

# Development of a process map for the delivery of virtual clinical pharmacy services at Odette Cancer Centre during the COVID-19 pandemic

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## Abstract

Virtual methods have been innovatively utilized to provide clinical and supportive care to patients with cancer. Oncology pharmacists have been actively involved in this movement, in order to minimize patient contact and decrease the risk of viral transmission for this high-risk group. In response to COVID-19 restrictions, the Odette Cancer Centre pharmacy modified the delivery of clinical pharmacy services (CPS), including medication histories and patient education/counseling, to a remote telephone-based model. Process maps were created to visualize workflow before and after the pandemic. Process metrics were tracked over a 6-week period. From March 25th to May 1st, 2020, 202 best-possible medication histories and baseline assessments were completed; 149 of these (74%) were completed remotely. For medication therapy counsels, 72 of 199 were completed remotely (36%). Despite workflow disruptions caused by the pandemic, these results demonstrate that clinical pharmacy service levels could be maintained by incorporating remote delivery approaches without significant investment in resources. Challenges included acceptance by patients and lack of technology to support system-level processes. Further research to develop, refine, and individualize virtual clinical pharmacy care models will help to consolidate the role of these approaches in the post-COVID-19 era.

## Keywords

Oncology, pandemic, telepharmacy, process change, medication management

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## Background

The COVID-19 pandemic has required rapid reorganization of healthcare service delivery models. Along with other healthcare professionals serving on the front-line of the pandemic, pharmacists have had an indispensable presence. Pharmacists have been stewards of health advice and information about COVID-19, ensured uninterrupted access to medicines, and continued to provide medication management services using telehealth.<sup>1–4</sup> In the oncology setting, guidelines for managing cancer patients in response to the pandemic were aimed at postponing non-urgent treatments and procedures, offering alternative treatment strategies, and shifting services away from in-person delivery.<sup>5–8</sup> Nonetheless, the majority of patients continued

systemic anticancer treatments during the pandemic.<sup>9</sup> Cancer patients have been shown to be at higher risk of severe disease (and complications) if they develop COVID-19 infection.<sup>10</sup> Therefore, it remains critical

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to minimize the risk of exposure and transmission of the virus to this vulnerable population.

Virtual care is a broad concept describing any interaction between patients and/or members of their circle of care that occurs remotely using any communication form or information technology.<sup>11</sup> The aims of virtual care are to facilitate and maximize the quality and effectiveness of patient care.<sup>11</sup> Although virtual healthcare delivery has been in discussion for decades as a means to improve healthcare access, adoption into day-to-day practice had been slow.<sup>11</sup> With the impact of COVID-19, legislation in several Canadian provinces rapidly changed to allow pharmacists to provide and bill for virtual clinical services such as medication reviews.<sup>12,13</sup> Flexible modes of service delivery enabled pharmacists to continue to provide valuable medication services to the healthcare system and represented large strides in the adoption of virtual pharmacy care. With no foreseeable end to following physical distancing guidelines and pandemic precautions, development of virtual care pharmacy models for professional services can bridge the gap to the digital age. Consequently, the need for remote patient care delivery by pharmacists (and other healthcare professionals) is likely to continue.<sup>14</sup>

The Odette Cancer Centre is an academic regional cancer centre at Sunnybrook hospital in Toronto, Ontario, Canada that provides intravenous anticancer therapy to approximately 100 adult outpatients per day. In the weeks following the declaration of the pandemic on March 11th, 2020, several policy changes at the institutional level were enforced at Sunnybrook. Due to the initial shortage of personal protective equipment and the risk of viral transmission, face to face contact was discouraged unless necessary to provide care.<sup>15,16</sup> Reduced availability of staff and students presented challenges to the maintenance of service delivery. Consistent with provincial guidelines, the hospital maintained strict visitor and accompaniment policies.<sup>15</sup> Although visitor restrictions are integral to reducing viral spread, the literature has reported anxiety and fear among patients with cancer about receiving their treatment during COVID-19,<sup>17</sup> which can be heightened with lack of caregiver support.

