

OUTCOMES OF CLINICAL MEDICATION REVIEWS IN AUSTRALIA AND THE UNITED STATES

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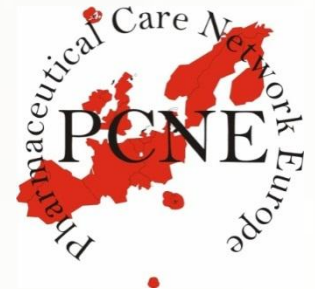
CLINICAL MEDICATION REVIEWS

- Address issues relating to the patient's use of medicines in the context of their clinical condition
- Includes access to clinical patient notes, includes all prescription, complementary and OTC medicines
- Patient always involved

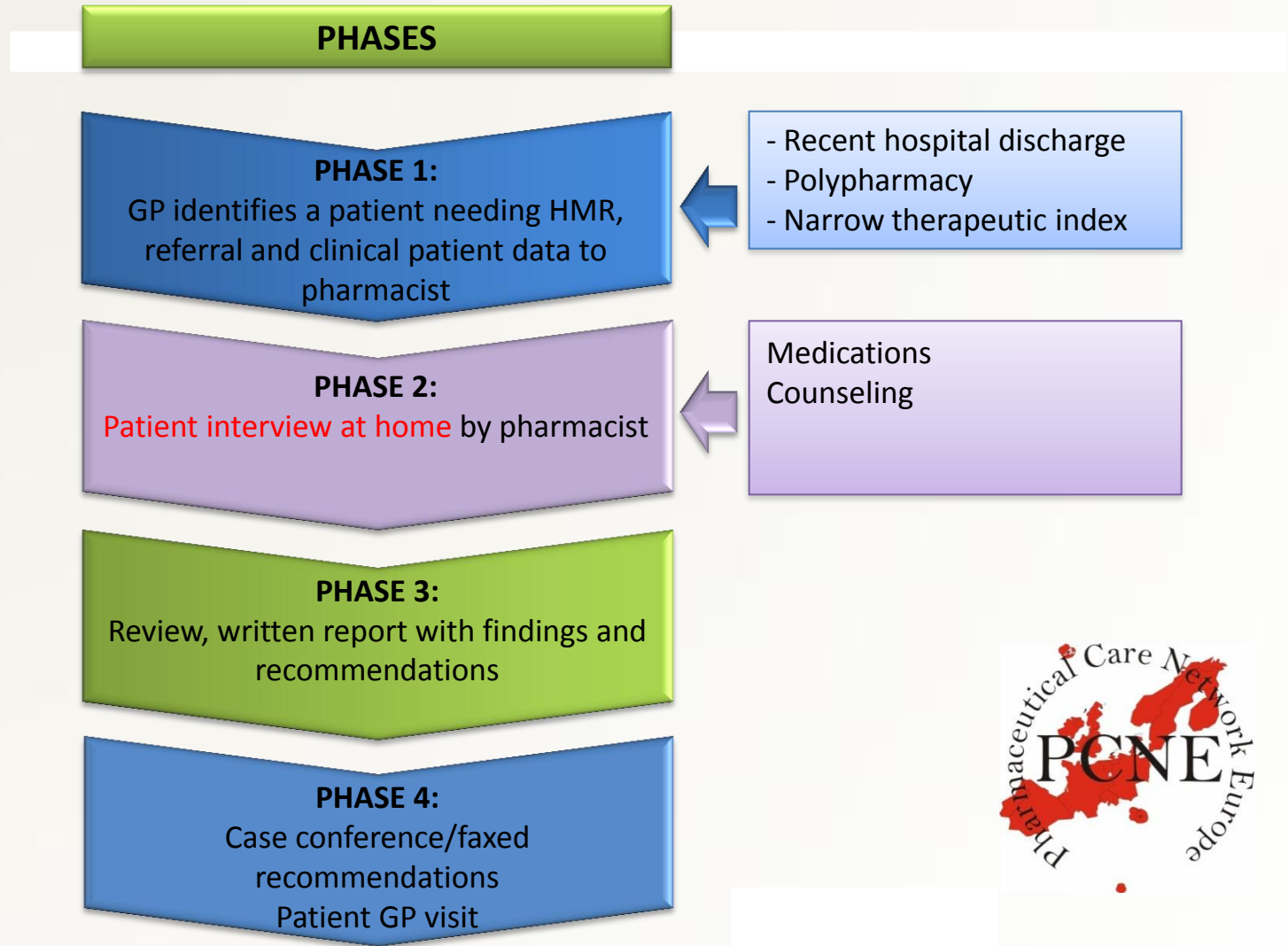


AUSTRALIA

- Home Medicines Review (HMR)
 - Commonwealth funding 1995 =>



AUSTRALIA: HOME MEDICINES REVIEW (HMR)



