

ORIGINAL ARTICLE

The Systematic Tool to Reduce Inappropriate Prescribing (STRIP): Combining implicit and explicit prescribing tools to improve appropriate prescribing

A. Clara Drenth-van Maanen MD, PhD^{1,2}  | Anne J. Leendertse PharmD, PhD⁵ |

Paul A. F. Jansen MD, PhD^{1,3} | Wilma Knol MD, PhD^{1,2} |

Carolina J. P. W. Keijsers MD, PhD^{2,6} | Michiel C. Meulendijk PhD⁸ |

Rob J. van Marum MD, PhD^{4,7,9}

¹Medical Doctor, Department of Geriatrics, University Medical Center Utrecht, Utrecht, The Netherlands

²Medical Doctor, Expertise Centre Pharmacotherapy for Old Persons (Ephor), Utrecht, The Netherlands

³Retired, Expertise Centre Pharmacotherapy for Old Persons (Ephor), Utrecht, The Netherlands

⁴Professor, Expertise Centre Pharmacotherapy for Old Persons (Ephor), Utrecht, The Netherlands

⁵Pharmacist, Department of General Practice, Julius for Health Sciences and Primary Care, University Medical Centre Utrecht, Utrecht, The Netherlands

⁶Medical Doctor, Department of Geriatrics, Jeroen Bosch Hospital, 's-Hertogenbosch, The Netherlands

⁷Professor, Department of Geriatrics, Jeroen Bosch Hospital, 's-Hertogenbosch, The Netherlands

⁸Data Scientist & Software Developer in Medical Informatics, Department of Information and Computing Sciences, Utrecht University, Utrecht, The Netherlands

⁹Professor, VUmc, Department of General Practice & Elderly Care Medicine, EMGO+ Institute for Health and Care Research, Amsterdam, The Netherlands

Correspondence

A. Clara Drenth-van Maanen, University Medical Center Utrecht, B05.256, PO Box 85500 3508 GA Utrecht, The Netherlands.
Email: clara.drenth@gmail.com

Abstract

Inappropriate prescribing is a major health care issue, especially regarding older patients on polypharmacy. Multiple implicit and explicit prescribing tools have been developed to improve prescribing, but these have hardly ever been used in combination. The Systematic Tool to Reduce Inappropriate Prescribing (STRIP) combines implicit prescribing tools with the explicit Screening Tool to Alert physicians to the Right Treatment and Screening Tool of Older People's potentially inappropriate Prescriptions criteria and has shared decision-making with the patient as a critical step. This article describes the STRIP and its ability to identify potentially inappropriate prescribing.

The STRIP improved general practitioners' and final-year medical students' medication review skills. The Web-application STRIP Assistant was developed to enable health care providers to use the STRIP in daily practice and will be incorporated in clinical decision support systems. It is currently being used in the European Optimizing tHERapy to prevent Avoidable hospital admissions in the Multimorbid elderly (OPERAM) project, a multicentre randomized controlled trial involving patients aged 75 years and older using multiple medications for multiple medical conditions.

In conclusion, the STRIP helps health care providers to systematically identify potentially inappropriate prescriptions and medication-related problems and to change the patient's medication regimen in accordance with the patient's needs and wishes. This article describes the STRIP and the available evidence so far. The OPERAM study is investigating the effect of STRIP use on clinical and economic outcomes.

KEYWORDS

medication errors, medication safety, patient safety, pharmacotherapy, prescribing

What is already known about this topic?

- Use of prescribing criteria decreases potentially inappropriate prescriptions.
- Explicit prescribing criteria do not require specific clinical expertise. These tools focus on medication and usually do not address patient-related risk factors common in older people, nor do they take into account patient preferences or previously unsuccessful treatment approaches.
- Implicit prescribing tools are time-consuming to use and require clinical expertise. Their main advantage is that they focus on the patient and decisions about prescribing appropriateness are made at an individual level.

What this paper adds:

- The Systematic Tool to Reduce Inappropriate Prescribing (STRIP) is the first prescribing tool that combines explicit and implicit prescribing criteria.
- The STRIP improves the prescribing skills of general practitioners and final-year medical students.
- The effect of STRIP on relevant clinical and economic outcomes is currently under investigation in a large European multicentre randomized controlled trial.

