The STRIPassistant
A digital tool to optimize polypharmacy

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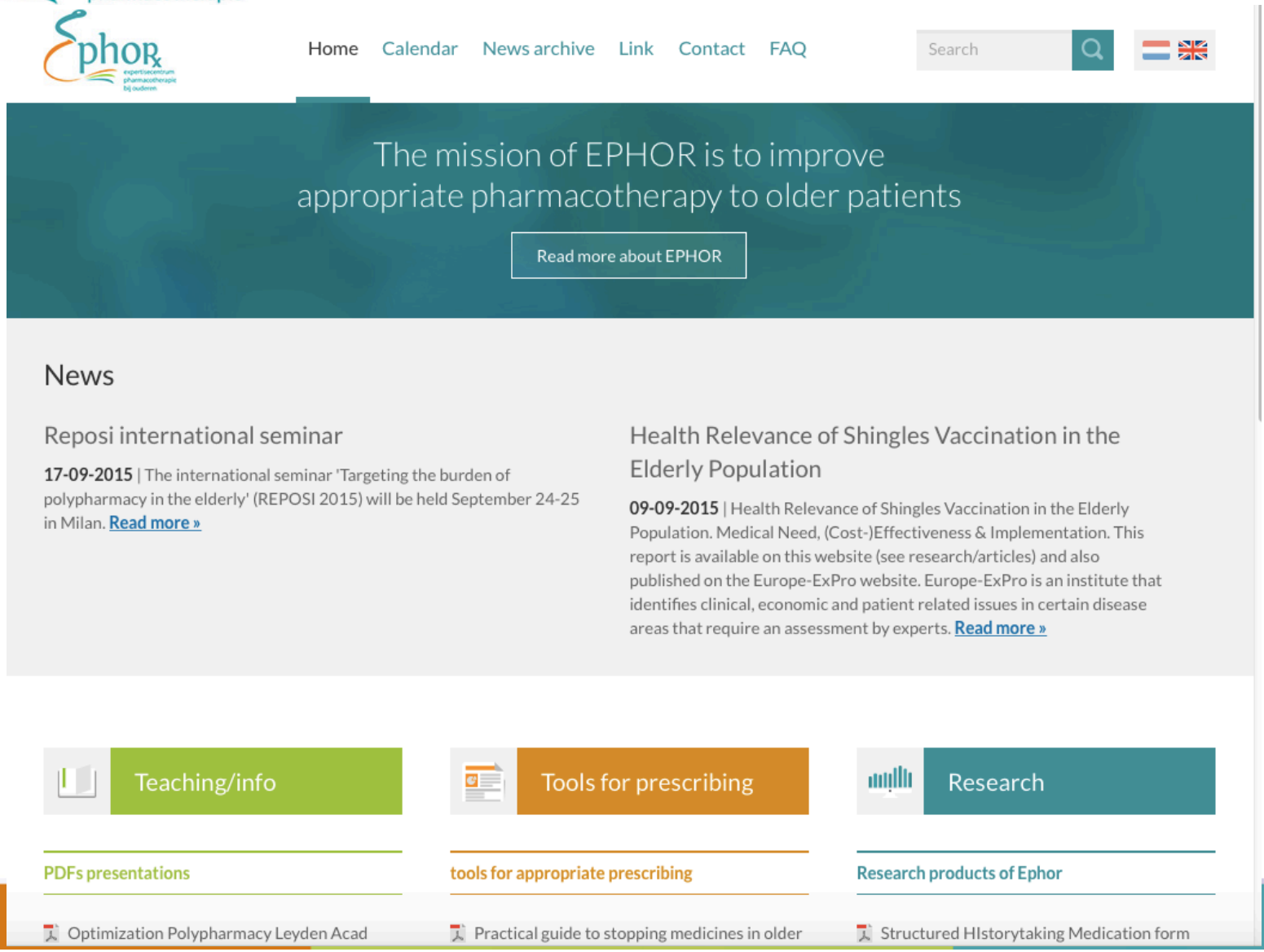

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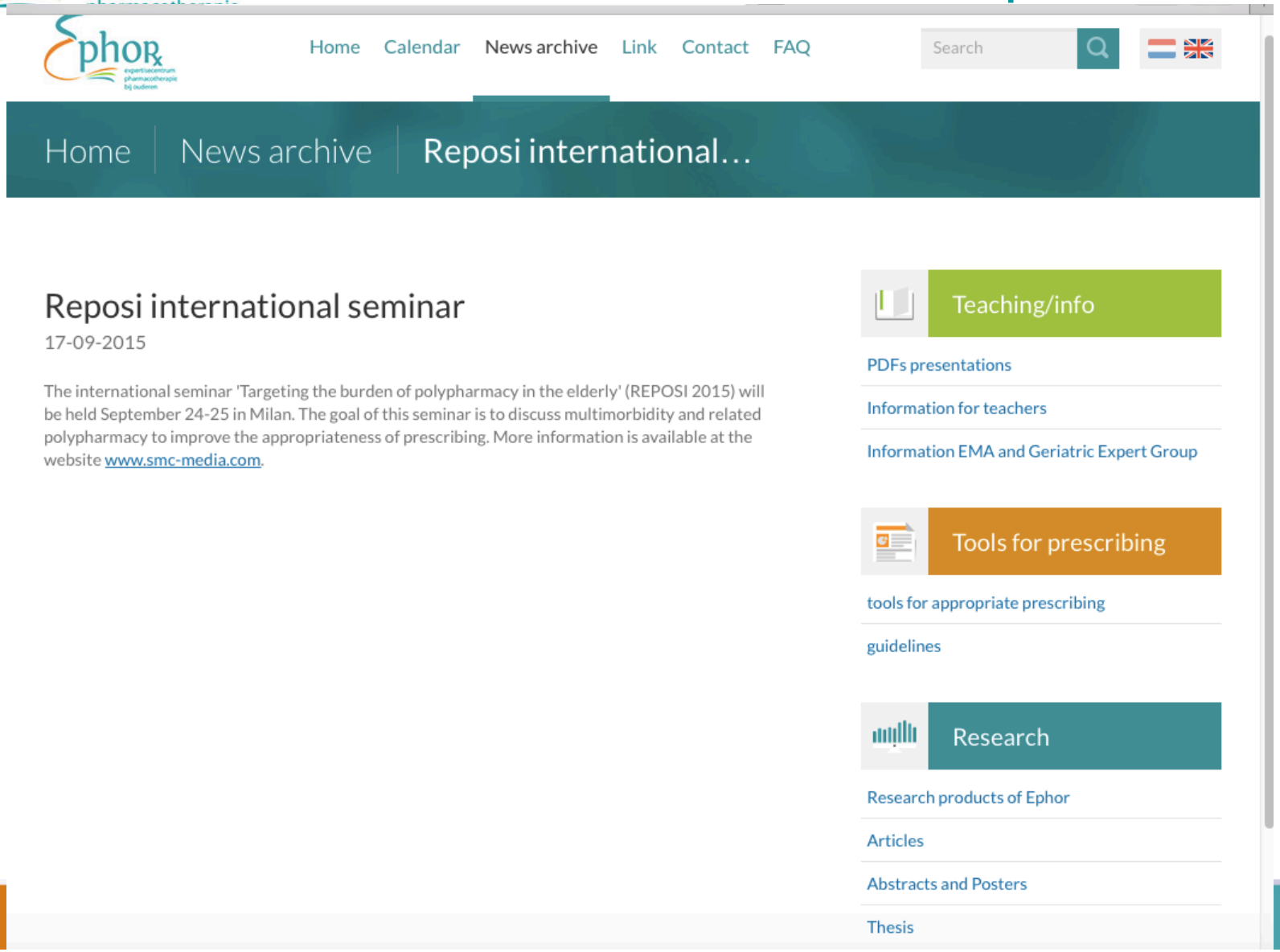


In the elderly often multimorbidity and polypharmacy

What is the mean drug use in geriatric patients?

