

Individualized Medication Review in Older People: Differences Due To Place of Residence Being Their Own Home or A Nursing Home

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Abstract

Background: Ageing is associated with complex and dynamic changes leading to multimorbidity and, therefore, polypharmacy. A periodic medication review in frail older people lead to optimize medication use. The aims of the study were to identify inappropriate prescription and to assess the results of a medication review in older people, according to their place of residence.

Methods: This was a study with paired pre- and post-medication review data based on person-centered prescription, with a follow-up assessment at three months. We recruited patients who lived in the community, either in their own home or in a nursing home. We select patients of 65 years or more with multimorbidity whom his General Practitioner identified difficulties with the prescription management and the need of a medication review. Finally, a medication review was carried out through the application of the Patient-Centered Prescription model. Data collected were: age, sex, place of residence, morbidities, functional and cognitive status, frailty index, number of medications, therapeutical complexity, anticholinergic and/or sedative burden and monthly medication expenditure.

The Chi-square test or Fisher's exact test were used to evaluate the relationship between qualitative variables and the patients' place of residence. Student's t-test was used to analyze the relationship between quantitative variables and the patients' place of residence.

Results: 428 patients. 90% of people presented at least one inappropriate prescription in both settings. In nursing homes, a higher number of implemented optimization proposals was detected (81.6% versus 65.7% ($p < 0.001$)). Post-medication review, nursing-home patients had a greater decrease in their mean number of medications, polypharmacy prevalence, therapeutic complexity and in monthly medication expenditure ($p < 0.001$).

Conclusions: Patient-Centered Prescription model detected a high number of inappropriate prescriptions in both settings. However, once medication was reviewed and optimization proposals implemented, nursing-home patients presented

Background

In recent decades, the increasingly ageing population has brought with it a high prevalence of chronic diseases. As chronic diseases are associated with functional impairment and disability, a large number of older adults require daily assistance and are often placed in nursing homes [1].

When two or more chronic conditions coexist, it is known as multimorbidity. Elderly patients with multimorbidity often present frailty criteria, which is a common clinical syndrome that carries an increased risk of poor health outcomes [2]. Consequently, they usually require greater medical care and, as a result, polypharmacy (the concurrent use of five or more medications [3]) is common among them.

Multimorbidity and polypharmacy are associated with an increased use of inappropriate prescriptions (IP), and, consequently, with a higher risk of suffering adverse drug reactions (ADR) [3].

Given the marked vulnerability of frail patients, there is concern and evidence they may not benefit from intensive management of chronic conditions in the same way as study populations do. Therefore, it becomes essential to ensure that the benefit of treatment outweighs the harm it may do to very vulnerable patients, in whom the risk of side effects may be particularly high [3].

Therefore, it becomes necessary to establish a periodic Medication Review (MR) for frail elderly patients, which is a structured evaluation of patient's medicines with the aim of optimizing medication use and improving health outcomes. This entails detecting medication-related problems and recommending interventions [4].

Study objectives:

- To study the frailty characteristics of the analyzed population
- To identify inappropriate prescriptions in older patients and to assess the results of a medication review based on a patient-centered prescription model, in terms of polypharmacy, therapeutical complexity and anticholinergic and sedative burden and, monthly medication expenditure.
- To study the implementation of proposals to optimize medications, differences according to their place of residence.

Methods

Design

It was a study with paired pre- and post-MR data, with a follow-up assessment at three months. We recruited patients who lived in the community, either in their own home or in nursing home, from a semi-urban area in Catalonia (Spain).

Participants

Patients were consecutively considered for inclusion if they met the following eligibility criteria: older people (≥ 65 years) with multimorbidity (two or more morbidities) to whom his General Practitioner identified difficulties with the prescription management and the need of a MR from a consultant team (make up from a geriatrician and a clinical pharmacist). Patients in their probable last hours or days of life were excluded.

From June 2019 to October 2020, potential participants were enrolled in the study of informed consent was provided by them, or their main caregiver in case of them being unable to provide consent, as approved by ethics committee. To identify the cohort, it was called Community Elderly Patients cohort (CEP cohort).

