

Optimizing Medication Management During the COVID-19 Pandemic: An Implementation Guide for Post-Acute and Long-Term Care

Post-acute and long-term care (PA-LTC) facilities provide care to frail and vulnerable older adults. Resources, staffing, and training support are limited, and turnover is high during average times. The coronavirus disease 2019 (COVID-19) pandemic has illustrated how fragile and underresourced this setting of care is globally. The Centers for Disease Control and Prevention (CDC) National Center for Health Statistics estimated, from February 1, 2020, to April 25, 2020, a total of 6,723 of 37,308 COVID-19 deaths (18%) occurred in nursing homes and long-term care facilities,¹ and in several states, such facilities account for more than half of all COVID-19 deaths.² Unfortunately, the CDC's number is an underestimation due to variability in nursing home testing capabilities and reporting until action was taken on April 19, 2020.³ It seems every day that there is a new case of an outbreak in a PA-LTC site and continued confusion as well as concerns on how best to manage this extraordinary challenge. In this commentary, we describe the rationale and content highlights of an implementation guide to improve medication management in PA-LTC settings during the COVID-19 pandemic.⁴

WHY WAS THIS GUIDE CREATED?

As PA-LTC facilities have struggled to cope with the current and projected surge of residents with COVID-19 and the staffing challenges of maintaining a healthy workforce, a key issue that has emerged is medication management and administration. In the best of times, distributing medications to PA-LTC residents is a complex and highly time-consuming process. Numerous medications are commonly ordered multiple times per day at specific times. Additionally, they may need to be administered via enteral tubes, or to residents whose cognitive or swallowing impairments create additional challenges. For this reason, preparing and “passing” (administering) medications often consumes a tremendous proportion of nursing and other staff time, can be perceived as problematic and inefficient, and is a common source of error.^{5,6} In addition, many medication orders have hold parameters or criteria for additional doses, which further increase the burden on nursing staff.

During the current pandemic, these challenges may be stretched to the breaking point. Inconsistent and insufficient staffing can slow down an already laborious process, as shown in a time-and-motion study that found that nursing staff who are not familiar with the residents and facility took 32% longer to complete a medications pass.⁷ Donning and doffing personal protective equipment and other infection control measures further add time, complexity, and potential for error. Frequent, close contacts between nursing staff and residents during medication passes may increase risk of disease transmission in either direction. Finally, all of this further strains staff and decreases the time they have to perform other essential activities for residents.

To address this challenge, a multidisciplinary team took action to provide practical guidance on strategies to improve medication management and support the efforts of frontline staff within these care settings. The goal of this guide is to improve resident-centered health and well-being by reducing use of unnecessary medications and the potential for related adverse events, simplifying medication management, and reducing opportunities for transmission of COVID-19 between residents and staff. Streamlining medication administration may also increase the time that staff have available for other direct care activities.⁸ There is precedent for this type of effort from a recently published trial—the Simplification of Medication Prescribed in Long-Term Care Residents—which, using fairly simple changes to medication orders, led to a sustained reduction in number of medication administration times.⁹

RECOMMENDATIONS

The guide offers a series of recommendations (Table 1). Some recommendations focus on reducing use of medications that are often unnecessary or inappropriate. This includes certain vitamins and herbal medications that are commonly used but rarely have a compelling indication, as well as medications inappropriate for a person's circumstances, such as long-term preventive medications for a person with limited life expectancy. Because of the imperative to reduce resident-staff contact in high-risk situations of potential infection transmission, it may also be advisable to temporarily discontinue medications, such as bisphosphonates and vitamin B₁₂.

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Table 1. Recommendations to Reduce Medication Burden

Type of recommendation	Examples or comment
Medications that may be discontinued (temporarily or permanently)	Vitamins, herbal medications, appetite stimulants, bisphosphonates (temporarily), and long-term preventive medications (e.g., statins and aspirin) in people with comfort-oriented goals or limited life expectancy
Medications that can be changed to require less frequent dosing	Metoprolol tartrate → metoprolol succinate; consolidate laxatives to be administered at a single time; discontinue short-acting insulins
Medications whose monitoring can be changed	Consider reducing the frequency of monitoring of pulse, blood pressure, and fingerstick glucose in residents who are stable; if a medication requires frequent checks but may not be needed (e.g., short-acting insulins), consider discontinuation
Administer medications at different times to reduce number of medication passes	Administer statins and alpha-blockers with other medications during day (not a separate pass at bedtime)
Medications that require crushing	Change to liquid formulations if possible to ease burden of administration
Align medication administration times	Eliminate outlier medication administration times if not necessary; change “every 12 hours” medications to “twice daily” unless medication requires precise dosing interval
Convert nebulizers to handheld inhalers where possible	To avoid aerosolization of SARS-CoV-2. Many people with cognitive impairment can successfully use metered-dose inhalers with a spacer or breath-actuated devices.
Consider replace standing dose acetaminophen with as-needed dosing to aid in fever surveillance	Special caution with this recommendation to avoid worsening of pain control, especially for residents unable to communicate or advocate for their own needs.
Enhance hygiene during medication passes	Observe resident hand hygiene before handing medications; if appropriate, place medications on bedside table rather than handing directly to resident

Note: Incomplete list. For the full list, please view the guide.⁵

Abbreviation: SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

These medications often have appropriate therapeutic uses but may be able to be held for a period of weeks to a few months without compromising goals of care.

