Deprescribing, Medication Optimization and the Drug Burden Index

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Presenter Disclosure

• Presenter’s Name: Marci Dearing

• I have not received a speaker’s fee for this learning activity
Commercial Disclosure

• I have relationship(s) with commercial interests:

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Objectives

- Discuss polypharmacy, potentially inappropriate medications, and deprescribing

- Define and review the Drug Burden Index (DBI) and DBI Calculator©

- Discuss the role of the pharmacist in medication optimization strategies

- Review pharmacist-led intervention study
Introduction

- Caring for an aging population is challenging

- With aging often comes multimorbidity, leading to polypharmacy

- Older adults are more sensitive to adverse effects due to pharmacokinetic and pharmacodynamic changes

- Interestingly, concerns about adverse effects of medications was ranked a top health priority by older Canadians
Older Adults

- High risk of prolonged hospital stays, institutionalization and death
- High rate of readmission to hospital
- Frailty
- Risk of functional deterioration
- Medical errors
- Polypharmacy and potentially inappropriate medications (PIMs)
- Delirium
Polypharmacy

What is the definition of polypharmacy?

A) Taking more than one medication
B) Taking four or more medications
C) Taking five or more medications
D) Taking ten or more medications
E) Taking more medications than one can handle
Polypharmacy

- Definition is variable
- Majority of studies define polypharmacy as **FIVE** or more medications
- More medications than clinically indicated
- May vary depending on setting
- Multiple medications may be appropriate
Too Many Medications?

- 2 out of 3 Canadians (66%) over the age of 65 take 5 or more prescription medications

- 1 out of 4 Canadians (27%) over the age of 65 take at least 10 different prescription medications

- 89% of older inpatients were willing to stop one or more of their regular medications
Potentially Inappropriate Medication Use

- Almost **half of older adults** are taking one or more medications that are potentially inappropriate.

- Carries significant morbidity and mortality as well as treatment burden.

- Anticholinergic, sedative/hypnotic, antipsychotic, cardiac medications, NSAIDs, etc.
Deprescribing

‘Deprescribing is the process of withdrawal (or dose reduction) of an inappropriate medication, supervised by a health care professional with the goal of managing polypharmacy and improving outcomes.’

Potential Benefits of Deprescribing

- Reduced ADRs
  - Falls
  - Cognitive impairment
- Reduced hospitalizations
- Reduced mortality
- Improved adherence
- Reduced financial costs
- Improved quality of life
- No change (?)

Limited information about long term clinical benefits
Best data on benefits of known high risk medications in specific populations
Potential Harms of Deprescribing

• Adverse drug withdrawal reactions
• Return of medical condition
  – Long term negative effect to interruption of therapy
• Pharmacokinetic and pharmacodynamic disruptions
• Damage to the doctor-patient relationship
  – Psychological impact on the patient
  – Feeling of being ‘given up on’

Likely safe with minimal harms when planned and monitored
Deprescribing

- What is the best approach?
- Tools to aid in clinical decisions
- Resources
Resources

Canadian Deprescribing Network

deprescribing.org
Deprescribing Opportunities in Hospital

- Medication history is routinely done
- Close monitoring
- Collection of full history and investigations, routine discussion and consideration of patient specific factors
- Multidisciplinary team
Barriers to Medication Optimization

- Presentation of an acute problem
- The culture is to prescribe more medications, with stopping a lower priority
- Inertia in work practice, and reluctance to question a colleague’s prescribing decisions, may lead to prescribing medications without review
- Fragmented care – difficulties accessing complete medical histories
- Fear of consequences
- Lack of processes
Medication Optimization During Hospitalization

**On admission**
- 7.1 regular medications
- 23.8% taking ≥10 medications
- 54.8% taking ≥1 PIMs

**During hospitalization**
- 0.6% medications deprescribed
- 84.1% reactive and 15.9% proactive

**On discharge**
- 7.6 regular medications
- 28.3% taking ≥10 medications
- 60.8% taking ≥1 PIMs

Deprescribing Post Discharge

22% of medications that were intentionally ceased during hospital admission were **restarted** in the 5 months following discharge.

