Interior Health

Pharmacy Residency Research Project Proposal

WORKING TITLE OF THE PROJECT

Development, Implementation, and Evaluation of Behaviour Change Interventions (BCIs) to Support Antimicrobial De-escalation (AD) at a Tertiary Hospital

PRINCIPAL INVESTIGATOR

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CO-INVESTIGATORS

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RESEARCH SITE(S)

Kelowna General Hospital

PROPOSED RESEARCH QUESTION(S)

POPULATION: *Prescribers/clinical pharmacists on target wards at KGH (TBD)*

INTERVENTION: *Design, implementation and evaluation of Behaviour Change Interventions (BCIs) using previously identified barriers and facilitators to prescribers/pharmacists performing antimicrobial de-escalation (AD) derived from a qualitative meta-synthesis of the literature (D. Lau, Pharm 473 project, 2019 unpublished).*

COMPARATORS: *Pre- and post- implementation data from same hospital ward(s) and prescribers/pharmacists*

OUTCOMES:

To be measured pre- and post- intervention on target ward(s) and in target population(s), specifically:

1) *Changes in prescribers'/clinical pharmacists' perceived satisfaction with BCI, reduction/elimination of barriers to de-escalation, subjective competency in promoting de-escalation, de-escalation knowledge and skills, application of information*
2) *Monthly measurement of World Health Organization (WHO) defined daily dose (DDD) and days of therapy (DOT) of empiric broad spectrum IV antibiotics (e.g. carbapenems, piperacillin-tazobactam, vancomycin, etc. goal: decreased consumption) and narrow spectrum IV antibiotics (e.g. penicillin, cloxacillin, cefazolin, etc.; goal: increased consumption)*
3) *Monthly measurement of DDD and DOT of all PO antibiotics (goal: increased consumption)*
4) *Monthly cost of antimicrobials in above categories (broad spectrum, narrow spectrum, PO)*
5) *The proportion of eligible patients who receive appropriate de-escalation of their antimicrobial regimen*
6) *Time to appropriate antimicrobial de-escalation*
7) *Balancing measures: proportion of patients with inappropriate antimicrobial de-escalation*

STUDY DESIGN: *Prospective interventional cohort study with retrospective medical record review*

OBJECTIVES (SHOULD LINK TO OUTCOMES)

1) *To select, develop, implement, and evaluate evidence-informed interventions to address prescribers' and pharmacists' perceived modifiable barriers and enhance existing facilitators to participation in de-escalation of antimicrobial agents.*
2) *To determine prescriber/pharmacist satisfaction with the evidence-informed interventions (e.g. improved competency in assessing a patient for AD).*
3) *To analyze antimicrobial consumption data pre/post intervention on target ward(s)*

RATIONALE (LIMIT TO 150 WORDS)

[include the reason(s) for focusing on your stated objectives AND reasons for choosing the study design proposed]

Antimicrobial stewardship (AMS) is an activity that includes appropriate selection, dosing, route, and duration of antimicrobial therapy. The primary focus of an AMS program is to optimize the use of antimicrobials to achieve the best patient outcomes, reduce the risk of infections, reduce or stabilize levels of antibiotic resistance, and promote patient safety. One of the activities of an effective AMS program is the promotion of antimicrobial de-escalation (AD). Antimicrobial de-escalation entails the immediate replacement of empiric broad-spectrum antimicrobials with antimicrobial agents with the narrowest possible spectrum once the causative microorganism and results of antimicrobial sensitivity testing are known. De-escalation may also include discontinuation of dual antimicrobial coverage in favour of a single, narrower-spectrum agent once microbial culture and sensitivities are known. Antimicrobial de-escalation is anticipated to result in decreased antimicrobial resistance, adverse effects and cost. Despite the potential benefits, literature has demonstrated that only approximately a third of eligible hospitalized patients receive de-escalation of their antimicrobial regimen.

Behaviour Change Interventions (BCIs) are defined as "coordinated sets of activities designed to change specified behavior patterns." There are four tasks that need to be completed when designing BCIs targeting health care professionals (HCPs): 1) identifying barriers and facilitators, 2) selecting intervention components, 3) using theory, 4) engaging end-users. In 2019, a Pharmacy 473 student

(Dorothy Lau) and Sean Gorman, PharmD performed a qualitative meta-synthesis of the literature to identify barriers and facilitators to antimicrobial de-escalation (unpublished). Using a rigorous methodology, they identified 12 qualitative studies and used a well-accepted theoretical framework of behaviour change (TDF) to identify themes pertaining to barriers and facilitators to HCPs performing AD. They then mapped and grouped these themes to the COM-B model (Capability, Opportunity, and Motivation as determinants of behaviour).

