**Children’s & Women’s Health Centre of BC Pediatric Pod – Lower Mainland Pharmacy Services**

**Pediatric Critical Care Rotation**

# DESCRIPTION

The Pediatric Intensive Care Unit (PICU) of BCCH is a 22 bed unit dedicated to the treatment of critically ill and chronically ventilated children. The ward is staffed on a 24-hour basis by intensive care physicians, medical fellows & residents, nurses, and respiratory therapists. Clinical Pharmacists, physiotherapists, and dieticians provide 5 days per week service. Clinical pharmacy service allocated to the unit is approximately 0.5 FTE. The PICU Satellite Pharmacy provides medications 7 days per week from 8am to 4pm; and wardstock medications are available via an automated dispensing machine (Pyxis). Other medical intensive care support programs include extracorporeal life support (ECLS), renal replacement therapy (CRRT), and plasmapheresis.

# GOALS

1. To review medical conditions and drug therapies encountered in critically ill children.
2. To increase knowledge of pharmacotherapy in critically ill children.
3. To improve pharmaceutical care skills & patient work up process.
4. To participate as a pharmacist on the care team.

# BC PHARMACY PRACTICE RESIDENCY PROGRAM OBJECTIVES

These are working objectives and should be achieved by the end of the BC Pharmacy Practice Residency Program.

Pharmaceutical Care:

Identify patients most likely to experience drug-related problems (DRPs)

Develop a patient database 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 on the unit

 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


# ROTATION-SPECIFIC OBJECTIVES:

At the completion of the rotation, the Pharmacy Resident will be able to:

1. Explain the pathophysiology of disease states and conditions that affect critically ill patients.
2. List the most common conditions affecting critically ill patients.
3. List the most common drugs used in the treatment of critically ill patients.
4. Describe the pharmacology, dosage considerations, pharmacokinetics, and toxicities for drugs used in the treatment of critically ill patients (e.g., antiepileptics, asthma,

cardiovascular, analgesics and sedatives, gastrointestinal medications, anti-infectives, and

inotropes & vasopressors).

1. Interpret & use patients’ laboratory results in the assessment and monitoring of pharmacotherapy.
2. Create a monitoring plan that incorporates patient specific parameters and allows for the assessment of progress towards achieving goals of therapy.
3. Retrieve and evaluate data from the literature to aid in clinical decision making.
4. Perform appropriate calculations/estimations to optimize drug therapy in critically ill patients using pharmacokinetic principles and patient-specific parameters.
5. Estimate renal function in patients and make recommendations for drug dosage adjustments if necessary.
6. Compare and contrast the different types of dialysis and explain how they influence drug disposition.
7. Describe extracorporeal life support and explain how it influences drug disposition.
8. Describe plasmapheresis and explain how it influences drug disposition.
9. Appraise critically ill patients’ current drug therapy and prioritize their drug related problems.
10. Formulate recommendations for critically ill patients, and document these as appropriate.
11. Create and implement a care plan for critically ill patients.
12. Explain medication safety initiatives in the Pediatric Intensive Care Unit

# RESIDENT’S LEARNING OBJECTIVES

Residents will identify several of their own objectives for the rotation. These should be documented in their ePortfolio and assessed at evaluation points during the rotation.

1.

2.

3.

# REQUIRED ACTIVITIES

The Resident will:

1. Attend daily pediatric critical care patient work rounds with the PICU team.
2. Provide pharmaceutical care to the medical patients on the ward 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. Number of patients will be determined based on the Resident’s previous experience and proficiency and will be modified at the discretion of the Preceptor.
3. Assist the medical team in the initiation and continuation of appropriate drug therapy.
4. Liaise with ward based Pharmacist and provide patient handover summary of drug related issues and monitoring needs for patients being transferred to the ward.
5. Document all clinical activities in the patient’s health record as deemed appropriate. Notes should be discussed with the preceptor BEFORE placing them in the chart.
6. Attend pharmacy and PICU education sessions (e.g., journal club and other scheduled presentations).
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 and/or Advances in Pediatrics in room D308 from September to June on Friday afternoons from 12:00pm - 1:00pm. Schedule of topics are available at: <http://www.pediatrics.med.ubc.ca/Events/PediatricGrandRounds/Online.htm> <http://www.pediatrics.med.ubc.ca/Events/AdvancesInPediatrics.htm>
8. Prepare at least two topics per week for discussion with preceptor. These may include topics pre-selected by the preceptor as well as specific topics on which the student would particularly like to expand their knowledge base.
9. Meet daily with preceptor to discuss the patients being followed, issues of interest, therapeutic controversies, ongoing evaluation, and special topics (outlined in #8).
10. If applicable during the rotation, identify an adverse drug reaction and report it to DPIC/Health Canada using the proper form. The ADR should also be posted on the

