Medication Review in the LIMM (Lund Integrated Medicines Management) Model

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MALMÖ UNIVERSITY

I have no conflict of interest

Teaching goals

- Present the LIMM model
- Demonstrate crucial aspects of identification of drug related problems, implementation of Medication Review, and resolution of Medication Review related problems
- Discuss the pharmacist's role for development, education and implementation
- Discuss responsibilities, aims and quality in the discharge Medication Review process based on the patient's perspective

Three questions

- An undesired patient experience that involves drug therapy and that actually or potentially interferes with the desired patient outcome
  - This is the classic Cipolle, Strand, Morley definition of a drug related problem. True or false

- The Cipolle DRP classification system is optimal for use in practice and research
  - True or false

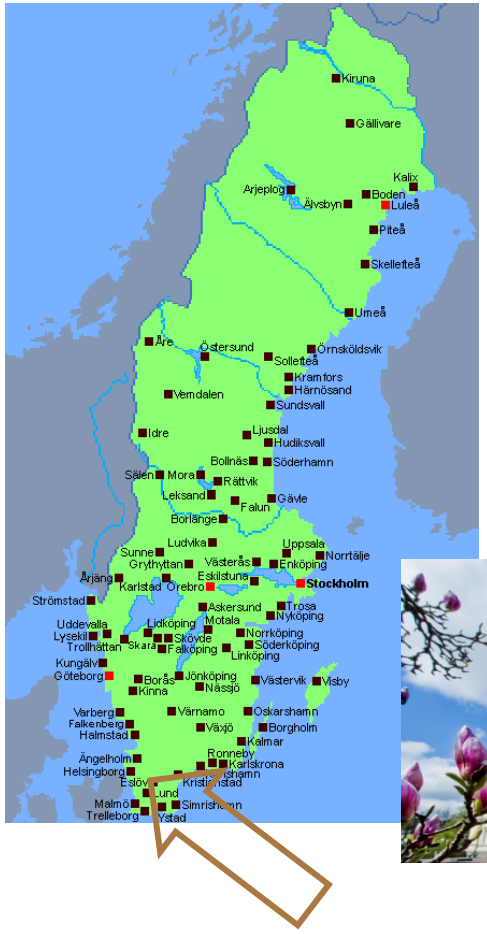
- The LIMM-model is based on a pharmacist running the process and all activities
  - True or false

Learning objectives

At the end of this session, participants will be able

- To overlook successes and pitfalls of integrated medicines management
- To understand the importance of systematic training sessions to improve patient care
- To describe the demonstrated model
- To implement MUST-dos in the Medication Review process
- Use patient safety and -quality aspects to plan for the best Medication Review process
- To implement a model in their own environment
- To communicate with educational and professional bodies in order to implement a national systematic training module

LIMM developed at Lund University Hospital



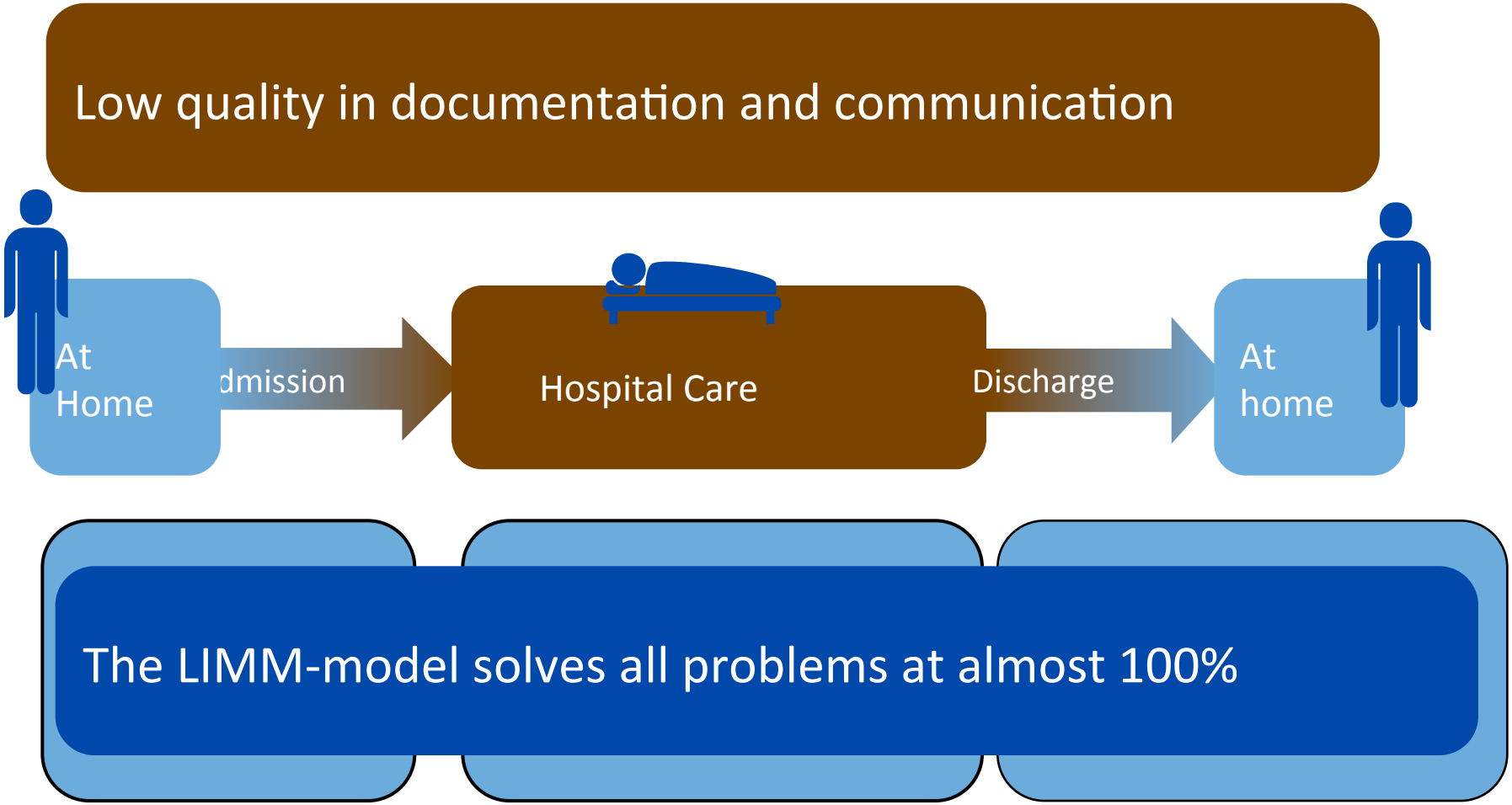
City of Lund
Founded y 990
Population 76.000

