Health Information Technology in Geriatrics

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Canadian Geriatrics Society, 38th Annual Scientific Meeting
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Faculty / Presenter Disclosure

• **Faculty**: Benoit Cossette

• **Relationships with financial sponsors**: none
Presentation Plan

• Appropriate use of antipsychotics in long-term care homes
  - Québec OPUS-AP program
  - Canadian Foundation for Healthcare Improvement AUA Pan Canadian project

• Integrated knowledge translation (KT) strategy to reduce the use of potentially inappropriate medications
Appropriate use of antipsychotics in long-term care
Background

- Up to 80% of long-term care residents have a diagnosis of major neurocognitive disorder.
- The vast majority of them have behavioral and psychological symptoms of dementia (BPSD).
- Non-pharmacological approaches should generally be used as first-line treatment for cases of BPSD.
Background

- The efficacy of antipsychotics for the management of behavioral and psychological symptoms of dementia (BPSD) is at best modest.

- The use of antipsychotics has been associated with an increased risk of mortality and stroke in older long-term care residents.
A persisting situation

Omnibus Budget Reconciliation Act (OBRA) – Nursing Home Reform (1987): “Directed at protecting residents of long-term care facilities from medically unnecessary physical or chemical restraints imposed for purposes of discipline or convenience”
Current situation in Québec

In phase 1 of the OPUS-AP program conducted in 24 long term care facilities (CHSLD) in Québec, among 1054 residents:

51.7% had ≥ 1 antipsychotic prescription

Among 464 residents with neurocognitive disorder and ≥ 1 antipsychotic prescription:

67.2% were judged eligible for deprescribing
Achieving and sustaining a reduced use of antipsychotic in long term care

Health Information Technology to support a sustained reduction in antipsychotic use in long-term care

- Optimizing Practices, Use, Care and Services – Antipsychotics (OPUS-AP) – Québec

- Canadian Foundation for Healthcare Improvement (CFHI) – Appropriate Use of Antipsychotics (AUA) – Pan Canadian initiative
Optimizing Practices, Use, Care and Services – Antipsychotics (OPUS-AP)

Funding:
Ministère de la santé et des services sociaux (Qc)

Canadian Foundation for Healthcare Improvement
OPUS-AP

Objectives

- Ensure the appropriate use of antipsychotics in long-term care (CHSLD).
- Reinforce the use of patient centered care strategies.
- Increase the use of non-pharmacological interventions when managing behavioral and psychological symptoms of dementia (BPSD).

Phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Year</th>
<th>CHSLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>2018</td>
<td>24</td>
</tr>
<tr>
<td>Phase 2</td>
<td>2019-20</td>
<td>136</td>
</tr>
<tr>
<td>Phase 3</td>
<td>2021</td>
<td>317</td>
</tr>
</tbody>
</table>
LE DISPOSITIF DE RENFORCEMENT DE L'AMÉLIORATION DE LA QUALITÉ

Stratégie axée sur les résidents et leur famille

MENTORAT
ENGAGEMENT DU PERSONNEL ET DES FAMILLES

REPÉRAGE DES RÉSIDENTS avec prescription inappropriée
ÉLABORATION D’UN PLAN D’ACTION suivi et MAJ
RECOURS AUX OUTILS CLINIQUES

COLLECTE DE DONNÉES TRIMESTRIELLES
ENQUÊTES SUR LES CHANGEMENTS
RAPPORTS DE MI-PARCOURS ET DE FIN

Révision des médicaments – Dépresseur - Suivi - Stratégies de communication de base – Approches non pharmaceutiques

L’ÉQUIPE INTERDISCIPLINAIRE D’AMÉLIORATION DES SOINS EN CHSLD

Leadership - Gestion de changement

Communication (internes et de masse)
Data collection – OPUS-AP, phase 1

REDCap™

- Secure web application
- Compliant: 21 CFR Part 11, FISMA, HIPAA
- Data storage / access by long term care facilities
- Reports generated: 1) for all CHSLD; 2) by CHSLD
- Data entry: diagnoses, Cohen-Mansfield questionnaire, neuropsychiatric inventory, falls, restraints
- Data import: medications
**REDCap™ – baseline questionnaire**

### Résident

<table>
<thead>
<tr>
<th>Event Modification</th>
<th>Record ID 603 (Numéro de dossier 309-34782)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom d'événement</td>
<td>To-Entrée dans l'étude</td>
</tr>
</tbody>
</table>

#### 1-Numéro de dossier
* doit fournir une valeur

- **Value**: 309-34782

#### 2-Quelle est la date à laquelle l'extraction des données médicaments du logiciel pharmacie a eu lieu?
* doit fournir une valeur

