

Approach for improving the appropriateness of drug prescribing-

Focus on process and drug related patient problems

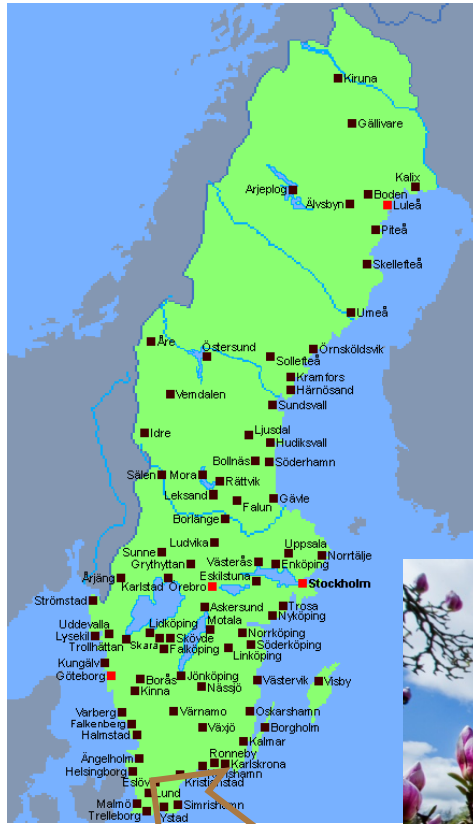
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Lund and Lund University



City of Lund
Founded y 990
Population 76.000



Lund University
Founded y 1666 (1438)
47.000 students



Drug Related Problems (DRP)

- If not properly selected and used medications can cause problems with potential negative clinical consequences.
- Pharmaceutical Care and Medication Therapy Management are based on identifying, resolving and preventing DRPs for the patient.
- Physicians, pharmacists and nurses need basic skills for practice and development of better services



Quality of care according to Donabedian

- Best patient outcome to the lowest possible cost



- How can we **Focus in this presentation**



Examples: 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.



Identify
Solve
Prevent



Hospital Care, a supportive process

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



Hospital Care, a (non-) supportive process

Low quality in documentation and communication



The L IMM-model solves all problems at almost 100%



The LIMM -model (Lund Integrated Medicines Management)



A systematic approach to individualise and optimise drug treatment



Example of tools

LIMM Medication Interview (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

□ LMI Bilaga 5
□ AL

Läkemedelsintervju- slutenvård

APOTEKET FARMACI
Region Syd, Område Mitt

Ärd	Säng	Namn	Födelseår	Utförd (datum, tidpunkt)	Uppföljja (dat sign)
-----	------	------	-----------	--------------------------	----------------------

Aktuell läkemedelslista (enligt journal)				Korrekt lm lista				Sköter lm själv			
Patient sköter lm själv? <input type="radio"/> Ja <input type="radio"/> Nej				Apotek? <input type="radio"/> Nej <input type="radio"/> Ja, version				Deaning* <input type="radio"/> Korrekt <input type="radio"/> Inal <input type="radio"/> Följa <input type="radio"/> UT			
Dat IN	Läkemedel, beredningsform, styrka	Dosering	Kommentar	Dat UT	Korrekt	Inal	Följa	UT	Om problem (x) Ej problem (✓)		

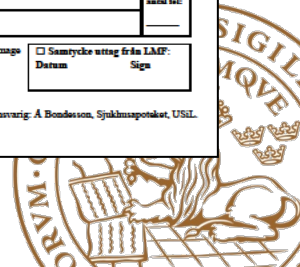
* Info från patient/amblygi(PA), vårdcentral (VC), kommun (K), Apotek (A), o-dos (E-d), läkemedelsförtäcksningen (LMP). Ange även datum för senaste uttag (LMP).

Övrig info från samtal:

Tar du några andra läkemedel? agonotroper kottar inhalationsläkemedel smärta hjerta mage
 sömn diabetes receptfria läkemedel naturläkemedel vid behov. Hur ofta tar du dem? (sagt/rundan osv)
 Hanteringsproblem? Svtja; krossa/dela FA ut lm ur förpackningen Inhalera
 Biverkningar?

Lm lista, sand fel.
 Datum: _____ Sign: _____

Version 2008-12-17 Dokumentansvarig: A Bondesson, Sjukhusapotek, USH.



