**Appendix 1:** Scheduling and duration of pharmacy learner rotations during the study period, where × indicates the presence of the staffing or pharmacy learner on the service.

Date (by week)	Pharmacist 1	Pharmacist 2	Pharmacy Resident	Pharmacy Resident	Pharmacy Student	Pharmacy Student	Pharmacy Student	Pharmacy Student	Pharmacy Student
April 10–13	×	×	×		×				
April 18–21	×		×		×				
April 24–28		×	×		×				
May 1–5	×	×	×			×	×		
May 8–12	×	×				×	×		
May 15–19	×	×				×	×		
May 23–26	×	×				×	×		
May 29–June 2	×	×				×	×		
June 5–9	×	×				×	×		×
June 12–16	×	×				×			×
June 19–23	×	×				×			×
June 26–30	×	×						×	×
July 4–7	×	×		×				×	×
July 10–14	×	×		×				×	×
July 17–21	×			×				×	×
July 24–28	×	×		×				×	×
July 31–Aug 4	×	×						×	×
Aug 8–11	×							×	×
Aug 14–18	×	×						×	×
Aug 21–25		×							×
Aug 28–Sept 1		×							×
Sept 5–8	×	×							
Sept 11–15	×	×							
Jan 8–Feb 9	×	×							

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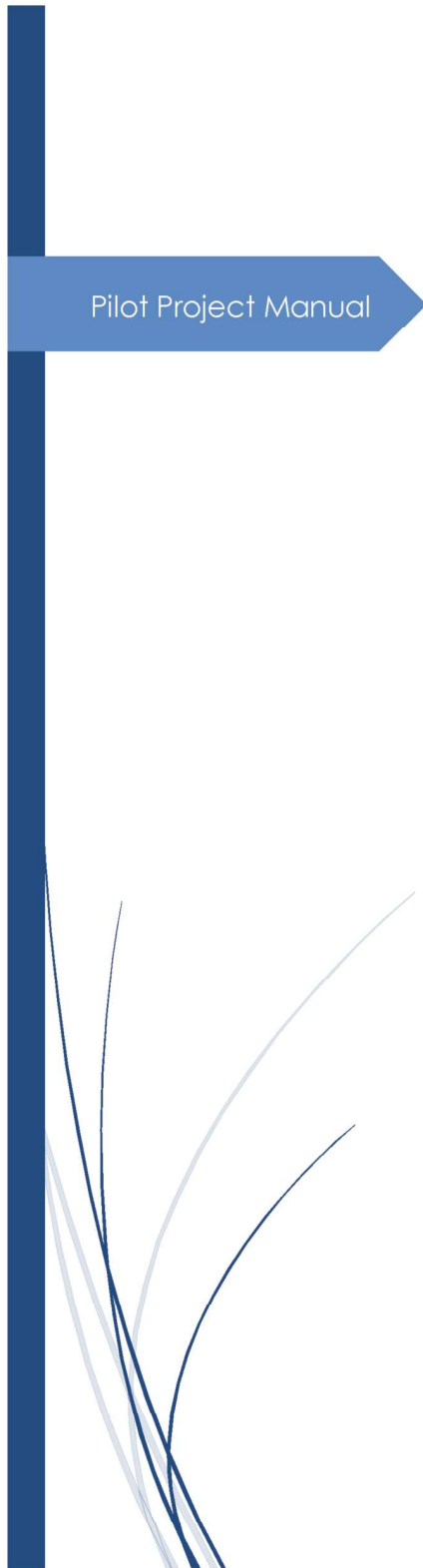
Pilot Project Manual

The Value of Pharmacy Learners

and their impact on patient care

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Purpose

The purpose of this pilot project is aimed to answering the question '**what effect do our pharmacy learners have on our ability to deliver patient care?**' Additionally, we will also be able to determine the impacts and compare & contrast the effects on patient care within each unit when there is: (overlapping pharmacist coverage versus single coverage) ± pharmacy resident ± pharmacy learner.

Design

To objectively measure the clinical services and interventions made by pharmacists, pharmacy residents and pharmacy students across periods of variation in clinical staffing and pharmacy learner rotations. Specifically, we will be monitoring Clinical Pharmacy Key Performance Indicators (cpKPI) as outlined below by the CSHP cpKPI Mobilization Guide.