Mean drug use

- At the geriatric department:
  mean 10,2 medicines
  (spread 2-24)

- number of OTC's: 2,0 (0-6, 83%)

International:
50.000 drug related admissions
/year per 10 million inhabitants

HARM study in NL (2006):

10% of admissions of older people are drug related

About half are preventable

Leendertse et al. Archives Int Med 2008; 63 (22): 2716-2724

The harmful medicines

- Trombocytes aggregration inhibitors
- Vitamin K antagonist
- NSAID's
- Psychotropics
- Antidiabetics
- Diuretics
- Glucocorticosteroïds
- Antibiotics

Risk factors

- Cognitive disorder (HR 11,9; 3,9-36,3)
- Polymorbidity (>5 HR 8,7; 3,1-24,1)
- Decreased renal function (HR 3,1; 1,9-5,20
- Not living at their own (HR 3,0;1,4-6,5)
- Polypharmacy (>5 HR 2,7; 1,8-3,9)
- Non adherence (HR 2,3; 1,4-3,8)

Medication review

Structured evaluation of a patient's medicines

- To optimize the impact of medicines
- And minimize the number of medication related problems

Prescribing Optimization Method

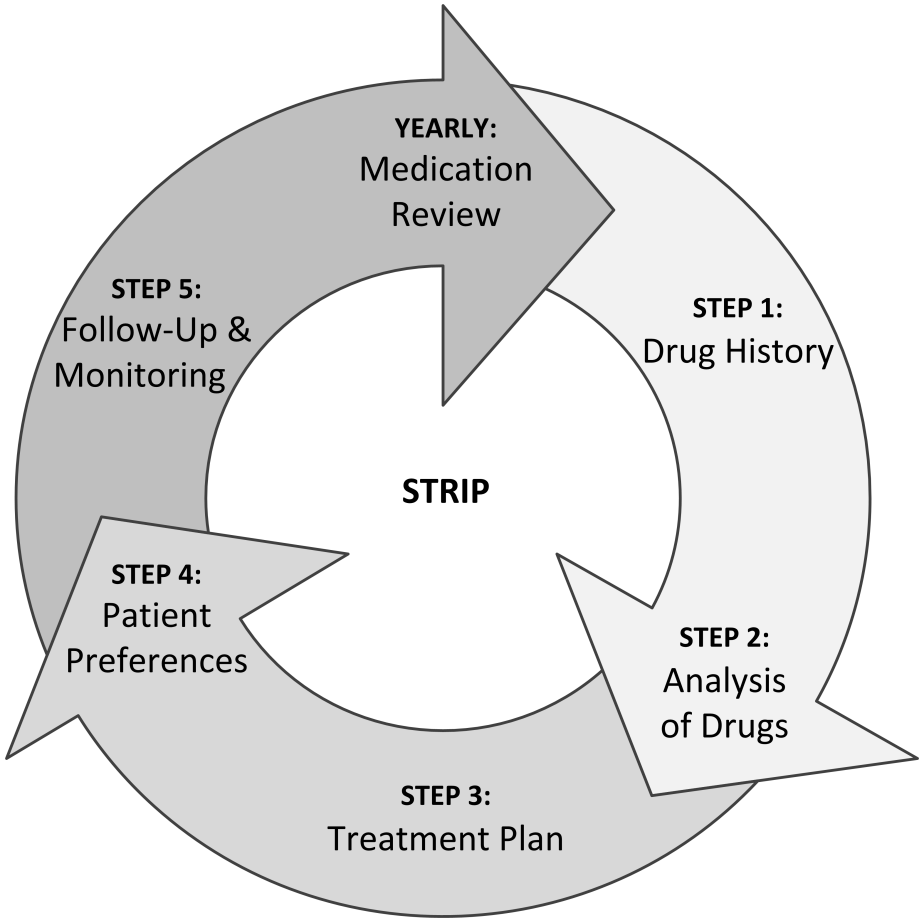
1. What does the patient really take?
2. Does the patient suffer adverse effects?
3. Which drug(s) should be added?
4. Which drug(s) are not necessary/contra-indicated?
5. Which clinical relevant interactions are to be expected?
6. Should the dose or dosefrequency be changed?

Drenth et al. Drugs and Aging 2009; 26: 687-701

Results of POM

- Improvement of 39% of correct decisions
- decrease of 27% of potentially harmful decisions
- On base of the POM pharmacists developed another tool, called the GIVE (Use/Indication/ Safety/Efficacy)
- To offer one tool to general practitioners and pharmacists POM and GIVE were combined to the Systematic Tool to Reduce Inappropriate Prescribing (STRIP)

STRIP is used in the Dutch guideline "Polypharmacy in old patients"(2012)



Step 1: drug history (SHIM)

Step 2: pharmaceutical analysis

Step 3: treatment plan (physician and pharmacist)

Step 4: shared decision

Step 5: follow-up and monitoring

1. Stuctured HIstory taking of Medication (SHIM)

- List of 16 questions
- About the prescribed medicines
- About OTC
- Including homeopathic drugs/herbal medicines
- Intake problems
- Adverse effects

SHIM results in 100 patients

- In 92% discrepancies
- Mean 3.7 ± 3.3
- Omission was the most common discrepancy
- Potential clinical relevance:
  - class 1: 28%
  - class 2: 56%
  - class 3: 16%

SHIM results

- 21% had discomfort because of the discrepancy: www.ephor.eu

STRIP Step 2: Pharmaceutical analysis

- Whats lacking: START
- What is not needed or contra-indicated: STOP(P)
- Adverse effects
- Clinically relevant interactions
- Dose and dosefrequency, generic available

Age and Ageing 2014; **0:** 1–6
doi: 10.1093/ageing/afu145

STOPP/START criteria for potentially inappropriate prescribing in older people: version 2

Denis O'Mahony[1,2], David O'Sullivan[3], Stephen Byrne[3], Marie Noelle O'Connor[2], Cristin Ryan[4], Paul Gallagher[2]

Strip-assistant description

- Decision support web service
- Aids physicians and pharmacists with reviewing medication through the STRIP method
- Generates advice based on patient data and explicit knowledge

STRIP-assistant

Dhr. Van D.
Leeftijd: 75

Klachten
Rug symptomen/klachten
Diarree
Nierfunctie, verminderde

Labwaardes
kalium: 3.7 mmol/l
digoxine (Lanoxin) spiegel: 1.2
glucose dagcurve (GDC): 6-10

natrium: 138
eGFR volgens MDRD formule: 52 ml/min/1,7
diastolische bloeddruk: 80 mmHg

Aandoeningen

R95:	Emfyseem/COPD
K86:	Essentiële hypertensie zonder orgaanbeschadiging
K76.02:	Vroeger myocardinfarct (> 4 wkn geleden)
K77:	Decompensatio cordis
K78:	Boezemfibrilleren/-fladderen
T90.02:	Diabetes mellitus type 2
T82:	Adipositas (Quetelet-index >30)
P76:	Depressie
L76.06:	Fractuur wervelkolom
T92:	Jicht
A97:	Geen ziekte
	Nieuwe aandoening

Medicijnen

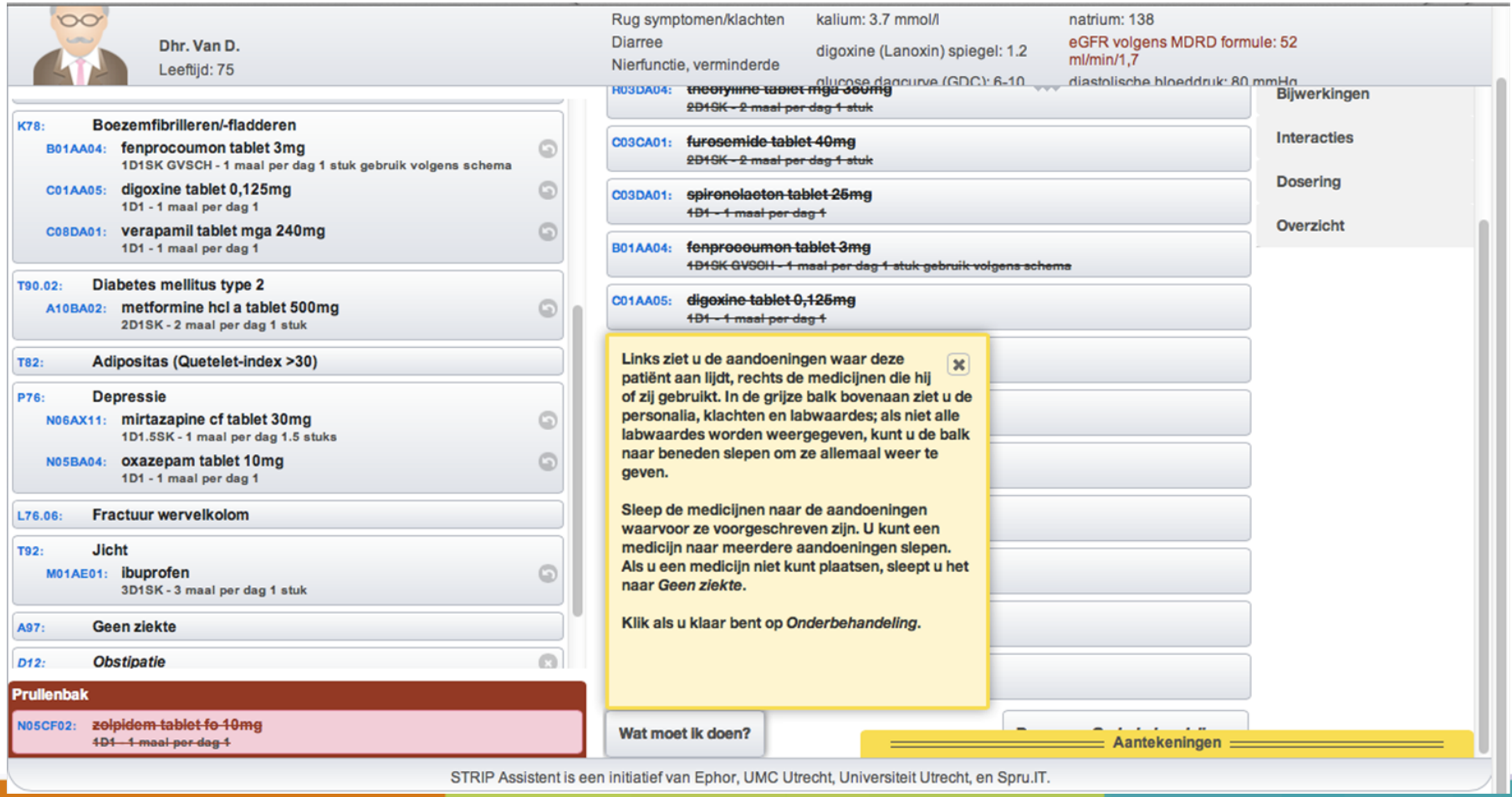
R03BB01:	**ipratropium aerosol 20ug/do 200do inh**	4D1DO ZN - 4 maal per dag 1 dosis zo nodig
R03AC12:	**salmeterol inhalatiepoeder 50ug/do 60do diskus**	2D1DO ZN - 2 maal per dag 1 dosis zo nodig
R03DA04:	**theofylline tablet mga 350mg**	2D1SK - 2 maal per dag 1 stuk
C03CA01:	**furosemide tablet 40mg**	2D1SK - 2 maal per dag 1 stuk
C03DA01:	**spironolacton tablet 25mg**	1D1 - 1 maal per dag 1
B01AA04:	**fenprocoumon tablet 3mg**	1D1SK GVSCH - 1 maal per dag 1 stuk gebruik volgens schema
C01AA05:	**digoxine tablet 0,125mg**	1D1 - 1 maal per dag 1
A10BA02:	**metformine hcl a tablet 500mg**	2D1SK - 2 maal per dag 1 stuk
N06AX11:	**mirtazapine cf tablet 30mg**	1D1.5SK - 1 maal per dag 1.5 stuks
N05BA04:	**oxazepam tablet 10mg**	1D1 - 1 maal per dag 1
N05CF02:	**zolpidem tablet fo 10mg**	1D1 - 1 maal per dag 1
A02AA02:	**magnesiumoxide kauwtablet 500mg**	3D2SK - 3 maal per dag 2 stuks
C08DA01:	**verapamil tablet mga 240mg**	1D1 - 1 maal per dag 1
M01AE01:	**ibuprofen**	3D1SK - 3 maal per dag 1 stuk