- **Value**: 2017-11-20

#### 3-Quel est le sexe du résident?
* doit fournir une valeur

- **Value**: Homme

#### 4-Date de naissance
* doit fournir une valeur

- **Value**: 1918-11-26

#### 5-Quel est l'âge du résident?
* doit fournir une valeur

- **Value**: 99

#### 6-Indiquez si "Oui" ou "Non", les situations suivantes s'appliquent à ce résident:

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Oui</th>
<th>Non</th>
</tr>
</thead>
<tbody>
<tr>
<td>Résident avec schizophrénie ou troubles psychotiques apparentés</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Résident avec Trouble dépressif majeur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Résident avec Parkinson</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Résident avec prescription</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Value**: réinitialiser la valeur

- **Value**: réinitialiser la valeur

- **Value**: réinitialiser la valeur

- **Value**: réinitialiser la valeur

- **Value**: réinitialiser la valeur

Data collection – OPUS-AP, phase 1

Medication data:
- Extracted with standard software function in an Excel™ format
- Imported into REDCap™

Medication softwares:
- SyPhaC™
- GESPHARx8™
- StatRx™
Data collection – OPUS-AP, by phase

**Phase 1 – 2018**
- REDCap™
- Medication software

**Phase 2 – 2019-20**
- Outils d’Évaluation Multi Clientèle (OEMC)
- Medication software
- REDCap™

**Phase 3 – 2021**: interoperability in a central Electronic Medical Record of the electronic clinical tools:
- Outils d’Évaluation Multi Clientèle (OEMC):
  - demographic information, diagnoses, falls, restraints…
- Medication software
1054 residents admitted on participating wards
- Mean age: 82.9 years
- Women: 63.4%
- Residents with neurocognitive disorder: 78.3%
- Residents prescribed:
  - ≥1 antipsychotic: 51.7%
  - ≥1 benzodiazepine: 37.4%
  - ≥1 antidepressant: 56.4%

464 residents in the follow-up cohort (major neurocognitive disorder & antipsychotic)
Creating collaboratives to spread evidence-informed improvement

15 teams across 8 PTs

56 LTC facilities  7034 residents

Appropriate Use of Antipsychotics

Reduced falls & aggressive behaviours

36% Percent of target residents with discontinued antipsychotic medication by Q3

18% Percent of target residents who had the dose of antipsychotic medication reduced by Q3

54% Percent of target resident reduced or discontinued from antipsychotic medication

cfhi-fcass.ca | @cfhi_fcass.ca
Residents assessment instrument (RAI) MDS 2.0

- Diagnosis of: schizophrenia, Huntington’s chorea, hallucinations, or delusions, and are not in hospice care or end-of-life residents.
- Restraints
- Behaviours: physical abuse, socially inappropriate or disruptive behaviour, resistance to care, verbal abuse, wandering.
- Falls
- RAI Outcome scales: CPS, DRS, Pain, ISE, ABS, ADL
Potentially Inappropriate Use of Antipsychotics in Long-Term Care

This indicator looks at how many long-term care residents are taking antipsychotic drugs without a diagnosis of psychosis. These drugs are sometimes used to manage behaviours in residents who have dementia. Careful monitoring is required, as such use raises concerns about safety and quality of care.

In Canadian long-term care homes, 1 in 5 residents is taking antipsychotic drugs without a diagnosis of psychosis (Source: CIHI, 2016)

62% of seniors in Canadian long-term care have been diagnosed with dementia (Source: CIHI, 2016)

Regional variation between long-term care homes in use of antipsychotic drugs

1 in 7 residents to 4 in 7 residents (Source: CIHI, 2016)
Integrated knowledge translation strategy to reduce the use of potentially inappropriate medications
Elder-friendly approach

Approche adaptée à la personne âgée (AAPA) en milieu hospitalier (MSSS)

• Emphasis on the prevention:
  - Delirium
  - Functional decline

• Priority to patients 75 years and older
Integrated knowledge translation strategy

• Printed educational materials
• Local opinion leaders
• Pharmacist – physician interventions based on the alerts of a computerized system
Computerized Alert System (CAS)

Electronic Medical Record
- Medications
- Laboratories

Med-Echo
- Diagnoses

Computerized Alert System

<table>
<thead>
<tr>
<th>Patients</th>
<th>Alerts</th>
<th>Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CNS4</td>
<td>quetiapine, lorazepam...</td>
</tr>
<tr>
<td>2</td>
<td>Dem + Rx-Ach</td>
<td>amitriptyline</td>
</tr>
<tr>
<td>3</td>
<td>Duplicate benzo</td>
<td>lorazepam, oxazepam</td>
</tr>
<tr>
<td>4</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
Knowledge Translation Strategy to Reduce the Use of Potentially Inappropriate Medications in Hospitalized Elderly Adults

