

# Polypharmacy in the age of COVID-19: medication management during a pandemic

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## Abstract

Polypharmacy has been implicated in adverse drug events, excessive healthcare spending, and complications in the management of COVID-19. Multimorbid older adults suffer some of the most severe COVID-19 health outcomes and are at the highest risk of polypharmacy. This article aims to highlight the issue of polypharmacy in the context of the current pandemic and suggests several interventions to minimize the disruption of effective care for at-risk populations. Such interventions include coordinating care delivery, changing physician prescribing attitudes, and improving patient health literacy. Polypharmacy is a major contributor to the risk of adverse drug events before, during, and after COVID-19 treatment. Managing polypharmacy is therefore critical to the provision of patient care during the pandemic.

and associated polypharmacy.<sup>11</sup> High risk prescribing may also increase risk of infection and adverse events. For example, chronic administration of NSAIDs may be linked to increased expression of ACE2, a potential entry point for SARS-CoV-2 into cells.<sup>12</sup> Prolonged corticosteroids may also increase the risk of viral replication and adverse events.<sup>13</sup> This article argues that coordinating care delivery, changing physician prescribing attitudes, and improving health literacy are useful interventions to minimize the impact of polypharmacy on patients during the COVID-19 pandemic.

## Factors contributing to polypharmacy

The causes of polypharmacy can be divided into two categories: patient-related and systems-related. Patient-related factors include attitudes regarding prescribing patterns, as well as knowledge deficits regarding alternative treatment plans and deprescribing options.<sup>2,14,15</sup> Systems-related factors include uncoordinated healthcare delivery and practitioner attitudes.<sup>16-18</sup> For physicians, interventions to mitigate polypharmacy may include: 1) coordinating care delivery through electronic health tools for medication reviews, 2) modifying prescribing attitudes by limiting medications to those recommended by clinical practice guidelines and deprescribing unnecessary medications, and 3) improving patient health literacy.<sup>11,19,20</sup> These interventions can directly improve patient outcomes by safely reducing potentially inappropriate medications (PIMs), which may result in a reduction in all-cause mortality (OR=0.74, 95% CI=0.65-0.84) and falls (OR=0.76, 95% CI=0.62-0.93).<sup>21</sup>

## Coordinating care delivery

Uncoordinated care delivery among older patients suffering from multiple chronic diseases contributes to polypharmacy. Coordinated care may be severely lacking for patients bouncing between specialists, hospitals, and family physicians, often resulting in compounding prescriptions.<sup>16</sup> Family physicians have expressed frustrations with extensive medical histories of patients alongside the many changes made during hospital or specialist visits, feeling pressured to continue prescribing according to prior plans made by specialists, and existing guidelines.<sup>14</sup> Since COVID-19 is a multisystem disease largely afflicting older adults with multiple chronic diseases, such patients require personalized comprehensive assessments to optimize medication management.<sup>22</sup> Gaps in care coordination can contribute to polypharmacy during the pandemic and therefore increase the risk of ADEs in this at-risk population.

## Introduction

In 2016, roughly one-third of elderly Canadians were prescribed five or more different classes of medications.<sup>1</sup> These medications were frequently prescribed in physician offices and hospitals, often to manage the effects of other medication side effects in dangerous prescription cascades.<sup>2</sup> This issue has been widely identified as polypharmacy – defined as the presence of five or more medications daily.<sup>3</sup> Polypharmacy has increased worldwide and has been implicated in adverse drug events (ADEs) contributing to nearly 10% of hospitalizations among the elderly.<sup>4-6</sup> Polypharmacy has also been associated with an increased risk of falls, heart failure, hospitalization, malnutrition, impaired cognition, and, most notably, COVID-19.<sup>6-10</sup>

Polypharmacy is common in older adults, where multimorbidity increases the risk of severe COVID-19 outcomes, including mortality.<sup>3</sup> COVID-19 infections in older adults also present atypically due to several factors including age, comorbidities,

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While coordinated care delivery has been highlighted as an effective means of managing polypharmacy, it requires a coordinated effort across prescribers, nurses, and pharmacists.<sup>23</sup> One such effort was the 'Care by Design' (CBD) model in a long-term care setting, which showed a decrease in residents with polypharmacy from 86.8% pre-CBD to 79.5% post-CBD ( $p=0.046$ ).<sup>24</sup> The mean number of medications per resident also decreased from 16.7 (SD 5.6) to 15.5 (SD 6.2) ( $p=0.037$ ), but not overall use of potentially inappropriate medications (PIMs) (86.2% versus 81.1%,  $p=0.16$ ).<sup>24</sup> Therefore, coordinating care delivery during the pandemic could provide patients with continued access to medication reviews between providers, thereby reducing the risk of polypharmacy.

