

What's New in the Patient Safety World

October 2018

STOPP/START/STRIP

In addition to Beers' List, we have described the START and STOPP tools for avoiding prescribing potentially inappropriate medications. Now we also have STRIP (Systematic Tool to Reduce Inappropriate Prescribing).

The STRIP combines both implicit and explicit prescribing tools ([Drenth-van Maanen 2018](#)). **Explicit** prescribing tools are usually developed on the basis of literature reviews, expert opinion, and consensus. These often include lists of drugs or drug classes to be avoided in older people because these drugs have an increased risk of negative outcomes or potential adverse consequences in this population. Beers' criteria and the START and STOPP tools are examples of explicit criteria.

On the other hand, **implicit** criteria use the knowledge or expertise a clinician or pharmacist can apply to any prescription. For example, they may take into account such patient-related factors like comorbidities, patient preferences, or previously unsuccessful treatment approaches.

STRIP has actually been around for some time now and has been shown to be effective in helping final-year medical students improve their prescribing skills ([Keijsers 2014](#)). Another study showed that physicians were able to significantly improve medication optimization for polypharmacy patients with the online STRIP Assistant tool ([Meulendijk 2015](#)). Appropriate decisions increased from 58% without the STRIP Assistant to 76% with it, and inappropriate decisions decreased from 42% without the STRIP Assistant to 24% with it. However, that came at a time expense. More time was spent optimizing medication with the STRIP Assistant (24 min.) than without it (13 min.), perhaps accounting for a marginal user satisfaction rating.

The STRIP consists of 5 steps:

1. medication assessment
2. pharmacotherapy review
3. pharmaceutical care plan
4. shared decision-making
5. follow-up and monitoring

The medication history/assessment consists of 10 topics:

1. Actual medication use
2. Use of herbal medications and/or self-care medications
3. Patient's expectations of his or her medications
4. Patient's previous experiences with medications

5. Patient's attitude towards taking medication
6. Complaints due to insufficient effect of medications
7. Allergies and adverse effects of medications
8. Follow-up of intake instructions (eg, taking the medication half an hour before breakfast)
9. Practical problems with medications use (eg, unable to swallow the medication)
10. Reasons for deviations from the medication regimen

The second step is the pharmacotherapy review. Here the patient's current morbidities and symptoms should be matched with the medications used by the patient. Additional information, such as blood pressure, weight, estimated glomerular filtration rate, and HbA1c are taken into consideration. Once therapeutic aims have been formulated, the medication list is checked for underprescribing, ineffective prescribing, overprescribing, side effects, contraindications, and drug-drug and drug-disease interactions, incorrect dosages/dosing frequencies, and practical intake issues. This is also where the START and STOPP criteria are implemented.

The third step is the pharmaceutical care plan, which sets:

- therapeutic aims
- relevant pharmacotherapy-related problems
- priority of these pharmacotherapy-related problems
- interventions, including the person responsible for these interventions
- how, when, and by whom the effect of these interventions will be evaluated

The fourth step, shared decision-making, takes into account patient preferences and addresses other problems that might interfere with the patient's ability to comply with the treatment plan.

The fifth step, followup and monitoring, is very important and one that often gets neglected. Note that you specified in Step 3 how, when, and by whom the interventions will be evaluated.

And note that we did not call the fifth step the last step. That's because the whole process is a cycle and one moves from Step 5 back to Step 1 and we start all over again.

The ongoing OPERAM study in Europe is investigating the effect of STRIP use on clinical and economic outcomes. A [video demonstration of the online STRIP Assistant tool](#) is available online (make sure you click the full screen icon so you can see details).

Another recently published study did not use the STRIP tool but did use two explicit criteria, the START and STOPP tools, to study the impact of prescribing at hospital discharge ([Counter 2018](#)). Counter and colleagues showed that the presence of potentially inappropriate medications (PIMs) and potential prescribing omissions (PPOs) in older adults discharged from hospital is significantly associated with repeated hospital admissions and mortality, respectively. Prescription of more than five medications was significantly associated with PIMs and PPOs. Presence of a PIM was associated with

three or more readmissions (odds ratio 2.43) and PPO's were associated with mortality (OR 1.88). This, of course, was a retrospective study. It would be interesting to see how something, like the STRIP tool, applied proactively would impact readmissions and mortality.