Benoit Cossette, BPharm, PhD, Josée Bergeron, BPharm, MSc, Geneviève Ricard, MD, Jean-François Éthier, MD, Thomas Joly-Mischlich, BPharm, MSc, Mitchell Levine, MD, MSc, Modou Sene, MSc, Louise Mallet, BScPharm, PharmD, Luc Lanthier, MD, MSc, Hélène Payette, PhD, Marie-Claude Rodrigue, MSc, and Serge Brazeau, MD

### Cohort

8622 patients; 14,071 admissions; 145,061 patient-days

#### Table 1. Participant Characteristics (14,071 Admissions)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>7,668 (54.5)</td>
</tr>
<tr>
<td>Age, mean ± SD</td>
<td>83.3 ± 5.9</td>
</tr>
<tr>
<td>Age, n (%)</td>
<td></td>
</tr>
<tr>
<td>75–84</td>
<td>8,842 (60.6)</td>
</tr>
<tr>
<td>≥85</td>
<td>5,639 (39.4)</td>
</tr>
<tr>
<td><strong>Morbidities</strong></td>
<td></td>
</tr>
<tr>
<td>Charlson Comorbidity Index, mean ± SD</td>
<td>1.87 ± 2.19</td>
</tr>
<tr>
<td>Dementia, n (%)</td>
<td>2,293 (16.3)</td>
</tr>
<tr>
<td>Functional decline, n (%)</td>
<td>1,363 (9.7)</td>
</tr>
<tr>
<td>Delirium, n (%)</td>
<td>1,198 (8.5)</td>
</tr>
<tr>
<td>Falls, n (%)</td>
<td>1,011 (7.2)</td>
</tr>
<tr>
<td>Orthostatic hypotension, n (%)</td>
<td>847 (6.0)</td>
</tr>
<tr>
<td>Parkinson’s disease and parkinsonism, n (%)</td>
<td>319 (2.3)</td>
</tr>
<tr>
<td><strong>Hospitalizations, n (%)</strong></td>
<td></td>
</tr>
<tr>
<td>≥1 in previous year</td>
<td>6,131 (43.6)</td>
</tr>
<tr>
<td>≥1 in previous month</td>
<td>1,911 (13.6)</td>
</tr>
</tbody>
</table>
Interrupted Time Series (ITS) analysis

Figure 1. Rate of patient-days with at least one potentially inappropriate medication (PIM) according to month.
### Table 2. Estimated Use of Potentially Inappropriate Medication (PIM) According to Segmented Regression Analysis

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Full Model</th>
<th>Most Parsimonious Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>All PIMs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIM use at start of observation</td>
<td>21.89 (20.17-23.60) &lt;.001</td>
<td>21.09 (20.3-21.88) &lt;.001</td>
</tr>
<tr>
<td>Preintervention trend, per month</td>
<td>-0.11 (-0.31-0.09) .31</td>
<td>Not retained</td>
</tr>
<tr>
<td>Change in rate immediately after intervention</td>
<td>-2.55 (-5.58-0.47) .12</td>
<td>-3.45 (-4.76 to -2.14) &lt;.001</td>
</tr>
<tr>
<td>Change in trend after intervention, per month</td>
<td>0.11 (-0.40-0.62) .68</td>
<td>Not retained</td>
</tr>
</tbody>
</table>
Reduction in targeted potentially inappropriate medication use in elderly inpatients: a pragmatic randomized controlled trial

Benoit Cossette¹,²,³,⁴ • Jean-François Éthier¹,⁵,⁶ • Thomas Joly-Mischlich¹,³ • Josée Bergeron³ • Geneviève Ricard¹,⁵ • Serge Brazeau⁵ • Mathieu Caron⁷ • Olivier Germain⁸ • Hélène Payette¹,² • Janusz Kaczorowski⁹,¹⁰ • Mitchell Levine⁴,¹¹

## Medication change

<table>
<thead>
<tr>
<th>Drug cessation or dosage decrease</th>
<th>Control % (modified drugs/drugs with intervention)(^a)</th>
<th>Intervention % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of interventions(^b)</td>
<td>99</td>
<td>52</td>
</tr>
<tr>
<td>Medication change at 48 h</td>
<td>15.9 (13/82)</td>
<td>45.8 (22/48)</td>
</tr>
<tr>
<td>Medication change at discharge</td>
<td>27.3 (27/99)</td>
<td>48.1 (25/52)</td>
</tr>
</tbody>
</table>

**Table 4** Medication changes for drugs for which a pharmacist intervened
Current project

Implementation of the Integrated Knowledge Translation Strategy in primary care
• Family Health Team practice, (Estrie region of Qc)
• 65 (18%) of 369 screened patients 65 and older with an alert
• Mean age: 77 years old; women: 71%
• Clinically relevant alert for 27 (42%) of 65 patients
• Change in medication in 17 (63%) of the 27 patients with a relevant alert
Our next project (Sept. 2018)

