PIM-CHECK: Development of the first electronic prescription-screening checklist to support healthcare professionals in the detection of potentially inappropriate medication

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Why it was done

- **8.8% of medication orders** contain **≥1 medication errors**[1]
- **Potentially inappropriate medication** (PIM)=
  - -under-prescriptions
  - -over-prescriptions
  - -interactions
  - -wrong choice of medication

➔ **Risk factor for medication errors**[2]

What was done

Development of the 1st Electronic prescription-screening checklist to detect PIM

What was achieved

- **Since the lauching in Feb 2016**

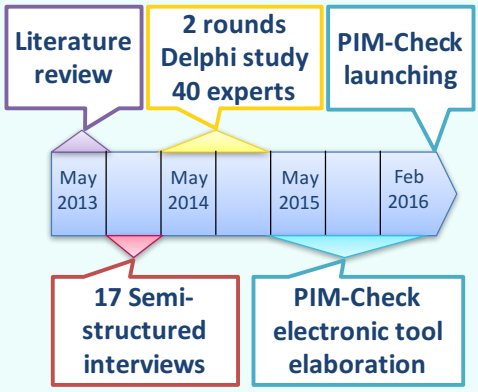
>95.000 connections, >66 countries

>7.100 connections/month

- **1st assessments**
- 109 patients : PIM-Check displayed **> 30 % of DRPs**

>73% at moderate or high risk for patients[3]

How it was done



PMCheck

Potentially Inappropriate Medication - Patients in the Internal Medicine unit

Functions

Screening PIM according to comorbidities ↕ treatements

Favourite items

Items list Including formation function

Content

- 17 specialities
- 56 pathologies
- 160 items
- 333 references
- 29 useful links

Target users

- Cliniciens
- Clinical pharmacists
- Students / Residents / Young healthcare professionals

www.pimcheck.org

What is next

Scientific perspectives

- Validation studies
- Update

Technological perspectives

- App development (offline access)
- Electronic health records integration

Collaborative perspectives

- International hospital
- Start-up, business incubator, public-private partnership

Références 1.Ashcroft DM, et al. Drug Saf. 2015 // 2. Naples J. J Am Geriatr Soc. 2016 // 3. Blanc AL, et al. PIM-CHECK used by physicians to reduce drug related problems in internal medicine. 22nd EAHP Congress. Poster CP-029

Good Practice Initiative
GPI CPS4977

Development and implementation of 'check of medication appropriateness' in a large tertiary care centre

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Background:

- Establishment of a full medical electronic patient record
- Rise of clinical pharmacy services
- Need for regulatory compliance by hospital accreditation

Last decade: Traditional drug-oriented services expanded towards patient-oriented services by imbedding computerized clinical decision support (CDSS) in the prescribing process and implementing bedside clinical pharmacy services, both leading to improved efficacy and safety of medication use.

Why was it done

- Due to limited resources, bedside clinical pharmacy services are not implemented on a hospital-wide basis in Belgian hospitals.
- To guarantee patient safety throughout the hospital, specifically targeting patients at risk, we started a new back-office clinical service

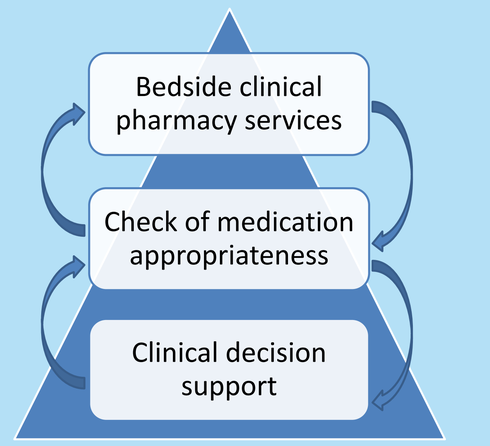

Fig 1. Concept - COMA is a liaison between CDSS and bedside clinical pharmacy. It is a dynamic concept with interaction towards the different levels to further improve patient safety.

What was done:

Development and implementation of central check of medication appropriateness (COMA) in hospitalized patients in a 2000-bed hospital

