Screening tools for the assessment of prescribing in older patients: Should we STOPP&START?

Olivia Dalleur

16.12.2013

Anne Spinewine, promoter (LDRI)
Benoît Boland, co-promoter (IRSS)

Lancet 2013; 381: 1312–22

Ageing in the European Union

Bernd Rechel, Emily Grundy, Jean-Marie Robine, Jonathan Cylus, Johan P Mackenbach, Cecile Knai, Martin McKee

Editorials British Journal of General Practice, August 2012

21st century health services for an ageing population:

10 challenges for general practice

MEDICATION

The rising prevalence of LTCs with age inevitably means that long-term prescriptions and polypharmacy are highest in older

LE FIGARO.fr

Encore trop de médicaments prescrits aux seniors

Mots clés : Surmédication, gériatrie, AUTOMEDICATION, Iatrogénie

Par Anne Prigent - le 23/04/2012

Chutes, hémorragies digestives, insuffisances rénales : la surmédication peut avoir des conséquences redoutables.

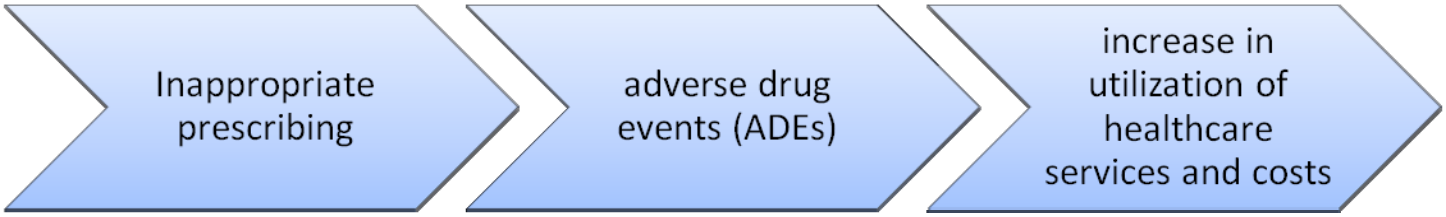
TIME Magazine

Overdosing The Elderly

Many older Americans are taking the wrong drugs

By Christine Gorman | Monday, Aug. 08, 1994

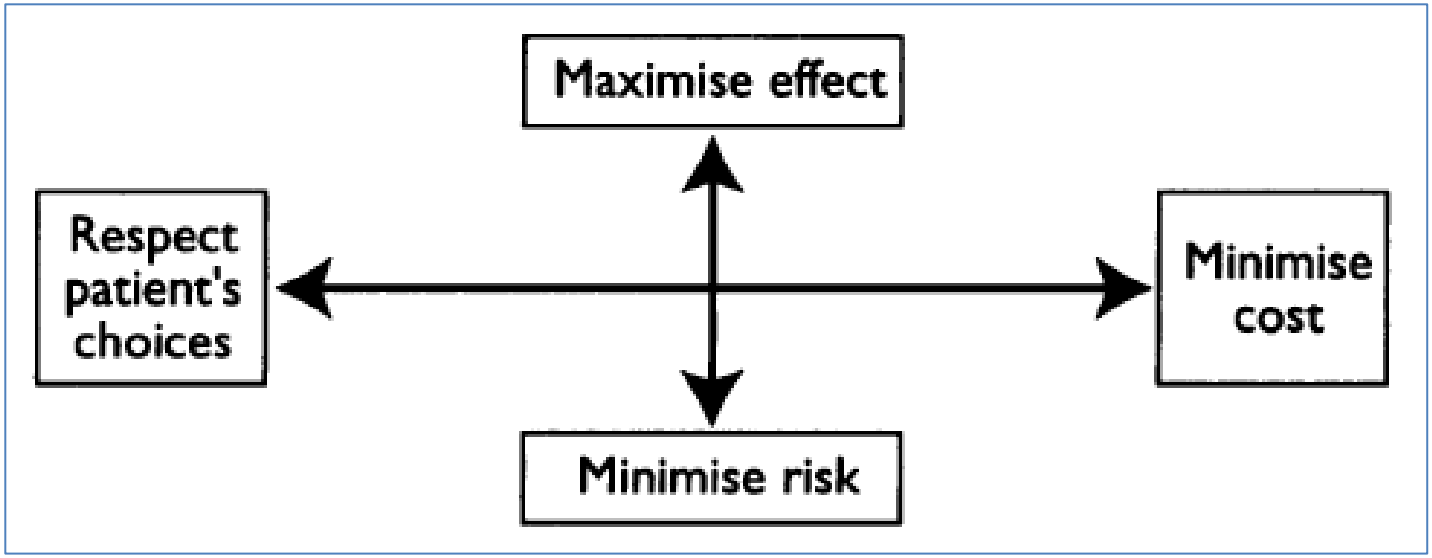
Drug-related problems in elderly patients



- Up to 35% community-dwelling older people ⇨ Adverse Drug Events
- 10 to 30% of hospitalizations ⇨ drug related problems
- 32-69% of Adverse Drug Events = preventable

Gallagher 2007; Hanlon 2004 ; Klarin 2005 ; Kongkaew 2008 ; Mannesse 2000 ; Col 1990 ; Franceschi 2008 ; Sorensen 2004 ; Page II 2006

Appropriateness



Barber 1995

Approaches for optimisation

- Educational approaches
- Multidisciplinary team interventions
- Involvement of geriatric evaluation and management (GEM) teams
- Pharmacist interventions
- Computerized decision support systems

Spinewine 2007 ; Forsetlund 2011 ; Castelino 2009 ; Verrue 2009

Inappropriate prescribing

Overuse

Misuse

Underuse

Spinewine2007, O'Connor 2012

Tools

- **Implicit** ⇨ Medication Appropriateness Index
- **Explicit** ⇨ STOPP&START

Spinewine 2007, Hanlon 1992, Gallagher 2008

STOPP&START

International Journal of Clinical Pharmacology and Therapeutics, Vol. 46 – No. 2/2008 (72-83)

STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation

P. Gallagher[1], C. Ryan[2], S. Byrne[2], J. Kennedy[2] and D. O'Mahony[3]

- **European**, 2008
- Evidence-based
- Consensus opinion of a panel of **experts** in geriatric medicine, clinical pharmacology, psychiatry of old age, pharmacy and general practice
- **Validated** (Delphi)
- Inter-rater reliability : **pharmacists/physicians**

- Organized by **system** + **relevant** categories in geriatrics

The tool

- **STOPP : 65 situations « at risk » linked with 29 drugs**

Table 1. **STOPP**: Screening Tool of Older People's potentially inappropriate Prescriptions.
The following drug prescriptions are potentially inappropriate in persons aged ≥ 65 years of age.

A. Cardiovascular system

1. Digoxin at a long-term dose > 125 µg/day with impaired renal function* (*increased risk of toxicity*) [Cusack et al. 1979, Gooselink et al. 1997, Haas and Young 1999].
2. Loop diuretic for dependent ankle edema only i.e. no clinical signs of heart failure (*no evidence of efficacy, compression hosiery usually more appropriate*) [Alguire and Mathes1997, Kolbach et al. 2004].

- **START : 22 situations « at risk » linked with 15 drugs**

Table 2. **START**: Screening Tool to Alert doctors to Right, i.e. appropriate, indicated Treatments.
These medications should be considered for people ≥ 65 years of age with the following conditions, where no contraindication to prescription exists.

A. Cardiovascular system

1. Warfarin in the presence of chronic atrial fibrillation [Hart et al. 1999, Ross et al. 2005, Mant et al. 2007].
2. Aspirin in the presence of chronic atrial fibrillation, where warfarin is contraindicated, but not aspirin [Hart et al. 1999, Ross et al. 2005].

Int J Clin Pharmacol Ther 2008; 46(2): 72 – 83.

Mme B a 88 ans. Elle vit seule dans sa maison, avec l'aide d'une infirmière 2x/semaine. Mme B a fait plusieurs chutes ces 12 derniers mois, elle a peur de chuter et a des troubles de l'équilibre.

