Chronic Kidney Disease

Chronic kidney disease clients include pre-dialysis, hemodialysis and peritoneal dialysis clients. For clients who are candidates for or recipients of a kidney transplant, refer to Candidate for or Recipient of Solid Organ or Islet Cell Transplant for additional recommendations.

Recommended vaccines for those with chronic kidney disease [A]	
All routine inactivated vaccines	Immunize according to routine schedule.
Pneumococcal vaccine	Conjugate and/or polysaccharide vaccine depending on age. Requires once only revaccination with polysaccharide vaccine.
Influenza vaccine	Immunize yearly (all those 6 months of age and older). Inactivated vaccine should be used.
Hepatitis B vaccine	Refer to Hepatitis B Vaccine Program for Chronic Kidney Disease Clients for dose and schedule information. Post-immunization serology for anti-HBs is recommended, as well as annual testing for the presence of anti-HBs. [B]
MMR vaccine	Refer to Immunization with Inactivated and Live Vaccines. Use Referral Form for MMR Vaccination.
Varicella vaccine	Refer to Immunization with Inactivated and Live Vaccines. Use Referral Form for Varicella Vaccination.

Bacterial and viral infections are a major cause of morbidity and mortality in individuals with chronic kidney disease or who are undergoing chronic dialysis.

Several issues put these individuals at increased risk of vaccine preventable diseases:

- Vascular access catheters
- Long-term peritoneal dialysis catheters
- Immunosuppression prior to transplantation
- Immune system compromise due to uremic state
- Lower seroconversion rates to vaccines
- Lower peak antibody titers following immunization
- More rapid decline of antibody levels following immunization.

Formulate immunization strategies early in the course of progressive kidney disease, particularly if transplantation and/or long-term immunosuppressive therapy are being considered.

Pay particular attention to ensuring there is adequate protection against hepatitis B, influenza, pneumococcal, and varicella diseases. Immunization should occur within the client's dialysis facility whenever possible.

[A] For specific vaccine schedule information, refer to Part 4 - Biological Products.
[B] Refer to the BC Renal Agency Hepatitis B Guideline *dated July 2018* (select Infectious Disease Guidelines → Hepatitis B Guideline) for assistance with decision making regarding hepatitis B immunization based on serology results.

Chronic Kidney Disease

Hepatitis B:

- Hepatitis B immunization may be more effective in individuals before the initiation of dialysis therapy.
- Seroconversion rates following hepatitis B immunization in the hemodialysis population are poor when compared with the general population.
- Protective antibody titers are defined as 10 IU/L or greater. Refer to the BC Renal Agency Hepatitis B Guidelines *dated July 2018* (select Infectious Disease Guidelines → Hepatitis B Guideline → Initial Hepatitis B Testing algorithm).
- In immunocompetent individuals, effective immunity after hepatitis B immunization is sustained even when anti-HBs levels drop to below 10 IU/L. In dialysis patients, protection against hepatitis B infection is lost when titers drop below this level. Subsequent exposure to hepatitis B virus may then lead to acute disease, and possibly a subsequent carrier state.
- Individuals with chronic kidney disease should be tested annually for the presence of anti-HBs. Administer a second series or booster dose of hepatitis B vaccine as necessary. Refer to the BC Renal Agency Hepatitis B Guidelines *dated July 2018* (select Infectious Disease Guidelines → Hepatitis B Guideline → Vaccine Responder Annual Testing algorithm).
- Persons who do not respond to the vaccine should be tested for the presence of HBsAg.
    - If HBsAg positive, refer to the BC Communicable Disease Control Manual, Chapter 1, Hepatitis B for case and contact management.
    - If HBsAg negative, counsel the client that they are at risk for hepatitis B infection. If an exposure to blood or body fluids occurs, the client will require post-exposure prophylaxis.

Influenza:

- Patients on dialysis are at greater risk for influenza mortality.

