Veterans Administration cooperative study. *Gastroenterology*. 1977;72:111–121.

Follow-up for HBV-exposed health workers



- Follow-up testing for antibodies to hepatitis B should take place among those who receive vaccine in response to exposure.
- Testing should be done 1–2 months after the last dose.
- If HBIG has been given in the past 3–4 months it is not possible to determine the response to the vaccine.

Exposure to HCV

- Risk of HCV transmission is relatively low.
- Seroconversion rate after accidental percutaneous exposure from an HCV source is 1.8% (range 0–7%).
- One study indicated transmission from hollow-bore needles only.
- HCV is rarely transmitted from exposure of mucous membrane or nonintact skin to contaminated blood

Sources: Centers for Disease Control and Prevention. Updated U.S. public health service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis. MMWR. 2001;50(RR11):21–23: <http://www.cdc.gov/MMWR/preview/MMWRhtml/rr5011a1.htm>.

Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR. 1998;47(RR19):1–39: https://www.cdc.gov/mmwr/preview/ind1998_rr.html

Management of HCV exposure

- No PEP is recommended following injury involving HCV-positive blood.
- Immunoglobulin and antiviral agents are not recommended.
- There is no vaccine against HCV.
- Identify infection and refer for evaluation of treatment options.
- Steps after HCV exposure are:
 - baseline testing for antibodies
 - alanine aminotransferase (ALT).

Follow-up for HCV exposure

- Test for anti HCV and ALT 4–6 months after exposure.
- Test for ribonucleic acid 4–6 weeks after exposure if early diagnosis is desired.
- Confirm repeatedly positive results in anti-HCV enzyme immunoassays with supplemental tests.
- If health care worker is seroconverted refer to a specialist.

Exposure to HIV

- Risk of HIV transmission after a percutaneous injury is approximately 0.3%.
- Risk may be higher in countries with higher prevalence or in health care settings where reuse of medical supplies and equipment is higher and overall safety standards are low.

HIV PEP following occupational exposure



PEP recommended	PEP not recommended
PEP is recommended if exposure meets all the following criteria: • the exposure took place within 72 hours; • the exposed individual is not known to be HIV infected; • the source of exposure is HIV infected or of unknown status; • exposure was caused by one or more of the following: • blood, body tissue, visibly blood-stained fluid, concentrated virus, cerebrospinal fluid, synovial fluid, peritoneal fluid, pericardial fluid, amniotic fluid.	PEP is not recommended if any of the following apply: • more than 72 hours has elapsed since the exposure; • the exposed person is already HIV positive; • exposure was to body fluids from a person known to be HIV negative (unless suspected of being high risk and in the “window period”); • exposure was to noninfected body fluid (faeces, saliva, urine or sweat); • only intact skin was exposed.

HIV PEP following occupational exposure contd.

PEP recommended	PEP not recommended
• exposure was through one or more of the following: • skin penetration with spontaneous bleeding or deep puncture • splash of significant amount of fluid to mucous membrane • if skin penetration occurred, exposure was from a recently used hollow-bore needle or other sharp object visibly contaminated with blood	

Evaluation of HIV infection

Type of exposure	Source HIV positive	Source HIV status unknown	Source HIV negative
Percutaneous injury, more severe	Recommend two-drug regimen	Consider HIV prevalence in population or subgroup	DO NOT recommend PEP, provided there is no risk that the source patient might be in the “window period”
Percutaneous injury, less severe	Recommend two-drug regimen	DO NOT recommend PEP	DO NOT recommend PEP
Splash, more severe	Recommend two-drug regimen	Consider HIV prevalence in population or subgroup	DO NOT recommend PEP provided there is no risk that the source person might be in the “window period”
Splash, less severe	DO NOT recommend PEP; two-drug regimen optional	DO NOT recommend PEP	DO NOT recommend PEP

Issues of PEP counselling

- PEP is for 28 days only and is not a treatment for HIV.
- HIV treatment is based on a combination of antiretrovirals to be taken continuously.
- Adherence is of high importance.
- Recommendations should include use of condoms and avoidance of donating blood, sperm or organs until a test six months after exposure is negative.
- Information on contraception should be given to women of childbearing age.
- Information on alternatives to breastfeeding should be given to lactating mothers.

