Age, Co-morbidities, Prescriptions & Drug Related Problems

Analysis of a Multi-Centre, Pharmacist-Directed Medication Reconciliation in Ontario, Canada
Background

- Pharmacists are valued as vital members of the HIV care team and are trained to perform routine medication reconciliation to detect drug related problems (DRP) that may compromise treatment success in HIV and co-morbidities.

- A medication reconciliation tool was developed and endorsed by the Canadian HIV/AIDS Pharmacists (CHAP) to detect DRP’s and collect valuable demographic and disease related data specific to the HIV population.
<table>
<thead>
<tr>
<th>Start Date dd/mm/yy</th>
<th>Name of Medication generic (brand)/ Rx/ OTC / Natural Health Product</th>
<th>Strength</th>
<th>How to take this medication</th>
<th>Purpose</th>
<th>Prescribed by</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>quantity</td>
<td>route</td>
<td>frequency</td>
<td>food (v)</td>
</tr>
</tbody>
</table>

**PERSONAL MEDICATION RECORD**

- **No Known Allergies**

<table>
<thead>
<tr>
<th>Allergies</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent</td>
<td></td>
</tr>
</tbody>
</table>

**Other Notes:**
**PATIENT INFORMATION**

**PATIENT NAME:**

**ADDRESS:**

**PHARMACIST:**

**DATE OF BIRTH:**

**MALE**

**FEMALE**

**TELEPHONE:**

**DATE:**

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**CONSENT**

(To be completed by the patient)

Do you consent to this medication review and allow this information to be shared with other Health Care Providers as appropriate under applicable law?

- [ ] INITIALS:

**HIV AND TREATMENT**

Do you know the names of your HIV meds?

- [ ] NO
- [ ] YES

Do you know your T cell or CD4 count?

- [ ] NO
- [ ] YES

Do you know your viral load?

- [ ] NO
- [ ] YES

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**ADHERENCE**

Pharmacists to Evaluate: Potential Adverse Drug Reaction (ADR)

How many doses of your HIV medication have you missed this week?

- [ ] NO
- [ ] YES

How many doses of your HIV medication have you missed this month?

- [ ] NO
- [ ] YES

Are you able to take your medications as directed?

- [ ] NO
- [ ] YES

Do you understand your medication instructions?

- [ ] NO
- [ ] YES

Do you have difficulty taking or swallowing medications?

- [ ] NO
- [ ] YES

Do you use any reminders to take your medications?

- [ ] NO
- [ ] YES

If you do use reminders, please check all that apply:

- [ ] Dosette/Sniffer
- [ ] Beeper/Cellphone

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**LIFESTYLE**

Smoker:

- [ ] NO
- [ ] YES

- [ ] DAILY

Alcohol consumption:

- [ ] None
- [ ] None
- [ ] <4 drinks/week
- [ ] <14 drinks/week
- [ ] >4 drinks/week
- [ ] >14 drinks/week

Desire to quit:

- [ ] NO
- [ ] YES

---

**Recreational Substances**

- [ ] Caffeine
- [ ] Opiates
- [ ] Amphetamines
- [ ] Other

---

**MEDICAL CONDITIONS**

- [ ] Cardiovascular
- [ ] Neuromuscular
- [ ] Respiratory
- [ ] Bone
- [ ] Gastrointestinal
- [ ] Mental Health
- [ ] Endocrine
- [ ] Cancer
- [ ] Renal
- [ ] Pregnancy
- [ ] Hepatic
- [ ] Skin

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**PHARMACEUTICAL OPINION**

Medication taken incorrectly or irregularly:

- [ ] AI

Drug without indication/therapeutic duplicate:

- [ ] TD

Indication without drug requiring drug:

- [ ] RD

Some drugs are used incorrectly:

- [ ] DE

Adverse Drug Reaction:

- [ ] ADR

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**Drug Related Problem**

**Code**

**Suggested Solution/Education Provided/Recommendation**
CONSENT
(To be completed by the patient)

Do you consent to this medication review and allow this information to be shared with other Health Care Providers as appropriate under applicable law? YES