Wat moet ik doen?

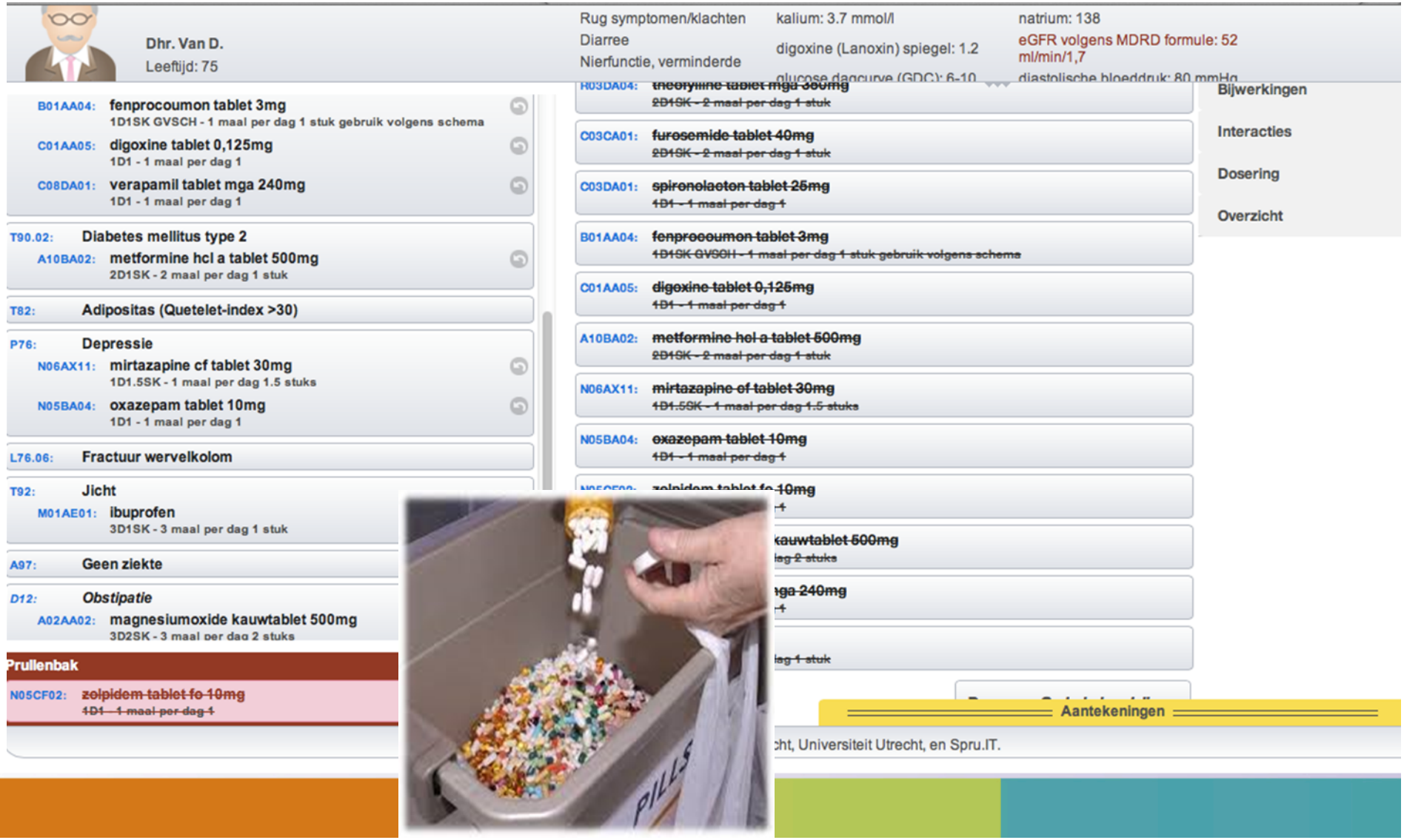
Door naar *Onderbehandeling* >

- Medicijnen
- Onderbehandeling
- Overbehandeling
- Bijwerkingen
- Interacties
- Dosering
- Overzicht

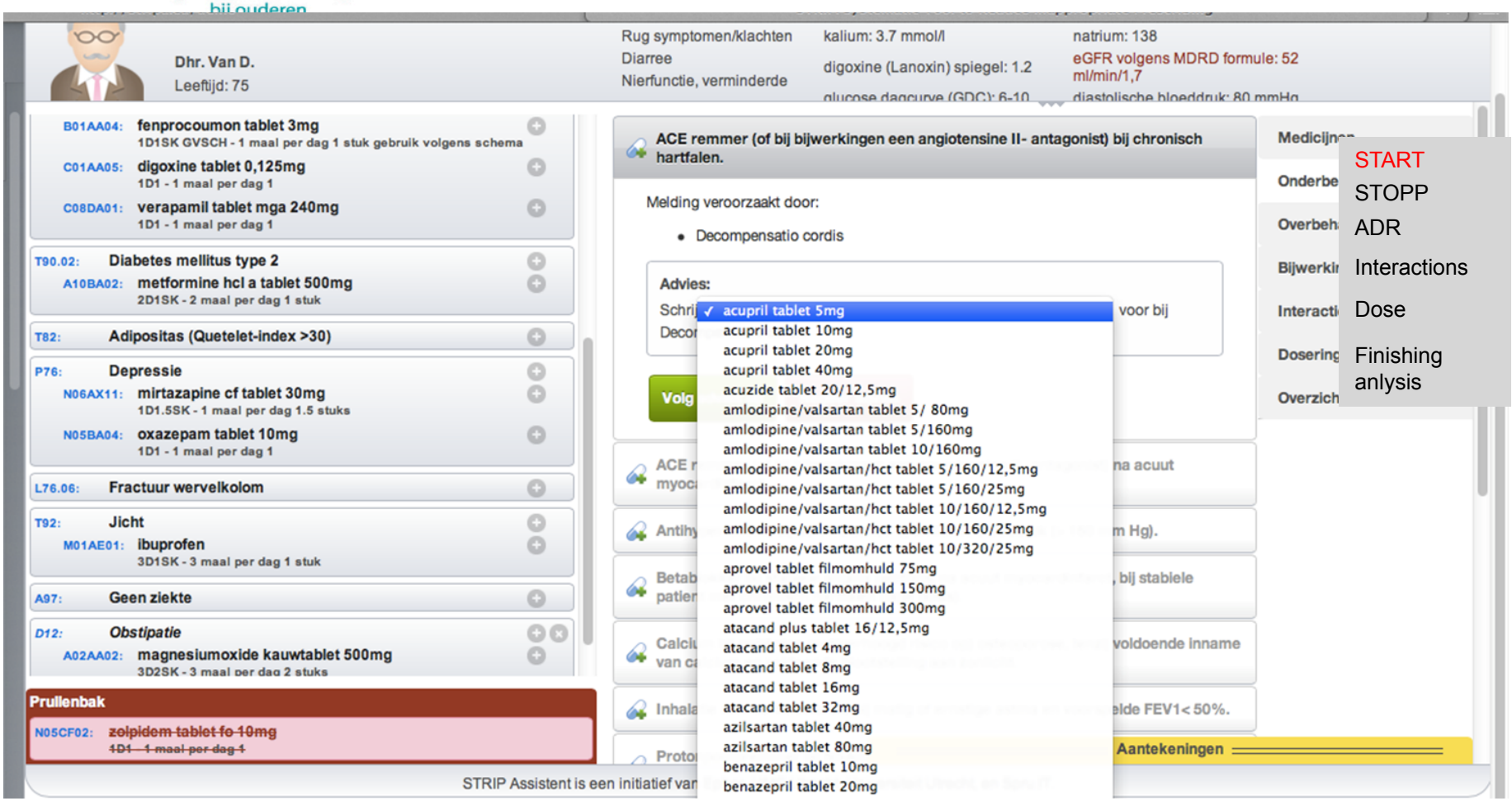
What to do?
Combine problems and medicines