Source: WHO (2010) Best practices for injections and related procedure toolkit. Available at: http://www.who.int/infection-prevention/publications/best-practices_toolkit/en/

Follow-up for HIV exposure

- The aim of follow-up visits is to:
 - support PEP adherence
 - prevent or treat side-effects of PEP
 - identify possible seroconversion
- Evaluation within 72 hours is important to monitor possible drug reactions.
- Test for HIV antibodies at baseline, six weeks and six months after exposure.
 - If seroconversion occurs, refer for treatment, care and support.
- Test for HIV antibodies if illness compatible with an acute antiretroviral syndrome occurs.

Reporting HIV exposure

- Reporting of the incident is important to evaluate the safety of working conditions and appropriate measures.
- All reports should be confidential.
- Information will be useful for future prevention.
 - For example, an incident of exposure can be helpful in evaluating health practices, policies and even products in use.
- Data collected are of two kinds:
 - data for risk assessment and post-exposure engagement
 - data that describe the circumstances of exposure – these are helpful in making recommendations for future prevention.

Questions

- Have you ever experienced a needle-stick injury?
- In your opinion what factors contributed to your needle-stick injury?
- Did you report it or not?
- Have you ever noticed a sharp being disposed of inappropriately? Did you report it to someone?
- How would you initiate a needle-stick reporting system in your facility and at the country level?

Interactive
question

Group work 2



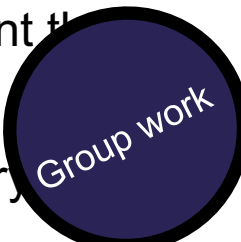
Scenario

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 HCV 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?



Eliminating unnecessary injections



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

Guidance on protection

- WHO recommends syringes with RUP features for all injections.
- RUP syringes with SIP features are highly recommended wherever possible.



Cost of SIP syringes

- Syringes with SIP features cost more than RUP syringes.
- RUP syringes cost about US\$0.05–0.08, while SIP syringes cost about US\$0.09–0.25 per syringe
- This could be an issue in low- and middle-income countries.
- However, if manufacturers are involved in discussions, prices may be able to be negotiated.

Protecting yourself and 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.

Reminder: protect the community

- Ensure waste is disposed of properly within the facility. It is your responsibility to ensure that **NO** infected waste reaches the community, where these items can be attractive to children to play with.



Leaflet on needlestick injuries



MAKE SMART INJECTION CHOICES

PREVENT NEEDLE-STICK INJURIES



World Health Organization

Key resource

Source: http://www.who.int/infection-prevention/tools/injections/IS_needlestick_Leaflet.pdf?ua=1

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: http://www.who.int/injection_safety/toolbox/9789241599252/en/

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

Leaflet on needlestick injuries contd.



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 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: http://www.who.int/injection_safety/en/



Key resource



All photos ©WHO/Arshad Altar.



Suggested reading

WHO (2010) Best practices for injections and related procedure toolkit. Available at: http://www.who.int/infection-prevention/publications/best-practices_toolkit/en/

NHS What should I do if I injure myself with a used needle? Available at: <https://www.nhs.uk/chq/Pages/2557.aspx?CategoryID=72>