Lund University
Founded y 1666 (1438)
47.000 students

Hospital Care, should be a supportive patient process

How to identify, solve and prevent DRP in the hospital process and further ….?

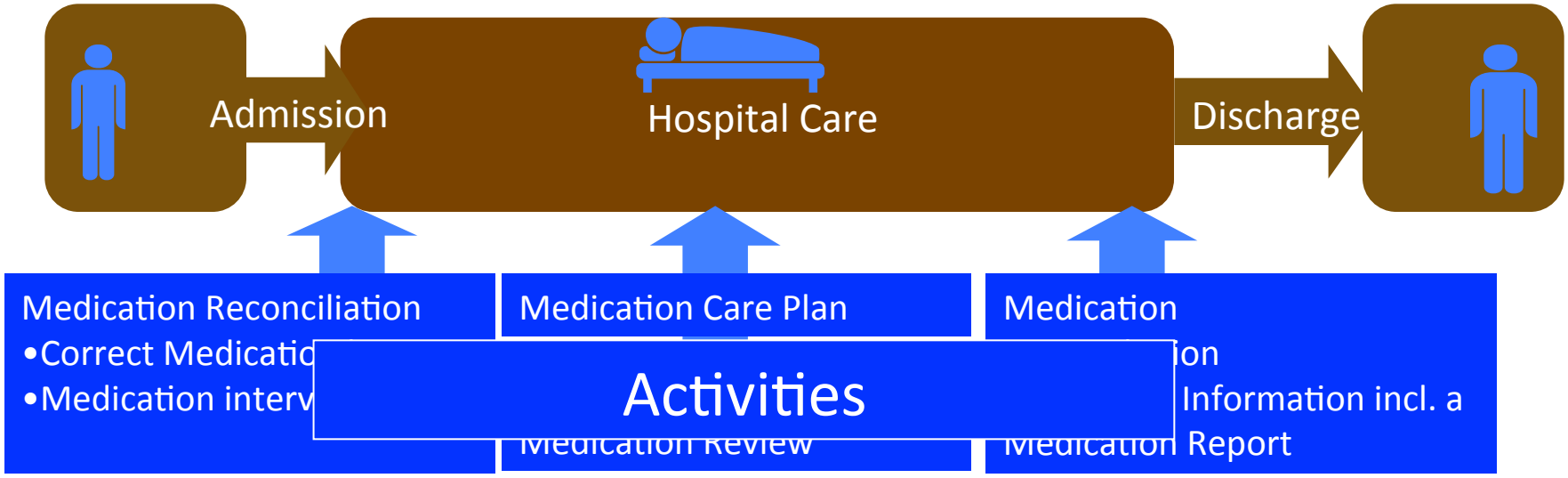
Hospital Care, a (non-) supportive process



Clinical Pharmacists Lund University Hospital 2007

Standing from left: Tanja Lehtinen, Linda Holmbjer, Lisa Larsson, Kristina Sörensen, Katarina Krynell, Eva Deierborg, Emmy Andersson, Sofia Jönsson, Åsa Bondesson and Sitting Tommy Eriksson

The LIMM -model
(Lund Integrated Medicines Management)

