

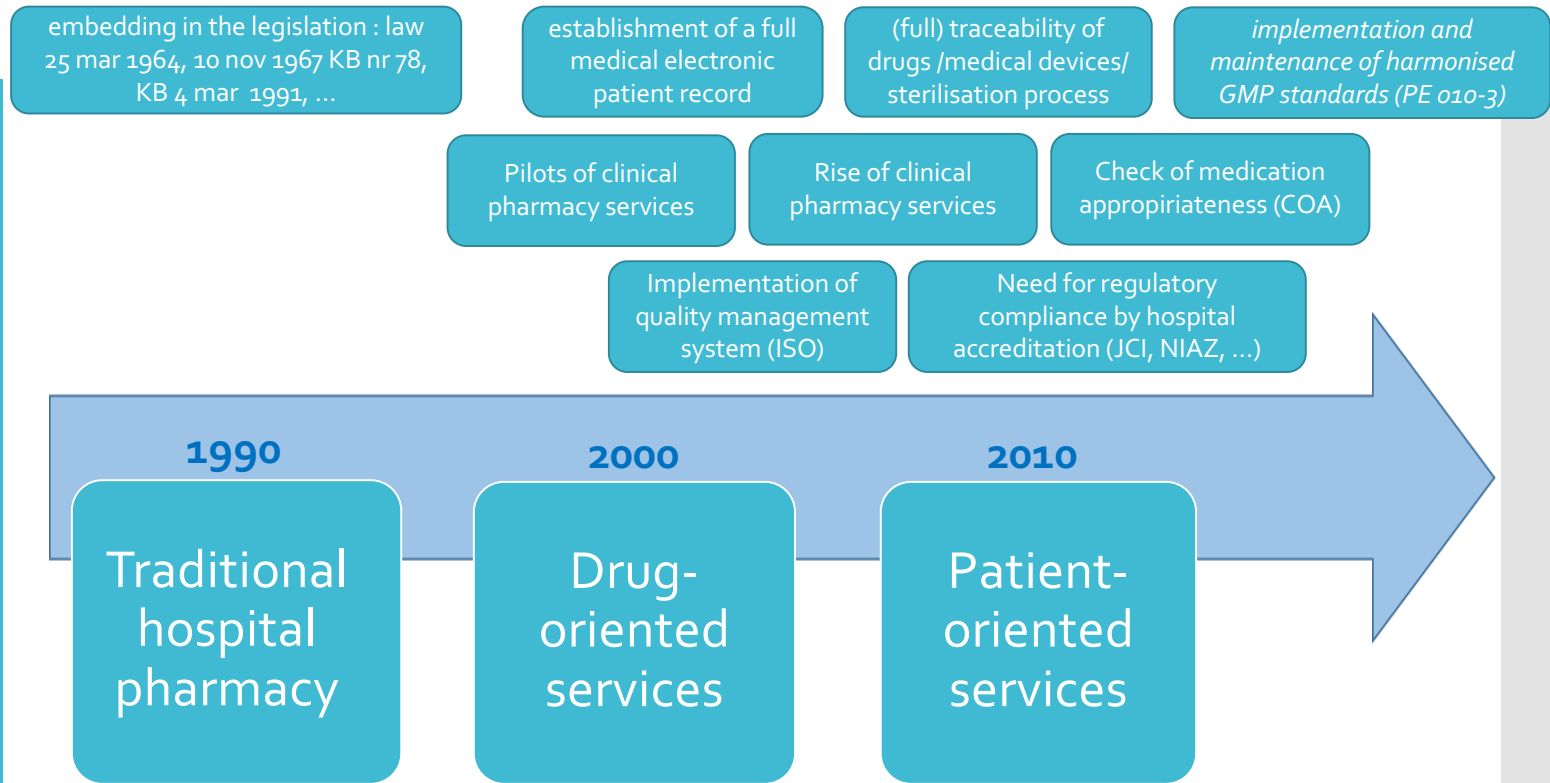


# Introduction

**Why this classic perception of the (hospital) pharmacist ?**  
(law 25 mar 1964)



# Background



## Background

Current situation of (clinical) pharmacy at UZ Leuven:

- ISO-9001 and JCI accredited
- Establishment of a full medical electronic patient record
- Prescriber support by aCDSS and nurse support by BSS
- Organisation of clinical pharmacy services:
  - Bedside clinical pharmacy on high risk wards
  - Computerized clinical decision support (CDSS): software control of : drug interactions, allergy, food, pregnancy, dosage, therapeutic duplication

Goals clinical pharmacy and CDSS

- improved efficacy and safety of medication use
- Improved patient safety

BUT

- Due to limited resources, bedside clinical pharmacy services are not implemented on a hospital-wide basis in Belgian hospitals.
- Fine tuning of aCDSS needed (cave alert fatigue)
  - Preventing medication errors
  - Need for specificity by computer risk assessment
  - Need for human screening of high risk patients

→ Artificial intelligence, machine learning, clinical pathways and **COA**

# Background

To guarantee patient safety throughout the hospital, specifically targeting patients at risk, we started a new back-office clinical service (= implementation of 'check of appropriateness')

- → **centralized service**

- For all patients at risk
- Personalized advise
- Evaluation of all prescriptions (independently of drug distribution)
- Maximum integration of structured data from patient file (e.g. laboratory results, biochemical parameters, ...)
- Uniform, validated, evidence based
- Unique through computerized risk assessment