***Antécédents**: ostéoporose (multiples fractures), cataracte opérée, infarctus récent, hypertension et diabète insulino-requérant (Hb1ac = 6,7%)*

***Médicaments** habituels :*

- *Movicol si besoin*
- *Loramet 1mg 1x/j*
- *Asaflow 80mg 1x/j*
- *Zocor 40mg 1x/j*
- *Emconcor 10mg 1x/j*
- *Aprovel 300mg 1x/j*
- *Insuline Humuline 2x/j*

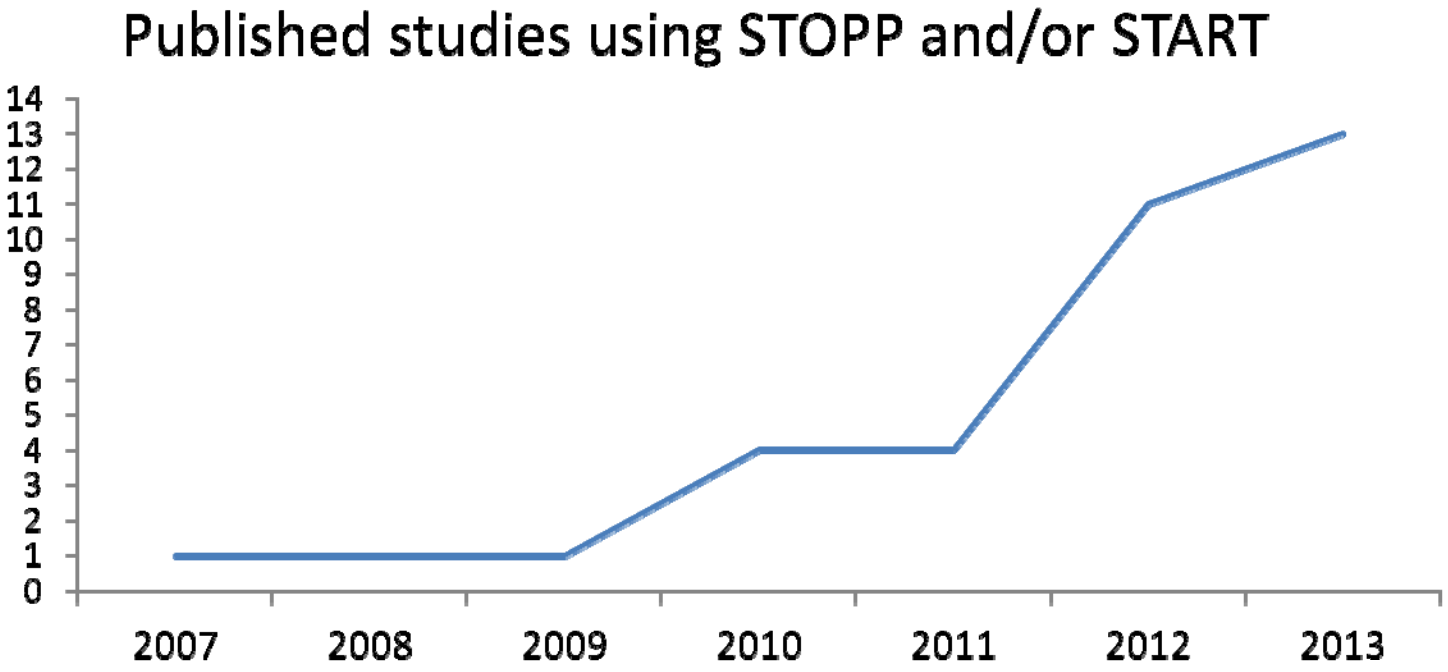
STOPP :

1. **Lormetazepam et chutes**
2. **Bisoprolol et diabète "trop" contrôlé donc probablement associé à des hypoglycémies (Hb1ac <7%)**

START :

3. **Traitement de l'ostéoporose connue**

Why STOPP&START?

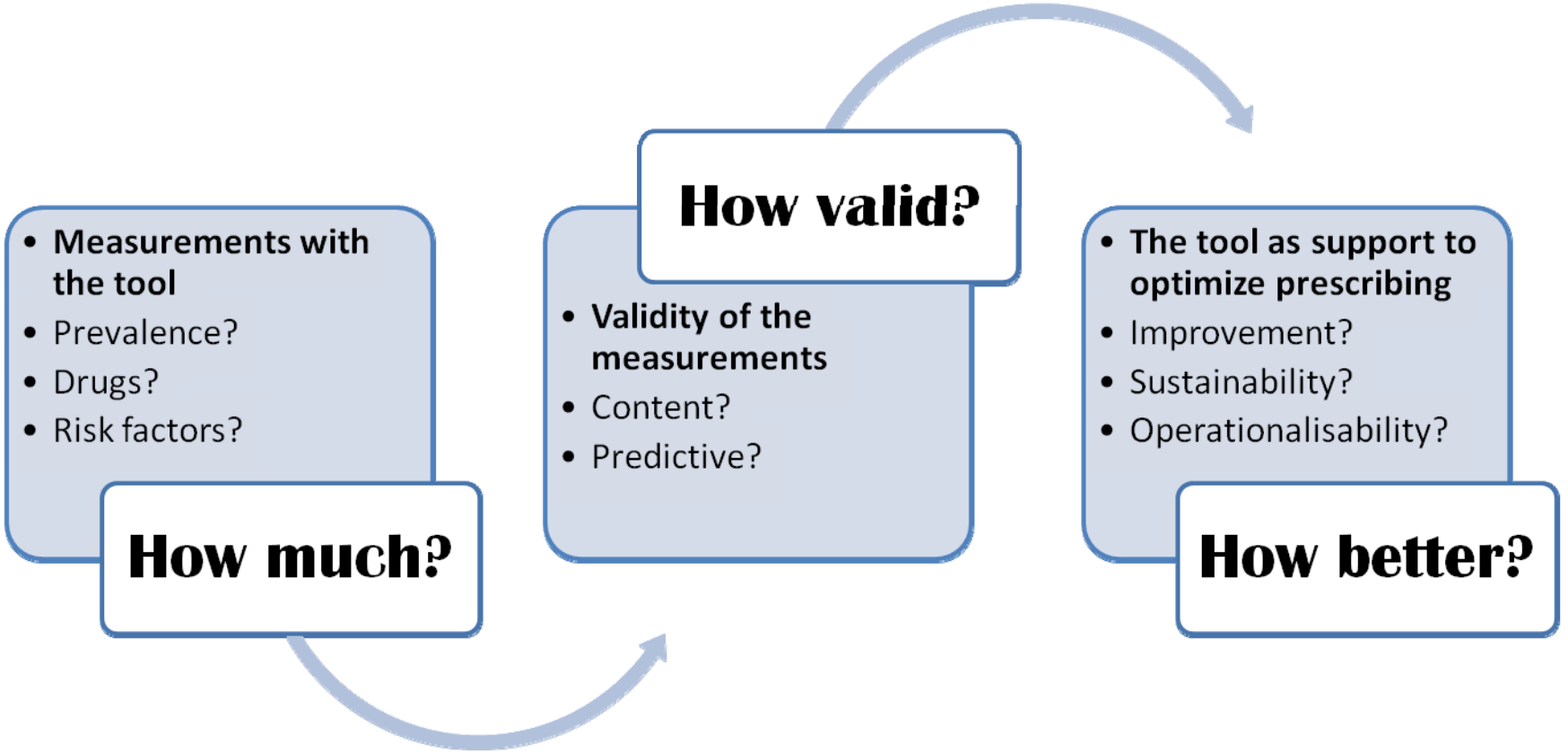


- European Union Geriatric Medicine Society

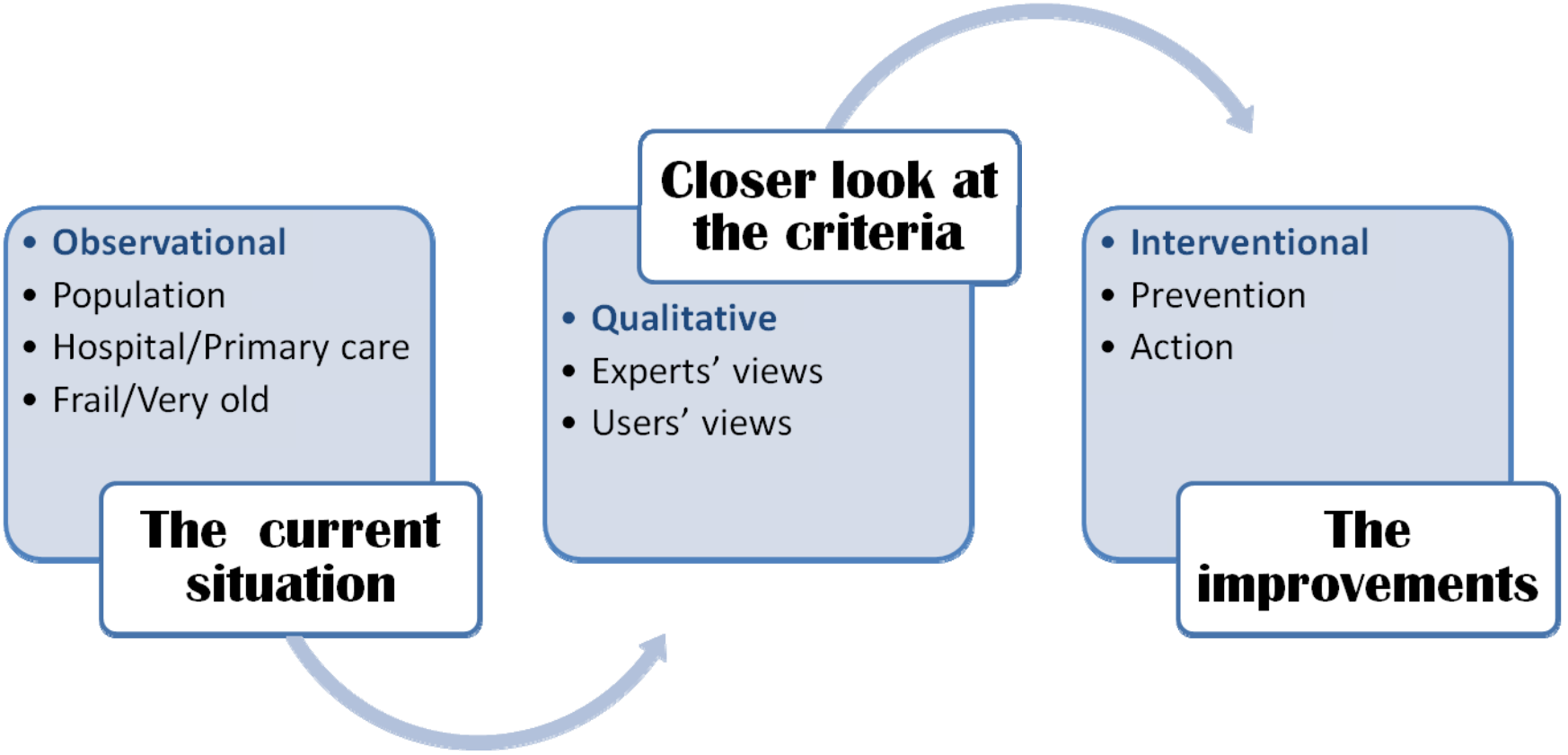
- STOPP-drugs ↑ risk of adverse drug events
- STOPP&START ↑ quality of prescribing

Barry 2007; Gallagher 2008; Ryan 2009; Cahir 2010; Pyszka 2010; Parsons 2012; Borges 2012, Liu 2012; Chen 2012; Wahab 2012; Bradley 2012; Onatade 2013; Yayla 2013, Frankenthal 2013; Ryan 2013; O'Sullivan 2013; Hill-Taylor 2013,

Should we use STOPP&START?