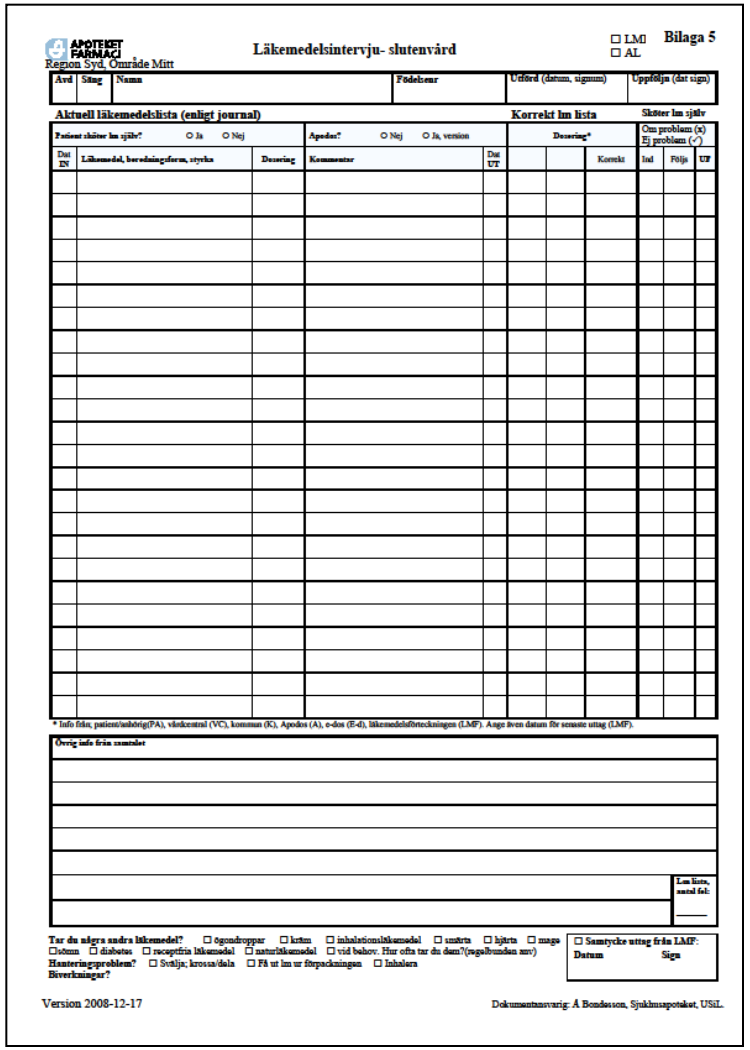


A systematic approach to individualise and optimise drug treatment

Example of tools

LIMM Medication Interview at admission

- Part 1 is focused on a correct patient medication list
- Part 2 adds questions on the patient problems with practical handling, knowledge and adherence
- Part 3 adds questions for a deepened assessment of adherence and beliefs



APOTEKET FARMACI
Region Syd, Område Mitt

Läkemedelsintervju- slutenvård

☐ LMI ☐ AL **Bilaga 5**

Avd	Säng	Namn	Födelsenr	Utförd (datum, signum)	Uppföljn (dat sign)

Aktuell läkemedelslista (enligt journal) — **Korrekt lm lista** — **Sköter lm själv**

Patient sköter lm själv? ○ Ja ○ Nej — Apodos? ○ Nej ○ Ja, version — Dosering* — Om problem (x) Ej problem (✓)

Dat IN	Läkemedel, beredningsform, styrka	Dosering	Kommentar	Dat UT			Korrekt	Ind	Följs	UF

* Info från, patient/anhörig(PA), vårdcentral (VC), kommun (K), Apodos (A), e-dos (E-d), läkemedelsförteckningen (LMF). Ange även datum för senaste uttag (LMF).

Övrig info från samtalet

Lm lista, antal fel: ____

Tar du några andra läkemedel? ☐ ögondroppar ☐ krämer ☐ inhalationsläkemedel ☐ snusar ☐ hjärtat ☐ mage ☐ sömn ☐ diabetes ☐ receptfria läkemedel ☐ naturläkemedel ☐ vid behov. Hur ofta tar du dem?(regelbunden anv)
Hanteringsproblem? ☐ Svälja; krossa/dela ☐ Få ut lm ur förpackningen ☐ Inhalera
Biverkningar?

☐ Samtycke uttag från LMF:
Datum Sign

Version 2008-12-17

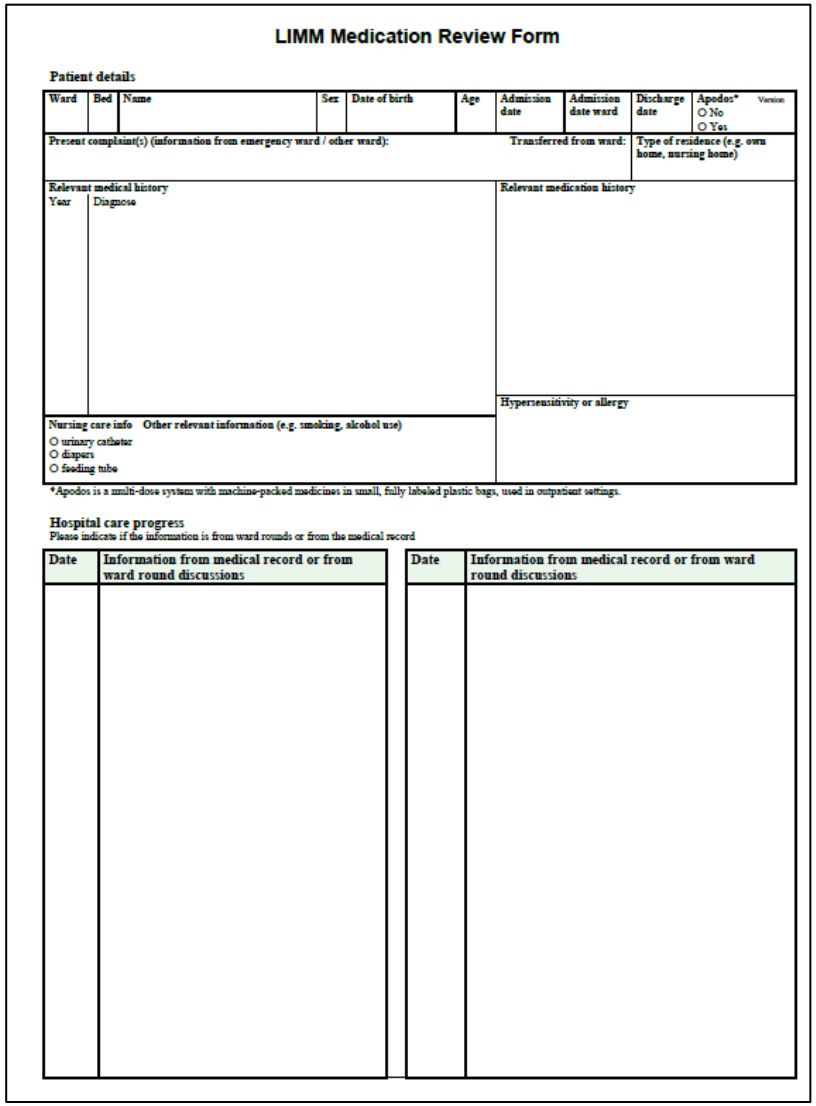
Dokumentansvarig: Å Bondesson, Sjukhusapoteket, USiL