**End 2015**



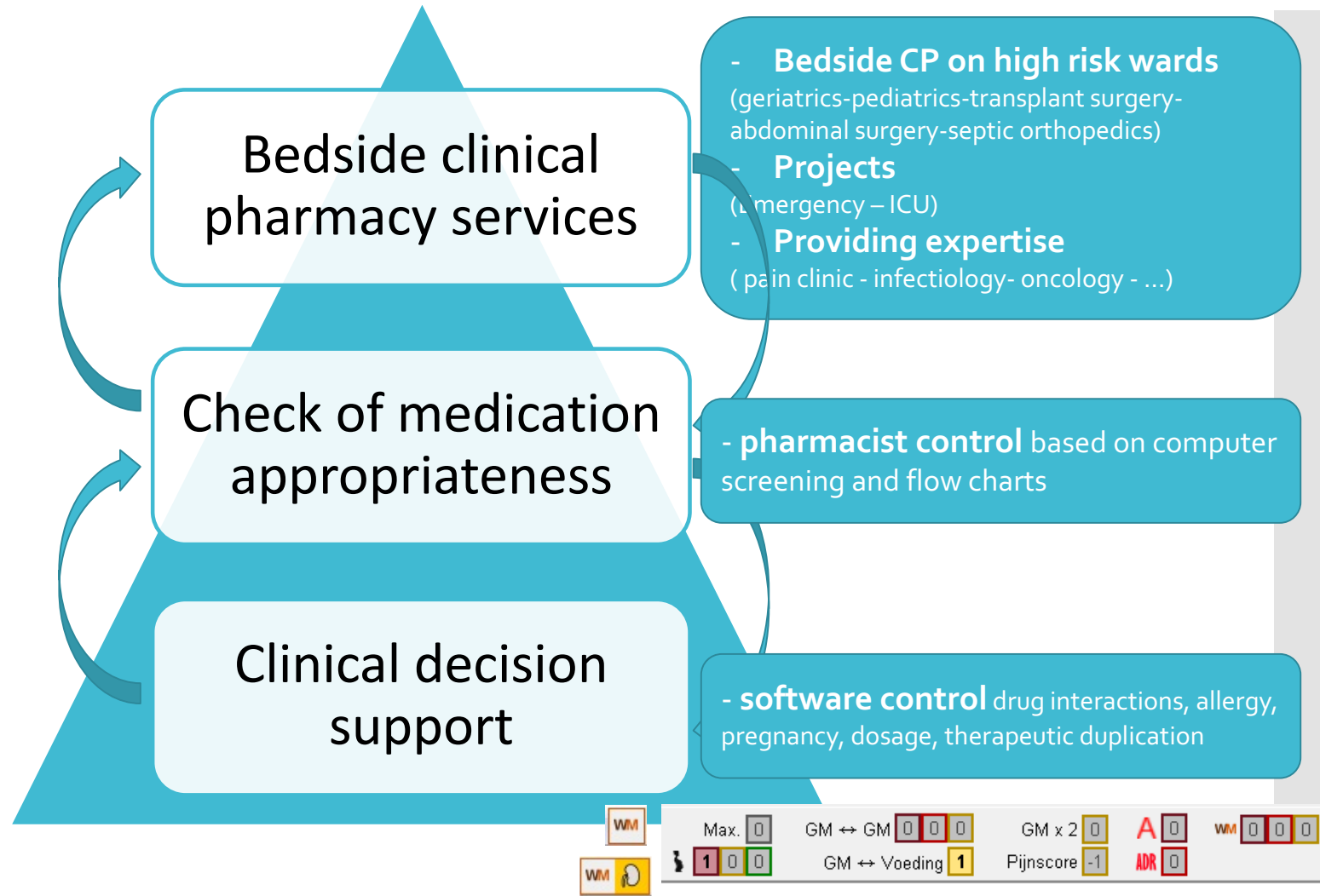
**Jan-feb  
2016**

**Mar 2016**



**May 2016**

# Vision on Clinical Pharmacy UZ Leuven



# COA ...

## How it works

a view in the command centre

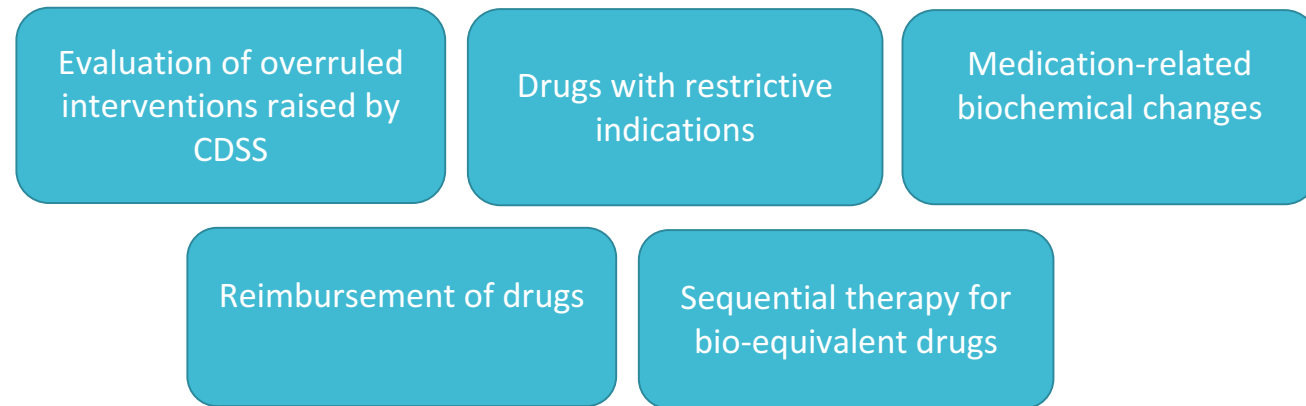
- HIS screens all prescriptions (new and existing) for risks
- Lists with high risk prescriptions are checked by a hospital pharmacist using standardized algorithms
- Interventions are performed via electronic warnings in patient file
- In case of a serious adverse event, a phone call is carried out to the treating physician

Link-KWS	Check	Opvolgnota	gebeld	eadnr	eenheid	Geslacht	naam	Leeftijd	kws_omsch	kws_vorm
<a href="#">ost:12345/s</a>	1	0	0		650				DAPSONE	CAPS 100
<a href="#">http://local</a>	1	0	0		467				MEROPEN	VIAL 1 G
<a href="#">http://local</a>	1	0	0		467				MEROPEN	VIAL 1 G
<a href="#">ost:12345/s</a>	1	0	0		650				DAPSONE	CAPS 100
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<a href="#">ost:12345/s</a>	1	1	1		4					



# COA ... What has been achieved

- Development of **75** specific algorithms covering **5** pharmacotherapeutic areas of interest



- Education of **8** pharmacists involved in CO(M)A, they cover 0,5 FTE
- During a 6-month period, **19220** prescriptions were checked

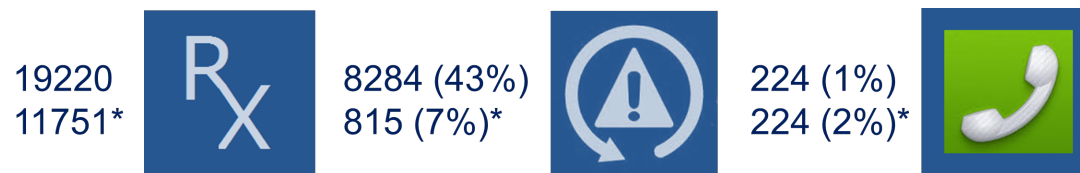


Fig 4. Details of amount of prescription's, electronic warnings and phone calls. \* = results without automatic warnings