As a valuable component to the oncology care team, pharmacists at the Odette Cancer Centre provide medication management services for patients receiving systemic cancer treatment. These clinical pharmacy services (CPS) include collection of the best possible medication history (BPMH), baseline patient assessment, educating patients about symptom and toxicity management, resolving any drug therapy problems surrounding supportive care medications, and conducting routine follow up (Table 1). Prior to the pandemic, clinical pharmacy services were delivered

**Table 1.** Clinical pharmacy (professional) services provided by odette cancer centre pharmacists for intravenous regimens.

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- Best possible medication history
  - Baseline symptom assessment
  - Pharmacotherapy workup/drug interaction check/optimize supportive care medications<sup>a</sup>
  - Provide patient education about chemotherapy toxicity management
  - Counseling for supportive care medications
  - Proactive follow up/adverse effects assessment
- 

<sup>a</sup>Supportive care medications include growth factor support injections, antiemetic therapies, infection prophylaxis agents, infusion reaction prophylactic regimens.

predominantly using face to face interactions on the day of chemotherapy. Patients starting new intravenous anticancer therapy, or patients with changes to supportive medications, were seen by a pharmacist or pharmacy student while their chemotherapy was being prepared. Approximately 10–12 patients would receive these services each day.

The purpose of this paper is to describe, in a process map, the process changes that were made to the delivery of clinical pharmacy services to ambulatory cancer patients prescribed intravenous anticancer therapies at Odette Cancer Centre in March–April 2020. We will also highlight the challenges when implementing virtual pharmaceutical care, and discuss the successes that can be considered for future virtual pharmacy delivery models.

## Methods

In response to the challenge of meeting standards of care at the outset of the pandemic, the clinical coordinator for oncology pharmacy (MP) was assigned the lead in developing a virtual pharmacy care model (see Figure 1). The clinical lead constructed a list of necessary CPS to be maintained through the pandemic for patients treated with intravenous anticancer therapy. All clinical pharmacy services were considered essential, except a targeted approach was developed for proactive patient follow-ups. Historically, the pharmacists conducted first cycle follow up for all patients receiving moderately and highly emetogenic chemotherapy regimens (MEC and HEC), or who had anti-emetic regimen changes. During the initial pandemic restrictions, follow up was conducted for all antiemetic changes, HEC patients, and a subset of high-risk patients undergoing treatment with MEC. The definition of high risk was based on clinician or pharmacist judgement, and guided by the patient having a history of poor tolerability to chemotherapy, risk factors for nausea and vomiting, or being at risk of non-adherence. It was necessary to apportion the resources

and duties required to complete these tasks to available staff members, considering the change in working location or temporary redeployment.

