Summer Student Research Program Project List

List Date: January 17, 2017

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Summer Student Research Program Project Description
SSRP-Albon-01

Supervisor: Dr. Simon Albon

Project Title: Peer review of teaching: Policy and process evaluation

Project Description: The quality of teaching in university contexts, including the Faculty of Pharmaceutical Sciences, is evaluated on three primary sources of evidence: 1) student evaluations of teaching, 2) self-assessment through creation of teaching dossiers, and; 3) peer reviews of teaching.1 Administered and supported by the Faculty's Office of Education Support and Development, specific policies and procedures are used for scheduling, collecting, reporting and archiving evidence related to teaching quality. While these university- and Faculty-mandated processes have been used for decades, in the past three years each has undergone significant revision to update policies, improve and streamline processes, and align them with contemporary thinking and scholarship. For continuous quality improvement purposes each now requires rigorous evaluation. This project will focus on evaluating the peer review of teaching process. For evaluation purposes, data sources will include interviews with Faculty peer reviewers and reviewees as well as analysis of policy and process documents by recognized experts in the area. The intent of this study is to examine the peer review of teaching process for what is working, what isn’t and how it can be improved.

Project Objectives: Two objectives guide this project:

1) To gather faculty perspectives and insights on the peer review of teaching process regarding its functionality and utility for collecting evidence on teaching quality.
2) To gather feedback from external stakeholders about the quality of our peer review of teaching policies and procedures along with suggestions for improvements.

Project Activities: The project will provide you with experience in the Scholarship of Teaching and Learning (SoTL) and research methods including literature review, ethics applications, qualitative and quantitative data collection and analysis, peer review, and dissemination. SoTL is emerging as a critical area of scholarly activity within the Faculty, and research of this kind provides an evidence-based contribution to improve teaching and curriculum in the E2P PharmD program.

The student undertaking this project will be expected to work effectively within general guidelines but with minimal direct supervision and to have excellent verbal and written communication skills.

**Summer Student Research Program Project Description**  
**SSRP-DeVera-01**

**Supervisor:** Dr. Mary De Vera

**Project Title:** Patient Outcomes Associated with Medication Non-Adherence in Systemic Lupus Erythematosus

**Project Description**

**Background:** Systemic lupus erythematosus (SLE) is a chronic systemic autoimmune rheumatic disease that results in protean clinical manifestations affecting most body systems. As there is no cure for SLE, chronic therapies, including antimalarials and immunosuppressive medications, are used to slow disease progression and prevent damage by controlling the immune diathesis. However, a very recent systematic review reported non-adherent rates in eleven included studies ranging from 43% to 75%, with studies consistently reporting that over half of patients are non-adherent. In contrast to the available evidence on the burden of non-adherence in SLE, there is limited evidence on the impacts of non-adherence.

**Project Overview:** The proposed SSRP project is part of a population-based research program on understanding and addressing medication non-adherence in SLE. The specific objectives are to evaluate the impact of medication non-adherence in SLE on 1) health care utilization; and 2) mortality.

**Methods:**

**Study Design:** Retrospective, longitudinal cohort study using an established population-based SLE cohort.

**Data Source and Cohort:** The project will utilize Population Data BC (PopData), an extensive data resource that contains all BC Linked Health data for applied health services and population health research covering the entire population of BC (estimated 4.7 million residents, January 2016) including files on all provincially funded health care professional visits, hospital admissions and discharges, interventions, investigations, demographic data, and vital statistics since 1990. These data are linked to the comprehensive prescription drug database, PharmaNet, which captures all prescriptions dispensed in community pharmacies, since 1996. The SLE cohort was previously created by applying the case definition of two International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM, 710.0) codes for SLE at least 2 months apart and within a 2-year period by a non-rheumatologist physician or one ICD-9-CM for SLE by a rheumatologist or from hospital (ICD-9-CM, 710.0 or ICD-10 M321, M32.8, and M32.9). From this cohort, patients with incident SLE as those who had no prior SLE visit during the 5 years prior to the date of SLE diagnosis (5-year sliding run-in period) will be identified.

**Assessment of Non-Adherence:** First, discontinuation of therapy will be defined when a 90-day permissible gap in treatment has been exceeded after completion of a prescription (date of dispensation plus days supply). Second, poor execution of the therapy regimen will be assessed using the proportion days covered (PDC), a measure of daily medication availability calculated as the total number of days with possession of medication in a period of time.

**Assessment of Outcomes:** First, health care utilization is a composite outcome including all outpatient visits (e.g. to primary care physicians, laboratory tests) and hospitalizations. Specifically, I will quantify both count and rate of health care visits. Second, I will use vital statistics data to assess mortality, which I will categorize as a binary (yes/no) variable.