patient’s PharmaNet profile if appropriate.

1. Present one case to the pharmacy staff.
2. Lead a journal club for the pharmacy staff at the discretion of the preceptor.
3. Complete a case based oral comprehensive exam.
4. Other activities as assigned by preceptor.

*Note: Failure to complete all required activities will result in failure of the rotation. All attempts will be made to adhere to the required activities format as outlined above. However, some modifications may be necessary.*

# GENERAL STRUCTURE OF THE ROTATION - See Attached Tentative Schedule

**POTENTIAL TOPICS FOR DISCUSSION**

The resident will encounter a variety of pediatric conditions, disease states and their pharmacotherapy (during patient care activities and discussions with the preceptor), which may include the following:

# Neurology

Status epilepticus Head injury

Pain control Sedation

# Respiratory

Acute severe asthma Epiglottitis, croup, bronchiolitis Respiratory failure Pneumonia

Principles of ventilator therapy

# Cardiovascular

Congenital heart disease

Post operative low cardiac output syndrome Cardiogenic shock

Congestive heart failure Cardiac arrhythmias Anaphylaxis

Cardiopulmonary resuscitation

ECMO

# Renal and Fluids

Fluids and electrolytes Acute renal failure

Renal replacement therapy

# Gastrointestinal

Stress ulcer prophylaxis

Principles of parenteral nutrition


# Hematology

Deep Vein Thrombosis Prophylaxis Coagulation

# Infectious disease

Meningitis/Encephalitis Septic shock

Ventilator Associated Pneumonia

**Medication Safety:** Prescribing guidelines Intravenous medication Standard concentrations High Alert Drugs


# COMMUNICATION EXPECTATIONS

1. 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.
2. The Resident will notify the preceptor AND residency coordinator in advance of required off-site activities and absences.

# PRECEPTOR RESPONSIBILITIES

1. Introduce the Resident to the medical ward, pharmacists, and team.
2. Provide orientation to pharmacy department and medical ward.
3. Take report of all patients.
4. Be available for consultation with Resident whenever possible.
5. Discuss clinical topics with student at least twice weekly.
6. Provide feedback on notes written in health record.
7. Schedule dates for presentations.
8. Keep the Resident informed regarding their availability for consultation and meetings.

# EVALUATION PROCESS

The evaluation procedure is an essential process in the Pharmacy Practice Residency Program. The process serves to document the activities and progress of the pharmacy practice resident throughout the year. The process also helps to reveal strong rotations as well as areas/individuals that require further development.

* 1. The resident will receive continuous formative feedback and instruction during the rotation, which should be considered part of the evaluation process.
	2. The resident will receive a formative evaluation at the end of the rotation. This

evaluation will also take into account the rotation-specific objectives and resident’s own objectives outlined above.

* 1. Evaluation forms will be accessible to all residents at the beginning of the program via the one45 web-based program by the coordinator. The e-forms should be fully completed at the end of each rotation by both the resident and the rotation

preceptor(s).

* 1. At the end of the rotation, the resident should complete only the **“Evaluation of the**

**Preceptor”, “Rotation”** and **“Self Evaluation”** e-forms while the preceptor(s) should complete only the “**Evaluation of the Resident**” e-form. Both parties should read and submit/sign the other’s evaluations respectively, after a face-to-face discussion.

* 1. If the web based program is down, both the resident and preceptor hardcopy evaluations should be sent to the current Residency Coordinator

# REQUIRED READING / REFERENCES:

Will be provided on rotation.