Example of tools

LIMM Medication Review during stay (page 1 of 3)

- **Decreased physical/body functions**
  Liver, kidney, swallowing problems, GI-probes
- **Specific medications**

  TDM-drugs, toxic/ high ADR, allergy/ oversensitive, PIM (in-appropriate in elderly)
- **Interactions**
  Drug-drug, food-drug, drug-food
- **Symptom – cased by medications**
- **Correct selection of medication**
  EBM, recommendations, Care-programs
- **Individualization and the big picture**
  Benefit-risk, polypharmacy, indication for treatment, compliance



LIMM Medication Review Form

Patient details

Ward	Bed	Name	Sex	Date of birth	Age	Admission date	Admission date ward	Discharge date	Apodos* Version O No O Yes

Present complaint(s) (information from emergency ward / other ward): Transferred from ward: Type of residence (e.g. own home, nursing home)

Relevant medical history
Year | Diagnose

Relevant medication history

Hypersensitivity or allergy

Nursing care info Other relevant information (e.g. smoking, alcohol use)
O urinary catheter
O diapers
O feeding tube

*Apodos is a multi-dose system with machine-packed medicines in small, fully labeled plastic bags, used in outpatient settings.

Hospital care progress
Please indicate if the information is from ward rounds or from the medical record

Date	Information from medical record or from ward round discussions	Date	Information from medical record or from ward round discussions

Example of tools

LIMM Discharge Information

- Written for the patient and includes;
  - Short presentation of causes for admission, what has been done and planned
  - Medication Report of all medication changes and the reasons for it (what and why)
  - Medication List with information on drug, dosing, effects and special remarks;
- Given to the patient at discharge
- Sent to the GP and the community care nurses on the day of discharge

- Developed by experts and patients

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Universitetssjukhuset
221 85 Lund
046-172408

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Test Testsson
Testgatan 11
21748 Teststad

Discharge information

Discharge physician: Jan Oscarsson
Responsible physician: Lydia Holmdahl
Family doctor: Sven Svensson, VC Mosseby
Admitted: 2009-03-08 – 03-14

About your disease
You have been admitted to hospital due to fever and shortness of breath and treated at ward nr 8. X-ray of the lungs showed pneumonia. Fluid in the lungs is a sign of worsening heart failure. You have been treated with antibiotics and diuretics during the hospital stay.

Plans and follow up
You will be admitted to the nursing home at for expanded care-planning. Your Family doctor will contact you within 4-5 weeks for control of your heart and lungs.

Medication Report

- Furosemide has been increased from 1 to 2 tablets due to increased heart failure
- Spironolakton has been added due to low potassium levels and heart failure.
- Doxycyline (antibiotics) added for another week
- Importal substitutes Lactulose due to nausea
- Tramadole has been deleted due to nausea and no further need
- Digoxin dose has been decreased from 0.25 mg to 0.13 mg, blood level was to high.

Medication	Effect	Morning	Lunch	Evening	Night	Comment
Tabl Furosemide 40mg	diuretics	1	1			
Tabl Spironolakton 25mg	diuretics, potassium sparing	1				
Tabl digoxin 0.13mg	for the heart	1				
Tabl Stilnoct 5mg	for sleeping				1	As needed
Tabl Doxycycline 100mg	antibiotics	1				To Mars 16
Dose powder Importal	against constipation	1				
Tabl Paracetamol 500mg	against pain	1	1	1		

Focus on Medication Review

The LIMM-model:
Activities, responsibilities and tools

When and how often	Activity and responsibility	Tool (instructions for each)
At admission Once for each patient	Admission Medication Reconciliation by a clinical pharmacist	**LIMM Medication Interview questionnaire**, part 1-3 depending on patient, disease, and medication characteristics. Part 1 is focused on a correct patient medication list Part 2 adds questions on the patient's problems with practical handling, knowledge and adherence Part 3 adds questions for a deepened assessment of adherence and beliefs.
During hospital stay Continuously for each patient	Medication Review and monitoring by a clinical pharmacist Symptom assessment by nurse or clinical pharmacist Organize a treatment plan based on above activities by a physician	**LIMM Medication Review form** **LIMM Symptom Scoring form** Documented in the patient chart
At discharge Once for each patient	Discharge Medication Reconciliation by a physician Quality control of Discharge Medication Reconciliation by a clinical pharmacist at regular intervals	**LIMM Discharge Information form**, including a Medication Report and a Medication Summary **LIMM Quality Control form** for Discharge Medication Reconciliation