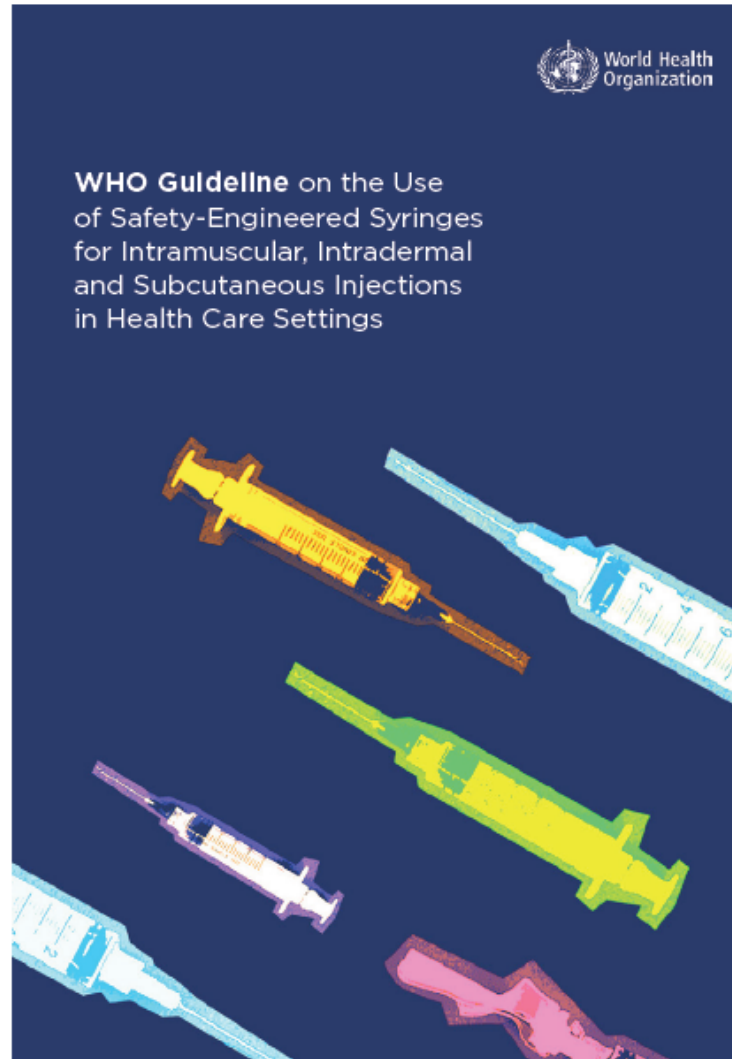


Session 4:

Injection safety implementation strategies

To reduce:

- reuse of injection equipment
- accidental needle-stick injuries
- overuse of injections
- unsafe sharps waste



To ensure:



- rational use of injectable drugs
- sufficient supply availability

Group work 3



- 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?



Key features of a national injection safety implementation strategy/campaign

- Political commitment
- Communication strategy for advocacy and awareness-raising
- Budget allocation and strategy for donor engagement
- Industry engagement/procurement strategy
- Target audience and stakeholder engagement strategy
- Health care worker safety, education and training
- Public awareness-raising and patient education and involvement
- Evaluation plan and indicators

Key features of an injection safety campaign at the facility level



- Commitment by facility management
- Budget allocation for injection safety
- Sensitization and awareness strategy for health care workers at the facility
- Procurement of safety-engineered devices
- Training plan for health care workers (including nurses, physicians, paramedics, housekeeping and sanitation workers)
- Patient education plan/material at inpatient and outpatient levels
- Waste management
- Ongoing evaluation plan and indicators

