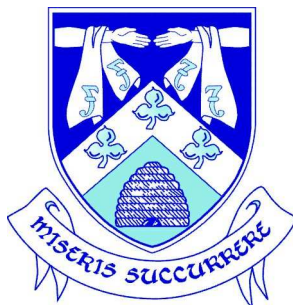


The Screening, prevention & management of BBV In patients requiring RRT.

Transplant, Urology & Nephrology Directorate



The Screening, prevention & management of BBV In patients requiring RRT

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CONTENTS

Section 1

1.0 Rationale

1.1 Scope

1.2 Principles

Section 2

2.0 Responsibilities of Medical and Nursing Personnel

Section 3

3.0 Haemodialysis

3.1 BBV's screening and interpretation of results in HD units

3.1.1 Hepatitis B

Figure 1 Schedule for testing for HBV infection

3.1.2 Hepatitis C

Figure 2 Schedule for management HCV positive patient

3.1.3 HIV

3.2 Ordering virology screen prior to HD

3.3 Virology results required before HD in open unit

3.4 Emergency HD required

3.4.1 Urgent results from NVRL

3.5 Regular HD patients

3.6 Management of Patient's who have received HD in another unit

3.6.1 Transfer from a unit within the Republic of Ireland.

3.6.2 Transfer from a unit outside the Republic of Ireland

4.0 Home Therapies-CAPD/CCPD/Home Haemodialysis

5.0 Therapeutic plasma exchange

6.0 CKD patients

7.0 Renal transplant patients

Table 1 Routine Virology surveillance

8.0 Patient Education & Consent

9.0 Hepatitis B vaccination

Table 2 Hepatitis B vaccination schedule

Table 3 Action following Anti- HBs (titre) level post vaccine

The Screening, prevention & management of BBV In patients requiring RRT.

10.0 Infection control practices for the haemodialysis unit

10.1 Environmental/ Design Considerations

10.2 Standard precautions

10.3 Documentation

10.4 Management of BBV infected patients

11.0 Distribution

12.0 Filing

13.0 Review

14.0 Superseded / Obsolete Documents

SECTION 4

Development and Consultation Process

SECTION 5

Recommended Reading

Appendices

- Appendix 1 Ordering of Hepatitis B & C, HIV and HCV PCR on computer
- Appendix 2 Renal Unit Virology Ordering and Testing out of office hours
- Appendix 3 Out of hours testing forms
- Appendix 4 Correct use of transport container for all virology
- Appendix 5 NVRL out of hours Urgent dialysis record
- Appendix 6 Reserve label
- Appendix 7 Algorithm for Management of weak positive & positive HCV result
- Appendix 8 Algorithm for Management of weak positive & positive HBV result
- Appendix 9 Algorithm for Management of weak positive & positive HIV results
- Appendix 10 Algorithm for Management of a previously identified BBV positive result
- Appendix 11 Sample daily, weekly & monthly cleaning and disinfection schedule
- Appendix 12 Cleaning and disinfection following Hepatitis B HD treatment
- Appendix 13 Unscheduled Wall washing
- Appendix 14 Cleaning and disinfection after isolation HIV/ HCV treatment
- Appendix 15 Haemodialysis Infection risk questionnaire
- Appendix 16 Effectiveness of heating in dialysis machines
- Appendix 17 Geographical distribution of HBV/HC/HIV endemicity

SECTION 1

1.0 Rationale: End Stage Renal Failure requires various forms of Renal Replacement Therapies (RRT) which includes Haemodialysis (HD), Continuous Ambulatory Peritoneal Dialysis (CAPD) and Transplantation. Patients undergoing RRT are at a higher risk of acquiring Blood Borne Virus (BBV) infections due to factors like impaired cellular immunity, underlying diseases, blood transfusions, frequent hospitalisations and the procedure of haemodialysis itself which requires blood exposure through a vascular access for prolonged periods. This document aims to provide guidelines for nurses and medical staff on the screening, prevention and management of BBV's in patients requiring Renal Replacement Therapies.

1.1 Scope: This guideline is in line with the guidelines published by the Department of Health and Children (DoHC) on Blood-Borne Viruses in Haemodialysis, CAPD and Renal Transplantation 2013.

This guideline applies to all medical and nursing staff working in the Transplant, Urology & Nephrology Directorate.

1.2 Principles: The Renal Unit strives to minimise the risk of transmission of blood borne viruses within all the patients undergoing Renal Replacement Therapies by the implementation of evidence based practice, standard and transmission based precautions.

SECTION 2

2.0 Responsibilities of Medical and Nursing Personnel:

- 1 Nursing staff must be aware that frequency of re-screening depends on the patient's respective treatment modality and previous screening results (See Table 1).
- 2 Nursing or medical staff must ensure patients are informed prior to all screening.
- 3 Medical staff should order virology screening prior to commencement of HD and review results.
- 4 Nursing staff must review virology screening results prior to commencement of each HD.
- 5 Nursing staff must manage HD machines as per the guidelines for the screening, prevention & management of BBV in patients requiring RRT.
- 6 Formal informed consent will be taken for routine virology screening in conjunction with consent for haemodialysis/CCPD/CAPD treatment.
- 7 Patients refusing consent for virology screening must be treated as positive for a BBV with isolation of machine and patient. Machine number used for these patients must be registered onto Clinical Vision.

SECTION 3

3.0 Haemodialysis

Transmission of BBV's in HD units

BBV infections are much more common in the haemodialysis population than the general population. Most reported Hepatitis B Virus (HBV) outbreaks among haemodialysis patients have occurred because of significant breaches in infection control practices and failure to vaccinate against hepatitis B. Prevalence of HBV in HD units has decreased dramatically due to increased adherence to infection control practices and availability of HBV vaccination. In contrast Hepatitis C Virus (HCV) infection is still highly prevalent in HD units. Two major factors associated with the higher prevalence of HCV are the number of blood transfusions received and the length of time on HD. With regards to transmission of Human Immuno Deficiency Virus (HIV), most studies fail to show transmission of the virus in HD units.

Prevention of Transmission

In order to prevent transmission of BBV's among patients undergoing RRT, rigorous adherence to the proposals in this guideline is imperative. Regular screening of all patients undergoing RRT must be performed and these patients must be considered potentially infected until fully tested. Prior to commencing HD all patients should be screened for evidence of HBV, HCV and HIV.

3.1 BBV's Screening and interpretation of results in HD units

3.1.1 Hepatitis B

Pre-HD

Pre-HD testing for HBV should include hepatitis B surface antigen (HBsAg), hepatitis B core antibody (anti-HBc), and hepatitis B surface antibody (anti-HBs) (Also refer to Figure 1 & Table 1).

Regular testing while on HD

Weak positive HBsAg can occur immediately after HBV vaccination. Therefore HD patients **should not be screened** for HBsAg for at least 10 days after HBV vaccination.

1. HBV susceptible patients (i.e. unvaccinated or non-responders to vaccine) should have HBsAg tested monthly (Refer to Table 1)
2. Patients who have shown an initial good response to vaccination (anti-HBs \geq 100 mIU/ml) should be tested for anti-HBs annually and for HBsAg three monthly.
3. Patients who have shown an initial low level response to vaccination (anti-HBs 10-99 mIU/ml) should be tested for anti-HBs annually and for HBsAg three monthly (See

paragraph 9.0 for further information on HBV vaccination and table 2 & 3).

4. Patients who are anti-HBc positive and HBsAg negative should have monthly HBsAg testing.
5. Anti HBcAb positive patients who are immunosuppressed* or likely to become immunosuppressed:
 - Test HBsAg weekly during period of immunosuppression, and for two months after completion of immunosuppressive treatment. Thereafter revert to monthly HbsAg.
 - Consider Referral to Hepatologist/ Infectious disease physician for advise regarding need for HBV anti-viral chemoprophylaxis & subsequent monitoring of HBV DNA.

*Immunosuppressed patient (e.g. HIV with CD4 count < 200/mm³, TNF- α antagonist, high-dose systemic steroids, immunosuppressive chemotherapy, hematopoietic stem cell transplant recipients, other immunosuppressants such as azathioprine, cyclosporine, methotrexate, cyclophosphamide, Leflunomide either alone or in combination with low doses of steroids, patients who received a solid organ transplant and are on immunosuppressive treatment currently, genetic conditions causing primary immunodeficiency, and as defined by attending consultant).

Interpretation of the HBV results and management of the patient:

HBsAg negative/anti-HBc negative:

No evidence of current or past HBV infection:

- HD in a multi-bedded unit provided no evidence of HCV or HIV infection.
- Proceed with HBV vaccination, if not already carried out (Table 2).

HBsAg positive/anti-HBc positive:

Evidence of acute or chronic HBV infection and the patient is infectious.

- The patient should be referred to a Hepatologist or infectious disease physician for on-going assessment and management.
- HD must be undertaken in an isolation room on a dedicated machine with dedicated HBV immune staff.
- See figure1 and paragraph 10.4 for management of a HBsAg positive patient.

HBsAg negative/anti-HBc positive, in a patient who is not immunosuppressed*:

Evidence of past infection

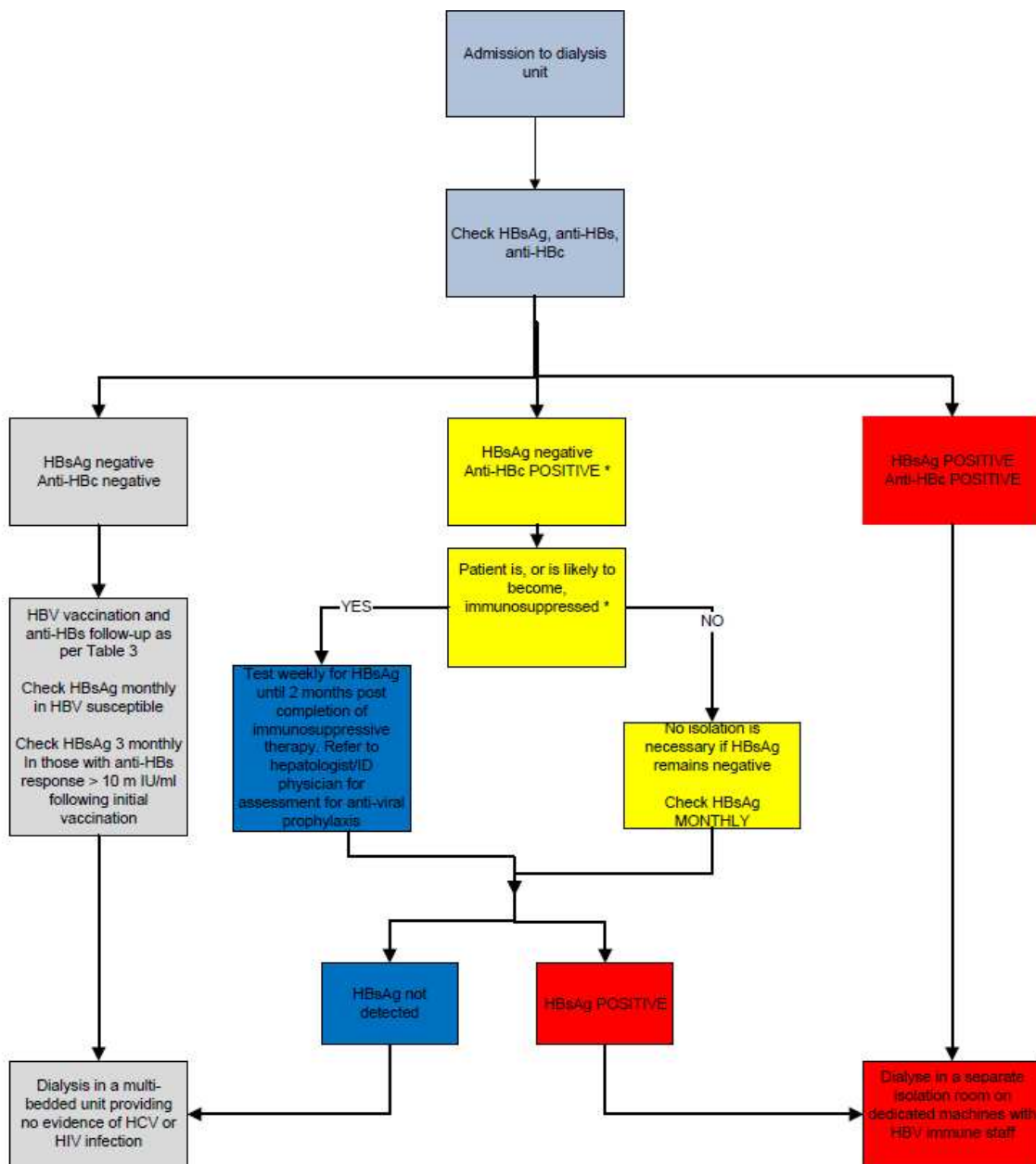
- No isolation is necessary if HBsAg remains negative.
- Carry out monthly HBsAg testing.
- However, please note intravenous immunoglobulin (IVIG) may contain anti-HBc; therefore an anti-HBc positive result should be reviewed in conjunction with the date of IVIG administration.

HBsAg negative/anti-HBc positive in an immunosuppressed* patient:

Evidence of past HBV infection but there is a risk of viral reactivation (i.e. reappearance of HBsAg)

- HD in a multi-bedded unit provided HBsAg remains negative.
- Test HBsAg weekly during period of immunosuppression, and for two months after completion of immunosuppressive treatment.
- Thereafter revert to monthly HBsAg.
- Consider referral to Hepatologist/Gastroenterologist/Infectious Disease physician for advice regarding need for HBV antiviral chemoprophylaxis and subsequent monitoring of HBV DNA.
- If HBsAg is detected, the patient should be managed as infectious.
- See figure 1 and paragraph 10.4 for management of an HBsAg positive patient.

Figure1: Schedule for testing for hepatitis B virus (HBV) infection



*Immunosuppressed patient (e.g. HIV with CD4 count < 200/mm³, TNF- α antagonist, high-dose systemic steroids, immunosuppressive chemotherapy, hematopoietic stem cell transplant recipients, other immunosuppressants such as azathioprine, cyclosporine, methotrexate, cyclophosphamide, Leflunomide either alone or in combination with low doses of steroids, patients who received a solid organ transplant and are on immunosuppressive treatment currently, genetic conditions causing primary immunodeficiency, and as defined by attending consultant).

3.1.2 Hepatitis C

Pre-HD

Test for anti-HCV, HCV Ag (Abbott Architect), 1 baseline HCV PCR and Alanine aminotransferase (ALT).

Regular testing while on HD (See Table 1)

Patients who are HCV Ag (Abbott Architect) negative, anti-HCV negative and baseline HCV PCR negative:

- 3 Monthly HCV Ag (Abbott Architect) and anti-HCV testing.
- Monthly ALT.

Providing that investigation for HCV Ag (Abbott Architect) is undertaken 3 monthly for all patients, including immunosuppressed, and 1 baseline HCV PCR is negative it is not necessary to have an annual HCV PCR.

Interpretation of HCV results and management of patients

Anti-HCV, HCV Ag (Abbott Architect) and HCV PCR negative patients: No evidence of HCV infection.

- Patients who are not classified as immunosuppressed*: May have HD in a multi-bedded unit when anti-HCV and HCV Ag (Abbott Architect) negative results are available (i.e. It is not necessary to wait for a HCV PCR negative result before HD in a multi bedded unit).
- Patients who are immunosuppressed* (including those on immunosuppressive therapy for a renal transplant) may only have HD in the multi-bedded unit when anti-HCV, HCV Ag (Abbott Architect) and a **negative HCV PCR** results are available provided there is no evidence of HBV or HIV infection.
- Thereafter they should be followed up as described in Table 1.

Anti-HCV and HCV Ag (ABBOTT ARCHITECT)/ HCV PCR positive

- There is serological or molecular evidence of HCV infection and patient is considered infectious:
- Patients should be cohorted or located in an isolation room for HD a dedicated machine is not required (see paragraph 10.4 and figure 2) HCV positive patients should be referred to a Hepatologist or an infectious disease physician for assessment and management.
- It is not recommended that patients be further cohorted based upon a HCV viral load threshold. However, emphasis should be placed upon the importance of procedures to prevent cross infection, especially if any patient has a very high HCV viral load.

Anti-HCV positive, HCV Ag (Abbott Architect) negative, ALT within normal limits and HCV PCR negative on 2 occasions taken 1 month apart.

- This profile is consistent with resolved HCV infection.
- The national policy advice that these patients maybe be dialyzed in a multi bedded unit; however ongoing monitoring is essential.
- Monthly HCV Ag (Abbott Architect) and ALT should be undertaken. However, the following experts should be consulted before a decision is made to dialyse these patients in the open unit, patients Nephrologist, Microbiologist or Hepatologist.

HCV Infected Individuals who are receiving anti-viral treatment

An increasing number of infected HCV patients are receiving anti-viral therapy to eradicate HCV infection. The aim is for the patient to be persistently HCV RNA negative after cessation of treatment. There are a number of stages regarding the anti-viral responses, listed below;

End of Treatment Response (ETR): Undetectable HCV RNA (<50IU/ml) at the cessation of anti-viral treatment.

Sustained Virology Response (SVR): Undetectable HCV RNA (<50IU/ml) , 24 weeks after end of anti-viral treatment.

Relapse after treatment: Re-appearance of HCV RNA(>50IU/ml) between cessation of anti-viral treatment and before 24 weeks have elapsed.