### Physician prescribing attitudes

Physician prescribing attitudes also contribute to persistent polypharmacy.<sup>25</sup> For example, some physicians may believe that patients expect them to prescribe medications in response to medical complaints and that their patients have no qualms regarding polypharmacy.<sup>2,14</sup> In 2002, almost two-thirds of physician visits ended with a prescription.<sup>26</sup> Rigid adherence to guidelines also leads to an increase in the number of prescriptions for each medical issue, further contributing to polypharmacy.<sup>2,14,17</sup> In some cases, physicians may find it easier to provide prescriptions to frail elderly patients rather than engaging in collaborative decision-making.<sup>17</sup> A recent study found that physicians who ranked the number of medications ( $p=0.007$ ), risk/benefit information ( $p=0.017$ ), and the utilization of medication optimization tools ( $p=0.05$ ) as more important prescribed fewer medications.<sup>27</sup> Less than half of Canadian seniors reported having the potential side effects of medications explained to them by practitioners.<sup>18</sup>

Despite 50% of older Canadians stating they would like to reduce the number of medications they are taking, over 80% would agree to take on more medications if their practitioner deemed it necessary.<sup>28</sup> If, however, physicians sought to deprescribe and simplify medication regimens, they could reduce the risk of medication-related harms during COVID-19 symptom management.<sup>20</sup> A systematic review supports this view, where seven of nine deprescribing studies reported statistically significant reductions in PIMs in the group that sought deprescription.<sup>29</sup> Medication regimens could be simplified by emphasizing patient goals through narrative-based techniques and utilizing shared decision-making models to help patients feel more at ease and willing to disclose information.<sup>26,30-34</sup> The result would ensure that prescriptions match patient goals for care, ultimately reducing the number of PIMs.

### Health literacy

The COVID-19 pandemic has highlighted the necessity of health literacy for the effective detection, diagnosis, prevention, and management of communicable diseases.<sup>35,36</sup> This extends to patient knowledge of deprescribing options, identification of potential opportunities for deprescribing, and patient engagement, all contributing to effective approaches to medication management and COVID-19 treatment.<sup>15</sup> Many patients may not know the names of prescribed medications or even their role in treatment, instead only remembering them by colours and dose.<sup>37</sup> Others may believe they have no choice but to continue with medications because stopping them may mean immediate death.<sup>2</sup> Patient knowledge

deficits are also influenced by attempts from pharmaceutical companies to encourage patients to seek novel treatments for medicalized issues that may be unnecessary or inappropriate.<sup>2,38</sup> This knowledge deficit increases the risk of PIMs, furthering the risk of ADEs. For example, a recent study found that of over 700 older patients suffering from polypharmacy, only 15% were able to recall indications for each of their medications.<sup>39</sup>

Furthermore, in a questionnaire assessing the impact of consumer-targeted deprescribing initiatives of 352 participants, 78.5% (95% CI 74.2-82.8) had no change or gained trust in choice of medical care, 75.4% (95% CI = 70.7-79.8) appreciated transparency in communication, and 81.9% (95% CI = 77.9-86.0) noted increased trust in their provider.<sup>40</sup> Interestingly, among older patients with lower health literacy, PIMs (OR=1.89, 95% CI=1.15-2.79) and polypharmacy (OR=1.20, 95% CI=1.03-2.15) were more likely.<sup>41</sup> A recent study also found that medication reviews could lead to a mean reduction of 2.36 medicines (SD 1.53) through the deprescribing process, ensuring that currently prescribed medications do not have ADEs and are required for treatment.<sup>42,43</sup> Patient education regarding medication reviews can therefore help simplify medication management during the pandemic, which this paper has already highlighted as beneficial to both patient and practitioner. Encouraging deprescribing education for patients will therefore change patient attitudes towards medication management.<sup>44</sup>

### Conclusion

Effective medication management and the importance of deprescribing have been highlighted by the effects of polypharmacy on at-risk patients during the COVID-19 pandemic. If physicians are responsible for starting medications, then it seems reasonable that they manage their rational deprescribing.<sup>45</sup> While long-term changes to address polypharmacy beyond the pandemic will involve engagement with policymakers and drug regulators, clinicians are poised to address the immediate challenges of the situation. This paper has highlighted several possible interventions to reduce potential ADEs in at-risk populations during and after the pandemic. These include coordinating care delivery, modifying physician prescribing attitudes, and improving patient health literacy. Polypharmacy is a major contributor to risks associated with potential ADEs before, during, and after COVID-19 treatment. It is therefore recommended that practitioners consider these issues to ensure effective care during the pandemic.

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