Seminar P4 - Sharing pharmacy information for safer transition of care

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Hospital pharmacist-epidemiologist

olvg

Conflict of interest

Nothing to disclose

Questions

- At hospital admission and/or discharge in 60% of medication lists there is a medication error
- Medicines reconciliation should be performed by a pharmacist
- Medicines reconciliation is the process of creating the most accurate list of medicines at all transition points

Haggerty JL, Reid RJ, Freeman GK, et al. Continuity of care: a multidisciplinary review. BMJ 2003;327(7425):1219-21.

Questions

- The main cause of hospital related medication errors during transition of care is lack of appropiate technology
- The involvement of patients in transition of care is a key point to improve safety
- Although there is a potential benefit of pharmacists interventions during transition of care, they have not been studied in randomized controlled trials

Medication is the

most commonly used intervention/treatment

yet we lack the overview…

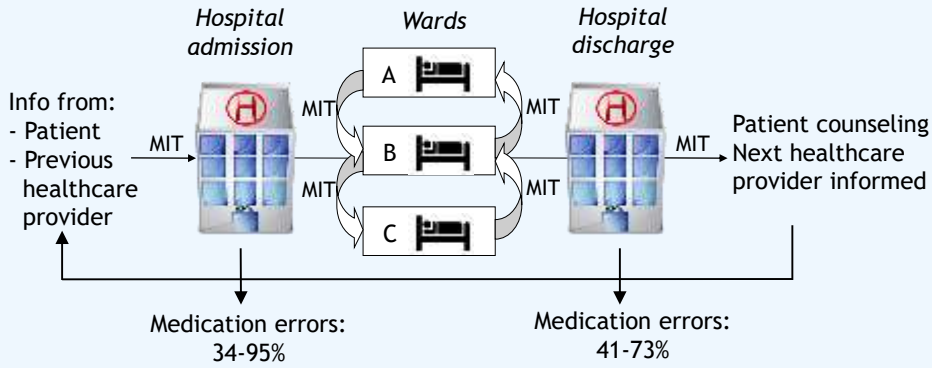
M. Fitzsimons, T. Grimes, M Galvin. Sources of pre-admission medication information: observational study of accuracy and availability. International Journal of Pharmacy Practice 2011;19;408-16

Continuity of care

- = continuum of care = seamless care etc.
- “the degree to which a series of discrete healthcare events is experienced as coherent and connected and consistent with the patient's medical needs and personal context”

Haggerty JL, Reid RJ, Freeman GK, et al. Continuity of care: a multidisciplinary review. BMJ 2003;327(7425):1219-21.

Continuity of pharmaceutical care

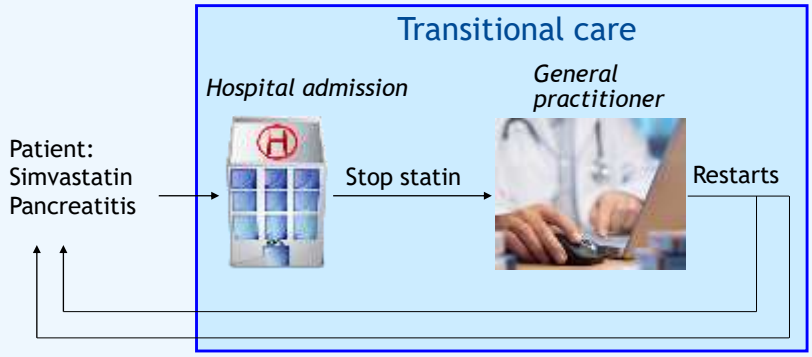


Medicines reconciliation

MIT= medication information transfer

Tam VC, et al. CMAJ. 2005 Aug 30;173:510-5. Schnipper JL, et al. Arch Intern Med 2006;166:565-71.
Wong JD, et al. Ann Pharmacother 2008;42:1373-9. Karapinar F, et al. Ann Pharmacother 2009;43:1001-10.

Case



Transitional care = set of actions to ensure continuity of health care as patients transfer between different locations or different levels of care

- Croonen H. A new generation medication surveillance is needed. Dutch Pharmaceutical Journal 2006.
- Joint Commission on The Accreditation Of Healthcare Organizations. Medication Reconciliation Handbook. ASHP; 2006.
- Van der Linden CM et al. Represcription after adverse drug reaction in the elderly: a descriptive study. Arch Intern Med. 2006;166:1666-7.