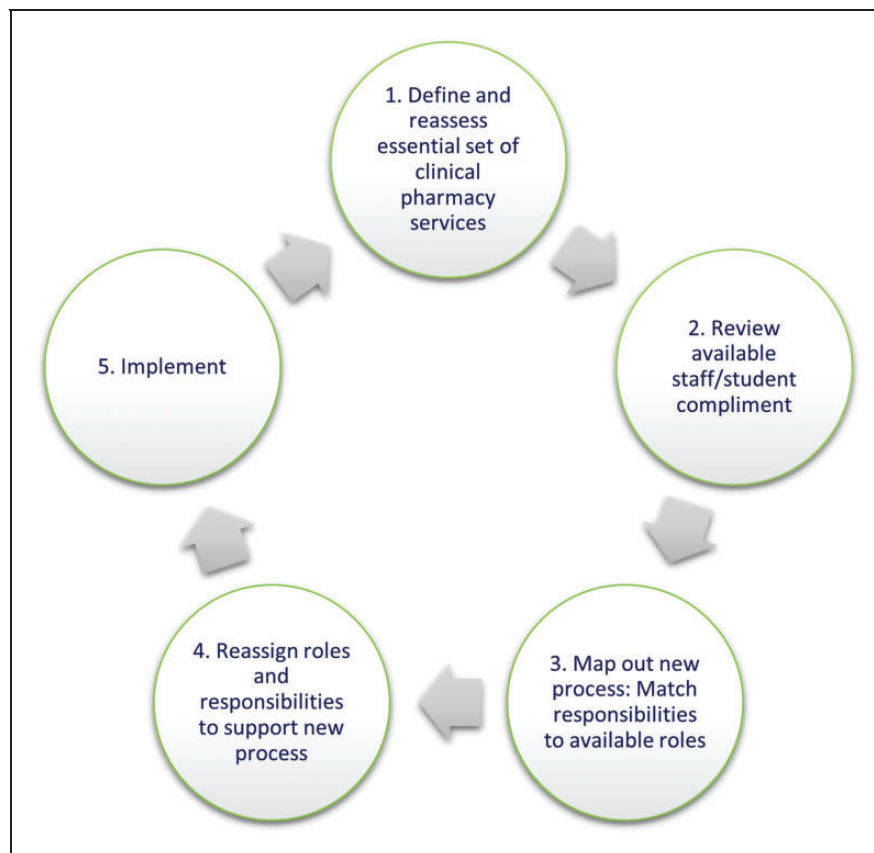
Microsoft Visio software was used to create a workflow diagram of CPS processes before and after implementation of COVID-19 pandemic restrictions. The new process was proposed at the clinical pharmacy meeting and subsequently accepted by management. The remote pharmacy clinical care model was implemented on March 25, 2020 two weeks after the pandemic was declared. Workload statistics were tracked from the time of implementation. The number of patients receiving remote pharmacist care was tracked over a 6 week period in an Excel spreadsheet until May 1st, 2020. This data collection period aligns with the peak of the pandemic for Ontario, Canada. Data for two key clinical pharmacy services were recorded: 1) the number of remote best possible medication histories and baseline assessments conducted, and 2) the number of patients receiving remote counseling for supportive medications. These data represent numbers for the intravenous anticancer therapy program only, and not for the outpatient pharmacy at Odette Cancer Centre or the oral chemotherapy program. The process

was iteratively refined in response to pharmacist feedback, with minor adjustments as required.

