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**KEY TERMS** | Hepatitis, dialysis, blood-borne viruses  
**SUMMARY** | ESKD patients have a higher risk than the general population to Hepatitis C as with Hepatitis B due to their deficient immune response and exposure to blood transfusions and haemodialysis equipment, therefore these patients require routine screening and vaccination where appropriate. All patients must be screened for Hepatitis B, C and HIV pre dialysis commencement. Standard precautions apply. Isolation of haemodialysis patients with Hepatitis B is required which includes the use of a dedicated haemodialysis machine.
1. **POLICY STATEMENT**
   This document is underpinned by the following policies and documents:
   - SESLHNPD/120 Hand hygiene and hand care
   - SESLHNPD/109 Serological Testing of Patients
   - SESLHNPD/112 Standard Precautions
   - NSW Health PD2007 036 Infection Control Policy
   - NSW Health PD 2005 048 HIV Antibody Testing – Counselling - Guidelines
   - SESIAHS PD 259 Vaccination – Hepatitis B – HARP funded services
   - NSW Health PD2005_162 HIV, Hepatitis or Hepatitis C – Health Care Workers Infected
   - NSW Health PD2011_005 Occupational Assessment, Screening and Vaccination Against Specified Infectious Diseases

2. **Background**
   End stage kidney disease (ESKD) patients have a deficient immune response and a higher prevalence of hepatitis B and C virus’ (HBV & HCV) increasing the risk of acquiring these on haemodialysis through risk factors such as shared machines and prolonged vascular access. Seroconversion rates are lower, antibody titres and duration of immunity are also reduced in the ESKD population and it is advised that vaccination occurs early in the disease process with a double vaccine dose. The most frequent blood-borne viruses encountered in worldwide dialysis units are Hepatitis B, Hepatitis C and less frequently HIV.

   ESKD patients have a higher risk than the general population to Hepatitis C as with Hepatitis B due to their deficient immune response and exposure to blood transfusions and haemodialysis equipment.

   HIV is less common in the dialysis setting, but patients are at risk due to blood exposure in dialysis. There are currently no vaccines for HIV.

**Definitions**

- **HBsAg**: Hepatitis B surface antigen
- **anti-HBs**: Hepatitis B surface antibody
- **anti-HBc**: Hepatitis B core antibody
- **anti-HCV**: Hepatitis C antibody
- **HBeAg**: Hepatitis B ‘e’ antigen
- **HBV**: Hepatitis B Virus
- **HCV**: Hepatitis C Virus
- **HIV**: Human Immunodeficiency Virus
- **BBV**: Blood borne virus
- **ESKD**: End stage kidney disease
- **HBV Susceptible**: anti-HBc negative, anti-HBs negative and HBsAg negative.
- **HCW**: Health Care Worker
SESLHD PROCEDURE

Hepatitis B, C and HIV detection and management in patients requiring dialysis

3. Responsibilities to patients
   - Staff must ensure all dialysis patients have a baseline screening for HCV, HBV and HIV.
   - Staff must ensure the patient consents to testing as part of NSW Health guidelines PD 2005_048.
   - Staff must ensure all consenting haemodialysis patients receive the hepatitis B vaccination unless they are HBsAg or anti-HBc positive.
   - Prompt notification of any seroconversion post dialysis to the Renal Director and patient nephrologist so that further investigations can be carried out to confirm this.
   - Cases of acute viral hepatitis are to be notified on clinical suspicion by the attending doctor to the Public Health Unit (Ph: 9382 8333) see 4.5.
   - Spouses and carers of BBV positive patients must have information available to manage their own exposure and Hepatitis B vaccination.

3.1 Employee responsibilities regarding own BBV status:
   - It is a requirement under NSW Health PD2011_005 that all staff are screened and vaccinated against infectious diseases such as Hepatitis B. Management plans must be put in place for non responders and vaccine decliners.
   - Policy NSW Health PD 2005_162 states that voluntary disclosure of BBV status by staff is encouraged where appropriate. Any self disclosure to the employer will be treated with confidentiality.
   - Infectious staff must not perform ‘Exposure Prone Procedures’ (EPPs), see NSW Health PD2005_162 glossary for full definition. The employer can advise the staff member regarding EPPs to avoid.
   - If a HCW is exposed to blood or other body substances the NSW Health policy PD2005_311 must be followed.

4. PROCEDURE
4.1 Universal Screening pre dialysis or at the start of dialysis or on transfer from another unit
   1. Screening includes Hepatitis B surface antigen (HBsAg), Hepatitis B surface antibody (Anti-HBs), Hepatitis B core antibody (Anti-HBc), Hepatitis C antibody (Anti-HCV), and HIV Antibody. Add PCR for HCV positive patients to see if they have active HCV.
   2. Anti-HBc positive patients should be tested for HBV DNA to establish their infectious status.
   3. HCV antibody positive patients need their infectious status established with further testing such as RNA. If the result is unequivocal test for RNA.