Inappropriate prescribing, particularly in the elderly, remains a significant patient safety issue. Add the STRIP tool to our armamentarium to combat such inappropriate prescribing.

Of course, the other very important part of medication management in all patients, not just the elderly, is **medication reconciliation** performed at all transitions of care. Regarding medication reconciliation, there is some recent disappointing news. Five hospitals implemented a standardized approach to admission and discharge medication reconciliation using an evidence-based toolkit with longitudinal mentorship from the study investigators ([Schnipper 2018](#)). Each study site used a pharmacist and a hospitalist to implement the toolkit with 11 intervention components. Unfortunately, though there was a reduction in total medication discrepancies, overall potentially harmful discrepancies did not decrease over time beyond baseline temporal trends. But there were significant differences between the study sites. Sites that successfully implemented the recommended interventions were more likely to achieve reductions in harmful medication discrepancies. Interestingly, sites that had installed new EHR's did not fare as well. Another study ([Horsky 2018](#)) compared 2 different medication reconciliation tools integrated into electronic health record systems (EHRs) and found the manner of presentation may have an important influence. Significantly fewer errors were made with the EHR that presented lists in a side-by-side view, automatically grouped medications by therapeutic class and more effectively identified duplicates. Participants favored that design and indicated that they routinely used several workarounds in the other EHR. Yet another study last year ([Stockton 2017](#)) found medication errors were common after the implementation of electronically prepopulated medication reconciliation forms. The authors recommended that prospective research examine the impact of prepopulated medication reconciliation forms and ensure they do not facilitate errors of commission. We actually highlighted problems with prepopulated medication lists a decade ago (see our December 30, 2008 Patient Safety Tip of the Week "[Unintended Consequences: Is Medication Reconciliation Next?](#)"). Bottom line: we still have a long way to go for optimal medication reconciliation.

Some of our past columns on Beers' List and Inappropriate Prescribing in the Elderly:

- January 15, 2008 "[Managing Dangerous Medications in the Elderly](#)"
- June 2008 "[Potentially Inappropriate Medication Use in Elderly Hospitalized Patients](#)"
- October 19, 2010 "[Optimizing Medications in the Elderly](#)"
- September 22, 2009 "[Psychotropic Drugs and Falls in the SNF](#)"
- September 2010 "[Beers List and CPOE](#)"

- June 21, 2011 “[STOPP Using Beers’ List?](#)”
- December 2011 “[Beers’ Criteria Update in the Works](#)”
- May 7, 2013 “[Drug Errors in the Home](#)”
- November 12, 2013 “[More on Inappropriate Meds in the Elderly](#)”
- January 28, 2014 “[Is Polypharmacy Always Bad?](#)”
- March 4, 2014 “[Evidence-Based Prescribing and Deprescribing in the Elderly](#)”
- September 30, 2014 “[More on Deprescribing](#)”
- February 10, 2015 “[The Anticholinergic Burden and Dementia](#)”
- May 2015 “[Hospitalization: Missed Opportunity to Deprescribe](#)”
- July 2015 “[Tools for Deprescribing](#)”
- November 2015 “[Medications Most Likely to Harm the Elderly Are...](#)”
- August 2, 2016 “[Drugs in the Elderly: The Goldilocks Story](#)”
- October 31, 2017 “[Target Drugs for Deprescribing](#)”
- January 2018 “[What Happens After Delirium?](#)”
- May 2018 “[Antipsychotic Use in Nursing Homes: Progress or Not?](#)”
- June 2018 “[Deprescribing Benzodiazepine Receptor Agonists](#)”

Some of our past columns on deprescribing:

- March 4, 2014 “[Evidence-Based Prescribing and Deprescribing in the Elderly](#)”
- September 30, 2014 “[More on Deprescribing](#)”
- May 2015 “[Hospitalization: Missed Opportunity to Deprescribe](#)”
- July 2015 “[Tools for Deprescribing](#)”
- April 4, 2017 “[Deprescribing in Long-Term Care](#)”
- October 31, 2017 “[Target Drugs for Deprescribing](#)”
- January 2018 “[What Happens After Delirium?](#)”
- June 2018 “[Deprescribing Benzodiazepine Receptor Agonists](#)”

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