

SCREEN



Supporting **C**linical **R**ules in the **E**valuation of **E**lderly with
Neuropsychiatric disorders

Disclosures

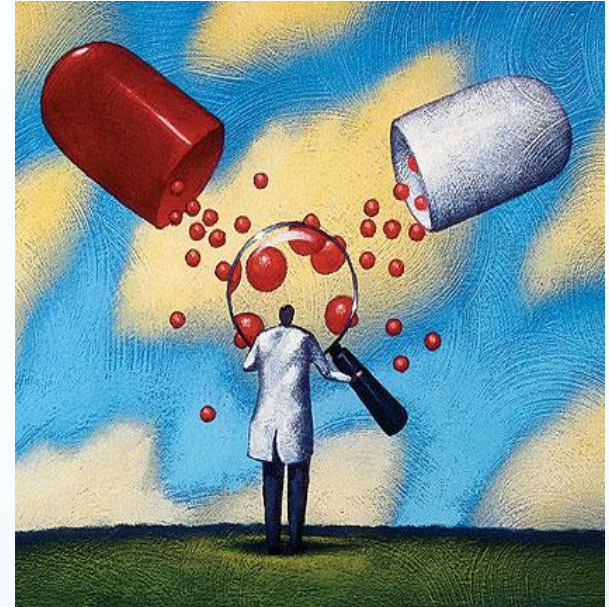
- Hugo de Wit
- Hospital pharmacist, Atrium-Orbis Medical Centre
- No conflicts of interest

Introduction

- More elderly
- Multimorbidity
- More drugs available for each indication
- Polypharmacy causing more side effects, interactions etc.

Medication reviews

- Healthcare inspectorate (IGZ):
 - Requires 1-2 a year a medication review



Survey among pharmacies

- Average 730 medication reviews per pharmacy needed
- Average of 29.3 minutes spend for each patient
- Total of 2.5 months of work for 1 pharmacy yearly to meet IGZ-requirements.
- Medication review is not continuously

Eur J Hosp Pharm doi:10.1136/ejhpharm-2014-000503 Clinical practice of medication reviews in institutional care settings for older people in the Netherlands: an explorative survey

CLEAR study

Clinical and Laboratory data Evaluation for an Appropriate medication Review

Quality of medication reviews relies on :

Which information is used

How this information is used

Who performs the medication review

} Substantial variability

Week 1

Medication list

Week 2

Medication list

Lab data

Week 3

Medication list

Lab data

Medical history

CLEAR study

Week 1	Case 1	Case 2	Case 3	
Maximum score (expert panel)	24	20	34	3%
Mean score (participants)	-0.82*	0.76*	2.39*	
SD	2.41	2.39	3.07	
%	-3.40%	3.82%	7.04%	
Week 2	Case 1	Case 2	Case 3	
Maximum score (expert panel)	24	20	34	18%
Mean score (participants)	3.50*	3.66*	6.97*	
SD	3.87	3.55	4.96	
%	14.58%	18.29%	20.51%	
Week 3	Case 1	Case 2	Case 3	
Maximum score (expert panel)	24	20	34	36%
Mean score (participants)	6.89*	7.18*	14.63*	
SD	4.91	3.94	6.80	
%	28.73%	35.92%	43.03%	

* Statistically significant $p < 0.001$

The solution?

- Automatic
- Standardized/objective
- Knowledge database
- Less time consuming
- More efficient (no or less unnecessary alerts)
- Around the clock surveillance
- System independent

CRR

- Clinical Rule Reporter
 - Extracting 3 different files
medication, patient characteristics, lab data
 - Upload to CRE (A'dam)
-
- Currently a daily evaluation of 2000 patients
 - Average time upload: 10-15 minutes

Which rules?

- Labdata (31 parameters)
e.g. Renal function, K, Na, Leuco, INR, albumin
- Stopdata
e.g. cytostatics, warfarin+LMWH
- START/STOPP criteria
e.g. Prolonged use of 1st generation antihistamines
- Indications → NHG-standards (GP)
e.g. myocard infarction, CHADS-2
- Possible medication errors
e.g. MTX, bisphosphonates 1x per week
- Identification risk patients
e.g. risk for delirium, PPI-prophylaxis, opioids + laxatives

