QUESTION 99
A 30-year-old medical officer sustains a needle-stick injury while treating a trauma patient in the emergency department. She had undergone a three-dose course of hepatitis B vaccine 10 years earlier and one year following this course was documented to be hepatitis B surface antibody (HbsAb)-positive. However, on repeat testing (done as a result of this incident), the medical officer is now found to be HbsAb-negative. The source patient in the needle-stick injury is known to be an intravenous drug user, and is shown to be hepatitis B surface antigen (HbsAg)-positive on baseline serology. Human immunodeficiency virus (HIV) and hepatitis C serology are negative.

In addition to counselling, which of the following is the most appropriate immediate action following this needle-stick injury?
A. Booster hepatitis B vaccination.
B. Hepatitis B immunoglobulin.
C. Hepatitis B vaccine and hepatitis B immunoglobulin.
D. No action required.
E. Post exposure prophylaxis for HIV.

The following body fluids pose a risk for blood borne virus transmission:
- Blood, serum, plasma and all biological fluids visibly contaminated with blood
- Pleural, amniotic, pericardial, peritoneal, synovial and cerebrospinal fluids
- Uterine/vaginal secretions
- Semen
- Laboratory specimens that contain concentrated virus

**HIV**
- Risk of transmission ~0.3% from blood exposure and ~0.09% after mucous membrane exposure
- Risk increased if:
  - Injury with a device visibly contaminated with blood
  - Injury with a hollow bore needle that has been placed directly in an artery or vein of the source patient
  - Deep injury to the exposed person
  - Source patient with advanced HIV disease or high viral load

**Hepatitis B**
- Transmission rates 6-30% from patients who are HBsAg positive
- Higher risk if source patient is HBVe antigen positive

**Hepatitis C**
- Risk of transmission 3-10% when source patient HCV antibody positive

**TESTING OF SOURCE PATIENT**
- Test for HIV antibody, HBsAg and HCV antibody
- If HCV antibody positive, test for HCV PCR for hepatitis C RNA (transmission much less likely to occur from a source who is PCR negative)

**MANAGEMENT OF EXPOSED PERSON**
Immediate Management:
- Remove contaminated clothing
- Wash area with soap and water and apply antiseptic
- Flush exposed mucous membranes with large amounts of water

Evaluation of Exposure:
- Examine for nature of exposure and counselling about the possibility of transmission

Testing of Exposed Person:
- Assess risk of tetanus, consider tetanus immunoglobulin/Td vaccine
- Test for HIV antibody, HCV antibody and antibody to HBsAg
- If source patient found to be HIV, HBV and HCV negative, no further action generally required unless there is reason to suspect the person is seroconverting or at high risk of bloodborne viral infection at the time of the exposure
- If source is positive for one of these viruses, pregnancy testing should be offered to exposed women of childbearing age

POST-EXPOSURE PROPHYLAXIS

HIV
- HIV PEP recommended – for percutaneous exposure to potentially infectious blood or body fluids (increased risk of HIV transmission)
- HIV PEP offered (but not actively recommended) – for ocular mucous membrane or non-intact skin exposure to potentially infectious blood or body fluids (less increased risk of HIV transmission)
- HIV PEP not offered – for any exposure to non-bloodstained urine, saliva or faeces (not potentially infectious for HIV)
- Limited data on the efficacy of PEP for HIV and potential toxicity need to be considered (especially if pregnant – limited data on toxicity)
- Usually use ZDV and 3TC
- Need to consider the antiretroviral drug history of the source patient also
- Can consider addition of 3rd antiretroviral drug (usually a protease inhibitor) for exposures that are particularly high risk
- Didanosine and ddC currently have no role in PEP
- Commence therapy ASAP after exposure (but can be considered at any point after exposure)
- Continue therapy for four weeks

HEPATITIS B
- If exposed person known to be immune to HBV (antiHBsAg ≥ 10mIU/mL) or if testing within 48hrs of exposure shows the exposed person to be immune → no further action required
- Testing for HBeAg and/or HBV DNA in persons who are HBsAg positive can assist in determining the risk of transmission
- If exposed person not immune to HBV or immune status in unknown, HBV immunoglobulin should be given within 48-72hrs
- In addition, HBV vaccine should be started from HCWs who have not received the vaccine

HEPATITIS C

- There is no PEP for hepatitis C
- The option of interferon-ribavirin prophylaxis is under review
- Source should be tested for HCV RNA to determine risk of transmission

COUNSELLING

- Must not donate blood, semen, organs or tissue for 6 months
- Should not share implements that could be contaminated with blood (eg: razors, toothbrushes)
- Should be informed of risk of sexual and IV transmission of HIV and HBV for 6 months and should be counselled about safe sex and safe injecting
- Should be advised about the remote risk of seroconversion of HIV up to 12 months after exposure
<table>
<thead>
<tr>
<th>SOURCE</th>
<th>EXPOSED</th>
<th>EXPOSURE</th>
<th>RECOMMENDED ACTION</th>
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<tbody>
<tr>
<td>HBsAg negative</td>
<td>Any</td>
<td>Any</td>
<td>No action required</td>
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<tr>
<td>HIV antibody negative</td>
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<td>HCV antibody negative</td>
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<tr>
<td>Low risk of seroconversion</td>
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<td>HIV antibody positive</td>
<td>HIV negative</td>
<td>Percutaneous exposure</td>
<td>HIV PEP recommended (ideally within 1-2 hours) – ZDT and 3TC</td>
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<td>High viral load</td>
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<td>Consider addition of protease inhibitor</td>
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<td>HIV antibody positive</td>
<td>HIV negative</td>
<td>Occular mucous membrane or non-intact skin</td>
<td>PEP offered but not actively recommended</td>
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<tr>
<td>HIV antibody positive</td>
<td>HIV negative</td>
<td>Non-blood stained urine, saliva or faeces</td>
<td>PEP not offered</td>
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<tr>
<td>HBsAg positive</td>
<td>Previous immunity (vaccination with immune response) or current HBsAb</td>
<td>Any exposure</td>
<td>No action required</td>
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<tr>
<td>HBeAg and HBV DNA testing to establish risk</td>
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<tr>
<td>HBsAg positive</td>
<td>Not immune – HbsAb negative, no previous immunisation or unresponsive to immunisation</td>
<td>Any exposure</td>
<td>HBV immunoglobulin plus HBV vaccine to prevent future risk</td>
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<tr>
<td>HCV antibody positive</td>
<td>HCV antibody negative</td>
<td>Any exposure</td>
<td>No PEP currently available (interferon-ribavirin under review)</td>
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<tr>
<td>HCV RNA testing to establish risk</td>
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Post-exposure counselling for all exposed persons
Consider risk of transmission of HIV vs toxicity especially if exposed person pregnant