**Pediatric Antimicrobial Stewardship / Infectious Diseases Rotation Children’s & Women’s Health Centre of BC**

**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 with over 400 inpatient beds and is the major referral centre for acutely ill or injured children in B.C. The Infectious Diseases Service provides inpatient and outpatient consultations to assist in the management of pediatric patients with a variety of infectious diseases. The team consists of an attending physician, medical fellows/residents/students, and collaborates with a pharmacist, microbiologists an infection control nurses. On average, 6 to 12 in-patient consults are accepted weekly with 10 to 25 provincial telephone consults weekly and continuing follow-up of 5 to 10 inpatients per day.

The pharmacy resident will participate primarily in the inpatient consultation services, and will also have the opportunity to engage in the multidisciplinary Antimicrobial Stewardship Program initiated in June 2013. Daily inpatient prospective Audit and Feedback is performed by a pharmacist on all inpatients receiving antimicrobials, in consultation with the Infectious Diseases team and microbiologist. To enhance judicious use of antimicrobials, the program also provides education in the form of presentations and written information, create antimicrobial use guidelines, review protocols and order sets involving antimicrobials, and conduct research to broaden understanding of antimicrobials in pediatric patients.

# Rotation Goals:

By the end of this rotation, the resident should be familiar with the care and management of acute pediatric infectious diseases patients and be able to function effectively and independently with the infectious diseases team. The resident should advocate for the judicious use of antimicrobials while collaborating with other health professionals, and apply evidence through critical evaluation to scientifically guide drug therapy.

# Rotation Learning Objectives:

1. General Principles:

Upon completion of the rotation, the pharmacy resident should be able to:

* 1. Describe the basic role of host factors in infectious diseases.
	2. Describe factors to consider in selecting antimicrobial therapy for a particular pediatric patient with a given disease.
	3. Describe factors to consider when evaluating patient response to antimicrobial therapy.
	4. Demonstrate the ability to provide pharmaceutical care to infectious diseases patients, including:

 Eliciting an accurate and relevant history to assess infectious diseases risk factors, including recent travel history, infectious diseases exposure, immunization history, recent antimicrobial use.

Identify and prioritize drug-related problems (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

Provide patient/family education as necessary and document actions

* 1. Demonstrate effective communication skills with interdisciplinary health care teams and to patients and caregivers, and collaborate with other clinical pharmacists to manage infectious diseases patients.
1. Laboratory

Upon completion of the rotation, the pharmacy resident should be able to:

* 1. Select and interpret commonly-applied microbiological, laboratory and investigational testing that is most appropriate and cost-effective for a particular patient.
	2. Describe the usual methods of antimicrobial identification and sensitivity testing and their clinical implications.
	3. Understand the limitations of laboratory data in establishing the diagnosis of an infectious disease.
1. Antimicrobial Therapy

Upon completion of the rotation, the pharmacy resident should be able to:

* 1. Describe the antimicrobial spectrum, mechanism of action, dosage considerations, pharmacokinetic parameters, clinical indications, toxicities, implications for pediatric patients, and costs of the following antimicrobial classes/agents: penicillins, cephalosporins, aminoglycosides, sulfonamides, tetracyclines, trimethoprim/sulfamethoxazole, macrolides, metronidazole, clindamycin, vancomycin, carbapenems, antituberculars, amphotericin B, azole antifungals, echinocandins, acyclovir, ganciclovir, foscarnet, quinolones, chloramphenical, antimalarials, mebendazole, albendazole.
	2. Define the incidence and significance of cross-sensitivity reactions between commonly used antimicrobial agents.
1. Disease States

Upon completion of the rotation, the pharmacy resident should be able to describe the usual etiology, clinical presentation, treatment, and monitoring of the following disease states in pediatrics:

* 1. Mandatory: CNS infections, infective endocarditis, pneumonia, common pediatric respiratory tract infections, intra-abdominal sepsis, skin and soft tissue infections, osteomyelitis, urinary tract infections, *Clostridium difficile*, tuberculosis, fungal infections
	2. Optional topics (depending on resident’s interests and patients): influenza and other viral infections, catheter related infections, congenital infectious diseases, septicemia, pharyngitis/tonsillitis, otitis media, mastoiditis, sinusitis, cervical lymphadenitis, preseptal

cellulitis, orbital cellulitis, dental abscess, animal bites, neonatal infectious diseases, infections in cystic fibrosis, febrile neutropenia, parasitic infections, zoonoses

