Nova Scotia Health COVID-19 Non-severe Therapy Consult Service: Lessons from a Hospital Pharmacy–Based Model

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INTRODUCTION

Antiviral therapeutics are key tools in the mitigation and control of SARS-CoV-2 infection in the COVID-19 pandemic. The antiviral nirmatrelvir/ritonavir can reduce hospital admissions and death when administered within the first 5 days of COVID-19 symptoms. In January 2022, when Health Canada authorized this medication for use in high-risk patients, health care systems were challenged to provide prompt, consistent, and measurable access to treatment for non-severe COVID-19.[1-4]

Nova Scotia has an aged and multimorbid population at risk of COVID-19 progression, hospital admission, and death. The Nova Scotia (NS) Health COVID-19 Non-severe Therapy Consult Service was established to screen, assess, and prescribe medications for non-severe COVID-19 using centralized virtual care in a hub-and-spoke model. More specifically, the consult service uses a collaborative model involving expert physicians and hospital pharmacists employed by the provincial health authority, NS Health. In Nova Scotia, the federally procured pandemic supply of nirmatrelvir/ritonavir, remdesivir, and anti-SARS-CoV-2 monoclonal antibodies is available only through designated physician and pharmacist prescribers. The model of care described here promotes medication use in accordance with the Nova Scotia COVID-19 therapeutic recommendations[5] and ensures sustainable and equitable distribution of medications.

DESCRIPTION OF THE CONSULT SERVICE

The NS Health COVID-19 Non-severe Therapy Consult Service was implemented on March 1, 2022. Self-referral by members of the public through an online "report and support" form is encouraged as the primary means of referral; alternatively, health care professionals can make referrals by telephone, email, or fax.

Report and Support

As noted above, self-referrals by members of the public to request medication for non-severe COVID-19 occur through the "report and support" web-based tool. Patients with a positive result on a COVID-19 rapid antigen test and those who have booked a COVID-19 polymerase chain reaction (PCR) test are encouraged to complete the online "report and support" form or call a toll-free number to receive assistance completing the form. This form allows prompt identification of high-risk individuals, who are most likely to benefit from therapeutics for non-severe COVID-19. The form collects demographic information, symptom details, and self-identified risk factors for progression to severe COVID-19, including immunosuppressive medications and conditions, pregnancy, chronic kidney disease, diabetes, heart disease, and chronic lung diseases.

Referral Criteria

Nova Scotia's Emerging and Re-emerging Infections Therapeutics and Prophylactics Recommendation Group comprises ethics experts, epidemiologists, research staff, leaders, and physicians (including L.B.) and pharmacists (including T.D.R.) with clinical expertise in areas such as infectious diseases, medical microbiology, pediatrics, and geriatrics. This group develops and maintains evidence-informed referral criteria to assess individuals for suitability to receive medications for non-severe COVID-19. These referral criteria (including symptoms of non-severe COVID-19, symptom onset less than 7 days prior, positive result on PCR or rapid antigen test, vaccination history, and risk factors for disease progression) guide assessment by a hospital pharmacist working within the consult service.

Prioritization Intelligence

Amalgamation of data from multiple sources was leveraged to facilitate efficient initial prioritization and screening for

COVID-19 therapeutic assessment. Embedded prioritization intelligence and data analytics are used to enhance efficiency, monitor capacity, and optimize patient throughput. Data from the "report and support" form, Nova Scotia's CANImmunize vaccine database, and the provincial laboratory system for positive PCR results are automatically imported into a secure SharePoint (Microsoft) site. The SharePoint site has embedded priority logic that sorts patients according to age, reported risk factors, and immunization status. Prioritization criteria are iteratively revised as local evidence-based COVID-19 treatment and vaccination guidelines are updated. Individuals with positive PCR results who did not complete a "report and support" form are also populated automatically into the system, and referrals from health care providers are entered manually by a pharmacist.

