



## Reducing UPOPs and Mercury Releases from The Health Sector in Africa

### *Module 9*

# *Sharps: Handling & Mitigation Measures*

**UNDP**

**Istanbul Regional Hub for Europe and the CIS**

**Key Plaza, Abide-i Hürriyet Cd. İstiklal Sk. No/11, Şişli, 34381**

**İstanbul, Turkey**

**Email: [XXX@undp.org](mailto:XXX@undp.org)**

**Tel: +90 xxxxxx**





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  - Safer design
  - Collection containers
  - Training
  - PPE
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- ▶ Recording sharps incidents
- ▶ Summary





# Background

- Sharps' are needles, blades (such as scalpels) and other medical instruments that are necessary for carrying out healthcare work and could cause an injury by cutting or pricking the skin.
- A sharps injury is an incident, which causes a needle, blade (such as scalpel) or other medical instruments to penetrate the skin. This is sometimes called a percutaneous injury.
- In 2007, the World Health Organization estimated annual global needlestick injuries at 2 million per year
- The European Biosafety Network estimated 1 million needlestick injuries annually in Europe (2010)
- The main risk from a sharps injury is the potential exposure to infections such as blood-borne viruses (BBV).



# Example: Directive 2010/32/EU

Directive 2010/32/EU - prevention from sharp injuries in the hospital and healthcare sector implements:

The Framework Agreement on prevention from sharp injuries in the hospital and healthcare sector signed by the European social partners HOSPEEM and EPSU on 17 July 2009, which is an annex to this Directive

The purpose of the Directive is to implement the Framework Agreement so as:

- ▶ to prevent workers' injuries caused by all medical sharps (including needle sticks);
  - ▶ to protect workers at risk;
- ▶ to set up an integrated approach establishing policies in risk assessment, risk prevention, training, information, awareness raising and monitoring;



# Example: Directive 2000/54/EC

Directive 2000/54/EC (safety of workers exposed to biological agents) states:

“Where prevention of workers exposure is not possible, the risk of exposure must be limited to as low a level as necessary in order to adequately protect the health and safety of the workers concerned, in particular by the following measures which are to be applied in light of the results of the risk assessment:

- keeping as low as possible the number of workers likely to be exposed;
- design of work processes and engineering control measures so as to avoid or minimise the release of biological agents into the workplace.”



# National Example TRBA 250

In Germany, the use of safety-engineered sharps is mandated by the Technical Rule 250 (TRBA 250) except in cases where it can be guaranteed that the patient being treated does not carry a blood-borne pathogen.

Spain provides its own picture of safety device regulation and adoption. Legislative and regulatory powers reside in each of the individual autonomous regions of Spain, and legislation mandating the use of safety devices now exists in five of the autonomous regions (Balears, Madrid, Castilla la Mancha, Galicia, Navarra).



# Case study: United Kingdom (EBN 2016)

- ▶ HSE has conducted 40 inspections in UK on compliance with Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 which derive from the Sharps Directive.
  - ▶ Health and safety breaches were identified in approximately 90% of the hospitals visited.
  - ▶ 83% of breaches failed to comply with the Sharps Regulations.
  - ▶ 10 improvement notices have been issued so far to at least a third of the hospitals visited.
- ▶ Inspections were conducted over two years and formally finished at the end of 2015 but Inspectors are still picking up further breaches.



# Case study in Azerbaijan

- ▶ Conducted using an easy to answer questionnaire
  - 10 - 50 participants per hospital (related to the size)
- ▶ Questionnaire
  - Part A: Anonymous questions about the person
    - Position in the hospital, gender, age, time working in the institution
  - Part B: Questions about the **personal opinion** of the waste management situation in the hospital
    - 4 main sectors, 6 questions each. 24 questions randomly spread
- ▶ Healthcare facilities covered in Azerbaijan
  - 57 (Hospitals, Polyclinics, Medical Points, Research Institutes)
- ▶ Azer Working Group were conducting the assessment



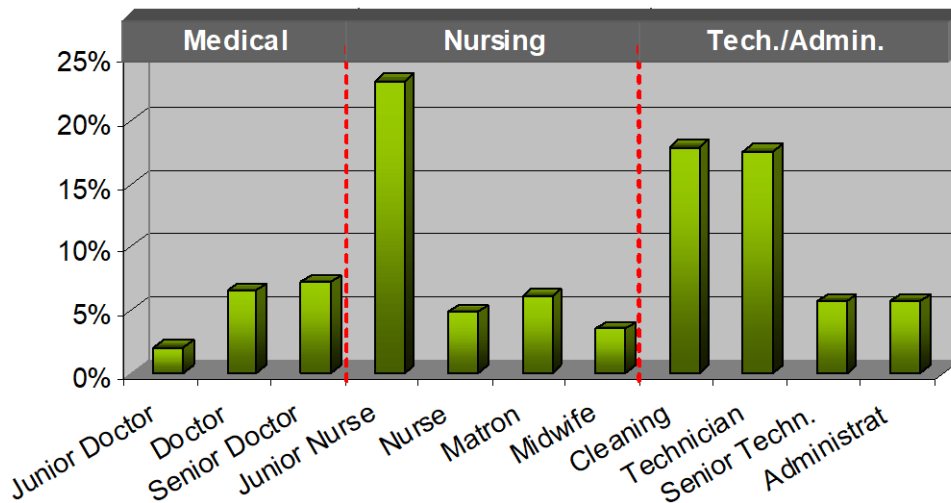


# Case study in Azerbaijan: Evaluation

- 722 collected questionnaires
- 81 % female, 19 % male
- Age structure
  - <25 Years, 42 persons (6%)
  - 25-34 Years; 141 persons (20%)
  - 35-50 Years; 305 persons (43%)
  - >50 Years; 224 person (31%)