Efficacy potassium

- When potassium affecting medication is used and potassium level is abnormal (<3.0 mmol/L or >5.0 mmol/L). 5%
- The CR is divided in two separate rules:
 - A hypopotassemia rule generating alerts if potassium decreasing medication is used and the potassium level is decreased (<3.0 mmol/L).
 - A hyperpotassemia rule generating alerts if potassium increasing medication is used and the potassium level is increased (>5.5 mmol/L). 40%
- The clinical rules are further developed:
 - The hypopotassemia rule generates alerts if potassium decreasing medication is used, the potassium level is <3.0 mmol/L, and no potassium supplements are used. 80%
 - The hyperpotassemia rule generates alerts if potassium increasing medication is used, the potassium level is >5.5 mmol/L, and no potassium binder is used.
- The hypopotassemia CR is adjusted so that alerts are generated if the potassium levels are <2.0 mmol/L, despite the use of potassium supplements. added

Added Value of the CRR in the hospital

Optimizing a computer assisted medication review in hospitalized patients: a pilot study. JAMIA. Submitted 2015

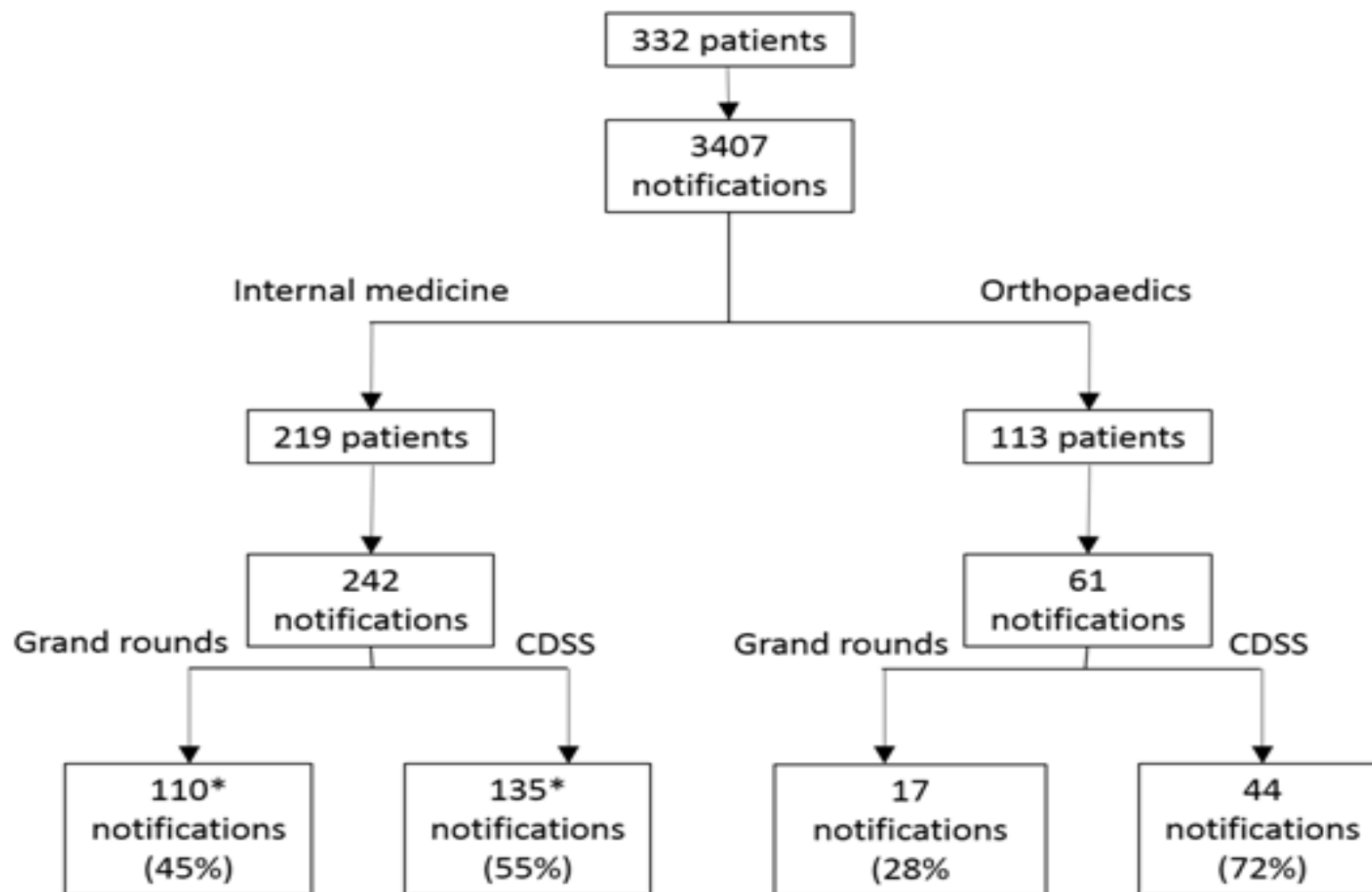
Introduction

- Medication management in hospital is a complex process
- Especially when reviewing complex hospitalized patients these medication reviews are prone to mistakes
- Physicians indicate that the work load is the most restricting factor in performing a proper medication review
- Medication often changes during admission requiring a continuous monitoring process

