**Pediatric Nephrology Rotation Children’s & Women’s Health Centre of BC Rotation Manual**

# DESCRIPTION

Children's & Women's Health Centre of British Columbia (C&W) consists of B.C.'s Children's Hospital, B.C.'s Women's Hospital and Health Centre, and Sunny Hill Health Centre for Children. C&W has the largest maternal-fetal-newborn clinical service in Canada and is the major referral centre for acutely ill or injured children in B.C. C&W has more than 400 in-patient beds including a pediatric intensive care unit and neonatal special care nursery. The C&W Pediatric Nephrology rotation is an elective rotation of the Pediatric Pod for the Lower Mainland Pharmacy Services (LMPS) Residency Program.

The rotation consists of one month spent with the nephrology pharmacist both in the Chronic Kidney Disease (CKD) clinic and kidney transplant clinic, and following inpatients on various wards in Children’s Hospital. The nephrology pharmacist works with a multi-disciplinary team in the clinic: nephrologists, nephrology residents and fellows, medical students, nurse clinicians, dietitians, physiotherapist, research assistants and social workers. Clinic patients or nephrology inpatients present with a wide variety of medical conditions and medications, with renal function varying from mildly impaired to end stage renal failure requiring dialysis and eventual renal transplant. Children’s Hospital cares for more than 300 renal patients; at any time, 15 to 30 patients are receiving hemodialysis or peritoneal dialysis and a number are awaiting transplantation.

The pharmacist sets patient care priorities based upon an assessment of individual patient’s likelihood of experiencing drug-related problems (DRPs) and identification of existing DRPs. The pharmacist develops and implements a care plan for priority patients, defines monitoring criteria, and evaluates outcomes of recommendations. Significant patient care events (e.g. drug dosage modification for renal impairment, seamless care with community pharmacies or physicians, drug interaction evaluation, medication history, pharmacokinetic evaluation, adverse reaction/drug interaction documentation, patient/family medication counselling) are documented in the patient’s health record. The pharmacist also provides drug information, in-service education, formulary and medication policy review and support to the nursing and medical staff. The pharmacist is called on for many renal-related issues, and is a resource for the pharmacy department in this area.

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# GOAL

* The Resident will develop the organizational and clinical skills required to provide pharmaceutical care in the CKD and kidney transplant clinic and on the inpatient ward.
* The Resident should be able to function effectively and independently in the general pediatric/nephrology setting.

# LEARNING OBJECTIVES

Per those listed for all LMPS Direct Patient Care (DPC) Rotations, available on our Evaluation Outcomes page at [http://www.lmpsresidency.com/residents/resident-manual/evaluation-](http://www.lmpsresidency.com/residents/resident-manual/evaluation-outcomes) [outcomes](http://www.lmpsresidency.com/residents/resident-manual/evaluation-outcomes)

The expected level of resident performance by the completion of this 4-week rotation is outlined in the Direct Patient Care In-Training Evaluation of Resident (ITER).

# ROTATION-SPECIFIC OBJECTIVES

Pharmaceutical Care:

* Identify patients most likely to experience drug-related problems (DRPs)
* Obtain patient information from the health record, the patient or family, and other caregivers
* Identify and prioritize a patient’s DRPs
* Interpret patients’ laboratory results and be able to use the information in the assessment of the patient’s DRPs
* Retrieve and evaluate data from the literature for the purpose of solving DRPs
* Develop and implement a pharmacy care plan by evaluating therapeutic alternatives, defining goals of therapy, and developing a monitoring plan
* Communicate care plan and discuss patients’ pharmacotherapy with the team
* Document the provision of pharmaceutical care in the patient’s health record
* Describe the pathophysiology of the diseases and the pharmacology of the treatment(s) for the purpose of identifying, preventing and resolving the patient’s drug-related problems
* Report any significant adverse drug reactions

Clinical pharmacokinetics:

* Describe the basic principles of clinical pharmacokinetics and pharmacokinetic parameters of the patients’ medications as well as drugs commonly used in nephrology
* Describe the basic principles of adjusting medication doses in patients with renal impairment
* Integrate pharmacokinetic principles with patient-specific parameters (e.g. demographics, disease states, serum drug concentrations, laboratory results, therapeutic endpoints) to perform appropriate calculations/estimations to optimize drug therapy
* Communicate and document pharmacokinetic recommendations to the medical and/or nursing staff