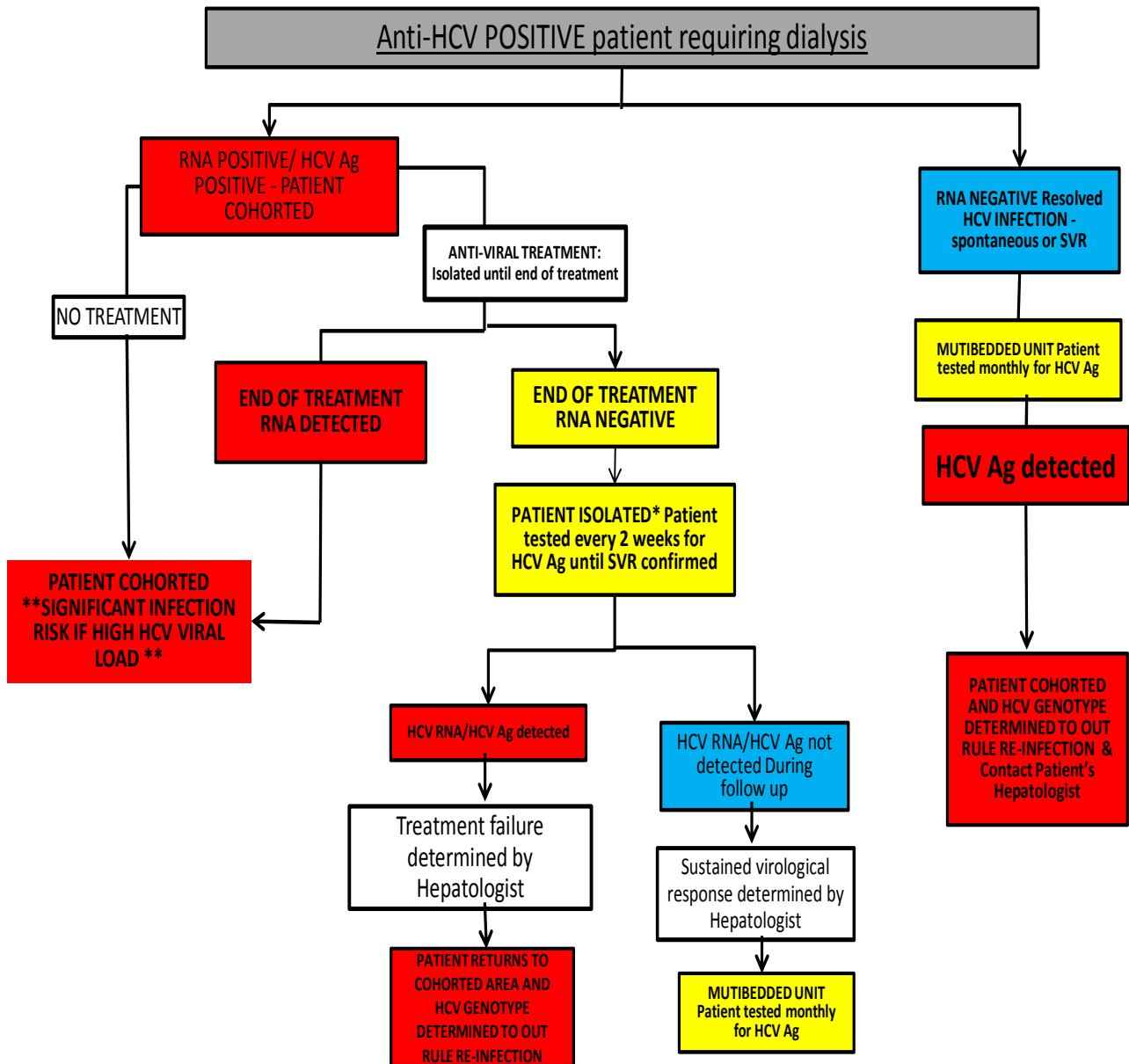
Re-infection: Re-infection with HCV of the same or another genotype in an individual who has cleared HCV infection (HCV RNA 'Not detected') either spontaneously or having achieved a SVR following anti-viral treatment.

- Patients who have an SVR to an anti-viral treatment should be regarded as having resolved HCV infection and in accordance with the "Blood Borne Virus in Haemodialysis Guidelines in Haemodialysis, CAPD and Renal Transplant 2010" they can be dialysed in the multi- bedded unit provided monthly HCV Ag testing.
- Patients who are HCV RNA negative (HCV RNA not detected) at the end of treatment (ETR) should be dialysed in isolation room and screened for HCV, until SVR is confirmed.

If HCV Ag or HCV RNA (>50 IU/ml) is detected any time within the 24 weeks following end of treatment, the patient should be managed as per paragraph 10.3, Management BBV infected patient.

In these cases HCV genotype should be preformed to out-rule re-infection with another HCV genotype. The situation does not automatically require a "look back" of patients in a multi-bedded unit. This should be discussed with the relevant Consultant Nephrologist & Microbiologist, virologists & public health.

Figure2: Schedule for management positive HCV patient



* In an isolation room to prevent HCV re-infection

3.1.3 HIV

Pre- HD

Pre HD screening should be carried out for HIV Ag/Ab (See Table 1).

Regular screening for HD patients

Annual HIV Ag/Ab screening (See Table 1).

Interpretation of HIV results and patient management.

HIV Ag/Ab negative:

No evidence of HIV infection

- HD can be undertaken in a multi-bedded unit provided no evidence of HBV and HCV infection.

HIV Ag/Ab positive:

Evidence of HIV infection and the patient is infectious.

- Patients should be segregated/ cohorted or located in an isolation room for HD (See paragraph 10.4).
- HIV positive patients should be referred to an infectious disease physician for assessment and management.

3.2 Ordering virology screening prior to commencing haemodialysis (HD)

Medical staff should order “admission virology” & HCV PCR on PIPE (see Appendix 1, 2, 3, 4 & 5 for ordering virology and transport of samples to Laboratory during non office hours).

Medical staff should also inform nurse in charge in the Acute Haemodialysis Unit St Peters, or St Martins ward (for GICU, CCU, RICU patients) as early as possible so that testing can be arranged during standard working hours (Monday –Friday).

Patients requiring dialysis must be tested **prior** to first dialysis for:

- HBsAg
- Anti-HBc
- Anti-HBs
- HCV Ag/Ab
- HIV
- HCV PCR

When ordering virology on PIPE: Order:

“ADM VIR” on PIPE &
“ANNHCV” on PIPE

1. ICU/CCU/RICU staff should take virology samples and send to Martins room1. Staff in St Martin’s room 1 will ensure HCV PCR sample spun if necessary and dispatched to laboratory and record dispatch of all virology samples to laboratory in the virology book located in St Martins Room 1.
2. All virology samples are tested in the National Virus Reference Laboratory (NVRL). For **Emergency samples** arriving after 5.30pm, NVRL should be contacted (Phone number in virology book in St Martins) and samples sent via taxi. Routine samples obtained after 4pm in Beaumont: HCV PCR samples should be Spun and sent to micro laboratory, admission virology should be kept in the fridge and sent to the micro laboratory at 8am the next morning to be sent out to the NVRL lab (see appendix 2, 3 & 4).

3.3 Virology results required before HD in open unit

Before HD in the open unit all patients must have a written result of:

- 1 **HBsAg** dated within last month if not immune.
(To confirm immunity -vaccination history & anti-HBs immediately post vaccination and within last year must be faxed by referring unit).
- 2 **HCV Ag & Ab** dated within the past 3 months.
- 3 **HIV** dated within past year.
- 4 **In addition patient with a transplant** for longer than 3 months must have a written report of a negative **HCV PCR** dated within past year.
- 5 Patients that are admitted from another dialysis unit in the republic of Ireland do not require retesting on admission once printed negative results are available from an accredited laboratory.
6. Pre dialysis patients require one baseline HCV PCR dated within the last 12 months prior to commencing haemodialysis. It is no longer deemed necessary to have a second HCV RNA pre dialysis.

Note

HD Machines should not be used for another patient until negative results obtained. Place 2 reserve labels (see appendix 6 for sample labels) on machine with patients' name & DOB until following negative results are available.

HBsAg	
HCV (Ag)	
HCV (Ab)	Negative
HIV	

& HCV PCR negative for Immunocompromised * eg.transplant patients.

3.4 Emergency HD required but no virology screen available

Every effort should be made to determine the virology status of a patient before HD.

In the event of a patient requiring HD after 9pm & no virology results or isolation available the consultant/registrar on call may contact on call staff within the NVRL to arrange emergency testing (see Virology Record Book for phone number).

- If a decision is made to dialyse a patient in the open unit without virology results available, the reason for urgent haemodialysis versus the risk for other patients must be documented in the notes.
- A risk management occurrence form **must be** completed.
- The CNM3/ Directorate Nurse Manager must be informed.
- Results **should** be available before 2nd HD. In the event that results are not available continue to isolate the patient and machine.

3.4.1 Urgent results from NVRL

HBsAg

HCV (Ag/Ab) Verbal results within 4-6 hours

HIV

HCV PCR within 5-7 days (Monday –Friday service only)

- All negative (HBsAg, HCV (Ag/Ab) & HIV) results will be phoned back to the dialysis unit. Ward areas that receive calls about virology should forward these to the dialysis unit.
- The results should be available on the pipe system later that day or the next day.
- On receipt of negative results for appropriate virology tests the reserve labels should be removed from HD machine and the **virology record book updated**. 2 HCWs (1 must be an RGN) should witness removal of the reserve label. The removal of the reserve label is updated in the virology record book.
- Verbal results from the NVRL will only be taken by nursing staff on patients in their unit. The result must be recorded in the virology record book with the result, name of nurse taking result & name of NVRL staff member.
- Clinical Vision database must be updated with verbal/faxed results, using date that the phoned result was received by nurse taking result over the telephone. Weak positive results should be recorded as such and advice from NVRL recorded in the "report" section.
- All virology hard copy reports should be reviewed by virology coordinator, entered into Clinical Vision and forwarded to each individual unit or ward.
- In the absence of the virology coordinator the CNM's in each unit are responsible to ensure results are reviewed, entered into clinical vision and forwarded to medical staff for review (see below for individual arrangements)-.
 - St Martins rooms 1 & 2 – hard copy reports are sorted by ward clerks and signed by the dialysis registrar before filing in the chart.

The Screening, prevention & management of BBV In patients requiring RRT.

- St Peters Acute HD & Outpatient's – Once reviewed by virology Co-ordinator, forward to consultants secretaries for signing & filing in chart.
- Home Therapies- Nursing staff sort reports by medical team to be signed by consultants registrars before filing in the chart.

3.5 Regular haemodialysis patients

Routine screening is scheduled and taken by the dialysis nurse on a planned basis as organised by the Clinical Nurse Manager. (See table 1).

- **Routine HBsAg should NOT BE taken within 10 to 14 days of administration of hepatitis B vaccination.**
- Renal Virology Co-ordinator or in her/his absence the CNM's in each unit compiles and updates monthly a list of regular patients who require monthly/3monthly/annual screening (See Table 1) depending on their status. This includes patients with a raised ALT who require additional screening.
- On a monthly basis the Renal Virology Co-ordinator reviews all virology screening and ALT results and compiles a report forwarded to DNM and CNM3 on compliance with the virology screening. Actions taken to correct non-compliance are recorded.

3.6 Management of patients who have received dialysis in another unit

3.6.1 Transfer from a unit within the Republic of Ireland.

Patients who have had HD in a unit in the Republic of Ireland **do not require BBV investigation** on admittance to another unit before commencement of HD provided a **printed** copy of BBV laboratory results, originating from a laboratory in accordance with the testing schedule and originate from an accredited laboratory (See table 1) is available to the receiving unit.

3.6.2 Transfer from a unit outside the Republic of Ireland

- Units accepting patients from a unit outside the Republic of Ireland (e.g. for holidays or a long term transfer) should receive: a print copy of BBV laboratory results, obtained from an accredited laboratory, in accordance with the testing schedule (See table 1) before HD.
- This print copy should reveal HBsAg, anti-HCV, HCV Ag (Abbott Architect), HCV PCR and HIV Ag/Ab negative before the patient can be dialyzed in a multi bedded unit.
- On admission repeat BBV testing should be undertaken in accordance with Table 1 .
- See paragraph 10.4 for management of **BBV positive patients**.

Beaumont patients receiving holidays abroad for a period of 2 weeks or less

Patients planning to have haemodialysis abroad should be informed of the risks and consequences of acquiring a blood borne virus and the need for testing and possibility of isolation on their return by nursing or medical staff.

- Re-admitted patients who have been dialyzed abroad for a period of 2 weeks or less should be tested for HBsAg, HCV Ag (Abbott Architect), anti-HCV and HIV Ag/Ab (Order 'HOLDIAL') before their first HD session on return but it is not necessary to have negative results before commencing HD in the open unit.
- Due to the incubation period for HBV, HCV and HIV, infection is unlikely to be detected in the first sample post HD abroad if the patient has been away for two weeks or less. The need for further testing will depend on the risk assessment (Appendix 15).

Haemodialysis abroad for a period of greater than 2 weeks

- These patients should be advised (prior to their holiday) to return to Beaumont Hospital HD unit, the day before they require haemodialysis for their virology to be taken.
- Re-admitted patients who have been dialyzed abroad for 2 weeks or more, a negative HBsAg, HCV Ag (Abbott Architect), anti-HCV and HIV Ag/Ab must be available before HD in the multi-bedded unit.

The Screening, prevention & management of BBV In patients requiring RRT.

- If results are not available, a clinical decision must be made as to possibility of the patient waiting 24 hours until they receive haemodialysis.
- In the event that the patient requires haemodialysis prior to the results being available, they will require haemodialysis in isolation.

Schedule of follow up testing following HD treatment abroad

To determine the ongoing testing protocol a risk assessment of the holiday HD unit must be carried out based upon:

- Whether the unit currently dialyses patients infected with BBV's and what their isolation/decontamination practices are.
- Recent BBV transmission incidents within that unit.
- The current questionnaire requesting this information is presented in Appendix 15.

The need for additional BBV investigation in the following situations should be based on risk assessment:

- Patients returning following HD in another unit outside Ireland (Refer to Appendix 17 for high risk areas).
- Patients who are being admitted from a unit where there has been a BBV transmission in the previous year.

If there is a **significant risk** of infection the patient should be tested for HBsAg, HCV Ag (Abbott Architect), HCV Ab and HIV Ag/Ab weekly for 3 months and this has to be documented in the patient's notes.

There is no need to isolate the machine for this 3 months period providing the results remain negative.

If a positive virology result is identified in a previously negative patient the Nephrologist and on call microbiologist, DNM, CNM3, Infection Control Nurse and Renal Virology Co-ordinator must be informed immediately.
(see section 14 and appendix 7/8/9 and 10 for further actions of positive or weak positive result)

Abnormal liver function

Any patient who develops abnormal liver function tests should be screened for HBV (HBsAg) and HCV (anti-HCV & HCV Ag (Abbott Architect) infection as appropriate.

4.0 Home Therapies - CAPD/CCPD/ Home Haemodialysis (HHD)

Before starting CAPD/CCPD/HHD, patients should be screened for HbsAg, Anti- HBc, anti HBs, Anti- HCV, HCV Ag, 1 baseline HCV PCR and HIV Ag/Ab. Refer to paragraph 10.3 for management of a BBV positive patient on Home Therapies. On admission to the hospital, patients on HHD do not need to be retested, provided the BBV results are in accordance with the testing schedule (See Figure 3).

Regular testing on CAPD/CCPD/Home Haemodialysis

Annual HbsAg, HCV (Ag/Ab) and HIV Ag/Ab & Anti-HBs. Annual testing should suffice for patients on HHD even if non-vaccinated, non-responders to vaccine or HBcAb positive. Patients on HHD, on return from holidays need to be retested (HbsAg, HCV (Ag/Ab), HIV) 4 weeks post holidays.

5.0 Plasmapheresis & Therapeutic Plasma Exchange (TPE) patient

- Screen for HBsAg, HCV Ab/Ag, anti-HBc & HIV on commencement of TPE. Screens must be sent as urgent.
- Machines used for TPE do not need to be isolated even if awaiting virology screens.

6.0 CKD Patients

Patients being reviewed in the general OPD with eGFR < 30 should have:

- HBsAg, HBcAb, anti-HBs & VZV IgG to determine need for Hepatitis B and Varicella vaccination pre ESKD & pre transplant assessment (valid for 1 month for HD purposes)
 - HCV (valid for 3 months for HD)
 - HCVPCR
 - HIV
- }

(Valid for 1 year for HD purposes)

7.0 Renal Transplant Patients

For patients transplanted before the introduction of above: all patients currently with a functioning kidney transplant, unless known to be HCV infected, should be tested on a one-off basis by, anti-HCV and HCV PCR, to out-rule the possible acquisition of HCV infection through past treatment for renal failure.

Transplanted patients who are approaching RRT should have the same testing schedule as the CKD patient i.e.

- HBsAg, HBcAb, anti-HBs (valid for 1 month for HD purposes)
 - HCV (valid for 3 months for HD)
 - HCVPCR
 - HIV
- }

(Valid for 1 year for HD purposes)

Table 1: ROUTINE VIROLOGY SURVEILLANCE

Patient status	On admission	Fortnightly	Monthly	3 Monthly	Annual
All Patients	HBsAg, anti-HBc, anti-HBs, anti-HCV, HCV Ag (Abbott Architect), HCV PCR HIV Ag/Ab, ALT				
HBV susceptible (unvaccinated and non responders to vaccine)			HbsAg		
Vaccinated- good response (anti- HBs \geq 100 mIU/ml)				HBsAg	Anti-HBs
Vaccinated- low level response (anti- HBs 10-99 mIU/ml)				HBsAg	Anti-HBs
Anti-HBc positive & HbsAg negative			HBsAg*		
Anti-HCV negative, HCV Ag/HCV RNA negative			ALT	Anti-HCV, HCV Ag (Abbott Architect)**	HCV RNA**
Anti-HCV positive, HCV Ag/ HCV RNA negative			HCVAg, ALT		
HIV Ag/Ab negative					HIV Ag/Ab
Home HD patients On treatment at home	HbsAg Anti-HBc Anti-HBs Anti-HCV HCV Ag HCV PCR, HIV				HbsAg Anti-HBs Anti-HCV HCV Ag HIV
CAPD/CCPD patients	HbsAg Anti-HBc Anti-HBs Anti-HCV HCV Ag HCV PCR, HIV				HbsAg Anti-HBs Anti-HCV HCV Ag HIV
Anti-HCV positive, HCV Ag/HCV RNA negative(including SVR attained)			HCV Ag		
Anti-HCV positive, HCV Ag/HCV RNA negative (after anti-viral treatment but before SVR attained)		HCV Ag			

*See management of immunosuppressed patient section 3.1.1 ** (Annual PCR is not necessary provided baseline HCV PCR is negative and HCVAb/Ag (Abbott Architect) are performed every 3 months.)