Background

Key performance indicators quantitatively measure an organization's goals.[1] In Canada, there are 8 nationally agreed upon clinical pharmacy key performance indicators.[1] Continual monitoring and improvement on the performance these cpKPIs are anticipated to influence clinically significant patient outcomes such as mortality and hospital readmissions.[1] However, these outcomes have only been validated for the inpatient setting.[1]

Table A1. Canada's Clinical Pharmacy Key Performance Indicators[i]

cpKPI	What is Measured
1. Medication Reconciliation on Admission	Proportion of patients who received documented medication reconciliation on admission (as well as resolution of identified discrepancies), performed by a pharmacist
2. Pharmaceutical Care Plan	Proportion of patients for whom a pharmacist has developed and initiated a pharmaceutical care plan
3. Drug Therapy Problems	Number of drug therapy problems resolved by a pharmacist per admission
4. Interprofessional Patient Care Rounds	Proportion of patients for who pharmacist participated in interprofessional patient care rounds to improve medication management

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5. Patient Education during Hospital Stay	Proportion of patients who received education from a pharmacist about their disease(s) and medication(s) during their hospital stay
6. Patient Education at Discharge	Proportion of patients who received medication education from a pharmacist at discharge
7. Medication Reconciliation at Discharge	Proportion of patients who received documented medication reconciliation at discharge (as well as resolution of identified discrepancies), performed by a pharmacist
8. Bundled patient care interventions	Proportion of patients who received comprehensive direct patient care from a pharmacist working in collaboration with the healthcare team

Within cpKPI 3 'Drug Therapy Problems' contains a subset of classifications in order to more accurately label the identified clinical issue. These classifications are detailed in Table 2.

Table A2. cpKPI 3: Drug Therapy Problems Subsets[1]

DTP Classification	Definition or Descriptor
A	Patient who does NOT have a clinical indication for the drug
B	The patient requires additional drug therapy
C	The patient is at risk for or experiencing a suboptimal response to the drug therapy
D	The patient needs a higher dose to benefit from drug therapy
E	The patient needs a lower dose to benefit from drug therapy
F	The patient is experiencing an adverse reaction to the drug
G	The patient is not able or willing to take the drug as prescribed

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Standard Operating Procedure

1. IF YOU ALREADY HAVE A SET OF STICKERS, SKIP TO STEP 2: Otherwise, retrieve a set of cpKPI stickers from the pharmacy. They should be located inside a folder. If you are unable to locate them or if the folder is empty, please contact Pharmacist XXX.
   a. If you are a **pharmacist**, proceed to step 2
   b. If you are a **pharmacy resident**, highlight all of your stickers in PINK
   c. If you are a **pharmacy learner (student)**, highlight all of your stickers in YELLOW

2. Retrieve a daily roster list of your unit.

3. EACH time you perform one of the cpKPIs, place the respective sticker under the patient name who received the service on your roster list. NOTE If you performed:
   * Refer to Addendum A for Quick cpKPI Reference List
   a. Medication Reconciliation on Admission (cpKPI 1)
      i. Check the box 'review' if you only reviewed the AMR
      ii. Check the boxes 'review' and 'discrepancy' if you found any discrepancies upon reviewing the AMR
   b. Drug Therapy Problem (cpKPI 3)
      i. Fill in the blank provided the DTP classification (A – G) identified
         * Refer to Addendum B for Quick DTP Classification Reference List
      ii. You may fill in multiple DTPs per sticker in order to conserve space
   c. Interprofessional Patient Care Rounds (cpKPI 4)
      i. If you attended the 'bullet' rounds at the nursing station then check the box 'bullet' and place the cpKPI 4 sticker at the top of your roster list rather than underneath each patient
      ii. If you attended bedside rounds then check the box 'other' and place the cpKPI 4 sticker under the relevant patient(s)
   d. Medication Reconciliation on Discharge (cpKPI 7)
      i. Check the box 'review' if you only reviewed the DMR
      ii. Check the boxes 'review' and 'discrepancy' if you found any discrepancies upon reviewing the DMR
   e. All Other cpKPIs (2, 5 or 6)
      i. Place the respective sticker under respective patient