Frequent monitoring related to medications is often unnecessary, burdensome to residents and staff, and associated with more harm than good. For instance, use of short-acting insulins in vulnerable older adults with diabetes mellitus, type II, is a paradigmatic example.¹⁰ The guide thus suggests reevaluating whether short-acting insulins can be eliminated in favor of using only long-acting insulins or oral medications. Even among diabetic residents who are not on insulin, monitoring can be tapered to a minimum number of checks, depending on the stability of glucose levels.

Major gains may also be achieved by reducing the number of medication passes required per resident. This can involve converting medications and medication regimens to alternatives that require less frequent dosing and consolidating and aligning the administration of medications to a limited number of times. For instance, twice-daily metoprolol tartrate can often be safely converted to once-daily metoprolol succinate. Long-half-life statins, such as atorvastatin, have similar effects on lipids regardless of time of dosing, and thus can be safely administered during the day with other medications rather than making a separate visit to dose at bedtime.¹¹

Finally, certain infection control issues merit close attention. To reduce potential aerosolization of virus, conversion from nebulizers to handheld inhalers should be considered where possible, especially if the latter can be deployed in easier-to-use forms (e.g., metered-dose inhalers with a spacer).¹² Reducing opportunities for contact-based transmission of virus by observing hand hygiene for residents before passing medications and avoiding direct hand-to-hand contact where feasible may reduce risks of disease transmission.¹³

These recommendations are offered as options to consider. They need to be adapted to local circumstances and implemented as an interdisciplinary team. Most important, they should be individualized to meet the care needs of each resident and are not intended to supersede clinical judgment or common sense.

IMPLEMENTATION AND AVOIDING UNINTENDED CONSEQUENCES

It may be difficult, and in some cases inadvisable, to implement all the recommendations in this guide at once. We recommend considering a staged approach to optimizing medication management during this pandemic. Recommendations should be reviewed with the interdisciplinary team, and leadership support should be engaged. The first items that should typically be considered for implementation are those that are essential for infection control. Next come changes that are generally low risk, can be quickly evaluated for individual appropriateness, and can be done immediately. This can include discontinuation of medications that are rarely essential, such as certain vitamins, and conversion to longer-acting medications when such conversions are routine and safe. Last but not least are changes that are generally low risk but may take more time for implementation, individual evaluation, communication with care team and resident, and monitoring. This can include change, such as discontinuing short-acting insulins. These may ultimately be the most impactful changes but should not be rushed so as to avoid potentially harmful mistakes or miscommunication.

It is imperative to be attentive to potential unintended consequences of these changes and to take proactive steps to prevent and mitigate their impacts. Some of these consequences and strategies to address them are shown in Table 2.

Table 2. Potential Unintended Consequences and Strategies to Address Them

Potential unintended consequences	Mitigation strategies
Long-term failure to restart useful medications that were temporarily discontinued and for which long-term use remains indicated.	Keep a list of all medications that are discontinued and involve the consulting pharmacist in this process. Schedule a meeting time with pharmacist, medical director, and director of nursing in 8 weeks to reevaluate all medications on the discontinued list.
Return of symptoms and/or other markers of disease activity, which may result in worsening health and additional care needs.	For each discontinued medication, make note of potential symptoms to monitor. Assess for those symptoms, and document with COVID-19 symptom assessments.
Resident and care partner perceptions of abandonment and reduced quality of care. Social isolation and fewer opportunities for evaluation as a result of less contact with staff.	Assure them of steps being taken to monitor and encourage them to express concerns or report any changes in symptom control. In care planning meetings, assess and address impacts of changes in medication-related interactions with nursing staff (e.g., impacts on hydration and loneliness). Note that additional assessments to monitor for early symptoms of COVID-19 infection may balance out the decrease in time spent in distributing medications.
Increased costs if less expensive medications are replaced with more expensive medications.	Work with dispensing pharmacy to identify formulary/cost issues.
Potential legal or survey consequences if adverse outcomes are attributed to medication management changes.	Document rationale for making medication changes and the monitoring that is being done to keep residents safe.

Abbreviation: COVID-19, coronavirus disease 2019.

Throughout this process, attention to communication among all members of the healthcare team is essential, including prescribing clinicians and frontline staff who have a ringside view of challenges and can provide critical insights about workflow. Communication with residents and their family, friends, or other care partners is also essential. Medication discontinuation and other changes can engender fear of the unknown, perceptions of abandonment, and cognitive dissonance (“my previous doctor told me it was essential to take this medicine and now you are saying I should stop/change it?”).^{14,15} Addressing such concerns and attending to the emotion behind them is critical to successful changes, and unless changes are urgently necessary due to health or safety considerations, it is best to achieve buy-in before changes are made.