USA: MEDICATION THERAPY MANAGEMENT (MTM)

- Medicare Prescription Drug, Improvement and Modernization Act 2003 (no detailed service requirements)
 - MTM can mean other services than medication review, e.g., disease management, anticoagulation therapy management
- The American Pharmacists Association (APhA) and the National Association of Chain Drug Stores Foundation (NACDS): a model framework
 - Usually includes several encounters, usually at the pharmacy or by phone



USA: MEDICATION THERAPY MANAGEMENT (MTM)

PHASES

PHASE 1:
Pharmacist identifies a patient needing MTM (health plan)

- High drug costs
- Chronic conditions
- Polypharmacy

PHASE 2:
Pharmacists discusses with patient at pharmacy/by phone: creates a database with patient information

PHASE 3:
Pharmacist lists DRPs, creates a plan

PHASE 4:
Intervention with patient or referral to/collaboration with physician

PHASE 5:
Personal medication record
Medication action plan
Documentation and follow-up



OUTCOMES OF HMR AND MTM



STUDY INCLUSION CRITERIA

- Clinical medication review for community-dwelling people, discussion with the patient
- At least some patients aged 65 or older
- Review included assessment of at least the following DRPs:
 - Untreated conditions, unnecessary medications
 - Effectiveness of therapy
 - Safety: doses, adverse drug reactions
 - Adherence



HOME MEDICINES REVIEW



PHARMACISTS RECOGNIZE DRPS

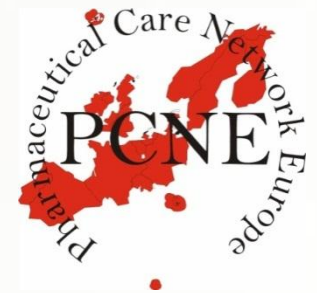
- 2.1–9.7 /patient
- MOST COMMON :
 - patients' poor adherence or knowledge
 - ADRs
 - Need for additional medication
 - Drug-drug interactions
 - Need for additional tests or monitoring



CLINICAL OUTCOMES

- No studies on actual outcomes on clinical conditions

Study	n	Result
Sorensen et al. (2004) RCT (6 months)	177 (intervention) 223 (control)	Physician-reported percentage of patients experiencing an ADE decreased in intervention group (37% vs. 49%), no change in the control group.



HOSPITAL ADMISSIONS/GP VISITS

Study	n	Result
Roughead et al. 2009 Retrospective cohort	273 (exposed) 5 444(control)	45% reduction in rate of hospitalization for heart failure at any time (HR 0.55)
Roughead et al. 2011 Retrospective cohort	816 (exposed) 16 320 (control)	79% reduction in likelihood of hospitalization for bleeding between 2 and 6 months
Sorensen et al. 2004 RCT (6 months)	177 (intervention) 223 (control)	No difference in use of hospital services, number of GP visits
Stafford et al. 2011 Analysis of HMR documentation	661	Avoided health care use per patient/year: 0.065 hospital days 0.63 GP visits, 0.16 specialist visits
Urbis Keys Young 2005 Interview	57	More patients reported having events before than after HMR: hospital admission (4 vs. 0); hospital stay (3 vs. 0); ED visit (3 vs 0); GP visit (5 vs. 2); specialist visit (3 vs. 0)

ECONOMICAL OUTCOMES

Study	n	Result
Krass and Smith 2000 Analysis of HMR case reports	105 170	Mean medication cost saving of AUD 19/month = AUD 229/year (p<0.005) Mean medication cost saving of AUD 22/month = AUD 262/year (p<0.001)
Nissen and Tett 2002 RCT (12 months)	88 (intervention) 82 (control)	Annual costs per patient rose AUD 14.11 less compared to controls (931 vs. 942)
Sorensen et al. 2004 RCT (6 months)	177 (intervention) 223 (control)	No difference in medication costs Adjusted net cost saving AUD 54/patient for drug, hospital service and GP visit costs
Stafford et al. 2011 Analysis of HMR documentation	661 data for drug cost analysis available for 560	Avoided health care costs per patient/year: 0.065 hospital days saving AUD 65 0.63 GP visits saving AUD 21 0.16 specialist visits saving AUD 11 Savings in medical investigations AUD 12 Savings in drug costs AUD 20 Total savings (AUD 128) do not cover the cost of HMR (AUD 329)

HUMANISTIC OUTCOMES

Study	n	Result
Krass and Smith 2000 Document analysis	170	40% of actual medication changes would result in significant positive effect on patient's health.
Nissen and Tett 2002 RCT	88 (intervention) 82 (control)	No difference in Health-Related Quality of Life (SF-36, QWB)
Sorensen et al. 2004 RCT (6/8 months)	177 (intervention) 223 (control)	No difference in Health-Related Quality of Life (SF-36) HMR improved the care of participants according to 92% of physicians and 94% of pharmacists. 97% of patients reported benefiting from the service.
Urbis Keys Young 2005 Interview Questionable method	57	Mean HRQoL Utility Score improved (0,562 > 0,681), most responsive attributes anxiety/depression and pain.