8.0 Patient education and Consent

- As part of the patient's ongoing education programme, all patients should be educated by experienced medical and nursing staff on the risks of infection from blood borne viruses in the haemodialysis unit and such education recorded in chart.
- Patient information sheet on Hepatitis B and vaccination leaflet should be given and explained to patient on initiation of treatment.
- Consent is to be gained for virology along with Haemodialysis by Consultant Nephrologist or Renal Registrar.

9.0 Hepatitis B vaccination

- All long term HD and CAPD/CCPD patients should be immunised against HBV.
- Patients with CKD should be offered hepatitis B vaccination at the earliest opportunity, ideally before reaching the stage of requiring HD/CAPD/CCPD or transplantation (e.g. GFR < 25mls/min/ stage 3 Chronic Renal Failure).
- Patients attending the CKD clinic are referred by Ambulatory Care Nurses to the Renal Virology Co-ordinator who advises the patient and their GP's to commence HBV vaccine, via letter & patients commenced on HD are vaccinated in the dialysis unit.
- On completion of vaccine course antibody titres are checked two months after the last dose of the vaccine. Patients who do not respond to the first course are started on an alternate course with a different brand of vaccine.
- The basic HBV vaccination schedule consists of three doses of vaccine at 0, 1 and 6 months. However, some renal patients will require more rapid protection, therefore an accelerated schedule (e.g. 0, 1, 2, 12 months or 0, 1, 2, 6 months) should be used.
- There are two HBV vaccines currently available for patients with renal insufficiency, HBvaxPRO[™] (40 mcg) and Fendrix[™] (20 mcg) (Table 2). These vaccines are not interchangeable and therefore once a course has been initiated with one vaccine it cannot be completed using the other vaccine.
- **Please note IVIG and other blood products may contain anti-HBs. Therefore the anti-HBs result should be reviewed in conjunction with the date of administration of these products.**
- For further information please refer to the latest edition of the RCPI National Immunisation Committee's Immunisation Guidelines for Ireland.
- Post Vaccination testing after initial course (table 3); Anti-HBs should be checked 2 months after course of vaccine has been completed:
 - Anti-HBs ≥ 100mIU/ml; This is considered a good response. If the patient is on HD, anti-HBs should be tested annually and HbsAg three monthly. If anti-HBs drops below 10mIU/ml, a booster dose of vaccine should be given and annual testing for anti-HBs continued. Retesting after the booster dose is not necessary.
 - Anti-HBs 10-99mIU/ml: An immediate booster should be given and anti-HBs retested at 2 months using 2 assays; if ≥10 is detected in both assays, this indicates an adequate response. If the patient is on HD, anti-HBs should be

tested annually and HbsAg every 3 months. If anti-HBs drops below 10mIU/ml, a booster dose of vaccine should be given and annual anti-HBs testing continued.

- Anti-HBs <10mIU/ml: This is considered non-response. Repeat a course of vaccination (a different brand of vaccine) and retest at 2 months post completion. HbsAg should be tested monthly during re-vaccination. The frequency of subsequent testing will be determined by the response to the repeat course of vaccination.
- Anti-HBs <10 mIU/ml after repeat vaccination: The patient should be regarded as susceptible to HBV infection and tested for HbsAg on a monthly basis. However, if the patient is no longer on HD, HbsAg is not required.

Previously vaccinated patients should be tested for anti-HBs on commencement of HD. Follow up testing and booster doses should be based on the anti-HBs level (both current and initial response taken 2 months after original vaccination course) as per table 3.

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Table 2: Hepatitis B Vaccination schedule

Vaccine	Dose and frequency	Post vaccination Anti-HBs (titre) check
HBvaxPRO	40 mcgs IM Deltoid muscle 0, 1 and 6 months	2 months post last dose
Fendrix* *This vaccine is specific for renal patients only	20 mcgs – IM Deltoid muscle 0, 1,2 and 6 months	2 months post last dose

Table 3: Action following Anti-HBs (titre) level post vaccination

Post-hepatitis B vaccination anti-HBs testing. Anti-HBs (mIU/ml)	Interpretation	Follow-up
≥ 100	Good response	Re-check anti-HBs annually and HBsAg 3 monthly if on HD. If anti-HBs < 10 mIU/ml, give booster dose of vaccine.
10-99	Give booster dose of vaccine. Check anti-HBs 2 months later using 2 different assays. Adequate response if both ≥ 10 mIU/ml.	Test for HBsAg 3 monthly if on HD. Re-check anti-HBs annually. If anti-HBs < 10 mIU/ml, give booster dose of vaccine.
< 10	Non-response. Repeat vaccination course (different brand). Check anti-HBs 2 months later. If anti-HBs < 10 mIU/ml, susceptible to HBV infection.	Test for HBsAg monthly if on HD (For Home Therapies annual testing is sufficient).

10.0 Infection control practices for the haemodialysis unit

10.1 Environmental / design Considerations

- Adequate layout and light is essential.
- There should be adequate space between patients' stations. UK guidance is included below for illustrative purposes. The relevant professional and technical staff should consider published guidance documents in the design of these units.

The Department of Health (UK) Recommends:

- 900mm (3ft) minimum between haemodialysis stations.
- 1-2 Isolation rooms (negative pressure ventilation) per 12 station units.
- One had basin between two HD stations, with one for each isolated or segregated area.

10.2 Standard Precautions

Standard precautions must be applied by all staff, to all patients, at all times and in all settings. Mandatory training of staff should be completed every two years, as per hospital policy. Standard precautions consist of 15 infection prevention and control practices. Due to infection risks associated with HD, additional measures (to standard precautions) have been recommended in international evidence based HD guidelines, and have been included in this guideline. The elements of standard precautions applicable to the haemodialysis unit are detailed below-

1. Hand Hygiene

This is the single most important measures to prevent the transmission of microorganisms in HD and CAPD settings.

Hands should be decontaminated as per WHO '5 moments of hand hygiene':

Before touching a patient

Before aseptic/ clean procedure

After Body fluid exposure risk

After touching patient

After touching patient surroundings

Also;

- The correct technique, using the 7 steps of hand hygiene should be adhered to at all times, as per Beaumont (2013) Hand Hygiene policy, using an alcohol hand based rub/ gel if hands are physically clean, or liquid soap and water.
- Alcohol hand solution is the preferred hand hygiene agent except in the following circumstances;
 - a) Liquid soap must be used when hands are visibly soiled or

- b) When caring for patients with diarrhoea. If patient has diarrhoea, it is necessary to use Hydrex (chlorhexidine) liquid soap.
- Staff must perform the appropriate hand hygiene **after** gloves removal, and **after** handling contaminated items. Staff must only use the approved hospital moisturiser, to prevent breakdown of skin integrity.

Patients should be educated and encouraged to wash their hands on arrival to the unit and;

- a) Before eating.
- b) After toileting, sneezing or coughing.
- c) On entering the unit.
- d) Before cannulation.
- e) Immediately after a HD treatment especially if they applied digital pressure to needle exit sites. This is advised to reduce the risk of contamination to surfaces or equipment (e.g., weighing scales).
- f) Before leaving the unit.
- g) Before connecting and disconnecting CAPD/CCPD lines.
- h) Before undertaking exit site care.
- i) After handling peritoneal waste.

(Also See Beaumont Hand Hygiene Policy, Department of Infection prevention and control, Beaumont Hospital, June 2007, for further information).

2. Occupational Health Programme

The recommendations from The Immunisation Guidelines of Ireland 2008 and the department of Health and Children, Prevention of Transmission of Blood Borne Disease in the healthcare setting, Department of Health and Children; 2005, guidelines are to be adhered to. Specific guidelines adhered to, to protect the employee include;

- All staff working in the renal unit should be referred to the Occupational Health department (OHD) before or immediately after starting work by their line manager for hepatitis B vaccination.
- Unless performing EPPs there is no need to screen for HCV or HIV infection in current or prospective staff of renal units, either routinely or at pre employment health assessment or periodically. However, those known to be at risk acquiring infection or known to be infected should seek advice from an Occupational Health Physician.
- Staff working in HD units in contact with patients, machines or materials used in HD should be immunized against HBV and their response to vaccine checked.
- Non-responders or poor responders should be tested annually for HBsAg.
- The following points should be clearly documented in the Occupational Health department in relation to staff members with BBV infection;
 - 1. That the infected health-care worker fully understands standard Precautions and the implications for patients (and others) should they be breached at any time.
 - 2. That the definition of exposure- prone procedure is understood.
 - 3. That the individual does not suffer from an exudative skin disorder (eg. Psoriasis or eczema).

- Screening guidelines for exposure prone procedures (EPP's) should be followed.
- HBV non-immune staff should not care for HBsAg positive patients during a HD treatment.
- Staff who are either HBeAg or HBeAg negative with an HBV DNA level exceeding 10^4 copies/ml should not undertake clinical procedures in the HD unit. Such procedures would include direct contact with HD process. Such restrictions need not be applied to staff that have no patient contactor who's clinical duties do not involve direct contact with patients' body fluids, vascular access lines/ ports or other relevant equipment. Decisions regarding the fitness for duty of a clinical health care worker in this context should be informed by competent risk assessment with attention to individual factors eg. No existing skin disease.
- There is a process in place with the renal unit & Occupational Health Department that allows the Directorate Nurse Manager (DNM) & CNM 3 to check that all vaccination procedures are completed and to alert the DNM & CNM 3 to staff not immune to hepatitis B.
- All patients on HD & peritoneal dialysis are offered hepatitis B vaccination.

3. Personal Protective equipment (PPE)/Staff protection

- Staff must wear(PPE) such as gloves, plastic aprons, masks and face shields when performing procedures during which spattering of blood might occur (i.e. haemodialysis, placing or removing needles in arteriovenous fistula's (AVF's) and stripping machines of blood contaminated tubing). Remove PPE when procedure is finished and clean and disinfect hands.
- Removal of all PPE, including face shield, and decontamination of hands is necessary between each patient and/or dialysis station, also if PPE is contaminated with blood or body fluid.
- Gloves, aprons and face masks are only single use.
- Gloves must be of correct size and any allergic reaction to the gloves must be reported to occupational health.
- Patients should wear a non-sterile glove when applying pressure to the fistula access site. The rationale for this is to reduce possible environmental contamination from patient's fingers.
- Staff must not wear gloves & aprons when at nurse's station or performing activities such as answering phone etc.
- Eye splash kits must be located in the clinical area if required.
- Disposable gloves should be worn for contact with equipment contaminated with blood or body fluids. HD machines should be considered contaminated during and after a treatment until cleaned and disinfected.
- Hands should be decontaminated after every single contact with machine even if it is only to stop an alarm on the machine.
- Staff should not eat or drink in the dialysis treatment area.

4. Management of needle stick injury and blood and body fluid exposure

In accordance with Beaumont Policy on Safe Handling and disposal of Sharps 2010

- Where possible needle-free or needle-safe devices should replace needles. Needles when used should never be resheathed. It is the responsibility of those generating sharps to dispose of same safely immediately after use into a sharps' box.
- The sharps bin should be temporarily closed while not in use.
- The sharps bin should not be more than 3/4th full.
- Needles / sharps injuries and splashes to mouth or eyes should be managed according to the guidelines on prophylaxis for and management of occupational blood exposure 2004. All haemodialysis areas must have an identifiable emergency eye wash solution accessible in the unit.

5. Management of Blood Spillages

- Healthcare workers should wear appropriate PPE before dealing with spillage.
- A solution of hypochlorite 10,000ppm should be reconstituted daily adding 7 (2.5gm) tablets of Precept to 1LT of water in a designated container. A label should be applied with information on the time & date the solution was prepared & the time & date it is to be discarded.
- All blood spillages must be treated immediately by placing absorbent paper hand towels over the spill, applying hypochlorite (Precept) 10,000 over the paper towels, and leave for 3 minutes, then discard paper towels into healthcare risk waste bin or ridged container ie. Zulu bin.
- Call the cleaners to clean the area as per protocol for cleaning blood spills.
- Discard gloves and apron into healthcare waste bin. Perform hand hygiene after discarding PPE.
- A clinical **risk occurrence form** must be completed for all blood spillages noting the station and the area that it occurred.

6. Management of Healthcare risk and non risk waste

Staff must adhere to Hospital Guidelines on the Disposal of Healthcare Risk Waste / Healthcare Non –Risk Waste and Recycling (2013), and Health Services Executive; Segregation, packaging and Storage Guidelines for Healthcare risk waste, 2010.

- All healthcare risk waste must be discarded appropriately. Dialysis blood lines and priming fluid contaminated with blood must be discarded into rigid healthcare risk waste containers (zulu bins) with the appropriate absorbent pads, which are sealed and tagged before leaving the unit.
- Used syringes even with no needles must be discarded in the sharps bin.
- See hospital guidelines as above for specifics on management of sharps and sharps disposal.

7. Management of Laundry and Linen

- All blood stained or considered contaminated, laundry must be placed in alginate bags and placed into a red laundry bag.
- Linen bags must be closed when two-thirds full and tied with the blue tie tag. Fire blankets must be placed in an alginate bag and placed into a blue laundry bag and tagged with a blue tag.

In accordance with the Society of Linen Services and Laundry Managers. Hospital Laundry Arrangements for Used, Foul and Infected Linen, 2008

8. Safe Injection Practice

- Antiseptic Non touch technique must be used to avoid contamination of sterile injection equipment.
- Each haemodialysis unit should have clearly designated clean and dirty areas. A clean utility room should be available as a clean area however due to lack of space this is not available in any of the 3 units. In the interim each unit should designate an area (if possible at least 3 feet from nearest dialysis station) as a clean area. This should be used for drawing up drugs, setting up for aseptic procedures etc. **Any article brought to a patient's station must not be returned, used or unused, to the clean area or used on another patient before cleaning and/or disinfection.** No healthcare risk bins, blood samples or contaminated equipment should be in this area.
- No handling or storage of unclean supplies, equipment, or blood samples should occur in the clean area.
- Each unit should have a designated dirty area for blood samples waiting collection, dirty clamps requiring cleaning & disinfection, used dialysis concentrate bottles etc. A blood fridge must be used for storing samples not for immediate dispatch to laboratory.
- Multiple dose medication vials **must** be discarded after each use (e.g. heparin, dextrose 50%, lignocaine etc) into the purple lidded rigid container. Needles, syringes and canula are sterile single-use and must not be re-used for another patient.
- The flow of work should always move from clean to dirty areas.
- Do not use bags or bottles of intravenous fluids as a common source of supply for multiple patients.

9. Patient care Equipment/ Instruments/ Devices

Recommendations in the following documents should be followed;
Health Service Executive. Code of Practice for Decontamination of Reusable Invasive Medical Devices 2007.

Creutzfeldt-Jakob Disease Infection Control Committee on behalf of the Scientific Advisory Committee of the HPSC and the National Creutzfeldt-Jakob Disease Committee DoHC. Guidelines on Minimising the Risk of Transmissible Spongiform Encephalopathy's in Healthcare Settings in Ireland 2004.

HD Machines and Equipment

- The external surface of each HD machine should be cleaned and disinfected after each treatment with Teepol and 1 tablet of precept (1,000ppm) in 1LT of water and rinsed with plain water after 3 minutes. Special attention should be paid to frequently touched areas on the machine (e.g. Control buttons).
- Between each patient and following a blood leak all dialysis machines are heat disinfected (see appendix 16, on effectiveness of Heat Disinfect); this disinfection is recorded in Clinical Vision in the comments section on the Flow sheet.
- Chemical and Heat Citric disinfection programmes are undertaken once weekly (as per manufacturer's instructions). This process is recorded in the **Equipment Disinfection Record**.
- Prior to removing haemodialysis blood lines from machine post treatment the venous and arterial transducer filters on the blood lines must be examined for breakthrough blood contamination by checking the back of the filters. If breakthrough blood or saline is noted the machine must be taken out of service until internal transducer is replaced. If breakthrough has occurred the machine components that may have come in contact with blood should be replaced or decontaminated by qualified personnel according to a protocol that incorporates the manufacturers' instructions before the machine is used again. Checking the filters after each HD must be recorded on the flow sheet by the nurse discontinuing HD.
- Each treatment bed, locker, table and chair to be cleaned with detergent and water (teepol 1 3mls (pump) in 1 L of water), before use on another patient.
- Blood spills must be treated with Precept (7 tablets to 1 Lt) first. If large blood spill occurs on machine - clean & disinfect as above & remove machine from use, inform technical staff, & record in "**Blood Spill Book**" & **complete a risk management occurrence form** stating machine number, station number and room. Technical staff must check if blood has penetrated casing of the machine & replace contaminated parts.
- All items taken to a patient's dialysis station should be disposed off after use or cleaned and disinfected with Teepol and Precept after use, not to be taken back to clean area. BP cuffs, ear phones and hoist slings (if applicable) are dedicated for single patient use and retained by the patient until next dialysis session. Tourniquets are single use.
- Clamps should be disposable or washed and sterilised after each treatment.
- Glucometers should be dedicated to an individual patient for each HD session. Following the HD session and before use on another patient the glucometer should be cleaned and disinfected as per IPCT instructions ie. with teepol & precept (1x 2.5mg tablet to 1lt water) dampened cloth, Glucometer boxes/trays with supplies (lancets etc) are for storage only and not to be used at point of care (ie. Patient's bed side).
- Clean and disinfect the dressing trolley with precept (1 tablet to 1lt water). before each use.
- See section 10.3 for management of HD equipment and treatment area used for BBV infected patients, see also appendix 12, 13 or 14 related to documentation of cleaning.

