PATIENT-CENTRED PRESCRIPTION MODEL TO IMPROVE EFFECTIVE PRESCRIBING AND MEDICATION ADHERENCE IN PATIENTS WITH MULTIMORBIDITY

Integrated Care Matters Series 3: Appropriate Polypharmacy & Adherence

Javier González Bueno. BCPS.
Pharmacy Department. Consorci Hospitalari de Vic (Barcelona).
22\textsuperscript{nd} November 2018
Where do we come from?

Adherence to long-term therapies: evidence for action.

Lack of adherence:
- Poor disease control
- Reduced survival and quality of life
- Increased healthcare expenditure

Multimorbidity:
- Frailty
- Increased disability and reduced survival
- Increased healthcare expenditure

Interventions aimed at improving medication adherence in patients with multimorbidity.

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Where do we come from?

PATIENT COMPLIANCE WITH ANTIHYPERTENSIVE REGIMENS
DAVID L. SACKETT, M.D., M.Sc. Epid.,

Figure 1. Compliance (by pill count) of hypertensive men in their 6th month of treatment.

Survey of medication adherence in Spain

1978  2016

<< If you want different results, do not do the same things >>
A. Einstein

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NEW APPROACHES
to improve medication adherence in patients with multimorbidity

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A new approach for improving medication adherence in patients with multimorbidity
A new approach for improving medication adherence in patients with multimorbidity

Tool for adherence assessment

Intervention model
Tools for medication adherence assessment

Toward appropriate criteria in medication adherence assessment in older persons: Position Paper

Anna Giardini¹ · Maria Teresa Martin² · Caitriona Cahill³,⁴ · Elaine Lebne⁵ · Enrica Menditto⁶ · Maria Strano⁷ · Sergio Pecorelli⁸,⁹ · Alessandro Monaco⁸ · Alessandra Marengoni¹⁰,¹¹

Pharmacy records
Self-report questionnaires
Tools for medication adherence assessment

Reporting of Patient-Reported Outcomes in Randomized Trials
The CONSORT PRO Extension
JAMA. 2013;309(8):814-822

Patient-Reported Outcome
An outcome reported directly by patients themselves and not interpreted by an observer; PROs may include patient assessments of health status, quality of life, satisfaction with care or symptoms, or patient-reported adherence to medication.

Self-report questionnaires

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Selection of tools for reconciliation, compliance and appropriateness of treatment in patients with multiple chronic conditions

Development and Evaluation of the Adherence to Refills and Medications Scale (ARMS) among Low-Literacy Patients with Chronic Disease

Sunil Kripalani, MD, MSc, 1 Jessica Risser, MD, MPH, 2 Margaret E. Gatti, MPH, 3 Terry A. Jacobson, MD 4
How often do you forget to take your medicine?
How often do you decide not to take your medicine?
How often do you skip a dose of your medicine before you go to the doctor?
How often do you miss taking your medicine when you feel better?
How often do you miss taking your medicine when you feel sick?
How often do you miss taking your medicine when you are careless?
How often do you change the dose of your medicines to suit your needs (like when you take more or less pill than you’re supposed to)?
How often do you forget to take your medicine when you are supposed to take it more than once a day?

Adherence with taking medications

None (1)
Some (2)
Most (3)
All (4)

How often do you forget to get prescriptions filled?
How often do you run out of medicine?
How often do you put off refilling your medicines because they cost too much money?
How often do you plan ahead and refill your medicines before they run out?

Adherence with the refilling of prescriptions

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ARMS questionnaire: multidimensional assessment of adherence

**Adherence with taking medications**

- How often do you forget to take your medicine?
- How often do you decide not to take your medicine?
- How often do you skip a dose of your medicine before you go to the doctor?
- How often do you miss taking your medicine when you feel better?
- How often do you miss taking your medicine when you feel sick?
- How often do you miss taking your medicine when you are careless?
- How often do you change the dose of your medicines to suit your needs (like when you take more or less pill than you’re supposed to)?
- How often do you forget to take your medicine when you are supposed to take it more than once a day?

**Adherence with the refilling of prescriptions**

- How often do you forget to get prescriptions filled?
- How often do you run out of medicine?
- How often do you put off refilling your medicines because they cost too much money?
- How often do you plan ahead and refill your medicines before they run out?
A new approach for improving medication adherence in patients with multimorbidity

Tool for adherence assessment

Intervention model

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Medication adherence

Patient-centered priorities for improving medication management and adherence


Effective prescribing

Adherence

Shared decision-making & patient feedback

- Process resulting in decisions made collaboratively by providers and patients, informed by the best evidence available, and weighted according to the specific characteristics and values of the patient. The goal of shared decision-making in medication management is to attain concordance, or equal buy-in, between provider and patient in regard to treatment goals and plan.
- Ongoing decision-making is facilitated by the patient’s ability to communicate with the provider as unanticipated barriers or new questions about their treatment regimen arise. Feedback is followed by an efficient process to modify the treatment plan if needed.