REVIEWS DECREASE INAPPROPRIATE PRESCRIBING

Study	n	Result
Castelino et al. 2010 Document analysis	372	Drug Burden Index improved (207 vs 157) % of PIM users (Beers) decreased (40% => 28%)
Castelino et al. 2010 Document analysis	270	Medication Appropriateness Index (MAI) score improved (18 => 9)



MEDICATION THERAPY MANAGEMENT



PHARMACISTS RECOGNIZE DRPS

- 1.0–3.6 /encounter, 3.3–10.4 / several MTM encounters
- Most common
 - Need for additional drug therapy
 - Poor adherence
 - Too low drug dose



CLINICAL OUTCOMES

Study	n	Result
Ellis et al.2000 RCT (1 year)	208 (intervention) 229 (control)	Greater positive change in the total cholesterol and LDL in the intervention group (p<0.05)
Fox ym. 2009 Controlled study	255 (intervention) 56 (control) 1803 (control with diabetes care)	69% of MTM patients had appropriate LDL levels vs 50% of nonparticipants and 54% of enrollees with diabetes care, p<0.001 Average LDL in the MTM group was lower (83 mg/dl) compared to diabetes care patients (94 mg/dl; p<0.001)
Isetts et al. 2003	2524	The rate of therapeutic goals achieved increased from 74% to 89% of 16 406 conditions
Isetts et al. 2008 Before-after (1 year)	285 (intervention) 126 (hypertension) 128 (hyperlipidemia controls)	Percentage of intervention patients' goals of therapy achieved increased from 76% to 90% % of patients meeting goals for hypertension (71% vs. 59%, p=0.03) and cholesterol (52% vs. 30%, p=0.001) greater in the interv. group

CLINICAL OUTCOMES

Study	n	Result
Planas et al. 2009 RCT (9 months)	32 (intervention) 20 (control)	Mean systolic BP decreased 17.3 mmHg, increased 2.7 mmHg for controls Proportion of patients at goal BP increased from 16% to 48% , decreased from 20% to 7% in controls
Ramalho de Oliveira et al. 2010 Document analysis	9 068	Of 12 851 medical conditions not in goal, 55% improved. Diabetics meeting goals 17% => 43%
Strand et al. 2004 Document analysis	2 985	Of 16 132 conditions 32% improved in status
Taylor et al. 2003 RCT	33 (intervention) 36 (control)	Proportion of patients responding to hypertension, diabetes, dyslipidemia and anticoagulation therapy increased significantly , decreased in control group

MORTALITY

Study	n	Result
Welch et al. 2009 Controlled study	459 (intervention) 336 (control)	Intervention patient less likely to die (OR 0,5)

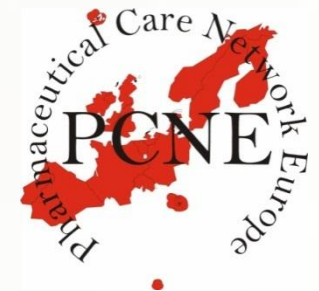


ECONOMICAL/USE OF HEALTH CARE RESOURCES

Study	n	Result
Chrischilles et al. 2004 Iowa Prospective cohort	524 (intervention) 1687 (control)	No difference in health care utilization (inpatient, outpatient, ED-visits) or charges between cases and controls.
Ellis et al. 2000, Malone 2000 Multicenter RCT	208 (intervention) 229 (control)	No difference in number of hospitalizations, prescription fills or total health care costs between groups
Fischer et al. 2002 Minnesota Before-after	231 (intervention) 444 (control)	No difference in mean number of hospital days, proportion with hospital admission or total charges
Isetts et al. 2008 Minnesota Before-after (1 year)	285 (intervention)	32% decrease in annual health care costs (11 965 \$ vs. 8 197\$), (even if drug costs increased) ROI 12:1
Smith et al. 2011 Connecticut Before-after (1 year)	88	Total annual cost saving compared to the year before USD 434 465/group. Drug costs -1123\$, other -472\$/patient