**Statistical Analyses:** To evaluate the association between non-adherence and health care utilization, Poisson regression will be used given that health care utilization will be quantified as a rate. To evaluate the association between non-adherence and mortality, Cox’s proportional hazards models will be used. Both analyses will adjust for potential confounders including age, sex, socioeconomic status, residence (urban vs. rural), comorbidities, and use of other medications.

**Role of the Summer Student:** The summer student will be trained on use of appropriate statistical analyses software to: 1) generate analytic datasets; and 2) conduct statistical analyses. The summer student will regularly meet with the supervisor to discuss and project and will also receive support from the research team, including statistician during the project term.
Supervisor: Dr. Mary De Vera

Project Title: Smartphone Medication Adherence Apps: A Scoping Report and Quality Assessment (SMAART)

Project Description

Background: For many patients living with lifelong diseases, managing conditions and taking medications as prescribed (“adherence”) is a challenge. Indeed, medication non-adherence has been declared by the World Health Organization as an epidemic, costing billions of dollars in wasted health care resources. There is surging interest on the applications of electronic health (eHealth) technologies – the transfer of health resources, care, and information by electronic means – in addressing medication non-adherence. With ubiquitous cellular phone use and ease of accessibility, smartphone apps may represent valuable tools to supporting patient adherence.

Project Overview: The proposed SSRP project is part of a research program on understanding how eHealth technologies can help support patients with adherence to their medications. The specific objectives are: 1) to conduct a scoping study of smartphone medication adherence apps (SMAA) across available operating systems (e.g. Apple, Android); 2) establish a framework for assessing the quality of SMAA; and 3) assess the quality of identified SMAAs.

Methods:

Scoping Report: A search of available SMAAs will be conducted by searching app sources (e.g. Apple iTunes, Android Marketplace). A search strategy will be developed as part of the SSRP but preliminary search terms include “medications”, “adherence”, “compliance”, “dose/dosing”, “drugs”, and “reminder.”

Developing Quality Assessment Framework: For all identified SMAAs, the following information will be extracted: name, developer (if available), rating (if provided), SMAA description, content, disease target (e.g. applicable in general or disease-specific), and cost. Key to the assessment will be functionality of each SMAA and we will also extract information on whether skipped doses are tracked, reminder functions, availability of medication information, and data storage. We will categorize extracted data to create a framework for assessing SMAAs, according to operating system, disease target, and functionality.

Assessing the Quality SMAAs: We will apply the quality assessment framework to assess identified SMAAs.

ROLE OF THE SUMMER STUDENT: The summer student will work closely with the supervisor and research assistant (RA) to develop the search strategy and quality assessment framework. The summer student will be responsible for executing the search, identifying SMAAs, extracting information, and performing quality assessment. An expected outcome of this project is the creation of a repository of SMAAs that can be continually updated as part of ongoing research on the application of SMAAs in addressing medication non-adherence.
Supervisor: Frances Simpson, Research Coordinator, Office of Experiential Education

Co-supervisors: Asal Taheri, Aileen Mira, Janice Yeung

Project Title: Evaluation of the Experiential Education Facilitator role at inpatient pharmacy practicum sites in British Columbia

Project Description:
Placement capacity, teaching workload, and the need for preceptor and learner support were identified as key areas of concern by the AGILE project (Advanced Experiential Learning in Institutional Pharmacy Practice)1 initiated by UBC’s Faculty of Pharmaceutical Sciences. These issues are becoming even more important with the increase in the experiential component of the curriculum (from 20 weeks to 46 weeks) with the transition from the BSc program to the Entry-to-Practice PharmD program.

In 2015, largely as a result of the AGILE recommendations, the Faculty’s Office of Experiential Education (OEE) introduced Experiential Education Facilitators (EEFs) at select inpatient practicum sites to provide on-the-ground support to preceptors and learners, with the goals of helping to manage clinical workload and optimize student learning. The objectives of this project are to evaluate the impact of the EEF implementation to date, including determining if the roles and responsibilities align with what was originally agreed upon, examining the impact on placement capacity for inpatient practicums, and evaluating the effect on student issues while on rotation.

The student should work within well-defined guidelines, but is expected to exercise some initiative and judgment in establishing priorities and carrying tasks through to completion. The student should be able to work effectively both independently and in a team environment and should have effective communication, organization, and analytical skills. Some research experience is preferred but not required; the student will receive training in all aspects of the project and feedback at regularly scheduled meetings.