Ester 80 years old

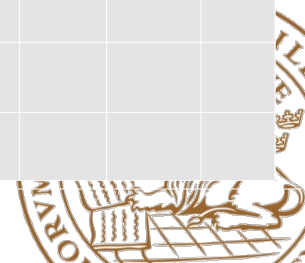
- Found on the floor in her apartment Friday afternoon
- At hospital admission
 - Slightly confused
 - High blood sugar
 - Low blood pressure
- Medication interview Monday morning according to LIMM



LIMM Medication Interview

Focus correct medication list

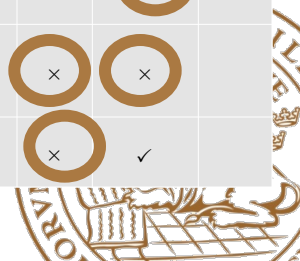
Avd 5		Säng 1:2		Namn Ester		Födelsenr XXXXXX		Initial (datum, sign ÅB 2008-09-30)		Uppföljn (dat sign)		
Anamnes/Aktuell läkemedelslista						Korrekt Im lista			Sköter Im själv			
Patient sköter Im själv? x Ja <input type="radio"/> Nej				Apodos? X Nej <input type="radio"/> Ja, version		Dose			Om problem (x) In problem (✓)			
Dat IN	L S	Medications		Dos	Kommentar	Dat	PAT	LMF	Correct	Ind	Följs	UF
		Omeprazol tabl 20 mg		1x1			-	-				
		Ramipril tabl 10 mg		1x1			1x1	1x1	1x1			
		Metoprolol SR tabl 50 mg		2x1			1x1	1x1	1x1			
		Simvastatin tabl 20 mg		1 tn			1 tn	1 tn	1 tn			
		Aspirin tabl 75 mg		1x1			1x1	1x1	1x1			
		Furosemid tabl 20 mg		1+1+0			1+1+0	1+1+0	1+1+0			
		Citalopran tabl 20 mg		1x1			10 mg x1	10 mg x1	10 mg x1			
		Flunitrazepam tabl 1 mg		1 tn			1 vb	1vb	1 vb			
		Metformin tabl 850 mg		1x1			1x1	1x1	1x1			
		Atenolol tabl 50 mg		1x1			1x1	1x1	1x1			



LIMM Medication Interview

Focus Knowledge and compliance

Avd 5		Säng 1:2		Namn Ester		Födelsenr XXXXXX		Initial (datum, sign ÅB 2008-09-30)		Knowledge	Compliance
Anamnes/Aktuell läkemedelslista						Korrekt Im lista					
Patient sköter Im själv? x Ja <input type="radio"/> Nej <input type="radio"/>				Artdos? X Nej <input type="radio"/> Ja, version <input type="radio"/>				Dose			
Dat IN	Läkemedel, beredningsform, styrka	Dos	Kommentar	Dat	PAT	LMF	Correct			UF	
	Omeprazol tabl 20 mg	1x1			-	-	-				
	Ramipril tabl 10 mg	1x1	Stopped taking, no effect		1x1	1x1	1x1	✓	✗		
	Metoprolol SR tabl 50 mg	2x1	Stopped taking no effect		1x1	1x1	1x1	✓	✗		
	Simvastatin tabl 20 mg	1 tn	Patient think it is sleeping pill		1 tn	1 tn	1 tn	✗	✓		
	Aspirin tabl 75 mg	1x1			1x1	1x1	1x1	✓	✓		
	Furosemid tabl 40 mg	1+1+0	Don't like it		1+1+0	1+1+0	1+1+0	✓	✗		
	Citalopram tabl 20 mg	1x1			10 mg x1	10 mg x1	10 mg x1	✓	✓		
	Flunitrazepam tabl 1 mg	1 vb	Patient sometimes take two		1 vb	1vb	1 vb	✓	✗		
	Metformin tabl 850 mg	1x1	Do not take this, do not know reason for use		1x1	1x1	1x1	✗	✗		
	Atenolol tabl 50 mg	1x1			1x1	1x1	1x1	✗	✓		