27% of medications that were ceased in hospital due to an ADR were **restarted** in the following 6 months.

Intervention study (comprehensive geriatric assessment) - 25% of medications that had been ceased were **restarted** within 1 year.

Optimizing Medication Use

Appropriate use of medications involves both **prescribing medications which are appropriate** and will benefit the individual and **deprescribing medications where the risks outweigh the benefits**.
Pharmacist Role in Medication Optimization

Catalyst for deprescribing

Tools can assist in deprescribing

Patient interaction

Collaboration

Improving outcomes
Project Introduction

- Pharmacist-led intervention to improve medication use in older in-patients: the Drug Burden Index (DBI)

- The DBI Calculator© is a clinical tool to enhance deprescribing in hospital

- Five wards within NSHA, Central Zone

- Patients ≥70 years old taking one or more medications with an anticholinergic or sedative effect regularly

- Started February 2019
# Anticholinergic and Sedative Medications

## Intended Effect (central to therapeutic action)
- Anticholinergics: i.e. allergic rhinitis, urinary incontinence, nausea/vomiting
- Sedatives: i.e. insomnia

## Unintended Effect (not central to therapeutic action)
- Anticholinergic: i.e. antidepressants, antipsychotics
- Sedatives: i.e. opioids, anticonvulsants

## Concerns
- Reduced/limited efficacy in older adults
- Increased risk of harms in older adults
- Negative effects of combinations
Why is the DBI Important?

- Functional impairment: 60% increase in fall-related hospitalizations
- Hospitalization: 30% increase in LOS and number of admissions
- Frailty: Doubles risk of incident frailty
- Mortality: 30% increase

DBI Score

- DBI score has been associated with **poorer physical function, reduced quality of life, frailty, falls and hospital readmission** in several studies.

- **Cognition and mortality** have been affected by DBI score in some studies, but not others.

- Longitudinal studies have found increased DBI is associated with **lower physical function, poorer delayed memory performance, increased physician visits and mortality**.
Implementation of the DBI Calculator©

- Use of the DBI Calculator© to enhance communication between healthcare professionals
- Provides guidance for deprescribing of anticholinergic and sedating medications
- Increasing DBI associated with negative outcomes
- Validated in other countries
- Supports deprescribing
Pharmacist Activities

- Enter medications into system (online DBI calculator)
- System calculates DBI score and generates recommendation report to discuss with team and then patient/family
- Medication calendar and discussion on discharge
The DBI Report

The Drug Burden Index Report

Patient Name: Test One Canada
Date of Report: 14/09/2018
DOS: 02/01/1948
General Practitioner: Dr Test

This patient has the following potential anticholinergic and sedative side effects:

<table>
<thead>
<tr>
<th>Medication</th>
<th>Frequency</th>
<th>DBI</th>
<th>Depresor?</th>
</tr>
</thead>
<tbody>
<tr>
<td>perindopril arginine 10mg</td>
<td>Daily</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>paracetamol 500mg</td>
<td>2-4x daily pm</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>hydrochlorothiazide 25mg</td>
<td>Daily</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>temazepam 10mg</td>
<td>nocte</td>
<td>0.50</td>
<td>0.00</td>
</tr>
<tr>
<td>amitriptyline 25mg</td>
<td>nocte</td>
<td>0.71</td>
<td>0.00</td>
</tr>
<tr>
<td>tiotropium 18mcg</td>
<td>puff daily</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Total DBI for this patient: 1.21

Low risk: DBI = 0
Moderate risk: 0 < DBI < 1
High risk: DBI ≥ 1

Note: When one medication is entered multiple times, the total DBI is calculated as a cumulative dose. Individual components may not add up to sum total.

What is the Drug Burden Index (DBI)?

The DBI is a measure of a patient’s total exposure to medications with anticholinergic and sedative properties only.