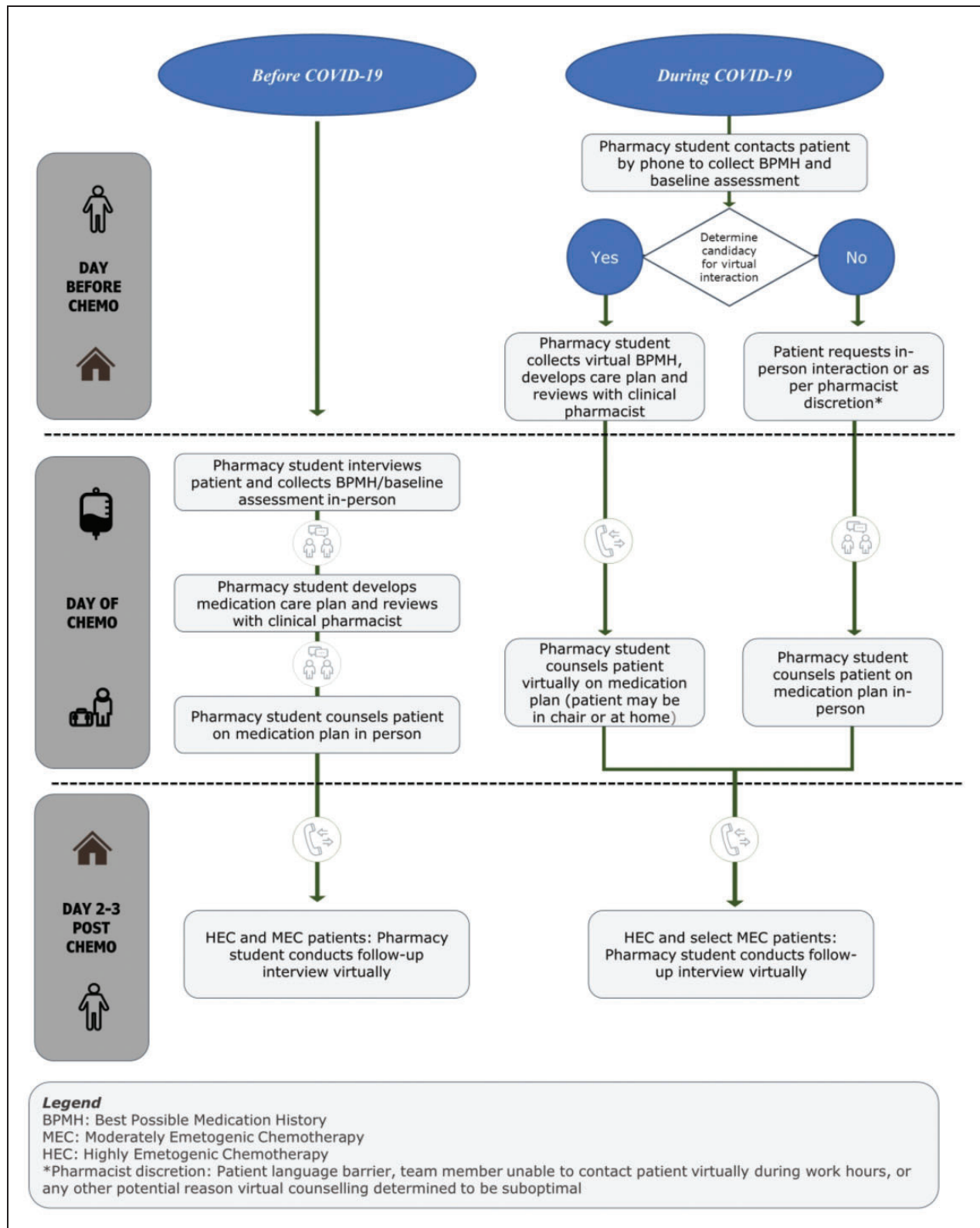
## Results

### *Clinical pharmacy services prior to COVID-19*

The process map outlining the delivery of clinical pharmacy services for intravenous anticancer therapy pre-COVID-19 is presented in Figure 2 (left panel). On the patient's treatment day, the pharmacy student collected a medication history, baseline symptom assessment, and resolved any drug therapy problems with the supervising pharmacists and oncology team. The patient and support person (if present) would be counseled on the take home medications while receiving their anticancer therapy infusion. The patient left the Centre with a specific medication calendar and monitoring plan for toxicity management. On day two to three of the chemotherapy cycle, the patient would receive a proactive follow up call from the pharmacist if required, to address any medication and toxicity related concerns. This follow up step was already performed remotely.



**Figure 1.** Steps in developing the process for virtual clinical pharmacy service model.



**Figure 2.** Process map for Odette Cancer Centre clinical pharmacy services, before COVID-19 (left panel) and during COVID-19 (right panel).

### *Clinical pharmacy services during COVID-19*

The process map for the revised workflow during the pandemic is provided in Figure 2 (right panel). In the revised process, patients were contacted the day before their chemotherapy appointment by telephone. The pharmacy student would gather the BPMH and baseline assessment, identify and resolve any drug therapy problems, and prepare the patient's care plan and supportive medication regimen calendar, all on the day before treatment. On the day of treatment, patients would receive phone counseling either on site via cell phone, or once the patient returned home from treatment, depending upon the time of their infusion. Proactive pharmacist follow up for the subset of identified patients continued in the same virtual manner via telephone.

### *Location of staff*

Clinical pharmacy services were completed by staff remotely, four (out of five) of whom were on site and one from a home workstation. Staff working from home were able to access all hospital healthcare applications remotely through the virtual server.