Should we use STOPP&START?



THE CURRENT SITUATION

The current situation

Drugs Aging (2012) 29:829–837
DOI 10.1007/s40266-012-0016-1

ORIGINAL RESEARCH ARTICLE

Inappropriate Prescribing and Related Hospital Admissions in Frail Older Persons According to the STOPP and START Criteria

Olivia Dalleur · Anne Spinewine · Séverine Henrard · Claire Losseau · Niko Speybroeck · Benoit Boland

Cliniques universitaires SAINT-LUC UCL BRUXELLES

Inappropriate prescribing in subjects aged 80 and older: the BELFRAIL population

Dalleur O., Boland B., De Groot A., Vaes B., Boeckxstaens P., Azermai M., Wouters D., Degryse J-M., Spinewine A.

BELFRAIL
BELGIAN COHORT OF THE VERY ELDERLY

Design and populations

- Objective :
  - Detection of potentially inappropriate prescribing according to STOPP&START

Admitted patients

- Cross-sectional study in a teaching hospital in Brussels
- 302 geriatric patients
  - Comprehensive Geriatric Assessment
  - >75y
  - Non-elective admission 2008
  - Frailty (ISAR >1)

Community-dwelling patients

- Post-hoc analysis of the baseline data of the BELFRAIL cohort
- 567 patients recruited by their general practitioner
  - Inclusion : ≥80y, 2008-2009, Comprehensive Geriatric Assessment
  - Exclusion : severe dementia, palliative care, medical emergency

Patients characteristics

Admitted patients

- Age 84
- Women 63%
- Nursing home 17%
- Polypharmacy 74%
- Cognitive disorder 25%
- *Frail*

Community-dwelling patients

- Age 84
- Women 63%
- Nursing home 10%
- Polypharmacy 61%
- Cognitive disorder 16%
- *Robust*

Drugs to target

Admitted patients

- **48**% of patients have ≥ 1 STOPP (0.7/patient)
  - BZD 24%
  - Aspirin 12%
  - Opiates 8%
  - β-blockers 6%
  - TCA 5%
- **63**% of patients have ≥ 1START (1.2/pt)
  1. Diabetes
  2. Osteoporosis
  3. P2 CV
  4. Atrial fibrillation
  5. COPD

Community-dwelling patients

- **41**% of patients have ≥ 1 STOPP (0.6/patient)
  - Aspirin 21%
  - Duplication 6%
  - BZD 5%
  - NSAIDS 5%
  - α-blockers 2%
- **59**% of patients have ≥ 1START (1.1/pt)
  1. P2 CV
  2. Diabetes
  3. Osteoporosis
  4. Chronic heart failure
  5. COPD

Pt Patient BZD benzodiazepines, TCA tricyclic antidepressants P2CV secondary cardiovascular prevention COPD chronic obstructive pulmonary disease

START > STOPP !

START in 60% patients > STOPP 40-50%

Drugs to target Underuse of anticoagulation in atrial fibrillation

Anticoagulation underuse is inappropriate and associated with aspirin in frail older patients with atrial fibrillation

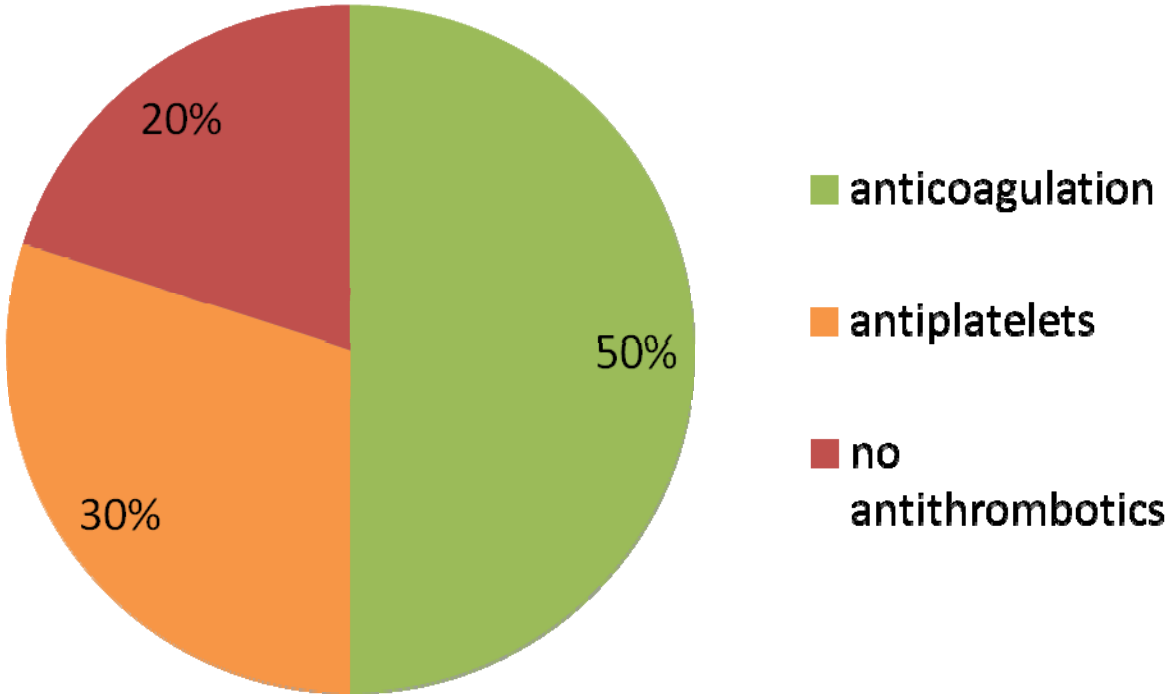
Frédéric Maes, Olivia Dalleur, Séverine Henrard, Dominique Wouters, Christophe Scavée, Anne Spinewine, Benoit Boland.

Underuse of anticoagulation

- Prevalence/Predictors/Stroke *vs*. bleeding risks?

- Design :
  - Cross-sectional study (Saint-Luc)
  - from Jan 2008 to Dec 2010
  - 773 patients
  - Inclusion : ≥75y, atrial fibrillation, high stroke risk
  - Exclusion : other indication, contra-indication

