When one medication leads to another in older adults: Understanding who is impacted and how often it occurs

Summary of findings from a research study:

Prescribing cascades, associated patient characteristics, and health-care utilisation in older community-dwelling adults in Ireland: a retrospective, observational cohort study. The Lancet Primary Care. 2026

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Background

This research is part of a 5-year programme of research funded by the Health Research Board Of Ireland focusing on medication safety and quality in older people attending general practice.

Older adults are more likely to live with several long-term health conditions that require multiple medications. The use of multiple medications is frequently necessary and there are pros and cons that need to be balanced, especially in older adults. But it can become so complex that there are often risk-benefit trade-offs. This can result in medication side effects and prescribing cascades.



Prescribing cascades = when a new medication is prescribed to treat/prevent a side effect caused by another medication.

Prescribing cascades can be intentional or unintentional.



Example of intentional prescribing cascade = prescribing anti-sickness medicine to prevent/treat vomiting due to chemotherapy.

Unintentional prescribing cascade = when a side effect is misinterpreted as a new problem, which results in prescribing a new (second) medication.

Example of an unintentional prescribing cascade = a patient with ankle swelling due to a side effect from high blood pressure medication is prescribed a diuretic as the swelling is misdiagnosed as a symptom of heart failure.

When this happens, the patient continues to be exposed to medication-related harm from the first medication, which is worsened by the additional risk from the second medication.



Not recognizing a medication side effect may be more likely to occur in older adults as there are typically several potential culprit medications, multiple underlying medical conditions and side effect symptoms can be vague with many possibles causes. This makes the process of identifying a prescribing cascade very challenging.

Why our study is needed

Recently, an international group of experts from different areas put together a list of nine clinically important prescribing cascades specifically focused on older adults, called ThinkCascades.

Research looking at which people are most affected by prescribing cascades is limited; for example, what demographic factors (such as age, sex and income) or clinical factors (such as number of health conditions or medications). To date, we don't know if prescribing cascades cause medication-related harm (e.g. further side effects, hospital admission, GP visits).

What we did

This study describes how common (incidence of) nine examples of prescribing cascades (ThinkCascades)in older people adults (aged 65 years or older) living in Ireland. It also explores what patient factors (characteristics) (e.g. age, sex, number of long-term health conditions etc.) are associated with those who experience a prescribing cascade as well as healthcare use after a prescribing cascade occurrence.

Data from 44 Irish General Practices was collected between 2011 and 2016 and nine examples of prescribing cascades were analysed involving medicines commonly prescribed in general practice. The study included over 12,800 older adults.

What we found

- The incidence of any prescribing cascade within 1 year was 3·2%.
- Of the cascades that occurred within 1 year, over 67% occurred within 6 months.
- The most common prescribing cascades identified were:
    - calcium channel blockers (blood pressure medicine) leading to diuretics (water tablet)
    - SSRI/SNRIs (used to treat depression and anxiety disorders) leading to sleep medications
    - alpha blockers (to treat prostate conditions) leading to vestibular sedatives (anti-dizziness tablets)
- Prescribing cascade occurrence was associated with older age but not with sex, health cover, multimorbidity, or number of unique medications.
- Prescribing cascade occurrence was associated with an increased number of subsequent GP visits (mean difference of 5 additional GP visits over 2 years follow up), but not emergency hospital admissions.

What this means

This study identified that prescribing cascades in older adults attending general practice in Ireland during 2011–16 were relatively uncommon but are a source of potentially avoidable harm.

Side effects from medications should be considered for older adults attending primary care with new symptoms, particularly after a new medication is started, as most prescribing cascades occurred within 6 months of initial prescription.

This may offer opportunities for doctors and pharmacists, when reviewing patient medications, to stop medications that may no longer be required.

What this changes



Most guidelines that doctors use to guide treatment decisions for patients only consider single diseases and not how to combine prescriptions for people living with multiple long-term conditions. Therefore, increasing awareness of side-effects to medications in older people presenting with new symptoms is an important step in identifying prescribing cascades. Furthermore, this may reduce the number of medications the patient needs to take overall thus reducing the risk of medication-related harm.



Prescribing cascade tools, such as ThinkCascades, can support prescribers in identifying prescribing cascades. Ideally having these integrated into primary care electronic health record systems for use during clinical care could support clinicians in their prescribing decisions.



Future research using different types of data is needed to examine in more detail the reasons for prescribing cascades and to examine other types of prescribing cascades that may occur.

How to find out more

Visit our Department of General Practice Research Webpage here

Two other published articles as part of this project can be found at:

- Prescribing cascades in community-dwelling adults: A systematic review - October 2022.
- Prescribing Cascade Analysis of National Database – June 2025

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