Hospital pharmacists on the COVID-19 Non-severe Therapy Consult Service complete patient assessments sequentially according to prioritization criteria, to ensure that patients at highest risk for progression to severe disease are assessed promptly. Self-reported information in the "report and support" form is confirmed by consult team pharmacists through review of electronic health records, laboratory results, and the provincial drug information system. The patient (or substitute decision-maker) is contacted by telephone or using the Zoom for Healthcare videoconferencing platform to collect additional key health information. For patients admitted to hospital at the time of assessment, consult pharmacists review the hospital medication profiles, laboratory results, and health records as appropriate, and the patient's nurse, most responsible physician, or both are contacted for collateral history and clinical impression.

The COVID-19 Non-severe Therapy Consult Service operates 7 days a week, from 0900 to 1700. The team consists of 9 full-time equivalent pharmacists and is supported by a 0.5 full-time equivalent on-call physician (including L.B.). The physician provides support to pharmacists for clinically complex non-severe cases of COVID-19 while also supporting additional hospital pharmacy–based teams who are caring for individuals with moderate or severe COVID-19 and those at risk of or already having persistent COVID-19. An experienced designated pharmacist prescriber trains new pharmacists to use the prescribing protocols, drug interaction tools, the SharePoint site, and electronic health records. After shadowing an experienced team member, the pharmacist trainee is assigned to complete and present a case to the clinical lead (T.D.R.) and clinical manager to ensure that sound clinical rationale and appropriate resources are in use before the pharmacist is granted prescribing authority and added to the designated prescriber list to allow access to the federally procured pandemic supply of COVID-19 medication.

The COVID-19 Non-severe Therapy Consult Service has implemented robust data capture to provide measurable care. At each assessment stage, data collected by the assessing pharmacist are entered into the SharePoint database. This enables the team to demonstrate in real time the extent of assessment coverage for high-risk individuals in rural and urban areas so that corrective strategies can be implemented if gaps are identified.

Task Shifting

Before March 1, 2022, infectious diseases physician prescribers were the sole prescribers of nirmatrelvir/ritonavir, remdesivir, and anti-SARS-CoV-2 monoclonal antibodies. Protocols for prescribing of nirmatrelvir/ritonavir and remdesivir by pharmacists were implemented on March 4, 2022, and January 18, 2023, respectively, to shift prescribing tasks from designated physician prescribers to designated pharmacist prescribers. Hospital pharmacists were enabled to prescribe, as appropriate, adjustments to eligible patients' regular medications in cases of clinically significant drug–drug interactions involving nirmatrelvir/ritonavir. As of May 1, 2022, all pharmacists in Nova Scotia were given protocol-based prescribing authority for inhaled budesonide for the treatment of mild COVID-19 respiratory symptoms.

Each patient referred to the consult service undergoes screening, an initial assessment to confirm referral criteria, and then a full assessment if referral criteria are met. Complete patient assessments require approximately 30–60 minutes, depending on case complexity.

Following assessment and prescribing, pharmacists provide patients with counselling to review the prescribed medication(s), changes made to regular medication(s), and monitoring for treatment efficacy and safety. During this discussion, the pharmacists coordinate access to outpatient pulse oximeters for high-risk patients, outpatient infusions of remdesivir, and prescription dispensing at a local community pharmacy; they also educate patients about how and when to access care should COVID-19 symptoms worsen. Individuals admitted to a hospital or long-term care facility receive counselling as described above and, where appropriate, a pharmacist from the COVID-19 Non-severe Therapy Consult Service shares the counselling parameters with the patient's health care provider (e.g., nurse or physician) and substitute decision-maker and coordinates medication procurement and administration in the institution. When the assessment is complete, a consult note is generated, which becomes part of the patient's permanent electronic health record. Pharmacist follow-up is assigned on a case-by-case basis.