Project activities:
1. Conduct a literature review
2. Complete the study’s ethics application
3. Assist with the development of data collection tools, including surveys and interview guides
4. Collect and analyze data related to inpatient pharmacy practicums
5. Attend regular meetings with the project team and other OEE summer students
6. Provide a written report outlining the impact of the EEFs on inpatient pharmacy practicums
7. Prepare a poster presentation summarizing the findings, and present in September 2017

1. Legal M. Advancing Experiential Learning in Institutional Pharmacy Practice (AGILE).
**Summer Student Research Program Project Description**

**SSRP-OEE-02**

**Supervisor:** Frances Simpson, Research Coordinator, Office of Experiential Education

**Co-supervisors:** Paulo Tchen, Janice Yeung

**Project Title:** Precepting beyond the practicum site: Recruiting and sustaining a cohort of pharmacy practice educators to supervise community outreach activities

**Project Description:**

The Faculty of Pharmaceutical Sciences is dedicated to supporting student pharmacists who are seeking opportunities for community outreach, such as educating the public about health and medication use topics, and about the profession of pharmacy and services pharmacists can provide. As student pharmacists are representing the Faculty and UBC, it is essential to ensure that appropriate oversight is given to the content that they are delivering to the public and that they are provided with supervision. A policy was approved in October 2016 to support these important learning experiences in a way that is transparent for faculty members and student pharmacists¹.

An important component of the policy is that a supervisor (a UBC affiliated and appointed individual) will supervise a student pharmacist for any community outreach activity when deemed necessary by the Faculty. The supervisor is a licensed pharmacist for all pharmacy practice activities conducted in the community. As the initiative is in its infancy, a current challenge is recruiting and sustaining a substantial cohort of these supervisors. The objectives of this project are to develop strategies to recruit these individuals, devise ways to sustain their involvement over time, establish the optimal number of individuals required to support the program, and determine how to target individuals whose areas of expertise match with specific community outreach activities.

The student should work within well-defined guidelines, but is expected to exercise some initiative and judgment in establishing priorities and carrying tasks through to completion. The student should be able to work effectively both independently and in a team environment and should have effective communication, organization, and analytical skills. Some research experience is preferred but not required; the student will receive training in all aspects of the project and feedback at regularly scheduled meetings.

**Project activities:**

1. Conduct a literature review
2. Determine effective strategies and recommendations to build a sustainable group of supervisors
3. Assist with the development of a system to track the community outreach activity supervisors
4. Attend regular meetings with the project team and other OEE summer students
5. Provide a written report outlining the recruitment strategy and recommendations
6. Prepare a poster presentation summarizing the findings, and present in September 2017

Supervisor: Dr. Brian Rodrigues

Project Title: Endothelial heparanase regulation of cardiac metabolism

Project Description:
Fatty acid (FA) delivery and utilization by the heart involves multiple sources and procedures. However, greater than 90% of plasma FAs are contained within lipoprotein-triglyceride (TG), that release FA through the action of lipoprotein lipase (LPL). Compared to other tissues, the heart has the most robust expression of LPL, and more meaningfully, LPL-mediated lipolysis of TG-rich lipoproteins to FA is suggested to be the principal source of FA for cardiac utilization. In the heart, LPL is produced in cardiomyocytes and subsequently secreted onto heparan sulfate proteoglycan (HSPG) binding sites on the myocyte cell surface, where the enzyme is momentarily located. From here, LPL is transported across the interstitial space onto comparable HSPG binding sites on the luminal surface of endothelial cells (EC) where LPL breaks down TG. HSPG are ubiquitous macromolecules present on cell membranes and extracellular matrix. Consisting of a core protein and heparan sulfate (HS) side chains, they can bind almost hundred different proteins including cytokines, enzymes and peptides and this binding function provides the cell with a rapidly accessible reservoir, precluding the need for de novo synthesis when the requirement for a protein is increased. Like LPL, vascular endothelial growth factor (VEGF) is a cytokine highly expressed in cardiomyocytes and tethered on cardiomyocytes cell surface HSPG. VEGF has an established role in regulating vascular permeability and vessel formation, but could also be involved in FA and LPL transport across the EC layer. EC heparanase is an endoglycosidase only expressed in EC and is uniquely capable of degrading HS at specific sites, thereby instigating protein release. Upon exposure to high glucose, it has been reported that heparanase is released from EC and thus capable of liberating a number of proteins from cardiomyocytes. This project will examine the mechanism by which endothelial heparanase, VEGF, and LPL work together to facilitate FA delivery and utilization to the cardiomyocytes following diabetes.