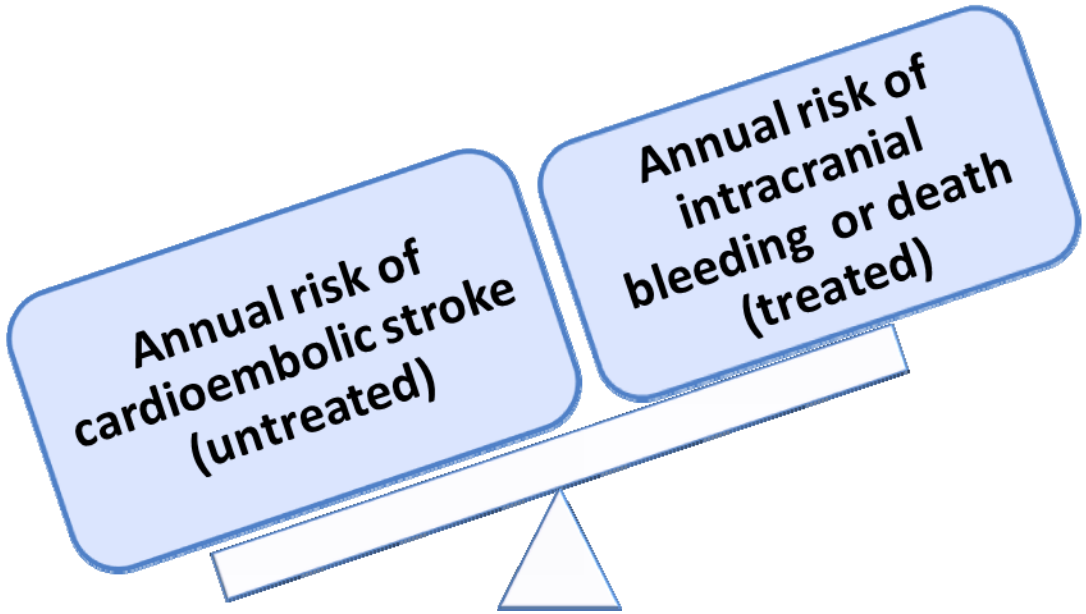
50% underuse


20%
50%
30%
anticoagulation
antiplatelets
no antithrombotics

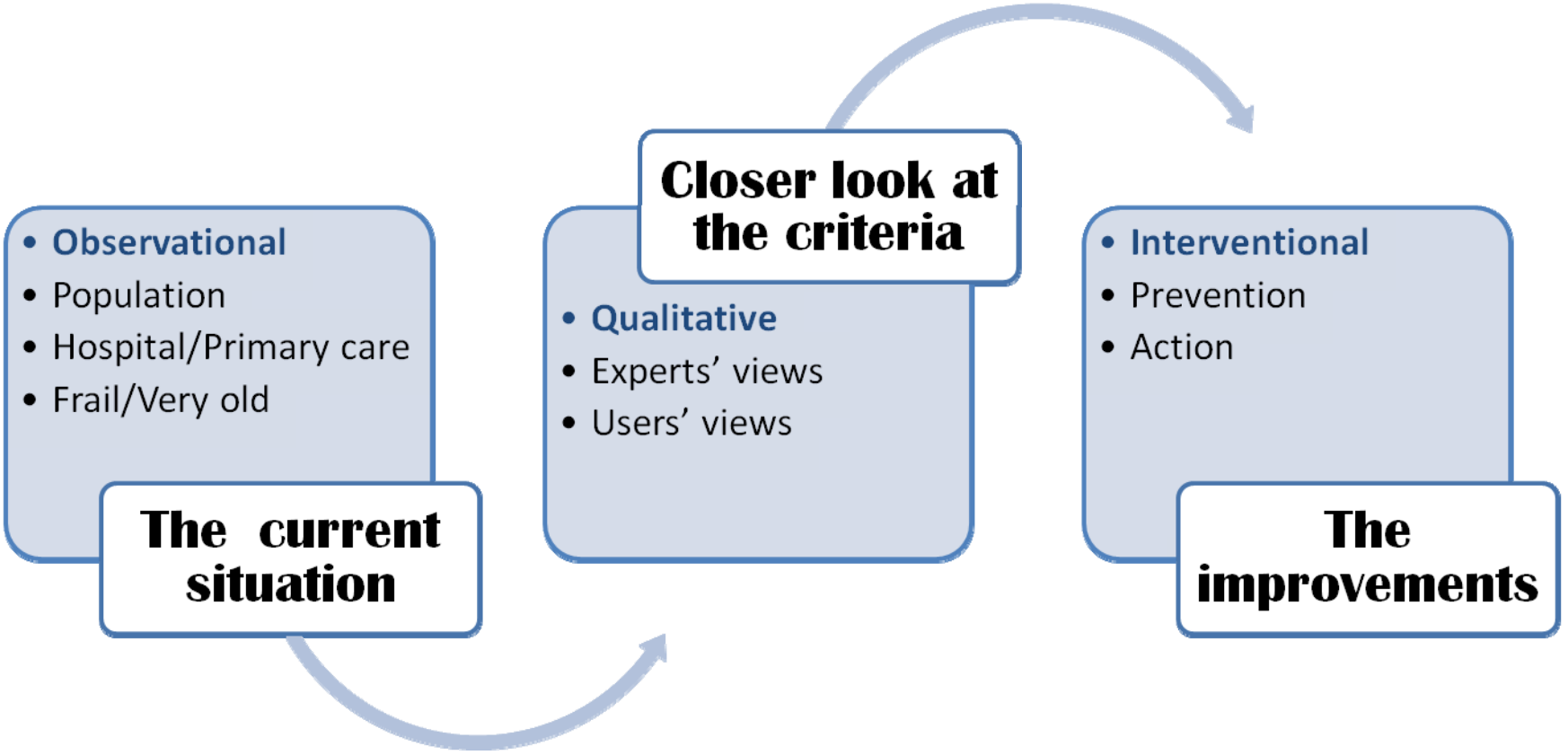
Main predictor of underuse = aspirin

- current antiplatelet therapy ↑ risk of underuse
- No association with
  - geriatric syndromes (falls, cognitive disorder,…)
  - risk of stroke
  - risk of bleeding (-antiplatelets)
  - previous stroke

Anticoagulation = favourable



Should we use STOPP&START?



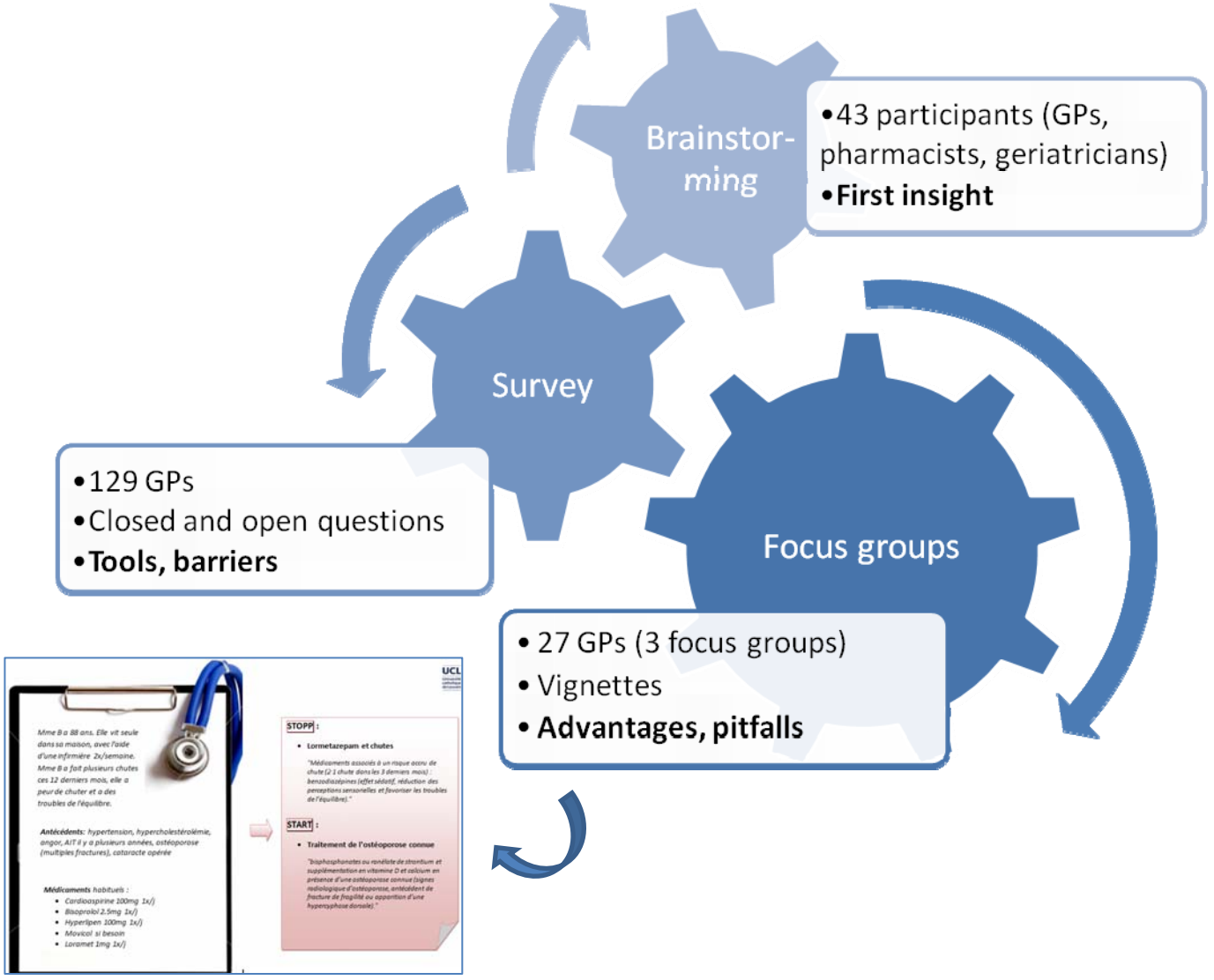
CLOSER LOOK AT THE CRITERIA

Qualitative study : Views of general practitioners

Views of general practitioners on the use of STOPP&START in primary care: a qualitative study.