Key messages

Continuity of care

- Communication starts with knowing
- Patients/carer: the only constant factor
- There is no continuity in one setting or one person/profession
- Use electronic records but be critical

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Medicines reconciliation

"The process of creating the most accurate list of medications at all transition points,
with the goal of providing correct medications"

- IHI. Protecting 5 million lives from harm. Getting started kit: prevent adverse drug events (medication reconciliation).
- Joint Commission on The Accreditation Of Healthcare Organizations. Medication Reconciliation Handbook. ASHP; 2006.

Medication reconciliation: 4 steps

- Verification: compare medication lists
  - Previous vs actual list: collect accurate medication history

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- Joint Commission on The Accreditation Of Healthcare Organizations. Medication Reconciliation Handbook. ASHP; 2006.

Medication reconciliation: 4 steps

- Verification: compare medication lists
  - Previous vs actual list: collect accurate medication history
- Clarification: check appropriateness
  - Persistence of inappropriate medication/dosages?
  - Undertreatment?

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Medication reconciliation: 4 steps

- Verification: compare medication lists
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- Clarification: check appropriateness
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- Reconciliation: document medication changes
  - Reasons for changes? Temporary or chronic use?

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Medication reconciliation: 4 steps

- Verification: compare medication lists
  - Previous vs actual list: collect accurate medication history
- Clarification: check appropriateness
  - Persistence of inappropriate medication/dosages?
  - Undertreatment?
- Reconciliation: document medication changes
  - Reasons for changes? Temporary or chronic use?
- Transmission: communicate updated medication list
  - Patient
  - Next healthcare provider

- IHI. Protecting 5 million lives from harm. Getting started kit: prevent adverse drug events (medication reconciliation).
- Joint Commission on The Accreditation Of Healthcare Organizations. Medication Reconciliation Handbook. ASHP; 2006.

Medication reconciliation at admission

Prescribed by hospital physician

Medication at admission
Acenocoumarol 1 mg
Furosemide 40 mg once a day
Spironolacton 25 mg once a day
Metoprolol 50 mg ER once a day
Perindopril 4 mg once a day
Temazepam 20 mg once a day

Community pharmacy records/patient

Pre-admission used medication
✓
✓
✓
✓
✓
New

Missing

Isosorbide-5-mononitrate 25 mg ER once a day
Isosorbide Dinitrate 5 mg if required

Simplified example of a real patient in our hospital

Medication reconciliation at discharge

Prescribed by hospital physician

Medication at discharge
Furosemide 40 mg once a day
Spironolacton 25 mg once a day
Metoprolol 50 mg ER once a day
Perindopril 4 mg once a day
Temazepam 20 mg once a day
Isosorbide-5-mononitrate 25 mg ER once a day
Isosorbide Dinitrate 5 mg if required

Community pharmacy records/ inhospital records/patient

Check of discharge medication
✓
✓, but hyperkalemia → stop
✓
✓, but kidney malfunction → 2 mg
Discussion with patient → stop
✓
✓

Missing

Acenocoumarol? → add

Simplified example of a real patient in our hospital

Cardiology ward (n=171)

	% pat with an intervention	Explanation
Hospital admission	69.6	Mainly discrepancies with medication used before hospital admission (69%)
Hospital Discharge	90.6	Still discrepancies present (59.1%) Optimize pharmacotherapy (72.5%)
Discharge counselling	94.7	Medication needs differ (34.5%) Optimize medication use (86.5%)
Information transfer	92.4	Mainly inform on medication changes + reasons and follow-up actions (91.8%)

Minimally one intervention was registered for all patients

Key messages

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- Use electronic records

Continuity: patient perspective

Informational need
What the medicine is for
Whether the medicine has any side effects
Whether there are any interactions
What the medicine does and how it works
Whether the medicine is reimbursed
How to use the medicine
Duration of use
How long does it takes before the medicine works
Whether the medicine can make you feel drowsy

Only constant factor in the healthcare system

Empower patients in their own care

-Research in progression

You as a partner in your healthcare

Health care personnel, such as doctors and pharmacist, try to help you with your medication use. But you also have an important role in your own healthcare. Here are some tips:

1. **Keep up with your medications**
   - Make sure you always carry an actual and complete medication list with you. You can request a medication list from your pharmacist.
   - Note on this medication list all medications you use including the medication which you may have bought without a doctor's recipe (e.g. herbals, vitamins, painkillers).