LIMM patient symptom scoring form

By nurse/nurse assistant/pharm

Ask activelly the patient about perceived problems, such as

	Yes	No	Comments
1 Dizziness			
2 General tiredness			
3 Memory disorders			
4 Poor sleep			
5 Dryness in mouth			
6 Nausea			
7 Constipation			
8 Urinary problems			
9 Pain			
10 Caugh			

Other symptoms observed or reported

LIMM Medication Review during stay (page 1 of 3)

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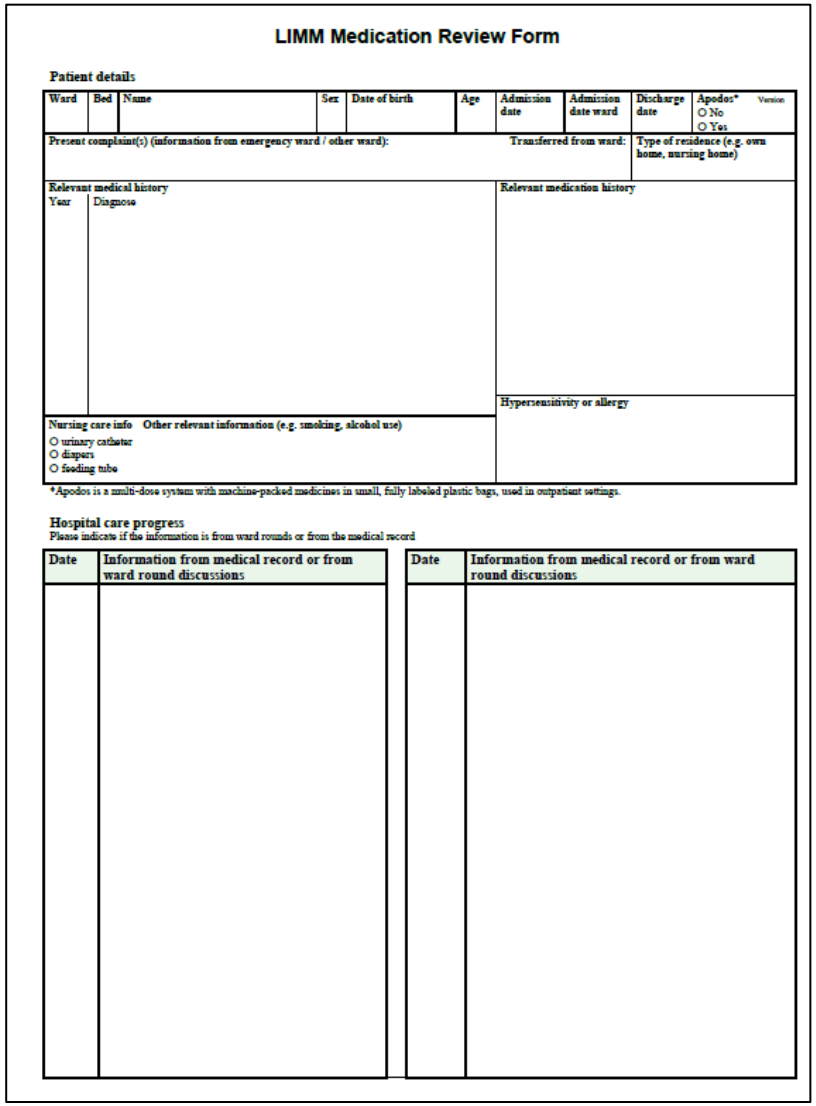

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Year | Diagnose

Relevant medication history

Hypersensitivity or allergy

Nursing care info Other relevant information (e.g. smoking, alcohol use)
O urinary catheter
O diapers
O feeding tube

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Hospital care progress
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Care-Plan for Medications performed by the team.

Nr/ Date	Problem	Mediaction	Objective	Follow-up (when, how, whom)	Results	Comment
1/ 1/3	High Blood pressure 195/95	Ramipril added	BP 140/80	Daily BP-monitoring by nurse asssist Follow up 5/3	BP 170/85	Follow up primary care 1 month.
2/ 1/3	Nause – cytostatics	Primperan added	No nausea	Control every day	2/3 Still nausea	
2/ 2/3	Nause – cytostatics	Zofran added	No nausea	As above	3/3 No nausea	

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Hospital care progress

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Identified drug related problems (DRP) **Suggested and implemented actions**

Score out DRPs which are no longer relevant; date and sign.

Date Sign	Potential and actual DRPs	Suggested action (pharmacist's suggestions)	Discussed w. physician Date/ Sign	Implemented actions (by physician or pharmacist)
	Medications requiring therapeutic drug monitoring			
	Inappropriate medications			
	Improper handling of medications (e.g. crushing, splitting, inhaling)			
	Clinically relevant drug-drug interactions			
	Medication or dose not adapted to patient characteristics (e.g. renal or liver function)			
	Unnecessary drug treatment Indication for a specific drug treatment missing			
	Short course medication Started Recommended length of treatment Stopped			

Date Sign	Potential and actual DRPs	Suggested action (pharmacist's suggestions)	Discussed w. physician Date/ Sign	Implemented actions (by physician or pharmacist)
	Untreated symptom or disease			
	Medication has caused inappropriate change of laboratory test results, medication related symptoms or adverse drug reactions.			
	Generic or analogous substitution according to the regional interchangeable medication list			
	Other DRPs			
	Errors or DRPs identified during the medication reconciliation and interview (please see the Medication Interview Questionnaire)			

Medication review conducted; date and signature.

