# Fostering Engagement from Nurses in Promoting IV to PO Conversion (FERN-IPO)

**Brenden Kilpatrick BSc (Pharm); Victoria Cox BSc (Pharm), ACPR, PharmD; Sean Gorman BSc (Pharm), ACPR, PharmD; Paula Araujo, RN, BScN, MSc, Nicole Delaney RN; Paula Cyra, BScN, RN; Piera Calissi BSc (Pharm), ACPR, PharmD; Edith Blondel-Hill MD; Melissa McQuat, BSc (Pharm), ACPR; Kate Boutin, BSc (Pharm), ACPR; Chase Fisher, BSc (Pharm), ACPR**

## Background

- 35% of antimicrobials used in hospital are discordant with guidelines.
- Only 30% of eligible patients in Interior Health are converted from IV to PO antimicrobials.
- Prescriber forgetfulness has been identified as a key barrier to conversion.

### Nurse Promotion of IV to PO Conversion

- Nurses have the skills to assess patients for IV to PO conversion and are the most abundant healthcare professionals in hospital.
- We previously identified barriers to nurse promotion of IV to PO conversion at Kelowna General Hospital (KGH) (Table 1).
- We speculated that a theory driven Behaviour Change Intervention (BCI) targeting these barriers may improve conversion rates.

## Objectives

To determine if the implementation of a BCI to improve promotion of IV to PO antimicrobial conversion by acute care nurses can:

1. Increase the percentage of treatment courses of IV antimicrobial therapy that are converted to PO therapy.
2. Measurably improve nurses' self-reported capability, opportunity and motivation to perform this activity.
3. Result in a decrease in the mean number of days of IV antimicrobial therapy prior to conversion to PO therapy.
4. Result in different rates of conversion on wards with a clinical pharmacist compared to wards without a clinical pharmacist.
5. Result in increased inappropriate IV to PO conversion.

## Design

**Design:** Prospective, quasi-experimental, historically controlled

**Setting:** KGH: 4A - Medicine/Thoracic Surgery (30 beds)
4B - Medicine/Oncology (30 beds)

**Timeframe:** Pre-intervention: Oct to Dec 2018
Post-Intervention: Jan to Apr 2019

**Population:** RNs & LPNs actively engaged in patient care on 4A/4B

**Data Collection:** Data abstracted from Meditech® database

## Methods

### BCI Development

- The COM-B model posits **C**apability, **O**pportunity, and **M**otivation dictate **B**ehaviour.
- Barriers to behaviour change can be mapped to the COM-B model.
- Evidence-based BCIs from the Cochrane EPOC professional behaviour change taxonomy have been mapped to the COM-B model to enable development of a comprehensive BCI.

**Table 1: Barriers to Nurse Involvement in IV to PO Conversion**

| Capability | Opportunity | Motivation |
|---|---|---|
| 1) Insufficient knowledge<br>2) No standard method to communicate assessment<br>3) No prompt for assessment | 1) Lack of prescriber accessibility<br>2) Perceived lack of prescriber cooperation | 1) Concerns about efficacy<br>2) Viewed as role of prescriber<br>3) Lack of confidence<br>4) Low priority nursing activity |

### BCI Implementation

- **In-service education:** 10 minute session delivered by clinical pharmacists daily for first two weeks of intervention period. After completion of in-person sessions, a recorded session was distributed via email to all participants.
- **IV to PO conversion guide:** Clinical decision pathway placed in vitals binders and MARs, on lanyard cards, and distributed by email to all participants.
- **Clinical Support Tool (CST):** A checklist of conversion criteria for patient assessment, intended to be placed in patient's medical record to facilitate communication.
- **Fidelity:** Intervention delivered as intended without significant modification.

**Table 2: Results**

| Endpoint | Before | After | Change | $\chi^2$ |
|---|---|---|---|---|
| IV to PO conversion rate | 26% (120/456) | 24% (86/362) | -2% | NSS |
| Highly bioavailable antimicrobials | 29% (13/45) | 23% (9/39) | -6% | NSS |
| 4A - no clinical pharmacist | 23% (52/228) | 16% (28/171) | -7% | NSS |
| 4B - clinical pharmacist | 30% (68/228) | 30% (58/191) | 0% | NSS |
| Time to PO therapy ($\bar{x}$) | 4.1 ± 0.5 days | 3.9 ± 0.6 days | - 0.2 days | NSS |
| Inappropriate conversion | 5% (6/120) | 3% (3/86) | -2% | NSS |

### Mediational Before & After Survey

- Utilized to understand factors contributing to the efficacy of the BCI.
- Distributed to 315 nurses during the first and last two weeks of the intervention.
- Contained nine validated questions linked to barriers within each COM-B domain (strongly disagree: 1 - strongly agree: 7).

**Table 3: Mediational Survey Results**

| | Question | Before (n=33) | After (n=22) | Δ | p |
|---|---|---|---|---|---|
| Capability | Knowledge | Neutral (4.4 ± 0.6) | Agree (5.8 ± 0.3) | 1.4 | <0.01 |
| | Ability to Communicate | Somewhat Agree (4.7 ± 0.6) | Agree (6.0 ± 0.3) | 1.3 | <0.01 |
| | Automaticity | Neutral (4.3 ± 0.6) | Somewhat Agree (4.9 ± 0.8) | 0.6 | NSS |
| Opportunity | Access to Prescriber | Agree (5.8 ± 0.6) | Agree (6.1 ± 0.3) | 0.3 | NSS |
| | Prescriber Amenability | Somewhat Agree (4.9 ± 0.4) | Somewhat Agree (5.3 ± 0.5) | 0.4 | NSS |
| Motivation | Belief of Benefit | Agree (6.0 ± 0.4) | Agree (6.3 ± 0.2) | 0.3 | NSS |
| | A Nursing Activity | Somewhat Agree (5.3 ± 0.5) | Agree (5.6 ± 0.5) | 0.3 | NSS |
| | Feasible in Practice | Neutral (3.8 ± 0.6) | Somewhat Agree (5.1 ± 0.6) | 1.3 | <0.01 |
| | A Priority Task | Neutral (4.2 ± 0.5) | Somewhat Agree (4.8 ± 0.6) | 0.6 | NSS |

## Discussion

### Strengths

- Improved knowledge and ability to communicate assessment.
- Improved belief that assessment was feasible in practice.

### Weaknesses

- Unable to establish enduring automaticity.
- Failed to convince nurses assessment is a priority activity.

### Limitations

- Low (30%) participation at in-person education sessions.
- No measurement of frequency of nurses' assessments.
- Informal feedback indicated few CSTs were completed.
- Workplace culture on 4A/4B may have affected results.
- Lack of team-based interventions and long-term follow-up strategies may have hindered adoption of BCI

## Conclusions

- IV to PO conversion rates were unchanged after implementation of the BCI.
- Self-reported capability to promote IV to PO conversion was improved however opportunity and motivation were not.
- The BCI was feasible to implement.
- **Future Research:** Study results will inform development of future BCIs to engage nurses in AMS activities.

UBC

Interior Health