WHO injection safety campaign



Multimodal

Collective Effort



MAKE SMART INJECTION CHOICES

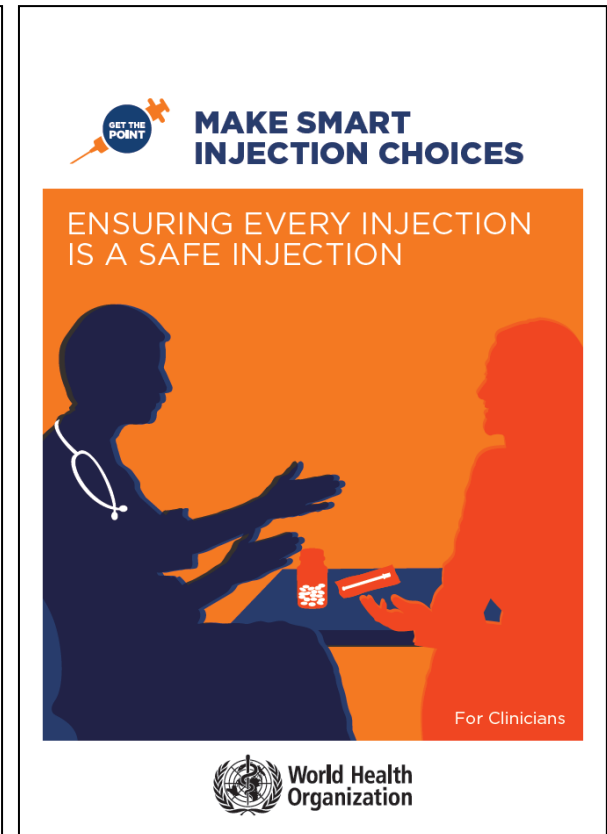
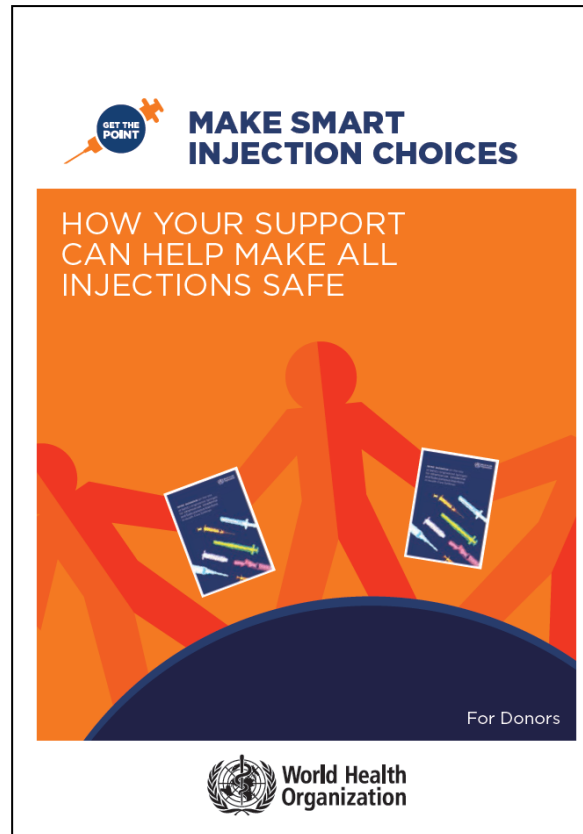
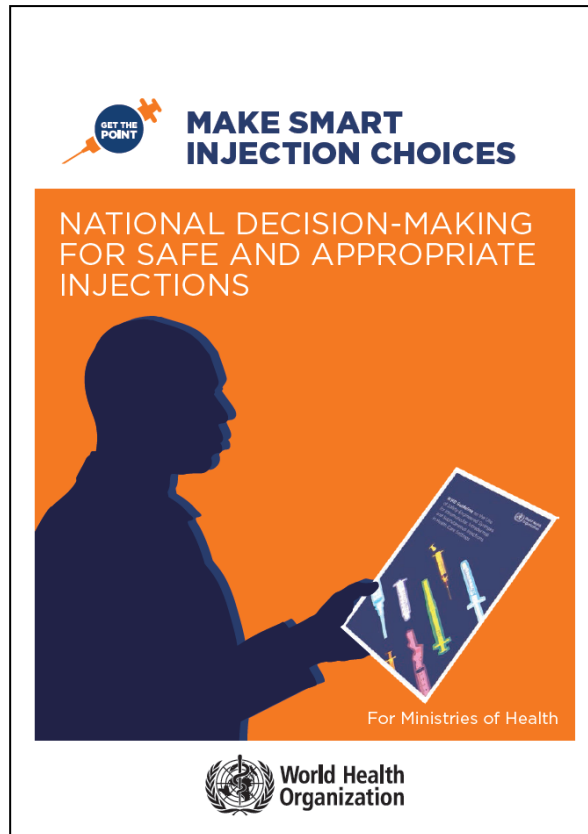


INJECTIONS: FAITES LES BONS CHOIX

Country example: India

- The Ministry of Health and Family Welfare in India has been aware of the problem and shown leadership and commitment to improve injection safety in the country.
- The State of Punjab has developed a comprehensive plan, which includes a detailed baseline assessment, and has initiated the process of introducing RUP syringes to the health system.
- At the district level, 40 model injection safety centres were established, as well as teaching and nursing institutes, to serve as training sites.
- A communication campaign was rolled out in 2017, targeting patients and communities.