2. **Share important information with your healthcare providers**
   - Show your complete medication list each time you visit a doctor.
   - Tell your doctor and pharmacists which allergies or serious side effects you have endured and whether you have a decreased kidney and/or liver function.

3. **Know the facts about your medication such as**
   - Why, when and how long you should use the medication.
   - Whether tablets or capsules may be crushed/opened..

4. **Never use someone else's medication and never share your medication with others.**

5. **Do not change your medication without consultation**
   - Do not change a dose or do not discontinue medication without consulting your healthcare provider. Even if you have no complaints, it is still important to use this medication. Some medication prevents healthcare problems.
   - Consult your doctor or pharmacist first before you buy medication without a doctor's recipe. They can check whether this medication can be combined with the medication you already are using.

Medication list for patient (reserse side)

Lucas Andreas

Medication summary per: 13 march 2009

Page 1

Patient: Mr. Example, 0: 10-10-1923
Patientid: 04585632
Admission date: 02-03-09

ALLERGY: PENICILLIN
CONTRA-INDICATION: DECREASED KIDNEY FUNCTION

Specialist: Dr. Internal
Specialism: Internal medicine
Ward: A6

Start until	Stop	Medication name (brand name)	Medication used for	Dose	Administration scheme Morning	Noon	Evening	Night
02-03-09		Acenocoumarol 1 mg tablet (Sintrom)	Blood thinning	Use according to blood tests Swallow your tablets whole with a drink of water	Use according to dosage scheme of anticoagulation clinic			
02-03-09		Furosemide 40 mg tablet (Lasix)	Water retention (oedema)	One tablet daily				
02-03-09		Metoprolol 50 mg SR tablet (Lopresor SR)	Cardiac illness	One tablet daily Swallow your tablets whole, do not chew				
02-03-09		Perindopril 2 mg tablet (Coversyl)	Cardiac illness	One tablet daily **Dose decreased due to decreased kidney function (date 12/3: 35 ml/min)**				
03-03-09		Isosorbide-5-mononitrate 25 mg capsule ER (Monosiodocard)	Angina (chest pain)	One tablet daily Swallow your capsule whole, do not chew				
03-03-09		Isosorbide Dinitrate 5 mg tablet (Isordil)	Angina (chest pain)	One tablet daily Let tablet dissolve under you tongue				
02-03-09	12-03-09	Temazepam 20 mg tablet (-)	Trouble sleeping	One tablets daily **Discontinued, no indication**				
02-03-09	12-03-09	Spironolactone 25 mg tablet (Aldactone)	Water retention (oedema)	One tablet daily **Discontinued due to increased potassium (date 12/3: 5,2 mmol/l)**				

Karapinar-Carkit F, Borgsteede SD, Zoer J, et al. The effect of the COACH program (Continuity Of Appropriate pharmacotherapy, patient Counselling and information transfer in Healthcare) on readmission rates … BMC Health Serv Res. 2010 16;10:39.

Discharge counseling: recall

Table 4. Recall of in-hospital medication changes* one week post-discharge

Patients	**Correct recall, n (%)**
With a medication change (n=88)	37 (42)
Without a medication change (n=16)	14 (88)
All patients (n=104)	51 (49)
Type of medication change	**Correct recall, n (%)**
New (n=162)	130 (80)
Dose-/frequency change (n=45)	23 (51)
Switch (n=35)	14 (40)
Stop (n=53)	20 (38)
All changes (n=295)	187 (63)

** Includes only medication intended for chronic use*

-Research in progression

Continuity?

- 54-82% does not know that medication was changed [1]
- 55% of patients uses the medication not as prescribed at discharge [2]

- Misinterpretation:
  - Baby dies due to bleeding in the brain (coagulation time too long)
  - The mother administered the vitamin K drops to herself

- Use teach back: check
  - ↑ knowledge, ↑ adherence [3]

[1] Ziaeian B, et al. J Gen Intern Med. 2012;27(11):1513-1520.
[2] Pasina L, et al. Drugs Aging. 2014;31(4):283-9.
[3] Negarandeh R, et al. Prim Care Diabetes. 2013;7(2):111-8.

