



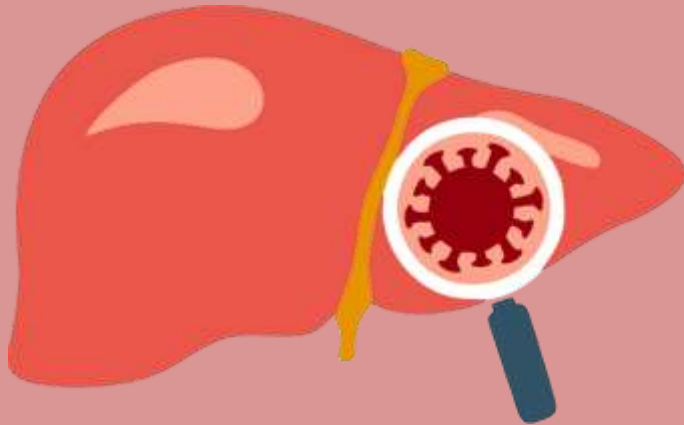
## Ms. Sarita Ahwal

**Lecturer**, College of Nursing, ILBS, New Delhi

- **B.Sc. (Hons.) Nursing**, AIIMS, New Delhi
  - **M. Sc. Nursing**, AIIMS, New Delhi
  - **Pursuing Ph. D Nursing**, CU, Punjab
- *Specialized in Medical Surgical Nursing with more than 8 years of experience in research and teaching.*
  - *Published several articles in National and International Journals. Has been a reviewer with CBS publications for various books.*
  - *Resource person and organizer in various projects, programs and national & international workshops like 8<sup>th</sup> & 9<sup>th</sup> World Congress on Clinical, Preventive Cardiology And Imaging”.*
  - *Conducting nationwide trainings on viral hepatitis, liver diseases and COVID-19 under project ECHO, & PRAKASH*
  - *Member in scientific Research and ethics committee at ILBS and Research Guidance for UG and PG thesis.*

# PRAKASH

**PR**ogrammed **A**pproach to **K**nowledge  
**A**nd **S**ensitization on **H**epatitis



## NSI & PEP

**Ms. Sarita Ahwal**

Lecturer, College of Nursing  
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New Delhi

# Learning Objectives



Definition

Risk of transmission

Incidence

NSI prevention

Protection against hepatitis B

How to handle NSI and PEP

# Introduction



Needle-stick and Sharp Injuries (NSIs) are accidental skin penetrating wounds caused by sharp instruments in a medical setting.

NSI is one of the most common cause of occupational injury.