Advocacy leaflets for ministries of health, donors and clinicians



Key
resource

Source: <http://www.who.int/infection-prevention/tools/injections/communications/en/>

Advocacy leaflets for health care providers, professional associations and industry members



MAKE SMART INJECTION CHOICES

SAFE INJECTION PRACTICES



For Health Care Providers



World Health Organization



MAKE SMART INJECTION CHOICES

GUIDING SAFE AND APPROPRIATE INJECTION PRACTICES



For Professional Associations

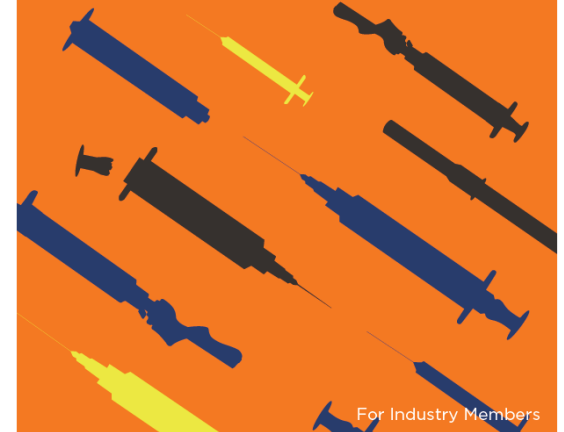


World Health Organization



MAKE SMART INJECTION CHOICES

HOW SMART TECHNOLOGY CAN HELP MAKE INJECTIONS SAFE



For Industry Members

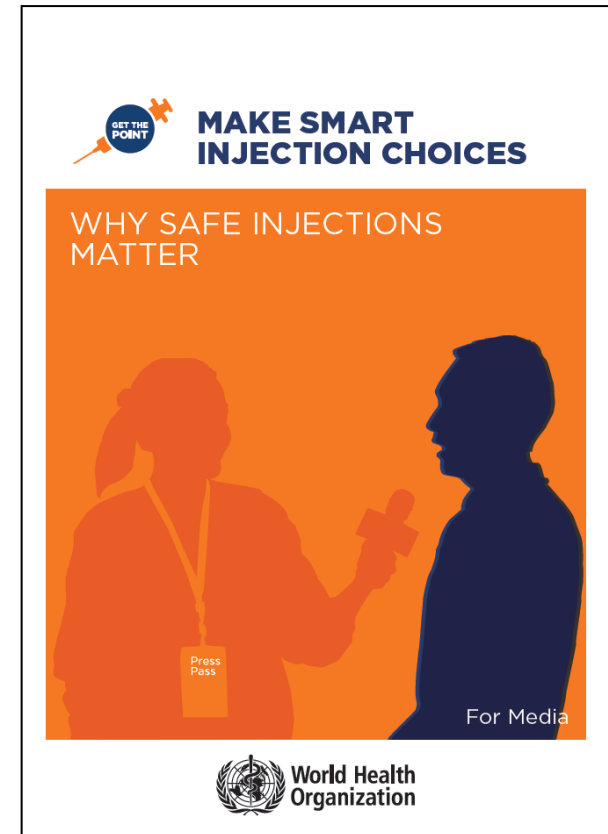
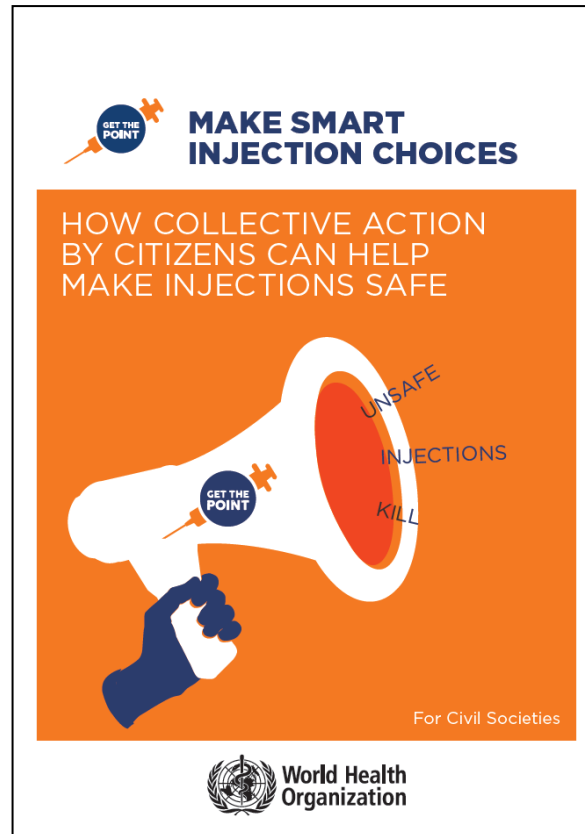
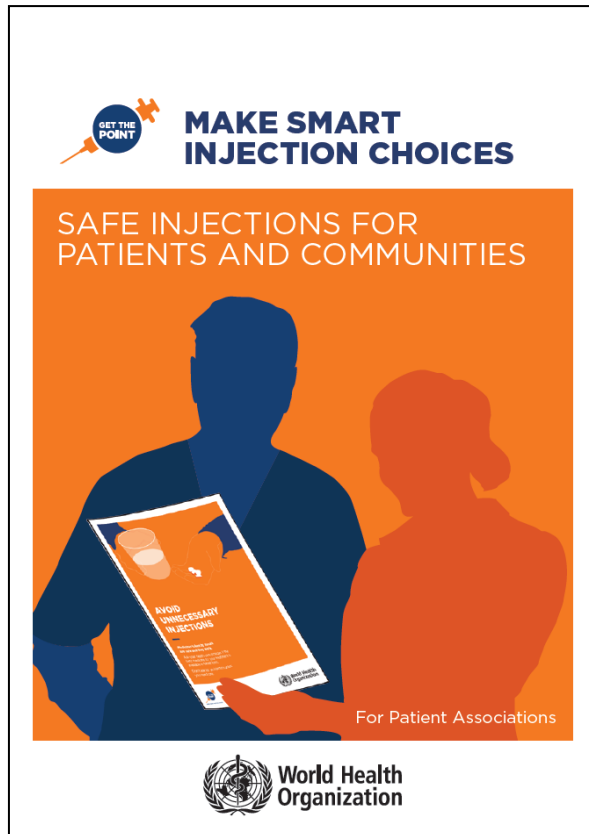


World Health Organization

Key
resource

Source: <http://www.who.int/infection-prevention/tools/injections/communications/en/>

Advocacy leaflets for patient associations, civil society and media organizations