4.2 Routine Screening for prevalent dialysis patients
   1. All dialysis patients should be screened regularly (6 monthly) for HBsAg, and serum transaminases monitored (6 monthly), unless ‘Natural immunity’ confirmed at baseline testing i.e. anti-HBc, anti-HBs positive and HBsAg negative, then test yearly only for HBsAg thereafter.
   2. Routine screening of HIV is not required unless susceptible.
4.3 **Initiation of Hepatitis B Vaccination**

- If Hepatitis B surface Antibody (anti-HBs) is negative or < 10 International units/L, and anti-HBc and HBsAg negative then vaccination should be initiated – ‘Susceptible immunity’.  
- If a patient has ‘natural immunity’ (HBsAg negative, anti-HBc positive, anti-HBs positive), vaccination is not required, but routine screening is required.  
- If a patient has ‘vaccinated immunity’ (HBsAg negative, anti-HBc negative, anti-HBs ≥ 10 International units/L), monitor and give boosters where required following routine screening.

4.4 **Hepatitis B Vaccination Dose in end stage kidney disease**

Higher doses of Hep B vaccination (double dose) are required in ESKD related to immunodeficiency *Australian Immunisation Handbook* p158.

- Adults should be given either:
  
  i. 1mL of adult formulation in each arm on each occasion (double dose) at 0, 1 and 6 months, or
  
  ii. 1mL of dialysis formulation vaccine on each occasion (single dose of double strength), at 0, 1 and 6 months.

- Initial post-vaccination serology should be taken 4-8 weeks after completion of the primary course.

- If the post vaccination anti-HBs <10 International units/L or negative, the patient should be offered booster doses which can be given as either a fourth double dose or a further 3 doses at monthly intervals, with further testing at least 4 weeks after the last dose (*Australian Immunisation Handbook* p 160).

- Regular re-testing (every 6 to 12 months) is recommended and booster doses given if anti-HBs < 10 International units/L.

- Persistent non responders should be informed that they are not protected.

4.5 **Notification of hepatitis**

- Any case of acute viral hepatitis, diagnosed on a clinical basis supported by acute elevation of liver enzymes, &/or diagnosed on evidence of seroconversion to markers of hepatitis B, C or D, are to be notified on clinical suspicion by the attending doctor (or delegate) to the Public Health Unit (Tel: 9382 8333). The laboratory will notify positive markers for hepatitis B, C or D independently but clinical notification by the attending doctor is also required in accordance with the Public Health Act 1991 (NSW).

5.0 **Isolation**

Standard Precautions must be applied at all times.

**Hepatitis B**: Infected patients (HBsAg positive) must be isolated for haemodialysis and use a dedicated machine. Where there is no separate room available, patients should be separated from the mainstream haemodialysis activity on dedicated machines.
• Patients (anti-HBs titre ≥10 International units/L) may undergo haemodialysis in the same area as a HBsAg positive patient or may serve as a geographic barrier between HBsAg pos and susceptible patients. When BBV positive patients are not being dialysed, the room/area may be used for uninfected patients after cleaning and disinfection. Haemodialysis is considered a 'very high risk area' (NSW Health PD2007 036 Infection Control Policy) meaning the functional areas require the highest level of intensity and frequency of cleaning.

Sharing of haemodialysis machines can be considered where the patients using that machine are immune to hepatitis B (anti-HBc positive or anti-HBs ≥10 International units/L) and are clear of any other BBV infection.

**Hepatitis C:** Isolation of haemodialysis patients and machines is not required but should be considered in a high prevalence area (Kociuba and Suranyi 2001). High prevalence classified as units where prevalence of HCV positive patients is >30%.

**HIV:** No haemodialysis isolation required.

### 5.1 Allocation of HCW to BBV positive patients

Dialysis staff caring for BBV infected patients should not care for susceptible patients at the same time. If staff have to care for both BBV infected and susceptible patients - rigorous attention to infection control precautions is required.

A HCW who is susceptible to HBV should not care for HBsAg positive patients.

### 6. Documentation

1. Dialysis Patient Screening and Hepatitis B Vaccination Procedure
2. Haemodialysis Serology Monitoring Chart

### 7. Audit

The Haemodialysis Group under the guidance of Dr Ivor Katz will be responsible for the review and update of the Hepatitis B, C and HIV detection and management in patients requiring dialysis protocol. Next due for review in 2013 or as new evidence becomes available.

### 8. References

Australian Immunization Handbook


European Renal Association-European Dialysis and Transplant Association (2002) "Prevention and management of HBV, HCV and HIV in HD patients" Nephrology Dialysis and Transplantation 17(suppl_7): 78-81


UpToDate (2010) "UpToDate Online” Retrieved 19/02/2010, from http://utdol.com/online/content/topic.do?topicKey=hepatitis/9842&selectedTitle=1%7E150&source=search_result#H4


8. REVISION AND APPROVAL HISTORY

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<tr>
<th>Date</th>
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<td>E Josland- Renal and Renal Supportive Care CNC</td>
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<td>1</td>
<td>Hyperlinks fixed E Josland</td>
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<td>Oct 2011</td>
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<td>Rebadged in SESLHD Template Michelle Bonner Acting Policy Officer</td>
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<td>Jan 2012</td>
<td>2</td>
<td>Feedback changes incorporated by Elisabeth Josland</td>
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<td>Feb 2012</td>
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<td>3</td>
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<td>November 2012</td>
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<td>Addition of words to 4.1 number 3 If the result is unequivocal test for RNA by E. Josland Renal and Renal Supportive Care CNC</td>
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