INITIALS:

HIV AND TREATMENT

Do you know the names of your HIV meds? NO
YES

Do you know your T cell or CD4 count? NO
YES

Do you know your Viral Load? NO
YES
### LIFESTYLE

<table>
<thead>
<tr>
<th>Smoker:</th>
<th># YRS:</th>
<th># DAILY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Desire to quit?</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

#### Alcohol consumption:

<table>
<thead>
<tr>
<th>Women:</th>
<th>Men:</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>&lt;9 drinks per week</td>
<td>&lt;14 drinks per week</td>
</tr>
<tr>
<td>&gt;9 drinks per week</td>
<td>&gt;14 drinks per week</td>
</tr>
</tbody>
</table>

#### Recreational Substance:

<table>
<thead>
<tr>
<th>Caffeine</th>
<th>Marijuana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamines</td>
<td>Opiates</td>
</tr>
</tbody>
</table>

Other:
ADHERENCE

Pharmacist to Evaluate: Potential DRP = adherence issues (AI)

How many doses of your HIV medication have you missed this week? [ ] [ ]

How many doses of your HIV medication have you missed this month? [ ] [ ]

Are you able to take your medications as directed? [ ] [ ] NO YES

Do you understand your medication instructions? [ ] [ ] NO YES

Do you have difficulty taking or swallowing medications? [ ] [ ] NO YES

Do you use any reminders to take your medications? [ ] [ ] NO YES

If you do use reminders, please check all that apply:
[ ] Dosette/Blister [ ] Beeper/Cellphone [ ] Other
<table>
<thead>
<tr>
<th>Medical Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypertension/hyperlipidemia</strong></td>
</tr>
<tr>
<td>Cardiovascular</td>
</tr>
<tr>
<td>Respiratory</td>
</tr>
<tr>
<td>Gastrointestinal</td>
</tr>
<tr>
<td>Endocrine</td>
</tr>
<tr>
<td>Renal</td>
</tr>
<tr>
<td>Hepatic</td>
</tr>
</tbody>
</table>
# DO YOU SUFFER FROM ANY OF THE FOLLOWING SYMPTOMS?
(if yes, check below and tell us how much it bothers you)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Tolerable</th>
<th>Requires Treatment</th>
<th>Tolerable</th>
<th>Requires Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Heartburn</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Headache</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Fatigue/Drowsiness</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Dizziness</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Sleep Problems</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Pain</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Numbness</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Rash/Itch</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Skin Discolouration</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Sexual Dysfunction</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Body Changes</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Other

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Healthcare provider to evaluate: Potential DRP = Adverse Drug Reaction (ADR)
Make recommendations for anything that "requires treatment" (RD)
• Self medicates for ED, diarrhea and heartburn,
• Internet meds for ED
• No longer has dizziness but difficulty sleeping, no RX
<table>
<thead>
<tr>
<th>ADDITIONAL POTENTIAL DRUG RELATED PROBLEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication taken incorrectly or irregularly</td>
</tr>
<tr>
<td>Drug/Drug or Drug/Food Interaction Possible</td>
</tr>
<tr>
<td>Problems with prescription reimbursement</td>
</tr>
<tr>
<td>Some drugs are dosed incorrectly</td>
</tr>
</tbody>
</table>
## ADDITIONAL POTENTIAL DRUG RELATED PROBLEM