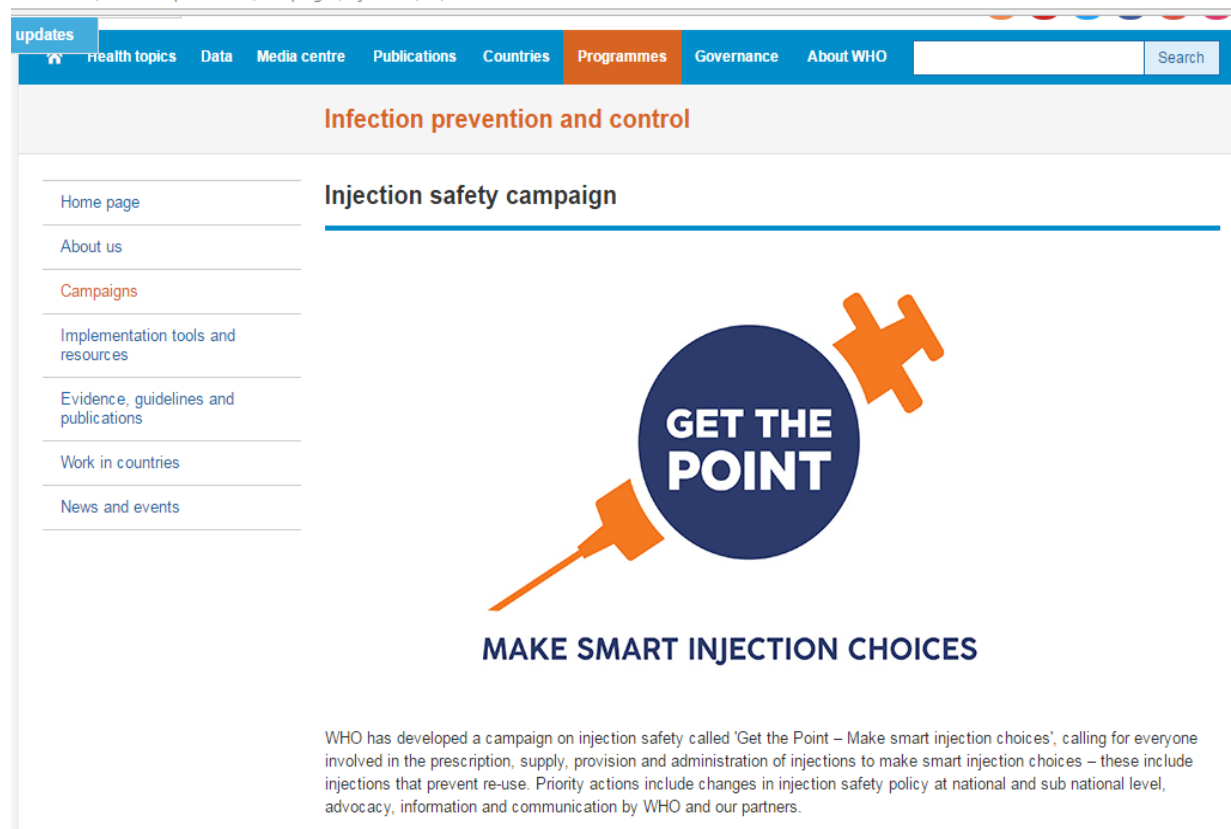


Key
resource

Source: <http://www.who.int/infection-prevention/tools/injections/communications/en/>

WHO injection safety page

www.who.int/infection-prevention/campaigns/injections/en/



The screenshot shows the WHO website's 'Infection prevention and control' section. The main heading is 'Injection safety campaign'. Below it is a large graphic with a blue circle containing the text 'GET THE POINT' and an orange syringe icon. Below the graphic is the text 'MAKE SMART INJECTION CHOICES'. At the bottom, a paragraph states: 'WHO has developed a campaign on injection safety called 'Get the Point – Make smart injection choices', calling for everyone involved in the prescription, supply, provision and administration of injections to make smart injection choices – these include injections that prevent re-use. Priority actions include changes in injection safety policy at national and sub national level, advocacy, information and communication by WHO and our partners.'

updates

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Infection prevention and control

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Evidence, guidelines and publications

Work in countries

News and events

Injection safety campaign



MAKE SMART INJECTION CHOICES

WHO has developed a campaign on injection safety called 'Get the Point – Make smart injection choices', calling for everyone involved in the prescription, supply, provision and administration of injections to make smart injection choices – these include injections that prevent re-use. Priority actions include changes in injection safety policy at national and sub national level, advocacy, information and communication by WHO and our partners.



Source: <http://www.who.int/infection-prevention/campaigns/injections/en/>

Suggested reading



WHO guidelines on injection safety available at: http://www.who.int/infection-prevention/publications/is_guidelines/en/



WHO Infection Prevention and Control Global Unit

