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

Bedside clinical pharmacy services
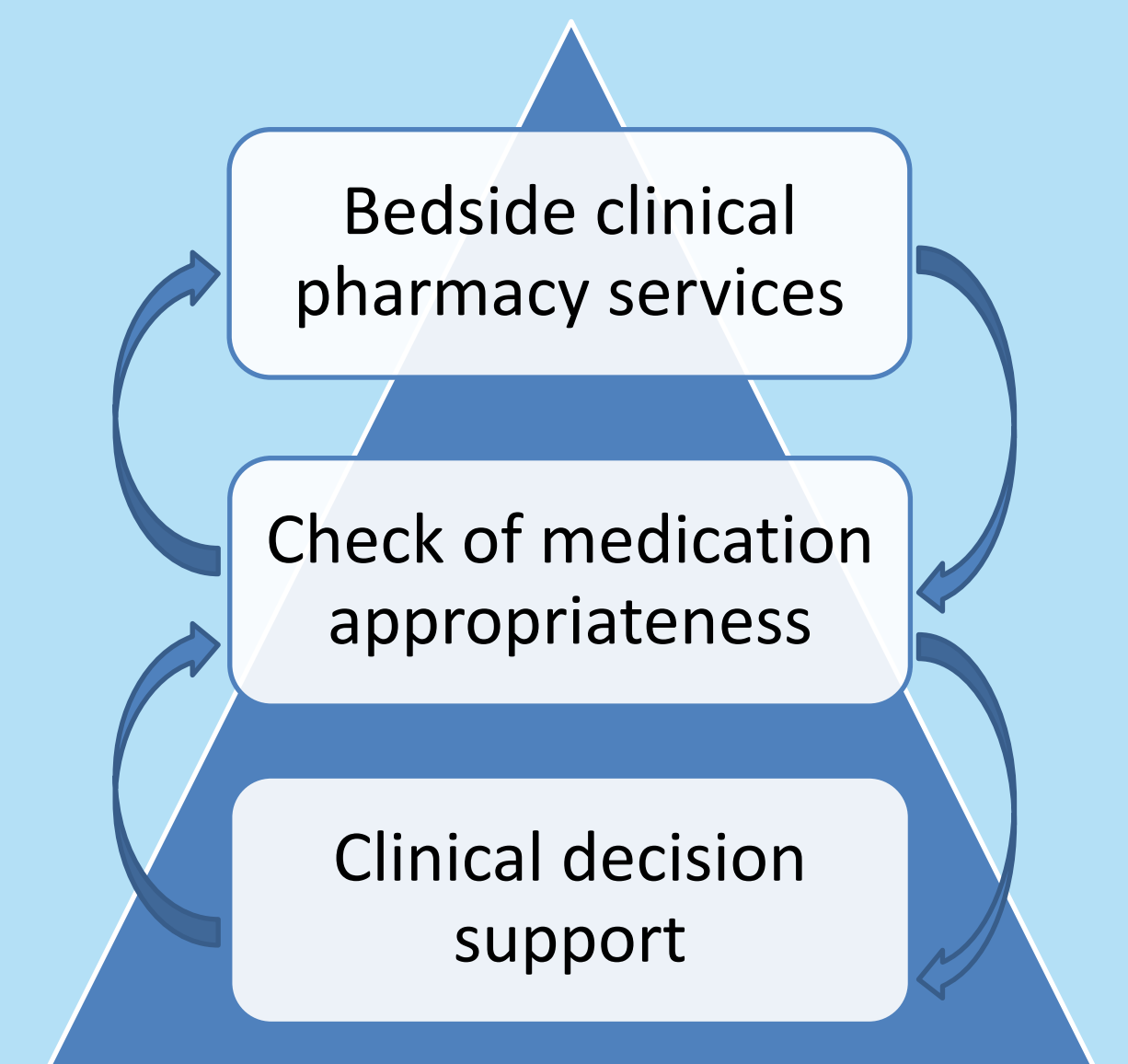Check of medication appropriateness
Clinical decision support