MMR:

- Viral diseases are a major cause of morbidity and mortality in clients who have renal disease or who are undergoing chronic dialysis.

Pneumococcal:

- Mortality rates after pneumonia in dialysis patients are up to 14-16 times higher than in the general population.
- Dialysis patients are also at increased risk of cardiovascular events after pneumonia.

Varicella:

- Susceptible immunocompromised persons are at increased risk of severe varicella disease.

NOTE: Clients with chronic kidney disease are recommended TB screening. Refer to the BC Communicable Disease Control Manual, Chapter 4 – Tuberculosis Manual and the BC Renal Agency Provincial Standards & Guidelines; Tuberculosis Screening & Follow-Up (for Peritoneal Dialysis) for more information.

Chronic Kidney Disease

Hepatitis B Vaccine Program for Chronic Kidney Disease Clients

Chronic hemodialysis clients are at high risk for HBV infection because the process of hemodialysis requires vascular access for prolonged periods. In an environment where multiple clients receive dialysis concurrently, repeated opportunities exist for person-to-person transmission of infectious agents, directly or indirectly via contaminated devices, equipment and supplies, environmental surfaces or hands of personnel. Furthermore, hemodialysis clients are immunosuppressed, which increases their susceptibility to infection.

Eligibility:

All pre-dialysis, hemodialysis and peritoneal dialysis clients in hospital, community, home or self-care settings are eligible for this program. Vaccine administration should occur at the dialysis facility; however, in some communities, the client may be referred to the local health unit to be immunized.

Pre-dialysis and Dialysis Clients [A]						
	ENGERIX®-B			RECOMBIVAX HB®		
Age	Dose	Volume	Schedule	Dose	Volume	Schedule
0 - 15 years	20 mcg	1.0 mL	0, 1 and 6 months	10 mcg [B]	1.0 mL	0, 1 and 6 months
16 - 19 years [C]	40 mcg	2.0 mL	0, 1, 2 and 6 months	10 mcg [B]	1.0 mL	0, 1 and 6 months
20 years of age and older [C]	40 mcg	2.0 mL	0, 1, 2 and 6 months	40 mcg [D]	1.0 mL	0, 1 and 6 months

Post-vaccination serology: Measure anti-HBs at 1-6 months after completion of the vaccine series to ensure that an adequate immune response has been achieved.

- If anti-HBs is ≥ 10 IU/L, consider immune. Client should be tested annually for the presence of anti-HBs. Administer a second series or booster dose of hepatitis B vaccine as necessary. Refer to the BC Renal Agency Hepatitis B Guidelines *dated July 2018* (select Infectious Disease Guidelines → Hepatitis B Guideline → Vaccine Responder Annual Testing algorithm).
- If anti-HBs is < 10 IU/L, provide a second vaccine series and re-assess anti-HBs 4 weeks later. If anti-HBs remains < 10 IU/L, consider as a 2-series non-responder and susceptible to hepatitis B. There is no benefit to further vaccination. Test annually for HBsAg. If an exposure to blood or body fluids occurs, the client will require post-exposure prophylaxis.

For ongoing management, refer to the BC Renal Agency Hepatitis B Guidelines *dated July 2018* (select Infectious Disease Guidelines → Hepatitis B Guideline) which provide recommendations related to: 1) Initial Hepatitis B Testing, 2) Vaccine Responder Annual Testing, 3) Isolated anti-HBc Positive Follow-up Testing and 4) Anti-HBc Positive Annual Testing. [E]

[A] There is no specific level of renal function that correlates well with vaccine immunogenicity, and therefore the recommendations for pre-dialysis clients are the same as those for dialysis clients.
[B] Use the adult formulation (10 mcg/1 mL).
[C] If any dose in the series is given as ENGERIX®-B, a 4-dose series is required.
[D] Use the RECOMBIVAX HB® Dialysis Formulation (40 mcg/1 mL).
[E] Serological recommendations for clients with chronic kidney disease differ slightly from other special populations due to the recommendation for annual testing.