10. Environmental Decontamination

Routine environmental cleaning is essential to minimise the risk of infectious agents contaminating the environment. Local guidelines developed from the cleaning Manual for Acute Hospitals (2006)

- All 3 HD units should have a cleaning and disinfection schedule for the environment and equipment (see appendix 11 for sample daily, weekly & monthly schedule). These schedules should be completed daily or as appropriate & retained for 12 months.
- Cleaning frequencies should reflect that HD and CAPD units are classified as high risk areas for environmental cleaning.
- Between each patient treatment the bed/ chair, locker, bed table etc. Should be cleaned with detergent and water before use for another patient, and a hypochlorite solution (10,000ppm) used after cleaning if visible blood is present.
- Dialysis equipment, patient charts etc. should not be brought into the kitchen.

11. Patient Placement

See paragraph 10.3 for patient placement for BBV positive patients.

12. Patient Movement and Transfer

The following information should be forwarded to the receiving unit

- Patient history
- Up to date BBV laboratory results
- Information on any BBV transmission in the previous six months in the referring unit

13. Dishes and eating utensils

- Dishes and utensils should be washed in a dish washer with temperatures reaching 65°C.

14. Respiratory hygiene and cough etiquette

Recommendations of Standard Precautions in Health care settings, HPSC 2009, are followed by all patients and staff.

15. Practices for special Lumbar puncture procedures

This element of standard precaution is not relevant to the haemodialysis. Though were relevant in the renal setting adherence to Standard precautions in healthcare setting. HPSC 2009, is adhered to.

10.3 Documentation

- Before each haemodialysis session the dialysis machine number and location of each station must be recorded on the haemodialysis flow sheet by the nurse commencing HD treatment. After each HD session the disinfection of the HD machine (heat) must be recorded on the flow sheet by the nurse discontinuing HD.
- **The cleaning of the bed station**, machine surface and the glucometers must also be documented on flow sheet.
- If a HD machine is changed on a patient during HD both machine numbers must be recorded on the renal database system in the comments box in the HD Administration (ie. Clinical vision/ eMed Renal).
- Nursing staff should record their names when connecting and disconnecting the patient to and from the dialysis machine on the flow sheet.
- The flow sheet for each HD session are not discarded but retained for future examination.

10.4 Management of BBV infected patients

In addition to standard precautions (Section 10.2) the following should be applied for all BBV positive patients:

- Patients who are BBV positive should not be dialysed in the open unit.
- Patients who are HBV positive must be dialyzed on dedicated machines in an isolation room. An updated list of machine numbers dedicated to the treatment of HBV, HCV and HIV positive patients is available in the unit at all times.
- Patient co-infected should not be dialysed in the same area as patients susceptible to the BBV.
- Staff should not take care of BBV positive patients and BBV negative patients at the same time.
- Protective clothing i.e. gloves, disposable plastic apron, mask, glasses or face shield should be worn when performing procedures during which spattering of blood might occur. Eye splash kits are located in the clinical area if required.
- Antiseptic soap (E.g. Hydrex) must be used by staff for hand hygiene.
- Surface of dialysis machine should be washed with teepol and precept 1 tablet after use (1,000 ppm), paying special attention to frequently touched areas on the machine (e.g. control buttons).
- The fluid pathways of the HD machine **must be heat disinfected** after each treatment.
- The disinfections are recorded in the VIRAL EQUIPMENT DISINFECTION RECORD and on Clinical Vision in the Comments section of the Flow sheet.
- Chemical and Heat Citric disinfection programmes are undertaken once weekly (as per manufacturer's instructions). This process is recorded in the **Equipment Disinfection Record**.

The Screening, prevention & management of BBV In patients requiring RRT.

- Laundry is placed in orange alginate bags after use and then into red laundry bags.
- Used fire blankets are placed in orange alginate bags after use and then into the blue laundry bags as per hygiene policy.
- Unless contaminated with blood, crockery and cutlery can be returned to the kitchen as usual. If contaminated with blood discard into healthcare risk rigid bin.
- Reusable medical equipment such as trays, glucometers, stethoscopes are to be cleaned and disinfected as per manufacturer's instructions before use on another patient.
- Each patient has his/her own blood pressure cuff, which the patient brings to HD each day, for individual patient use only.

Management of Hepatitis B (HBV) Positive Patients on Haemodialysis (in addition to 10.2 and in conjunction with appendix 12, checklist after Hepatitis B HD)

- All HBV positive patients are dialysed in room 2 in St. Peter's haemodialysis unit. Isolate the patient to a dialysis machine reserved for use for HBV positive patients with separate equipment, instruments, supplies and medications.
- There is a significant risk of HBV transmitted via environmental surfaces and therefore a dedicated machine must be used for HBV infected patients.
- Experienced nurses who are immune to hepatitis B will dialyse HBV positive patients and will not dialyse HBV negative patients for that dialysis shift. Scrubs must be worn and a disposable hat to be worn if the nurse is required to remain on duty after dialysing a Hep B patient.
- Where the Nurse must remain on in the unit after dialyzing a Hepatitis B positive patient, he/she must have a shower (hair to be washed if no hat was worn) prior to taking care of BBV negative patients.
- Dedicated HD machine used for Hepatitis B positive patients must be stored separately from other machines, under staircase in St Martins. When not in use these machines are disabled by the renal technician ensuring that they cannot be used in error.
- A list of the hepatitis B machine numbers is available in St Peters Acute unit and Renal data base system maintained up to date.
- HBV positive patients should not have HD at the same time and in the same segregated area/isolation room with patients positive for either HCV or HIV.
- The patients must be made aware of the potential dangers of hepatitis including the possibility of oral as well as sexual transmission in spouses / partners and public health informed of all new cases to ensure contact tracing & vaccination.
- The room and patient care equipment (bed, table) can be returned to general use, if it is no longer used for a HbsAg positive patient, provided that is cleaned with detergent and disinfected thoroughly using hypochlorite 1,000ppm, **See appendix 12** for checklist to be completed after every hepatitis B positive HD session.

Management of Hepatitis C Virus or RNA Positive Patients on Haemodialysis

(In addition to 10.2 also see appendix 13 checklist for cleaning post Hepatitis C or HIV HD)

- HCV Ag or RNA positive patients should be either segregated/cohorted in an area partitioned or physically separate from susceptible patients during HD or have HD treatment in an isolation room.
- It is not necessary to have a dedicated machine provided that disinfection processes are properly carried out between patients
- It is not recommended that patients be further cohorted based upon a HCV viral load threshold. However, emphasis should be placed upon the importance of procedures to prevent cross infection, especially if any patient has a very high viral load.
- Existing HCV machines that are no longer required to dialyse HCV positive patients will be stored beside the isolation room in St Peters ward.
- HCV positive patients should not have HD at the same time and in the same segregated area with patients positive for either HBV or HIV.
- The room/segregated area and patient care equipment (bed, couch, chair etc) can be returned to general use after a HD treatment provided that they are cleaned with detergent and disinfected thoroughly using hypochlorite 1000ppm. Check list, see appendix 13, to be completed post every HCV positive dialysis treatment.
- When cohorting patients with BBV's it should be ensured that cohorted patient's have the same BBV's.
- Patients who attain a SVR (Sustained Viral Response) to anti-viral treatment should be regarded as having resolved HCV infection and in accordance with the " Blood Borne Virus Guidelines in Haemodialysis, CAPD and Renal Transplantation 2010" they can be dialysed in the multi-bedded unit but tested monthly for HCV Antigen.
- According to the 2013 HSE Guidelines, Patients who are HCV RNA negative (HCV RNA not detected) at the end of anti-viral treatment (ETR) can be either;
 - a) Dialysed in an isolation room, if facilities available, until an SVR is confirmed.
 - OR
 - b) Dialysed in the multi bedded unit but tested for HCV Ag every two weeks until SVR confirmed.

Locally option a) is the management to be followed until an SVR is confirmed, see figure 2. If an SVR is not subsequently attained the patient should be cohorted with the HCV RNA positive patients, as above. In these cases HCV genotyping should be preformed to out-rule re-infection with another HCV genotype. This situation does not automatically require a "look back" of patients in the multi bedded unit. This should be discussed with the relevant microbiologists, Virologists and Public Health.

Management of HIV Positive Patients on Haemodialysis
(In addition to 10.0 and appendix 13)

- HIV positive patients should be either segregated/cohorted in an area partitioned or physically separate from susceptible patients during HD or have HD treatment in an isolation room on dedicated machines.
- An updated list of machine numbers dedicated to the treatment of HIV positive patients is available in the unit at all times.
- Existing HIV machines that are no longer required to dialyse HIV patients will be stored under the stair case beside St Martin's room 1.
- HIV positive patients should not have HD at the same time and in the same segregated area with patients positive for either HBV or HCV.
- The room/segregated area and patient care equipment (bed, couch, chair etc) can be returned to general use after a HD treatment provided that they are cleaned with detergent and disinfected thoroughly using hypochlorite 1000ppm.

BBV positive patients treated by CAPD/CCPD

- Patients on CAPD/CCPD who are infected with BBV's do not need isolation.
- Standard precautions should be sufficient to avoid cross-contamination.
- If CAPD/CCPD waste fluids known to be contaminated with BBV's, the entire CAPD and APD closed circuit to be disposed off in the Zulu bin. **Do not empty effluent.**
Zulu bin to be provided for disposal of all peritoneal dialysis bags.

BBV positive patients on Home Haemodialysis

A BBV positive patient who is being trained for Home Haemodialysis must be treated the same as a regular haemodialysis patient, see section 10.4. The staff training these patients must be dedicated to them and must not be involved in any other invasive procedures with other patients. When at home, the dialysis circuit is disposed off as clinical waste.

BBV's and patients with CKD but not on HD

Standard precautions should be observed for all patients with CKD who are not on HD.

11.0 Surveillance and Record Keeping

The Renal Virology Co-ordinator (RVC) is responsible for developing and maintaining a database for all patients to record HBV vaccination status. Results of serological and molecular tests for BBV are available in the electronic laboratory archive on the hospital ordering system PIPE. The hard copy of results returned from NVRL, are reviewed by the RVC and signed off by either the patients Consultant or their Registrar and for the St Martin's room 1 & 2 patient's by the Dialysis Registrar and then filed in the patient's medical chart. The results are input by the RVC to the renal data base system.

A risk management occurrence form is completed for any adverse events such as blood leaks, spills and malfunctions and forwarded to the HD Services CNM 3, where there is a log kept of any adverse events. HD machine cleaning and disinfection is recorded in the viral equipment disinfection record and entered post treatment on the clinical vision flow sheet, specifying the number and location of the machine, as well as the staff member connecting and disconnecting the patient.

Results of testing for BBVs and HBV vaccination status should be recorded in an accessible manner in individual patients' medical notes.

11.1 Audits

Yearly infection control audits in relation to preventing the transmission of BBVs in HD units should be undertaken jointly by the renal and infection prevention control teams.

12.0 Management of HCW's and carers in the HD setting

All staff working in contact with patients, machines or materials used in HD should be immunised against HBV and their response to vaccine checked. Non –responders or poor responders should be tested annually for HbsAg. Guidelines for exposure prone procedures (EPPs) should be adhered to. HBV non immune staff should not care for HbsAg positive patients during a HD treatment. (see section 10.2 Occupational Health Programme).

12.1 Careers

Careers who assist during the HD treatment of patients should be advised to obtain HBV vaccination from their GP.

13.0 Infection Control & education

Staff Members

Training and education for all employees at risk from occupational exposure to blood is to be undertaken annually and new employees before they begin working in a unit ie. Haemodialysis.

Training and education of patients

Training and education of patients (or family members for patients unable to be responsible for their own care) regarding infection prevention and control practices should be given on admission to the HD unit and annually thereafter. This should address;

- Personal hygiene and hand washing.
- The patient's role in preventing infection at the access site, and recognition of signs of infection. The education and training should be reviewed each time the patient has a change of access type.
- Recommendations for vaccination, ie. Hepatitis B, Influenza vaccination & Pneumococcal.

14.0 Identification of a positive or weak positive virology result

➤ **Communication:**

Weak positive or positive blood borne virus results will be phoned by the NVRL to

- a) Renal Virology Coordinator – 8092450 or 8093000 bleep 762 or in his/her absence;
- b) Nurse in charge St Martins room 1 or 2, St Peters Acute HD unit for samples sent from these units (ward details are on worksheet sent with all samples to NVRL) and Nephrology team for samples sent from ICU/RTU/CCU/OPD –

See Appendix 7, 8, 9, 10 - algorithm on management of weak positive or positive results after verbal report received.

- On receipt of a weak positive or positive result, the patient's nephrologist & Microbiology team on call must be informed immediately by the nurse in charge of the ward.
- The Renal Virology Coordinator or Nephrology team (registrar) will liaise with NVRL and microbiology team for interpretation of the result and ensure follow up testing is completed as advised, including determination of viral load etc.
- Patients will be informed of all confirmed positive results and its implications by their Consultant Nephrologist. Referral to specialist medical treatment and counselling will be offered to patient and family if necessary.
- In the case of positive HBsAg family and close contacts of the patient should be offered HBV Vaccine as appropriate.
- All interactions with patients will be recorded in detail in the medical and nursing notes.
- HIV, Hepatitis B and C are notifiable diseases, under infectious disease regulations. The Consultant Nephrologist must report positives to the **Director of Public health**. The laboratory director from where the sample is tested, NVRL, must also report the case.
- Information on newly diagnosed HIV is sent to HPSC via public health by the Consultant Nephrologist using a system of voluntary anonymised reporting. A special form is available from the Infectious Disease department for this purpose.
- Renal Virology Co-ordinator must be informed as soon as possible (bleep 762) by nurse receiving result.
- For dialysis management of this patient, see section 10.4.
- A risk occurrence form is to be completed.

➤ **Investigation:**

The source of the infection should be investigated. This should include review of the patient's recent medical history (e.g. blood transfusion, hospitalisation), history of high risk behaviour (e.g. injecting drug use, sexual activity), and practices and procedures.

➤ **Identification of the exposed cohort:**

The exposed cohort is defined as the patients who have shared a HD machine or HD session with the infected patient since that patient was last negative for markers of HBV, HCV or HIV infection.

If the infected patient has been dialysed in another HD unit in the last 3 months, the other unit must be informed of the incident. Patients in this other unit with therefore be part of the exposed cohort and need to be managed as such.

If patient from exposed cohort have been transferred to another HD unit, the director of this unit should be informed. The transferred patient's should be managed and followed-up as the exposed cohort.

➤ **Management of exposed cohort**

Patients belonging to this exposed cohort should be informed of the incident and counselled as appropriate. A risk assessment should be preformed based upon the source patients' viral load and risk of transmission.

HBV: HBsAg, anti-HBc and anti-HBs testing should be carried out immediately on all patients in the exposed cohort. Details of the hepatitis B Virus Vaccination history for exposed cohort should be reviewed and documented.

Thereafter, management of patients is dependent on their anti-HBs titres:

(a) Anti-HBs titre <100mIU/ml + history of HBV vaccination:

- Give booster dose HB Vaccine (40mcg)
- Test HBsAg weekly for 3 months
- Consider HBIG for non-responders to HBV vaccine (anti-HBs never \geq 10mIU/ml) and for those whose anti-HBs has fallen below 10mIU/ml.

(b) Anti-HBs \geq 100 mIU/ml + history of HBV vaccination:

- These patients are protected- therefore no further action is necessary.

(c) No history of HBV Vaccination.

- Test HBsAg weekly for 3 months.
- Commence accelerated course of HBV vaccine (dose 40mcg) immediately.
- Consider HBIG as appropriate

HCV: HCV Ag (abbott architect) and HCV antibody should be preformed immediately and then weekly on all the exposed cohort for a period of 3 months.

HIV: HIV Ag/Ab assays should be preformed immediately and then tested weekly on all exposed cohort for a period of 3 months.

The Screening, prevention & management of BBV In patients requiring RRT.

A copy of the policy will be circulated to the relevant areas by the Divisional Nurse Manager. The Clinical Nurse Manager in each area is responsible to ensure all staff access and read the policy, accessible on the Q Pulse system.

16.0 Filing

The Master copy will be filed in the Guideline folder in the directorate nurse manager's office. The guideline will be available for reading and review via Qpulse system.

17.0 Review

This policy will be reviewed in two years in March 2015.

18.0 Superseded/ Obsolete Documents

This is an updated version of the guidelines to prevent transmission of blood borne viruses in the haemodialysis unit and the guidelines for virology screening of renal patients.

SECTION 4

DEVELOPMENT AND CONSULTATION PROCESS

CONSULTANT SUMMARY	
Date PPPG issued for consultation	4 th October 2010
Number of versions produced for consultation	7 drafts.

Committees/meetings where PPPG was formally discussed	<p>Guideline committee (Dates: 26th October 2010, 30th November 2010, 18th Jan 2011 & 15th Feb 2011).</p> <p>Infection prevention and control meeting (11th Jan 2011).</p> <p>Meeting with Sharon, Nephrology consultants (24th Jan 2011).</p> <p>Nephrology Guideline Committee 26th November 2013.</p>
---	--

Where Received	Summary of Feedback	Actions/Response
The guideline committee meeting on 26 th October 2010.	The need for 2 baseline PCR's and emergency HD issues when no virology screens were available was discussed.	It was agreed that we would do only 1 baseline PCR and no annual PCR's.
The IPCT meeting on 11 th January 2011 (Prof. Conlon, Veronica Francis, Paul Lowe & Donia George were also present at this meeting to discuss about disinfection of HD machines).	A discussion took place regarding what the National Guidelines say about disinfecting the HD machine after treatment in a BBV positive patient and what our current practices are.	It was decided after the meeting that heat disinfection was enough to disinfect the HD machine after dialysing a BBV positive patient.
The guideline committee meeting on 18 th January 2011.	The committee was informed of the discussion between IPCT and the renal team (Prof. Conlon, Veronica Francis, Donia George & Paul Lowe)	Decision was made that heat disinfection would be used to disinfect the machines after treatment of a BBV positive patient. It was proposed that the guideline needed to be tidied up and would be ready to be signed off at the next guideline meeting.
Nephrology Guideline Committee 26th November 2013.	Key amendments were discussed related to 2013 HSE Guidelines	Decision was made to follow National Guidelines regarding management of HCV positive patient's, where, irrespective of viral load HCV positive patient's are cohorted. Also where patient is receiving anti-viral treatment the patient remains in isolation for haemodialysis until sustained viral response is

		obtained. Guidelines to be updated and finalised at next meeting.
Nephrology Guideline Committee 21/01/2014	Discussed the need to have enhanced standard precautions training annually as outlined by National Guidelines	Same agreed as action and incorporated into revised version.