Potential and actual DRPs, actions

- Problem identified (date), details in next slide
- Pharmacist suggestion
- Presented and discussed (date, person, function)
- Implemented action (physician, pharm)

Potential and actual DRPs, headings

- Medications requiring therapeutic drug monitoring
- Inappropriate medications
- Improper handling of medications (e.g. crush, split, inhale)
- Medication or dose not adapted to patient characteristics (e.g. renal or liver function)
- Indication for a specific drug treatment missing
- Short course medication
  - When started , recommended length of treatment, stopped
- Untreated symptom or disease
- Medication has caused inappropriate change of laboratory test results, medication related symptoms or adverse drug reactions.
- Generic or analogous substitution according to the regional interchangeable medication list
- Other DRPs
- Errors or DRPs identified during the medication reconciliation and interview (MedRec)

Examples of Definition DRP

Cipolle et al.

McGraw-Hill 2012

- An undesired patient experience that involves drug therapy and that actually or potentially interferes with the desired patient outcome

PCNE.org

Version 6.2. Assessed 2012 Oct 19

- An event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes.

Classification; problems and causes for DRP

Cipolle et al.

- Need for additional therapy
- Unnecessary drug therapy
- Wrong drug
- Dosage too low
- Adverse drug reaction
- Dosage too high
- Non-compliance

PCNE

- Problems
  - Treatment effectiveness
  - Adverse reactions
  - Treatment costs
  - Other
- Causes
  - Drug selection
  - Drug form
  - Dose selection
  - Treatment duration
  - Drug use/administration
  - Logistics
  - Patient
  - Other

Optimal classification system,
According to Van Mil et al 2004

- Based on clear definitions
- One choice of coding only; in general & for each category.
- Validated
- Easy to use for research and clinical practice
- Structured in a hierarchical manner
- Clearly separate causes from problems
- Have an intervention section
- Focus on the process of pharmaceutical care and outcomes of pharmacotherapy

- **No such system is available**

Sourses; identification of DRP

Patient/asssitant/family member

- Prescribed
- Dispenses
- Consumed/compliance
- Practical handling
- Knowledge
- Attitude

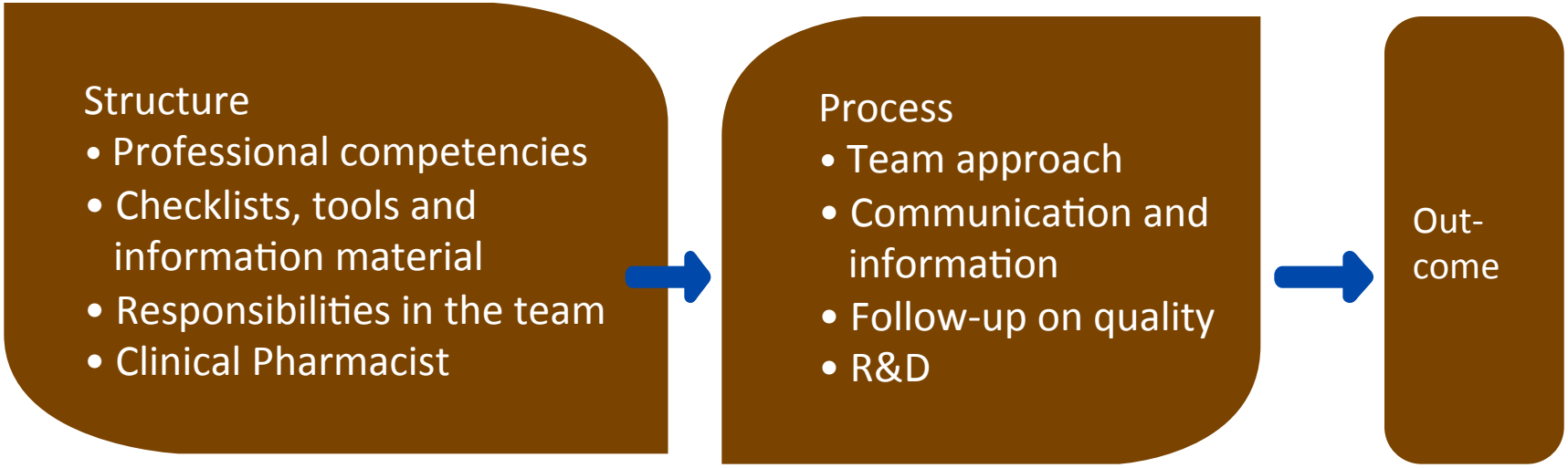
Health Care

- Records
  - Diagnosis
  - Allergies/cave
  - Prescription
  - Dispensed
  - Notes
  - Tests; lab, ADL
- Specific checklists
  - Symptoms/problems