ECONOMICAL/USE OF HEALTH CARE RESOURCES

Study	n	Result
Taylor et al. 2003 Alabama RCT	33 (intervention) 36 (control)	Greater decrease in annual number of hospitalizations (-22 vs. 0; $p=0.003$) and ED visits (-12 vs. 0; $p=0.044$) compared to controls
Welch et al. 2009 Colorado Controlled study	459 (intervention) 336 (control)	Intervention patients more likely to be hospitalized (OR 1.4) No difference in ED visits



ECONOMICAL OUTCOMES/USE OF HEALTH CARE RESOURCES

- Pharmacists' estimation:

Study	n	Result
Ramalhøde Oliveira et al. 2010 Minnesota	968	Savings 2,9 million Save/visit \$6, cost of MTM \$7 => ROI 1,29
Strand et al. 2004 Minnesota	2985	Savings 1,1 milj\$ (clinic visits 585 to 503) ROI 2:1

Results are based on pharmacists' MTM documentation



ECONOMICAL OUTCOMES/MEDICATION COSTS

Study?	n?	Result?
Christensen et al. 2007? North Carolina? Before-after?	67 (intervention)? 689 (control 1)? 870 (control 2)?	Drug used decreased in CONTROL group? No difference in drug costs?
Fox et al. 2009? Florida? Controlled study?	255 (intervention)? 56 (control)? 1803 (control with diabetes care)?	No difference in drug costs 9 months before and after intervention?
Welch et al. 2009? Colorado? Controlled study?	459 (intervention)? 336 (control)? ?	Intervention patients more likely to have increased medication costs? (OR 1,4)?

HUMANISTIC OUTCOMES /HRQOL

Study	n	Result
Isetts et al. 2006 Before-after (6 months)	285 (intervention) 285 (control)	Improvement in 3 of 10 dimensions of HRQoL: physical role (p=0.001); social functioning (p=0.014); and physical component summary scale (p=0.024) in the intervention group
Malone 2000, 2001 RCT (12 months)	208 (intervention) 229 (control)	Intervention patients declined less than controls for bodily pain domain (-2.4 vs. -6.3 units; p=0.004) and for change in health status rating (-6.3 vs. 2.4 units; p<0.004), not considered clinically significant.
Ramalhõede Oliveira et al. 2010 Survey	968	94% of respondents agreed that their overall health and wellbeing had improved.
Taylor et al. 2003 RCT (12 months)	33 (intervention) 36 (control)	No difference in HRQoL

OTHER HUMANISTIC OUTCOMES

Study ²	n ²	Result ²
Christensen et al. 2007 ² Before-after ²	67 (intervention) ² 689 (control ¹) ² 870 (control ²) ²	89% of patients satisfied with the review and quality of information provided by pharmacist ²
Isetts et al. 2006 ² Before-after ² (6 months) ²	285 (intervention) ² 285 (control) ² ²	No difference in perception of care between groups ²
Lewis et al. 2008 ² Prospective (3 months) ²	67 ² ² ²	Patient knowledge better at final evaluation compared to initial assessment (p<0.001) ² 59% of patients indicated improved health ²
Planas ym. 2009 ² RCT (9 months) ²	32 (intervention) ² 20 (control) ²	No difference in adherence ²
Taylor et al. 2003 ² RCT (12 months) ²	33 (intervention) ² 36 (control) ² ²	Medication compliance scores improved in intervention, not in control group. ² Medication knowledge scores improved 36%, ² decreased 15% in control group (p<0.0001) ²

REVIEWS DECREASE IN APPROPRIATE PRESCRIBING

Study	n	Results
Chrischilles et al. 2004 Prospective cohort study with a control group 9-month follow-up	524 (intervention) 1687 (control)	MAI score improved from 9.4 to 8.3, $p < 0.001$ Proportion of recipients aged ≥ 65 years or using PIMs decreased from 43% to 32%, $p < 0.05$
Taylor et al. 2003 RCT (12 months)	33 (intervention) 36 (control)	MAI index improved in all 10 domains, decreased in 5 domains for controls.

HMR IN CONCLUSION

- No change in HRQoL
- Modest decrease in costs – do not cover the costs of providing HMR
- Decrease inappropriate prescribing
- HMR may reduce hospital admissions for specific patient groups (warfarin users, heart failure patients)



MTM IN CONCLUSION

- MTM may improve patients' knowledge
- May have modest beneficial effect on HRQoL
- Conflicting results regarding use of other health care resources (hospitalizations, ED-visits)
- Beneficial effect on overall costs, even if drug costs may increase
- Good clinical outcomes



THANK YOUUUUU! 😊