1 | INTRODUCTION

Inappropriate prescribing, ie, prescriptions in which the risks of medication outweigh its benefits, is a major health care issue, especially regarding older patients.^{1,2} Several aspects make prescribing for older patients on multiple medications highly complex, and most prescribers find the increased number of older patients on polypharmacy a challenge. Older patients are at increased risk of adverse medication outcomes because of age-related changes in drug pharmacokinetics and pharmacodynamics.³ Moreover, polypharmacy, commonly defined as the chronic use of 5 or more medications, is common among elderly patients and is a well-known risk factor for poor drug compliance, medication-induced harm, and hospital admissions.⁴⁻⁶ Although polypharmacy is often indicated, it is difficult for practitioners to balance the benefit-risk ratio at the level of the individual patient, because of the increased frailty, cognitive decline, and polymorbidity of patients, and drug-drug and drug-disease interactions. Practitioners perceive self-efficacy (relating to knowledge, skills, and decision support) and feasibility (such as resource availability and work practices) as 2 barriers to minimizing potentially inappropriate medications.⁷

Patients on polypharmacy are often treated in different settings and by more than one doctor, who may be insufficiently aware of the medications prescribed by other doctors. This could increase the risk of medication errors because of conflicting information from different sources and/or poor communication between health care providers and patients. However, multiple prescribers appear not to be associated with inappropriate prescriptions.⁸

Another aspect that differentiates prescribing for older people from prescribing for younger people is the therapeutic aim, defined as the desired outcome and the specification of when this outcome

should be achieved.⁹ Therapeutic aims change from mainly curative in younger patients to symptom control (reducing or eliminating symptoms), maintaining current state or function, maintaining or improving quality of life, and palliation in older patients. When formulating therapeutic aims for older patients, doctors have to consider the remaining life expectancy and the patient's medication-related needs. To determine whether a patient's life expectancy will be long enough to achieve benefit from a particular medication, it is necessary to know how long the medication has to be used to be beneficial.¹⁰ It may take years before a person benefits from medications used for primary or secondary prevention, and therefore, these drugs might not be started or might even be discontinued in patients with a limited life expectancy. Shared decision-making among doctors, patients, and other health care professionals about therapeutic aims is important when deciding whether to stop, start, alter, or continue medications in older patients. Thus, for an individualized approach to a patient's treatment, the practitioner needs to consider not only practice guidelines but also the patient's needs, the patient's life expectancy, and the time to benefit of medications. This makes prescribing for older people, and particularly frail elderly people with multiple medical conditions, a challenge.

The aim of this article is to introduce the Systematic Tool to Reduce Inappropriate Prescribing (STRIP), which was developed to integrate the above-mentioned aspects of prescribing to improve appropriate prescribing for older people with multimorbidity and polypharmacy. The existing evidence for this method is summarized, and future perspectives are discussed.

2 | SYSTEMATIC TOOL TO REDUCE INAPPROPRIATE PRESCRIBING

The STRIP is an aid to improve appropriate prescribing and promotes collaboration between health care professionals, such as doctors and pharmacists. It was primarily developed for general practitioners and community pharmacists, but can also be used in a hospital setting. While implicit (judgement-based) and explicit (criterion-based) tools have been developed and used with advantage, they have rarely been used in combination. The development of the STRIP, its implementation in the Netherlands, the available evidence, and the future perspectives are detailed below.

2.1 | Development of STRIP

The STRIP combines both implicit and explicit prescribing tools. Explicit prescribing tools are usually developed on the basis of literature reviews, expert opinion, and consensus. They typically include lists of drugs or drug classes to be avoided in older people because these drugs have an increased risk of negative outcomes in this population. For example, anticholinergic medications have a stronger negative effect on cognitive functions in older patients than in younger patients. Explicit prescribing tools do not specifically require clinical expertise, an important advantage that makes them easy to use by less experienced practitioners. However, a disadvantage is that these tools

focus on the medication and are not patient centred because they usually do not address specific patient-related risk factors common in older people, such as co-morbidity, nor do they take into account patient preferences or previously unsuccessful treatment approaches. The Beers' criteria, developed in the United States in 1991 (last updated in 2015), were the first explicit prescribing tool.^{11,12} In Europe, the Screening Tool of Older People's potentially inappropriate Prescriptions (STOPP) and Screening Tool to Alert physicians to the Right Treatment (START) criteria are the most widely used explicit screening criteria.¹³⁻¹⁵

