Seminar M1
Inspired by STOPP/START:
a new prescription screening tool for adult patients

QUESTION 1
What is the most frequently observed drug-related problem among geriatric patients?

GREEN underprescription
RED overprescription
Seminar M1
Inspired by STOPP/START:
a new prescription screening tool for adult patients

QUESTION 2
What is the most frequently observed drug-related problem among internal medicine patients?

GREEN underprescription
RED overprescription
QUESTION 3

A 50 years patient is known for an ischaemic cardiopathy and a congestive systolic heart failure. He receives aspirin, metoprolol and atorvastatin. Is there a problem of:

GREEN underprescription

RED overprescription
STOPP

Screening Tool of Older Person’s Prescriptions

How can we effectively detect potentially inappropriate prescribing in old age?

START

Screening Tool to Alert doctors to Right Treatment
I have no conflict of interest to declare with respect to this symposium

Pr. P.-O. Lang
Heterogeneous group
Older people are often a heterogeneous group for which they are prescribed multiple medications.
Older people are often part of a heterogeneous group, which may lead to multiple comorbidities. This can increase the risk of adverse drug events (ADEs), drug-drug interactions, and drug-disease interactions, particularly since they are prescribed multiple medications. 

References:
- Spinewine A. Lancet 2007
- Klarin I. Drugs Aging 2005
- Lazarou J. JAMA 1998
Older people form a heterogeneous group often with multiple comorbidities.

Number of Emergency Department Visits for Adverse Effects of Medical Treatment

$\text{ADEs} = 30\% \text{ community-dwelling older people}$

**INAPPROPRIATE PRESCRIBING**

$\text{= MAJOR CAUSE OF DRPs}$

$\text{ADEs} = 30\% \text{ of hospital admissions of older people}$

Note: Data for 1994-2000 are 2-year averages.

Source: CDC, NHHS, National Hospital Ambulatory Medical Care Survey

For which they are prescribed multiple medications.

Spinewine A. Lancet 2007  
Klarin I. Drugs Aging 2005  
Lazarou J. JAMA 1998
Definition

**APPROPRIATE**
prescribing medication

**INAPPROPRIATE**
prescribing medication

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**It encompasses the use of medicines**

- clinically indicated
- at a right frequency and right periods
- with acceptable risks of adverse drug-drug interactions
- with acceptable risks of adverse drug-disease(s) interactions
- and prescribed with respect to patients’ life expectancy and disabilities

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**It encompasses the use of medicines**

- no clinically indicated
- at a higher frequency and/or longer periods than clinically indicated
- with high risks of adverse drug-drug interactions
- with high risks of adverse drug-disease interactions
- where adverse drug event outweighs the clinical benefit

---

Gallagher P. Int J Pharmaco Ther 2007
Definition

**APPROPRIATE prescribing medication**

- clinically indicated
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**INAPPROPRIATE prescribing medication**

- no clinically indicated
- at a higher frequency and/or longer periods than clinically indicated
- with high risks of adverse drug-drug interactions
- with high risks of adverse drug-disease interactions
- where adverse drug event outweighs the clinical benefit
- and the UNDER-USE of medicines that are clinically indicated

Gallagher P. Int J Pharmaco Ther 2007
Rochon PA. JAMA 1999
Review of the literature

**Systematic prescriptions review**
Based on explicit and implicit criteria for inappropriate prescribing

Beers MH. Arch Intern Med 1991
Hanlon JT. J Clin Epidemiol 1992
Fick DM. Arch Intern Med. 2003
Review of the literature

Systematic prescriptions review
Based on explicit and implicit criteria for inappropriate prescribing

**Appeared as**
- an attractive solution for limiting **PIM**
- an attractive solution for limiting **DRPs**

References:
- Beers MH. Arch Intern Med 1991
- Hanlon JT. J Clin Epidemiol 1992
- Fick DM. Arch Intern Med. 2003
Review of the literature

Systematic prescriptions review
Based on explicit and implicit criteria for inappropriate prescribing

APPEARED AS
- an attractive solution for limiting PIM
- an attractive solution for limiting DRPs

AVAILABLE TOOLS
- Beers’ criteria
- IPET – Improved Prescribing in the Elderly Tool
- MAI – Medication Appropriateness Index
- ACOVE – Assessing care of Vulnerable Elder under-use criteria

Beers MH. Arch Intern Med 1991
Hanlon JT. J Clin Epidemiol 1992
Fick DM. Arch Intern Med. 2003
Review of the literature

**Beers’ criteria (2003)**
The first well-organised list of common errors of prescribing in older people

Beers MH. Arch Intern Med 1991
Beers MH. Arch Intern Med 1997
Fick DM. Arch Intern Med 2003
Review of the literature

**Beers’ criteria (2003)**
The first well-organised list of common errors of prescribing in older people

**H O W E V E R**

Several deficiencies militate against their widespread use in European countries


O’Mahony D. European Geriatric Med 2010
Beers' criteria (2003)
The first well-organised list of common errors of prescribing in older people