Position	Number	%
Junior Doctor	15	2%
Doctor	47	6%
Senior Doctor	52	7%
Junior Nurse	168	23%
Nurse	35	5%
Matron	44	6%
Midwife	25	3%
Cleaning	130	18%
Technician	127	18%
Senior Techn.	41	6%
Administrat	41	6%
<b>Total</b>	<b>725</b>	<b>100%</b>

Participants by Position

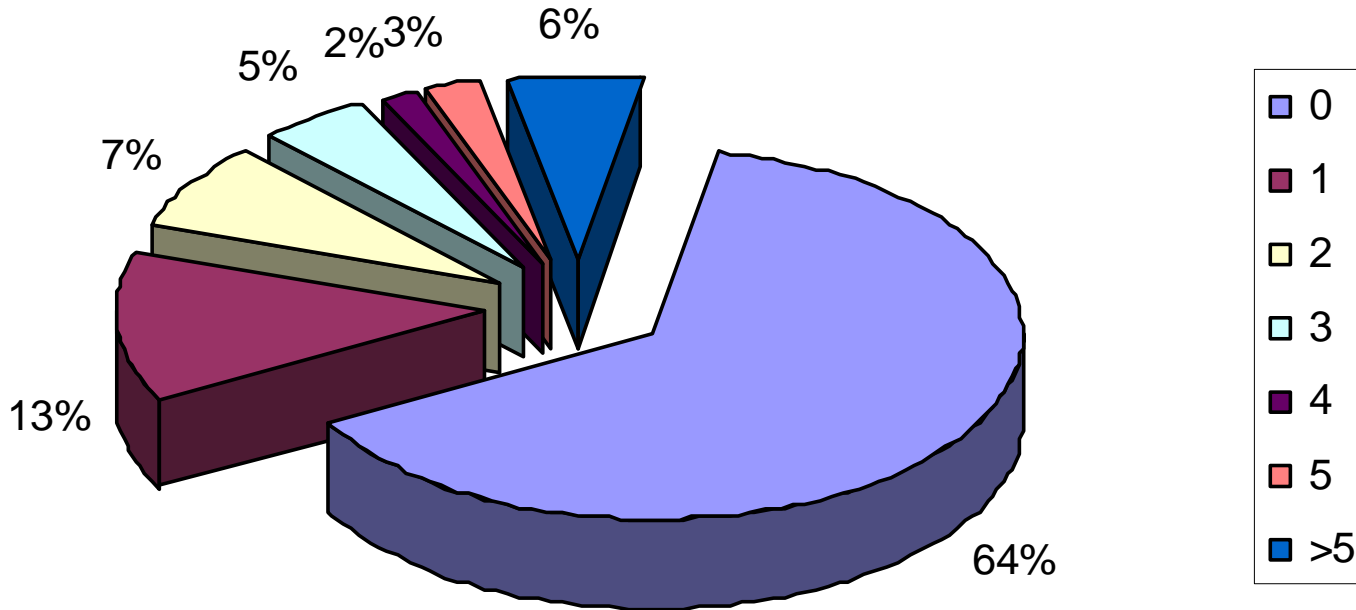




# Case study in Azerbaijan: Evaluation II

Percentage of persons who received sharps accidents during the last 12 months:

Percentage of amount of accidents per staff per year





# Sharps injuries – Potential infection

- The main issue with sharps injuries is the potential risk of infection
- The risk of infection is dependant on many factors:
  - The prevalence of infection in patients,
  - The frequency and type of exposure,
  - The transmission rate of the infection (what disease etc),
  - The susceptibility of the host.
- **Prevention is better than a cure!!!**



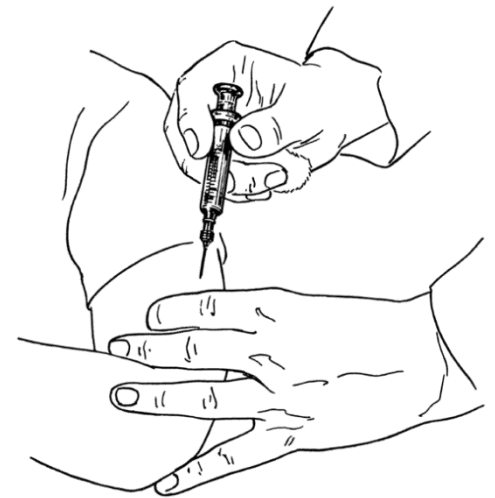
# Mitigation measures

## Universal measures:

- Precautionary Principle: treat all blood/bodily fluids as potentially infectious (conduct a risk assessment if required)
- Must be observed in **all** situations where there is contact with potentially infectious materials

