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# Changes in Potentially Inappropriate Prescribing with Nursing Home Admittance

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*Canadian Association for Health Services and Policy Research Conference*
*Montreal, Quebec*

# Background

- Inappropriate drug prescribing a common and enduring controversy in nursing home care
- Associated with increased risk for
  - Falls
  - Hospitalization
  - Mortality

# Background

- Beers' Criteria is an internationally recognized, widely used means of classifying potentially inappropriate prescribing (PIP) in older adults
  - Poor efficacy
  - Dramatic negative side effects
  - Demonstrated alternatives

| Drug Classifications | Individual Drugs |
|---|---|
| Benzodiazepines | Diazepam, fluazepam, clonazepam, prazepam, chlordiazepoxide, clorazepate, nitrazepam |
| Sedatives or Hypnotics | meprobamate, secobarbital, pentobarbital, butabarbital, amobarbital, methohexital, mephobarbital |
| Non-steroidal anti-inflammatories | Indomethacin, phenylbutazone |
| Narcotics | Propoxyphene, pentazocine, meperdine |
| Antihypertensives | Reserpine, methyldopa |
| Platelet inhibitors | Dipyriadamole, ticlopidine |
| Dementia treatment | Cyclandelate, ergoloid mesylates, isoxsuprine |
| Antiarrythmic | Disopyramide |
| Skeletal Muscle Relaxants | Carisoprodol, chlorzoxazone, metaxalone, methocarbamol, cyclobenzaprine, orphenadrine |
| Antimuscarinic | Oxybutynin |
| Antidepressant | Doxepin, amitriptyline |
| Oral hypoglycemics | Chlorpropamide |
| Antispasmodics | Belladonna, clidinium, dicyclomine, hyoscyamine, propantheline bromide |
| Antiemetic | Trimethobenzamide |
| Antihistamines | Chlorpheniramine, cyproheptadine, dexchlorpheniramine, diphenhydramine, hydroxyzine, promethazine, tripelennamine |

# Background

- Majority of the literature examining PIP in nursing home settings has focused on prevalence rates
- Little research has identified PIP onset and cessation with nursing home admission
  - Resident, facility, and health care system risk factors?
- Could help guide timing and location of drug reduction intervention

# Objectives

1) Describe prevalence of PIP overall and by drug category
2) Summarize trajectories of PIP with NH admission
   - i.e., continuation, onset, cessation
3) Determine resident, health care system and facility risk factors associated with PIP onset and cessation

# Method

- Data
  - Administrative health care data housed at the Manitoba Centre for Health Policy
  - Drug Programs Information Network (DPIN) data from Manitoba nursing homes
- Cohort
  - All newly admitted nursing home residents in Manitoba from April 2001 to March 2006 (N=6755)
  - DPIN records for 120 days prior to admission and 91-211 days after this date