O. Dalleur, J-M. Feron, A. Spinewine

Qualitative study



Views of GP about STOPP&START

Agreement between general practitioners

Incentives to use the tool

The advantage is that you can maybe put your finger on things you had overlooked

Barriers to use the tool

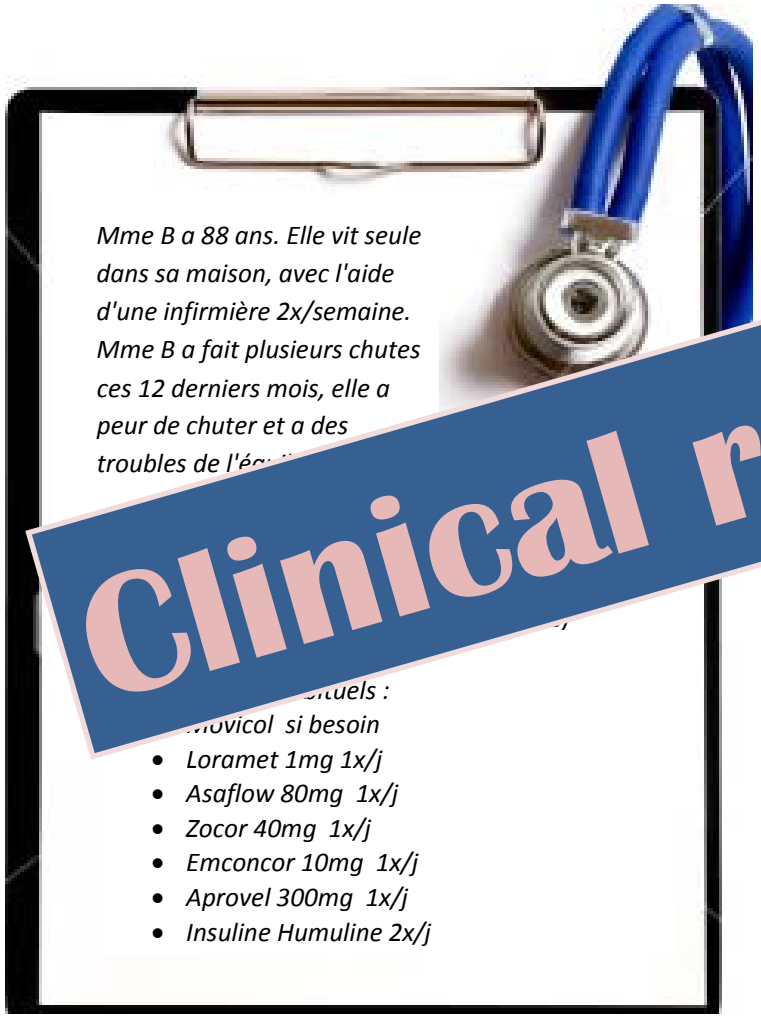
If…if you start implementing that, you need to allow twenty minutes, in fact even more, half an hour just to check the list to see what will be added or removed and also another quarter of an hour for talking with the patient.

Diverging views between general practitioners

I mean to say, it doesn't teach us anything! Well, not much, anyway. What it will do is remind us…that we have to stop and think about things.

Projected use of the tool

- Adaptations for practice
  - Computerization
  - Education
- Best moment for use
  - Selected patients
  - Schedule for treatment review
- Team work, interdisciplinarity
- Voluntary use



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…tuels :
…ovicol si besoin

- *Loramet 1mg 1x/j*
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- *Zocor 40mg 1x/j*
- *Emconcor 10mg 1x/j*
- *Aprovel 300mg 1x/j*
- *Insuline Humuline 2x/j*

STOPP :

1. **Lor…**

3. **Traitement de l'ostéoporose connue**

Clinical relevance?

STOPP&START criteria frequently rated as of major clinical importance

- STOPP
  - Aspirin and warfarin in combination
  - Neuroleptic drugs & falls
  - Diltiazem or verapamil & moderate/severe heart failure
  - Long-term long-acting benzodiazepines
  - Selective serotonin re-uptake inhibitors & hyponatremia
- START
  - Warfarin & chronic atrial fibrillation
  - Antiplatelets / statins & secondary cardiovascular prevention
  - Angiotensin converting enzyme inhibitor & chronic heart failure/acute myocardial infarction
  - Calcium and vitaminD & osteoporosis

No consensus ?

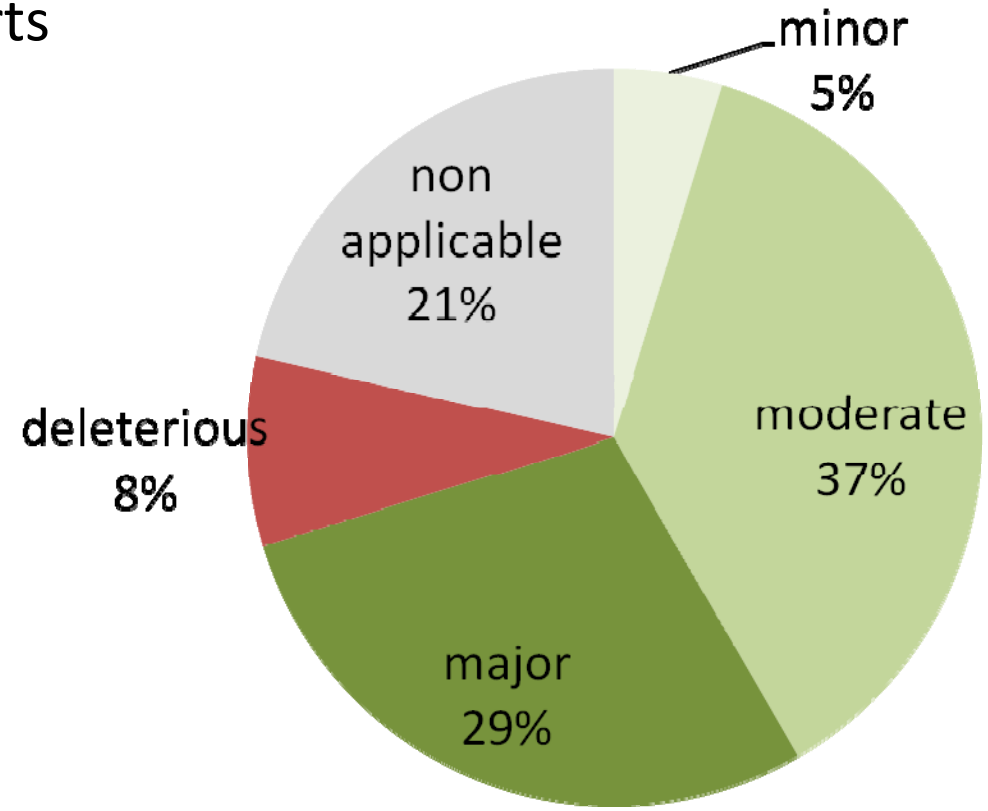
≠ implicit judgement

Patient background / data available

Criterion content

Variable relevance of STOPP recommendations

- The 84 inappropriate medications (STOPPs) present upon admission of 50 patients
- 3 experts



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- *Aprovel 300mg 1x/j*
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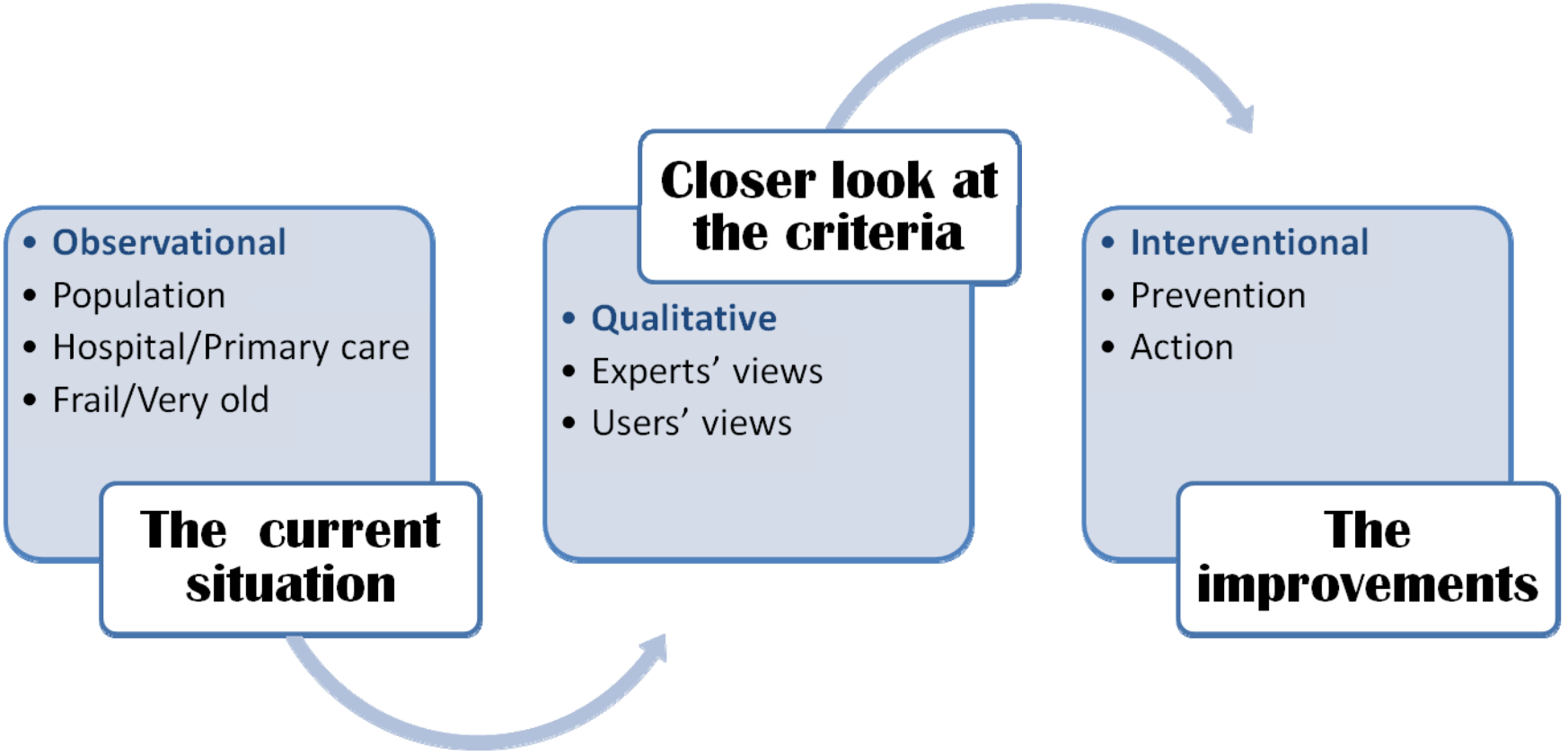
STOPP :

1. **Lormeta[illegible]chutes**
2. **Bisoprolol et diabète "trop" contrôlé donc probablement associé à des hypoglycémies (Hb1ac <7%)**

START :

3. **Traitement de l'ostéoporose connue**

Should we use STOPP&START?



