Explicit and implicit checklists and possible tools supporting the execution of a medication review

Nejc Horvat, M.Pharm., PhD
Chair of Social Pharmacy
University of Ljubljana - Faculty of Pharmacy
Appropriate prescribing

- medications have clear, scientific-based indication (efficiency)
- well tolerated (safety)
- cost effective
- respect patient’s preferences, individualised (≠ rational prescribing)

criteria, tools, guidelines to assess appropriateness of prescriptions
### Implicit and explicit tools

<table>
<thead>
<tr>
<th>explicit (criterion-based)</th>
<th>implicit (judgement-based)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• developed from literature reviews, expert opinions, consensus techniques</td>
<td></td>
</tr>
<tr>
<td>• lists of drugs, drug-classes, dosages known to cause harmful effects (drug/disease specific)</td>
<td></td>
</tr>
<tr>
<td>• applied with little/no clinical judgement</td>
<td></td>
</tr>
<tr>
<td>• low cost</td>
<td></td>
</tr>
<tr>
<td>• don’t address burden of co-morbidities, patient preferences =&gt; rigid standards</td>
<td></td>
</tr>
<tr>
<td>• regular updates are needed</td>
<td></td>
</tr>
<tr>
<td>• country-specific adaption necessary</td>
<td></td>
</tr>
<tr>
<td>• e.g. statement: „Avoid benzodiazepines (any type) for treatment of insomnia, agitation, or delirium in older adults.“ (Beers, 2012)</td>
<td></td>
</tr>
<tr>
<td>• e.g. tools: Beers, McLeod, START, STOPP, PRISCUS</td>
<td></td>
</tr>
<tr>
<td>• rely on expert professional judgement</td>
<td></td>
</tr>
<tr>
<td>• focus on the patient, address entire medication regimen (patient specific)</td>
<td></td>
</tr>
<tr>
<td>• time consuming</td>
<td></td>
</tr>
<tr>
<td>• low reliability</td>
<td></td>
</tr>
<tr>
<td>• e.g. statement: „Is there an indication for the drug?“ (Medication Appropriateness Index)</td>
<td></td>
</tr>
<tr>
<td>• e.g. tools: MAI, Lipton criteria</td>
<td></td>
</tr>
</tbody>
</table>

**combinations**
Beers criteria (USA)

- first developed in 1991 for nursing home residents using consensus techniques
- potentially inappropriate drugs for people aged ≥ 65
- 19 medications/classes to avoid generally + 11 medications for which doses, frequencies, durations should not be exceeded

**Beers 1997**
- 28 generally avoided medications/classes
- 15 conditions and medications that should be avoided in these conditions

**Beers 2003**
- 48 generally avoided medications/classes
- 20 conditions and medications that should be avoided in these conditions

**Beers 2012**
- 34 generally avoided medications/classes
- 14 conditions and medications that should be avoided in these conditions
- 5 medication to be used with caution
Beers criteria (USA)

- includes:
  - strength of recommendation: strong, weak, insufficient
  - quality of evidence: high, moderate, low

- most used set of criteria worldwide

Beers criteria (USA)

- numerous modifications

STOPP (Screening Tool of Older Person’s potentially inappropriate Prescriptions)

- 2008, Ireland, consensus techniques

- aged ≥ 65

- 65 criteria arranged according to physiological system accompanied by explanation why the prescription is potentially inappropriate (overprescribing)

- updated 2014: 80 criteria

- e.g. „Beta-blocker in combination with verapamil or diltiazem (risk of heart block).“

- available at: http://ageing.oxfordjournals.org/content/early/2014/11/18/ageing.afu145.full.pdf+html (the tools available to subscribers in Age and Ageing online)
START (Screening Tool to Alert doctors to the Right Treatment)

- 2008, Ireland, consensus techniques
- aged ≥ 65
- 22 medications arranged according to physiological system (they are effecting) that should be considered for people with certain conditions (underprescribing)
- updated 2014: 34 medications
- e.g. „Beta-blocker with ischaemic heart disease.“
- available at: http://ageing.oxfordjournals.org/content/early/2014/11/18/ageing.afu145.full.pdf+html (the tools available to subscribers in Age and Ageing online)
PRISCUS list

- Latin „ancient“
- aged ≥ 65
- 83 potentially inappropriate medications, designed for German health-care system
- provides main concerns, possible therapeutic alternatives and precautions

<table>
<thead>
<tr>
<th>Medication</th>
<th>Main concerns (selected)</th>
<th>Possible therapeutic alternatives</th>
<th>Precautions to be taken when these medications are used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesics, anti-inflammatory drugs</td>
<td>Indomethacin, Acetaminophen, Ketoprofen, Naproxen, Meloxicam, Phenytoin, Etoricoxib</td>
<td>Very high risk of gastrointestinal hemorrhage, ulceration, or perforation, which may be fatal</td>
<td>Paracetamol, (weak) opioids (transadlol, codeine), weak NSAID (e.g., ibuprofen)</td>
</tr>
</tbody>
</table>
MAI (Medication Appropriateness Index)

- Implicit
- 1992, USA, expert panel
- All age groups
- 10 questions
- 3-point Likert scale (appropriate- marginally appropriate- inappropriate)
- Weighted score 0-18


<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there an indication for the drug? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the medication effective for the condition? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the dosage correct? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the directions correct? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the directions practical? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there clinically significant drug–drug interactions? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there clinically significant drug–disease/condition interactions? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there unnecessary duplication with other drug(s)? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the duration of therapy acceptable? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is this drug the least expensive alternative compared to others of equal utility? Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Complete instructions in the use of the scale are available upon request.
†Don’t know.
Australian prescribing indicators tool

- combination explicit + implicit
- 2008, Australia, clinical guidelines (2012 validated by consensus technique)
- aged ≥ 65

- 41 prescribing indicators + criteria usage information
  - avoidable medications in certain conditions
    - e.g. „Patient with cardiovascular disease is NOT taking an NSAID.“
  - recommended treatment in certain conditions
    - e.g. „Patient at high risk of a recurrent cardiovascular event is taking a statin.“
  - medication monitoring
    - e.g. „Patient taking warfarin for AF has an INR between 2 and 3.“
  - interactions
    - e.g. „Patient has no clinically significant medication interactions (agreement between two medication interaction databases).“
  - smoking, vaccination, ...

- available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3467596/
Tools: are they of any use?

▶ Beers criteria:
- higher probability of hospitalization with ≥2 potentially inappropriate medications-PIM (Ruggiero, 2010).
- Significantly increased risk of ADR in elderly with ≥1 PIM. (Passarelli, 2005)
- Increased risk of hospitalization, death with PIM. (Dedhiya, 2010)
- Increased risk of falling when using PIM. (Gallagher, 2008)

▶ STOPP/START criteria as an intervention:
- applied at a single time point during hospitalization for acute illness in older people significantly improve medication appropriateness, an effect that is maintained 6 months post-intervention. (Gallagher, 2011)
- Applied within 72 h of admission significantly reduce ADRs and average length of stay by 3 days in older people hospitalized with unselected acute illnesses. (O'Connor, 2013)

▶ STOPP criteria medications are significantly associated with adverse drug events. (Hamilton, 2011)

▶ MAI: higher MAI scores related to higher probability of hospitalization (Schmader, 1997)
Tools: are they of any use?

- a substitute for the prescriber’s careful clinical decision making
- alert health care professionals to the likelihood of inappropriate prescribing
Literature