## Mitigation measures:

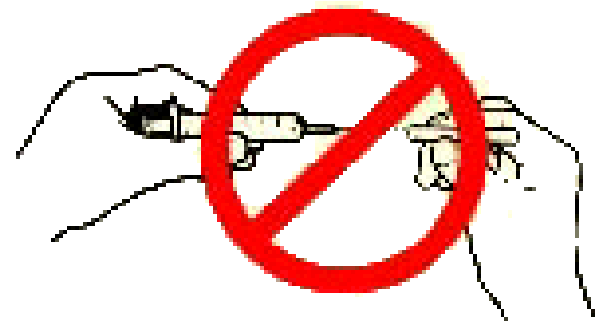
- (a) Elimination
- (b) Safe Place options
- (c) Safe Person options





# Mitigation measures II

- Avoid injections (where possible)
- Use safer sharps designs
- Use sharps containers
- Train staff in sharps safety (include no recapping policy etc)
- PPE (gloves etc)
- Vaccination





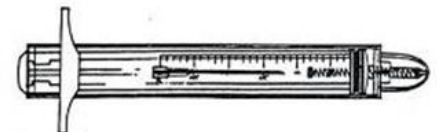
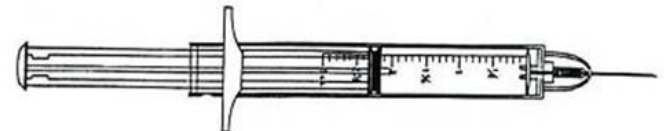
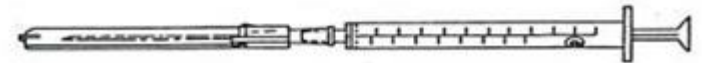
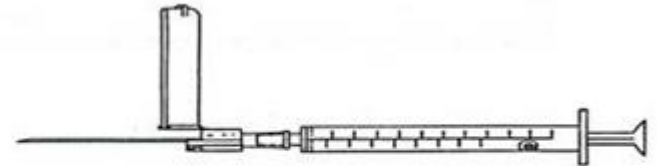
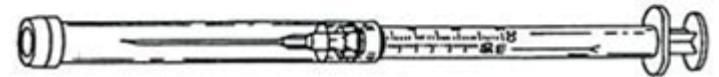
# Safer sharps design

- **Needle-less System:** a device that does not use needles for the collection or withdrawal of body fluids, or for the administration of medication or fluids
- **Sharps with Engineered Sharps Injury Protection:** a non-needle sharp or a needle device used for withdrawing body fluids via a vein or artery, or for administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident
- **Blunt Tip Blood Drawing Needle:** a device for sucking fluids into a syringe – infusion tubes can be injected with pharmaceutical solutions without the use of needles



# Safer sharps design (examples)

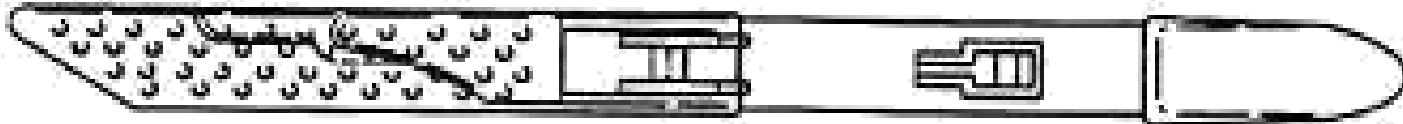
- Hypodermic syringes with “Self-Sheathing” safety feature
- Hypodermic syringes with an “Add On” safety feature
- Hypodermic syringes with “Retractable Technology” safety feature





# Safer sharps design (examples) II

Disposable scalpels with safety features:







# Sharps disposal containers

## General requirements:

- Must safely contain contaminated sharps:
  - At the point of use;
  - During temporary storage;
  - During handling and transport to the point of treatment and final disposal.
  
- Must be:
  - Closable,
  - Puncture-resistant,
  - Leakproof on the sides and bottom, and
  - Appropriately labeled or color coded



# Sharps disposal containers II

- **Types of container:** Safety boxes made of cardboard



- Will be supplied folded,
- Usually volume of 5 litres,
- Collection of complete syringes, infusion sets, scalpels etc.
- Mainly used in case of incineration and during immunization campaigns



