Inappropriate Prescriptions according to STOPP and related hospital admission in geriatric patients

O. Dalleur¹,* C. Deliens⁵, C. Losseau², S. Henrard³, N. Speybroeck³, A. Spinewine⁴, B. Boland²

¹ Pharmacy department and 2 Geriatric Medicine, St-Luc Hospital, UCL, Brussels
³ Institute for Health and Society, UCL, Brussels
⁴ Louvain Drug Research Institute and CHU Mont-Godinne, UCL
⁵ Pharmacy, Institut Jules Bordet, ULB, Brussels
                                                                                                                                                                                                                   Belgium

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Introduction

- Many drugs can be considered as inappropriate in geriatric patients.
- Several tools to detect inappropriate prescription in elderly: Beers, Laroche, STOPP-START …

STOPP (Screening Tool of Older Person’s Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation International Journal of Clinical Pharmacology and Therapeutics, Vol. 46 – No. 2/2008 (72-83)
Screening Tool of Older Persons' Potentially inappropriate Prescriptions Age and Ageing 2008; 37: 673–9
Introduction

- **STOPP&START**
  - European
  - Consensus opinion of a panel of experts in geriatric medicine, clinical pharmacology, psychiatry of old age, pharmacy and general practice.

- **STOPP** : 65 situations « at risk » linked with 29 drugs

- *Cardiovascular system, Central nervous system and psychotropic drugs, Gastrointestinal system, Drugs that adversely affect fallers, Analgesic drugs,*...
**STOIPP List**
65 situations, 29 drugs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Risk situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digoxin</td>
<td>&gt; 125µg/d + impaired renal function (GFR &lt; 50ml/min)</td>
</tr>
<tr>
<td>Loop diuretic</td>
<td>1\textsuperscript{st}-line monotherapy for hypertension; ankle edema</td>
</tr>
<tr>
<td>Thiazide diuretic</td>
<td>without heart failure</td>
</tr>
<tr>
<td>B-blocker</td>
<td>COPD; diabetes + frequent hypoglycemic episodes</td>
</tr>
<tr>
<td>Dil/Ver</td>
<td>NYHA class III or IV heart failure</td>
</tr>
<tr>
<td>CCB</td>
<td>chronic constipation</td>
</tr>
<tr>
<td>Vasodilatators</td>
<td>postural hypotension</td>
</tr>
<tr>
<td>Dipyridamole</td>
<td>monotherapy for CV P2</td>
</tr>
<tr>
<td>Aspirin</td>
<td>+VKA/peptic ulcer without antiH2/PPI; ≥ 150 mg/j; dizziness, CV P1</td>
</tr>
<tr>
<td>VKA</td>
<td>+aspirin/clopidogrel:dipyridamole with concurrent bleeding disorder; duration(&gt;6 m and DVT ; 12 m and PE)</td>
</tr>
</tbody>
</table>
STOPP List
65 situations, 29 drugs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Risk situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCA’s</td>
<td>dementia; glaucoma; cardiac conductive abnormalities; constipation; + opiate or CCB; prostatism</td>
</tr>
<tr>
<td>BZDs</td>
<td>fall; Long-term long-acting</td>
</tr>
<tr>
<td>Neuroleptics</td>
<td>fall; Long-term+Parkinson; phenothiazines+epilepsy; long-term as hypnotic</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>to treat side effects of neuroleptics; antispasmodic drugs+chronic constipation</td>
</tr>
<tr>
<td>SSRI’s</td>
<td>hyponatremia (&lt; 130 mEq/L)</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>of first-generation antihistamines &gt; 1 week; fall</td>
</tr>
<tr>
<td>Loperamide</td>
<td>diarrhea of unknown cause; severe infective gastroenteritis</td>
</tr>
<tr>
<td>Codéine</td>
<td>diarrhea of unknown cause; severe infective gastroenteritis</td>
</tr>
<tr>
<td>IPP</td>
<td>for peptic ulcer disease at full therapeutic dosage &gt; 8 weeks</td>
</tr>
</tbody>
</table>
### STOPP List

**65 situations, 29 drugs**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Risk situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theophylline</td>
<td>monotherapy for COPD</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>systemic instead of inhaled in moderate-severe COPD; monotherapy for rheumatoid arthritis or osterarthritis</td>
</tr>
<tr>
<td>Ipratropium</td>
<td>glaucoma</td>
</tr>
<tr>
<td>NSAID</td>
<td>peptic ulcer without antiH2/PPI; moderate-to-severe hypertension; heart failure; mild osteoarthritis; +VKA; chronic renal failure; long-term to treat gout + no CI to allopurinol</td>
</tr>
<tr>
<td>Colchicine</td>
<td>long-term to treat gout + no CI to allopurinol</td>
</tr>
<tr>
<td>Anti-diabetics</td>
<td>long-acting (glibenclamide, chlorpropamide)</td>
</tr>
<tr>
<td>Estrogens</td>
<td>breast cancer or venous thromboembolism; without progestogen in patients with intact uterus</td>
</tr>
<tr>
<td>α-blockers</td>
<td>♂ incontinence; long-term urinary catheter</td>
</tr>
<tr>
<td>Antimuscarinic</td>
<td>dementia; glaucoma; prostatism; constipation</td>
</tr>
<tr>
<td>Opiates</td>
<td>fall; powerful as 1st-line for mild-to-moderate pain; &gt;2w with constipation without laxatives; dementia unless palliative care/management of moderate/severe chronic pain syndrome</td>
</tr>
</tbody>
</table>
Purpose