Patient Interview and Education:

* Interview patients to obtain a complete and accurate medication history
* Interview patients to assess attainment of pharmacotherapeutic goals
* Identify patients who may require medication counselling and communicate appropriate information to them and/or their families
* Demonstrate the use of patient counselling aids

In addition:

* Describe the basic pathophysiology, signs and symptoms of various renal medical conditions as assigned by the preceptor. This may include, but may not be limited to: nephrotic syndrome, anemia in CKD, hypertension in CKD, renal bone disease, and acute kidney injury.
* Describe the methods used to estimate glomerular filtration rate in children.
* Identify the methods of determining target blood pressures for children.
* Describe the classes of medications used to control hypertension in children with kidney disease and their pharmacological differences
* Name two erythropoiesis-stimulating agents (ESAs) and describe the differences between the agents.
* Name the vitamin D analogues prescribed to children with CKD, and describe the differences between the different analogues.
* Name the various phosphate binders and describe their role in the management of CKD- mineral bones disease
* Describe common immunosuppressant therapies used in the management of pediatric kidney transplant recipients

# RESIDENT’S OWN OBJECTIVES

Residents will identify several of their own learning objectives for the rotation. These should be documented in their ePortfolio prior to the start of the rotation, discussed with the preceptor on day 1 of the rotation, and assessed at the various evaluation points throughout the rotation.

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# REQUIRED ACTIVITIES

The resident will:

1. Provide pharmaceutical care to the patients on the ward or in the CKD clinic as per the objectives above. This involves daily patient evaluation for efficacy and toxicity of existing therapy as well as detecting and solving potential drug-related problems. Patient load will be determined based on the Resident’s previous experience and proficiency and will be modified at the discretion of the preceptor.
2. Assist in the initiation and continuation of appropriate drug therapy.
3. Provide medication counselling and perform medication histories on all patients under his/her care when appropriate. This may include medication reconciliation using the Medinet and/or PROMIS database(s).
4. Provide discharge counselling to all patients who require it and liaise with community pharmacist and/or physician whenever indicated (via letter, PharmaNet, verbal).
5. Document all clinical activities in the patient’s health record.
6. Attend pharmacy education sessions (e.g., journal club, case presentations and other

scheduled activities).

1. Meet daily with preceptor to discuss the patients being followed, issues of interest, therapeutic controversies, ongoing evaluation, and special topics.
2. If applicable during the rotation, identify an adverse drug reaction and report it to Health Canada using the appropriate form. The ADR should also be posted on the patient’s PharmaNet profile if appropriate.
3. Present one case (or one clinical question) to the pharmacy staff or Nephrology division.
4. If time permits, provide an in-service to nursing or medical staff at the discretion of the preceptor OR lead a journal club for the pharmacy staff at the discretion of the preceptor.
5. Other activities as assigned by preceptor.
6. Complete and submit any relevant procedure logs to the preceptor via one45 during the course of the rotation. Please see [http://www.lmpsresidency.com/residents/resident-](http://www.lmpsresidency.com/residents/resident-manual/procedure-logs) [manual/procedure-logs](http://www.lmpsresidency.com/residents/resident-manual/procedure-logs) for further details.
7. If time permits, the resident may attend Grand Rounds at The Chan Centre for Family Health Education from September to June on Friday mornings from 8:30am - 9:30am. Schedule of topics are available at: <http://www.pediatrics.med.ubc.ca/Events/PediatricGrandRounds/Online.htm>

# POTENTIAL TOPICS FOR DISCUSSION:

Become familiar with drug therapy and disease states common to CKD and/or dialysis patients and be able to monitor appropriate laboratory parameters of the following:

* + Calcium/phosphate balance, iPTH, renal bone disease (osteodystrophy)
	+ Anemia, erythropoiesis-stimulating agents (ESAs), and iron therapies
	+ Hypertension and issues surrounding treatment
	+ Peritonitis
	+ Medication dosing for patients receiving PD or HD (eg. vancomycin, other medications)
	+ Dialysis modalities
	+ Stages and evaluation of renal failure
	+ Nephrotic Syndrome
	+ Acute Kidney Injury
	+ Medications in kidney transplantation
	+ Transplant immunosuppression therapeutic drug monitoring

# COMMUNICATION EXPECTATIONS

1. The resident will discuss all recommendations with the preceptor prior to implementation, unless otherwise arranged with the preceptor.
2. The resident will discuss all written chart notes with the preceptor prior to placing them in the chart, with the exception of medication histories and allergy clarifications, unless otherwise arranged with the preceptor.
3. The resident will notify the preceptor in advance (i.e.: prior to the start of the rotation) of all

required off-site activities (e.g.: ADS, BC Wide case presentations, etc.) and absences during the rotation.