*(Orji Eoet al,2002)*

# NSI: a serious threat to HCWs

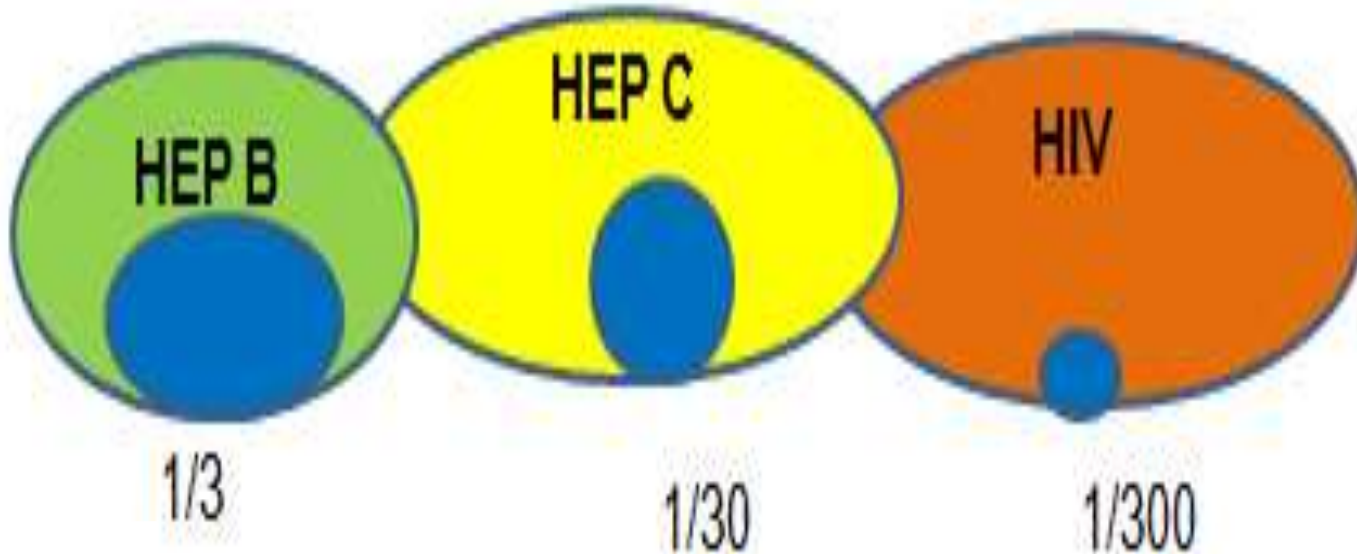
- Exposure to sharps carries a significant occupational risk of transmission of deadly and dangerous blood-borne pathogens.
- The most serious infections are:
  - **Hepatitis B**
  - **Hepatitis C**
  - **HIV**
- WHO reported that globally 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in HCWs are due to needle-stick injuries.

*(World Health Organization, 2011)*

# Which of the following infections carries the highest risk of transmission due to NSI?

1. HIV
2. Hepatitis B
3. Hepatitis C

# Risk of transmission



# Incidence

- CDC estimates that about 3,85,000 sharps injuries occur annually among health care workers in hospitals worldwide.
  - Out of the 35 million health-care workers, 2 million experience percutaneous exposure to infectious diseases each year.
- (World Health Report by WHO (2002))*



# In India

- The reported authentic data of NSI in India are scarce due to infrequent reporting.

*(Muralidhar S et al, 2010)*

- It is believed that 40–75% of these injuries are not reported.

*(Goel, V. et al, 2017)*

- 44.1% Staff Nurses had percutaneous injury at least once in their professional career.

*(Srinivasan M et al, 2013)*

# Epidemiology of NSI

- Who?
  - Where?
    - When?
      - How?

## Occurrence of Needlestick and Injuries among Health-care Workers of a Tertiary Care Teaching Hospital in North India

[Varun Goel](#), [Dinesh Kumar](#), [Raghavendra Lingaiah](#), and [Sarman Singh](#)

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This article has been [cited by](#) other articles in PMC.

### Abstract

[Go to:](#)

### Introduction:

[Go to:](#)

Occupational hazards such as accidental exposure to sharp, cuts, and splashes are common among health-care workers (HCWs).

### Aims and Objectives:

[Go to:](#)

To determine the occurrence of self-reported occupational exposures to these hazards and to know the prevalent practices following the exposure. The second aim was to know the baseline antibody levels against hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) immediately after these accidents.

### Methods:

[Go to:](#)

An observational prospective study was done in the HCWs of a tertiary care academic health organization of North India from January 2011 to December 2013. At the time of self-reporting of injury, a questionnaire was administered. Blood sample of HCWs and of the source, if identified, was collected for baseline HBV, HCV, and HIV serum markers. The exposed HCWs were followed up and repeat testing was

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A prospective look at the burden of sharps injuries and splashes among trauma health care workers in developing cou [Injury. 2014]

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Post Exposure Prophylaxis for Occupational Exposures to HIV and Hepatitis B: Our Experience of Thirte [J Clin Diagn Res. 2016]

European recommendations for the management of healthcare workers occupationally exposed to hepatitis E [Euro Surveill. 2005]

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Hepatitis B vaccination coverage among healthcare workers at national hospital in Tanzania: hov [BMC Infectious Diseases. 2017]