4. At the end of the day, file away the roster list in a folder placed in the pharmacy. This may also be done weekly but take care not to lose your daily rosters.
   *Refer to Addendum C for a Sample Roster List

5. Repeat from Step 1 on each new day.

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Addendum A. Quick cpKPI Reference List

	cpKPI
1	Medication Reconciliation on Admission
2	Pharmaceutical Care Plan
3	Drug Therapy Problems*
4	Interprofessional Patient Care Rounds
5	Patient Education During hospital Stay
6	Patient Education at Discharge
7	Medication Reconciliation at Discharge
8	Bundled Patient Care Interventions¥

* Give yourself a cpKPI 3 sticker regardless of whether or not your recommendation for resolving an identified DTP was accepted. An assessment was conducted nonetheless.

*¥ There is no action required on your part for cpKPI 8. i.e. there will be **NO** sticker. This will be completed by the data analyst.*

Addendum B. DTP Classification Reference List

DTP Classification	Definition or Descriptor
A	Patient who does NOT have a clinical indication for the drug
B	The patient requires additional drug therapy
C	The patient is at risk for or experiencing a suboptimal response to the drug therapy
D	The patient needs a higher dose to benefit from drug therapy
E	The patient needs a lower dose to benefit from drug therapy
F	The patient is experiencing an adverse reaction to the drug
G	The patient is not able or willing to take the drug as prescribed

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Commonly confused DTP examples:

Clinical scenario	DTP
Narrowing/changing antibiotic therapy (ex from pip-tazo to ampicillin)	A + B
Dose decrease required due to renal impairment, Drug tapering	E
Chemotherapy order preparation Ex: transcribe order for 2 chemo drugs and 3 antiemetics	B x 5
Drug Acquisition issues Ex: providing outpatient script to fill "own med", performing process to obtain a non-funded or non-covered drug (SAP, EAP, TRS etc)	G

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Addendum C. Sample Pharmacy Student Roster List

DATE 17/03/17 TIME 06:01 A.M. PAGE   7 REPORT *$B1EXW5   cpKPI 4; rounds Bullet✓

PHARMACY - CENSUS BY SERVICE FOR ONC

RM / BED	PATIENT NAME	S	SVC	DOCTOR	ADM DATE	MED REC	AGE
-------	DIAGNOSIS------------	-	---	---------	---------	--------	---
-							
5106-1	▮▮▮▮ , ▮▮▮▮	M	ONC	▮▮▮	16/03/17	▮▮▮	78
	METS COLON CA						

cpKPI 2; PhC care plan   cpKPI 1; AMR Rev✓

5106-2	▮▮▮ , ▮▮▮ ▮▮▮	F	ONC	▮▮▮	16/03/17	▮▮▮	56
	CHF						
5108-2	▮▮▮ , ▮▮▮	F	ONC	▮▮▮	10/03/17	▮▮▮	21
	FEBRILE NEUTROPENIA						
5109-1	▮▮ , ▮▮▮	F	ONC	▮▮▮	14/03/17	▮▮▮	68
	PLEURAL EFFUSION						

cpKPI 2; PhC care plan   cpKPI 3; DTP resolve

5110-1	▮▮▮ , ▮▮	M	ONC	▮▮▮	15/03/17	▮▮▮	98
	PNEUMONIA						
5111-1	▮▮▮ , ▮▮ ▮▮	F	ONC	▮▮▮	26/02/17	▮▮▮	42
	SMALL CELL LUNG CA						

cpKPI 5; Educate pt in hosp

5111-2	▮▮ , ▮▮	M	ONC	▮▮▮	13/03/17	▮▮▮	76
	METS PROSTATE CA						

cpKPI 6; Educate pt at D/C   cpKPI 7; DMR Rev✓

*Note a pharmacist roster list will not have highlighted stickers and pharmacy resident should be highlighted in pink

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[1] Fernandes O, Toombs K, Pereira T et al. Canadian Consensus on Clinical Pharmacy Key Performance Indicators: Knowledge Mobilization Guide. http://www.cshp.ca/productsservices/cpkpi/CSPH-Can-Concensus-cpKPI-Knowledge-Mobilization-Guide.pdf. Published March 2015. Accessed April 2017.