1. The resident is encouraged to provide on-going, daily feedback to the preceptor to assist in enriching his or her own learning experience throughout the course of the rotation.

# PRECEPTOR RESPONSIBILITIES

The preceptor will:

1. Meet with the resident on day 1 of the rotation to discuss the goals and objectives of the rotation and work with the resident to develop a schedule for all rotation-specific activities and therapeutic discussions.
2. Clearly communicate expectations of the resident at the start of the rotation and throughout the rotation as required.
3. Provide the resident with a brief orientation and introduction to the pharmacy department, ward, and health care team.
4. Meet with the resident briefly every morning to triage and identify patients for work-up.
5. Meet with the resident daily to discuss and review all patients under the resident’s care, incorporating clinical and therapeutic topic discussions at least 1-2 times per week.
6. Be available to the resident in person or by phone at all times during the rotation.
7. Schedule a presentation date and time with the department and assist the resident in selecting their topic for their journal club/nursing in-service/case presentation at least 2 weeks in advance of the scheduled date.
8. Review and provide feedback on any relevant procedure logs submitted by the resident via one45 during the course of the rotation.
9. Provide informal feedback to the resident on their performance on a daily basis, and complete and discuss all required written evaluations with the resident by the completion of the rotation.

# EVALUATION PROCESSES

Guidance on Evaluation Policies and workflow are available at

<http://www.lmpsresidency.com/residents/resident-manual/evaluation-policies>

1. The resident will receive a written, formative evaluation at the midpoint of the rotation. This evaluation will take into account the rotation-specific objectives and the resident’s own learning objectives.
2. The resident will receive a written, summative evaluation at the end of their rotation. This evaluation will take into account the rotation-specific objectives and the resident’s own learning objectives.
3. The resident will receive continuous feedback throughout the rotation and this will be

considered part of the evaluation process.

1. The resident will provide written evaluations of both the preceptor and the rotation and complete a written self-evaluation prior to the last day of the rotation.
2. The preceptor and resident will discuss their respective evaluations in person at midpoint and on the last day of the rotation.

# REQUIRED READING & RESOURCES

* Massengill SF, Ferris M. Chronic kidney disease in children and adolescents. Pediatrics in review.

2014 Jan 1;35(1):16-29.

* Whyte DA, Fine RN. Chronic kidney disease in children. Pediatrics in review. 2008 Oct 1;29(10):335.
* Halloran PF. Immunosuppressive drugs for kidney transplantation. New England Journal of Medicine.

2004 Dec 23;351(26):2715-29.

# Useful references and resources

* <https://kdpnet.kdp.louisville.edu/renalbook/>(Drug Prescribing in Renal Failure “Bennets”)
* <http://www.hosp.uky.edu/Pharmacy/CPS/PKmanual-disclaimer.html>
* <https://homedialyzorsunited.org/wp-content/uploads/2013/04/2013-Dialysis-Drugs.pdf>

(Dialysis of Drugs 2013)

# Useful websites:

* [www.bcrenalagency.ca](http://www.bcrenalagency.ca/)
* <http://www.transplant.bc.ca/>(particularly the clinical guidelines and pharmacy sections)
* [www.kidney.ca](http://www.kidney.ca/) A national, non-profit organization dedicated to improving the health and quality of life of people living with kidney disease.
* [www.kidney.org](http://www.kidney.org/) The NKF supports the prevention of kidney disease, the health and well being of affected individuals and their families, and increases the availability of organs for transplantation in the US.
* [http://www.bcchildrens.ca/About-Site/Documents/CNS%20Physician%206%20X%209-](http://www.bcchildrens.ca/About-Site/Documents/CNS%20Physician%206%20X%209-070317-A_FINAL.pdf) [070317-A\_FINAL.pdf](http://www.bcchildrens.ca/About-Site/Documents/CNS%20Physician%206%20X%209-070317-A_FINAL.pdf) BCCH Nephrotic Syndrome Handbook for Physician’s