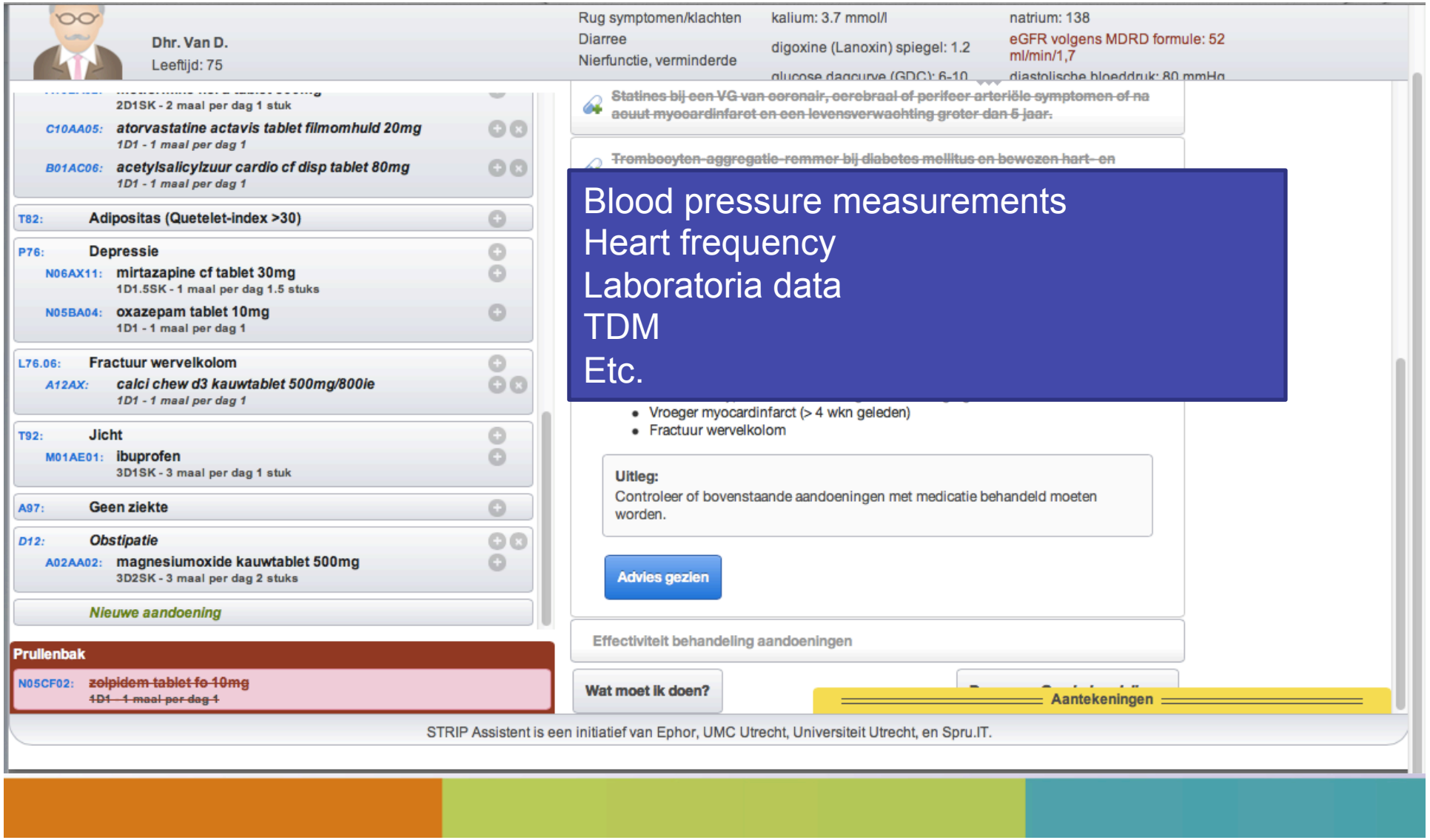
Or use the trash



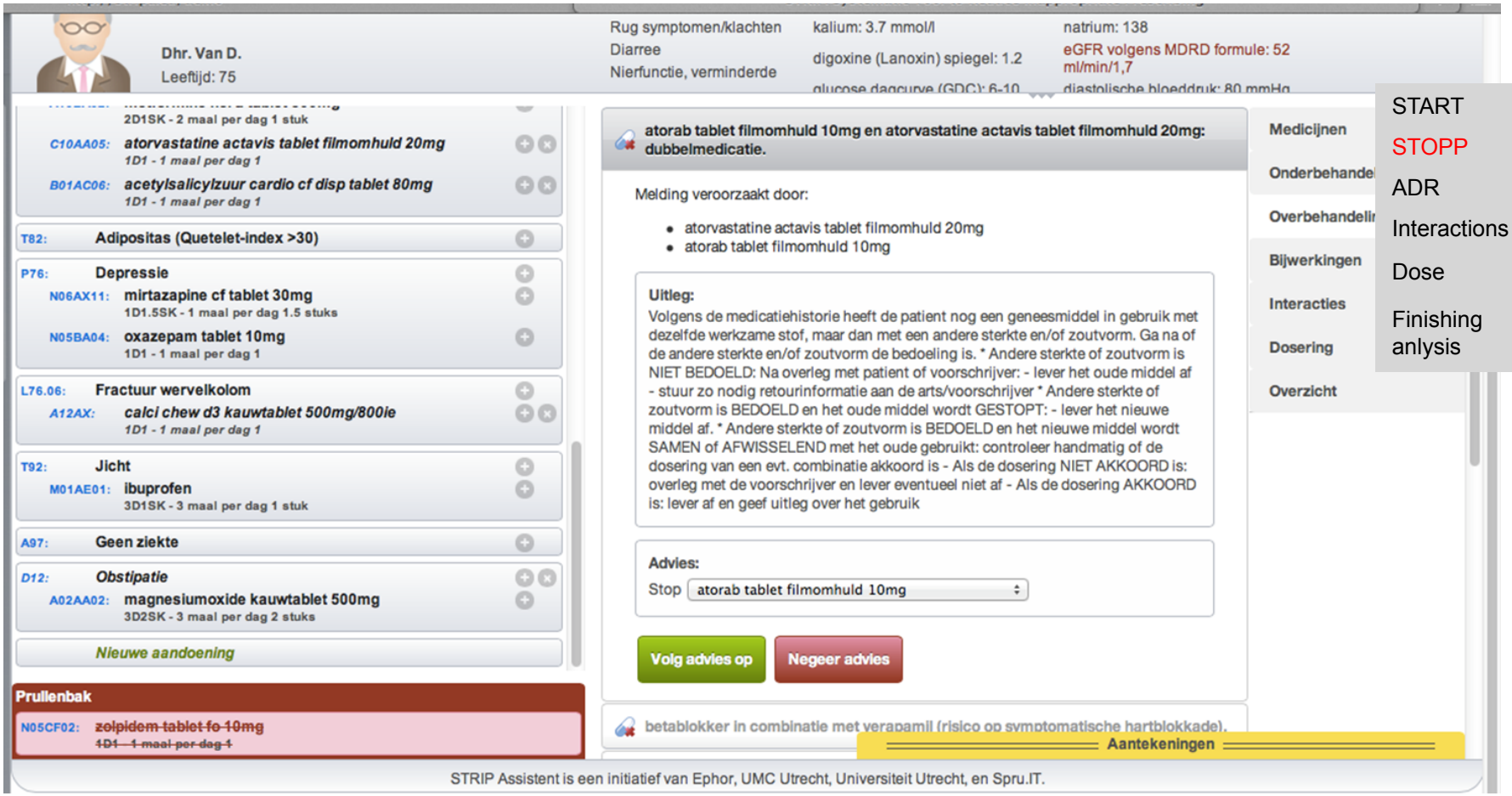
Whats lacking: START