PROGRAM EVALUATION

From March 1, 2022, to November 30, 2023, a total of 105 117 patients were screened, 17 385 patients were fully assessed during consultations lasting 30–60 minutes, 8177 patients received prescriptions for therapy for non-severe COVID-19, and a total of 11 862 medications were prescribed (Figure 1);

the total number of individual prescriptions was slightly smaller, at 10 322, because some prescriptions contained orders for more than 1 medication. Of the 14 732 patients assessed between July 27, 2022, when enhanced data integration and collection began, and November 30, 2023, 71.7% (n = 10 570) were ambulatory outpatients, 17.4% (n = 2570) were hospital inpatients, and 10.8% (n = 1592) were residents of long-term care or group homes. Overall, of the 10 322 prescriptions for therapy for non-severe COVID-19, 91.0% (n = 9392) were issued by designated pharmacist prescribers and 9.0% (n = 930) by designated physician prescribers. Before implementation of the pharmacist prescribing protocol for remdesivir for non-severe COVID-19 (i.e., March 1, 2022, to January 17, 2023), 82.2% of prescriptions for non-severe COVID-19 were issued by designated pharmacist prescribers and 17.8% by designated physician prescribers (Figure 2). Following implementation of the pharmacist prescribing protocol for remdesivir for non-severe COVID-19, on January 18, 2023, pharmacists were responsible for 97.5% of all prescriptions for non-severe COVID-19 therapeutics (Figure 2).

The virtual hub-and-spoke model of care described here promotes access by self-referral to screening for medication to treat non-severe COVID-19 across Nova Scotia in both urban and rural settings, achieving a referral distribution of 49% for the Central Zone, 21% for the Western Zone, 17% for the Eastern Zone, and 13% for the Northern Zone since enhanced data collection began July 27, 2022. Prioritization intelligence and automation have enabled the identification of individuals at highest risk of disease progression

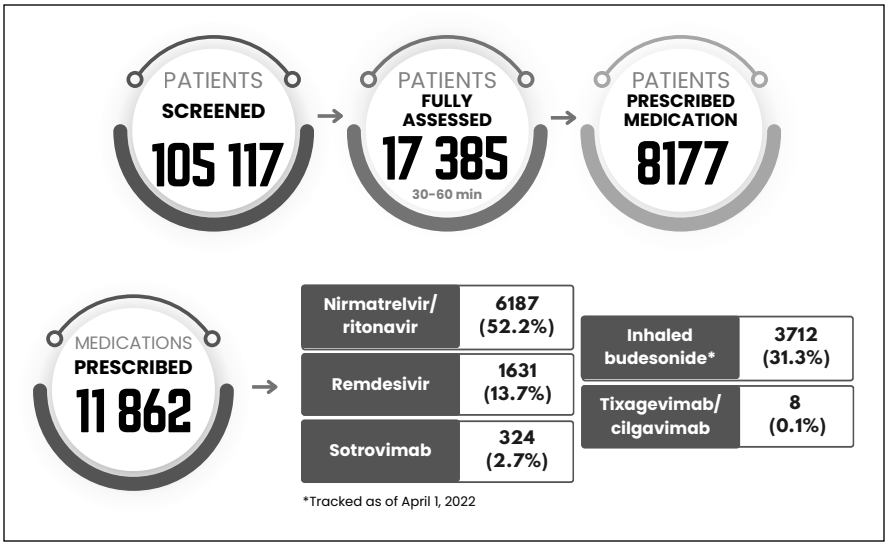

FIGURE 1. Nova Scotia Health COVID-19 Non-severe Therapy Consult Service metrics and medications prescribed (March 1, 2022, to November 30, 2023).