Key messages

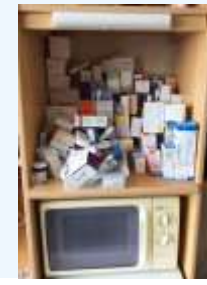
Continuity of care

- Communication starts with knowing
- Patients/carer: the only constant factor
- There is no continuity in one setting or one person/profession
- Use electronic records but be critical

Transitional care

- Beyond hospital walls:
  - ADEs for 19% of patiënts (<14 days after discharge)
  - 1,7 DRPs despite med.rec. at hospital discharge
    - Generally due to newly prescribed drugs

→Collaboration needed with primary care



- Kanaan AO, et al. J Am Geriatr Soc. 2013;61:1894-9.
- Coley KC, et al. Pharmacotherapy 2012;32:10(e270).

ADE= Adverse Drug event
DRPs= Drug Related Problems

Overview for next healthcare provider

Lucas Andreas

Medication overview and discharge prescriptions per: 13 march 2009

Page 1

Hospital Pharmacy
Jan Tooropstraat 164
1061 AE Amsterdam
Tel. 020-5121700
Fax. 020-4126211

Patient: Mr. Example, O. 16-10-1920
Patientnumber: 12345678
Admission date: 02-03-09

Specialist: Dr. Internal
Specialism: Internalmedicine
Ward: A8

ALLERGY: PENICILLIN
CONTRA-INDICATION: DECREASED KIDNEY FUNCTION

Start until	Stop	Medication name	Dose	Remarks	Number to deliver*	Administer route
02-03-09		Acenocoumarol 1 mg tablet	Use according to blood tests			Oral
02-03-09		Furosemide 40 mg tablet	One tablet daily			Oral
02-03-09		Metoprolol 50 mg ER tablet	One tablet daily			Oral
02-03-09		Perindopril 2 mg tablet	One tablet daily	Dose decreased due to decreased kidney function (date 1.20: 35 ml/min)		Oral
02-03-09		Monocedocard 25 mg ER capsule	One tablet daily			Oral
02-03-09		Isordil 5 mg tablet	One tablet daily			Oral
02-03-09	12-03-09	Temazepam 20 mg tablet	One tablet daily	Discontinued, no indication		Oral
02-03-09	12-03-09	Spironolactone 25 mg tablet	One tablet daily	Discontinued due to increased potassium (date 1.20: 5.2 mmol/l)		Oral

Name hospital physician: .....
Signature: .....

Community pharmacy: .....
Fax: .....
Please deliver medication: Yes / No , date .....

Deliver pill box: Yes / No
The patient has received an administration scheme
This information is also sent to the general practitioner
Please inform anticoagulation clinic

Backup/substitutions have been performed in hospital (unless intentional medication change)
Community pharmacy please consider above medication as discharge prescriptions

* If number = 0, do not deliver medication, patient has a stock

Continuity post-discharge

- Despite medicines reconciliation
  - Discharge letter completeness: 63% (e.g. changed drugs, allergies absent)
  - GP files: 16% (files were not updated)
  - Community pharmacy
    - Medication changes: 50%
    - Allergies: 51%

Karapinar-Çarkıt F, et al. Completeness of patient records in community pharmacies post-discharge after in-patient medication reconciliation. Int J Clin Pharm. 2014;36(4):807-14.
Uitvlugt EB, et al. Completeness of medication related information in discharge letters and general practitioner overviews. Accepted Int J Clin Pharm

Key messages

Continuity of care

- Communication starts with knowing
- Patients/carer: the only constant factor
- There is no continuity in one setting or one person/profession: train and delegate
- Use electronic records but be critical

Use of IT

- A must, but IT is an AID
- Integrated electronic health records
  - no decrease of ADEs
- Electronic medicines reconciliation
  - Document pre-admission medication
  - System compares it with currently prescribed medication

- Boockvar KS, et al. Qual Saf Health Care. 2010;19:e16.