Finally, once the threat of COVID-19 has passed, some of the changes recommended in this guide will be moot. The potential value of many others will persist, because the quality and workload challenges they address were present before the COVID-19 pandemic and will likely continue beyond it. Of special note, this guide is intended to complement, rather than replace, other efforts to improve quality and safety in PA-LTC settings. Its goal is to address some “low-hanging fruit” that can often be changed fairly quickly.¹⁶ Further efforts to address other, more challenging medication-related issues, which may be more important for quality and safety goals, can and should persist, albeit with the recognition that these changes take time.

FUTURE STEPS

This guide is one small part of a larger global movement to improve the quality of care as well as resources for the interdisciplinary team in the PA-LTC setting. Rapid and easy access to necessary tools, including evidence-based

standards, algorithms, and care plans embedded within the workflow, is critical. This guide represents an attempt to do that, but more work will be needed to mobilize national and international efforts.

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REFERENCES

- Centers for Disease Control and Prevention National Vital Statistics System. Provisional Death Counts for Coronavirus Disease (COVID-19). <https://www.cdc.gov/nchs/nvss/vsrr/COVID19/index.htm>. Accessed April 22, 2020
- Centers for Medicare and Medicaid Services. Upcoming Requirements for Notification of Confirmed COVID-19 (or COVID19 Persons Under Investigation) Among Residents and Staff in Nursing Homes. <https://www.cms.gov/files/document/qso-20-26-nh.pdf>. Accessed April 30, 2020.
- Chidambaram P. State Reporting of Cases and Deaths Due to COVID-19 in Long-Term Care Facilities. <https://www.kff.org/medicaid/issue-brief/state-reporting-of-cases-and-deaths-due-to-covid-19-in-long-term-care-facilities>. Published April 23, 2020. Accessed May 1, 2020.
- University of Maryland School of Pharmacy. Optimizing Medication Management During the COVID-19 Pandemic: Implementation Guide for Post-Acute and Long-Term Care. <https://www.pharmacy.umaryland.edu/centers/lamy/optimizing-medication-management-during-covid19-pandemic/>. Accessed April 25, 2020
- Kaasalainen S, Agarwal G, Dolovich L, Papaioannou A, Brazil K, Akhtar-Danesh N. Nurses' perceptions of and satisfaction with the medication administration system in long-term-care homes. *Can J Nurs Res*. 2010;42(4):58-79.
- Scott-Cawiezell J, Pepper G, Madsen R, et al. Nursing home error and level of staff credentials. *Clin Nurs Res*. 2007;16(1):72-78.
- Thomson MS, Gruneir A, Lee M, et al. Nursing time devoted to medication administration in long-term care: clinical, safety, and resource implications. *J Am Geriatr Soc*. 2009;57(2):266-272.
- Liebel DV, Watson N. Consolidating medication passes: it can lead to more time with patients. *Am J Nurs*. 2005;105(12):63-64.
- Sluggett JK, Hopkins RE, Chen EY, et al. Impact of medication regimen simplification on medication administration times and health outcomes in residential aged care: 12 month follow up of the SIMPLER randomized controlled trial. *J Clin Med*. 2020;9(4):E1053.
- Lipska KJ, Krumholz H, Soones T, Lee SJ. Polypharmacy in the aging patient: a review of glycemic control in older adults with type 2 diabetes. *JAMA*. 2016;315(10):1034-1045. <https://doi.org/10.1001/jama.2016.0299>.
- Awad K, Serban MC, Penson P, et al. Effects of morning vs evening statin administration on lipid profile: a systematic review and meta-analysis. *J Clin Lipidol*. 2017;11(4):972-985.e9.
- Lavorini F, Mannini C, Chellini E, Fontana GA. Optimizing inhaled pharmacotherapy for elderly patients with chronic obstructive pulmonary disease: the importance of delivery devices. *Drugs Aging*. 2016;33(7):461-473.
- Cao J, Lansing B, Min L, et al. Multidrug-resistant organisms on patients' hands: a missed opportunity. *JAMA Intern Med*. 2016;176:705-706.
- Reeve E, Low LF, Hilmer SN. Beliefs and attitudes of older adults and carers about deprescribing of medications: a qualitative focus group study. *Br J Gen Pract*. 2016;66(649):e552-e560.
- Nicosia FM, Spar MJ, Stebbins M, et al. What is a medication-related problem? a qualitative study of older adults and primary care clinicians. *J Gen Intern Med*. 2020;35(3):724-731.
- Ouslander JG. Improving drug therapy for patients with life-limiting illnesses: let's take care of some low hanging fruit. *J Am Geriatr Soc*. 2020;68(4):682-685.