Methods

- During 4 months observation of the weekly grand rounds
- Internal medicine and orthopedia
- Remarks physicians were compared with alerts of the CRR
- CRR consisted of 469 rules of which 120 were specialised for the hospital setting
- Relevance of th remarks/alerts was determined by two internists

Number of patients and notifications during grand rounds and from the CDSS according to department

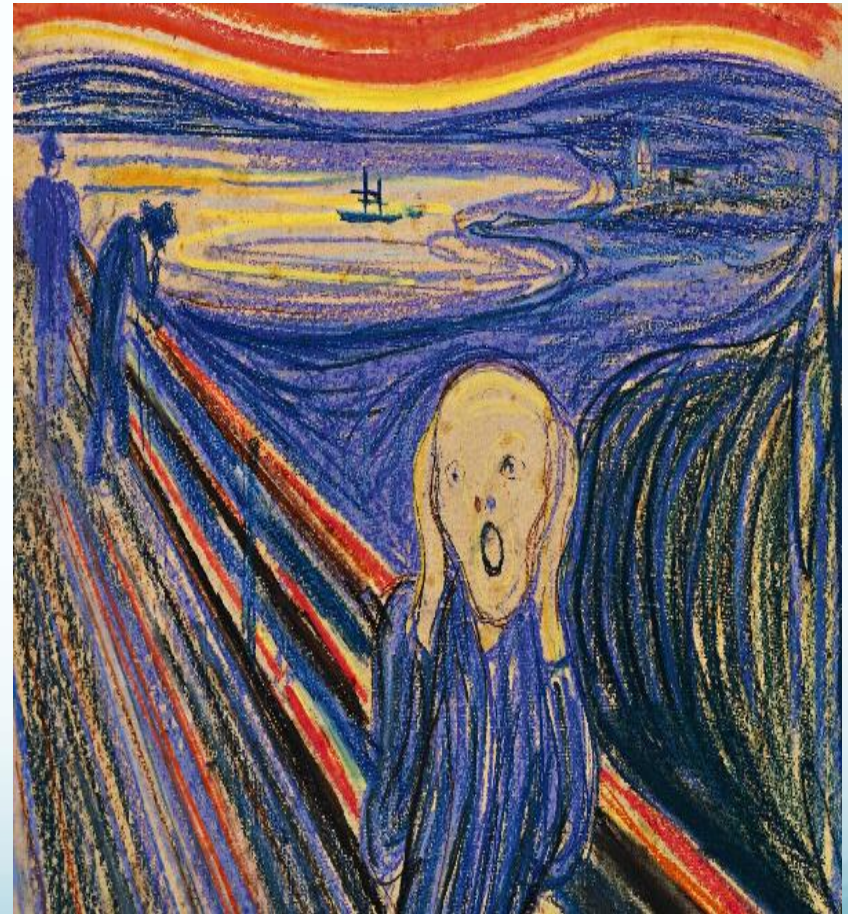


*3 notifications made in both grand rounds and by the CDSS

SCREAM

**Supporting
Clinical
Rules
Engine in the
Adjustment of
Medication**

Edvard Munch



SCREAM

- Primary endpoints: death, fall, delirium, hospital admission: combined
- >3000 patients (Envida, Orbis, Heerlen, Novicare, Helmond)
- 1 year
- Pharmacists: labdata+pat characteristics+meddata

SCREAM: time schedule

- IRB: Green light
- First Nursing Home: December 2013
- Last NH: q2 2015
- Randomisation: regular care versus regular care+CRR
- Active group: email with remark
- Both groups: every week a questionnaire (2-3 min)

Preliminary results

- First 800 patients (400 in active group)
- First day 676 emails
Now weekly less than 20
Total: 1680
- First analysis
No difference in
 - quality of life
 - number of deaths

SCREENED: and beyond..

- Other institutions
- Family practise (1^{ste} lijn)
- Stichting StatusScoop
 - Koppeling via het LSP
 - Labuitslagen
 - Medicatie uit AIS
 - Clinical Rules

To be continued

Thank you for your attention

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