ADEs= Adverse Drug Events

Patient portals

- Upload medication history to an online portal
  - e.g. using GP/community pharmacy records
- Patient logs in and verifies his own drugs
  - In general suitable for planned admission, clinic visits
  - 50% reduction in time needed
  - Increased detection of discrepancies and patient activation to discuss DRPs, ADEs
  - Could increase med.rec. implementation
  - For pharmacy: from collecting a list to evaluating the pharmacotherapy on the list

Lesselroth B, et al. J Comm J Qual Pat Saf. 2009;35:264-70.
Weingart SN, et al. Int J Med Inform. 2008;77:161-8.
Schnipper JL, et al. J Am Med Inform Assoc. 2012;19(5):728-34.
Heyworth L, et al. J Am Med Inform Assoc. 2014;21:e157-62.
Chrischilles EA, et al. J Am Med Inform Assoc. 2014;21:679-86.

Key messages

Continuity of care

- Not just simply matching medication lists
- Patients/carer: the only constant factor
- There is no continuity in one setting or one person/profession: train and delegate
- Use electronic records but be critical

Communication requirements in the Netherlands

Dutch Healthcare

- Generally one community pharmacy
  - Medication records relatively complete
  - Regional electronic records
- One general practitioner
  - Sends patients to hospital if necessary

Dutch policy document

- <24 hours an updated medication overview for
  - Hospital physician at (unplanned) hospital admission
  - Next healthcare provider at hospital discharge
- Updated medication overview
  - Prescribed, used, administered medication (plus prescriber)
  - (Reasons for changing/discontinuing medication)
  - Allergies, contra-indication, ADEs
  - Etc.

Developments

- Med.Rec. generally performed by pharmacy technicians
  - Pharmacists are regarded too expensive
  - Difficulty in implementation for all patients
    - Increased due to reimbursements
- Standardised medication overview
  - Standardise communication nationwide
  - Problems with implementation in IT systems

OLVG hospital

- Six departments (in 9 years)
  - Surgery, cardiology, pulmonology, neurology, internal medicine → move towards ED department
  - Recently: outpatient clinics
- Hospital pharmacist/researcher
  - Development procedures/checklists
  - Agreements with wards
- Pharmacy technicians, pharmaceutical consultant
  - Perform medication reconciliation
- Hospital physician
  - Act on information provided

Karapinar-Carkit F, Borgsteede SD, Zoer J, et al. The effect of the COACH program (Continuity Of Appropriate pharmacotherapy, patient Counselling and information transfer in Healthcare) on readmission rates … BMC Health Serv Res. 2010 16;10:39.

Pharmaceutical consultant

- Pharmacy technician with 3 years of additional training
  - Communication, drug related problems
- Capable of working independently
  - Supervision by pharmacists
  - Documents all relevant information
- Compared to pharmacists
  - Less use of medical terms
  - Recognise drug forms, colours etc.

Hospital admission and discharge

- Make medication overview using
  - Community pharmacy and inhospital records
  - Patient/family information
    - (containers, general practitioner)
- Check
  - Discrepancies: intentional?
  - Treatment according to guidelines?
  - Allergies/contra-indications documented?
  - Reason for medication changes?
  - Patient counselling and inform next healthcare provider

Questions

- At hospital admission and/or discharge in 60% of medication lists there is a medication error.
- Medication reconciliation should be performed by a pharmacist.
- Medication reconciliation is the process of creating the most accurate list of medications at all transition points

Haggerty JL, Reid RJ, Freeman GK, et al. Continuity of care: a multidisciplinary review. BMJ 2003;327(7425):1219-21.

Conclusions

- Sharing pharmacy information
  - Requires correct knowledge
  - Requires medicines reconciliation
  - To increase implementation IT is needed (aid!)
- Communication only works with accurate documentation
- Collaboration is needed across the care continuum
  - Beyond our hospital walls

So…

We are not there yet

But this is what we want…

Time to challenge ourselves

Acknowledgements

- Pharmaceutical consultants
- Pharmacy technicians
- Wards and patients

- Healthcare insurer Achmea
- (Hospital)pharmacists
  - P.M.L.A. van den Bemt
  - S.D. Borgsteede
  - A.C.G. Egberts
  - M.J.A. Janssen
  - J. Zoer