## Overrule severe drug interaction

COA... an  
example from  
practice



GM ↔ GM 1 1 3  
GM ↔ Voeding 1

**Zeer ernstige interacties**

**Drug - drug interactie**

**AROMASIN (TABL 25 MG)      TEGRETOL (TABL CR 200 MG)**  
(Substraten (CYP3A4))      (Enzyminducerende stoffen (CYP3A4))

Gecontroleerde periode: 25-10-2016 00:00 - 16-11-2016 00:00

Effect: Verminderde doeltreffendheid van de betrokken stoffen mogelijk

Meer info...

**Extra opmerkingen**

Overweeg een alternatief, dosisverhoging of TDM voor het substraat dat geïnduceerd wordt door de combinatie met

Overrule nodig

Epilepsie + borstCa

Overruled door: [REDACTED]

Breast cancer therapy will  
be less effective

## Overrule severe drug interaction

COA... an  
example from  
practice



Medicatie	Toed.	di 01-11	wo 02-11
<del>AROMASIN (TABL 25 MG)</del>	PO	25 mg	25 mg
<del>MORFINE HCL (AMP INJ 10 MG/1 ML)</del> # bij pijn om de 4 uur	SC	6*5 mg	
<del>MORFINE HCL (AMP INJ 10 MG/1 ML)</del> # enkel op de PAZA	IV-Bolus	⇔ 5*1 mg	
<del>PETHISOM (AMP 100 MG/2 ML)</del> # enkel op de PAZA	IV-Bolus	⇔ 1*20 mg	
DAFALGAN (TABL FORTE 1 G) # bij pijn om de 8 uur	PO	3*1 g	
DAFALGAN (TABL FORTE 1 G)	PO		
PARACETAMOL FRESENIUS (FL INJ 500 MG/50 ML) # bij pijn om de 6 uur	IV-Inf	700 mg (2/3)	3*700 mg (3/4) + 700 mg
PARACETAMOL FRESENIUS (FL INJ 1 G/100 ML)	IV-Inf	750 mg	
TEGRETOL (TABL CR 200 MG)	PO	2*200 mg	3*200 mg
LODMETAZEPAM EC (TABL 1 MG)	PO	1*1 mg	

03-11-2016 09:21	✓ flap prima , vndg labo als labo ok mag DVC uit, BS uit		assistent	03-11-2016 09:25
	Oncologie gaat nakijken of aromasine therapie dient aangepast te worden			
02-11-2016 14:25	✓ advies apothek: cfr tel gesprek: interactie tussen aromasin en tegretol(Afname werking aromasin mogelijk). Graag nazicht therapie		apothek	02-11-2016 14:48

## COA... an example from practice



### Overrule severe drug interaction

bevindingen

Geachte collega

Herevaluatie adjuvante antihormonale therapie tijdens opname op dienst reconstructieve heelkunde.

Gezien significante interactie (D) tussen tegretol (sterke CYP3A4 inducer) en aromasin is een posologieverhoging van aromasin volgens het US-label naar 50 mg/dag aangewezen. Er is geen restrictie in het aantal afleverbare verpakking zo aanvraag tot terugbetaling in adjuvante setting werd goedgekeurd.

Er werd met patiënte dan ook besproken om de posologie van Aromasin te verhogen naar 1 \* 2 tabletten/dag, onder controle van de subjectieve tolerantie. We zien patiënte terug op raadpleging in februari op het multidisciplinair borstcentrum. Dan zal tevens een botdensitometrie worden ingepland.

Met collegiale hoogachting



## COA ... a possible future

- **Medico-legal framework for the hospital pharmacist to adapt prescriptions in line with the prescribed therapy (e.g. dose escalation, dose reduction, modification of infusion time, ...)**
- Continuation of multi-disciplinary collaboration (MFC, DC, IT, ...)
- Evaluation of the current COA process, with emphasis on improving performance
- Development of new algorithms, also expanding to other areas of interest
- Supported by scientific research
  - Satisfaction survey
  - Acceptance trial
  - Measure of clinical/ economic impact



It's just the beginning