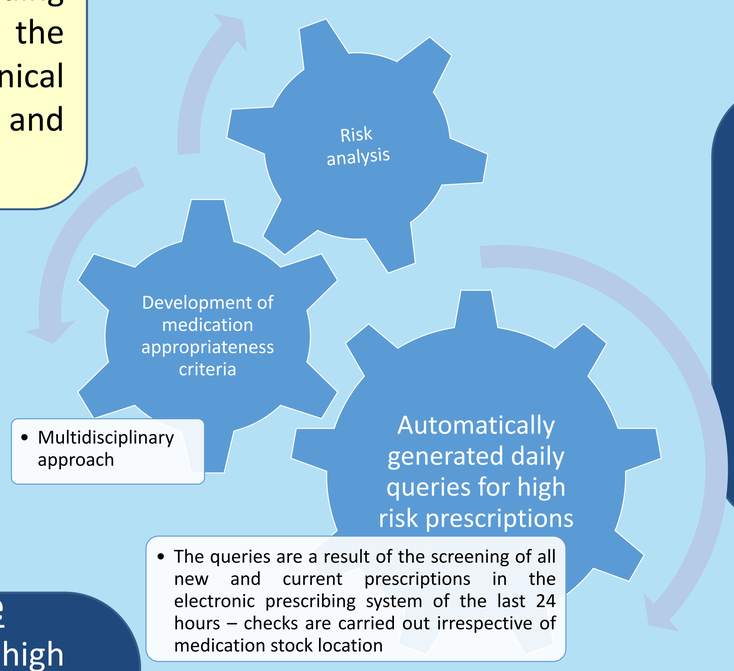

Fig 2. Schematic overview of development of queries for high risk medications

University Hospitals Leuven
- 2000 beds
- 5000 new prescriptions per day
- Period March-September 2016: 32500 hospitalizations

How was it done

- Automated queries 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

Drugs with restrictive indications

Evaluation of overruled interventions raised by CDSS

Medication-related biochemical changes

Sequential therapy for bio-equivalent drugs

Reimbursement of drugs

Fig 3. Schematic overview of 5 pharmacotherapeutic areas covered by check of treatment appropriateness

What has been achieved

- Development of **75** specific algorithms covering **5** pharmacotherapeutic areas of interest
- Education of **8** pharmacists involved in COMA, they cover 0,5 FTE
- During a 6-month period, **19220** prescriptions were checked

19220 / 11751*

8284 (43%) / 815 (7%)*

224 (1%) / 224 (2%)*

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

During a 6-month period, 19220 prescriptions were checked for which 8284 (43%) electronic warnings were sent and 224 (1%) phone calls were carried out. When analysed without automatic warnings for sequential therapy, 11751 prescriptions were checked for which 815 (7%) electronic warnings were sent and 224 (2%) phone calls were carried out.

Future

- Evaluation of the current COMA process, with emphasis on improving specificity
- Development of new algorithms, also expanding to other areas of interest
- Development of an easy access training tool for hospital pharmacist to perform COMA

National Consensus on Core Competencies for Clinical Pharmacists in Norway

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What was done?

Integrated Medicines Management (IMM) in Norway consists of the tasks medicines reconciliation, medicines review, patient counseling and discharge service (se fig 1).

- We have compiled the core competencies clinical pharmacists need when executing each of the tasks in the IMM-model.
- We have suggested educational activities in order to reach the competency needed.

Why was it done?

Since 2012 there has been a national agreement on using the IMM-model in hospitals among all four Hospital Pharmacy Trusts in Norway. A complete post-graduate educational program for clinical pharmacists did not exist, and defining core competencies was necessary in order to prioritise educational activities.

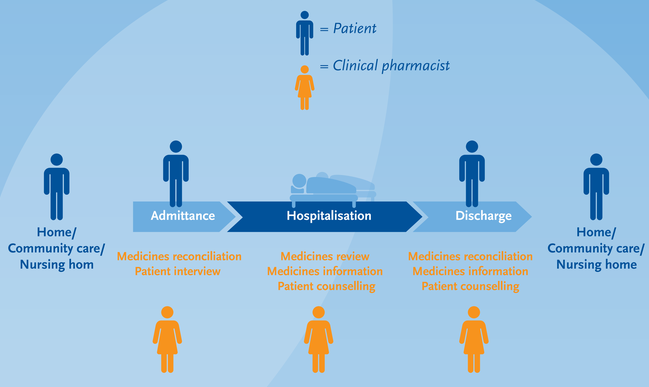
How was it done?

Six experienced clinical pharmacists representing all four Hospital Pharmacy Trusts and the two independent hospital pharmacies in Norway agreed on which competencies a clinical pharmacist needs. The competencies were finally compiled as core competencies, further specified with learning objectives. For each learning objective, existing educational opportunities were assessed and the need for any additional training was specified. A suggested time schedule for the recommended training was made.

What has been achieved?

Due to an agreement on core competencies including the educational activities:

- Mutual expectations on competencies makes it easier for both clinical pharmacists and their leaders to identify the need of further training and also to prioritise the right educational activities.
- Areas with limited educational opportunities were revealed (e.g adherence, handling of side effects and communication)



Figur 1. Illustration of the IMM-model in a standard patient care pathway, depicting roles, settings and tasks.

What next?