SECTION 5

REFERENCE DOCUMENTS

1. 1. Blood Bourne Viruses in the Haemodialysis, CAPD and Renal Transplant Setting (2013) Department of Health and Children.
2. -Blood-Borne Viruses in Haemodialysis, CAPD and Renal Transplantation. Department of Health and Children 2010.
3. ANNA (2001) Core Curriculum for Nephrology Nursing .4th Ed. Janetti Inc. New Jersey.
4. ANNA (1998) Contemporary Nephrology Nursing. Janetti Inc. New Jersey.
5. Bundschu, D. (1993) A New Enemy Hepatitis C. EDTNA/ERCA Journal XIX-2: 22-24.
6. Lindley, E., Elshivers, M., Moll, R., Jadoul, M., Jayeskera, H., Zampieron, A., Harrington, M. & De Vos, J. (2001) Epidemiology and Management of Hepatitis C in Haemodialysis Patients: An Informal Multidisciplinary Review. EDTNA/ERCA Journal. XXVII, no. 3 p. 156-161.
7. Schneeberger PM, Keur I, van Loon AM, Mortier D, de Coul KO, van Harperen AV, Sanna R, van Der Heijden TG, van Den Hoven H, van Hamersve;t HW, Quint W, van Doorn LJ. (2000) The Prevalence and Incidence of Hepatitis C virus infections among Dialysis Patients in the Netherlands: a nationwide prospective study. Journal of Infectious Diseases; 182(5): 1291-9.
8. Center for Disease Control and Prevention (CDC) Morbidity and Mortality Weekly Report (2001). 50 No. RR5.
9. Immunization Guidelines of Ireland 2008.
10. Working Group (2002) Good Practice Guideline for Renal Dialysis/ Transplantation. Public Health Laboratory Services. UK 1-64.
11. Immunisation Guidelines for Ireland. 2008 edition. www.hpsc.ie

12. Heath Building Note 07-02. Satellite HD Unit. Department of Heath 2008. Stationary office London.
13. Heath Building Note 07-01. Main Renal Unit. Department of Heath 2008. Stationary office London.
14. Guidelines for the design and Construction of Healthcare Facilities. American Institute of Architects 2006
15. Health Services Executive: Healthcare Risk Waste Management: Segregation, Packaging and Storage Guidelines for Healthcare Risk Waste, 2010.
http://www.dohc.ie/publications/pdf/healthcare_waste_packaging2010.pdf?direct=1
16. Society of Linen Services and Laundry Managers. Hospital Laundry Arrangements for Used, Foul and Infected Linen, 2008
17. Standard Precautions in Healthcare Settings. www.hpsc.ie
18. Health Service Executive. Code of Practice for Decontamination of Reusable Invasive Medical Devices 2007.
19. Creutzfeldt-Jakob Disease Infection Control Committee on behalf of the Scientific Advisory Committee of the HPSC and the National Creutzfeldt-Jakob Disease Committee DoHC. Guidelines on Minimising the Risk of Transmissible Spongiform Encephalopathies in Healthcare Settings in Ireland 2004.14

Beaumont Guidelines

1. Standard and Transmission –based precautions policy Infection Prevention & Control team 2007.
2. Department of Infection Prevention and Control Hand hygiene Policy 2007.
3. Guidelines on prophylaxis for and management of occupational blood exposures 2004.
4. Guidelines on the disposal of healthcare risk waste and healthcare non-risk waste 2010.
5. Department of Infection Prevention and Control Policy on Linen Management 2007.
6. Guidelines for the prevention of infection with hepatitis B, C & HIV and other blood borne diseases 2002.
7. Vaccination Schedule for Patients with Pre End Stage and End Stage Renal Disease 2005.
8. Policy on the Role of the Occupational Health Service, Beaumont Hospital November 2011/OHD.
9. Policy Safe Handling and disposal of Sharps (2010) Infection Prevention and Control

The Screening, prevention & management of BBV In patients requiring RRT.

Team, Beaumont Hospital.

Appendix 1

Computerised Ordering of HBsAg, anti-HBc, anti-HBs, HIV, HCV, HCV PCR

BOTTLES:

- For all or any of the 'ADMINVIR' admission virology bloods (HBsAg, anti HBc, anti-HBs, HIV & HCV) One White Blood Bottle is required. 7-10mls clotted blood (fill bottle to maximum level indicated on bottle),
- HCV PCR: This sample needs to be in a separate bottle to that for other serology samples. All HCV PCR samples must be processed or frozen awaiting testing within 6 hours.

PIPE

1. Select Events & Patient ordering.
2. Enter patient episode number.
3. Click on mnemonic & then type in **ADM**. This will bring up option of admission virology (HBsAg, anti-HBc, anti-HBs, HIV & HCV) & **HCVANN** will bring up option of HCV PCR (dialysis only).
4. Order **STAT** if urgent.
5. Click on tab button directly under Clinical Info (on the right hand side of screen) and select printer for labels (note for Room 1 printer – select St Martins not Martins1).
6. Click on the SAVE button – tests ordered.
7. Place sample in Bio-Hazard bag.
8. Complete details in virology record book and if samples are stored in fridge overnight, complete section with date sample sent to lab.

Note

- 3 labels will be printed for each test – use 1 label for the specimen bottle, 1 for Virology record book for each test and 1 for Microbiology request form if sending after 16.30.
- **ONE SAMPLE ONLY PER BAG.** If samples are packaged incorrectly the laboratory will return the sample.
- **URGENT SAMPLES MUST BE IDENTIFIABLE WITH URGENT WRITTEN ON THE REQUEST FORM**(if out of office hours) **and** by selecting **STAT on PIPE**, and delivered to laboratory as soon as possible, see appendix 2, 3, 4,5, 6 for out of office hours Urgent Virology.
- **HCV PCR** samples must be processed or if not urgent frozen waiting for testing testing within 6 hours.

Appendix 2

Renal unit Virology ordering and testing outside office hours

BOTTLES:

- For all or any of the 'ADMINVIR' admission virology bloods (HBsAg, anti HBc, anti-HBs, HIV & HCV) One White Blood Bottle is required. 7-10mls clotted blood (fill bottle to maximum level indicated on bottle),
- HCV PCR: This sample needs to be in a separate bottle to that for other serology samples. All HCV PCR samples must be processed or frozen awaiting testing within 6 hours.

Urgent During office hours: 9am – 16.30pm

- **Ordering:**
 - **Virology;** order on PIPE see appendix 1, and use 'out of hours order forms' (appendix 3).
 - **HCV PCR;** PIPE order & complete 'out of hours order forms' (see appendix 3).
- Samples must be identified as Urgent by ordering **STAT** on PIPE and outlining urgent on form.
- Write details in Virology Record Book.
- Send sample directly to Microbiology for spinning and separating and who will sample to NVRL.

Outside Office Hours:

National Virus Reference laboratory out of hours

(After 4:30pm Monday to Friday, Saturday, Sunday and bank holiday Monday)

Routine:

- a) Take sample as before.
- b) Order test as routine or timed, on PIPE.
 - Virology bloods; kept in units' specimen fridge until 8am following morning to be sent via chute or porter to Microbiology department.
 - HCV PCR; Spin and Separate the sample, centrifuge available in St. Martins dialysis. Take to Microbiology PCR FREEZER.

Outside Office Hours:

Urgent:

- Nurse in charge to phone NVRL when sending urgent samples out of hours. To ensure that urgent Virology samples are sent and reported within the target time or 4-6 hours and that samples are transported in a safe manner.

Contact technologist on call in National Viral Reference Laboratory, phone 021 452 1935, leave message for technologist to phone the ward.

- Same as above a) b) (**ensure ordered as stat**) and c) if HVC PCR required
- Complete out of hours order form (appendix 3)
- Package sample in correct transport container (see appendix 4).
- On receipt of call from National Viral Reference Laboratory Technologist, send box to main reception staff who will arrange transport of specimens to UCD when available otherwise arrange Hospital Taxi service to transport to; **UCD National Virus Reference Laboratory, University College Dublin, Belfield, Dublin 4.**
- Complete the form 'NVRL Out Of Hours Urgent Dialysis Record', (see appendix 5) to ensure sample is logged on PIPE, send completed form as soon as possible to Microbiology department.

Appendix 3

Out of Hours testing Forms Virology and PCR

Haemodialysis VIROLOGY form and HCV PCR form in addition to computerised ordering is required for urgent on-call testing (See appendix 2, 3, 4, 5), when completed these accompany the blood samples to the NVRL.

Renal unit NVRL VIROLOGY order form for on-call ordering only (Sent with blood sample in insert of bio hazard bag in transport box)

Renal unit Beaumont Hospital		Attach patient blood order label here <u>or</u> complete patient details in I.T. downtime	
Routine	<input type="checkbox"/>	Surname _____ First name _____ DOB _____ MRN _____ Episode No _____	
Urgent	<input type="checkbox"/>		
Date: _____			
✓ tests required HBsAg <input type="checkbox"/> HCV <input type="checkbox"/>			
HIV <input type="checkbox"/> HBcAb (core) <input type="checkbox"/> (Note – If all 5 tests ordered – 1 large white tube sufficient)			
Clinical details _____			
HBsAb/Anti-HBs/titre (✓ box) Admission <input type="checkbox"/> After 1 st vaccine course <input type="checkbox"/> After boost <input type="checkbox"/> After 2 nd vaccine course <input type="checkbox"/> Annual screen <input type="checkbox"/>		Use ward/unit & phone number stamp below ↓ Phone any seroconversions to ward and microbiologist at 8092646	

Renal unit NVRL HCV PCR order form for on –call ordering only (Sent with blood sample in insert of bio hazzard bag in transport box)

Renal unit Beaumont Hospital		Attach patient blood order label here <u>or</u> complete patient details in I.T. downtime	
Routine	<input type="checkbox"/>	Surname _____ First name _____ DOB _____ MRN _____ Episode No _____	
Urgent	<input type="checkbox"/>		
Date: _____			
HCV PCR <input type="checkbox"/> (always inform lab if urgent on 2647/2646) (Office hours - send to micro lab ASAP – outside office hours, spin, decant into white tube & to micro lab freezer ASAP)			
Clinical details _____			
Use ward/unit & phone number stamp below ↓ Phone any seroconversions to ward and microbiologist at 8092646			

Appendix 4

Correct Use of Transport Container for on call virology

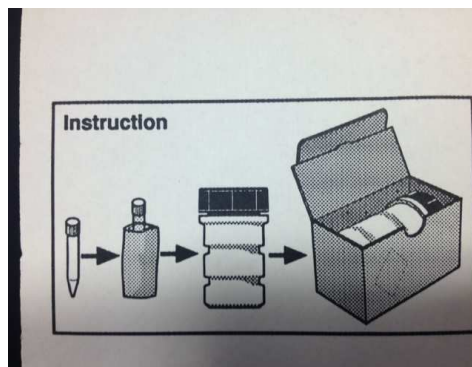
National Virus Reference laboratory out of hours

(After 4:30pm Monday to Friday, Saturday, Sunday and bank holiday Monday)

To ensure that urgent Virology samples are sent and reported within the target time or 4-6 hours and that samples are transported in a safe manner.

Contact technologist on call in National Viral Reference Laboratory, phone 2830800. Ask the service to contact Unit 140898, leave message for technologist to phone the ward.

All samples



1. Using the above transport carton and tubes place blood specimen into a transport tube, available from the Microbiology Department.
3. Place blood sample in white tube into green topped tube with absorbent paper, seal tube. Place tube/ tubes into biohazard bag with request form and into secondary ridged green cylinder and close. Place cylinder into transport box and close.
4. Write in space provided NVRL as the laboratory and name of unit from where it was sent.
5. On receipt of call from National Viral Reference Laboratory Technologist, send box to main reception staff who will arrange transport of specimens to UCD when available otherwise arrange Hospital Taxi service to transport to; **UCD National Virus Reference Laboratory, University College Dublin, Belfield, Dublin 4.**

Appendix 5

The Division of Laboratory Medicine, Beaumont Hospital					
Doc No:	MF-MIC-NVRL Urgent Dialysis	Revision	1	Active Date	1st June 2011
NVRL Out of Hours Urgent Dialysis Record					

For ALL specimens going directly by Taxi to the NVRL

- ❖ **Please attach one bar code label, fill in Date and Time sent and Sign**
- ❖ **Send Form in the Pneumatic Tube system to 2647 (Microbiology)**

For any queries please contact Microbiology on 2647

<i>Bar Code Label</i>	<i>Date</i>	<i>Time</i>	<i>Signature</i>

Received by: _____

Date:

Appendix 6

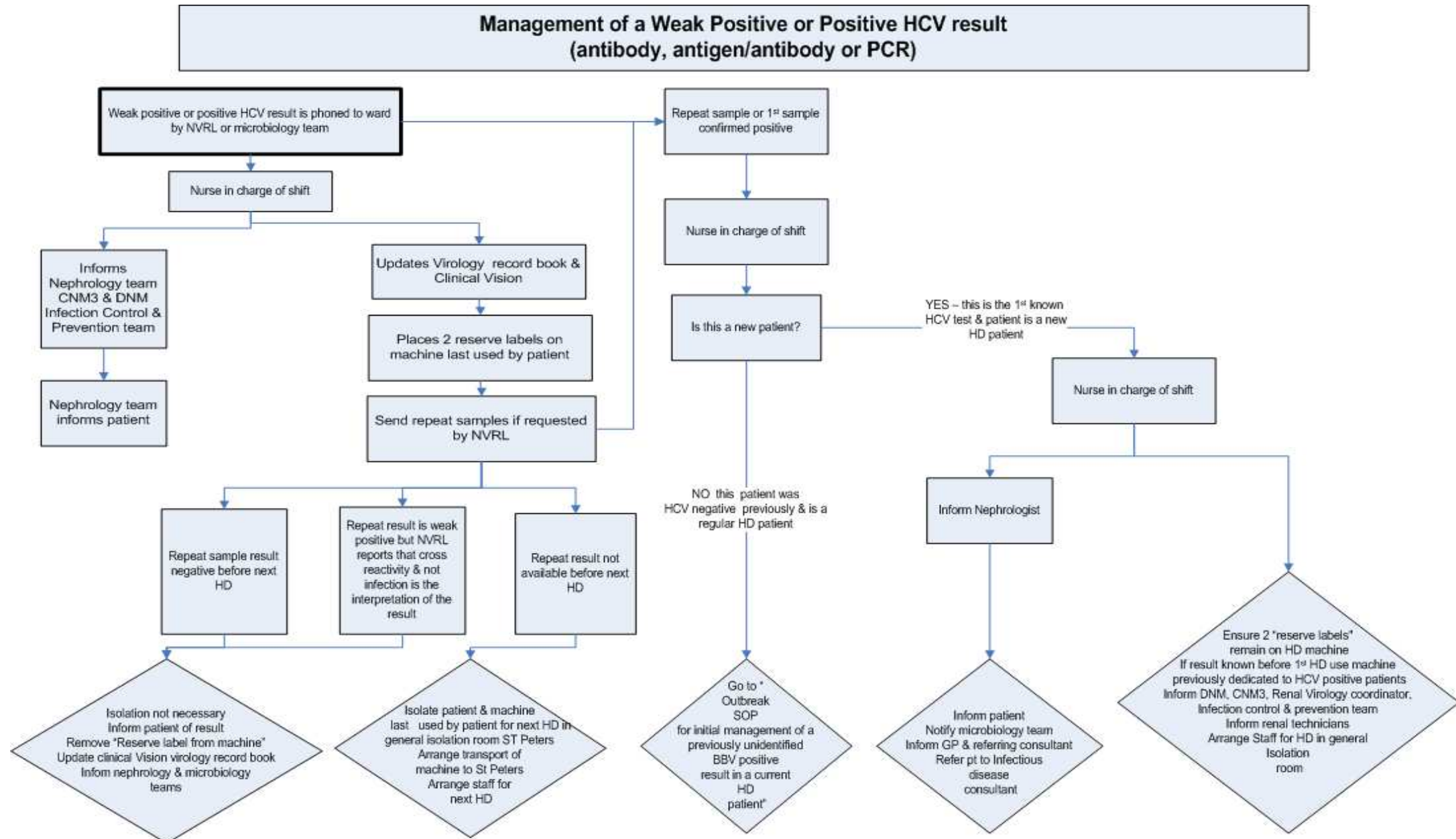
Reserve labels for HD machines

<div>RESERVE FOR</div> <div>Name: _____</div> <div>D.O.B: _____</div>
--

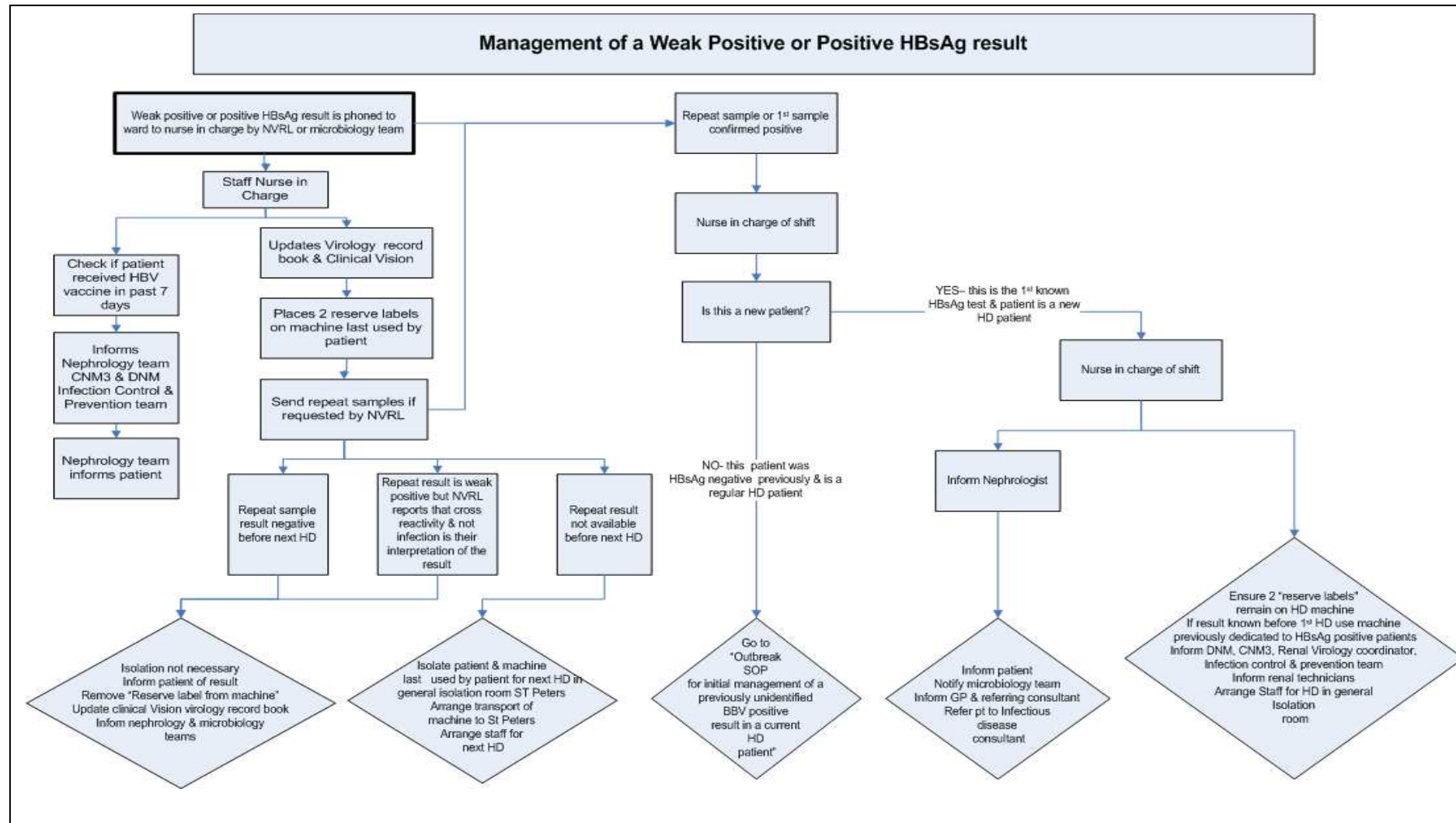
<div>Reserve FOR HCV PCR</div> <div>Name: _____</div> <div>D.O.B: _____</div>
--

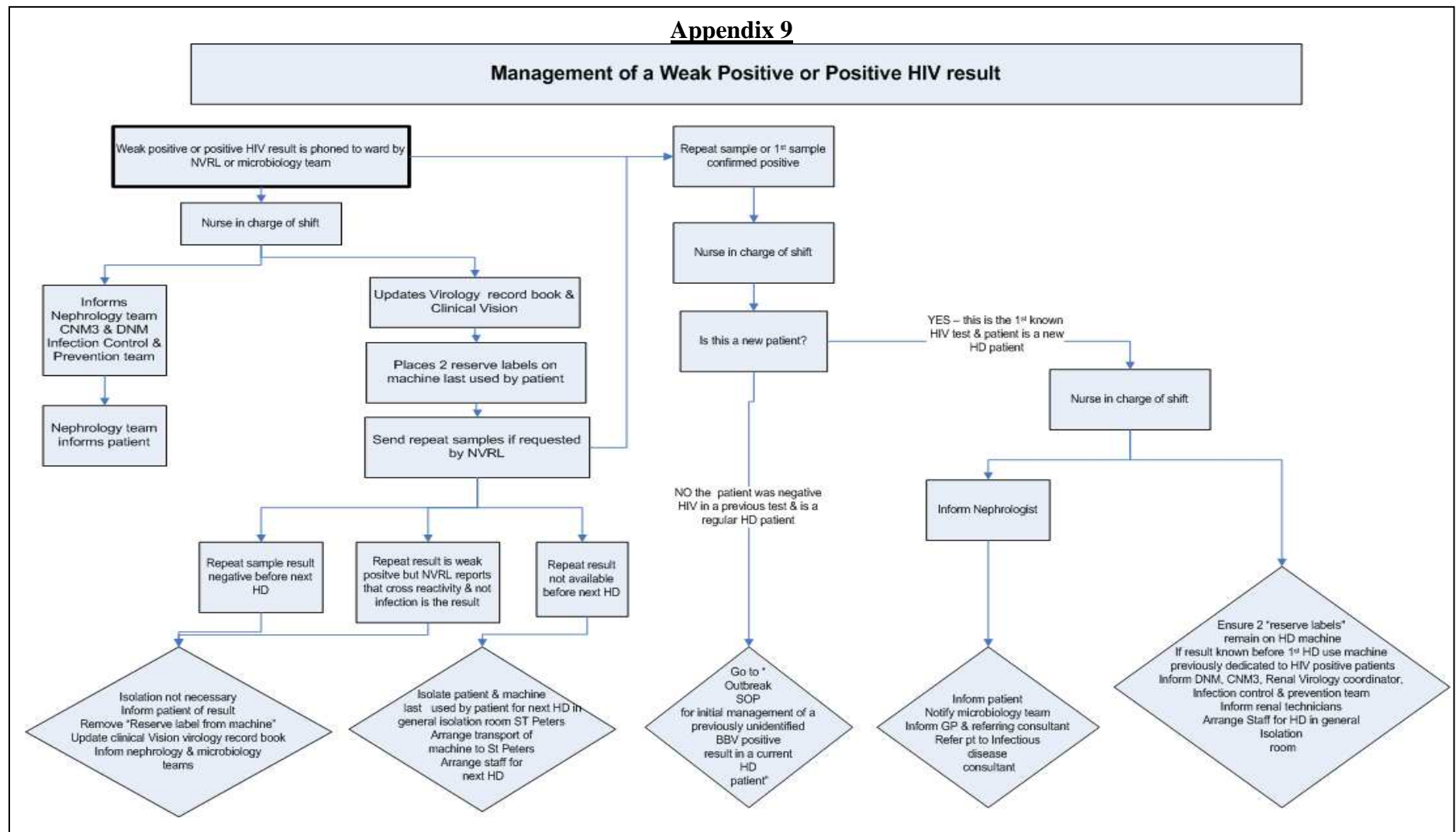
The Screening, prevention & management of BBV In patients requiring RRT.

Appendix 7



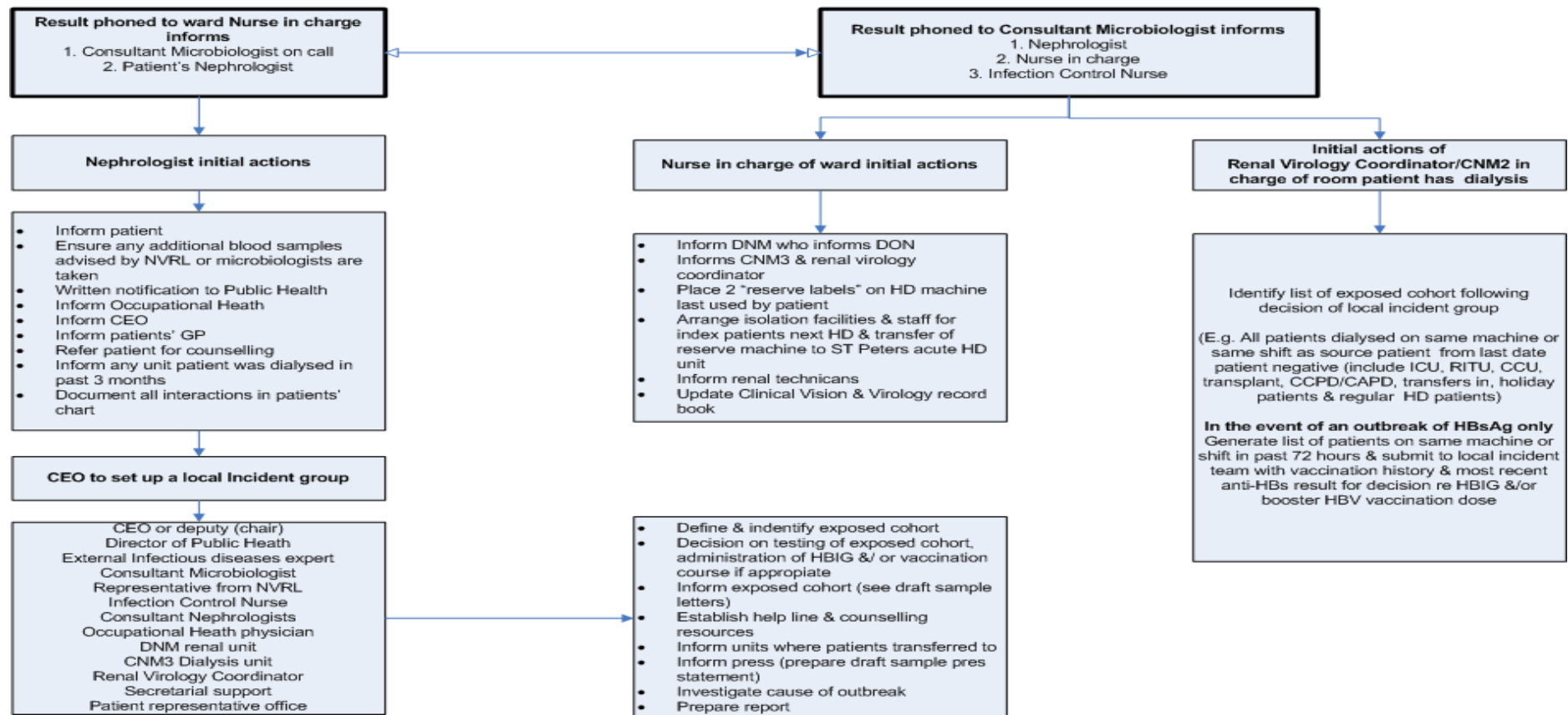
Appendix 8





Appendix 10

SOP for the Initial Management of a Previously Unidentified BBV Positive Result in a Current HD patient



Appendix 11

Sample Room 1

Cleaning & Disinfection Schedule

Daily record of decontamination of General Equipment Date_____

EQUIPMENT	PREFERRED METHOD OF DECONTAMINATION	FREQUENCY	Responsibility of	Sign when complete & any additional comments
Dressing Trolley with drawers X 2	Teepol and presept 1000 ppm, if contaminated with body fluids (see note 1), with blood (see note 2)	Daily	HCA	Sign_____
Procedure Tray	Teepol and presept 1000 ppm, if contaminated with body fluids (see note 1), with blood (see note 2)	Daily, pre & post use	HCA/ Nurse	Sign_____
Zulu bin holder	Teepol and presept 1000 ppm, if contaminated with body fluids (see note 1), with blood (see note 2)	Daily	HCA	Sign_____
Scales (weighing)	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2)	Complete scales daily & arms & seat after each patient	Infected patient: wash with teepol and precept 1 tablet in 1LT HCA/Cleaners	Sign_____
Sharps bin holder	Teepol and presept 1000 ppm, if contaminated with body fluids (see note 1), with blood (see note 2)	Daily – replace with new sharp bin after cleaning	Teepol and presept 1000 ppm if stained at any time HCA	Sign_____
Suction machines & Regulator points Oxygen points	Wipe the external surface with Teepol and hot water.	Daily	Use filter with regulator & replace if wet and or 3 monthly Write date that filter was opened on filter HCA – see monthly list	Sign_____

The Screening, prevention & management of BBV In patients requiring RRT.

Laundry bag holder	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2)	Daily	Household staff	Sign_____
Fridges EPO x 2	Record temperature on chart	Daily	Nursing	EPO fridge 1 temp _____ EPO fridge 2 temp _____ Sign_____
Glucometer monitor & box	Wash with teepol, if contaminated with body fluids (see note 1), with blood (see note 2) dry & restock.	Daily & if soiled	Nursing	Sign_____
ACT machine	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2)	Daily and when soiled	HCA	Sign_____

Note 1 – Articles stained with body fluids, add 1 tab precept to 1000mls water with teepol, rinse with plain water after 2-3 minutes

Note 2 – Blood on equipment, using a paper towel damped in a solution of 10,000 ppm (7 tablets precept in 1Lt of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using paper towel dampened with plain water (wear goggles when using 10,000 ppm in addition to gloves and aprons)

Always wear gloves, aprons (& face protection when using precept) when cleaning equipment, remove and wash hands when procedure completed

The Screening, prevention & management of BBV In patients requiring RRT.

Sample Room 1

Daily record of decontamination of General Equipment

Date _____

EQUIPMENT	PREFERRED METHOD OF DECONTAMINATION	FREQUENCY	Responsibility of	Sign when complete & any additional comments
Thermometer	Wash with teepol and dry	Daily & after each use	HCA	Sign _____
Infusion pump No 1	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2) - unplug before cleaning	Daily and after use	HCA	Sign _____ _____
No 2	As above	Daily & after each use	HCA	Sign _____ _____
No 3	as above	Daily & after each use	HCA	Sign _____ _____
BP monitors No 1	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2) – unplug before cleaning	Daily & after each use	HCA	Sign _____ _____
No 2	As above	Daily & after each use	HCA	Sign _____ _____
No 3	As above	Daily & after each use	HCA	Sign _____ _____
Fans (outer surface)	Teepol / hot water. if contaminated with body fluids	Daily & after each use	HCA	Sign _____

The Screening, prevention & management of BBV In patients requiring RRT.

No 1 & 2 No 3 & 4	(see note 1), with blood (see note 2)- unplug before cleaning			_____
IV stands no 1 & 2	Teepol and presept 1000 ppm- if contaminated with blood, body fluids (see note 1 & 2)	After every use	HCA	Sign _____ _____
Dressing trolleys	Teepol and precept 1000 ppm-	Before each use	HCA/Nursing	Sign _____ _____
Marquette Cardiac monitor	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2) – unplug before cleaning	Daily	HCA	Sign _____ _____
Blood cultures box	Teepol, if contaminated with body fluids (see note 1), with blood (see note 2	Daily & if contaminated	HCA	Sign _____ _____

Note 1 – Articles stained with body fluids, add 1 tab precept to 1000mls water with teepol, rinse with plain water after 2-3 minutes

Note 2 – Blood on equipment, using a paper towel damped in a solution of 10,000 ppm (7 tablets presept in 1Lt of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using paper towel dampened with plain water (wear goggles when using 10,000 ppm in addition to gloves and aprons)

Always wear gloves, aprons (& face protection when using precept) when cleaning equipment, remove and wash hands when procedure completed

Sample Room 1

Daily record of decontamination of General Equipment

Date_____

EQUIPMENT	PREFERRED METHOD OF DECONTAMINATION	FREQUENCY	Responsibility of	Sign when complete & any additional comments
SPO2 monitor	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2) unplug before cleaning	Daily	HCA	Sign_____
Dressing Trolleys X 2 in open unit	Teepol and presept 1000 ppm-	Daily	HCA	Sign_____
Sluice room equipment sink	Teepol / hot water. if contaminated with body fluids (see note 1), with blood (see note 2)	DAILY	HCA - Stainless steal sink	Sign_____
Commode	Teepol and presept 1000 ppm-	Daily and after each use	HCA	Sign_____

Note 1 – Articles stained with body fluids, add 1 tab precept to 1000mls water with teepol, rinse with plain water after 2-3 minutes

Note 2 – Blood on equipment, using a paper towel damped in a solution of 10,000 ppm (7 tablets presept in 1Lt of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using paper towel dampened with plain water (wear goggles when using 10,000 ppm in addition to gloves and aprons)

Always wear gloves, aprons (& face protection when using precept) when cleaning equipment, remove and wash hands when procedure completed

The Screening, prevention & management of BBV In patients requiring RRT.

Bed Space Cleaning Schedule

EQUIPMENT	PREFERRED METHOD OF DECONTAMINATION	FREQUENCY	Responsibility of
HD machines & bottom tray	Teepol and presept 1000 ppm If large blood spill- clean as per note 2 below & remove machine from use, inform technical staff, & record in “ Blood Spill Book ”	After every dialysis	HCA/Nurses
Dialysis bed/chairs	Teepol and presept 1000 ppm	After every dialysis	HCA/Household/staff nurses
Bed table & locker	Teepol and presept 1000 ppm	After every dialysis	HCA/Household staff/nurses (Ensure a vomit bag & tissue box are in the drawer for use by next patient)
Dialysis clamps	Washer – disinfectant	After every use	HCA
BP monitors/BP cuffs & leads	Wipe the external surface with Teepol and hot water- if contaminated with blood, body fluids or a known infected case Add precept 1000ppms - unplug before cleaning	Daily and between patients	HCA/Nurses
Dressing Trolley	Teepol and presept 1000 ppm	Before & after every use	HCA/Nurses
Stethoscopes	Wipe with teepol	After every use	HCA/Nurses
Chart holders	Teepol - if contaminated with blood, body fluids (see note 1 & 2)	After every use	HCA/Nurses

Note 1 – Articles stained with body fluids, add 1 tab precept to 1000mls water with teepol, rinse with plain water after 2-3 minutes

Note 2 – Blood on equipment, using a paper towel dampened in a solution of 10,000 ppm (7 tablets presept in 1Lt of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using paper towel dampened with plain water (wear goggles when using 10,000 ppm in addition to gloves and aprons)Always wear gloves, aprons (& face protection when using precept) when cleaning equipment.