Resources

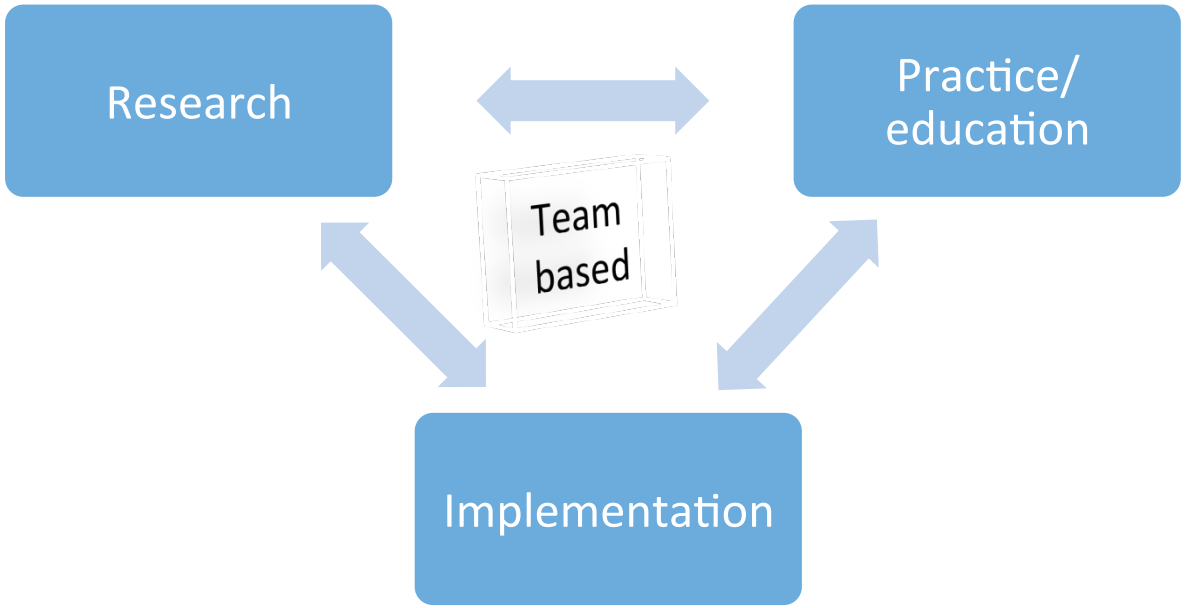
- Competent professionals, clinical pharmacists
  - Trained and experienced, start as a student
  - Continuous education
- Systematic approach
  - Team based, skills used optimal
  - Medication Reconciliation, Medication Review, patient support (concordance)
  - Checklists and support
- Documentation and Communication
  - Reporting
  - Responsibilities

Quality assurance in the LIMM-model



Using the same structure and process (and prove it) the LIMM-model can be implemented in similar settings and the outcomes guaranteed

Reason for success of LIMM-model



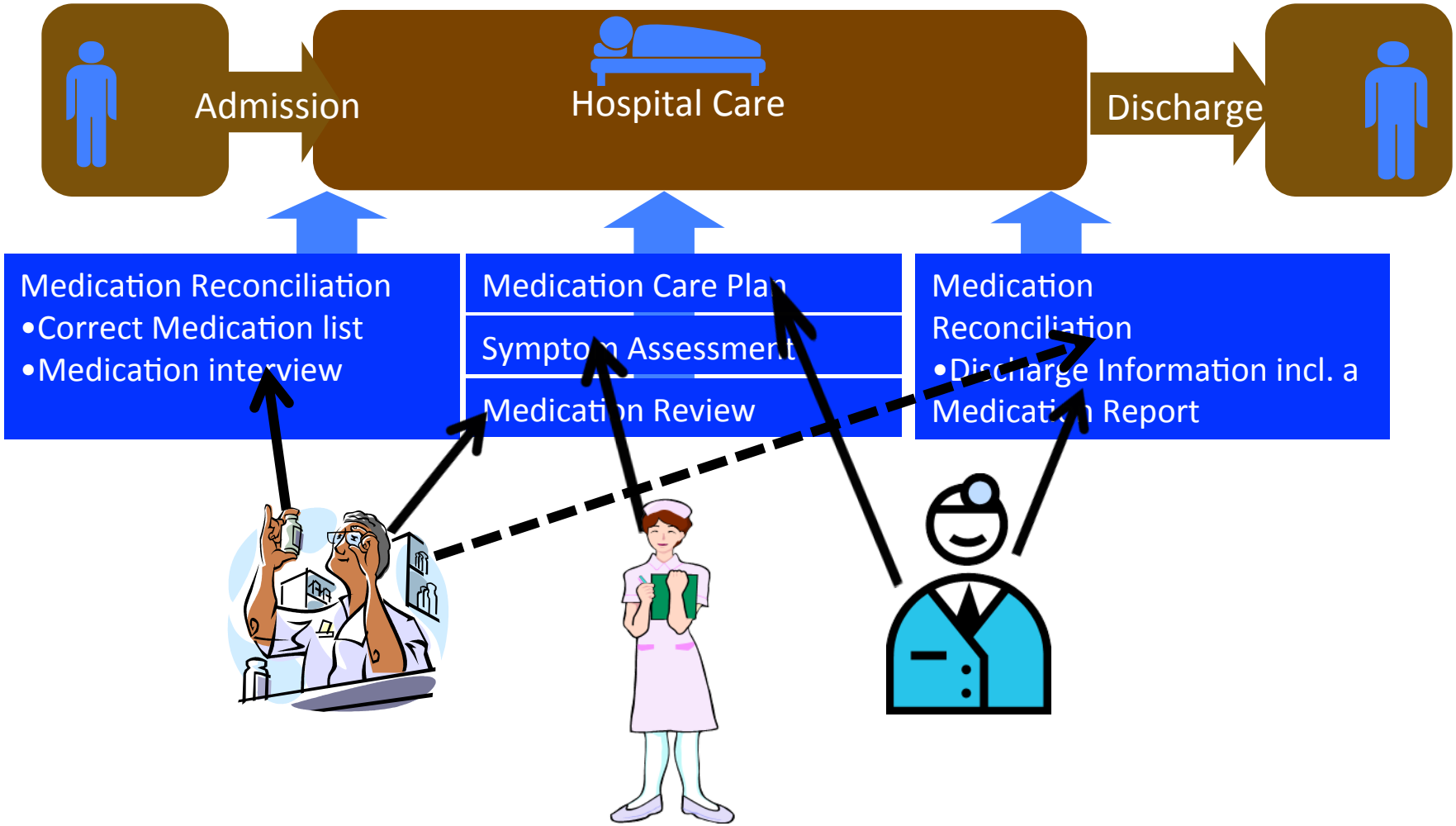
Practical and Quality Aspects on Med Rec