Implicit criteria are quality indicators of prescribing that a clinician or pharmacist can apply to any prescription. Implicit criteria are not drug or disease specific and consequently rely on the clinician's medical knowledge and expertise. The limitations of implicit prescribing tools are they are time-consuming and dependent on clinical expertise. Their main advantage is that they focus on the patient and thus, decisions about prescribing appropriateness are made at an individual level. The Medication Appropriateness Index is a well-known implicit tool, but is mainly used in research because of its time-consuming nature.¹⁶ The Dutch Prescribing Optimization Method addresses the most frequently occurring prescribing errors, as described in the literature.¹⁷ In 6 steps, it monitors medication adherence, underprescribing, overprescribing, adverse effects, interactions, and dosage and dosing frequency. Preventing Hospital Admissions by Reviewing Medication was also developed in the Netherlands and is designed to support the total pharmaceutical care process.¹⁸ It consists of a patient interview, a pharmacotherapy review, and the implementation and follow-up evaluation of a pharmaceutical care plan. Four focus points guide the pharmacotherapy review: drug indication, effectiveness, safety, and correct use.¹⁹

The STRIP actively involves the patient and promotes cooperation among different health care providers, such as doctors, pharmacists, and home care nurses, and focuses on the evaluation and monitoring of changes made to the medication regimen. In this way, changes to the medication regimen reflect the patient's wishes, needs, and concerns regarding medication use, which should improve patient satisfaction and medication adherence.

The STRIP consists of 5 steps (Figure 1).

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

1. Medication assessment

The aim of the medication assessment is to collect information about the actual medication use and to gain an understanding of the patient and his or her wishes, experiences, and beliefs about medications. This information will enable the doctor to make rational decisions about medications, together with the patient, and to determine whether the patient's medication-related needs are being met. The assessment is performed in the presence of the patient

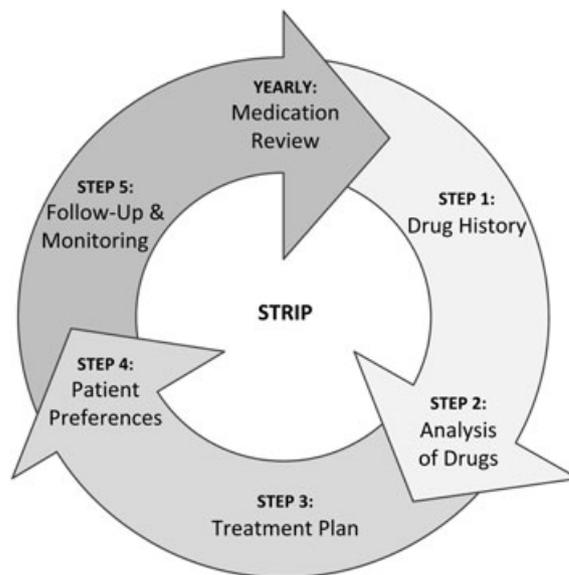


FIGURE 1 Flowchart Systematic Tool to Reduce Inappropriate Prescribing

and/or caretaker responsible for giving the medication to the patient.

A list of medications dispensed by the pharmacy and the medication vials of the patient form the basis of the medication history. This information is supplemented by information collected with a structured questionnaire, such as the Structured History taking of Medication use questionnaire, which has proven valid for this purpose.^{20,21} Table 1 shows which topics need to be discussed when taking the medication history.

2. Pharmacotherapy review

The aim of the pharmacotherapy review is to identify potential pharmacotherapy-related problems. The patient's current morbidities and symptoms should be matched with the medications used by the patient (as determined in step 1) and, if possible, with additional information, such as blood pressure, weight, estimated glomerular filtration rate, and HbA1c. 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

TABLE 1 Ten topics of the medication history

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

frequencies, and practical intake issues. The START and STOPP criteria are implemented in this step of the STRIP to facilitate the pharmacotherapy review.

3. Pharmaceutical care plan

The aim of the pharmaceutical care plan is to achieve agreement between doctor and pharmacist about therapeutic aims and how these aims should be achieved. The pharmaceutical care plan sets out the following:

1. therapeutic aims;
 2. relevant pharmacotherapy-related problems;
 3. priority of these pharmacotherapy-related problems;
 4. interventions, including the person responsible for these interventions;
 5. how, when, and by whom the effect of these interventions will be evaluated.
- ### 4. Shared decision-making

The aim of this step is to meet the medication-related needs of the patient. Together, the patient and doctor establish the goals of therapy and discuss ways to resolve pharmacotherapy problems and to prevent new problems from developing. The patient's cognitive capacity determines the extent of his or her involvement. All changes to the medication regimen are communicated to all other involved health care providers.

