

Highlights of 4th edition of Infection Control Guideline on Nephrology Services in Hong Kong

Dr Leo LUI

Associate Consultant, Infection Control Branch, Centre for Health
Protection

Infectious Disease and Infection Control Forum, 22 February 2024

Haemodialysis patients are at increased risk of infections

- Uremia affects the immune system
- Process requires vascular access for prolonged periods with multiple patients receiving haemodialysis concurrently, and opportunities for direct or indirect transmission of pathogens
- Dialysis patients often require frequent hospitalization and surgery with increased exposure to HAIs

Collaboration between HA and CHP

- In order to identify gaps and training needs on infection control issues for public and private renal units and dialysis centres in Hong Kong, Infection Control Branch (ICB) of Centre for Health Protection (CHP) and Central Renal Committee (CRC) of Hospital Authority (HA) had launched a programme since 2008 to promote infection control in local renal units and nephrology services
- To drive the programme forward, a collaborative working group was formed consisting of the representatives from different parties

Guideline on Infection Control in Nephrology

- Reference for both public and private dialysis service providers
- First edition was in 2010, revised every several years
- Last edition (3rd edition, version 3.2) completed revision in October 2019, before COVID-19
- 4th (current) edition completed revision and issued in December 2023

Site visits

- ICB performed site visits in 2023 to:
 - Public hospital haemodialysis centre
 - Community haemodialysis centre
 - Home haemodialysis patient
- Objectives of the site visits:
 - To gain deeper understanding of operation in different settings
 - To incorporate these observations into the guideline

Major references of the guideline

- Overseas health authorities
 - Centers for Disease Control and Prevention (CDC)
 - Department of Health, United Kingdom
 - Ministry of Health, Singapore
- Professional societies and organizations
 - Association for the Advancement of Medical Instrumentation (AAMI)
 - International Society of Peritoneal Dialysis (ISPD)
 - Infectious Diseases Society of America (IDSA)
 - Association for Professionals in Infection Control and Epidemiology (APIC)
- Local resources
 - The University of Hong Kong (HKU)
 - Scientific Committee of Infection Control (SCIC) of CHP
 - Scientific Committee on Vaccine Preventable Diseases (SCVPD) of CHP
 - Hong Kong College of Physicians (HKCP) and Central Renal Committee (CRC) of HA
 - Central Committee on Infectious Disease and Emergency Responses (CCIDER) of HA

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Highlighted updates

Chapter 1 (Viral Hazards)

- 1.3 Measures for preventing respiratory virus transmission in dialysis units
 - Standard and Transmission-based precautions
 - Placement in well-ventilated area separated from others
 - Wearing of mask
 - Cough etiquette
 - Flu vaccine
- Taken into account the resumption of normalcy of our society, with balance between the need for stringent infection control measures, practicality and disease severity of COVID infection

Chapter 2 (Bacterial & Fungal Hazards)

- 2.1.2a *Candida auris* is included in the guideline as one of the multidrug-resistant organisms (MDROs).
- 2.1.2d Medical equipment including haemodialysis machines needs to be properly cleaned and disinfected after use by an MDRO carrier patient
- 2.2 Number of tuberculosis notifications updated

Chapter 3 (Prevention of Dialysis-Associated Risks)

- 3.1 Updated data from National Healthcare Safety Network (NHSN) Dialysis Event Surveillance, Centers for Disease Control and Prevention (CDC) on rate of blood stream infections in various types of vascular accesses
- 3.1.1 Added Table 1 Characteristic of vascular access for haemodialysis to illustrate the method, pros and cons of various types of vascular accesses

Table 1. Characteristic of vascular access for haemodialysis [3, 4, 63]

Type	Method	Pros	Cons
AVF	A surgical anastomosis is created between an artery and a vein to create a large vessel for cannulation and flow	Preferred access type Lowest risk of infection and complications	Requires 6 weeks to 4 months of maturation before AVF can be used
AVG	A synthetic graft is used to create the anastomosis between an artery and vein	Risk of infection comparable to AVF	Requires 3-6 weeks of maturation before AVG can be used Higher rate of complication compared to AVF Life span of graft is shorter than that of AVF
Tunnelled central venous catheter	Cuffed catheters are inserted into large veins through a tunnel under the skin	Immediate access to bloodstream for HD	Much higher rate of infection than AVF or AVG
Non-tunnelled central venous catheter	Catheter is percutaneously placed through the skin directly into a large vein.	Immediate access to bloodstream	Highest risk of infection

- 3.1.3j US CDC recommends chlorhexidine-impregnated dressings to protect the insertion site of short-term, non-tunneled central venous catheters. They may be considered in units with high infection rates. For long-term hemodialysis catheters in well-healed access sites, it is unclear whether use of a chlorhexidine dressing reduces risk of infectious complications.

- 3.2.6 Recommend that the exit site be cleansed at least twice weekly and every time after a shower or vigorous exercise.
- 3.2.7 Recommend daily topical application of antibiotic cream or ointment (mupirocin or gentamicin) to the catheter exit site to prevent catheter-related infection.