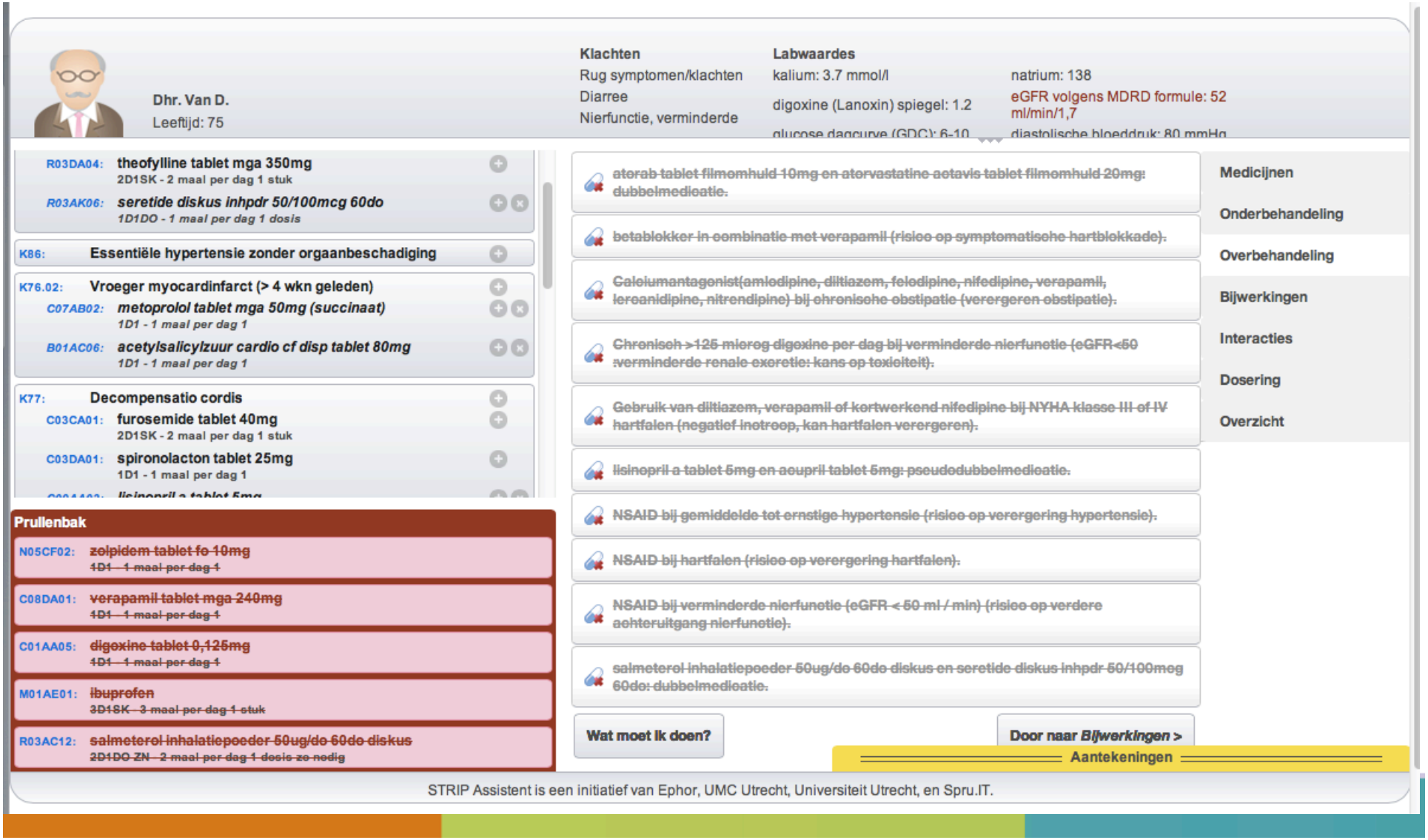
Control of ineffective treatment



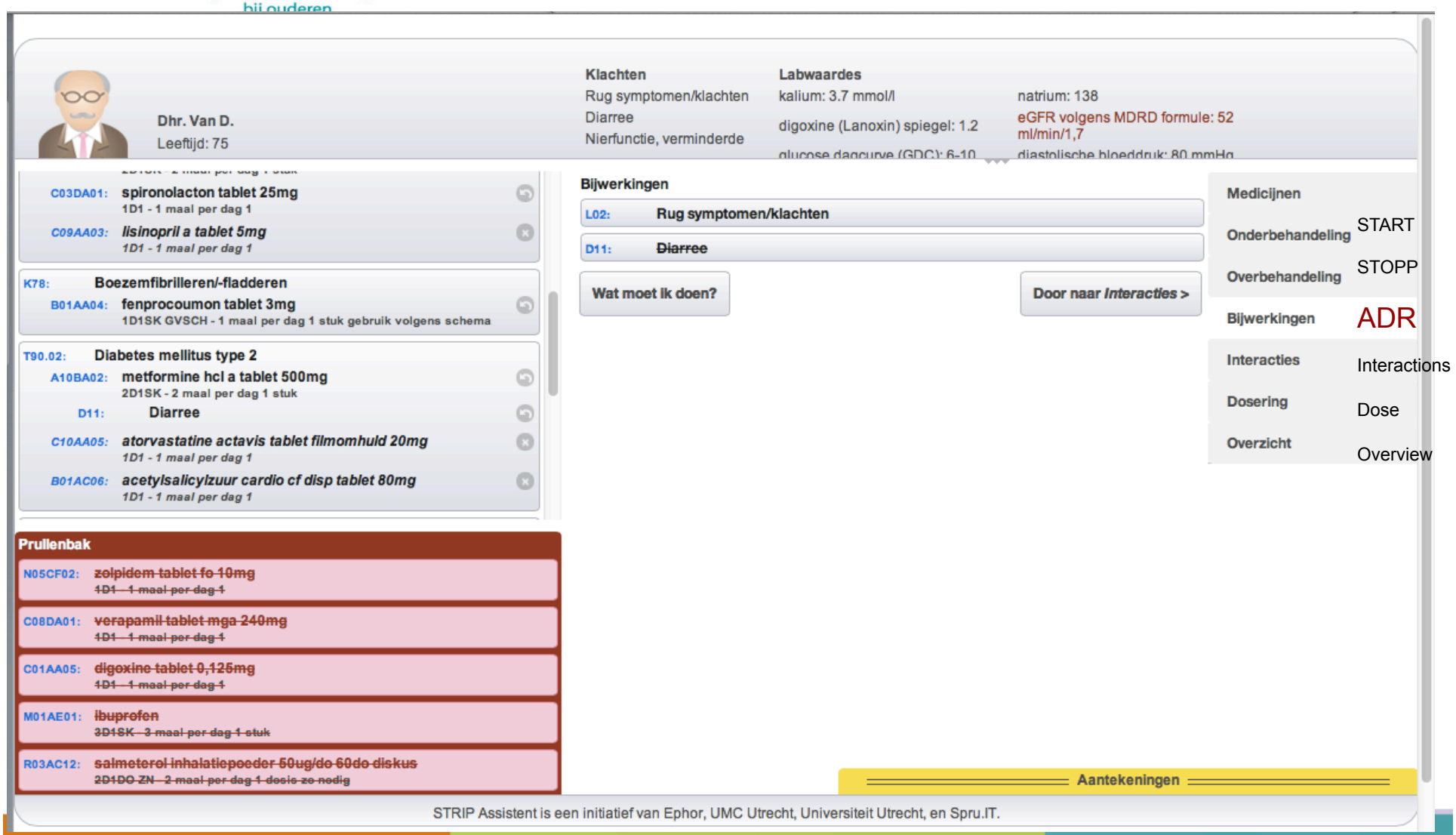
What's not necessary/contra-indicated? STOP