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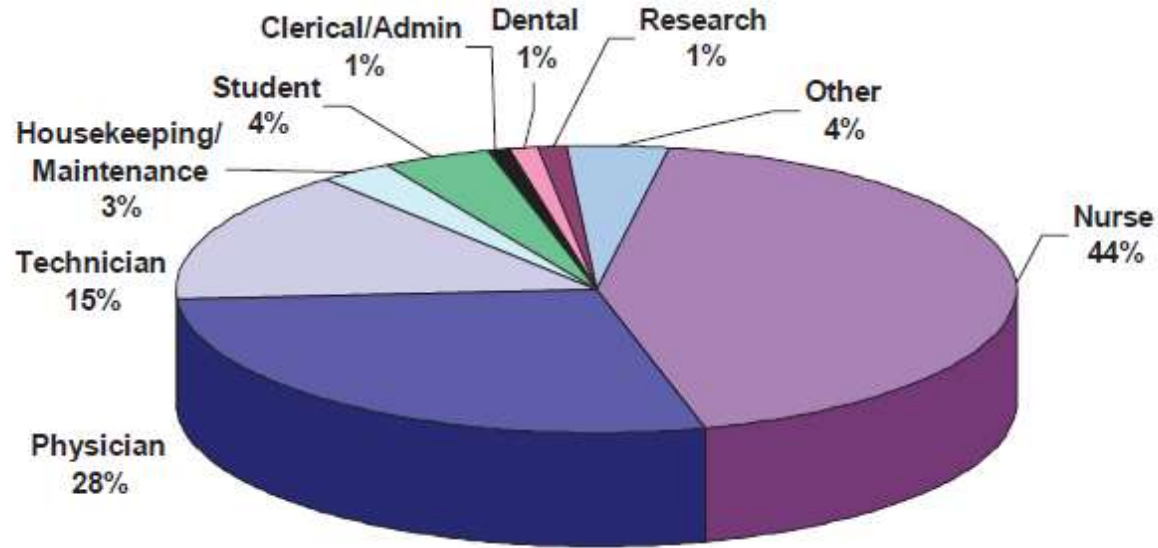
# Needle prick injury reported by health-care workers (n=476)

Needle prick injury/blood splash	Number	Percentage	Procedure during which injury occurred	
Total episodes			Blood sample collection	227 47.7
Needle prick	410	86.1	IV cannulation	148 31.1
Blood splash	19	4.0	Recapping needle after use	54 11.3
Cuts from sharp	47	9.9	Detaching needle after use	18 3.8
Distribution according to the category of staff			Surgery	29 6.1
Physicians	351	73.7	Immediate actions undertaken by HCW following exposure (KABP)	
Nurses	91	19.1	Squeezed the affected part	297 62.4
Hospital waste disposal staff	15	3.2	Cleaned with disinfectant like spirit	67 14.1
OT/Hospital Attendants	14	2.9	Washed with soap and water	34 7.1
Laboratory staff	5	1.1	Did nothing	8 1.7
Place of occurrence			Washed with soap and water and squeezed the affected part	60 12.6
Emergency and ICUs	229	48.1	Cleaned with disinfectant and squeezed the affected part	10 2.1
General ward	142	29.8		
Operation theater	16	3.3		
Labour room	39	8.1		
Treatment room	43	9.0		
Others	7	1.4		
Site of exposure				
Finger	324	68.1		
Hand other than fingers	127	26.7		
Face/eye	19	3.9		
Others	6	1.3		

**Source:** Goel V et al. Occurrence of Needle Stick and Injuries among Health-care Workers of a Tertiary Care Teaching Hospital in North India. [J Lab Physicians](#). 2017 Jan-Mar; 9(1): 20–25.

