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

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Appropriate prescribing

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

challenge

criteria, tools, guidelines
to assess appropriateness
of prescriptions

Implicit and explicit tools

explicit (criterion-based)

- developed from literature reviews, expert opinions, consensus techniques
- lists of drugs, drug-classes, dosages known to cause harmful effects (drug/disease specific)
- applied with little/no clinical judgement
- low cost
- don‘t address burden of co-morbidities, patient preferences => rigid standards
- regular updates are needed
- country-specific adaption necessary
- e.g. statement: „Avoid benzodiazepines (any type) for treatment of insomnia, agitation, or delirium in older adults.“ (Beers, 2012)
- e.g. tools: Beers, McLeod, START, STOPP, PRISCUS

implicit (judgement-based)

- rely on expert professional judgement
- focus on the patient, address entire medication regimen (patient specific)
- time consuming
- low reliability
- e.g. statement: „Is there an indication for the drug?“ (Medication Appropriateness Index)
- e.g. tools: MAI, Lipton criteria

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
- updated 1997, 2003, 2012

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

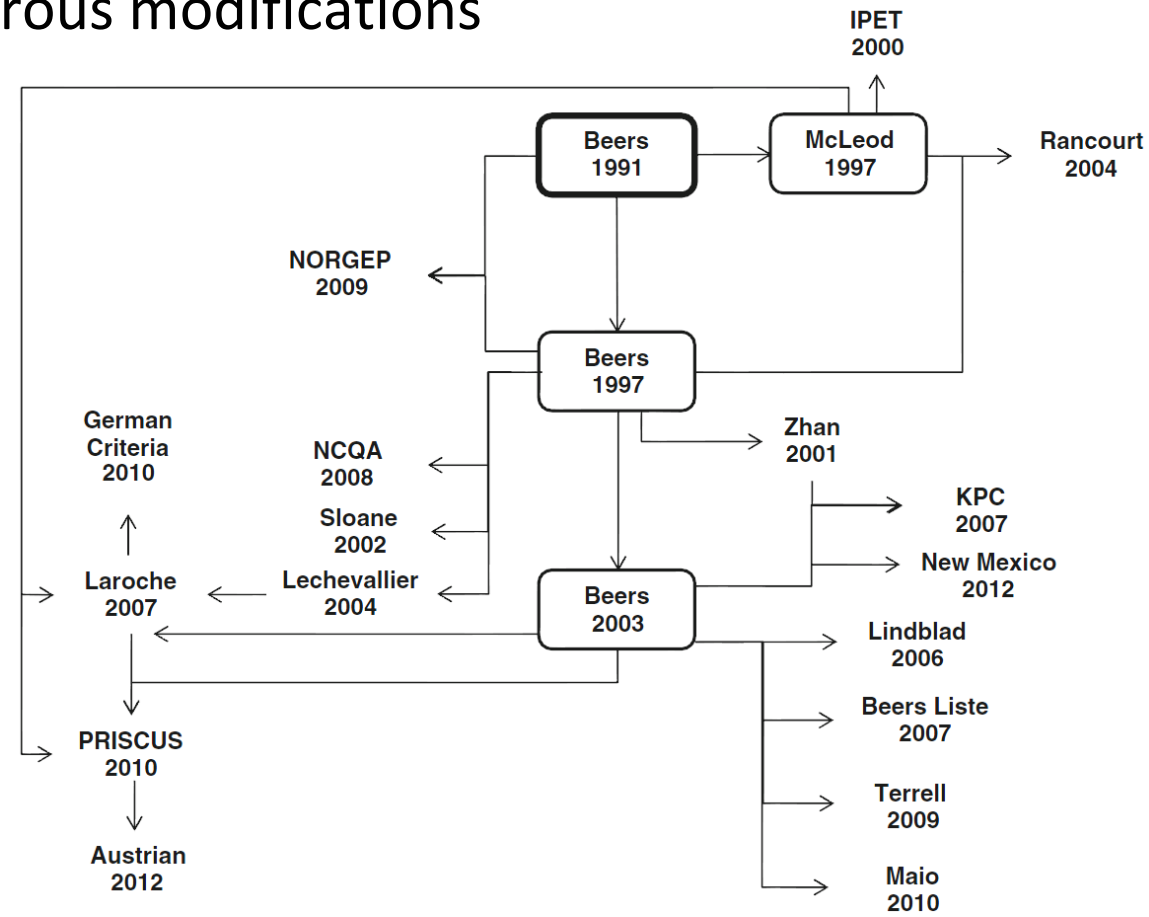
Beers criteria (USA)

- includes:
  - strength of recommendation: strong, weak, insufficient
  - quality of evidence: high, moderate, low
- most used set of criteria worldwide
- available at: http://www.americangeriatrics.org/files/documents/beers/2012BeersCriteria_JAGS.pdf

Organ System or Therapeutic Category or Drug	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Barbiturates Amobarbital* Butabarbital* Butalbital Mephobarbital* Pentobarbital* Phenobarbital Secobarbital*	High rate of physical dependence; tolerance to sleep benefits; risk of overdose at low dosages	Avoid	High	Strong

Beers criteria (USA)

- numerous modifications



*Kaufmann CP, Tremp R, Hersberger KE, Lampert ML. Inappropriate prescribing: a systematic overview of published assessment tools. Eur J Clin Pharmacol. 2014 Jan;70(1):1-11. doi: 10.1007/s00228-013-1575-8.