Effective prescribing

- Process by which a provider selects the best medication regimen for accomplishing clinical and patient-centered goals after weighing shared decision making information. Effective prescribing also results in patient understanding of how, when, and why the medication is to be taken.

Medication taking behavior

- Healthcare system processes and designs that help patients with their medication taking behavior at home, including strategies such as reminders and automated refills. This medicine-taking behavior is what has traditionally been viewed as “adherence.”
A patient-centered prescription model assessing the appropriateness of chronic drug therapy in older patients at the end of life


**OBJETIVO:** SSDC compartido

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Overview of systematic reviews

- Strategies to reduce medication regimen complexity through simplifying dosing schedules and/or deprescribing.

- Delivery personalized dosage systems

Delphi methodology

- Strategies to enhance communication between patients and healthcare professionals.

- Counselling and educational interventions for patients and/or caregivers regarding their clinical condition, relevance of treatment and medication adherence.
Patient-Centred Prescription model to improve effective prescribing and medication adherence in patients with multimorbidity

1) Patient-Centered assessment
- Determination of care goal (Survival, improving or maintaining function or symptomatic control).
- Multidimensional assessment of adherence with the ARMS scale.
(Identifies non-adherence barriers which allow the individualization of subsequent interventions)

2) Diagnosis-Centered assessment
- Deprescribing strategies to simplify regimen complexity.

3) Medication-Centered assessment
- Simplify dosing regimens
- Identify and replace high risk medications.

4) Therapeutic Plan
Individualized therapeutic plan is agreed with the patient and/or main caregiver.
Includes:
- Motivational interviewing and counseling
- Use of Mobile ICT*
- Use of Personalized Dosage Systems prepared by community pharmacies*

* Depending on the patient-centered assessment

PCP Model
Four steps based on a shared decision-making process including patient, physician and clinical pharmacist.

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PCP Model

A case report

Male, 84 years

Patient with frailty and multimorbidity

Hospital Admission
He was admitted in an intermediate care centre after supracondylar amputation of the lower left extremity.

Manuel

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### PCP Model

#### A case report

<table>
<thead>
<tr>
<th>Conditions at baseline</th>
<th>Drug therapy at baseline</th>
</tr>
</thead>
</table>
| **Type 2 Diabetes Mellitus** | - Insulin glargin 18 UI/24h  
- Insulin glulisine /8h  
- Repaglinide 0.5mg/8h |
| **Coronary Heart Disease** | - Aspirin 100mg/24h  
- Clopidogrel 75mg/24h  
- Isosorbide mononitrate 40mg/8h  
- Ranolazine 750mg/12h  
- Atorvastatin 40mg/24h  
- Furosemide 40mg/24h |
| **Peptic Ulcer** | - Pantoprazol 40mg c/24h |
| **Overactive bladder** | - Long-acting tolterodine 4mg/24h |
| **Peripheral Arterial Disease** | - Acetaminophen 1g/6h  
- Oxycodone 10mg-0-20mg |
| **Glaucoma** | - Latanoprost 0,005% 1 drop upon awakening |
| **Anxiety-depressive disorder** | - Lorazepam 1mg/12h |

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PCP Model: a case report

Patient centered assessment

Diagnosis centered assessment

Drug centered assessment

Treatment plan

**Functional**

*Instrumental activities:* Partially preserved.

*Activities of daily living:* Barthel index 60/100

**Mental**

No cognitive impairment (Pfeiffer 1).

**Social**

Social vulnerability

<table>
<thead>
<tr>
<th>Geriatric syndromes</th>
<th>Falls</th>
<th>Pressure ulcers</th>
<th>Polypharmacy</th>
<th>Dysphagia</th>
<th>Constipation</th>
<th>Malnutrition</th>
<th>Pain</th>
<th>Dyspnoea</th>
<th>Insomnia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