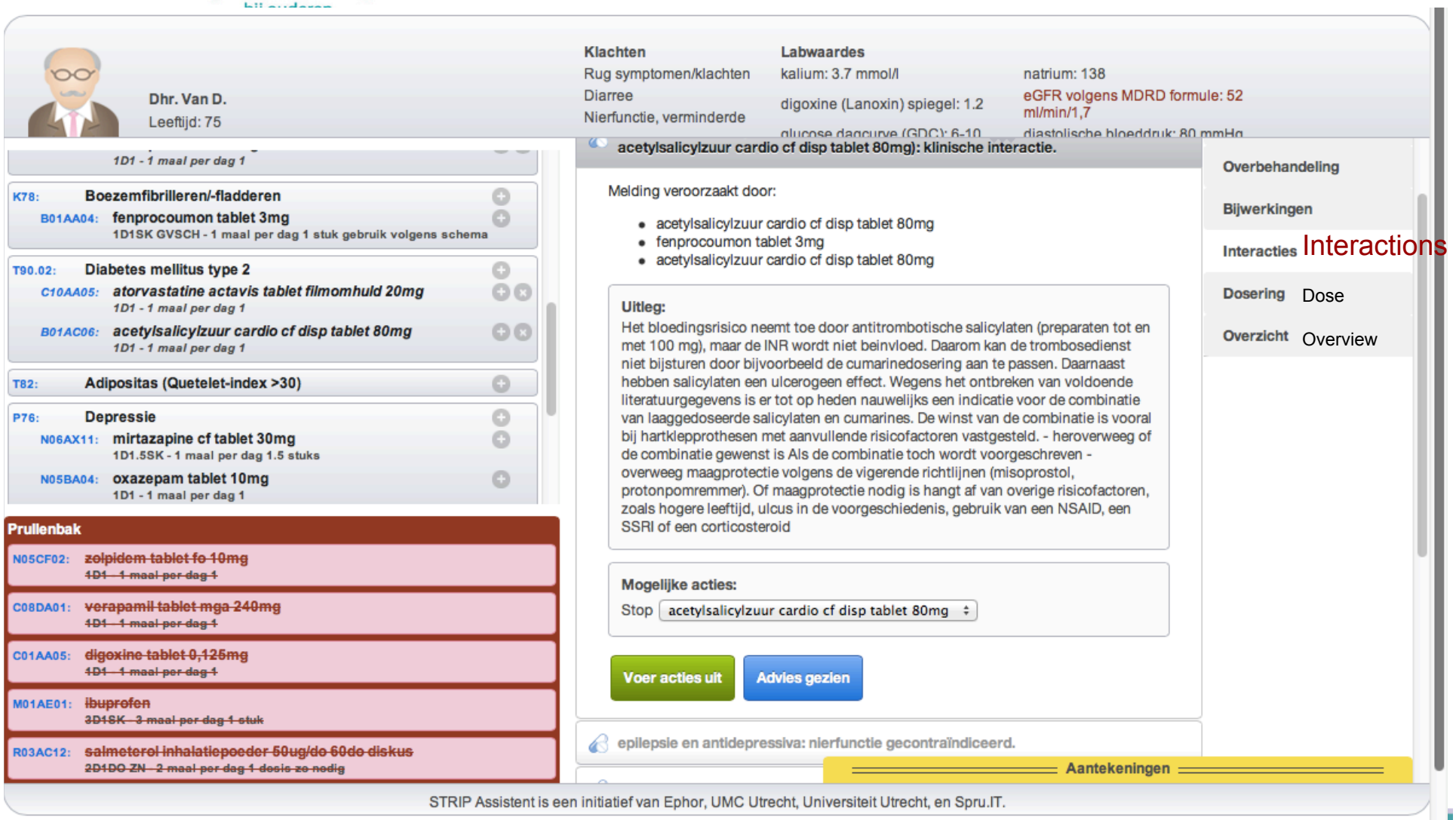
STOP(P) link to laboratory data



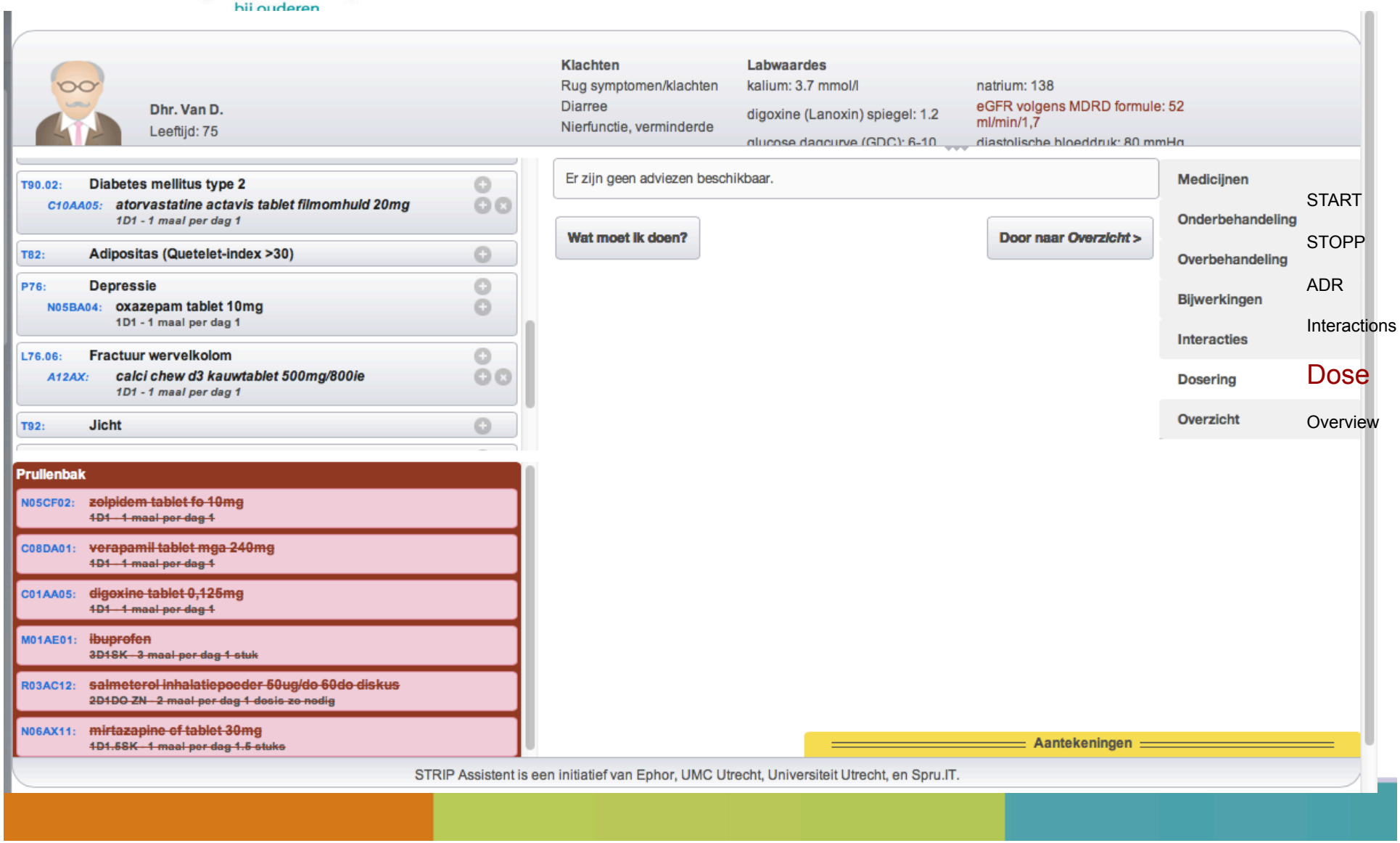
Are signs and symptoms adverse drug reactions?