- Additional slides based on questions I regularly receive

Medicines reconciliation vs review

Medicines reconciliation	Medicines review
Overall: assumes that the pre-admission used medication is indicated	Overall: indications of the entire pharmacotherapy are assessed and evaluated
Focus: medication changes and discrepancies	Focus: complete pharmacotherapy
Includes medicines optimisation: evaluation of the medication list with "simple" criteria e.g. laxative + opioid, NSAID + protonpumpinhibitor	Includes extensive sources for the review, including all lab parameters, previous ADEs, STOPP START criteria, Beers criteria etc. Includes evaluation of the changes over time

Sint Lucas Andreas Ziekenhuis

beter veiliger vriendelijker

Hospital admission and discharge

Admission

Rubbish in = rubbish out

Easier

Planned admission

Surgery: check medication that should be discontinued

Discharge

Check changes, last check

Medication still needed?

Correct substitutions due to hospital formulary

Inform patient and next healthcare provider

Time per patient

	Time (min)
Medication reconciliation at admission	15
Medication reconciliation at discharge	20
Discharge counseling	23 (5-45)
Inform next healthcare provider	2

- Literature: 30 min to 2 hours/patient

- Bayley BK, et al. Evaluation of patient care interventions …by a transitional care pharmacist. Ther Clin Risk Manag 2007;3:695-703.
- Jack BW, et al. A reengineered hospital discharge program to decrease rehospitalization. Ann Intern Med 2009, 150:178-87.

Return investment

- Approximately 60 min per patient
  - Associated labour costs: € 41 / patient
  - Medication costs savings < 6 months: € 97 /pat
    - Substitute medication to cheaper alternative
    - Discontinue medication (55% of patients overtreatment)
  - Benefit: € 56 /patient (€37 - €71)

Karapinar-Çarkit F, et al. Effect of med. rec. on medication costs after hospital discharge in relation to hospital pharmacy labor costs. Ann Pharmacother. 2012;46:329-38.

Evaluation

Internal medicine

Regular care (n=341)
- Physician-nurse
- No med. rec. structurally
- No structured patient counseling
- Incomplete transfer at discharge

COACH (n=365)
- Pharmaceutical consultants
- Med. rec. on admission/discharge
- Discharge counseling
- Information transfer GP/community pharmacy

Patients were sign. more ill

Before: usual care	Implementation	After: COACH program
April 2009 – Nov 2009	Dec 2009 – March 2010	March 2010 – Dec 2010

Karapinar-Çarkıt F, Borgsteede SD, Zoer J, et al. The effect of the COACH program (Continuity Of Appropriate pharmacotherapy, patient Counselling and information transfer in Healthcare) … BMC Health Serv Res 2010;16;10:39.

COACH program: effects

- DRPs(n=365)
  - 89%: discrepancies with medication used at home
  - 80%: optimisation of pharmacotherapy
  - 10 interventions per patient
    - 6/pat: medication change
    - 4/pat: optimise medication use by patient
- Patient satisfaction
  - 69% usual care vs 87% COACH: significant
- Unplanned readmission
  - 27% usual care vs 33% COACH: no sign. difference

COACH program: effects

Table 3: Characteristics of all drug-related hospital re-visits

	Before period (n=34)	After period (N=44)
Preventability		
No	20 (58.8%)	28 (63.6%)
Side effect	17 (50.0%)	27 (61.3%)
Worsening condition	3 (8.8%)	1 (2.3%)
Yes, potentially with	14 (41.2%)	14 (31.8%)
Medication reconciliation*	4 (11.8%)	1 (2.3%)
Medication review†	4 (11.8%)	7 (15.9%)
Adherence focus‡	5 (14.7%)	4 (9.1%)
Unclear category§	1 (2.9%)	2 (4.5%)
No conclusion possible||	-	2 (4.5%)
Readmission potentially preventable with COACH program	10 (29.4%)	7 (15.9%)
Readmission related to index hospitalisation¶	11 (32.4%)	16 (36.4%)
Readmission caused by a medication change initiated after the index hospitalisation**	6 (17.6%)	13 (29.5%)

Research in progress

COACH program: costs

- Cost-effectiveness
  - Costs for society vs unplanned readmission
  - COACH: €6845/pat vs control: €7952/pat
  - Savings: €1160/pat (95% BI: -3168 – 847)
  - Patient diary (low response)

→ From a societal perspective: no cost-effectiveness shown

Research in progress