# Sharps disposal containers III

- **Types of container:** Safety boxes made of plastic



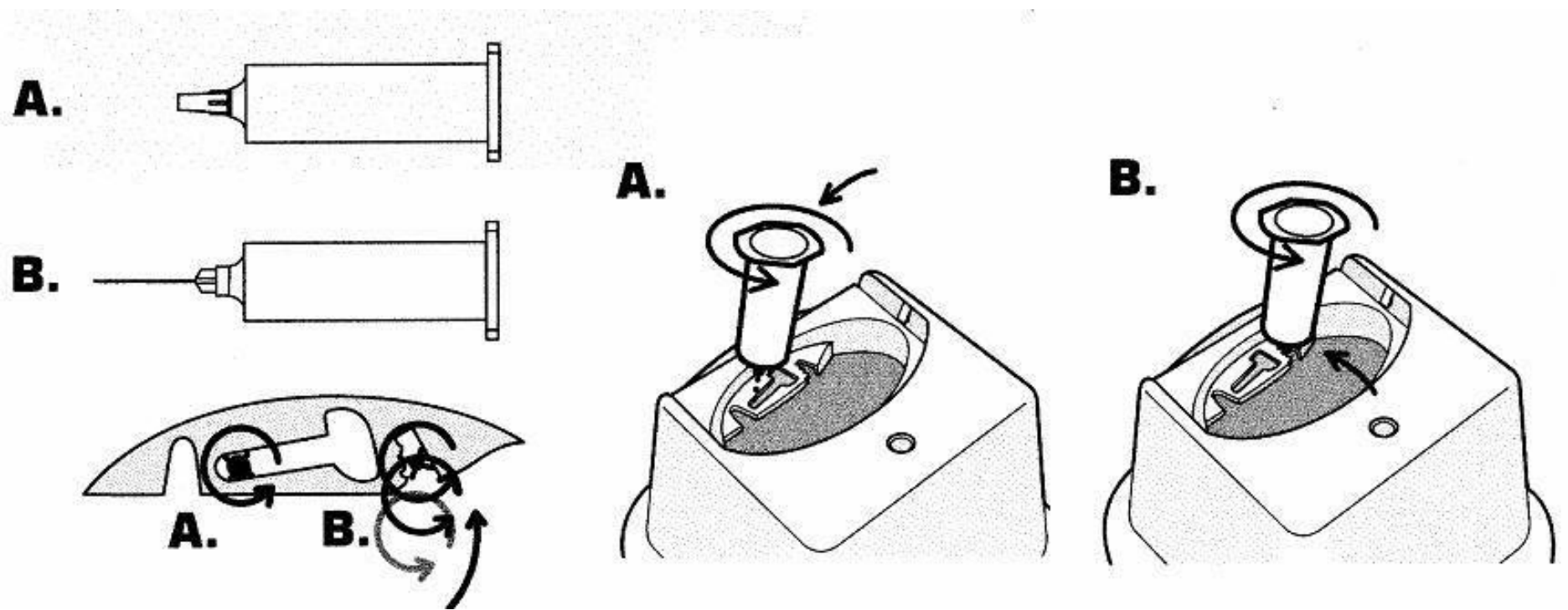
- Different capacities available,
- Two different types:
  - Collection of complete syringes, infusion sets, scalpels etc.
  - Separation of sharp items with needle removal features → Reduction of volume





# Sharps collection containers IV

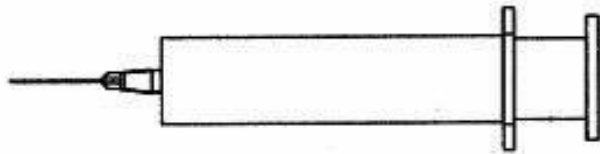
Disposal of a Luer - Lock & blood extraction systems:



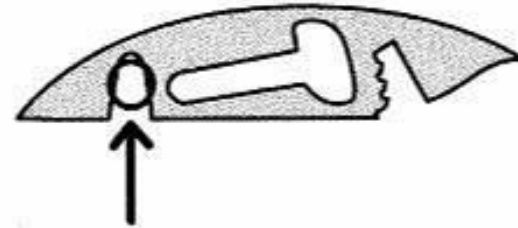
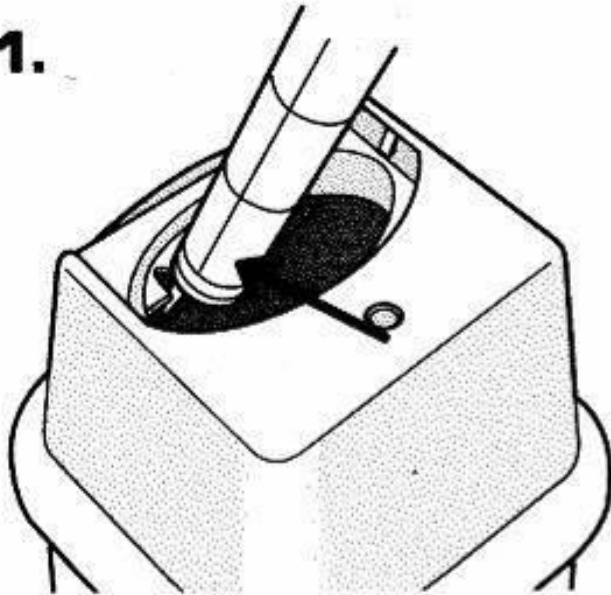


# Sharps collection containers V

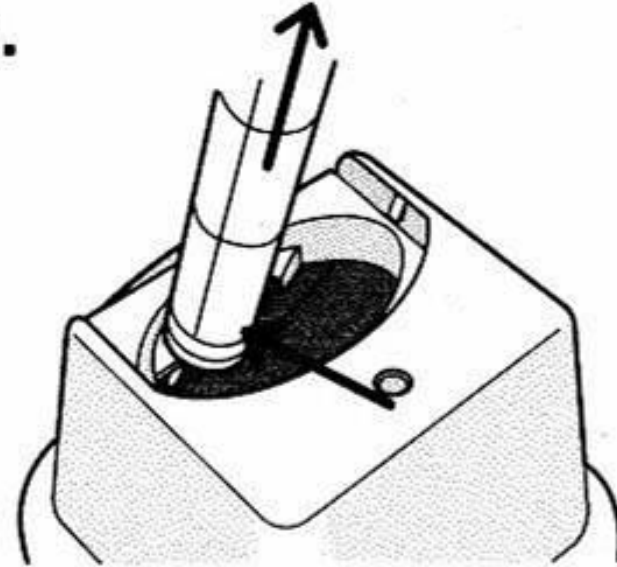
Disposal of a Luer - Slip systems:



1.