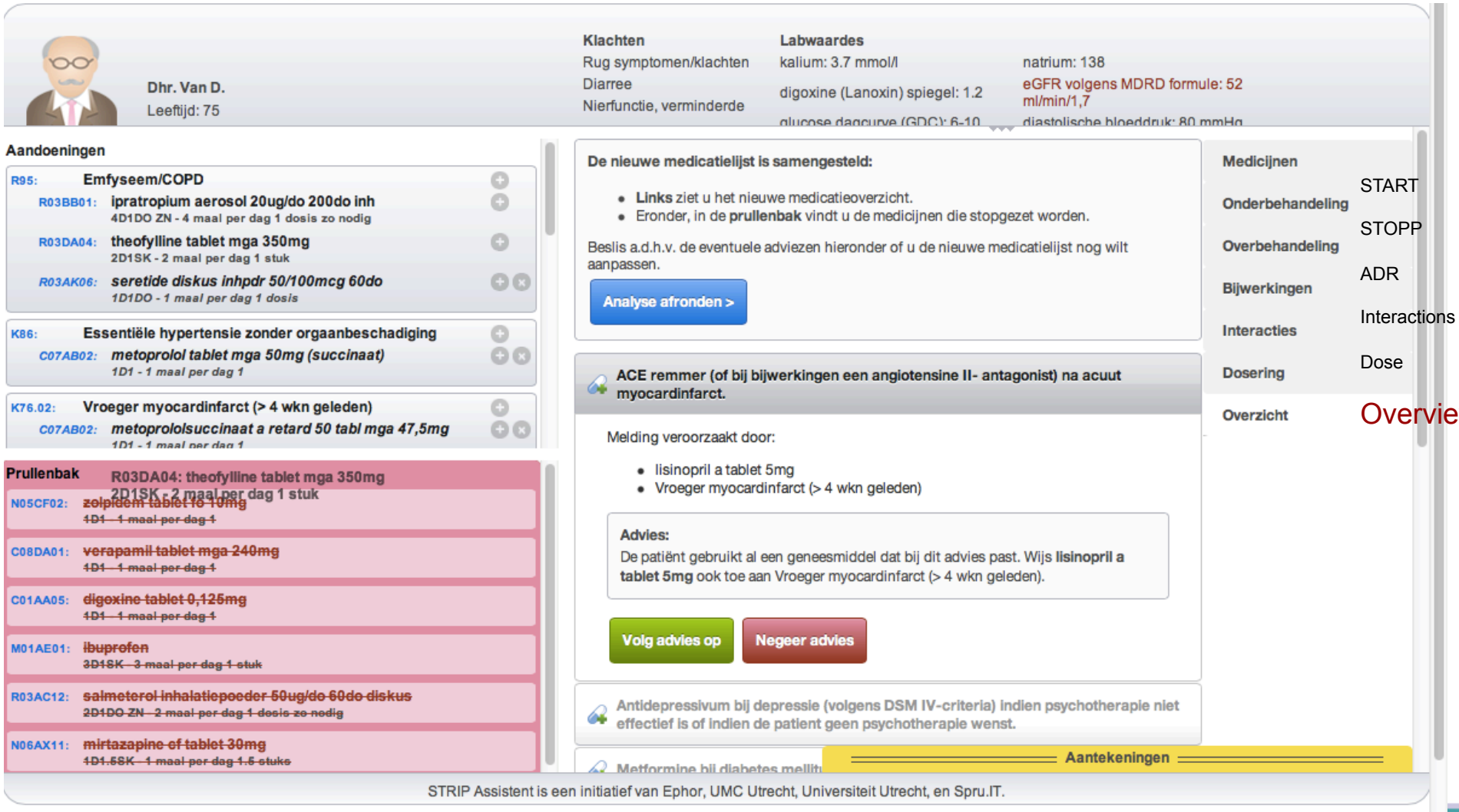
Clinical relevant interactions



Dose control, dose frequency, generic?



Overview: end result control



STRIP-assistant: Evaluation of usability

- Is the STRIP Assistant usable for GPs optimizing medical records of polypharmacy patients?

- 43 respondents optimize a fictional patient record with and without aid by STRIPA (pre test-post test design)

- Outcome:
    1. effectiveness: quality (compared to expert panel)
    2. efficiency: differences in time
    3. satisfaction: survey

STRIP-assistant usability: Results

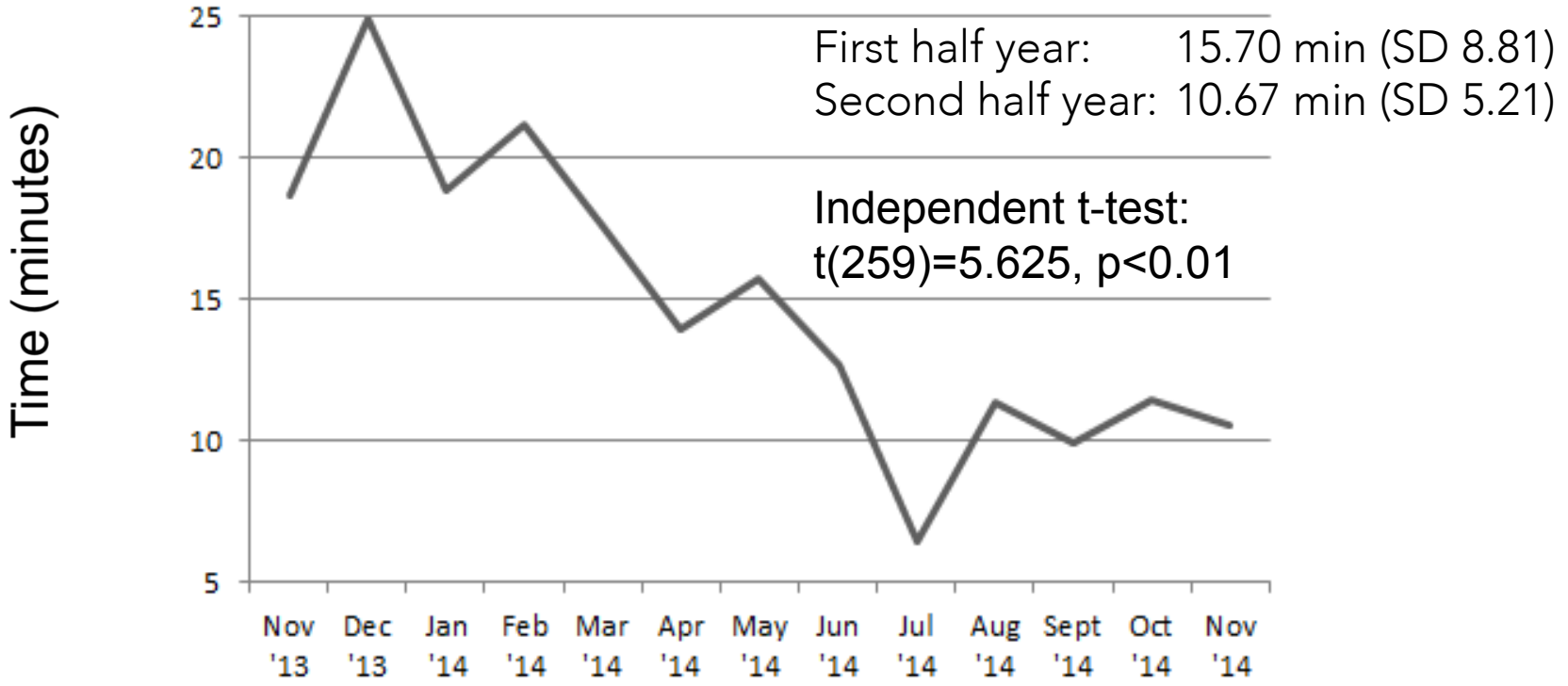
	Usual care	STRIP Assistant	Statistics
The STRIP Assistant positively influences the number of *appropriate decisions* made in a medication review: accepted.	418 (58%)	656 (76%)	Paired t-test: t(42)=8.80, p<0.0001
The STRIP Assistant negatively influences the number of *inappropriate decisions* made in a medication review: accepted.	302 (42%)	210 (24%)	Paired t-test: t(42)=8.93, p<0.0001
The STRIP Assistant negatively influences the *time* taken to perform a medication review: rejected.	13 minutes	24 minutes	Paired t-test: t(42)=7.07, p<0.0001
Users perceive using the STRIP Assistant as *satisfactory*: rejected.		63.25 (SUS-score)	Quality consensus test: 63.25 < 70

Meulendijk et al. (2015) *Drugs & Aging*, 32:495-503.

STRIP-assistant: evaluation of efficiency over time

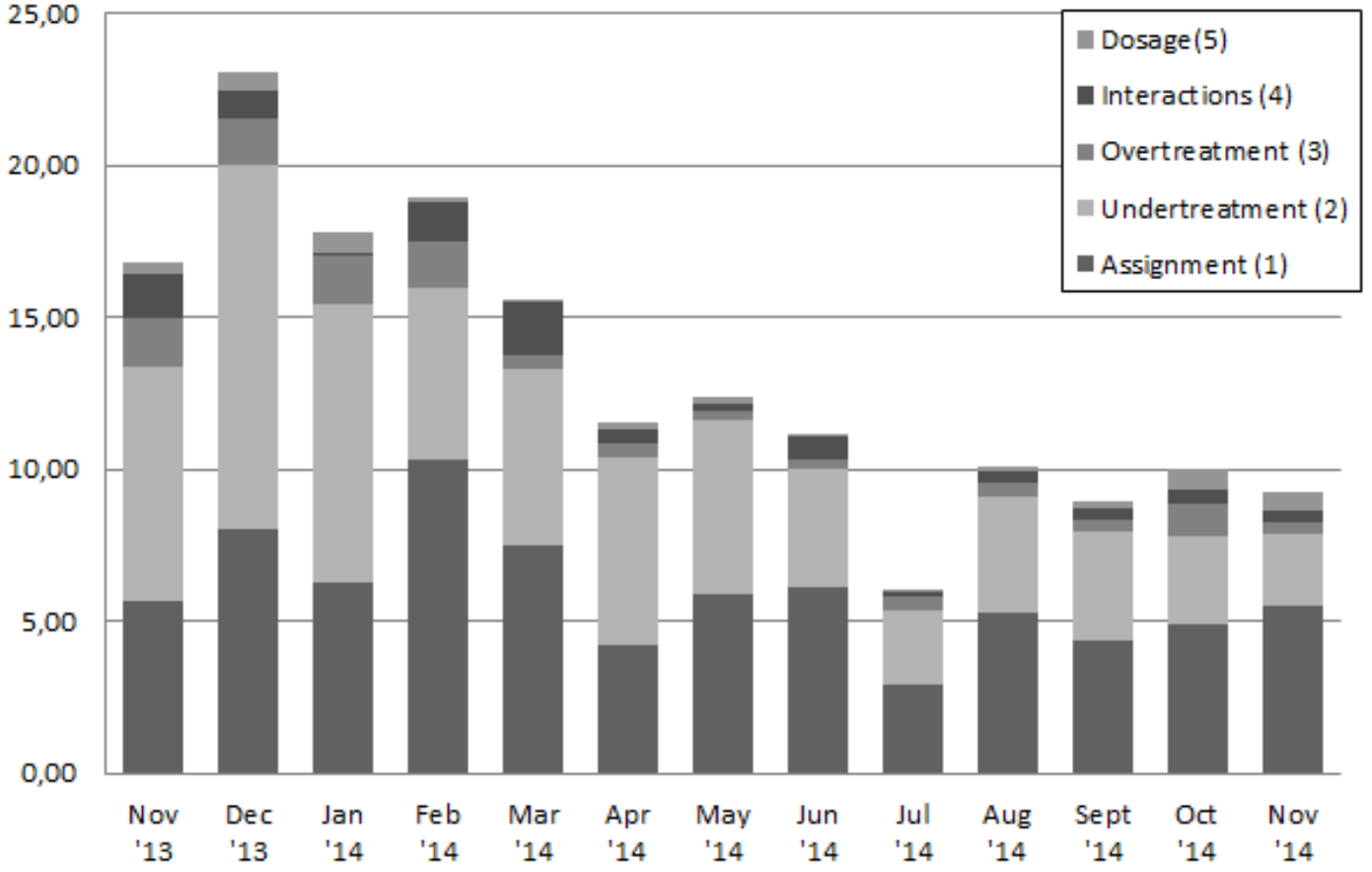
- Do users grow more efficient performing decision supported medication reviews over time
- 13 general practices in Amsterdam
- 4 experts team consisting of a GP and a pharmacist
- 261 medication reviews, including pharmaceutical analysis with the STRIP-assistant from november 2013 – november 2014
- Outcome: efficiency, measured through clickstream analysis