LIMM Medication Interview studies


- Descriptive study at two Acute Medicine wards Lund University Hospital 2007 (Hellström 2012a)
 - Performed by a trained clinical pharmacist using LIMM-admission forms
 - Review of medication list in EHR, >1 dose given to the patient
 - 420 of 670 patients (63%) > 1 discrepancy in medication list, in total 1136, mean 1.7 per patient.
 - Pharmacist recommended 813 corrections
 - 760 (93%) recommendations were corrected/solved
- 59% of pharmacists' recommendations were ranked at least as somewhat significant (Bondesson 2012b)



Exemple of tools

LIMM Medication Review (continuously)

- **Decreased physical/body functions**
Liver, kidney, swallowing problems, GI-probes
- **Specific medications**
TDM-drugs, toxic/ high ADR, allergy/ hyper-sensitive, PIM (in-appropriate in elderly)
- **Interactions**
Drug-drug, food-drug, drug-food
- **Symptom – caused by medications**
- **Correct selection of medication**
EBM, recommendations, Care-programs
- **Individualization and the big picture**
Benefit-risk, polypharmacy, indication for treatment, compliance

Arbetsunderlag för läkemedelsgenomgång 

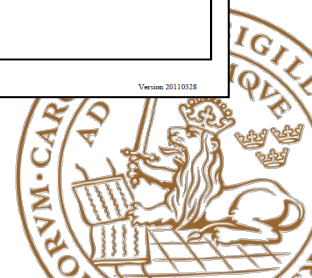
Bakgrundsinformation

Avd/boende	Plats/Säng	Födelsenumsnr	Patientens namn	Kön	Ålder	Uttag in	Datum avd	Datum ut
Orsak till intagning på sjukhus:				Från avd:	Boendeform: <input type="checkbox"/> hemma utan HT <input type="checkbox"/> hemma med HT <input type="checkbox"/> annat boende	Bor: <input type="checkbox"/> ensam <input type="checkbox"/> tillsammans med		
Medicinsk historik År: _____ Diagnos: _____				Läkemedelshistoria: CAVE: Omvårdnadsinfo Övrigt Patient tvål <input type="checkbox"/> sona/REG <input type="checkbox"/> CVK <input type="checkbox"/> K&D				

Beskrivning av vårdförloppet
Då information finns under rönt, dokumentera "rönt" under datum.

Datum	Information från journalrond	Datum	Information från journalrond

Dokumentation: Anja Söderström, Läkemedelsrådet, Koordinationsteamet, Region Skåne Version 20110328



LIMM Medication Review studies

- Un-identified DRPs decreased from from 9 to 1 (Bondesson 2012b)
- 62-81% of DRP identified by pharmacist were recommended to physician for implementation (Bondesson 2012a, Bergkvist 2011)
- The physicians accepted and implemented 90% of the clinical pharmacists' recommendations (Bondesson 2012a)
- Most recommendations, 83%, were ranked 3 (somewhat significant) or higher (Bondesson 2012a)
- Medication appropriateness index (MAI) improved and ,inappropriate drugs decreased by 50-60% (Bergkvist 2009a, Hellström 2011)




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

Universitetssjukhuset i Lund



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Universitetssjukhuset
221 85 Lund
046-172408

19 121212-1212
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.
- Doxycycline (antibiotics) added for another week
- Importal substitutes Lactulose due to nausea
- Tramadol 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		

LIMM Discharge Information studies

- Comparative study before (179 patients) and after introduction (248 patients) at 7 wards, Lund University Hospital 2006 (Midlöv 2008a+b)
- Errors were non-documented discrepancies between medication list in discharge information and actual Medication list in community care
- Correct medication list improved from 34 to 68% ($p < 0.001$) and mean number of errors per patient decreased from 2.2 to 0.97 ($p < 0.001$) (Midlöv 2008a)
- Health care contacts within 3 months after discharge decreased from 8.9 to 4.4% ($p = 0.049$) (Midlöv 2008b)
- Quality control and feedback by a pharmacist before patient discharge further decreased error rates by;
 - 45% ($p = 0.012$) (Bergkvist 2009b)
 - 35% ($p = 0.037$) (Midlöv 2012)



Sources; identification of DRP

Patient/carer

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

Health Care

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



Resources

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



Evidences; from process to outcome

Process	Outcomes			
	Mortality	Morbidity	Health Care contacts	Costs
↓ DRP				
↓ Medication Errors				
↓ ADE ADR				
↑ Compliance				
↑ Appropriateness				



Thanks

Presentation Round table
A multidisciplinary approach-
Focus on outcomes from the LIMM-model