- 3.4 Staff Training and Supervision

- Provide training to staff on infection control, technique for catheter insertion, maintenance of HD and PD catheters, standard operating procedures.
- Staff supervision and competency assessment before considered to practice safely
- Inspect catheter site and systemic signs and symptoms of vascular access related infection at each dialysis session
- Staff should receive infection control training especially on hand hygiene and personal protective equipment (PPE)
- Adherence to infection control practice is important to prevent catheter site infection, peritonitis and bacteremia

Chapter 4 (Serology Screening for Blood-borne Viruses)

- 4.1 Added tales for interpreting HBV and HCV test results.
- FAQ Q1&2 Deleted negative anti-HBs as one of the factors to be considered for 'occult' HBV infection. Also updated wordings

Table 4: Interpretation of HCV Test Results [4]

Anti-HCV	HCV-RNA	Interpretation	Action
+	+	<ul style="list-style-type: none"> • Acute hepatitis C • Chronic hepatitis C 	Clinical evaluation and consider to start treatment
+	-	<ul style="list-style-type: none"> • Resolved hepatitis C • Acute HCV during low-level viremia • False-positive anti-HCV test • False-negative HCV-RNA test 	HCV-RNA test every 6 months
-	+	<ul style="list-style-type: none"> • Early acute HCV • Chronic HCV in a setting of immunosuppressed state • False-positive HCV-RNA test 	Clinical evaluation and consider to start treatment
-	-	• No infection	Anti-HCV test every 6 months (HD)

Table 3: Interpretation of HBV Test Results [4, 74]

HBsAg	Anti-HBc	IgM Anti-HBc	Anti-HBs	Interpretation	Action
-	-	-	-	Susceptible	Receive HBV vaccination
+	+	+	-	Acute infection or viral reactivation of chronic infection	Check HBsAg 6 months later and manage accordingly
-	+	-	+	Past infection, recovered and immune or occult HBV infection	Continue annual anti-HBs testing (HD) and check HBV DNA
+	+	-	-	Chronic infection	Clinical evaluation for complications +/- treatment
-	+	-	-	False positive (i.e., susceptible), past infection, or occult HBV infection	Repeat serology test & check HBV DNA (See Appendix A FAQ Q1&2)
-	-	-	+	Immune if titer is ≥ 10 mIU/mL	Continue annual anti-HBs testing (HD)

Chapter 5 (Immunizations)

- HBV vaccine
 - 5.1.1b Topical application of imiquimod prior to intradermal injection of vaccine may enhance immune response in dialysis patients.
- Pneumococcal vaccine
 - 5.3.2 State the recommended use of 23-valent pneumococcal polysaccharide vaccine (23vPPV) and pneumococcal conjugate vaccines (PCV13) to high risk individuals according to recommendations from the Scientific Committee on Vaccine Preventable Diseases (SCVPPD)
 - 5.3.3 PCV15 can be used as a direct replacement for PCV13 at any point during the course of immunization.
 - 5.3.3a Individuals may choose to receive PCV20 to protect themselves against IPD. If PCV20 is used, it does not need to be followed by a dose of 23vPPV.

- Coronavirus Disease 2019 Vaccination

- 5.4.1 & 5.4.2 State the importance of receiving vaccination in reducing hospitalization and death, especially among those with underlying medical problems
- 5.4.3 JSC-EAP recommended another booster to be given at least 6 months after the last dose or COVID-19 infection (whichever is later) for the high risk priority groups, including persons with kidney disease.
- 5.4.4 In view of scientific development on COVID-19 vaccines and continuous update of vaccination recommendations from overseas health authorities, it is recommended to keep track on the latest local vaccination strategies issued by the SCVPD.

Chapter 6 (Water Treatment System)

- 6.3.3 a Samples should be analysed as soon as possible after collection ... If samples cannot be analysed within 4 hours of collection, they should be stored at $<10^{\circ}\text{C}$ without freezing ... Sample storage for more than 24 hours should be avoided, and sample shipping should be in accordance with the laboratory's instructions
- 6.3.9 Home dialysis using a portable RO water treatment system must meet the same standards of water and dialysate as those provided for in-center treatment.
- Added Table 5 Recommended sampling and limit levels for quality of dialysis fluids for haemodialysis

Chapter 7 (Infection Control Practices in Renal Units)

- 7.4 Equipment and Instrument
 - 7.4.6 Minimise storage of equipment close to dialysis machines and patients.
- 7.5 Medications
 - 7.5.3 Do not handle and store medications / clean supplies in the same or adjacent area that used equipment or blood samples are handled

Chapter 8 (Home Peritoneal Dialysis)

- 8.2.1 ... Dialysis equipment, tubing and machines should be properly stored to prevent contamination or damage by pets.

Chapter 10 (Surveillance and Audit)

- Title renamed from “surveillance” to “surveillance and audit”
- 10.2 Quality of water for haemodialysis should be monitored
- 10.4 Each renal unit should regularly audit the compliance of staff to infection control practices such as hand hygiene.
- 10.5 ...For example, the centre can adopt the surveillance methodology suggested by NHSN of CDC

Where can the updated guideline be found

- The 4th edition guideline can be downloaded at:
 - https://www.chp.gov.hk/files/pdf/ic_gu_nephrology_services_in_hk.pdf
(English)
 - https://www.chp.gov.hk/files/pdf/ic_gu_nephrology_services_in_hk_chi.pdf
(Chinese)

Thank you