STRIP-assistant: efficiency over time



Meulendijk et al. (2015) **Submitted**

STRIP-assistant: efficiency over time



Meulendijk et al. (2015) **Submitted**

STRIP-assistant: conclusions

- The STRIP-assistant significantly improve the number of appropriate and decrease the number of inappropriate choices.

- Users spend significantly more time optimizing health records with (unfamiliar) clinical decision support systems than without any digital assistance.

- The amount of time users need to perform similar tasks decreases significantly as they gain experience.

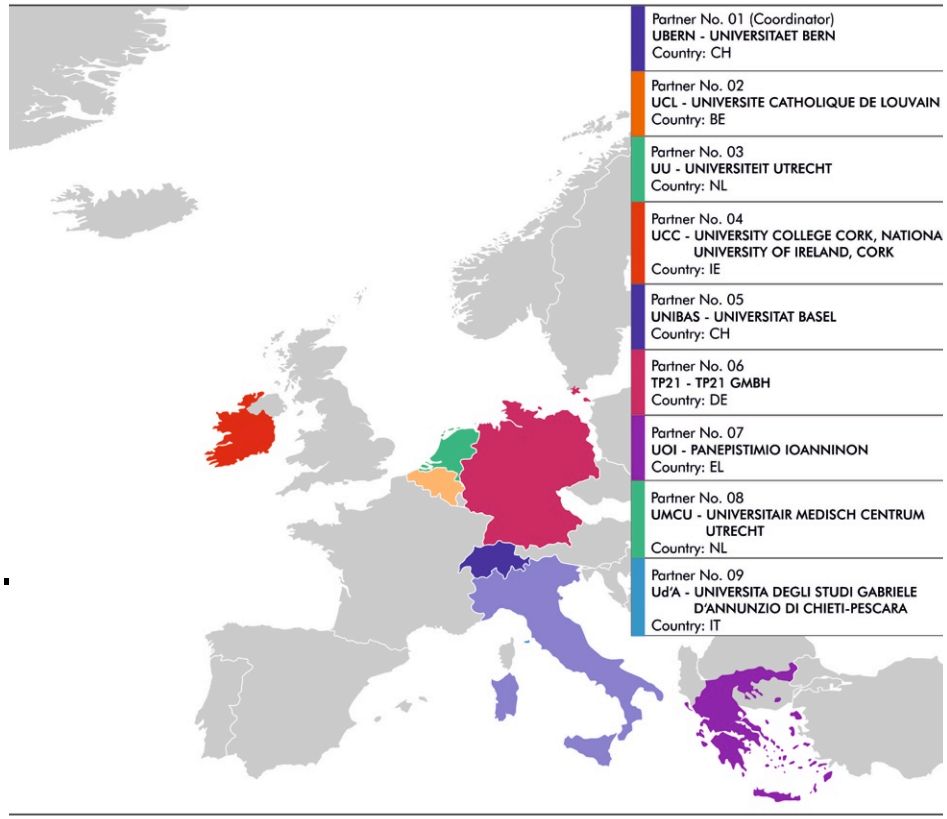
The OPERAM study

Optimising thERapy to prevent Avoidable hospital admissions in the Multimorbid elderly

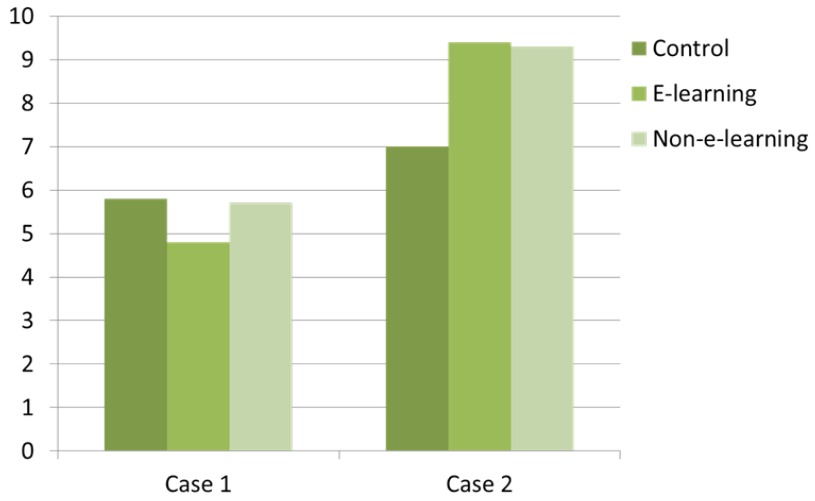
01.05.2015 – 30.04.2020

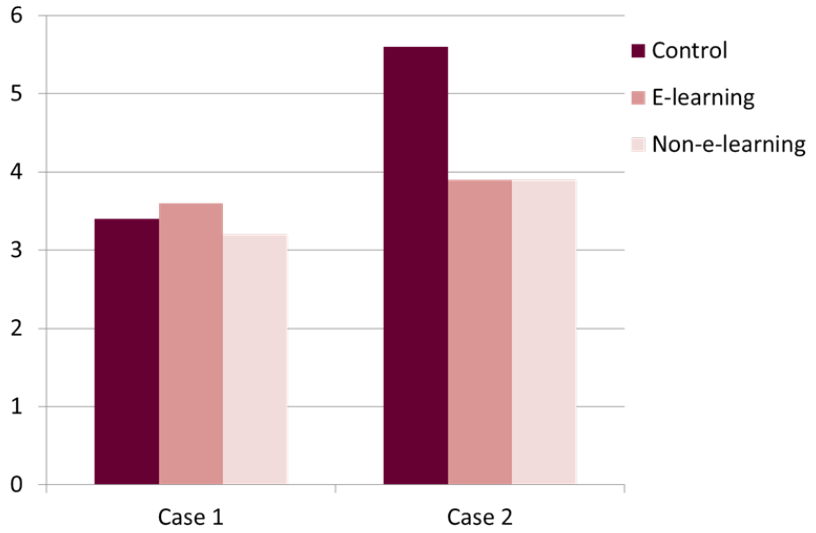
Aims of OPERAM

- Impact of STRIP-assistant on drug-related hospital admissions
- Multicentre RCT
- Network meta-analysis of pharmacological and non-pharmacological interventions



RCT: STRIP in education





34% more correct decisions

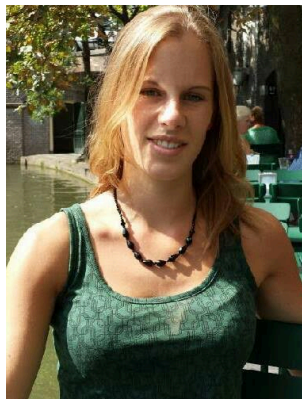
30% fewer potentially harmful decisions

Carolina J P W Keijsers et al. J Am Ger Soc 2014; 62, Issue 7, July 2014: 1353–1359

http://videodemo.stripa.eu/english/

The Utrecht team

- Wilma Knol
- Lianne Huibers
- Paul Jansen
- Michiel Meulendijk
- Ian Shen
- Marco Spruit



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