1. Antimicrobial Stewardship

Upon completion of the rotation, the pharmacy resident should be able to:

* 1. Describe the rationale for implementation of antimicrobial stewardship programs and list five general goals of the program.
	2. Identify and antimicrobial stewardship strategies in managing inpatient use of antimicrobials.
	3. Demonstrate effective collaboration with healthcare providers (clinical pharmacists, infectious diseases team, microbiologists, primary teams) to promote application of antimicrobial stewardship principles.

# Required Activities

During the rotation, the resident will:

1. Provide pharmaceutical care to admitted patients followed by the infectious diseases service.

Patient load will be determined based on the resident’s previous experience and proficiency and will be modified at the discretion of the preceptor.

1. Provide medication counselling and perform medication histories on all patients under his/her care when appropriate.
2. Attend and participate in daily infectious diseases/ infection control rounds at 1:15 pm in room 2J41 from Monday to Friday.
3. Provide daily prospective Audit and Feedback service as part of the Antimicrobial Stewardship

program. Patient load and percentage of total rotation time spent on audit and feedback will be determined in discussion between resident and preceptor and dependent on resident’s interest in antimicrobial stewardship activities, proficiency, and Infectious Diseases service activity.

1. Document all clinical activities in the patient’s health record as deemed appropriate.
2. Meet with the preceptor daily to discuss patient management issues and specific clinical topics.

These may include topics pre-selected by the preceptor and topics on which the resident would particularly like to expand their knowledge base.

1. Attend CHIMP (Children’s Hospital Infection/Immunology and Microbiology Program) rounds on Thursdays from 12-1 pm.
2. Attend pharmacy education sessions (e.g. journal club and other scheduled presentations).
3. The pharmacy resident may have an opportunity to tour and visit the microbiology lab to better understand how samples are processed and procedures to obtain and report culture and sensitivity results.
4. Present at least case/ clinical topic/ therapeutic controversy to pharmacy staff and/or lead a journal club to pharmacy staff and/or provide an inservice to infectious diseases/infection control/ microbiology staff. This may include participating in a presentation with the

fellow/residents/students of the infectious diseases team for CHIMP rounds.

1. Other activities as assigned by the preceptor.

# Preceptor Roles and Responsibilities:

The preceptor will:

1. Discuss the goals and objectives with the resident at the start of the rotation.
2. Design a rotation schedule and discuss activities and discussion topics with the pharmacy resident.
3. Introduce the pharmacy resident to the Infectious Diseases and Infection Control team, clinical pharmacists, and any other relevant medical staff, orient the student to the relevant clinical care areas in BCCH, and ensure the student has appropriate computer and department access.
4. Provide the student with the local antibiogram, and demonstrate access to local empiric antibiotics guidelines and relevant available treatment algorithms.
5. Take report of all patients.
6. Be available for consultation with the pharmacy resident whenever possible.
7. Discuss clinical topics with the resident 2 to 3 times weekly.
8. Provide feedback on clinical performance, written notes, presentations, etc.
9. Keep the pharmacy resident informed regarding their availability for consultation and meetings.
10. Arrange for the pharmacy resident to visit the microbiology laboratory if possible.

# Communication Expectations:

1. The student will notify the preceptor in advance of any required absences / off-site activities.
2. The student will discuss with the preceptor any documentation that will be left on the patient’s chart, or a copy should be made for the preceptor to review afterwards, as arranged with the preceptor.
3. The student will discuss with the preceptor all recommendations and ‘feedback’ in Antimicrobial Stewardship activities prior to implementation.

# Suggested References/ Resources:

Red Book: Report of the Committee on Infectious Diseases, American Academy of Pediatrics Mandell: Principles and Practice of Infectious Diseases

The Sanford Guide to Antimicrobial Therapy

Infectious Diseases Society of American Practice Guidelines: <http://www.idsociety.org/Index.aspx> BC Centre for Disease Control <http://www.bccdc.ca/default.htm>

Long, Sarah S. Principles and Practice of Pediatric Infectious Diseases 2012. Churchill Livingstone. (Available as e-Book from UBC Library)