THE IMPROVEMENTS

¼ admission potentially related to STOPP&START

Main reason for admission (n=302)	Medications prescribed/ omitted inappropriately	n	PPV[b]
STOPP-related admission		54[a]	
Fall with fracture	Fall-risk–increasing drugs[c]	46	0.68
Bleeding	Aspirin/NSAID	3	0.07
Heart failure	NSAID	2	0.25
START-related admission		38[a]	
Fall with fracture	Calcium, vitamin D and bisphosphonates	19	0.25
Ischemic heart disease	Antiplatelets	5	0.07
	Statins	5	0.09
Stroke	Antithrombotic agents	2	0.06

NSAID nonsteroidal anti-inflammatory drug, *PPV* positive predictive value

[a] Only the most frequent inappropriate prescribing events are listed.

[b] PPV = the number of patients who had an admission potentially related to inappropriate prescribing of a drug divided by the number of patients who had that drug prescribed inappropriately

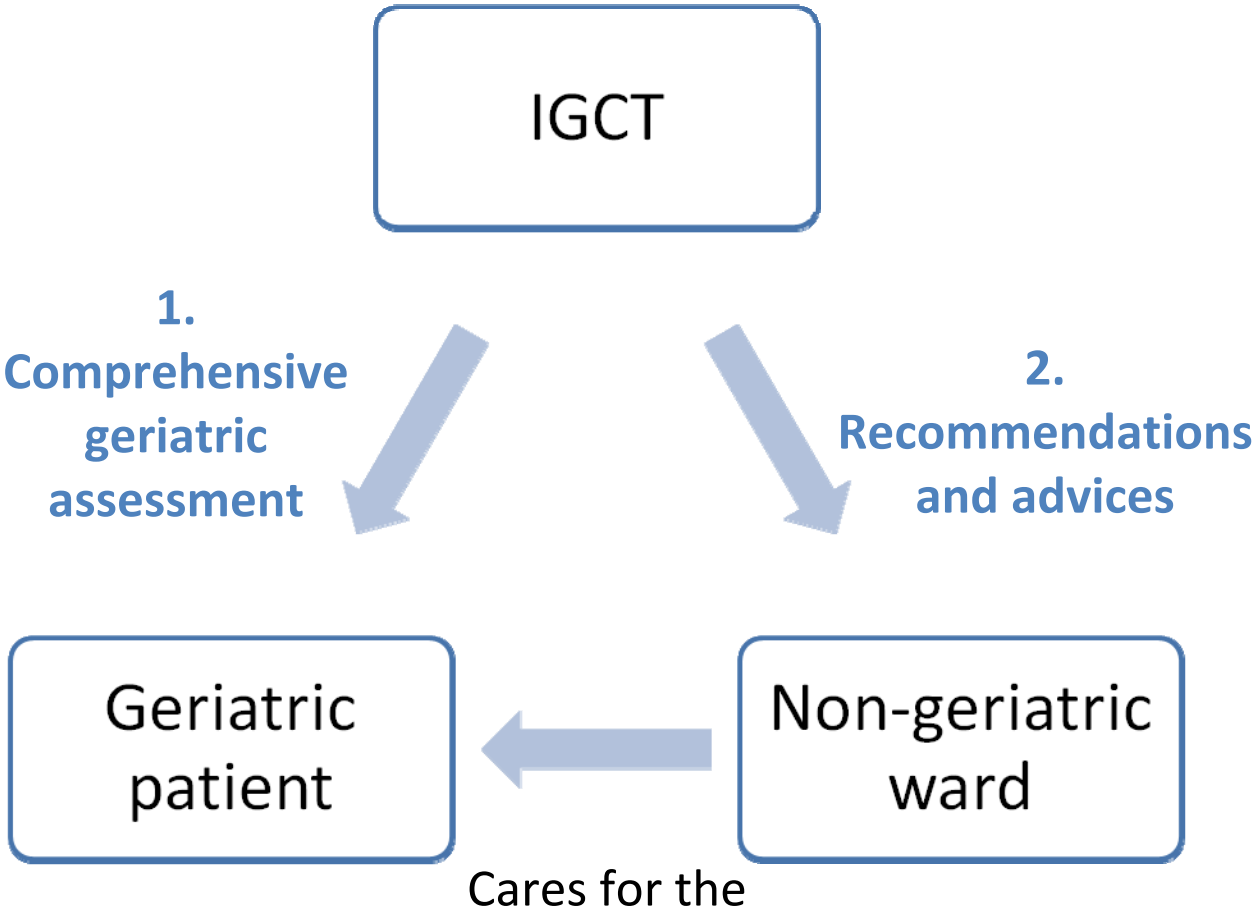
[c] Fall-risk–increasing drugs: benzodiazepines (*n* = 35), opiates (*n* = 10), neuroleptics (*n* = 12) and antihistamines (*n* = 2)

Randomized controlled study with STOPP

Reduction of potentially inappropriate medications using the STOPP criteria in frail older inpatients: a randomized controlled study

O. Dalleur , B. Boland, C. Losseau , S. Henrard , D. Wouters, N. Speybroeck , J.M. Degryse, A. Spinewine

Internal geriatric consultation Team (IGCT)



RCT STOPP

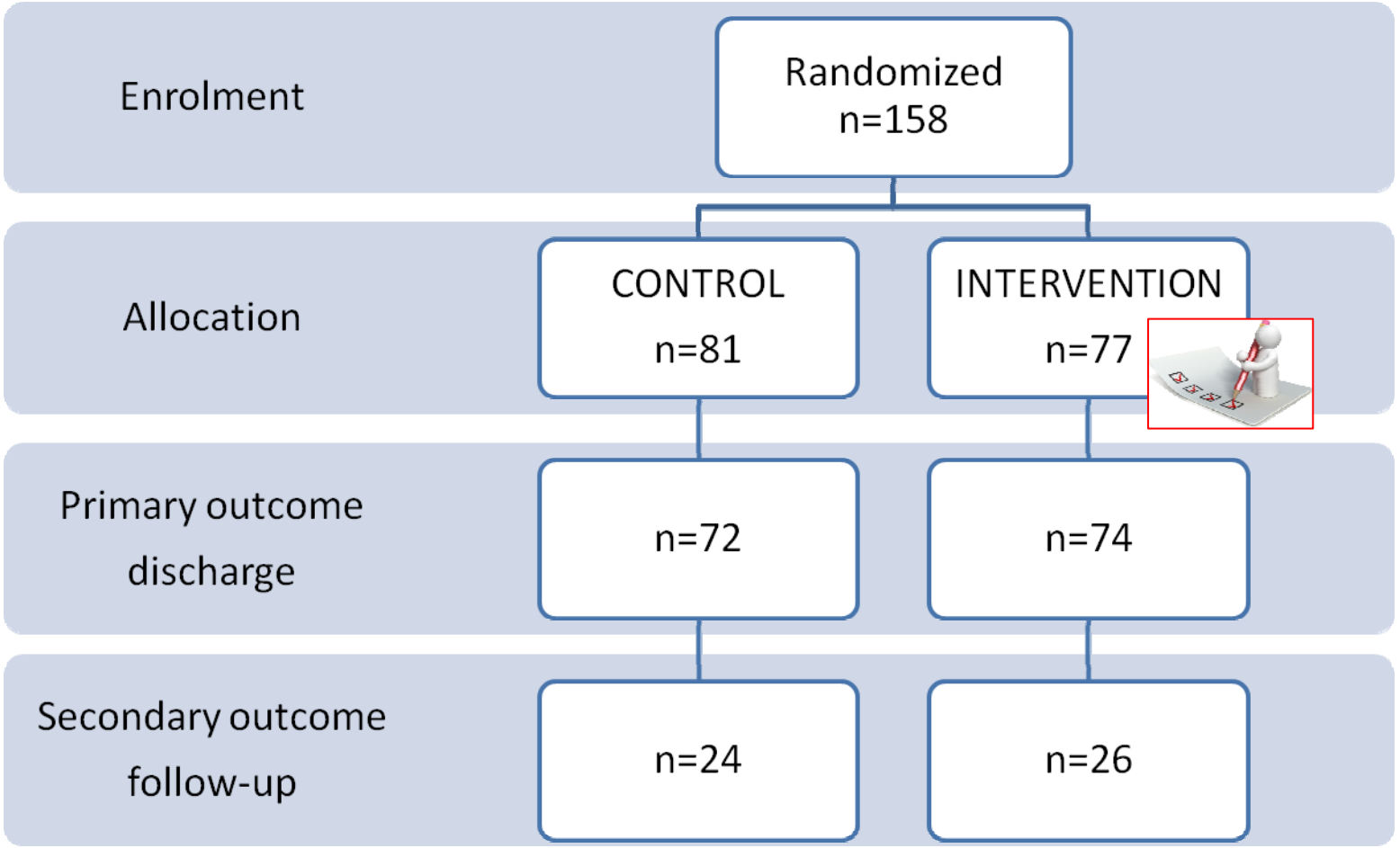
- Objective
  - Reduction of inappropriate medications at hospital discharge
  - Follow-up 1y