Sample St Martins room 1
Weekly record of decontamination of General Equipment

Week beginning Monday _____

EQUIPMENT	PREFERRED METHOD OF DECONTAMINATION	FREQUENCY	Responsibility of	Sign when complete & any additional comments
Blood sample fridge	Wipe with Teepol -- if contaminated with blood, body fluids (see note 1 & 2)	Weekly Monday	HCA	Sign _____ Date _____
Centrifuge x 2	Sheila to sort - unplug before cleaning		HCA	Sign _____ Date _____
Fans (blades)	Teepol - if contaminated with blood, body fluids (see note 1 & 2) - unplug before cleaning	Weekly Monday	HCA	Sign _____ Date _____
Emergency box – behind bed	Teepol - if contaminated with blood, body fluids (see note 1 & 2)	Weekly – Saturday night - - restock if necessary	Nursing	Sign _____ Date _____
Medicine Fridge EPO x 2	Wipe with teepol - if contaminated with blood, body fluids (see note 1 & 2)	Weekly – Tuesday	Nursing	Sign _____ Date _____
Emergency Trolley (External surface)	Teepol - if contaminated with blood, body fluids (see note 1 & 2)	Weekly – Thursday	Nursing	Sign _____ Date _____

Note 1 – Articles stained with body fluids, add 1 tab precept to 1000mls water with teepol, rinse with plain water after 2-3 minutes

Note 2 – Blood on equipment, using a paper towel damped in a solution of 10,000 ppms (7 tablets precept in 1Lt of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using paper towel dampened with plain water (Wear goggles when using 10,000 pmm in addition to gloves and aprons)

Note 3 – Unplug all electrical equipment before washing – avoid over wetting such equipment

Always wear gloves, aprons (& face protection when using precept) when cleaning equipment, remove and wash hands when procedure completed

The Screening, prevention & management of BBV In patients requiring RRT.

Sample St Martins

Monthly schedule of cleaning of storage shelving and cupboards

Month _____

Equipment	PREFERRED CLEANING METHOD	Frequency	Responsibility of	SIGNATURE
Storage shelving x 2 (under sluice sink)	Empty and wash with teepol solution – dry and restock –	3 rd Monday each month		Sign _____ Date _____
Rack System	Remove item & wash with Teepol, dry & replace items	3 rd wed of month	HCA & Nursing	Sign _____ Date _____
Pharmacy press	Empty and wash with teepol solution – dry and restock	3 rd Saturday night	Nursing Check expiry dates & return unnecessary items	Sign _____ Date _____
Defrost EPO fridges x 1	Move all items to number no 2 fridge – wash with teepol, if contaminated with body fluids (see note 1) or blood (see note 2)	4 th Saturday	Nursing	Sign _____ Date _____
Defrost EPO fridges x 2	Move all items to number no 1 fridge – wash with teepol, if contaminated with body fluids (see note 1) or blood (see note 2)	4 th Saturday	Nursing	Sign _____ Date _____
Dressing shelves	Empty and wash with teepol	2 nd Tuesday	HCA	Sign _____

The Screening, prevention & management of BBV In patients requiring RRT.

	solution – dry and restock, if contaminated with body fluids (see note 1) or blood (see note 2)			<div></div> <div>Date</div> <div></div>
--	---	--	--	---

Note 1 – Articles stained with body fluids, add 1 tab precept to 1000mls water with teepol, rinse with plain water after 2-3 minutes

Note 2 – Blood on equipment, using a paper towel damped in a solution of 10,000 ppm (7 tablets precept in 1Lt of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using paper towel dampened with plain water (Wear goggles when using 10,000 ppm in addition to gloves and aprons)

Always wear gloves, aprons (& face protection when using precept) when cleaning equipment, remove and wash hands when procedure completed

Checklist after Hepatitis B positive Haemodialysis

Appendix 12

An Isolation room used to dialyse a patient positive for Hepatitis B cannot be used to dialyse another patient until this protocol has been completed

(Hep B positive patient should only be dialysed in the designated isolation room)

ROOM NUMBER _____ DATE _____ TIME _____

Section A & B of this protocol to be each treatment

Section A

Action	CAPTIALS & Signature													
Nurse in charge informed that room has been used for HBV positive patients														
H/D machine disinfection record book completed														
Clean Glucometer, if applicable, as per hospital policy														
H/D outer surface washed with Teepol and 1 tablet of presept in 1LT and rinsed with plain water after 3 minutes														
Laundry is placed in orange alginate bags after use and then into red laundry bags.														
Used fire blankets are placed in orange alginate bags after use and then into the blue laundry bags as per hygiene policy.														
Bed or chair, mattress, locker, bed table, trolley washed with Teepol and 1 tablet of presept in 1LT of water and rinsed with plain water after 3 minutes														
Sharps box sealed, signed and tagged and removed from room after treatment (ensure external sharps box is clean)														
All items used or not are discarded appropriately (e.g. swabs, tape, gloves, face shields etc in health care risk waste, IV sets, syringes & needles in sharps box, emergency/ suction equipment)														
Clean and disinfect BP cuff using Teepol and presept 1 tablet in 1 LT of water and give to patient Discard if blood stained. (BP cuff is strictly single patient use). Only use disposable finger stats probe and discarded after use.														
Clean & disinfect weighing scales with Teepol and 1 tablet of presept in 1LT														
Floor, all surfaces including items listed below are cleaned and disinfected using Teepol and presept 1 tablet per LT of water by domestic cleaning staff. Bins are emptied	Sign off after checking that cleaning is satisfactory													
<table border="1"> <tr> <td>Door Handles</td> <td>Floor</td> </tr> <tr> <td>Wardrobes inside & Out</td> <td>Toilet & Shower cubicle</td> </tr> <tr> <td>Hand wash sink</td> <td>Taps</td> </tr> <tr> <td>Ledges including window ledges</td> <td>Bins (inside & out)</td> </tr> <tr> <td>TV remote control</td> <td>TV surface</td> </tr> <tr> <td>BP monitor</td> <td></td> </tr> <tr> <td>Other: (specify item)</td> <td></td> </tr> </table>		Door Handles	Floor	Wardrobes inside & Out	Toilet & Shower cubicle	Hand wash sink	Taps	Ledges including window ledges	Bins (inside & out)	TV remote control	TV surface	BP monitor		Other: (specify item)
Door Handles	Floor													
Wardrobes inside & Out	Toilet & Shower cubicle													
Hand wash sink	Taps													
Ledges including window ledges	Bins (inside & out)													
TV remote control	TV surface													
BP monitor														
Other: (specify item)														
The only items remaining in room after a treatment are the haemodialysis machine/s, an empty locker, bed table, chair, and monitor														

Note 1 – Blood on equipment or surfaces, using a j-cloth damped in a solution of 10,000 ppm (7 tablets presept (2.5mg) in 1LT of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using j-cloth dampened with plain water (Wear goggles when using 10,000 ppm in addition to gloves and aprons) Always wear gloves and aprons when cleaning equipment, remove and wash hands when procedure complete.

Section B

Following discharge of patient positive for hepatitis B

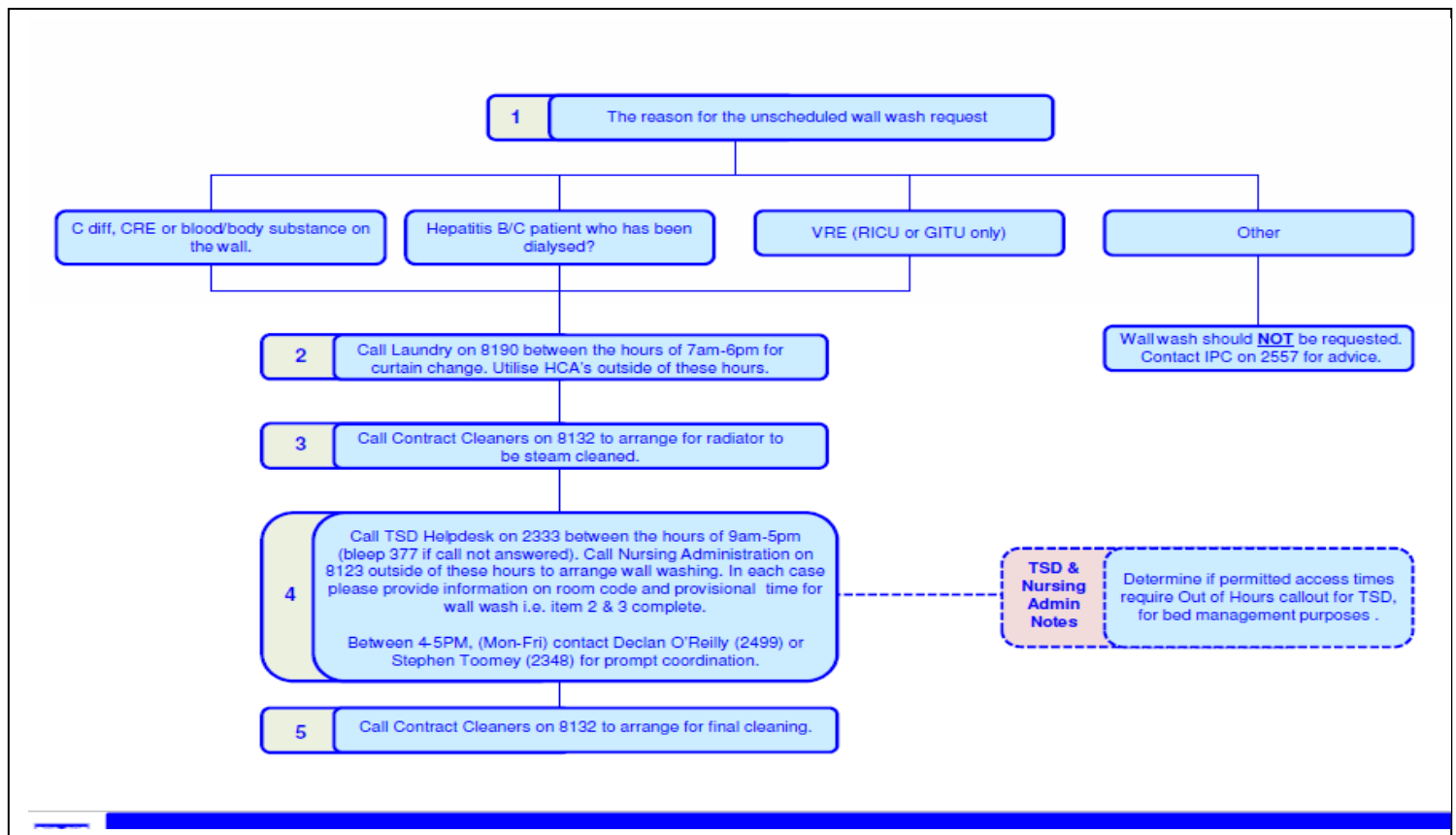
- Technician to move dedicated machine to storage area
- Curtains to be removed including shower curtain if applicable
- Discard emergency equipment (suction & oxygen tubing & masks)

THE FOLLOWING CLEANING AND DISINFECTION SCHEDULE MUST BE CARRIED OUT DOCUMENTED AND SIGNED OFF PRIOR ROOM IS RELEASED FOR USE FOR ANOTHER PATIENT (See appendix 13 on unscheduled wall washing)

1. Contact Cleaners to be contacted to steam clean radiator.
2. TSD staff to & disinfect all walls with Teepol & precept (1,000ppm*)(see note 1 on management of blood splash)
3. For safety purposes when cleaning monitors and leads ie. TV/ remote control/ heart monitor, unplug and wipe surfaces with dampened cloth using teepol and precept (1,000ppm*).
4. Cleaning staff remove fire blanket and wash complete bed frame & mattress /locker/bed table/BP monitor with Teepol, wash & disinfect all surfaces and floor with Teepol & precept (1,000ppm*), and rinsed with plain water after 3 minutes (see note 1 on management of blood splash).
5. If out of hours; the Nurse who carried out the isolation dialysis is required to carry out this cleaning. Cleaning staff to then wash & disinfect all surfaces and floor with Teepol & precept (1,000ppm*) (see note 1 on management of blood splash)

*See Hygiene Department SOP's on Safe System of Work on Handling & Use of Precept and correct labelling of precept and teepol mixtures. Concentration of 1,000 parts per million is achieved by adding 1 x 2.5mg tablet of Precept to 1 litre water and 3ml of Teepol.

Day of Discharge Date _____	Nurse after checking cleaning staff & TSD staff (radiators and walls) Signature_____GRADE_____
Room released for use Date _____ Time _____	Nurse after checking room following All cleaning is complete (As per Section A & B) Senior nurse/CNM2/3/ICN/ Virology nurse specialist Signature_____GRADE_____



Note: Local IPCT and National Guidelines do not identify need for wall washing post HCV positive dialysis treatment unless there is a blood splash.

Checklist after Hepatitis C & HIV Haemodialysis

Appendix 14

An Isolation room used to dialyse a patient positive for Hepatitis C or HIV cannot be used to dialyse another patient until this protocol has been completed

Room NUMBER _____ DATE _____ TIME _____

Section A and Section B (page 2) to be completed after each treatment

SECTION A

Action	Signature & CAPTIALS													
Nurse in charge informed that room has been used for HCV <input type="checkbox"/> or HIV <input type="checkbox"/> positive patients														
H/D machine disinfection record book completed														
Clean Glucometer, if applicable, as per hospital policy														
H/D outer surface washed with Teepol and 1 tablet of presept in 1LT and rinsed with plain water after 3 minutes														
Laundry is placed in orange alginate bags after use and then into red laundry bags.														
Used fire blankets are placed in orange alginate bags after use and then into the blue laundry bags as per hygiene policy.														
Bed or chair, mattress, locker, bed table, trolley washed with Teepol & precept (1,000ppm*) and rinsed with plain water after 3 minutes														
Sharps box sealed, signed and tagged and removed from room after treatment (ensure external sharps box is clean)														
All items used or not are discarded appropriately (e.g. swabs, tape, gloves, face shields etc in health care risk waste, IV sets, syringes & needles in sharps box, emergency/ suction equipment)														
Clean and disinfect BP cuff using Teepol and presept (1,000ppm*) and give to patient Discard if blood stained. (BP cuff is strictly single patient use). Only use disposable finger stats probe and discard after use.														
Clean & disinfect weighing scales with Teepol & precept (1,000ppm*)														
Floor, all surfaces including items listed below are cleaned and disinfected using Teepol and presept (1,000ppm*) by domestic cleaning staff. Bins are emptied	Sign off after checking that cleaning is satisfactory													
<table border="1"> <tr> <td>Door Handles</td> <td>Floor</td> </tr> <tr> <td>Wardrobes inside & Out</td> <td>Toilet & Shower cubicle</td> </tr> <tr> <td>Hand wash sink</td> <td>Taps</td> </tr> <tr> <td>Ledges including window ledges</td> <td>Bins (inside & out)</td> </tr> <tr> <td>TV remote control</td> <td>TV surface</td> </tr> <tr> <td>BP monitor</td> <td></td> </tr> <tr> <td>Other: (specify item)</td> <td></td> </tr> </table>		Door Handles	Floor	Wardrobes inside & Out	Toilet & Shower cubicle	Hand wash sink	Taps	Ledges including window ledges	Bins (inside & out)	TV remote control	TV surface	BP monitor		Other: (specify item)
Door Handles	Floor													
Wardrobes inside & Out	Toilet & Shower cubicle													
Hand wash sink	Taps													
Ledges including window ledges	Bins (inside & out)													
TV remote control	TV surface													
BP monitor														
Other: (specify item)														
The only items remaining in room after a treatment are the haemodialysis machine/s, an empty locker, bed table, chair, and monitor														

Note 1 – Blood on equipment or surfaces, using a j-cloth damped in a solution of 10,000 ppm (7 tablets precept in 1LT of water), gently rub the contaminated surface until clean and wipe off after 2-3 minutes using j-cloth dampened with plain water (Wear goggles when using 10,000 ppm in addition to gloves and aprons) Always wear gloves and aprons when cleaning equipment, remove and wash hands when procedure complete.

Section B

Following discharge of patient positive for hepatitis C or HIV

Technician to move dedicated machine to storage area
 Curtains to be removed including shower curtain if applicable
 Discard emergency equipment (suction & oxygen tubing & masks)
 Wash weighing scales with precept & tepool (1,000*)

THE FOLLOWING CLEANING AND DISINFECTION SCHEDULE MUST BE CARRIED OUT BY COMPETENT STAFF

1. For safety purposes when cleaning monitors and leads ie. TV/ remote control/ heart monitor, unpulg and wipe surfaces with dampened cloth using teepol and precept (1,000ppm).
2. Cleaning staff remove fire blanket and wash complete bed frame & mattress /locker/bed table/BP monitor/weighing scales with Teepol & precept (1,000ppm*) and rinsed with plain water after 3 minutes (see note 1 on management of blood splash).
3. If out of hours; the Nurse who carried out the isolation dialysis is required to carry this out. Cleaning staff to wash & disinfect all surfaces ad floor with Teepol & precept (1,000ppm*), (see note 1 on management of blood splash)
4. If at any stage during treatment wall become contaminated with blood it must be immediately cleaned and post treatment TDS staff must be contacted to & disinfect all walls with Teepol & precept (1,000ppm*) of water (see note 1 on management of blood splash) and appendix 13.

*See Hygiene Department SOP's on Safe System of Work on Handling & Use of Presept and correct labelling of precept and teepol mixtures. Concentration of 1,000 parts per million is achieved by dissolving 1 x 2.5mg tablet of

Presept to 1 litre water and 3ml of Teepol.

<p>Day of Discharge</p> <p>Date _____</p>	<p>Nurse after checking all cleaning of room as per section A and B Senior nurse/CNM2/3,/ICN,/ Virology nurse specialist</p>
<p>Room released for use</p> <p>Date _____</p> <p>Time _____</p>	<p>_____ Grade _____</p>

HAEMODIALYSIS INFECTION RISK ASSESSMENT QUESTIONNAIRE

If you can assist us in providing haemodialysis for our patient we would appreciate if you can complete this infection risk questionnaire and return it by fax to 00 353 1 8092899.

This form should be completed by either a member of the Medical or Nursing staff.