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“
- 2010, Germany, consensus techniques, based on Beers 1997/2003, McLeod 1997, Laroche 2007
- aged ≥ 65
- 83 potentially inappropriate medications, designed for German health-care system
- provides main concerns, possible therapeutic alternatives and precautions
- available at: http://priscus.net/download/PRISCUS-Liste_PRISCUS-TP3_2011.pdf (in German), http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2933536/

Medication	Main concerns (selected)	Possible therapeutic alternatives	Precautions to be taken when these medications are used
Analgesics, anti-inflammatory drugs			
NSAID • indometacin • acemetacin* • ketoprofen* • piroxicam • meloxicam* • phenylbutazone • etoricoxib	• very high risk of gastrointestinal hemorrhage, ulceration, or perforation, which may be fatal • indometacin: central nervous disturbances • phenylbutazone: blood dyscrasia • etoricoxib: cardiovascular contraindications	• paracetamol • (weak) opioids (tramadol, codeine) • weak NSAID (e.g., ibuprofen)	• use in combination with protective agents, e.g., PPI • follow-up for gastrointestinal manifestations (gastritis, ulcer, hemorrhage) • monitoring of renal function • monitoring of cardiovascular function (blood pressure, signs of congestive heart failure) • dosing recommendation: shortest possible duration of therapy • phenylbutazone: monitoring of blood counts as well

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

To assess the appropriateness of the drug, please answer the following questions and circle the applicable score:

1. Is there an indication for the drug? Comments:	1 Indicated	2	3 Not Indicated	9 DK†
2. Is the medication effective for the condition? Comments:	1 Effective	2	3 Ineffective	9 DK
3. Is the dosage correct? Comments:	1 Correct	2	3 Incorrect	9 DK
4. Are the directions correct? Comments:	1 Correct	2	3 Incorrect	9 DK
5. Are the directions practical? Comments:	1 Practical	2	3 Impractical	9 DK
6. Are there clinically significant drug–drug interactions? Comments:	1 Insignificant	2	3 Significant	9 DK
7. Are there clinically significant drug–disease/condition interactions? Comments:	1 Insignificant	2	3 Significant	9 DK
8. Is there unnecessary duplication with other drug(s)? Comments:	1 Necessary	2	3 Unnecessary	9 DK
9. Is the duration of therapy acceptable? Comments:	1 Acceptable	2	3 Unacceptable	9 DK
10. Is this drug the least expensive alternative compared to others of equal utility? Comments:	1 Least expensive	2	3 Most expensive	9 DK

*Complete instructions in the use of the scale are available upon request.
†Don't know.

Hanlon JT et al(1992) A method for assessing drug therapy appropriateness. J Clin Epidemiol 45(10):1045–1051

Australian prescribing indicators tool

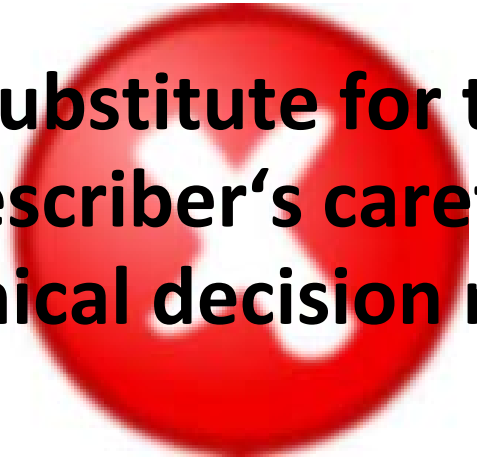
- combination explicit + implicit
- 2008, Australia, clinical guidelines (2012 validated by consensus technique)
- aged ≥ 65
- 41 prescribing indicators + criteria usage information
  - avoidable medications in certain conditions
    - e.g. „Patient with cardiovascular disease is NOT taking an NSAID.“
  - 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

- Kaufmann CP, Tremp R, Hersberger KE, Lampert ML. Inappropriate prescribing: a systematic overview of published assessment tools. Eur J Clin Pharmacol. 2014 Jan;70(1):1-11. doi: 10.1007/s00228-013-1575-8.
- O'Connor MN, Gallagher P, O'Mahony D. Inappropriate prescribing: criteria, detection and prevention. Drugs Aging. 2012 Jun 1;29(6):437-52.
- American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012 Apr;60(4):616-31.
- O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2014 Oct 16.
- Holt S, Schmiedl S, Thürmann PA. Potentially inappropriate medications in the elderly: the PRISCUS list. Dtsch Arztebl Int. 2010 Aug;107(31-32):543-51.
- Basger BJ, Chen TF, Moles RJ. Validation of prescribing appropriateness criteria for older Australians using the RAND/UCLA appropriateness method. BMJ Open. 2012 Sep 14;2(5).
- Hanlon JT, Schmader KE, Samsa GP, Weinberger M, Uttech KM, Lewis IK, Cohen HJ, Feussner JR. A method for assessing drug therapy appropriateness. J Clin Epidemiol. 1992 Oct;45(10):1045-51.