5. Follow-up and monitoring

The aim of this step is to implement the proposed medication changes and to evaluate the effect of these changes. The pharmaceutical care plan documents how, when, and by whom changes to the medication regimen are evaluated and when the next revision of the medication regimen is planned.

2.2 | Implementation of the STRIP

In the past, in the Netherlands, practitioners and pharmacists were trained to use different prescribing tools, which did not stimulate cooperation. As previous research has shown that a combined approach involving general practitioners and community pharmacists is the most effective in reducing potentially inappropriate prescribing, there was a need for a single prescribing tool that could be used by both doctors and pharmacists.²² In the Netherlands, general practitioners and community pharmacists receive funding for reviewing the medication of elderly patients on polypharmacy. The STRIP was developed for this purpose and was incorporated in the 2012 multidisciplinary guideline "Polypharmacy in older people" developed by the Dutch College of General Practitioners, the Royal Dutch Pharmacists Associations, the Dutch Society for Clinical Geriatricians, and the Dutch Federation of Medical Specialists.²³ It is supported by the Dutch Association of Elderly Care Physicians and

Social Geriatricians, the Association of Catholic Organizations of Senior Citizens in the Netherlands, and the Dutch Nurses Association. The guideline provides guidance on how to perform a medication review and is primarily intended for use in the primary care setting, by general practitioners and community pharmacists.

2.2.1 | STRIP and medical education

Previous studies have shown that medical students lack the knowledge and skills needed to prescribe appropriately for patients on polypharmacy. A multicentre randomized controlled trial was performed to investigate whether the STRIP improves the medication review skills of final-year medical students.²⁴ For practical reasons, it was not possible to study the entire STRIP, so the second step of the STRIP (pharmacotherapy review) was studied. In total, 106 final-year medical students from 2 Dutch universities were asked to optimize the medication lists of case histories, making use, or not, of the STRIP. Students using the STRIP made more correct decisions (+34% (9.3 vs 7.0); $P < .01$; $r = .365$) and fewer potentially harmful decisions (-30% (3.9 vs 5.6); $P < .01$; $r = .386$) than the students who did not use the STRIP, as determined by an expert panel made up of clinical geriatricians and clinical pharmacologists. The students were positive about the STRIP.

2.2.2 | STRIP Assistant implementation in clinical decision support systems

The STRIP should be implemented in a clinical decision support system to make it time efficient. In 2013, in a survey among 500 Dutch general practitioners, nearly all 184 respondents reported having a clinical information system, but only 21% indicated having a decision support plug-in. Respondents were mainly (57%) positive about the STRIP, provided that it improves the quality of prescribing and does not require extensive investment of time or money.²⁵ The STRIP Assistant was developed to enable doctors and pharmacists to effectively and efficiently incorporate the STRIP method into daily practice. It is a stand-alone Web application to assist physicians and pharmacists with the pharmacotherapeutic analysis of a patient's current medication, by providing specific advice (start or discontinue drugs, adjust dosage) on the basis of information from the patient's medical record and the decisions made by doctors and pharmacists during the medication review. This advice is based on knowledge of clinical interactions, double medication, contraindications, dosage and dose frequency, and implementation of the START and STOPP criteria.^{26,27} The Assistant incorporates information on the patient's medical conditions, symptoms, drugs used, drug contraindications, and relevant clinical data (such as renal function and weight). A video demonstrating the use of the STRIP Assistant can be viewed online.²⁸

In a validation study, 42 doctors were asked to optimize 2 comparable case histories, using the STRIP Assistant for one and "normal practice" for the other. Medication optimization improved significantly when the STRIP Assistant was used: The proportion of appropriate decisions increased from 58% without the STRIP Assistant to 76% with it ($P < .01$), and the proportion of inappropriate decisions decreased from 42% without the STRIP Assistant to 24% with it ($P < .01$).²⁹ While medication optimization took longer with the STRIP

Assistant, it was hypothesized that this difference would disappear as doctors become more experienced in using the Assistant. This was demonstrated in a subsequent study involving 4 teams of experts (general practitioners and pharmacists) who used the STRIP Assistant to review the medications of patients in 13 general practices located in Amsterdam, the Netherlands. Over 13 months, the teams performed 261 medication reviews. An independent *t* test showed that it took statistically significantly less time to perform the medication review as respondents gained experience with the STRIP Assistant ($M = 10.67$, $SD = 5.21$); $t(259) = 5.625$ ($P = .000$).³⁰