Name of Haemodialysis unit: _____

Address of unit: _____

Management of all patients

1.	Is the internal fluid pathway of the dialysis machine disinfected after each patient?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.	Is the external surface of the dialysis machine cleaned and disinfected after each patient?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3.	What Detergent and/or Disinfectant do you use?		
4.	Is the equipment in the bed space (ie. Chair, locker, bed table etc.) cleaned after each use?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
5.	Are patient's tested for Blood borne Virus routinely in the unit? If yes please provide details;	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	Blood borne Virus	Type of test	Frequency
	Hepatitis B (HBV)		
	Hepatitis C (HCV)		
	HIV		

Management of Hepatitis B Positive Patients

6.	Are patient's infected with Hepatitis B surface antigen (HBsAg) positive patients in your unit? (If No proceed to question 12)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
7.	If yes are HBV surface antigen positive patients dialysed in an isolation room?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
8.	If no are HBsAg positive cohorted/ segregated from HBsAg negative patient's	Yes <input type="checkbox"/>	No <input type="checkbox"/>
9.	Are HBV surface antigen patients dialysed on dedicated machines?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
10.	Do you dialyse Hepatitis B core (Antibody) positive patients in the same room as Hepatitis B surface antigen positive patients?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
11.	Do staff care for HBsAg positive and HBsAg negative patient's at the same time?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
12.	Has any patient, who on admission to your unit was HBsAg negative, became HBsAg positive in the past 2 years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Management of Hepatitis C Positive Patients

13.	Do you dialyse Hepatitis C Antigen positive patients at your unit? (If No Proceed to question 16)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
14.	Are HCV infected patients cohorted/segregated from HCV negative patients?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
15.	If a patient is <u>only</u> HCV <u>Antibody</u> positive (RNA/PCR and HCV Antigen negative) does the Patients dialysed in the same room as HCV <u>Antigen</u> positive patients?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
16.	Has any patient, who on admission to your unit was HCV negative, tested positive for HCV in the past 2 years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Management of HIV Positive Patients

17.	Do you dialyse HIV positive patients at your unit? (If no proceed to question 20)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
18.	If yes are they dialysed on dedicated machines?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
19.	Are HIV positive patients cohorted/ segregated from HCV negative patients?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
20.	Has any patient, who on admission to your unit was HIV negative, became HIV positive in the past 2 years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Questionnaire completed by _____ Position or Grade: _____
Date completed _____

HAEMODIALYSIS INFECTION RISK ASSESSMENT QUESTIONNAIRE

If you can assist us in providing haemodialysis for our patient we would appreciate if you can complete this infection risk questionnaire and return it by fax to 00 353 1 8092899. This form should be completed by either a member of the Medical or Nursing staff.

Name of Haemodialysis unit: _____

Address of unit: _____

Management of **CRE/CPE Positive Patients**

21.	Do you routinely screen for Carbapenem Producing Enterobacteriaceae Infection (CPE) on all patients visiting your unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
22.	Has any patient been diagnosed with a positive CPE infection, dialysed in your unit in the last twelve months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Questionnaire completed by _____ Position or Grade: _____
Date completed _____

Appendix 16

1 (2)

Effectiveness of Heating in Dialysis Machines	
Distribution: To whom it may concern	Page: 1/2
cc: -	Date: 030410
Report: MON3410 (Ga 030410)	
Issued by: Dr Rolf Nystrand, Microbiologist	

1. Introduction

The disinfection process in dialysis machine AK200 ULTRA S performed by using heat is evaluated in terms of temperature and its effect on microorganisms.

The machine model AK200 ULTRA S is chosen as being the most complex type. Consequently this evaluation and the conclusions are also valid for AK 95, AK 95 S, AK 100, AK 100 ULTRA, AK 200, AK 200 ULTRA and AK 200 S.

2. Dialysis machine

The dialysis machine type used in this investigation is AK200 ULTRA S with programme version 4.00. The number of cycles used during heat disinfection can be preset. This evaluation is based on 25 cycles.

The evaluation is made by using Pt 100 thermoelements in different positions in the fluid path of the machine.

Upstream positions before dialyser show higher temperatures as they are closer to the heating vessel.

Due to the *construction principle single pass*, i.e no recirculation, no fluid from downstream dialyser position can come in contact with the fluid circuit upstream dialyser position. Because of this only positions downstream dialyser are of interest for this evaluation and presented in this report.

3. Result of temperature measurement

Two significant positions downstream the dialyser position were investigated and the results are given in Table 1.

Table 1. Temperatures (total time above the given temperatures)

Position	Temp °C	Time minutes	Max temp
T 5 Just after dialyser	>60	36,67	
	>70	32,33	
	>80	14,0	
	>85	0,67	86,6
T 6 After Flow Input Pump and before Heat Exchanger	>60	33,33	
	>70	30,33	
	>80	14,33	
	>85	3,33	88,3

4. Calculation of D-values and log inactivation

Generally an increase in temperature of 10°C means in principle that the speed of chemical reactions doubles. In connection with steam sterilisation a temperature raise from 121°C to 131°C means that the D-value (D-value= dose (= in this case time at the different temperatures required to inactivate 90% or one logarithm of a population of a microorganism) changes with a factor of 10.

This means that at 121°C is the D-value for *Bacillus stearothermophilus* 1.5 minutes. At 111°C it is 15 minutes and at 131°C 0.15 minutes.

The Screening, prevention & management of BBV In patients requiring RRT.

2 (2)

A similar discussion is applied on Hepatitis B in order to calculate the inactivation at different temperatures (Table 2).

Table 2. D-values and log inactivation at different temperatures based on Shikata (1978)

Temperature °C	D-value minutes	Hepatitis B Log Inactivation Position just after dialyser T5	Hepatitis B Log Inactivation Position after Flow Input Pump and before Heat Exchanger T6	Remark
>60	160	0.22	0.20	Not used in calculation, too low to be significant
>70	16	1.94	2.02	
>80	1.6	8.33	6.87	
>85	0.51	1.31	6.52	
>90	0.16	0	0	

In Table 2 temperatures 80 - 84°C are presented as 80°C and temperatures 85° – 86.6° resp 88.3° are presented as 85°C. This means that the calculated D-values are the minimum values achieved.

In literature (Shikata 1978) is given 10 hours to inactivate 4 log CID (CID = Chimpanzee Infectious Dose) of Hepatitis B at 60°C. This gives a D-value at 60°C of 150 minutes. This value differs from the calculated D value of 160 minutes in this investigation but is of the same magnitude. The calculated D-value provides a z-value of 10. The actual z-value for Hepatitis B is not known but the deviation caused by this will not be significant at lower temperatures as the inactivation at these temperatures is low.

5. Comment

The result of Shikata (1978) is in practice used by the manufacturers of blood products, for instance Factor VIII and IX (Mitra 1986), in order to inactivate Hepatitis B. In these processes 60°C for 10 hours are used.

The result shows that Hepatitis B is in fact inactivated at the low temperature of 60°C.

The inactivation in AK200 ULTRA S is given for temperatures above 80°C where the log inactivation is most significant. Times at lower temperature gives lower inactivation due to longer D-value.

The calculated log inactivation based on the temperature measurements for Hepatitis B in the investigated positions at 80°C (80 - 84°C) and 85°C (85° – 86.6° resp 88.3°) is 9.64 for position T5 and 13.39 for position T6.

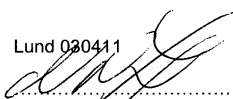
6. Conclusion


The heating programme of AK200 ULTRA S is effective against Hepatitis B. In addition all disinfection programs are tested in accordance with NFS 90-304 and established to fulfil the requirements expressed in the same standard.


7. References

Shikata, T et al Journal of Infectious Diseases 138, 242 – 244 (1978)
Mitra, G Ng, P K Thrombosis Research 41:3, 291 – 300 (1986)

Lund 020411


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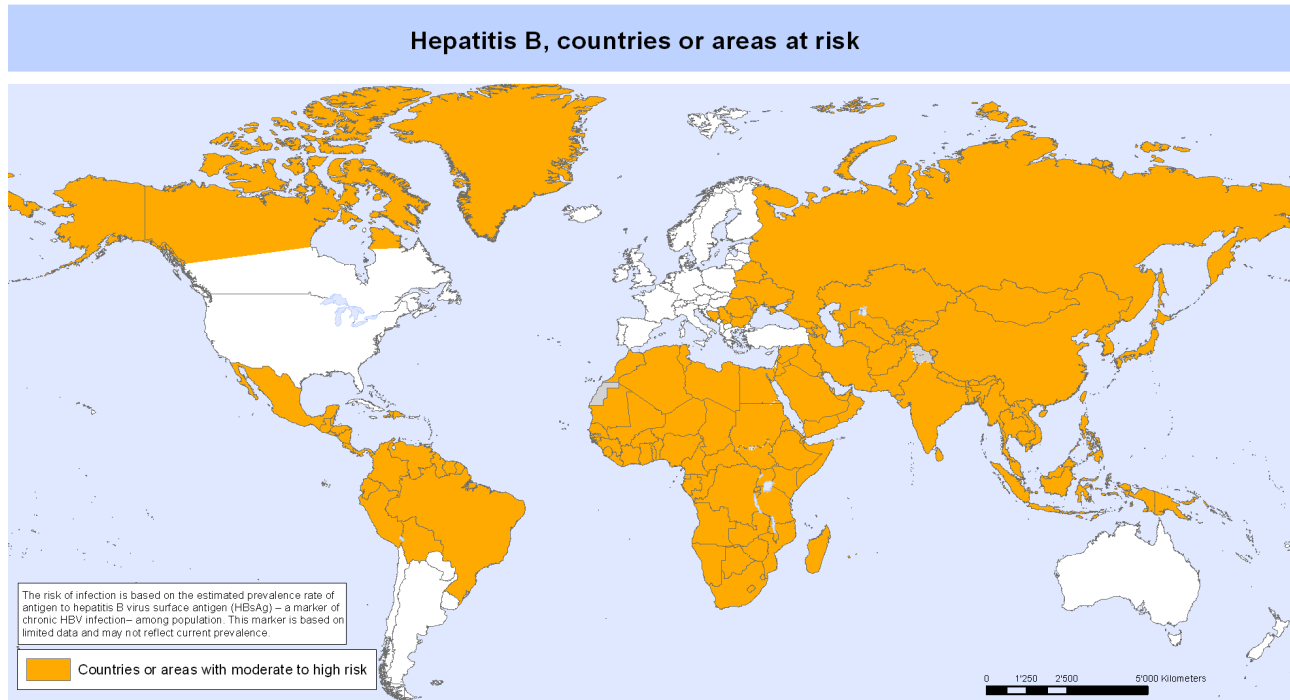

Evi Martinson
Microbiologist
Microbiology, Toxicology and Clinical Affairs
Gambro Lundia AB

Appendix 17

Geographical distribution of HBV: Countries or areas at risk 2012

Orange: High (HBsAg prevalence $\geq 8\%$) & Intermediate (HBsAg prevalence 2%–7%)

White: Low (HBsAg prevalence $< 2\%$)



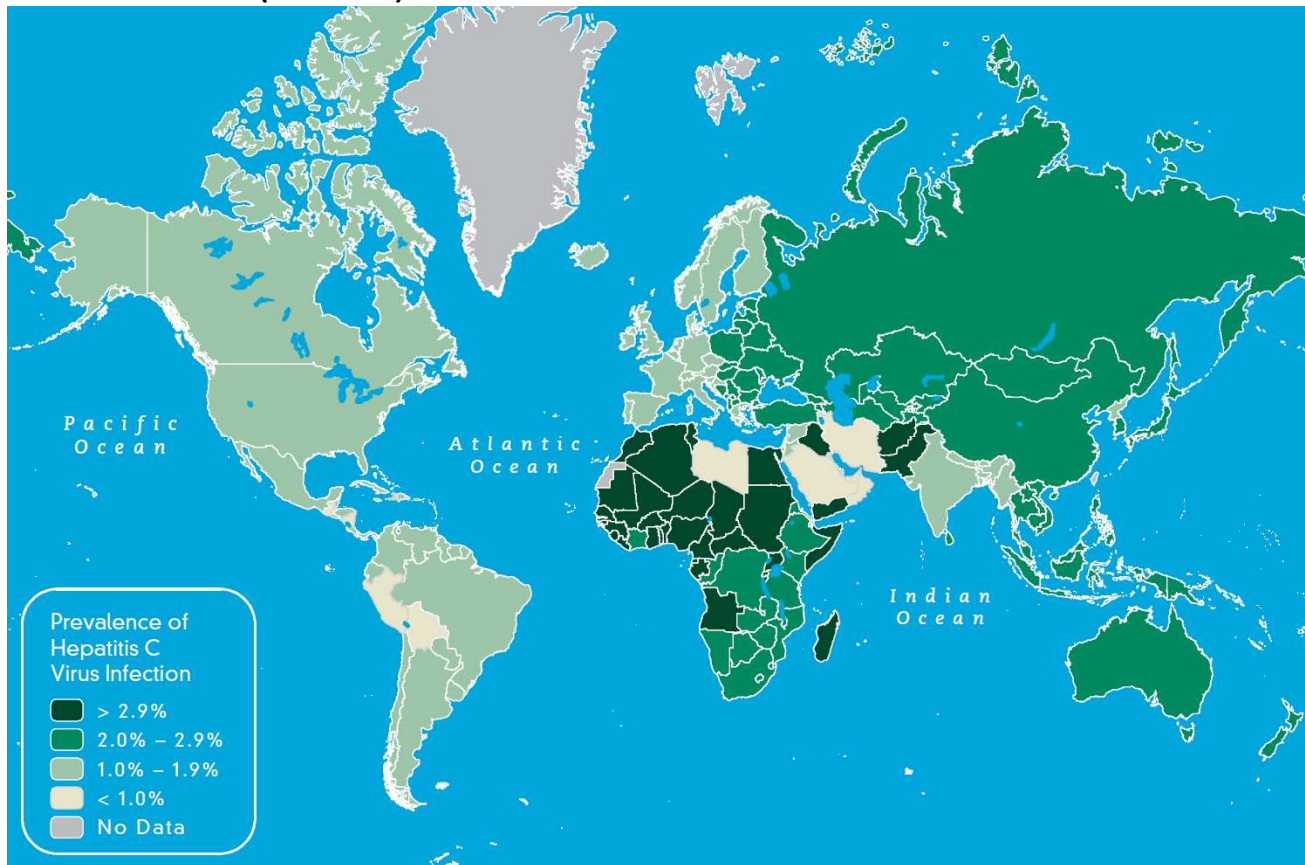
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization/CDC
Map Production: Public Health Information
and Geographic Information Systems (GIS)
World Health Organization

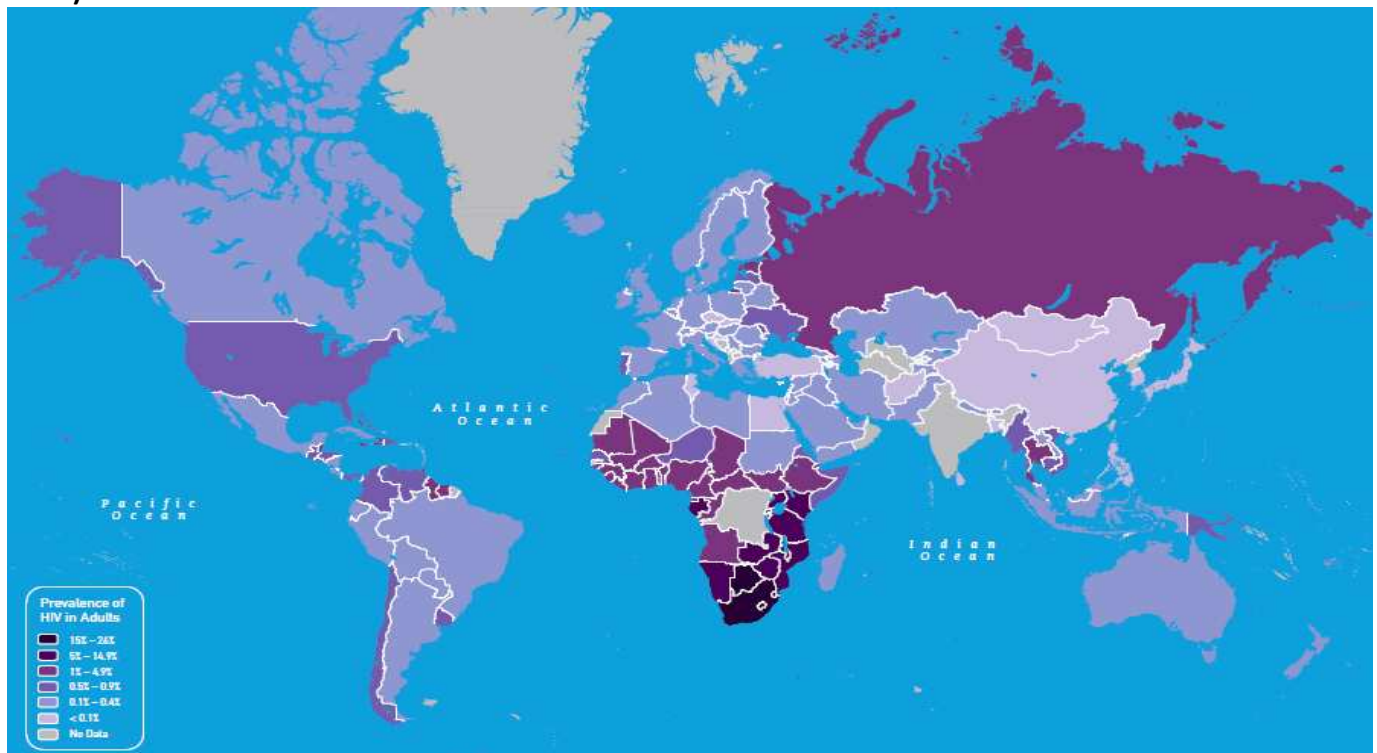


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Prevalence of HCV (CDC 2012)



Prevalence of HIV in adults (CDC 2012)



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