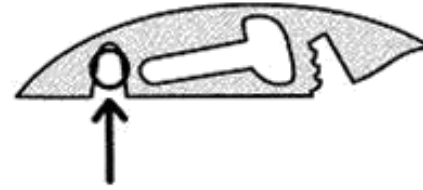
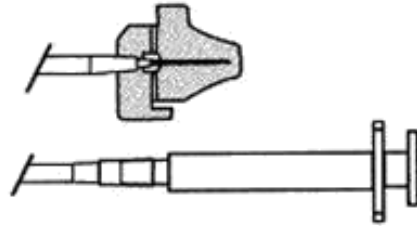
2.





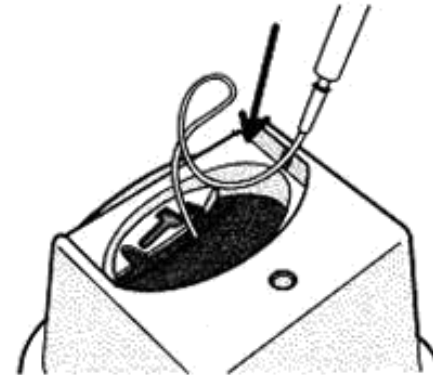
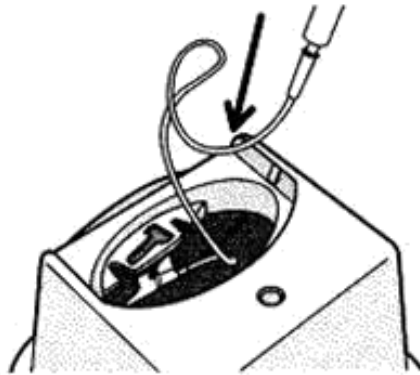
# Sharps collection containers VI

Disposal of a butterfly:



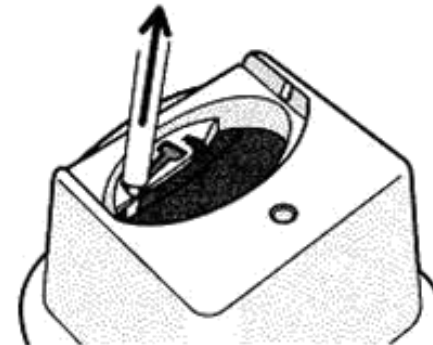
1.

2.



3.

4.







# Sharps collection containers VII

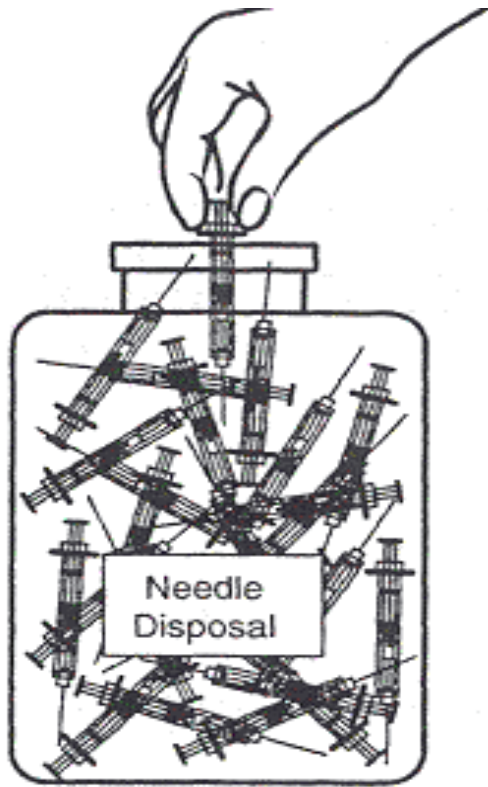
- Types of container: Improvised containers





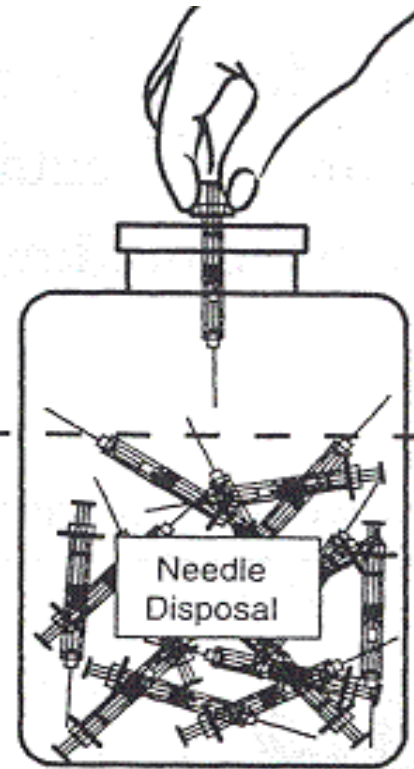
# Sharps collection containers: Correct use IV

▶ Do not overfill!