3 | FUTURE PERSPECTIVES AND RESEARCH

The aim of the European OPTimizing thERapy to prevent Avoidable hospital admissions in the Multimorbid elderly (OPERAM) project, involving doctors in Switzerland, the Netherlands, Ireland, Belgium, Germany, Italy, and Greece, is to optimize pharmacological and nonpharmacological therapy, primarily to reduce avoidable hospital admissions among elderly patients (aged ≥ 75 years) using multiple medications for multiple medical conditions (3 or more coexistent chronic conditions).³¹ The core part of the OPERAM project is a large, multicentre cluster randomized clinical trial of the STRIP (Assistant), with a view to improving drug compliance. The aim of the trial is to determine whether pharmacotherapy optimization reduces hospital admissions and other relevant clinical and economic outcomes, such as quality of life, patient preferences, drug compliance, health care use, and cost-effectiveness. The intention is to recruit 1900 patients over 18 months. The medications of 50% of the patients will be reviewed as usual or with the STRIP, and patients will be followed up for 12 months.

4 | CONCLUSIONS

The STRIP was developed to assist practitioners, pharmacists, patients, and other health care providers to systematically identify potentially inappropriate prescriptions and medication-related problems and to change the patient's medication regimen in accordance with the patient's needs and wishes. Implementation of the STRIP in clinical decision support systems is necessary to facilitate its use in daily practice. A large European study is in progress to investigate its effect on hospital admissions, quality of life, patient preferences, drug compliance, health care use, and cost-effectiveness.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENT

Funding was provided by the Netherlands Organization for Health Research and Development to the Expertise Centre Pharmacotherapy for Old persons (Ephor).

REFERENCES

- Spinewine A, Schmader KE, Barber N, et al. Appropriate prescribing in elderly people: How well can it be measured and optimised? *Lancet*. 2007;370(9582):173-184.
- O'Connor MN, Gallagher P, O'Mahony D. Inappropriate prescribing: Criteria, detection and prevention. *Drugs Aging*. 2012;29(6):437-452.
- Jansen PAF, Brouwers JRB. Clinical pharmacology in old persons. *Forensic Sci*. 2012;2012, Article ID 723678. <https://doi.org/10.6064/2012/723678>
- Leendertse AJ, Egberts AC, Stoker LJ, van den Bemt PM. Frequency of and risk factors for preventable medication-related hospital admissions in the Netherlands. *Arch Intern Med*. 2008;168(17):1890-1896.
- Stichting Farmaceutische Kengetallen. Polyfarmacie voor 1 op de 10 apotheekbezoekers. *Pharmaceutisch Weekblad* 2012. Jaargang 147, nummer 47.
- Qato DM, Alexander GC, Conti RM, Johnson M, Schumm P, Lindau ST. Use of prescription and over-the-counter medications and dietary supplements among older adults in the United States. *JAMA*. 2008;300(24):2867-2878.
- Anderson K, Stowasser D, Freeman C, Scott I. Prescriber barriers and enablers to minimising potentially inappropriate medications in adults: A systematic review and thematic synthesis. *BMJ Open*. 2014;4:e006544. <https://doi.org/10.1136/bmjopen-2014-006544>
- Vingerhoets R, Wieringa MH, Egberts ACG, Jansen MMPM, Jansen PAF. Multiple physicians are not independently associated with inappropriate prescribing: A cross-sectional study of geriatric patients. *Br J Clin Pharm*. 2014;77(1, January):213-215.
- Holmes HM, Hayley DC, Alexander GC, Sachs GA. Reconsidering medication appropriateness for patients late in life. *Arch Intern Med*. 2006;166(6):605-609.
- Holmes HM, Min LC, Yee M, et al. Rationalizing prescribing for older patients with multimorbidity: Considering time to benefit. *Drugs Aging*. 2013;30:655-666.
- Beers MH, Ouslander JG, Rollinger I, Reuben DB, Brooks J, Beck JC. Explicit criteria for determining inappropriate medication use in nursing home residents. UCLA division of geriatric medicine. *Arch Intern Med*. 1991;151(9):1825-1832.
- American Geriatrics Society 2015 Beers criteria update expert panel. American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2015;63:2227-2246.
- Gallagher P, Ryan C, Byrne S, Kennedy J, O'Mahony D. STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation. *Int J Clin Pharmacol Ther*. 2008;46(2):72-83.
- Barry PJ, Gallagher P, Ryan C, O'Mahony D. START (Screening Tool to Alert doctors to Right Treatment)—an evidence-based screening tool to detect prescribing omissions in elderly patients. *Age Ageing*. 2007;36(6):632-638.
- 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*. 2015;44:213-218.
- Hanlon JT, Schmader KE, Samsa GP, et al. A method for assessing drug therapy appropriateness. *J Clin Epidemiol*. 1992;45(10):1045-1051.
- Drenth-van Maanen AC, van Marum RJ, Knol W, van der Linden CM, Jansen PA. Prescribing optimization method for improving prescribing in elderly patients receiving polypharmacy: Results of application to case histories by general practitioners. *Drugs Aging*. 2009;26(8):687-701.
- Leendertse AJ, de Koning FH, Goudswaard AN, et al. Preventing hospital admission by reviewing medication (PHARM) in primary care: Design of the cluster randomized, controlled, multi-centre PHARM-study. *BMC Health Serv Res*. 2011;11:4.
- Hepler CD, Strand LM, Tromp D, Sakolchai S. Critically examining pharmaceutical care. *J Am Pharm Assoc (Wash)*. 2002;42(5 Suppl 1):S18-S19.
- Drenth-van Maanen AC, Spee J, van Hensbergen L, Jansen PAF, Egberts ACG, van Marum RJ. Structured history taking of medication use reveals iatrogenic harm due to discrepancies in medication