Frailty index (FRÀGIL-VIG): 0.36 (moderate frailty)
## PCP Model: a case report

### Adherence assessment. ARMS questionnaire

<table>
<thead>
<tr>
<th>Adherence with TAKING medications</th>
<th>Answers</th>
<th>Complexity</th>
<th>Adverse events</th>
<th>Inadequate knowledge and/or beliefs</th>
<th>Socioeconomic aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you forget to take your medicine?</td>
<td>Some</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you decide not to take your medicine?</td>
<td>Most (tolterodine)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you skip a dose of your medicine before you go to the doctor?</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you miss taking your medicine when you feel better?</td>
<td>Most (acetaminophen)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you miss taking your medicine when you feel sick?</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you miss taking your medicine when you are careless?</td>
<td>Some</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you change the dose of your medicines to suit your needs (like when you take more or less pill than you’re supposed to)?</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you forget to take your medicine when you are supposed to take it more than once a day?</td>
<td>Some</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Potential barriers for non-adherence

<table>
<thead>
<tr>
<th>Adherence assessement. ARMS questionnaire</th>
<th>Complexity</th>
<th>Adverse events</th>
<th>Inadequate knowledge and/or beliefs</th>
<th>Socioeconomic aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence with the REFILLING of prescriptions</td>
<td>Answers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you forget to get prescriptions filled?</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you run out of medicine?</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you put off refilling your medicines because they cost too much money?</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you plan ahead and refill your medicines before they run out?</td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PCP Model: a case report

Patient-centered assessment

- Maintaining function
- Ease the management of medication regimen complexity
- Safety of pharmacotherapy
- Education

Diagnosis centered assessment

Drug centered assessment

Treatment plan

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### PCP Model: a case report. DIAGNOSIS centred assessment.

<table>
<thead>
<tr>
<th>Baseline conditions</th>
<th>Drug therapy at baseline</th>
<th>DIAGNOSIS centered assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type 2 Diabetes Mellitus</strong></td>
<td>Insulin glargin 18 UI/24h</td>
<td>• <strong>STOP</strong> Repaglinide: Hb\textsubscript{A1c} 7.2%</td>
</tr>
<tr>
<td></td>
<td>Insulin glulisine /8h</td>
<td>• Ambulatory blood glucose monitoring</td>
</tr>
<tr>
<td></td>
<td>Repaglinide 0.5mg/8h</td>
<td>• Insulin therapy optimization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coronary Heart Disease</strong></td>
<td>Aspirin 100mg/24h</td>
<td>• <strong>STOP</strong> Ranolazine: Scarce efficacy</td>
</tr>
<tr>
<td></td>
<td>Clopidogrel 75mg/24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isosorbide mononitrate 40mg/8h</td>
<td>• <strong>STOP</strong> Clopidogrel: &gt;12 months on therapy</td>
</tr>
<tr>
<td></td>
<td>Ranolazine 750mg/12h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Atorvastatin 40mg/24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Furosemide 40mg/24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Peptic Ulcer</strong></td>
<td>Pantoprazol 40mg c/24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overactive bladder</strong></td>
<td>Long-acting tolterodine 4mg/24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Peripheral Arterial Disease</strong></td>
<td>Acetaminophen 1g/6h</td>
<td>• <strong>START</strong> Gabapentin 300 mg/12h: Uncontrolled neuropathic pain</td>
</tr>
<tr>
<td></td>
<td>Oxycodone 10mg-0-20mg</td>
<td>• <strong>CHANGE</strong> Acetaminophen 1g/8h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>REDUCTION</strong> Oxicodone 10 mg c/12h</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Glaucoma</strong></td>
<td>Latanoprost 0.005% 1 drop upon awakening</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anxiety-depressive disorder</strong></td>
<td>Lorazepam 1mg/12h</td>
<td>• <strong>START</strong> Sertraline 50 mg c/24h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>CHANGE</strong> Lorazepam 1 mg “if needed”</td>
</tr>
</tbody>
</table>

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Development and Validation of the Medication Regimen Complexity Index

Johnson George, Yee-Teng Phun, Michael J Bailey, David CM Kong, and Kay Stewart

*Ann Pharmacother* 2004;38:1369-76.