- The report will be implemented in all Norwegian hospital pharmacies following local adjustments.
- An initiative to integrate relevant competencies into the curricula of Pharmacy Programmes in Norwegian Universities has started, and this will continue.
- Hopefully, our work will encourage further cooperation on educational activities between health regions in Norway.
- Another effect of this joint effort may be that less training will be needed when, clinical pharmacists move between regions.

Medicines reconciliation	Medicines review	Patient counselling	Discharge service
Competencies essential to perform the task			
• Health care system incl. sources for drug information • Working Method • Medical Records; understanding of, and documentation in • Practical knowledge of medicines (i.e administration forms, generics, aids) • Communcation (with patients and other health care professionals) • Understanding the mechanisms of adherence to drug treatment • Hygiene and HSE (Health, Safety and Environment)	• Working method • Pharmacotherapy, interactions and EBM (Evidence Based Medicine) • Practical knowledge on medicines incl. drug distribution • Preparation and administration of drugs; incl fluid therapy and nutrition as needed • Monitoring of effects and side effects • Adherence to drug treatment • Communcation (other health care professionals) • Medical Records; understanding of, and documentation in	• Working method including communication skills • Adherence to drug treatment • Pharmacotherapy • Handling side effects • Medical Records, documentation	• Communcation (patients and other health care professionals) • Practical knowledge of • medicines • Pharmacotherapy • Adherence to drug treatment • The health care system incl drug prescribing routines in different health units, and cooperation between health care units (how to contribute to seemless care)

Table 1: Competencies essential to perform medicines reconciliation, medicines review, patient counselling and discharge service respectively

Area of competence	Learning objectives	Relevant training opportunities and courses (pre- certificate)	Post-certificate training
Health care system incl. sources for drug information	1. Method of reconciling 2. Organization of health care system 3. Use of and interpretation of drug information sources 4. Ethics (professional cooperation and patient's integrity)	**Learning objectives 1-3:** • Local IMM-course incl practical in-clinic training with trained supervisors *Suggested alternative courses:* • Course **FARM3001** Clinical Pharmacy and Pharmacotherapeutics, Norwegian University of Science and Technology (NTNU) or • Course **FRM 5905V** – Clinical pharmacy work methods, University of Oslo (Both courses requiring additional practical in-clinic training)	**Learning objective 4:** Suggested training: • Cases discussed locally • Ethics book (2017) and Course under planning by H Frøyland (2017)

Tabell 2. Example of competency area to be covered including the specified learning objectives. Relevant training suggested completed pre- or post certificate.

SYKEHUSAPOTEKENE
SJUKEHUSAPOTEKA VEST
Lovisenberg sykehusapotek
SYKEHUSAPOTEKENE I MIDT-NORGE
Diakonhjemmet Sykehusapotek
SYKEHUSAPOTEK NORD
DAVVI BUOHCCEVIESSOAPOTEHKA

TASKFORCE TO FACILITATE THE INTRODUCTION OF BIOSIMILARS NATIONALLY
The cases of Infliximab and Etanercept

What was done?

To facilitate the introduction of biosimilar medicines in Denmark, a special Taskforce was appointed.
The aim was to enhance knowledge of biosimilar medicines among healthcare professionals and prepare implementation of biosimilar medicines in the clinical setting.

Why was it done?

Introducing biosimilar medicines in the clinical setting may significantly reduce hospital medicines expenditure – but only if the biosimilar medicines are used. Lack of knowledge and insecurities about biosimilar medicines among healthcare professionals and patients must to be addressed to ensure implementation in the clinical setting.

How was it done?

