Chronic kidney disease: The basics

Learning Outcome Objectives
Upon successful completion of this module, you should be able to:
1. Describe the anatomy and function of the kidney.
2. Explain the methods used to measure kidney function, and their limitations.
3. State the K/DOQI classification of kidney function, and incorporate it into therapy decisions.
4. Discuss various factors that affect medication use in kidney disease and dialysis.
5. Discuss medication causes of nephrotoxicity.
6. Describe the pathophysiology of calcium and phosphate metabolism.
7. Outline the complications and treatment options associated with alterations in calcium, phosphate, vitamin D and parathyroid hormone levels.
8. Describe the mechanism and etiology of albuminuria.
9. Define the treatment targets and monitoring parameters for albuminuria, hypertension and diabetes mellitus.
10. Discuss the symptoms of renal anemia and its implications.
11. Explain the role of erythropoietin and the parameters for its use in renal anemia.
13. Explain the connection between CKD and cardiovascular disease.
14. Describe the risk factors and management of cardiovascular disease in CKD.

Authors: Jennifer Dyck, B.S.P., ACPR
Jennifer is the first pharmacist to work with Manitoba Transplant in the Adult Kidney Program in Winnipeg. At the time of writing, she was a clinical support pharmacist in Regina with the Regina Qu’Appelle Health Region (RQHR). In 2005, she became the first pharmacist to join the Saskatchewan Transplant Program in Regina. While at RQHR, Jennifer also practised in the Chronic Kidney Disease Clinic, Home Hemodialysis and Peritoneal Dialysis Clinics and In-Centre Hemodialysis Unit.

Christina Bodnar, B.S.P.
Christina is a staff pharmacist within the RQHR. She is a member of the renal pharmacy team and actively contributes to the care of patients in a variety of clinical settings including the Chronic Kidney Disease Clinic, Home Hemodialysis and Peritoneal Dialysis Clinics and In-Centre Hemodialysis Unit. Christina was instrumental in developing the Anemia Management Certification Program within the RQHR and is one of the first Saskatchewan pharmacists to enter into a collaborative prescribing agreement with nephrologists for anemia management.

Bruce Lang, B.S.P.
Bruce has worked in various aspects of hospital pharmacy including intensive care, pediatrics, medicine and, for the past 10-plus years, nephrology. Within the RQHR, his focus of care is aiding in the management of pharmacotherapy in the Hemodialysis Unit and for those with chronic kidney disease not yet on dialysis.

Peter Ricci, B.S.P., ACPR
Peter works for the Department of Pharmacy Practice in the RQHR. Peter is part of the Renal Pharmacy team, which works with outpatients in the Chronic Kidney Disease Clinic, Home Hemodialysis and Peritoneal Dialysis Clinics and In-Centre Hemodialysis Unit.

**Expert Reviewer:** Piera Calissi, B.Sc. (Pharm.), Pharm.D., FCSHP
Piera’s areas of interest include all aspects of chronic kidney disease. She is the clinical pharmacy specialist for the Interior Health Authority Renal Program in Kelowna, B.C., where she provides pharmaceutical care to the program patients. Piera also acts as a preceptor to pharmacy students and residents, and is a clinical instructor at the University of Toronto (distance PharmD program). She is the author of numerous articles and is a regular presenter in the area of chronic kidney disease.