- Intervention

Systematic screening with STOPP

+ recommendations

Patients flow

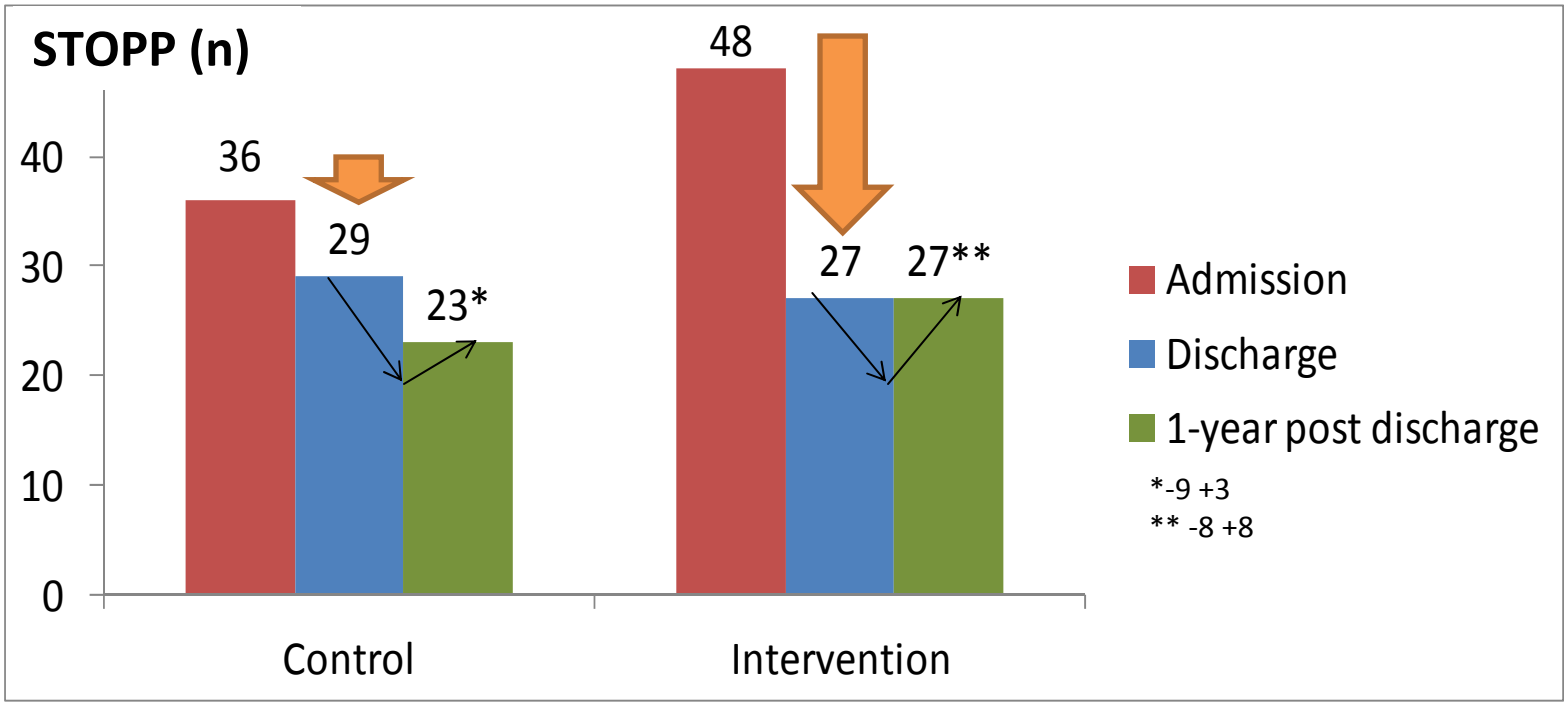


The improvements

- Discharge

  STOPPdiscontinuation rate at discharge **X2**
  (-40% vs. -19%, p=0.013).

- Follow-up
  - 93% answers
  - 50 patients
  - STOPP not restarted



The improvements

- STOPP screening + recommendations
  - discontinuation x2 at discharge
  - persist one year

⇨ Knowledge on geriatric pharmacotherapy = needed

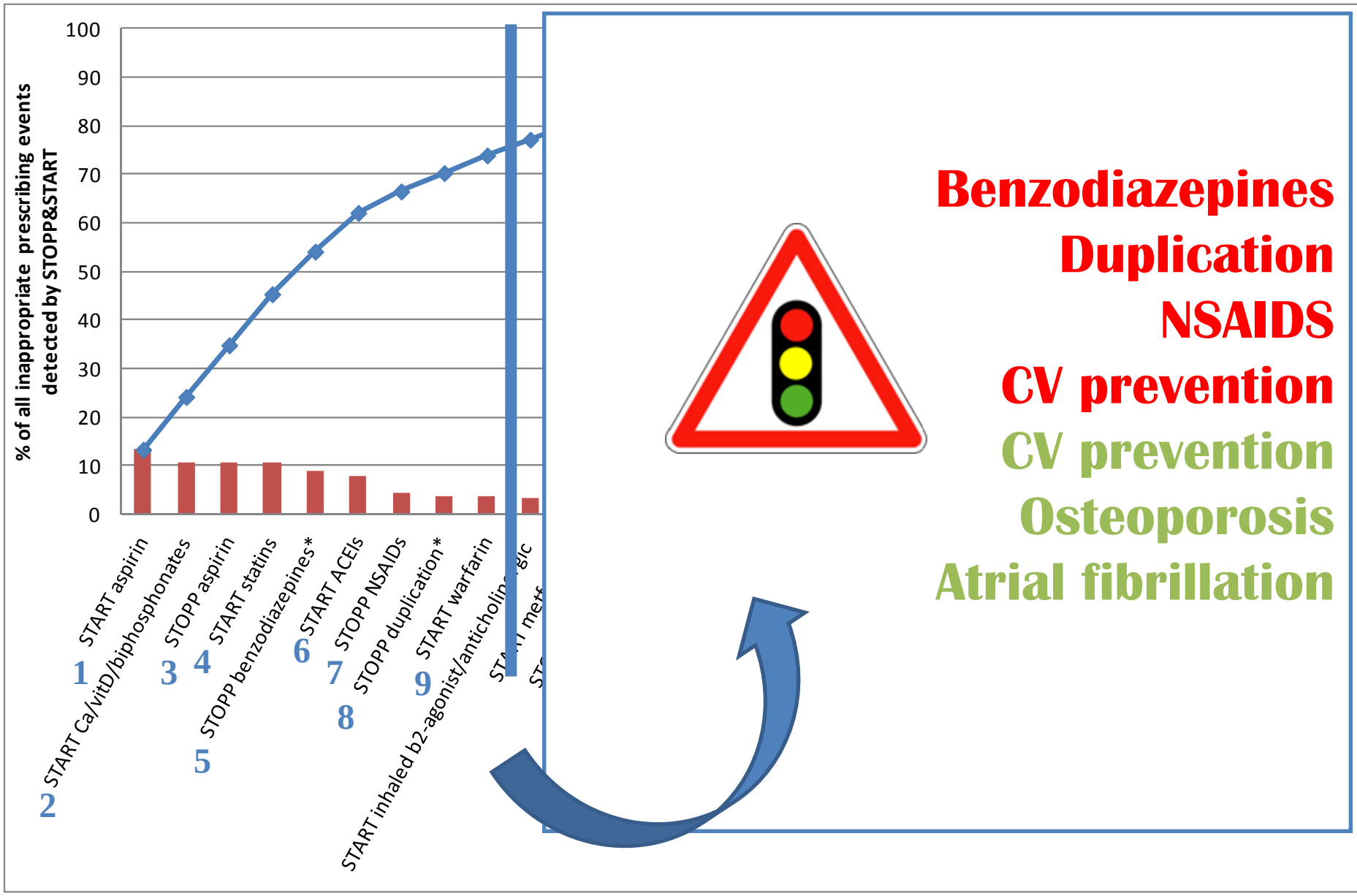
⇨ Systematic screening = efficient

⇨ Hospital admission = good opportunity

⇨ Collaborating with general practitioners = essential

- START?

LEARNINGS AND PESPECTIVES


% of all inappropriate prescribing events detected by STOPP&START
100
90
80
70
60
50
40
30
20
10
0
1 START aspirin
2 START Ca/vitD/biphosphonates
3 STOPP aspirin
4 START statins
5 STOPP benzodiazepines*
6 START ACEIs
7 STOPP NSAIDs
8 STOPP duplication*
9 START warfarin
START inhaled b2-agonist/anticholin
Benzodiazepines
Duplication
NSAIDS
CV prevention
CV prevention
Osteoporosis
Atrial fibrillation

Short version of STOPP&START?