Slide credit: Ms. Tarika Sharma

**Figure 1. Occupational Groups of Healthcare Personnel Exposed to Blood/Body Fluids;  
NaSH, 6/95 to 12/03 (N=23,197)\***



# Needle prick injury reported by health-care workers (n=476)

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Slide credit: Ms. Tarika Sharma

# **Prevention of NSI and Protection against Hepatitis**

# Safe handling of needles





# Safe disposal of needles and sharps

- Never re-cap needles.
  - Place them uncapped into a sharps container immediately
- Dispose sharps in approved puncture proof containers.
- Never open a safety box.
- Never fill a safety box more than three-quarters full.



# Safe Injection Practices

1. Needles and syringes are **single use devices**.
2. Do not administer medications **from a single-dose vial or IV bag to multiple patients**.
3. Limit the use of multi-dose vials and dedicate them to a **single** patient whenever possible.
4. Always use **aseptic technique** when preparing and administering injections.



Stop The Reuse!!



112 1-877-1111-1111

# One One One rule !!!

**Stop The Reuse!!**



NSI & PEP – Ms. Sarita Ahwal

# Use safety-engineered devices

- Use **safety syringes** with a sharps injury protection (SIP) feature as recommended by WHO.



# Injection Safety

<https://www.youtube.com/watch?v=nzv4wkQkqQoV>

Year : 2010 | Volume : 2 | Issue : 2 | Page : 53-61

## Needle stick injuries: An overview of the size of the problem, prevention & management

Moazzam A Zaidi<sup>1</sup>, Salem A Beshyah<sup>2</sup>, Robin Griffith<sup>3</sup>

<sup>1</sup> Occupational & Environmental Health and Safety, Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates

<sup>2</sup> Department of Medicine, Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates

<sup>3</sup> Occupational and Aviation Medicine, University of Otago, Wellington, New Zealand

...more than 20 additional types of infectious agents documented to be transmitted through needle sticks. More than 80% of needle stick injuries are preventable with the use of safe needle devices. Legislation has been developed in many countries to protect HCPs by encouraging employers to use best practices to prevent these exposures. Many different protocols for post exposure management of

# Wear protective barriers



# Sensitize HCWs.....









# Get yourself vaccinated.....

WHO recommends that all HCWs should be **vaccinated** against hepatitis B.

# Vaccination for adults:

## *Three Shots*

Vaccine	Dose 1	Dose 2	Dose 3
 <b>3-dose vaccine series</b>  Brand names: Engerix-B, Recombivax HB, Twinrix (hepatitis A and B)	Now 	1 month after dose 1 	6 months after dose 1 



# The recommended schedule of hepatitis B vaccination for adults is:

1. 0.5 ml at 1 and 6 months
2. 0.5 ml at 0,1,6 months
3. 1 ml at 1 and 6 months
4. 1 ml at 0,1,6 months