The next step in this program of research is to develop and implement BCIs to overcome these barriers and facilitators to AD. Previously identified themes may be mapped to the Cochrane Effective Practice and Organization of Care (EPOC) health professional behaviour change taxonomy, which consists of evidence-based health system interventions to design comprehensive BCIs to address barriers and facilitators to changing a target behaviour. Using the APPEASE criteria (e.g. are the proposed interventions Affordable, Practical, Effective, Acceptable, Safe, and Equitable?), BCIs can be developed and implemented.

We have selected a prospective cohort study design in which prescribers and clinical pharmacists on each target ward will act as their own controls to minimize other confounders (i.e. patient acuity and illness severity and type) that may confound analysis across different hospital wards.

SIGNIFICANCE (LIMIT TO 100 WORDS)

[Include an explanation of potential value of project to patient care, pharmacy department, hospital, health authority, and/or pharmacy profession as appropriate; if applicable, what will you do if the results are positive and what will you do if the results are negative?]

Participation of prescribers and pharmacists in AMS activities and specifically AD is expected to result in increased appropriate antimicrobial use, improved patient outcomes, decreased medication costs and decreased antimicrobial resistance. We also aim to increase the confidence and competence of prescribers and pharmacists in regard to AD activities. If the results of our study are positive, we may roll out similar BCI at other institutions within IH. If the results are negative, we will reflect upon the reasons for this, and address any modifiable problems or obstacles to implementing further interventions to improve AMS activities in KGH and IH in the future.

PROPOSED RESEARCH METHODS

[Indicate proposed methods of screening/sampling, data collection (eg. chart review, patient interviews), and analysis]

1. *Screening: not applicable*
2. *Sampling: consecutive sample of every prescriber/clinical pharmacist on chosen interventional ward(s) if possible (likely not possible to include all staff due to vacation, shift work etc.)*
3. *Ethics submission of protocol by November 2023*
4. *Pre-implementation data collection:*
    a. *Monthly on target ward(s) x 6 months prior to intervention (July 1 2023 –Dec 31 2023)*
        i. *Data collection per Objectives section above*
    b. *Survey distribution to prescribers/pharmacists to assess baseline knowledge/confidence in AD*
5. *Intervention: TBD; implementation period Jan 1-31 2024*
6. *Post-implementation data collection:*

    a. *Monthly on target ward(s) Feb-April 2024 (3 months for residency project; 6 months for publication purposes?)*
        i. *Data collection parameters identical to pre-implementation, for comparison*
    b. *Survey distribution to prescribers/pharmacists to assess baseline knowledge/confidence in AD*
7. *Data analysis: April 2024*
8. *Poster presentation: May 2024*
9. *Manuscript completion (first draft): July 2024*

FUNDING SOURCES

[Indicate if there are any costs associated with the project and if any funding will be sought for the project and list the funding agency]

All costs associated with this residency project will be covered, in-kind, by IH Pharmacy Research.

ANTICIPATED START DATE OF THE RESIDENCY PROJECT

[For residency projects, it is preferable if the project can start at the beginning of the residency]

Mid-June 2023

ANTICIPATED END DATE OF THE RESIDENCY PROJECT (CONSIDER FOR FEASIBILITY OF RESIDENCY PROJECT)

April 2024

PROJECT SUITABILITY (*FOCUS ON RESIDENCY PROJECT SUITABILITY*)

After consideration of the "**FINER**" criteria (**F**easible, **I**nteresting, **N**ovel, **E**thical, **R**elevant) I believe that the project meets all the Project Suitability Criteria **YES** (indicate YES/NO)

EQUITY, DIVERSITY, INCLUSION CONSIDERATIONS (contact Sean if you have questions)

This proposed research has the potential to:

- ☐ Increase healthcare and health disparities (reconsider the design and methods to prevent this)
- ☐ Maintain healthcare and health disparities (reconsider the design and methods to prevent this)
- ☐ Reduce healthcare and health disparities in equity-deserving groups (ideal)