	Top 10 of most frequent inappropriate prescribing[a]	Good predictive validity[b]	Major relevance[c]
START			
ACEIs	*		*
Aspirin	*		
Statins	*		*
Warfarin	*	*	*
Ca/vitD/ biphosphonates	*	*	*
Inhaled b2-agonist/ anticholinergic	*		
STOPP			
Benzodiazepines	*	*	*
Aspirin	*		*
Calcium channel blockers			*
Duplication	*		*
NSAIDs	*		
Neuroleptics		*	
SSRIs			*

Abbreviations: ACEIs angiotensin-converting enzyme inhibitors; Ca Calcium;; NSAIDS non steroidal anti-inflammatory drugs; PPIs proton pump inhibitor; SSRI selective serotonin reuptake inhibitor; TCAs tricyclic antidepressants.
a. most frequent criteria detected in chapters I and III; b. according to chapter I and Gallagher et al. ; c. according to the experts in chapters III and IV.

Recommendations to improve validity and applicability of STOPP&START

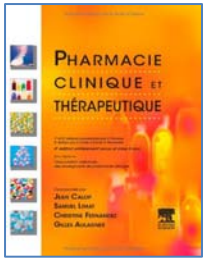
General comments	Recommendations to improve the validity of the criteria	Recommendations to improve the applicability of the criteria
patient context •Severity •Cardiovascular/ neurologic •Allergies **drug information** •indication •dosage	• contra-indications • no overlap • range of application • time to benefit	• definitions • monitoring tips • alternatives (pharmacological and non-pharmacological)

Computerized Decision Support System ?

Take home messages for healthcare policy makers

- **Incentives** to help the implementation of the tool and regular **medication review**:
  - one medical consultation a year
  - criteria in accredited computerized clinical decision support system
  - medication review with general practitioners and pharmacists
  - medication reviews for the local nursing home.
- **Clinical pharmacist** in the internal geriatric consultation team
- **Education**

Education



CHAPITRE 59

MÉDICAMENTS ET PERSONNES ÂGÉES

Anne Spinewine
Chargé de cours à l'Université catholique de Louvain, Louvain Drug Research Institute et Faculté de Pharmacie et des Sciences Biomédicales, Bruxelles, Belgique ; Responsable du service de pharmacie clinique, Centre hospitalier universitaire de Mont-Godinne, Yvoir, Belgique

Olivia Dalleur
Pharmacien hospitalier clinicien, docteur(e) en sciences pharmaceutiques ; Université catholique de Louvain, Cliniques universitaires Saint-Luc, Louvain Drug Research Institute, Faculté de Pharmacie et des Sciences Biomédicales, Bruxelles, Belgique

MG & GERIATRIE

STOPP&START

Dépister nos prescriptions inappropriées chez les patients âgés

START & STOPP

Pour la bonne prise en charge des patients gériatriques à St Luc.

Sélection des médicaments les plus souvents inappropriés.

Si...	START !
FA (hors CI aux AVK : épisode hémorragique, thrombopénie, cirrhose, non-compliance. *Les chutes ne sont pas une CI majeure!*)	AVK
FA (et CI aux AVK)	Aspirine
Diabète et ≥ 1 facteur de risque CV (HTA, chol., tabac)	Aspirine
	Statine
Athéro-sclérose (coronaire, cérébrale ou périphérique (patient en rythme sinusal))	Aspirine
Athéro-sclérose coronaire, cérébrale ou périphérique chez un patient avec **indépendance fonctionnelle** et une espérance de vie > 5 ans	Statine
Ostéoporose connue	Calcium et vitamine D

STOP(P) !	Si...
Benzodiazépine	A **longue durée d'action** utilisée > 1 mois (longue durée ou métabolites actifs longue durée : Fristum=clobazam, Rivotril=clonazepam, Tranxène=clorazepate, Valium=diazepam, Rohypnol=flunitrazepam, Stauzodorm=flurazepam, Victan=loflazepate d'éthyle, Mogadon=nitrazepam, Calmo-Seresta=oxazepam, Lysanxia=prazepam et Mylostan=témazépam)
	ATCD de **chute** ces 3 derniers mois
Aspirine	ATCD **d'ulcère** gastrique et utilisé sans protection gastrique (IPP ou anti-H2)
	Combinaison aux **AVK** sans protection gastrique (IPP ou anti-H2)
	Dose d'entretien > **150mg**
	Prévention primaire (sans diabète) (pas d'ATCD coronaire, pas d'AVC, pas de maladie vasculaire périphérique, pas d'occlusion, pas de revascularisation)
	Maladie hémorragique
Bétabloquant	En combinaison au **Verapamil**
	Non cardio-sélectif et **BPCO** (Non cardio-sélectif (A. : Visken=pindolol, Inderal=propranolol, Solotex=sotalol))
	Diabète et symptômes d'hypoglycémies ≥ 1x/mois
Opioïde	**Puissant** en première ligne au long cours (Analgésiques puissants : Durogesic=fentanyl, Palladone=hydromorphone, morphine, Haphenon=méthadone, Oxycontin/Oxynorm=oxycodone, Dipidolor=pentazocine)
	Au long cours et ATCD de **chute** ces 3 derniers mois
	> 2 semaines et **constipation** chronique importante
	Au long cours chez le patient **dément** (sauf soins palliatifs et douleur chronique)

Chez les patients âgés à profil gériatrique, il y a souvent

≥1 médicament dangereux à STOPPer (52%) et/ou

≥1 médicament utile à STARTer (61%).

Take home messages for clinicians

- Potentially inappropriate prescribing at home is **highly prevalent**
- **Underuse** > overuse
- **Implemented in clinical practice on a regular basis**
- Six actions would prevent 75% of potentially inappropriate prescribing:

•Benzodiazepines
•Duplication
•NSAIDS
•CV prevention
•Osteoporosis
•Atrial fibrillation

- **Global context** of the patient / STOPP&START does not replace good **clinical judgement**
- STOPP&START ⇨ **multidisciplinary** team, multistep approach
- Implementation in **nursing homes**

COME · ON
Collaborative approach to Optimise MEdication use for Older people in Nursing homes

Perspectives

Comorbidity

Frailty

Point of view of the patient

Reasons of underuse

New oral anticoagulants

Adverse drug event

Nursing home

Clinical pharmacy and general practice

Anticholinergic burden

Length of stay

Short list

Clinical pharmacist & IGCT

Atrial fibrillation & dual therapy

L'outil STOPP&START

La situation actuelle

- **Observation**
- Patients âgés/très âgés/fragiles
- Hôpital et ambulatoire

- Sur-utilisation: ± 40-50% patients
- Sous-utilisation: ± 60% patients

- **Médicaments**:
  - benzodiazépines,
  - CV (aspirine, statines),
  - Ca+vit D
  - Anticoagulants

Les critères en question

- **Qualitative**
- Experts/utilisateurs

- **Contenu**
  - Les plus fréquents = importance modérée ou majeure
  - Influences
    - Utilisateur
    - Patient
    - Contexte

Améliorations

- **Intervention**
- Prévention (1/4 admissions)
- Action

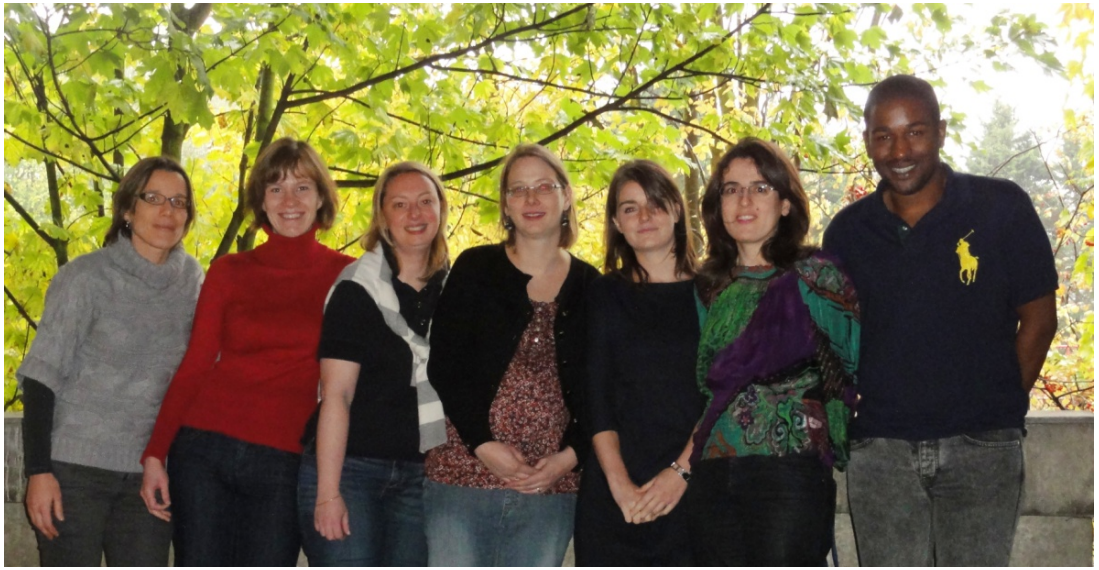
- Diminution des médicaments inappropriés à la sortie de l'hôpital: -**50**%

- **Effet persistant** à 1 an

- **Idées pour l'implémentation**: informatisation, formation, interdisciplinarité, temps pour discuter avec le patient

Should we STOPP&START?

Thanks



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