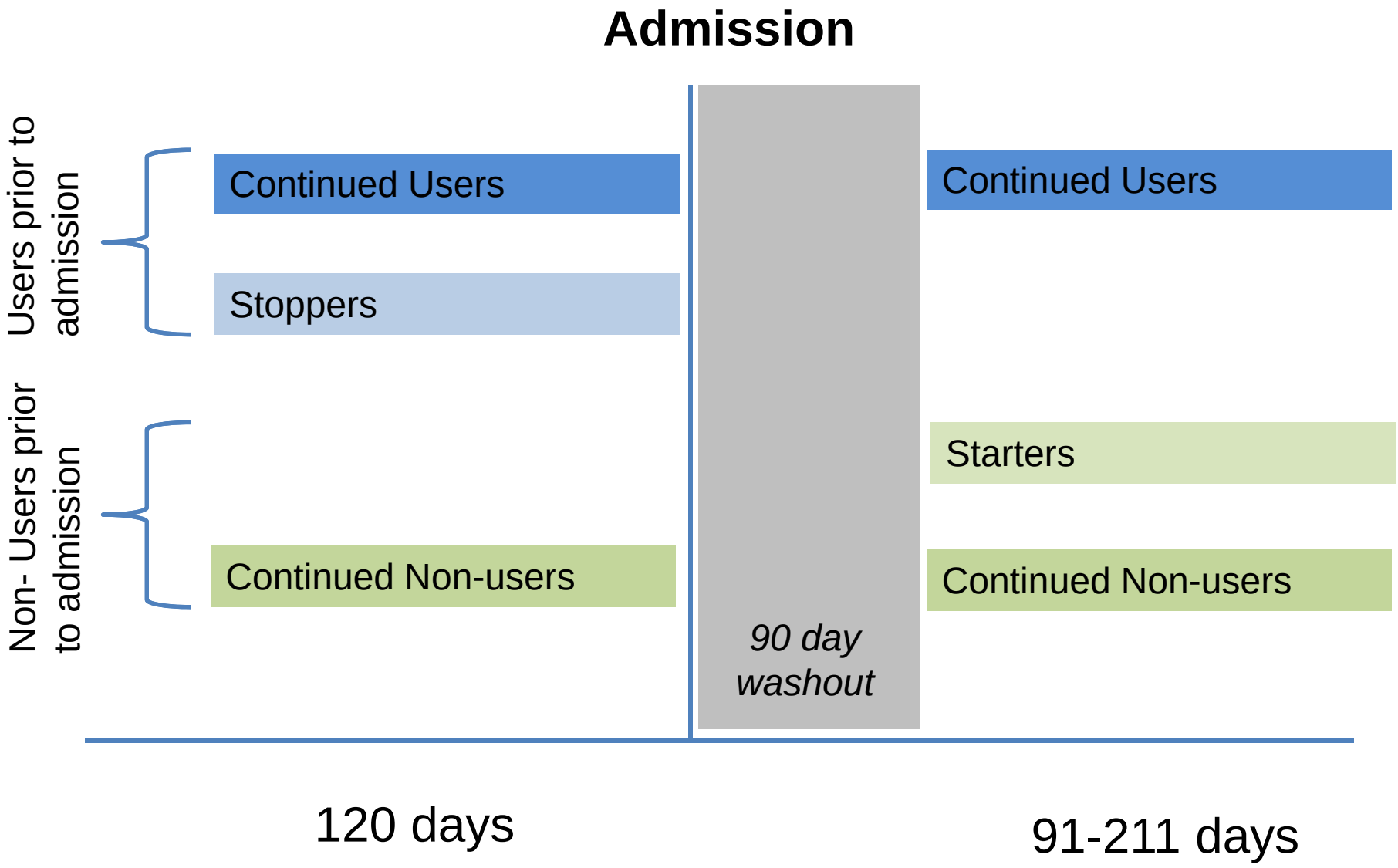
# Method

- Exclusionary criteria
  - Facilities receiving drugs from hospital-based pharmacies
  - Residents < 65 years of age
  - Residents who died < 120 days following admission
  - Residents with excessive hospital length of stay (>90 days) during study period

# Method

- PIP defined as a subset of Beers' Criteria from 1991 and 1997
- Residents PIP classified as:

1. PIP Users Prior to Admission
   - Continued Users: PIP at baseline and follow-up
   - Stoppers: PIP at baseline only
2. PIP Non-Users Prior to Admission
   - Incidence Users: PIP at follow-up only
   - Continued non-users: non PIP before or at follow-up


Admission
Users prior to admission
Non- Users prior to admission
Continued Users
Stoppers
Continued Non-users
90 day washout
Continued Users
Starters
Continued Non-users
120 days
91-211 days

# Method

- Nursing home facility variables
  - Owner/operator type: Profit, not for profit
  - Location: Urban, rural
- Resident characteristics
  - Age
  - Sex
  - Level of care (I through IV)
  - Dementia
  - Number of chronic health conditions
- Health care system variables
  - Hospitalization prior to admission
  - Number of prescribing physicians
  - Polypharmacy

# Results

| **Table 1: PIP User Groups in Manitoba Nursing Homes** | |
|---|---|
| Overall Cohort | 6,755 (100) |
| 1) PIP Users Prior to NH Admission | 801 (11.9) |
| a) Continued Users (PIP prior to and after NH admission) | 472 (58.9) |
| b) Stoppers (PIP before but not after NH admission) | 329 (41.1) |
| 2) Non-Users Prior to NH Admission | 5954 (88.1) |
| a) Incident Users (PIP after NH admission) | 568 (9.5) |
| b) Non-users (No PIP before or after NH admission) | 5386 (90.5) |

# Results

| Table 2: Distribution of Use by Medication Category | | | |
|---|---|---|---|
| | Distribution of Prevalence Users by Drug Class (N=1,040) | Distribution Across User Groups | |
| | | Continued Users (N=472) | Incidence Users (N=568) |
| Antiarrythmic | 0.3** | 100 | 0 |
| Antidepressants | 295 (28.4) ★ | 154 (32.5) | 141 (24.8) |
| Antihistamines | 209 (20.1) ★ | 32 (6.8) | 177 (31.1) ★ |
| Antihypertensives | 17 (1.6) | -- | -- |
| Antimuscarinic | 223 (21.4) ★ | 92 (19.4) | 131 (23.0) |
| Antispasmodics | 0.2 | -- | -- |
| Benzodiazepines | 284 (27.3) ★ | 129 (27.3) | 155 (27.2) |
| Narcotics | 12 (1.2) | -- | -- |
| Non-steroidal anti-inflammatories | 23 (2.2) | -- | -- |
| Platelet inhibitors | 33 (3.2) | 26 (5.5) | 26 (4.6) |
| Skeletal Muscle Relaxants | 23 (2.2) | -- | -- |

# Results

- Resident and health care risk factors for stopping PIP relative to continuing PIP
  - Female AOR **0.6 (0.4-0.9)****
  - Level IV care AOR **2.0 (2.2-3.8*)**
  - Hospitalization prior to admission AOR **2.3 (1.6-3.1)*****
  - Polypharmacy AOR **0.5 (0.3-0.6)*****

# Results

- Resident, facility, health care system risk factors for incident PIP relative to non-PIP use
  - Age 64-74 AOR **1.5 (1.1-2.0)****
  - Polypharmacy AOR **2.7 (2.3-3.3)*****
  - For-profit facility AOR **0.8 (0.6-0.9)***
  - Urban facility AOR **1.3 (1.1-1.7)****

# Discussion

- First study to separate PIP into different trajectories of use and non-use
- Majority of people on PIP prior to admission, remained using PIP after admission
- Majority of people not on PIP prior to admission remained as such after admission
  - 10% became prescribed PIP after admission

# Discussion

- Our findings mirrored other published research on the most common PIP
  - Antihistamines
  - Antimuscarinics
  - Antidepressants
  - Benzodiazepines
- Particular attention should be paid to reducing use of these PIP

# Discussion

- Hospitalization prior to admission was uniquely associated with stopping PIP at nursing home admission
  - Focus of intervention and future research
- Facility risk factors more prominent in predicting incident PIP
- Our results underscore the risks associated with polypharmacy

# Limitations and Future Directions

- Lack of hospital-based drug data
  - Excluded residents with extended hospital stay
- DPIN data from hospitals is needed in order to provide a more complete understanding of PIP prior to and following nursing home admission

# Acknowledgements

University of Manitoba | Manitoba Centre for Health Policy

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