# Are you vaccinated against Hepatitis B?

- a. Yes
- b. No
- c. Don't know

# Are you immunized against Hepatitis B?

- a. Yes
- b. No
- c. Don't know

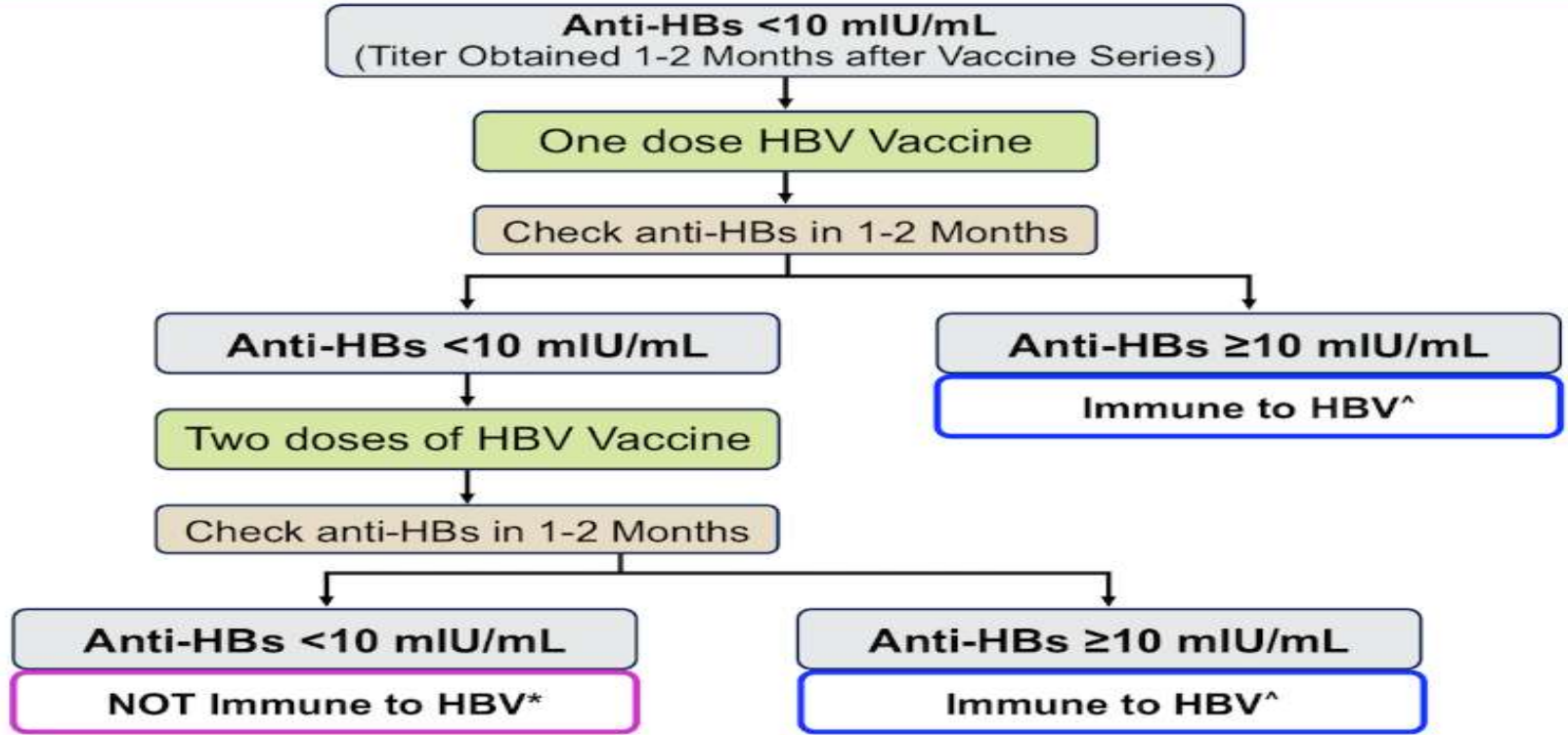
# *Get your HBs antibody titre done.....*

A post-vaccination anti-HBs titer of  $\geq 10$  mIU/mL is considered as "positive" or "reactive".

# When should one get the anti-Hbs titre checked?

- a. After 1<sup>st</sup> dose of vaccination
- b. After 24 hours of the 3<sup>rd</sup> dose of vaccination
- c. After 1-2 months of the third dose of vaccination
- d. Soon after 1<sup>st</sup> and 3<sup>rd</sup> doses

# Approach to Vaccine Nonresponders Health Care Workers





# What is **TRUE** about the booster dose of HBV vaccination for adults?

1. Recommended for all after completion of three doses of hepatitis B vaccine
2. Recommended only if Anti-Hbs titre is less than 10 mIU/ml after completion of three doses of hepatitis B vaccine
3. Not recommended for adults
4. Recommended only for non-responders

## **A person is considered immunized against hepatitis B infection if:**

- a. Vaccinated with 3 doses of hepatitis B vaccine at 0, 1, & 6 months interval.
- b. Anti-Hbs titre is more than 10 mIU/ml after completion of 3 doses of hepatitis B vaccine
- c. Anti-Hbs titre is more than 10 mIU/ml after completion of 2 doses of hepatitis B vaccine
- d. Anti-Hbs titre is more than 10 mIU/ml after completion of 1 dose of hepatitis B vaccine

# HBV: Risk after needle stick

- ~0% in immunized HCWs
- 6% to 30% in unvaccinated/unimmunized HCWs

# Post Exposure Prophylaxis

# If You Get a Needle Stick Injury

Take the following actions immediately

First aid  
management

Inform your  
supervisor and  
follow the NSI  
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.