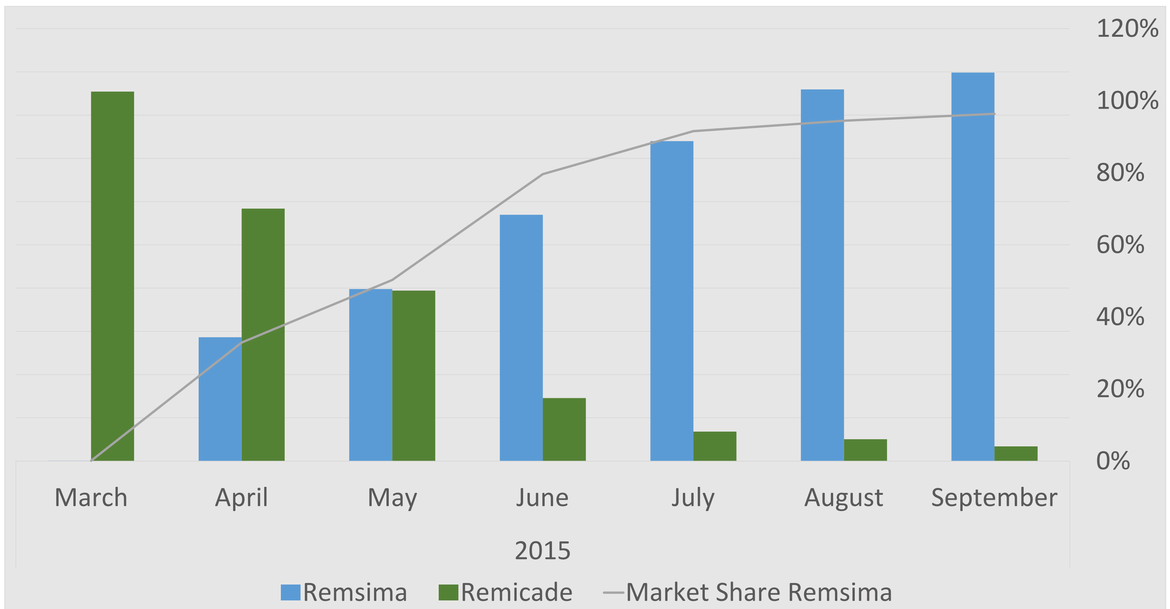
A special “Taskforce for introduction of biosimilars” was appointed. The Taskforce consisted of physicians including clinical pharmacologists, pharmacists, drug tender specialists and staff from the “Council for the Use of Expensive Hospital Drugs”, who issue national treatment guidelines.
Planning the introduction of biosimilar infliximab in Denmark started more than a year prior to the granting of marketing authorization.

During this time, the Taskforce arranged seminars and facilitated meetings with specialists from the clinical setting to provide knowledge of biosimilars, to discuss the introduction of biosimilar medicines and how to switch patients. Based on these discussions the “Council for the Use of Expensive Hospital Drugs” recommended the use of biosimilar medicines nationally.
The Taskforce also created educational materials for doctors, nurses and patients and a “Q & A” website.

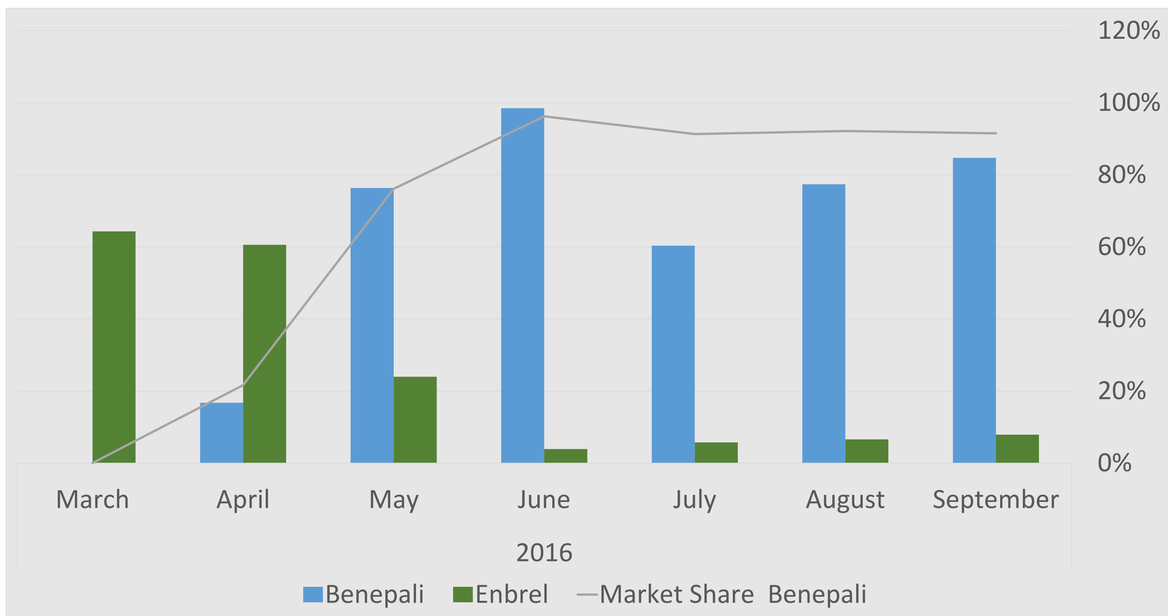
What has been achieved?

Biosimilars were adopted into the Danish market after a very quick introduction. The market share of the biosimilars was 95% within 3-4 months.

Introduction - Infliximab



Introduction - Etanercept



The price reduction after introducing biosimilar medicines was approx. 60%, and the quick implementation of the drugs in the clinical setting has significantly reduced medical costs.

Total annual savings in Denmark: 22 mio € (infliximab) and 15 mio € (etanercept. Estimate based on the first 6 months).

What next?

More new biosimilar medicines are expected to be introduced into the Danish market in the near future.
The Taskforce will continue their work to ensure similar successful implementations.

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