### Table 1: Alignment of EHR data to MRCI components

<table>
<thead>
<tr>
<th>MRCI component A: form/route</th>
<th>MRCI component B: dosing frequency</th>
<th>MRCI component C: special instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected form/route combinations from original MRCI developers</td>
<td>Selected dosing frequency combinations from original MRCI developers</td>
<td>Selected special directions from original MRCI developers</td>
</tr>
<tr>
<td><strong>Dosage form</strong></td>
<td><strong>Route</strong></td>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td>Tablet</td>
<td>Oral</td>
<td>1.0</td>
</tr>
<tr>
<td>Spray</td>
<td>Topical</td>
<td>1.0</td>
</tr>
<tr>
<td>Gel</td>
<td>Topical</td>
<td>2.0</td>
</tr>
<tr>
<td>Spray</td>
<td>Nasal</td>
<td>2.0</td>
</tr>
<tr>
<td>Drop</td>
<td>Oral</td>
<td>2.0</td>
</tr>
<tr>
<td>Drop</td>
<td>Ophthalmic</td>
<td>3.0</td>
</tr>
<tr>
<td>Inhalator</td>
<td>Inhalation</td>
<td>3.0</td>
</tr>
<tr>
<td>Ampoule pen</td>
<td>Subcutaneous</td>
<td>3.0</td>
</tr>
<tr>
<td>Ampoule</td>
<td>Subcutaneous</td>
<td>4.0</td>
</tr>
<tr>
<td>Additional form/route weights established by committee for this EHR application</td>
<td>Examples of additional ‘&amp; as needed’ frequency weights established for this EHR application</td>
<td>Additional special instructions established by committee for this EHR application</td>
</tr>
<tr>
<td>Liquid</td>
<td>Intravenous</td>
<td>3.0</td>
</tr>
<tr>
<td>Implant</td>
<td>Subcutaneous</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Clinical Outcomes Associated with Medication Regimen Complexity in Older People: A Systematic Review

DOE: 10.1111/jgs.14682
JAGS 2016

Cross-cultural Adaptation and Validation of the Medication Regimen Complexity Index Adapted to Spanish

Medication Regimen Complexity and Polypharmacy as Factors Associated With All-Cause Mortality in Older People: A Population-Based Cohort Study

MRCI predicts in geriatric population...
### PCP Model: a case report. DRUG centered assessment.

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<td></td>
</tr>
<tr>
<td></td>
<td>Insulin glulisine 8h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repaglinide 0.5mg/8h</td>
<td></td>
</tr>
<tr>
<td><strong>Coronary Heart Disease</strong></td>
<td>Aspirin 100mg/24h</td>
<td>• <strong>SUBSTITUTION</strong> Long acting isosorbide mononitrate 50mg/12h</td>
</tr>
<tr>
<td></td>
<td>Clopidogrel 75mg/24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isosorbide mononitrate 40mg/8h</td>
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<td>Furosemide 40mg/24h</td>
<td></td>
</tr>
<tr>
<td><strong>Peptic Ulcer</strong></td>
<td>Pantoprazol 40mg c/24h</td>
<td>• <strong>SUBSTITUTION</strong> Omeprazol 20 mg/24h</td>
</tr>
<tr>
<td><strong>Overactive bladder</strong></td>
<td>Long-acting tolterodine 4mg/24h</td>
<td>• <strong>STOP</strong> Tolterodine: Adverse events: dizziness in a patient at risk of falling</td>
</tr>
<tr>
<td><strong>Peripheral Arterial Disease</strong></td>
<td>Acetaminophen 1g/6h</td>
<td></td>
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<td></td>
<td>Oxycodone 10mg-0-20mg</td>
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</tr>
<tr>
<td><strong>Glaucoma</strong></td>
<td>Latanoprost 0,005% 1 drop upon awakening</td>
<td>• <strong>CHANGE</strong> Latanoprost 0,005% 1 drop/24h at bedtime</td>
</tr>
<tr>
<td><strong>Anxiety-depressive disorder</strong></td>
<td>Lorazepam 1mg/12h</td>
<td></td>
</tr>
</tbody>
</table>
PCP Model: a case report.

- Reach consensus with patient (and/or caregivers) about changes and recommendations
- Provide education and counselling about pharmacotherapy
- Register changes on medical records
- Referral to community pharmacy (baseline MRCI 49 → 38)

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PDS Prescription Algorithm

- Bridging the gap between Hospital & Community Pharmacy -

Adherence assessment

ARMS questionnaire

Prognostic factors analysis

High Medication Complexity (MRCI ≥ 35) and/or

Severe dependency (Barthel ≤ 40) and/or

Cognitive impairment (MMSE <25)

Caregiver

PDS Prescription

Refilling by Community Pharmacy

Revisió farmacoterapèutica geriatria/farmacèutica:
- Objetiu assistencial del pacient: Manteniment de Funcionalitat.
- Crònica: No etiquetat. Al nostre entendre compleix criteris de PCC.
- Intervencions acordades:
  - ADHERÈNCIA: Pacient amb farmacoteràpia d'èlevada complexitat (MRCI>35), deterior cognit i dependència funcional severa. Recomanem dispensació de medicació per oficina de farmàcia mitjançant SPD.
A new approach is needed to improve adherence in patients with multimorbidity that includes:

- Appropriate tools for a multidimensional assessment of medication adherence that allow tailoring the interventions according to the barriers of non-adherence previously identified.

- Interdisciplinary approaches, sensitive to values and preferences of every patient and focused on effective prescribing.