Pharmacist role for:

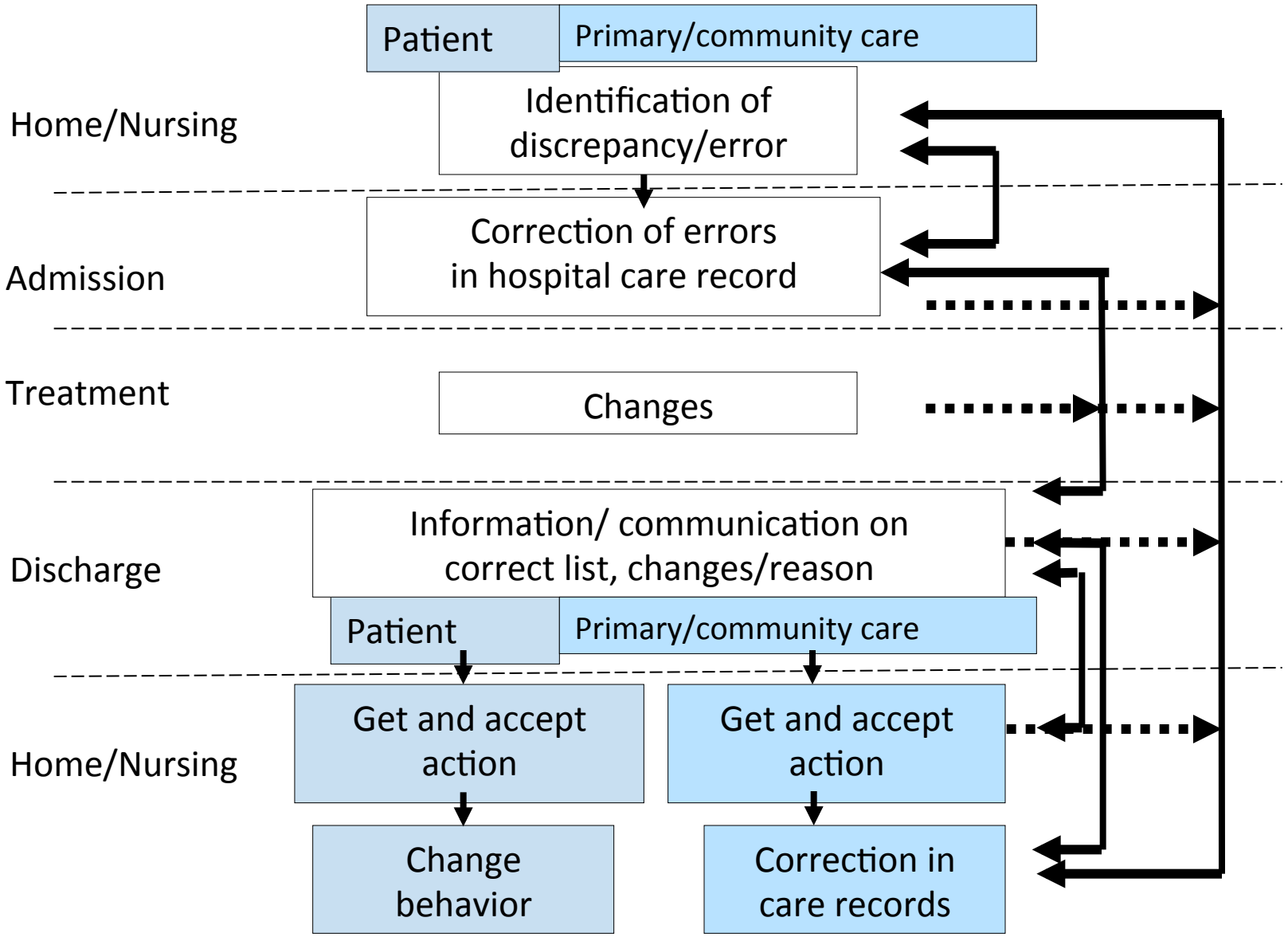
- Description of problems?
- Development and implementation of routines?
- Education of other professionals and students?
- Show improvements?
- Performing services?
  - Hospital
  - Primary care
  - Communication between hospital and community care

The LIMM-model A team approach

- The pharmacist is the engine
- The activities and responsibilities are divided.



Measuring errors and improvements.



Implementation. Prepare an action plan

- Identify a local, interested and important physician.
- Identify local problems in hospital medication list from a small study, use students and focus on patient problems and patient needs
- Calculate a relevant clinical- and economical benefit for the patients and the hospital from the local study and international studies
- Present the problems and suggest improvements based on a team approach and included as a quality improvement and patient safety concern in the hospital

Summary point

- The pharmacist can and must be the engine for medication safety
  - Med Rec and Med Rev problems are a very good starting point
- Help each other or ”Steal with pride” from good practices and prepare a local systematic consept for medication patient safety.
- Prepare an action plan
- Be visible, professional and thrustworthy
- Integrate practice, education and research
- Use a team approach and focus on the patient needs

Thanks

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