<table>
<thead>
<tr>
<th>Drug Related Problem</th>
<th>Code</th>
<th>Suggested Solution/ Education Provided/ Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication taken incorrectly or irregularly</td>
<td>AI</td>
<td>Drug without indication: therapeutic duplicate</td>
</tr>
<tr>
<td>Drug/Drug or Drug/Food Interaction Possible</td>
<td>DI</td>
<td>Indication without drug: requires drug</td>
</tr>
<tr>
<td>Problems with prescription reimbursement</td>
<td>AI</td>
<td>Suboptimal Response to therapy</td>
</tr>
<tr>
<td>Some drugs are dosed incorrectly</td>
<td>DE</td>
<td>Adverse Drug Reaction</td>
</tr>
<tr>
<td>Missing evening doses</td>
<td></td>
<td>AI Use a beeper as well as dosette or switch to QD regimen</td>
</tr>
<tr>
<td>Using internet ED meds</td>
<td></td>
<td>DI Interacts with ARV’s, advised to inform clinic and dosing</td>
</tr>
<tr>
<td>Self medicating for GERD</td>
<td>SR/TD</td>
<td>Increase dose or change PPI or try a different ARV regimen</td>
</tr>
<tr>
<td>Difficulty sleeping</td>
<td></td>
<td>SR/RD Suggest a bedtime sleeping aid/ could this be the depression?</td>
</tr>
<tr>
<td>Self medicating for diarrhea</td>
<td>ADR</td>
<td>AI Diet consult/switch to another ARV regimen</td>
</tr>
<tr>
<td>Wants to quit smoking</td>
<td></td>
<td>RD Consider adding treatment for this that may also augment depression med</td>
</tr>
<tr>
<td>Patient does not tolerate EFV</td>
<td></td>
<td>ADR Update records and do not include EFV in your ARV regimen</td>
</tr>
</tbody>
</table>
Purpose

- We sought to determine the relationship between four age strata and the number of types of co-morbidities, prescription drugs, and drug-related problems in HIV patients in Ontario, Canada.

- Predicting that disease and drug burden would increase as age increases, resulting in more drug-related problems.
Methods

• 8 pharmacists from three regions in Ontario used the Medsrec Tool to perform medication reconciliation visits on randomly-selected HIV-positive patients over a 2-month period.
• The data was collated, analyzed and then divided into 4 age groups; <40, 40-49, 50-59, ≥60 years.
• In each age stratum, we examined the number and types of co-morbidities, number of prescription medications and numbers and types of drug-related problems.
DEMOGRAPHICS

Total: 161

**PRESCRIPTION**
- AVG # OF MEDS: 7
- Range: 1 - 19
  - 78%

**OTC**
- 22%

**AGE (range 20-80)**
- <40yo
- >40yo (79%)

**GENDER**
- Female (80%)
- Male
CO-MORBID DISORDERS

avg. 3/person

Cardiovascular Disease
Neuromuscular Disorders
Respiratory Diseases
Bone Disease
Gastrointestinal Disorders
Mental Health
Endocrine Disorders
Cancer
Renal Disease
Pregnancy
Hepatic Disease
Skin Disorders
Other
DRUG RELATED PROBLEMS

226 Identified (0-4 per person)
### Stratified by Age

<table>
<thead>
<tr>
<th>AGE</th>
<th>NUMBER (n)</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>35</td>
<td>21.7%</td>
</tr>
<tr>
<td>40-49</td>
<td>63</td>
<td>39.1%</td>
</tr>
<tr>
<td>50-59</td>
<td>46</td>
<td>28.6%</td>
</tr>
<tr>
<td>&gt;60</td>
<td>17</td>
<td>10.6%</td>
</tr>
</tbody>
</table>
Co-morbidities, Rx and DRP's by Age Strata

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Co-morbidities</th>
<th>Rx meds</th>
<th>DRP's</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>50-59</td>
<td>3</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>&gt;60</td>
<td>3</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

Age (yrs)
- <40
- 40-49
- 50-59
- >60
Drug related problems

- The most common types of drug related problems were adverse drug reactions and adherence issues, with a similar prevalence in those aged < 50 years and ≥50 years (64.7% vs. 65%).
- Drug interaction issues were more common in those ≥50 age groups (12.7% vs. 8.2%).
- Indications requiring therapy and sub-therapeutic responses were also identified more often in the ≥50 age groups (68.3% vs. 49%).
Conclusions

- Medication Reconciliation performed on PHA’s by Ontario pharmacists revealed a substantial number of Drug Related Problems.
- These data demonstrate the increased need for greater pharmaco-vigilance as the HIV population ages and the number of co-morbidities and prescription drugs increases.
- This underlies the importance of maintenance, inclusion or training of specialized pharmacists on all HIV care teams to conduct these thorough medication reviews now and in the years to come.