# If You Get a Needle Stick Injury

Take the following actions immediately



First aid  
management

Inform your  
supervisor and  
follow the NSI  
reporting  
mechanism of  
your health  
facility

Identify the source  
patient.

Get the  
patient  
tested taking  
consent.

Get tested for  
HIV, hepatitis B,  
and hepatitis C  
infections.



# PEP (First Aid treatment)

Contaminated wound	Contaminated Intact Skin
<p><b><u>DO NOT squeeze</u></b> Encourage bleeding from the skin wound and wash injured area with soap and water</p>	<p>Wash the area under running water with soap</p>
Contaminated Eyes	Contaminated Mouth
<p>Gently rinse the eyes wide open with water.</p>	<p>Spit out any fluid - rinse the mouth with water and spit it out again.</p>

# Do Remember the Don'ts!!!

- Do not panic!
- Do not reflexively place pricked finger into mouth.
- Do not squeeze blood from wound
- Do not apply alcohol, betadine or any other chemical on the wound.





# If You Get a Needle Stick Injury

Take the following actions immediately



First aid  
management



Inform your  
supervisor and  
follow the NSI  
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mechanism of  
your health  
facility



Identify the source  
patient.

Get the  
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tested taking  
consent.



Get tested for  
HIV, hepatitis B,  
and hepatitis C  
infections.



# Report the incident !!!

- While every needle stick and sharps injury should be **documented**, many people do not report them.
- Reporting and documentation of occupational exposure are important and are invaluable in guiding prevention efforts.

# NSI Reporting Form (ILBS)

**NEEDLE STICK INJURY REPORTING FORM**

**Details of Health Care Worker (Exposed):**

Name: ..... Age/Sex: ..... UHID No.: ..... D.O.J.: .....

Designation: ..... Duty Area: ..... Doctor In charge on duty: .....

Address (present residential): .....

Phone No.: ..... Office Extn. No.: .....

Marital Status: ..... Significant Medical History: .....

Previous NSI History (If Any): .....

Type of Injury: ..... Date/Time of Exposure: .....

**Type of Exposure (preferably contaminated with body fluid): -**

1. Hollow-bore needle
2. Solid needle
3. Visible Blood Present
4. Device had been directly in source artery/vein
5. Other Sharp
6. Unknown

**Action Taken after Exposure: -**

1. Washing of exposed area/hand washing	Yes/No
2. Squeezing of exposed area	Yes/No
3. Exposed wounded area under running water	Yes/No
4. Use of any kind of antiseptic solution/chemical	Yes/No

**Brief History of the Patient (Source):**

Name of the patient: ..... Age/Sex: ..... UHID No.: .....

Ward/Bed No.: ..... Consultant Name: .....

Address (present residential/Contact No.): .....

Confirmed Diagnosis: .....

Any Others: .....

Sign of HCW (Exposed)      Sign of Nurse In charge      Sign of Duty Doctor      Sign of ICN

**Note:** -NSI reporting form to be completely filled by Nurse in charge with HCW and shall be submitted to ICN immediately.

# If You Get a Needle Stick Injury

Take the following actions immediately



First aid  
management



Inform your  
supervisor and  
follow the NSI  
reporting  
mechanism of  
your health  
facility



Identify the source  
patient.



Get the  
patient  
tested taking  
consent.



Get tested for  
HIV, hepatitis B,  
and hepatitis C  
infections.