Why is the DBI important?

The DBI is associated with poor clinical outcomes in older patients, including:
- Functional impairment: e.g., balance, falls
- Frailty: 80% increase in fall-related hospitalisations
- Hospitalisation:
  - 30% increase in length of stay and number of admissions
  - 30% increase in mortality

What does the score mean?

The DBI score measures the risk of functional impairment from a patient’s prescribed anticholinergic and sedative medications.

What can you do?

- Review all of your patient’s medications that contribute to DBI score and may be impairing their function
- Review all of your patient’s medications as risks and benefits of medicines change over time, and polypharmacy is associated with adverse outcomes in older people
- Where clinically appropriate, trial dose reduction or cessation of those medications where risk outweighs benefit

Disclaimer: This Drug Burden Index report was produced by the Goal Directed Medication Review Electronic Decision Support System (G-MEDSS) and is to be used for research purposes only, and by Australian registered healthcare practitioners only, in their patient research applications. This project has approval from the Northern Sydney Local Health District Human Research Ethics Committee, Sydney, Australia (NRES17/52). More information can be found at https://www.aims.org.au/disclaimer for more information.

Final Page
# Preliminary Intervention Results

<table>
<thead>
<tr>
<th>Baseline Characteristic</th>
<th>N=27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Frailty Scale [mean]</td>
<td>5.26</td>
</tr>
<tr>
<td>Number of Comorbidities [mean]</td>
<td>7.67</td>
</tr>
<tr>
<td>Number of Falls in the Last Year [mean]</td>
<td>3.26</td>
</tr>
<tr>
<td>Reason for Admission [total (percent)]</td>
<td></td>
</tr>
<tr>
<td>Falls/Fracture</td>
<td>7 (26)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3 (11)</td>
</tr>
<tr>
<td>Falls</td>
<td>2 (7)</td>
</tr>
<tr>
<td>Total Number of Medications [mean]</td>
<td>7.56</td>
</tr>
<tr>
<td>Number of DBI Medications (ATC Code) [total]</td>
<td></td>
</tr>
<tr>
<td>Antidepressant (N06A)</td>
<td>22</td>
</tr>
<tr>
<td>Hypnotic/Sedative (N05C)</td>
<td>8</td>
</tr>
<tr>
<td>Antiepileptic (N03A)</td>
<td>7</td>
</tr>
</tbody>
</table>
Results are available for 27 participants.

Mean DBI score was 1.34 (standard deviation (SD)=1.11) on admission and 1.09 (SD=0.99) on discharge.

No adverse medication-associated events related to the intervention have been observed.
Results to Date

DBI Score [mean]

- Admission: 1.5
- Discharge: 1.0

Total Medications [mean]

- Admission: 8
- Discharge: 6
Results to Date

Preliminary results indicate that the intervention may be effective at reducing DBI scores in older adults during hospitalization which could lead to reduced medication-related harms.
After Discharge

- Communication with primary care provider and regular pharmacy
- Follow-up at 3 months to determine sustainability and impact of intervention
- Assessing DBI score, ER visits, rehospitalization, and mortality
- Sub-study to determine barriers and enablers to success of implementation
Deprescribing Research in Hospital

- A recent pharmacist-led RCT using the DBI Calculator© found that the intervention group had a greater reduction in their DBI score, **improved clinical outcomes, and fewer new adverse drug reactions while in hospital**

- The MedSafer Study: A Controlled Trial of an Electronic Decision Support Tool for Deprescribing in Acute Care increased the proportion of patients deprescribed PIMs at hospital discharge

- Shed-MEDS: pilot of a patient-centered deprescribing framework reduces medications in hospitalized older adults being transferred to inpatient post-acute care
Take Home Points

- Polypharmacy is a prevalent and concerning issue
- Opportunity to improve health outcomes in older adults
- Potential for pharmacist intervention
- Opportunities and barriers to deprescribing
- Project aims to describe feasibility and evaluate success of The DBI Calculator© implementation
Questions?

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