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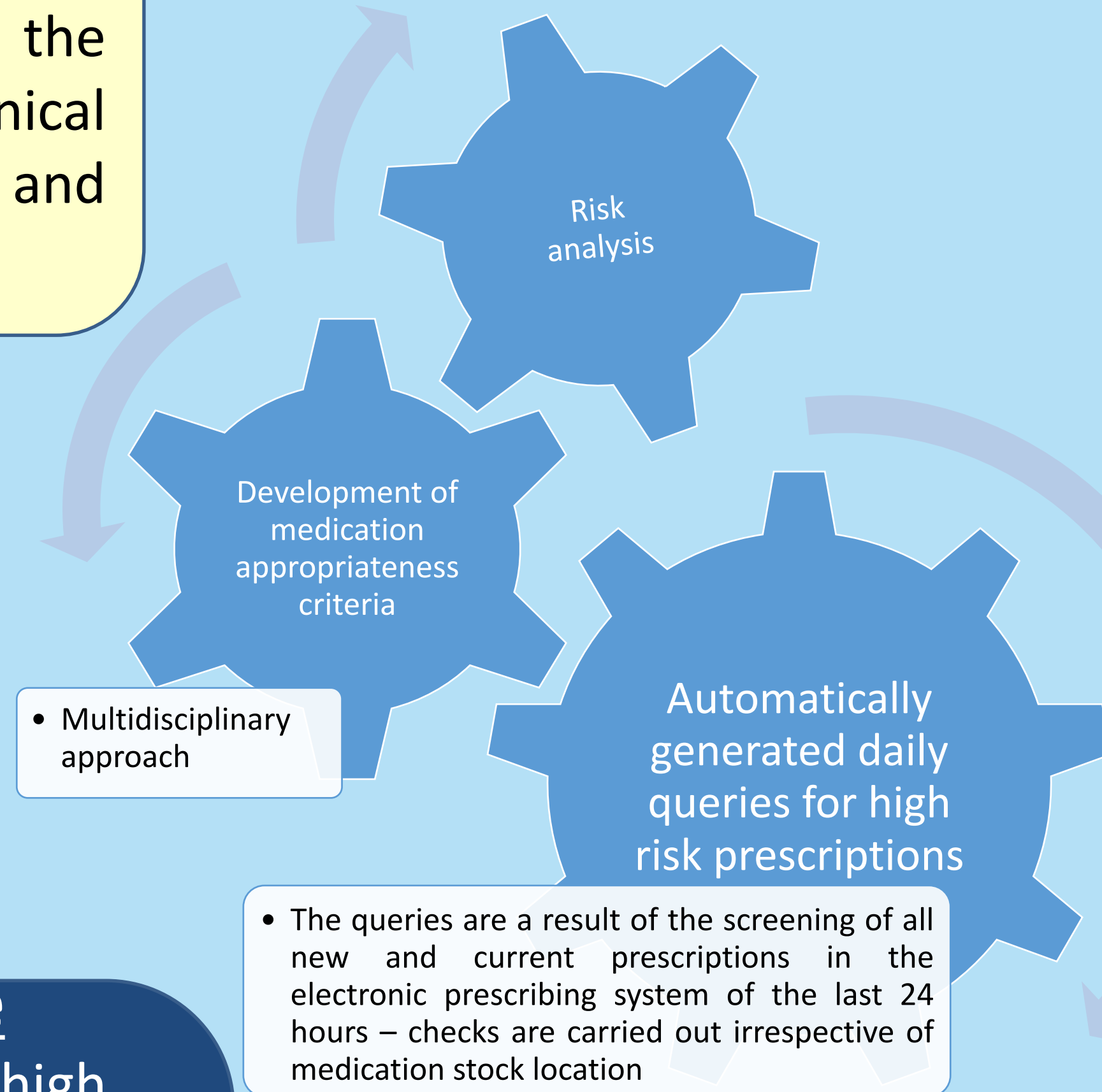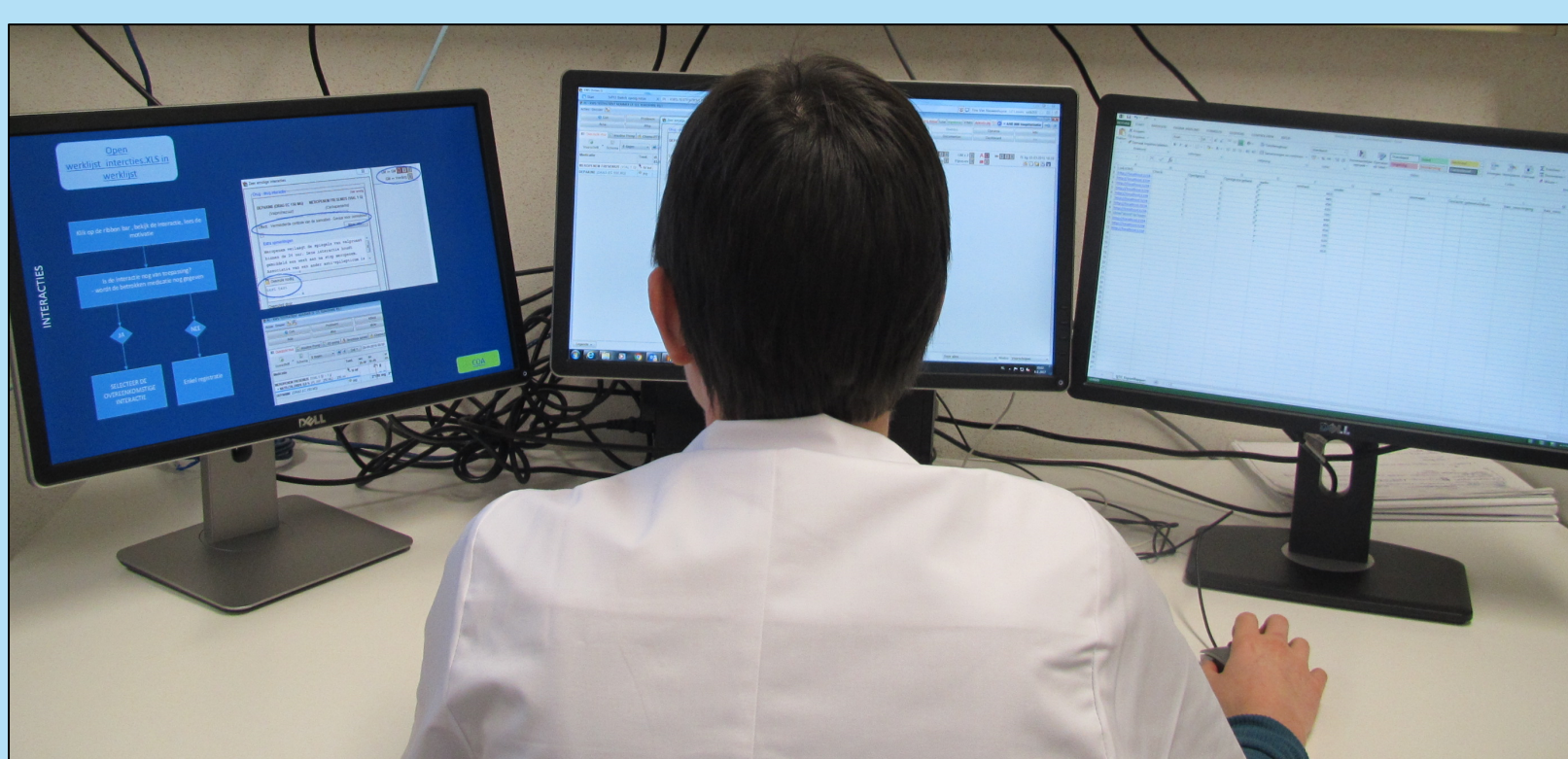
University Hospitals Leuven
- 2000 beds
- 5000 new prescriptions per day
- Period March-September 2016: 32500 hospitalizations

Risk analysis

Development of medication appropriateness criteria

- Multidisciplinary approach

Automatically generated daily queries for high risk prescriptions

- The queries are a result of the screening of all new and current prescriptions in the electronic prescribing system of the last 24 hours – checks are carried out irrespective of medication stock location

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

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
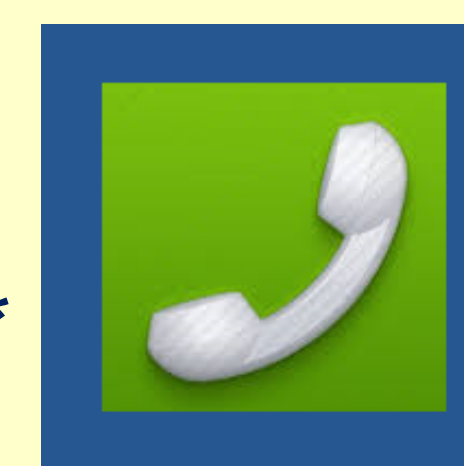11751*

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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