Prior to COVID workflow changes, all BPMHs for intravenous chemotherapy patients were collected via face-to-face encounters. However, once COVID restrictions were put in place, 73% (149/202) of BPMHs were completed remotely. The average success rate in reaching the patient for the first BPMH and initial assessment was 84% (Figure 3(a)). Overall, the success rate of completing a BPMH and baseline assessment over the phone was 74%, increasing from 67 to 79% over the study period.

Over the six-week data collection period, 36% (72/199) of all supportive medication regimen counseling interactions were performed remotely (Figure 3(b)). This increased over time, from 30% to 56%, as pharmacy staff became more proficient and comfortable with the process. The majority of these virtual encounters were conducted over the telephone; only two medication counsels during this study period utilized video conferencing technology (this represents 2.7% of all virtual counsels or 1% of total counsels). These data only represent numbers for intravenous anticancer therapy, and not for the outpatient pharmacy at Odette Cancer Centre or the oral chemotherapy program.

### **Discussion**

The intent of this study was to map out the CPS process changes during the COVID-19 pandemic that were designed to minimize in person encounters while providing the same level of medication-related education and support. The major change established in the

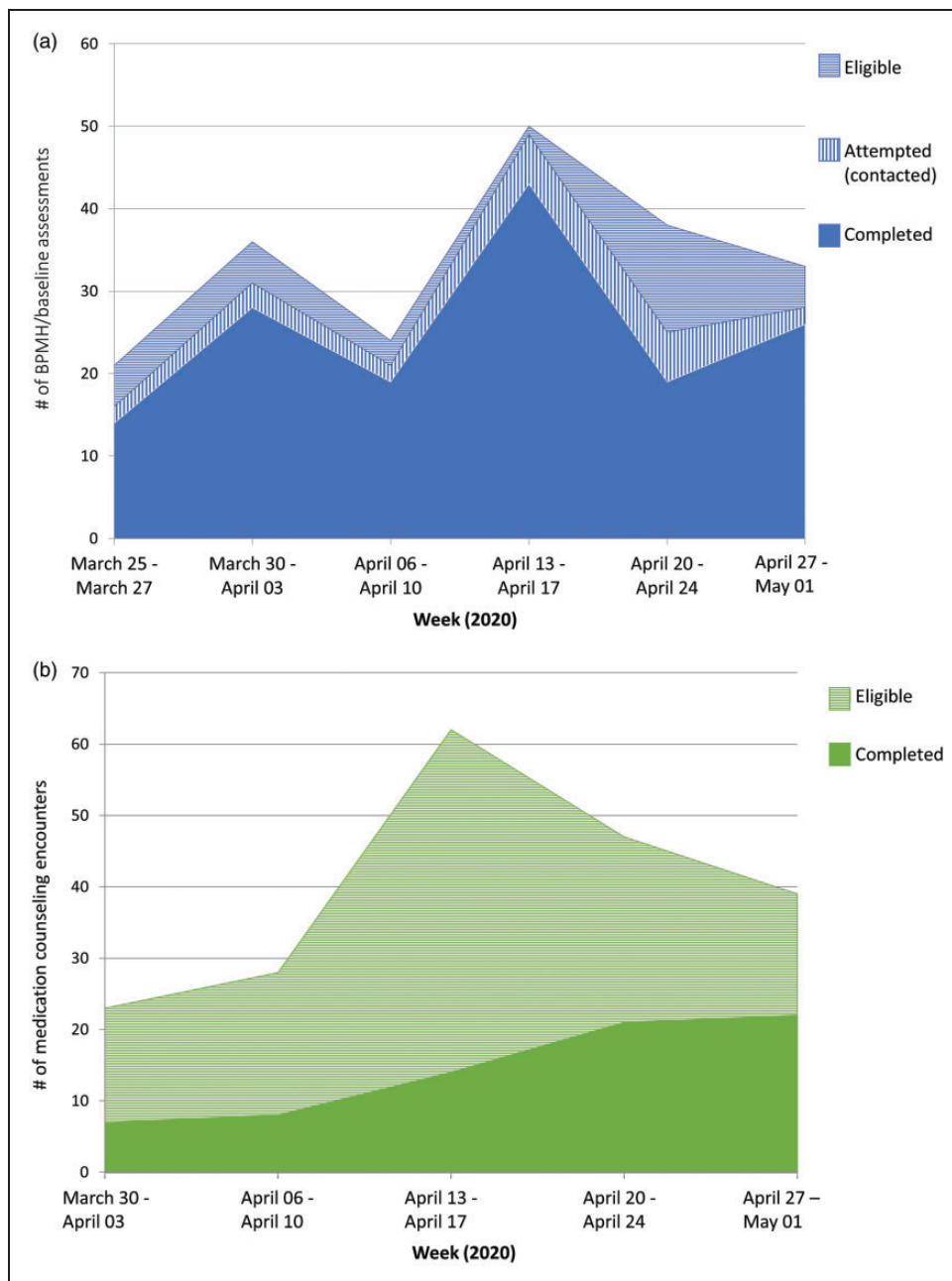
clinical pharmacist workflow was the shift of BPMH collection and patient assessment to the day before chemotherapy. Clinical pharmacy staff were able to reach a considerable proportion of our patients virtually, while maintaining usual clinical pharmacy service delivery. In the follow up program, we were able to continue proactive calls for all patients meeting the updated eligibility criteria. Elson et al. reported a successful experience in meeting healthcare system needs in an inpatient hospital setting, using a similar process to re-distribute clinical pharmacy services to be completed remotely.<sup>2</sup>