**UNSAFE**

Too Full



**SAFE**

3/4 full

▶ The container must be closed prior transport!!!





# Needle removal devices

## ► Needle cutter:

- Separate the needle from a syringe or the plastic hub of a needle by means of a simple mechanical action,
- Collection of needles in a secure container within the device.





# Disposal

- ▶ Disposal methods should:
  - Ensure that needles can not be re-used,
  - Be selected in consideration of economical and environmental aspects.
- ▶ Treatment as infectious waste:
  - Incineration,
  - Autoclaving.
- ▶ Disposal option for rural areas:
  - Sharp pit

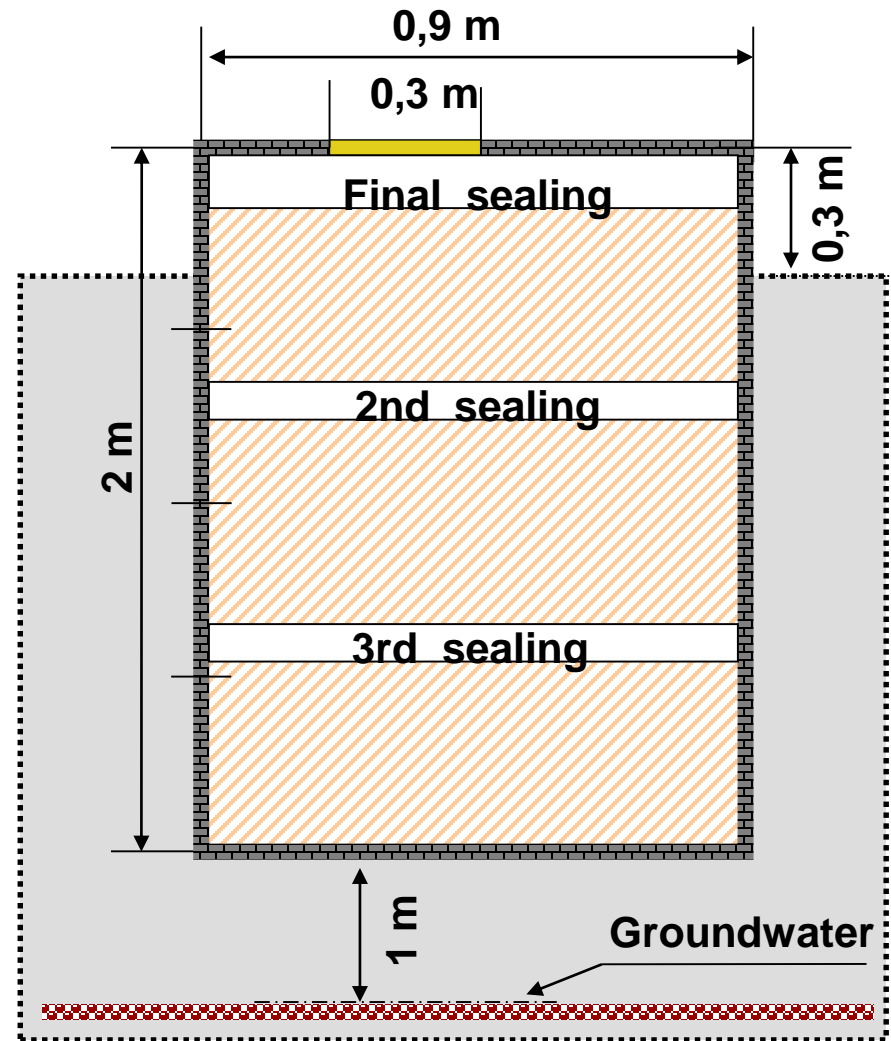




# Disposal

## Requirements

- ▶ Hatch should be easy to open, should hermitically close the tank and should be lockable.
- ▶ Tank should be water tight and impermeable.
- ▶ Capacity planning (for 5years):
  - $V = 50l * \text{number of beds}$

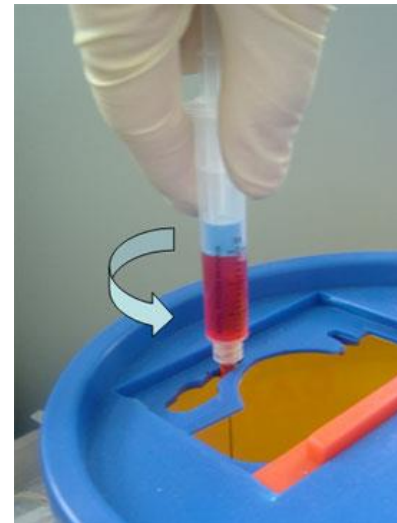
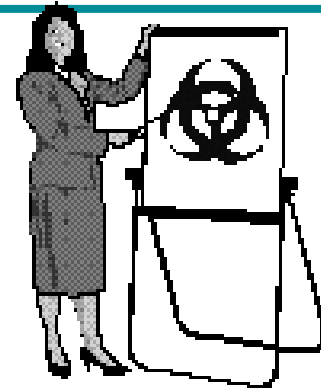




# Training

- Target groups:
  - Medical staff,
  - Transport & cleaning staff,
  - Disposal companies.