# Laboratory evaluation (source and exposed)

Source [Patient]	Exposed [HCP]
HBsAg	HBsAg
HCV RNA, Anti-HCV	Anti-HCV
Anti-HIV 1&2 (HIV 1&2 Ag-Ab)	Anti-HIV 1&2 (HIV 1&2 Ag-Ab)
	Anti-HBs (titers)

- For HIV -informed consent of the exposed person.
- Other tests (specific situation):
  - Viral loads of HBV, HCV, HIV
  - LFT (serum ALT/AST) if PEP indicated
  - CBC (if HIV PEP i.e. HAART indicated)

# Post exposure testing

Exposed Person	Postexposure testing	
	Source patient (HBsAg)	HCP testing (anti-HBs)
Documented responder after complete series	Not indicated	Not indicated
Documented non-responder after two complete series	Yes	Not indicated
Response unknown after complete series	Yes	Yes
Unvaccinated/incompletely vaccinated or vaccine refusers	Yes	Not indicated

# And the final step!!!

- Take Post exposure prophylaxis as recommended....



# Post Exposure Prophylaxis for HBV

Exposed Person	HBsAg- positive/unknown	HBsAg-negative
Documented responder after complete series	No action needed	
Documented non-responder after two complete series	HBIG x 2 one month apart	No treatment
Response unknown after complete series	Test for anti-HBs 1. If inadequate, HBIG X 1 plus initiate revaccination 2. If adequate, no treatment	Test for anti-HBs 1. If inadequate, Booster dose and Additional 2 doses if needed 2. If adequate, no treatment
Unvaccinated/incompletely vaccinated or vaccine refusers	HBIG X 1* & complete Hepatitis B vaccination	Complete Hepatitis B vaccination



# Scenarios

- Source is found to be HBsAg- positive/unknown
- Source is found to be HBsAg-negative

# PEP for HBV: Scenario 1

Exposed Person	HBsAg- positive/unknown
Documented responder after complete series	No action needed
Documented non-responder after two complete series	HBIG x 2 one month apart
Response unknown after complete series	Test for anti-HBs 1. If inadequate, HBIG X 1 plus initiate revaccination 2. If adequate, no treatment
Unvaccinated/incompletely vaccinated or vaccine refusers	HBIG X 1* & complete Hepatitis B vaccination

# Case scenario

- Exposed : unvaccinated
- Source : positive HbsAg

## Answer Options:

- a. Initiate HB vaccine
- b. HBIG X 1\* & complete Hepatitis B vaccination
- c. Give two doses of HBIG

# PEP for HBV: Scenario 2

Exposed Person	HBsAg-negative
Documented responder after complete series	No treatment
Documented non-responder after two complete series	No treatment
Response unknown after complete series	Test for anti-HBs 1. If inadequate, Booster dose and Additional 2 doses if needed 2. If adequate, no treatment
Unvaccinated/incompletely vaccinated or vaccine refusers	Complete Hepatitis B vaccination

# Case scenario

- Exposed : unvaccinated
- Source : negative

## Answer Options:

- a. Initiate HB vaccine
- b. Test for anti-HBs and If adequate, no treatment
- c. Test for anti-HBs and If inadequate, HB vaccine booster dose

- Which is **true** about post exposure prophylaxis against hepatitis B for an exposed person to a known source?
  - a. If unvaccinated, take only HBIG.
  - b. If unvaccinated, take both HBIG and Hepatitis B Vaccine.
  - c. Treatment remains same for both vaccinated and unvaccinated person.