To study the performance of STOPP in detecting inappropriate prescribing (IP) and related acute hospital admission in frail older people.
Methods

- **Study**: transversal retrospective study

- **Eligibility**:
  - acute hospital admission (not in a geriatric unit) in 2008
  - age ≥ 75 years
  - frailty score ISAR ≥ 2/6
  - CGA by the geriatric liaison team

- **Data collection**
  - **geriatric**: social situation, functional/mental status, nutrition
  - **medical**:
    - detailed medical history/comorbidities (including GFR)
    - drug list at home
    - Main reason for admission
Methods

- **End points**
  - IP events at home
  - Hospitalisation related to IP
    - *IP = inappropriate prescription = the patient receives a drug he should not receive according to STOPP criteria*

- **Analyses**
  - Comparison of drug list according to STOPP criteria by a clinical pharmacist and a geriatrician to detect IP
  - Frequency measures (prevalence, proportion)
  - Determination of relation between hospital admission and IP based on clinical judgement.
Results 1: population characteristics

302 frail older people
Age 84 years ± 5; ♀ 62 %
Home 83 % (alone 43 %) vs. nursing home 17 %
ISAR score: 2 - 6 / 6; average 3,5 ± 1

- Geriatric Syndromes
  - falls (58 %),
  - malnutrition (30 %),
  - cognitive decline (25 %),
  - depression (25 %)

- Co-morbidities
  - hypertension (55 %),
  - ischemic CV diseases (40 %),
  - osteoporosis (26 %),
  - atrial fibrillation (25 %),
  - diabetes (23 %),
  - COPD (15 %)
Results 2: drugs before admission

Drugs:

2.028 drugs (7±3)
≥ 5 drugs/day : 74 %

Detection of 210 IP events
in 2.028 medications at home (~1 drug/ 10)
in 144 patients (144/302) : prevalence 48 % (~1 patient/ 2)

Distribution : 0 (52 %), 1 (29 %), 2 (16 %), ≥ 3 (3 %)
Results 2: drugs before admission

Multivariate analysis

- significantly associated with:
  - history of recent falls [OR 2.7; 95%CI 1.6-4.7]
  - polymedication [OR 1.9; 1.1-3.5].
- Positive trend for association with diabetes, [OR 1.8; 0.98-3.4; p=0.06].
- No significant association was observed with any co-morbidity
Results 2: IP according to STOPP drug classes

[prevalence /302 patients] (proportion /210 IP):

- BZD [23 %] (0.33)
- Aspirine [11 %] (0.17)
- Opiates [8%] (0.11)
- B-blocker [6%] (0.09)

- Following: TCA’s, Neuroleptics, Corticoïds, NSAID [2-5%]

- Others [< 2 %] (<0.04)
Results 2: IP according to STOPP “drugs adversely affecting fallers”

- 176 of 302 patients (58%) received “drugs adversely affecting fallers”

- 112 of 210 IP events (53%) were “drugs adversely affecting fallers”
  - previous falls and benzodiazepines 70,
  - opiates 24,
  - neuroleptics 13,
  - antihistamines 5.
Results 3: hospital admissions (n=302)

- The most frequent main reasons for acute hospital admission were
  - Cardio-respiratory symptoms: 113
  - Falls: 104
  - Abdominal reason: 38
  - Infection: 31
  - Other: 16
Results 3: hospital admissions and IP events

- Hospital admission was related to IP in 54 patients (18%),
  - 47 falls (46 fractures + 1 other)
  - 4 abdominal problem (contipation, hemorrhages)
  - 2 cardio-thoracic problem (NSAID+heart failure)
  - 1 other
Results 3: hospital admissions and IP events

- 54 of the 302 hospital admissions related to IP

Multivariate analyses:
- predictors of IP-related admission
  - history of previous falls (p<0.001)
  - nursing home residency (p=0.05)
Results 3: hospital admissions and “drugs adversely affecting fallers”

- 46 patients were admitted for fall with fracture while receiving “drugs adversely affecting fallers” despite history of recent fall.
  - 66 IP events
    - BZDs: 38
    - Opiates: 13
    - Neuroleptics: 12
    - Antihistamines: 3
  - The use of “drugs adversely affecting fallers” was associated with IP-related hospital admission.
    - OR 5.2 [2.3-11.5] p<0.001
Conclusions

1. IP in frail older persons at home according to STOPP
   □ 1 prescription/10; 1 patient/2
   □ Most frequent ones: BZD, Aspirine, Opiates, B-blocker
   □ 1 IP event/2 was drugs adversely affecting fallers
      ■ mainly benzodiazepines
      ■ which contributed 1/6 acute hospital admissions

2. 1 acute hospital admission/5 was related to IP events
   □ Mainly for fall

⇒ Screening for fall history, benzodiazepine use and treatment modification are of paramount importance in frail older persons.