Our team had greater success in conducting the BPMH remotely compared to medication counseling. A few patients did not receive medication counselling virtually because of communication issues, lack of a cellphone, individual preference, or staff hours of the Centre (if waiting to counsel the patient when they returned home from treatment). The pharmacist who worked flex time hours from home was able to accommodate evening medication counsels where applicable. Active communication between remote and on-site clinical pharmacy staff was essential to coordinate the patient's care effectively.

### **Successes**

Completing the baseline pharmacy assessment the day before chemotherapy also resulted in other workflow efficiencies with respect to resolving drug therapy problems. Staff provided positive feedback about this change, which enabled sufficient time to complete the required order changes with the oncology care team. In the context of the pandemic, patients seemed receptive of the shift to phone interactions with the pharmacist. In particular, the process of counseling patients remotely once they returned home was well-received. Patients and their agents appreciated the presence of (support of) a caregiver when interacting with the pharmacist. Consistent with the literature,<sup>17</sup> many patients expressed feeling nervous about attending the upcoming chemotherapy appointment unaccompanied and in the midst of a pandemic. During these baseline assessments on the day before treatment, pharmacists were able to respond to patient concerns about their treatment and visit to the centre during COVID-19. For this reason, among the earlier efficiencies described, the pharmacy department at Odette Cancer Centre has continued this practice for intravenous anticancer therapy patients, even as pandemic restrictions have eased.

The role of clinical pharmacists is well-established at Odette Cancer Centre and integrated into the oncology team's workflow. In conducting clinical assessments, pharmacists screen for potential drug interactions, provide patient education for chemotherapy and



**Figure 3.** Panel A: Number of best possible medication history (BPMH) with baseline assessments conducted remotely each week by pharmacist or pharmacy student from March 25 to May 01, 2020. Panel B: Number of medication counseling encounters conducted remotely each week by pharmacist or pharmacy student from March 30 to May 01, 2020. Medication counseling encounters from March 25 to March 27 were not tracked.

supportive medications, improve adherence to therapy, and support the patient to manage toxicities.<sup>18,19</sup> Prior to the COVID-19 pandemic, communication between pharmacists and oncologists was already conducted virtually (predominantly by email). As oncologists shifted the majority of their practice to virtual clinic visits<sup>5-7,9</sup> pharmacists continued patient assessments and monitoring and were able to preserve the open collaborative channels with oncologists and other

members of the health care team. Standards of care were maintained and lapses in care were avoided.