- histories in hospital and pharmacy records. *J Am Geriatr Soc.* 2011;59(10):1976-1977.
21. Prins MC, Drenth-van Maanen AC, Kok RM, Jansen PAF. Use of a structured medication history to establish medication use at admission to an old age psychiatric clinic: A prospective observational study. *CNS Drugs.* 2013;27(11):963-969.
22. Multidisciplinaire richtlijn Polyfarmacie bij ouderen 2012. Available: https://www.nhg.org/sites/default/files/content/nhg_org/uploads/polyfarmacie_bij_ouderen.pdf. Accessed 28 Jun 2017.
23. Geurts MM, Talsma J, Brouwers JR, de Gier JJ. Medication review and reconciliation with cooperation between pharmacist and general practitioner and the benefit for the patient: a systematic review. *Br J Clin Pharmacol.* 2012;74(1):16-33.
24. Keijsers CJ, van Doorn AB, van Kalles A, et al. Structured pharmaceutical analysis of the Systematic Tool to Reduce Inappropriate Prescribing is an effective method for final-year medical students to improve polypharmacy skills: a randomized controlled trial. *J Am Geriatr Soc.* 2014;62(7):1353-1359.
25. Meulendijk M, Spruit M, Drenth-van Maanen C, Numans M, Brinkkemper S, Jansen P. General practitioners' attitudes towards decision-supported prescribing: an analysis of the Dutch primary care sector. *Health Informatics J.* 2013;19(4):247-263.
26. Z-Index. G-standaard—Z-Index. Available at <https://www.z-index.nl/g-standaard> Accessed at 4 Feb 2016.
27. De Groot DA, De Vries M, Joling KJ, et al. Specifying ICD9, ICPC and ATC codes for the STOPP/START criteria: A multidisciplinary consensus panel. *Age Ageing.* 2014;43(6):773-778.
28. Meulendijk MC. STRIP Assistant [online]; 2014. Available at <http://videodemo.stripa.eu/english/> Accessed at 28 Jun 2017.
29. Meulendijk MC, Spruit M, Drenth-van Maanen AC, et al. Computerized decision support improves medication review effectiveness: An experiment evaluating the STRIP Assistant's usability. *Drugs Aging.* 2015;32(6):495-503.
30. Meulendijk MC, Spruit M, Willebroordse F, et al. Efficiency of clinical decision support systems improves over time. *J Med Syst.* 2016;40:76.
31. Lavan AH, Gallagher PF, O'Mahony D. Methods to reduce prescribing errors in elderly patients with multimorbidity. *Clin Interv Aging.* 2016;11:857-866.

How to cite this article: Drenth-van Maanen AC, Leendertse AJ, Jansen PA F, et al. The Systematic Tool to Reduce Inappropriate Prescribing (STRIP): Combining implicit and explicit prescribing tools to improve appropriate prescribing. *J Eval Clin Pract.* 2017;1-5. <https://doi.org/10.1111/jep.12787>