- Contents:
  - Risks,
  - Safe handling,
  - PPE,
  - Labelling – Transport – Disposal.

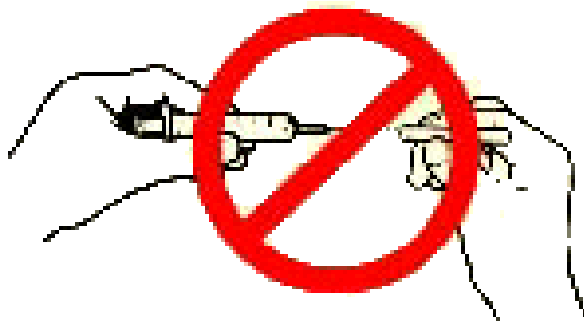


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# Re-capping !

- Past studies of needle stick injuries have shown that approximately 10% to 25% occurred when recapping a used needle
- **Introduce & enforce a strict no recapping policy!!!**





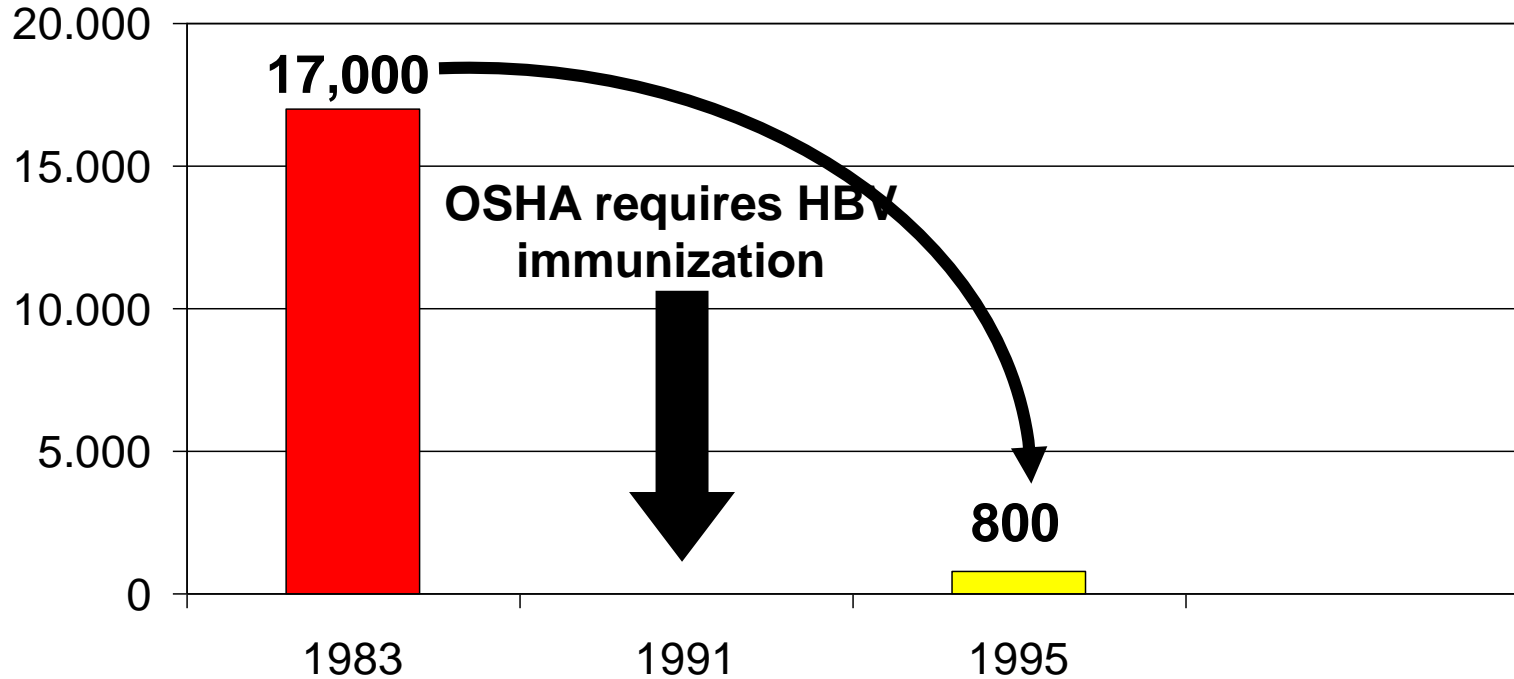
# The Importance of Immunization

- Immunization is the most effective preventive strategy against Hepatitis B transmission
- **All health workers** – *including waste disposal workers, and emergency and safety workers* exposed to the risk of bloodborne pathogens – are at risk of exposure. They should be immunized either before training or as soon as possible when at work, unless they are already immunized.
  - 37% of hepatitis infections in healthcare workers from occupational exposure<sup>2</sup>
- **Vaccines that are safe, cost-effective, and meet current WHO quality standards are widely available**

2. Prüss-Ustün et al., Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers (2005)



# Decrease in HBV cases among health workers after immunization



This policy had the greatest impact in eliminating the transmission of HBV to health workers