### Challenges

Barriers to providing virtual care have been previously reported.<sup>11,20</sup> Privacy and security issues remain a prevailing concern, requiring express consent from the patient for conducting healthcare and relaying patient

information over remote systems.<sup>3</sup> Lack of technology and familiarity with operation of audio-video equipment and programs further hinders provision of clinical telepharmacy.<sup>20</sup>

The Ontario Telemedicine Network (OTN) and MedMe Health are secure platforms that can be used to provide virtual healthcare services, meeting the requirements set out by the Personal Health Information Protection Act (PHIPA).<sup>21</sup> In our study, one individual had limited experience with the OTN platform when conducting medication counsels with video (five patients, two during the above study period). Most of the patients were unfamiliar with the technology set-up, did not have the equipment required, or did not feel it was necessary to use video. Some unregulated videoconferencing platforms may be more readily available and familiar for patients, such as FaceTime, Zoom, or WhatsApp, yet their routine use is controversial.<sup>21</sup> At a minimum, it is recommended that applications should be encrypted, and explicit patient consent to use these platforms to provide healthcare should be obtained.<sup>21</sup> At Sunnybrook Odette Cancer Centre, use of a videoconferencing platform must also be endorsed by the institution's privacy policies and COVID procedures.

A challenge encountered at our Centre when providing virtual clinical pharmacy services was patient suitability for remote phone consultation. These key vulnerabilities of virtual healthcare communication have been acknowledged by Elbedenni and Yeats.<sup>3</sup> Without non-verbal cues to guide the interaction and demonstrate patient understanding, it is difficult to ascertain effectiveness of the counseling. Chemotherapy medications have the potential to cause serious toxicities and are often associated with complex supportive care medication regimens. It is critical that patients understand the risks and benefits of these therapies and be able to respond to treatment toxicities amenable to self-management.

### Study limitations

Here we recount our experience at a single cancer centre; therefore, suitable process changes will vary depending on the baseline clinical structure. In addition, this process map is only applicable to the clinical pharmacy program for intravenous anticancer therapy. Despite promising results in this short-term period, not all patients could be reached the day prior for collecting the BPMH. In addition, not all patients consented to have their assessments or medication counseling provided over the phone and requested to be seen in person. Pharmacy staff were able to accommodate patients requesting in-person consultation when they arose. However, this suggests the need for systematic

procedures for patient contact, such as generating appointments.

A metric of interest which was not recorded was the time required for remote versus in-person interactions. It would have been valuable to compare the time pharmacists spend completing remote interactions to those in-person to evaluate efficiency, in addition to collecting the perspective of patients to ensure that the virtual communication is meeting their needs.

### Further research

The next steps for this initiative are multifold. Many other cancer centre pharmacies pivoted to remote pharmacy professional service delivery during COVID-19, offering an opportunity for shared learning in the unique challenges faced and facilitators identified. As a result, we are conducting a survey and interview study of Canadian cancer centre pharmacists' experiences providing clinical pharmacy services during the COVID-19 pandemic. In response to the concerns raised over the efficacy of virtual medication counseling in constructing patient understanding, we aim to develop a strategy to identify patients who are most suitable to receive remote telepharmacy services in a safe and effective manner. Secondly, we plan to measure the satisfaction with remotely-delivered pharmacist services by cancer patients at our centre.

### Conclusion

The important pharmacist role in providing patient-centered chemotherapy counseling and expert medication support has been consistently demonstrated.<sup>19,22</sup> With increasing adoption of virtual healthcare for oncology patients (not requiring physical assessment), pharmacists have an opportunity to lead/develop transcendent strategies to encompass these modalities into their clinical workflow.

To our knowledge, this is the first study reporting the experience of providing oncology pharmacy services to cancer outpatients during the pandemic. We identified that a well-defined process, flexibility in staff roles and working environments and strong communication between pharmacy team members were key factors to success in the remote delivery of outpatient oncology pharmacy services. Further research is needed to define the best practices and implementation of virtual pharmacy care across healthcare systems, as well as the experience of patients in receiving remote pharmacist consults.

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