<table>
<thead>
<tr>
<th>Drugs listed in Beers' criteria that are rarely used in European practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethobenzamide</td>
</tr>
<tr>
<td>Metaxalone</td>
</tr>
<tr>
<td>Halazepam</td>
</tr>
<tr>
<td>Hydroxyzine</td>
</tr>
<tr>
<td>Cyclandelate</td>
</tr>
<tr>
<td>Guaniedrel</td>
</tr>
<tr>
<td>Mesoridazine</td>
</tr>
<tr>
<td>Amphetamines</td>
</tr>
<tr>
<td>Dyclomine</td>
</tr>
</tbody>
</table>

29/78 medications are obsolete or no longer available in Europe

O'Mahony D. European Geriatric Med 2010
Beers’ criteria (2003)
The first well-organised list of common errors of prescribing in older people

HOWEVER

Drugs listed in Beers’ criteria that are not actually contra-indicated in older people, according to up-to-date evidence based drug formularies

<table>
<thead>
<tr>
<th>Amitriptyline</th>
<th>Nitrofurantoine</th>
<th>Amiodarone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxazosin (α-blocker)</td>
<td>Propanolol</td>
<td></td>
</tr>
</tbody>
</table>

Beers’ criteria do not included several important instances of potentially inappropriate prescribing

<table>
<thead>
<tr>
<th>Drug-drug interaction</th>
<th>Drug class prescription duplication</th>
<th>Prescribing omission</th>
</tr>
</thead>
</table>

O’Mahony D. European Geriatric Med 2010
Some prescriptions to be avoided in elderly patients that are not mentioned in Beers’ criteria (2003)

<table>
<thead>
<tr>
<th>Medication</th>
<th>Indication/Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop diuretic</td>
<td>For dependent ankle edema only i.e. no clinical signs of heart failure</td>
</tr>
<tr>
<td>Thiazide diuretic</td>
<td>With a history of gout</td>
</tr>
<tr>
<td>Aspirin</td>
<td>To treat dizziness not clearly attributable to cerebrovascular disease</td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
<td>With glaucoma</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>To treat extrapyramidal side-effects of neuroleptic medications</td>
</tr>
<tr>
<td>Proton pomp inhibitor</td>
<td>For peptic ulcer at full therapeutic dosage for &gt; 8 weeks</td>
</tr>
<tr>
<td>Theophylline</td>
<td>As monotherapy for COPD</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>With heart failure</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>With chronic renal failure</td>
</tr>
<tr>
<td>Vasodilator drugs</td>
<td>With persistent postural hypotension</td>
</tr>
<tr>
<td>Neuroleptics</td>
<td>And recurrent falls</td>
</tr>
<tr>
<td>Any duplicate drug class</td>
<td>Prescription e.g. two concurrent opiates, NSAIDs, loop diuretics, ...</td>
</tr>
</tbody>
</table>

O’Mahony D. European Geriatric Med 2010
Given these deficiencies of BEERS’ criteria, D. O'Mahony’s research group sets about drafting a new and different set of potentially inappropriate prescribing criteria in older people, based on the following precepts …
Criteria should capture common and important instances of potentially inappropriate prescribing medication.
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Criteria should be organised according to physiological systems, as is the case with most drug formularies.
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Criteria should give special attention to drugs that adversely affect patients at risk of falls.
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Criteria should give special attention to drugs that adversely affect patients at risk of falls.

Criteria should give special attention to opiate use in older people.
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Criteria should give special attention to opiate use in older people.

Duplicate class prescription should be highlighted.
### STOPP
**Screening Tool of Older Person’s Prescriptions**

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### START
**Screening Tool to Alert doctors to Right Treatment**
### STOPP
**Screening Tool of Older Person’s Prescriptions**

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<th>Criteria</th>
<th>Details</th>
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<tr>
<td>The criteria should represent the consensus views of a panel of experts in prescribing in older people.</td>
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**START**
**Screening Tool to Alert doctors to Right Treatment**
STOPP
Screening Tool of Older Person’s Prescriptions

2003
First draft list of potential errors of prescribing commission = 68 STOPP
First draft list of potential errors of prescribing omission = 22 START

2004
Prevalidation pilot study in hospitalised older patients
O’Reilly V. Irish J Med Sci 2004

START
Screening Tool to Alert doctors to Right Treatment
**STO**PP

*Screening Tool of Older Person’s Prescriptions*

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**2006**
Validation by Delphi consensus methodology involving 18 experts in geriatric medicine, clinical pharmacology, clinical pharmacy, old age psychiatry and primary care

**65 STO**PP and **22 START**

Gallagher P. Int J Pharmacol Ther 2008

**START**

*Screening Tool to Alert doctors to Right Treatment*
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START
Screening Tool to Alert doctors to Right Treatment

RESULTS
- Validation in terms of its content
- Validation in terms of its inter-rater reliability
Representing the consensus views of a panel of experts, the STOPP (65)/START (22) criteria:

- capture common instances of potentially inappropriate prescribing
- are organised according to physiological systems
- give special attention to drugs that adversely affect fallers
- give special attention to opiate use in older people
- highlight duplicate class prescription
- address potentially serious errors of prescribing omission
Representing the consensus views of a panel of experts, the STOPP (65) / START (22) criteria:

H. Drugs that adversely affect fallers
1. Benzodiazepines (sedative, may cause reduced sensorium, impair balance) [Tinetti 2003].
2. Neuroleptic drugs (may cause gait dyspraxia, parkinsonism) [Tinetti 2003].
3. First-generation antihistamines (sedative, may impair sensorium) [Sutter et al. 2003].
4. Vasodilator drugs with persistent postural hypotension, i.e. recurrent > 20 mmHg drop in systolic blood pressure (risk of syncope, falls) [Leipzig et al. 1999].

I. Analgesic drugs
1. Use of long-term powerful opiates, e.g. morphine or fentanyl as first-line therapy for mild-to-moderate pain (World Health Organization analgesic ladder not observed) [American Geriatrics Society Panel on Persistent Pain in Older Persons 2002].
2. Regular opiates for more than 2 weeks in those with chronic constipation without concurrent use of laxatives (risk of severe constipation) [Walsh 1999].
3. Long-term opiates in those with dementia unless indicated for palliative care or management of moderate/severe chronic pain syndrome (risk of exacerbation of cognitive impairment) [American Geriatrics Society Panel on Persistent Pain in Older Persons 2002].

J. Duplicate drug classes
Any duplicate drug class prescription, e.g. 2 concurrent opiates, NSAIDs, SSRI's, loop diuretics, ACE inhibitors (optimization of monotherapy within a single drug class should be observed prior to considering a new class of drug).
Representing the consensus views of a panel of experts, the \textbf{87} \textbf{STO\textsuperscript{P}P (65)/START (22)} criteria:

\begin{itemize}
\item \textbf{B. Respiratory system}
\begin{enumerate}
\item Regular inhaled $\beta_2$-agonist or anticholinergic agent for mild-to-moderate asthma or COPD [Buist et al. 2006].
\item Regular inhaled corticosteroid for moderate/severe asthma or COPD, where predicted FEV$_1$ < 50% [Buist et al. 2006].
\item Home continuous oxygen with documented chronic type 1 respiratory failure (pO$_2$ < 8.0 kPa, pCO$_2$ < 6.5 kPa) or type 2 respiratory failure (pO$_2$ < 8.0 kPa, pCO$_2$ > 6.5 kPa) [Cranston et al. 2005, Buist et al. 2006].
\end{enumerate}

\item \textbf{C. Central nervous system}
\begin{enumerate}
\item L-DOPA in idiopathic Parkinson's disease with definite functional impairment and resultant disability [Kurlan 1998, Danisi 2002].
\item Antidepressant drug in the presence of moderate/severe depressive symptoms lasting at least three months [Lebowitz et al. 1997, Wilson et al. 2006].
\end{enumerate}

\item \textbf{D. Gastrointestinal system}
\begin{enumerate}
\item Proton pump inhibitor with severe gastroesophageal acid reflux disease or peptic stricture requiring dilation [Hungin and Raghunath 2004].
\item Fiber supplement for chronic, symptomatic diverticular disease with constipation [Aldoori et al. 1994].
\end{enumerate}
\end{itemize}
STOPP/START criteria were never meant to replace clinical judgement that is based on high-level clinical skills and knowledge; rather they were intended as an aid to routine pharmacotherapy/pharmaceutical care.
Since the first iteration of **STOPP/START** in 2008

- More than 111 publications describing the use of this set of criteria (>80 original research articles in various clinical scenarios, originate from 24 countries)

- **STOPP** criteria are associated with ADEs, unlike Beers 2003 criteria
- **STOPP/START** criteria as an intervention applied at single time improve medication appropriateness
- **STOPP/START** criteria as an intervention applied within 72h of admission reduce ADRs and average length of stay by 3 days

- This set of criteria has been adapted into different languages (Czech language, French, and Spanish)

In 2014, an updated version of **STOPP/START**.v2 has been published

- Some criteria were no longer considered completely accurate and relevant
- The licensing of important new drugs since 2008
- The recognition of a more extensive list of PIMs than originally included
IP is a major public health problem and commonly presents in older population.

ADEs-associated morbidity can be effectively prevented by using a systematic prescription review + a prescribing optimization.

In this objective, STOPP/START appears as a tool:
- that captures common instances of potentially IP, including PO
- that is well designed (according to physiological systems)
- that is easy and quick to use (< 2 minutes)
- with a good inter-rater reliability (physician, pharmacist)
Screening Tool of Older Person's Prescriptions

I DO THANK YOU FOR YOUR ATTENTION

Screening Tool to Alert doctors to Right Treatment