Mahoney F et al. Archives of Int Med 157 (1997): 2601-2603



# Vaccine Dosing and Efficacy

- ▶ Vaccination at 0, 1 and 6 months
  - Dose: 1 mL IM injection
  - No pre-vaccination or post-vaccination serological testing indicated
  
- 95% of healthy infants, children and young adults will be protected after the 3-dose series



# Overcoming Barriers to Immunization

- ▶ Demonstrate that management is committed to health of workers
- ▶ Provide and promote free, accessible vaccination
- ▶ Educate workers about the risk of occupational exposure and the efficacy of vaccination
- ▶ Integrate immunization into pre-employment orientation
- ▶ Monitor immunization coverage



# Elements of Postexposure Management

- Wound Care
- Assessment of Infection Risk
  - Type and severity of exposure
  - Infection status of the source
- Treatment, follow-up and counseling
- Exposure reporting

## Box 4.1 Steps to take in cases of occupational exposure to blood

1. Apply first aid care, as appropriate (see Section 4.3.1, below).
2. Notify a supervisor. The health-care worker should report immediately to the medical services and seek advice on the need for PEP for HIV and HBV.
3. Carry out an immediate medical evaluation, including a risk assessment and follow-up care (e.g. counseling and PEP) as appropriate.
4. Complete an exposure form documenting the circumstance and report the exposure in the needle stick injury surveillance system.



# In case of

## Postexposure Management:

- Wound Care
  - Clean wounds with soap and water
  - Flush mucous membranes with water
  - No evidence of benefit for:
    - application of antiseptics or disinfectants
    - squeezing (“milking”) puncture sites
  - Avoid use of bleach and other agents
- Alert the supervisor and take injured person to a doctor for further treatment.
- Report the incident via the accident reporting system.
- If possible, identify the source patient. Ensure that the patients blood (with permission) & the injured persons are tested for:
  - HIV
  - HBV/HCV



# Additional Resources

- WHO Best Practices for Injections and Related Procedures:  
[http://whqlibdoc.who.int/publications/2010/9789241599252\\_eng.pdf](http://whqlibdoc.who.int/publications/2010/9789241599252_eng.pdf)
- NIOSH Bloodborne Pathogens website:  
<http://www.cdc.gov/niosh/topics/bbp/>
- Preventing Needlestick Injuries Toolkit training materials:  
[http://www.who.int/occupational\\_health/activities/pnitoolkit/en/index1.html](http://www.who.int/occupational_health/activities/pnitoolkit/en/index1.html)



# Recording sharp incidents

- All incidents involving sharps must be reported and the details recorded
- The Exposure Report
  - Date and time of exposure
  - Procedure details...what, where, how, with what device
  - Exposure details...route, body substance involved, volume/duration of contact
- Information about source person and exposed person
- All the reports should collated annually & passed to the responsible person for review

Образац I

## ИЗВЕШТАЈ О ПОВРЕДИ НА РАДУ

### I. ПОДАЦИ О ПОСЛОДАВЦУ

1. Обавезник подносила пријаве о повреди на раду (послодавац)	Пуни назив послодавца (пословно име, односно лично име или други назив под којим предузетник обавља делатност)
2.	Седиште и адреса послодавца (улица и број, општина, место, држава)
3.	Рег. број обавештаја доприноса
4.	ПИБ
5.	Шифра делатности
6.	Укупан број запослених

### II. ПОДАЦИ О ЛИЦУ ОДРЕЂЕНОМ ЗА БЕЗБЕДНОСТ И ЗДРАВЉЕ НА РАДУ КОД ПОСЛОДАВЦА

7. Име и презиме	
8. ЈМБГ	
9. Адреса пребивалишта	

### III. ПОДАЦИ О ПОВРЕЂЕНОМ

10. Име и презиме повређеног	
11. ЈМБГ	
12. Пол (мушки – женски)	<input type="checkbox"/>
13. Дан месец и година рођења	
14. Пребивалиште	Улица и број Место, општина Држава
15. Место рада	Улица и број Место, општина Држава

16. Врста и степен стручне спреме повређеног	
17. Врста и степен стручне спреме прописане за обављање послова на којима је повређени претрпео повреду на раду	
18. Статус повређеног	<input type="checkbox"/> у радном односу <input type="checkbox"/> ван радног односа <input type="checkbox"/> послодавац

### IV. ПОДАЦИ О НЕПОСРЕДНОМ РУКОВОДИОЦУ ПОВРЕЂЕНОГ

19. Име и презиме	
20. ЈМБГ	
21. Адреса пребивалишта	
22. Послови које обавља	

### V. ПОДАЦИ О РАДНОМ МЕСТУ И ПОСЛОВИМА ПОВРЕЂЕНОГ И ВРЕМЕНУ И МЕСТУ НАСТУПАЊА ЊЕГОВЕ ПОВРЕДЕ НА РАДУ

23. Радно место на које је повређени распоређен	
24. Посло који је повређени обављао у моменту када се догодила повреда на раду	



# Summary

- Sharps pose a high risk of infection.
- When dealing with sharps remember the precautionary principle.
- Recapping is a major cause of sharps injuries so should be prohibited.
- All incidents and accidents should be reported & investigated.
- **Remember: Prevention is better than a cure!**