Transitional Care Services

Reductions in Medication-Related Hospitalizations in Older Adults with Medication Management by Hospital and Community Pharmacists: A Quasi-Experimental Study

Karen L. Pellegrin, PhD, MBA, a Les Krenk, RPh, b Sheena Jolson Oakes, PharmD, RPh, c

JAGS 65:212-219, 2017
Discussion

Using the existing electronic tools (medication software, electronic medical record, discharge summaries…) has multiple advantages:

- Avoids double data entry
- Data validated by the clinical processes
- Providing feedback to the clinicians on their practices, based on the data that they enter
- Possibility to add data to the clinical tools based on the clinicians’ needs
- Longitudinal assessment of the clinical practices
Discussion

Using the existing electronic tools also has disadvantages:

- Clinical needs can differ from evaluation needs
- Clinical data structured as aggregated / free text data

Using the existing electronic tools has more advantages than disadvantages
What is the Canadian Longitudinal Study on Aging (CLSA)?

“The Canadian Longitudinal Study on Aging is the largest most comprehensive research platform and infrastructure available for aging research with longitudinal data that will span 20 years from over 50,000 Canadians over the age of 45”

A research platform – infrastructure to enable state-of-the-art, interdisciplinary population-based research and evidenced-based decision-making that will lead to better health and quality of life for Canadians
The CLSA platform collects data and biospecimens from:

- 51,338 Canadian women and men aged 45 - 85 at baseline
  - Questionnaires by telephone interview (~150 min) on 21,241 participants
    - Randomly selected 10 provinces
  - Questionnaires by in-person interviews (~60 min) and physical assessments (~180 min) on 30,097 participants
    - Randomly selected 25-50 km of 11 sites in 7 provinces

20 year study: Follow up every 3 years, maintaining contact in between

Data Linkage with health care, mortality and disease registries

- The CLSA is currently in Follow-up 2 of data and biospecimen collection
- Data from the Baseline are available and already used by the research community and governments. Data from Follow Up 1 will be available in 2019.
Steps in Data Access Process

1. Data Preview Portal:
   User reviews data available

2. User applies for data

3. CLSA performs administrative & statistical review

4. CLSA Data and Sample Access Committee Review & approvals

5. User signs Data & Sample Access Agreement & provides proof of ethics approval

6. CLSA prepares and delivers dataset
Questions ?

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SCHÉMA

Tous les résidents des unités participant à OPUS-AP (n=1054, 100%)

- Résidents sans prescription d'antipsychotiques (n=509, 48%)
- Résidents sans diagnostic de trouble neurocognitif majeur (n=228, 22%)

Cohorte de suivi (TNCM+ antipsychotique) (n=464, 44%)

Prescription d'antipsychotique au dossier pour un résident avec:
- Résident avec symptômes psychotiques ou des symptômes d'agressivité en présence d'un danger pour le résident ou pour autrui (n=88, 19%)
- Schizophrénie ou troubles psychotiques apparentés (n=26, 6%)
- Trouble dépressif majeur (n=19, 4%)
- Troubles bipolaires ou apparentés (n=14, 3%)
- Déficience intellectuelle (n=1, 0,2%)
- En contexte de fin de vie (n=2, 0,4%)
- Famille désire poursuivre l'antipsychotique (n=26, 6%)
- Non-admis à l'unité lors de la saisie (n=1, 0,2%)
- Autre (n=17, 4%)

Résidents éligibles à la déprescription (n=312, 67%)
### 5-Sexe

**Actualiser** | **Afficher en graphique à barres**

<table>
<thead>
<tr>
<th>Total (N)</th>
<th>Manquant</th>
<th>Unique</th>
</tr>
</thead>
<tbody>
<tr>
<td>1052</td>
<td>2 (0.2%)</td>
<td>2</td>
</tr>
</tbody>
</table>

**Comptages/fréquence:** *Homme* (385, 36,6%), *Femme* (667, 63,4%)

![Chart showing the distribution of males and females](image-url)
A fluctuating situation

Reducing Excessive Use of Antipsychotic Agents in Nursing Homes

Jerry H. Gurwitz, MD  JAMA  July 11, 2017  Volume 318, Number 2

- 1996: antipsychotic use (US): 16%
- The introduction of atypical antipsychotics changed prescribing patterns
- Impact of the initiative led by the Centers for Medicare & Medicaid Services (CMS)
Monitoring & intervention cycle

Baseline Inter. PIMs: A, B, C, D

12 months: ↓A, ≈B, ↓C, ≈D
12 months Monit: A, C, D
12 months Inter: B, E, F

24 months: ↑A, ≈B, ↓C, ≈D, ≈E, ↓F
24 months Monit: B, C, D, F
24 months Inter: A, E, G

PIMs: potentially inappropriate medication