# Case scenario

- Exposed : vaccinated and documented responder with Anti HBs titre =100
- Source : positive

**No treatment**

# Case scenario

- Exposed : vaccinated with complete two series of HBV vaccine and Anti HBs titre = 2
- Source : positive

**HBIG x 2**





Exposed Person	Postexposure testing		HBsAg- positive/unknown	HBsAg-negative
	Source patient (HBsAg)	HCP testing (anti-HBs)		
Documented responder after complete series	No action needed			
Documented non-responder after two complete series	Yes	Not indicated	HBIG x 2 one month apart	No treatment
Response unknown after complete series	Yes	Yes	Test for anti-HBs 1. If inadequate, HBIG X 1 plus initiate revaccination 2. If adequate, no treatment	Test for anti-HBs 1. If inadequate, If inadequate, Booster dose and Additional 2 doses if needed 2. If adequate, no treatment
Unvaccinated/incompletely vaccinated or vaccine refusers	Yes	Not indicated	HBIG X 1* & complete Hepatitis B vaccination	Complete Hepatitis B vaccination

- Which of the following is **NOT TRUE** about PEP in case of a needle stick injury encounter by a healthcare worker (HCW)?
  1. For a documented responder after complete series of vaccination, no action is recommended
  2. For documented non-responder, check the anti –HBs titre before vaccination
  3. Unvaccinated HCW should receive vaccination in all cases.
  4. HCW with anti-HBs titre of  $\geq 10$  mIU/ml need neither HBIG nor hepatitis B vaccine

# State true/false

- Irrespective of the response of the previously vaccinated exposed HCW, who has been exposed to the blood of a HBsAg negative source , No treatment is recommended.
  - a. True
  - b. False

- Select the **Correct** statement about HBIG.
  1. HBIG provides passive immunity
  2. Two doses of HBIG are given one month apart.
  3. HBIG and Hepatitis vaccination can be given one the same day but one different sites.
  4. All of the above

The dose and route of HBIG for exposed HCW is:

1. 0.05 mL/kg Intramuscular
2. 0.05 mL/kg Subcutaneous
3. 0.06 mL/kg Intramuscular
4. 0.06 mL/kg Subcutaneous

# PEP HBV

- The ideal time frame is within 48 hours of exposure, although it can be considered up to one week
- HBIG- 0.06mL/kg intramuscularly

# Follow up of the Exposed

- ✓ HBV- baseline and 6 months

# Post Exposure care for HCV



In case source is HCV positive test of HCW is recommended for early testing anti-HCV within 48 hours



additional follow-up testing for HCV RNA at 3–6 weeks and at 4–6 months for anti-HCV



Refer to a hepatologist

HCV RNA can be done as early as 15 days



## **Which of the following is NOT a PEP component for HCV?**

- a. Baseline anti HCV antibodies and LFTs test of HCW is recommended.
- b. Follow up of the exposed recommended till 6 months.
- c. Refer to a hepatologist.
- d. No follow up is required once baseline tests are performed.

- Post exposure prophylaxis is not available for which blood borne pathogen?
  - a. HIV
  - b. Hepatitis B
  - c. Hepatitis C
  - d. None of the above

# Take Home message

- Vaccination against Hepatitis B.
- Treat all patients as potentially infectious.
- Getting acquainted to Hospital protocol for NSI.
- Follow safe injection practices.
- Avoid recapping of needles.
- Spread awareness.
- Don't ignore if any NSI occur.





**Your Query Please!!!**

# Conclusion

- Prevention of Needle stick injury/sharp injury is possible in almost all cases.





## ALL ABOUT NEEDLE STICK INJURIES



### All About Needle Stick Injuries

Needlestick and Sharp Injuries (NSIs) are accidental skin penetrating wounds caused by sharp instruments in a medical setting.



### Upcoming Trainings

NSI will conduct trainings on Prevention of Needle Stick Injuries. Training Schedules will get updated time to time on our website. Click here to see the upcoming trainings



### Report An Incident

If you have been affected with a Needle Stick Injury, please report here and our team of experts will revert in 24 hours.

**Website : [nsi.ilbs.in](http://nsi.ilbs.in)**

**Email: [nsi@ilbs.in](mailto:nsi@ilbs.in)**

**Thank you for your  
attention!**