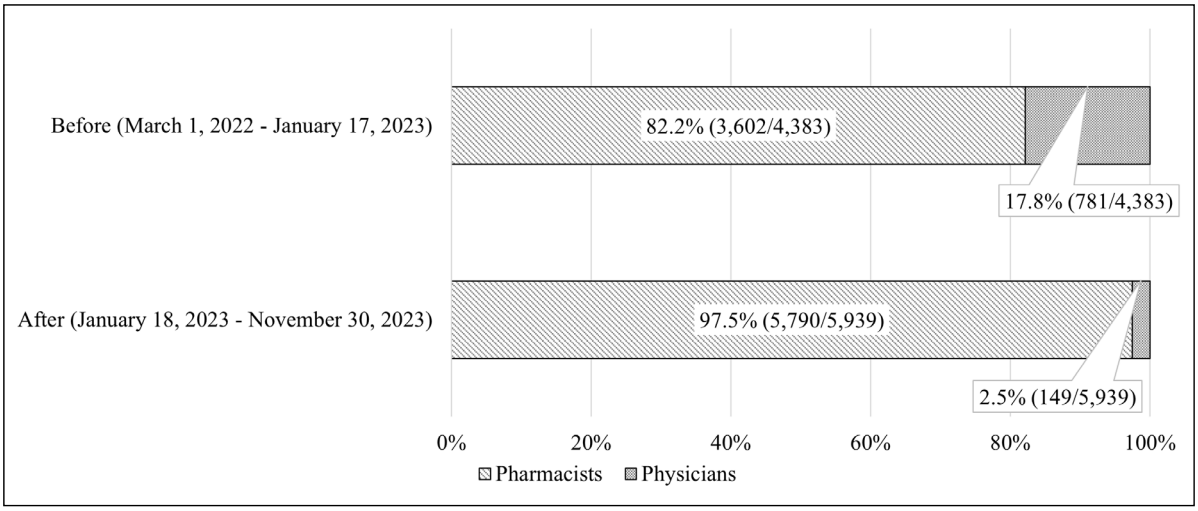

FIGURE 2. Prescriptions issued (for nirmatrelvir/ritonavir, remdesivir, and budesonide), by prescriber type, before and after implementation of pharmacist prescribing protocols for all first-line therapeutics.

by sorting input data for those over 65 years of age, those not sufficiently vaccinated, and those who are immunocompromised. Individuals in the highest-risk category were screened and assessed for therapeutics by the COVID-19 Non-severe Therapy Consult Service a median of 1 day after a positive result on COVID-19 testing and a median of 3 days after onset of COVID-19 symptoms. Workload statistics were used to monitor capacity and gauge the human resource requirements of the team.

Before implementing the COVID-19 Non-severe Therapy Consult Service, a team of pharmacists and physicians manually completed data amalgamation, patient screening, assessment, and documentation. From December 1, 2021, to February 28, 2022, the 4-member team of pharmacists and infectious diseases physicians screened and assessed an average of 129 patients per month and wrote 43 prescriptions per month for therapeutics to treat non-severe COVID-19. The inception of the COVID-19 Non-severe Therapy Consult Service and the shift to automated screening and assessment on March 1, 2022, increased the monthly averages to 5006 patients screened (3781% increase), 828 patients assessed (542% increase), and 565 prescriptions issued (1214% increase) as of November 30, 2023. This technology also impelled adherence to protocols and increased the transparency and quality of clinical documentation.

IMPLICATIONS AND SIGNIFICANCE FOR PRACTICE

A self-referral–based, collaborative hub-and-spoke pharmacist prescriber model in Nova Scotia effectively provides access to therapeutics for non-severe disease in an evidence-based, timely manner that promotes rural–urban equity, provides transparency concerning use of the federal drug supply, and demonstrates the value of leveraging automation and the advantages of incorporating technological intelligence as a novel strategy to support front-line patient care. This model has potential for future use in screening, assessment, and prescribing for other respiratory viruses or infectious diseases.

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Competing interests: For activities unrelated to the work reported here, Tasha Ramsey has received speaker's honoraria from the Canadian Society of Hospital Pharmacists (CSHP) and has served in a volunteer capacity on the CSHP Education Committee and the Nova Scotia Emerging and Re-emerging Infections Therapeutics and Prophylactics Recommendation Group; Mackenzie d'Entremont-Harris received travel support from the Nova Scotia Health Pharmacy Department Education Fund and the Queen Elizabeth II Division of Vascular Surgery and has served in a volunteer capacity on the Awards Committee of the Nova Scotia Branch, CSHP; Lisa Nodwell has served in a volunteer capacity as the Nova Scotia Branch Advocacy Representative to CSHP Council; and Lisa Barrett has received grants, consulting fees, and speaker's honoraria from Abbvie and Gilead and has served in a volunteer capacity on the Nova Scotia Emerging and Re-emerging Infections Therapeutics and Prophylactics Recommendation Group. No other competing interests were declared.

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