Data Collection

- Personal data: Age, gender, and place of residence.
- Functional data: Dependence/independence for medication management. Dependence/independence for basic activities of daily living (Barthel Index (BI) [5]).
- Medical data: the morbidities (from the expanded diagnostic clusters within the Johns Hopkins University ACG system [6]) and age-adjusted Charlson Index [7]. Dementia diagnosis, as stated in the medical records, and the degree of deterioration was established in accordance with GDS (Global Deterioration Scale) [8]; Blood pressure levels available in the last year. Geriatric syndromes.
- Analytical data: Full blood count, ionogram, urea and electrolytes. Also, glycosylated haemoglobin (HbA1c) available in the last year.
- Pharmacological data: total number of chronic medications taken by each patient (for at least six months) at baseline. Polypharmacy (≥ 5 medications) or excessive polypharmacy (≥ 10 medications) [9] at baseline.
- Frailty: measured by the Frail-VIG index (FI) [10]. FI was categorized as: i) $FI < 0.20$: no frailty; ii) $FI 0.20-0.35$: mild frailty; iii) $FI 0.36-0.50$: moderate frailty; and iv) $FI > 0.50$: severe frailty.
- Identification of end-of-life patients (EOL patients) (NECPAL CCOMS-ICO© [11]): these were patients considered to be in the final months or year of their life. The criteria used to identify them were: i) identification as such by their primary care physician, ii) advanced illness criteria [11] or iii) frail-VIG index > 0.50 .
- Individual main therapeutic goal: According to their baseline situation, a therapeutic aim was established: i) survival, in patients with a fit baseline situation; ii) maintaining functionality, in patients with an intermediate baseline situation; and iii) symptomatic control in the most vulnerable patients (patients in EOL situation should be included).
- Therapeutical complexity (measured by MRCI (Medication Regimen Complexity Index)) [12]. It was categorized as: i) $0-19.99$: low complexity; ii) $20-39.99$: moderate complexity; and iii) ≥ 40 : high complexity.
- Anticholinergic and sedative burden (DBI (Drug Burden Index) [13]). It was categorized as: i) $0-0.99$: low DBI; ii) $1-1.99$: moderate DBI; and iii) ≥ 2 : high DBI.
- Monthly medication expenditure: overall expenditure for public health care insurance was taken into consideration (without patient contribution).

Medication review:

Each patient's treatment was analyzed by applying the Patient-Centered-Prescription (PCP) model [14]. This is a systematic 4-stage process, carried out by a multi-disciplinary team formed by patient's General Practitioner and the nurse with a consultant team (a geriatrician and a clinical pharmacist). The model centers therapeutic decisions on the patient's global assessment (comprehensive geriatric assessment (CGA), the calculation of the FI) and the resulting individual main therapeutic goal. These decisions were

taken in conjunction with the patient or with the main caregiver in cases of incapacity according to the baseline situation (Fig. 1).

Criteria used to determine IP: the following recommendations were used to identify IP in the most prevalent chronic conditions [14]:

- Patients at the end of life (according to NECPAL CCOMS-ICO©[11]): the indication of medications aimed at prolonging survival was reassessed. Medications for primary prevention were evaluated for potential discontinuation and those for secondary prevention were individualized in accordance with patient goals [15].
- Type 2 Diabetes Mellitus(T2DM): to optimize hypoglycemic therapy two important proposals were considered: i) **Therapeutic intensity criteria:** taking *American Diabetes Association(ADA)* guidelines as our basis [16, 17], we established a maximum HbA1c target for each patient profile (Table 1). ii) **Qualitative criteria regarding drug prescription to consider inappropriate prescription:** The prescription of sulphonylureas (SU) was considered inappropriate due to their high risk of hypoglycemia [17, 18]. Patients with doses of metformin not adjusted for renal failure [17]. And the use of insulins associated with the highest risk of hypoglycemic episodes (short-acting insulins, mixtures and postprandial use) was considered inappropriate, except in justified cases [17].

Table 1. HbA1c target according to each patient profile

Target	Patients		
	Healthy Elderly*	Frail Elderly [†]	Elderly in a probable EOL situation [‡]
Qualitative Glycaemic	Similar to those for diabetic young adults	Avoid symptomatic hypoglycaemic and or hyperglycaemic episodes	Quality of life preservation [§]
Quantitative Hba1c[¶]	≤ 7- 7.5%	≤ 8.0%	Avoid reliance on A1C ^{**}
Therapeutic Goal^{††}	Prolong survival	Maintain functionality	Symptomatic treatment

*Good functional and cognitive status, and long-life expectancy

† With functional disability and dementia or moderately limited life expectancy.

‡ End-of-life (EOL) situation, understood as a period of 1-2 years.

¶ HbA1c, Glycosylated Haemoglobin

** Glucose control decisions should be based on avoiding hypoglycaemia and symptomatic hyperglycaemia

^{††} Based on the Patient Centred Prescription (PCP) Model.

- Hypertension and cardiovascular therapy: it is recommended less intensive control in people with multimorbidity, especially in cases of dementia or limited life expectancy [19]. We proposed measures for pharmacological adjustment in end-of-life patients whose mean systolic blood pressure (SBP) was under 130 mmHg in the last year [15].
- Dyslipidemia: statins are not recommended in end-of-life patients [15], regardless of the indication, especially for primary prevention. In addition, withdrawal of lipid-lowering medication was suggested for people who had total cholesterol (TC) lower than 150mg/dl, given that it is a malnutrition marker [20].
- Mental health and Dementia: the recommendations of the European Association of Palliative Care were followed. They define a different therapeutic objective in patients with dementia according to the evolutionary stage of their pathology [21]. Regarding chronic antipsychotic treatment, the progressive decrease in doses was proposed in people who had not had behavioral disorders in last 3–6 months [15, 22].
- Pain: in accordance with Beers/STOPP criteria, the following proposals were made [18, 23–25]: i) Tricyclic antidepressants to treat neuropathic pain were avoided, due to their anticholinergic effects. ii) Non-steroidal anti-inflammatory drugs (NSAID) were recommended at the lowest dose and for the shortest time possible. iii) Weak opioids such as tramadol and codeine were recommended only at low doses. iv) Major opiates, such as morphine or oxycodone, should always be combined with a laxative. v) Meperidine is not recommended because of its anticholinergic potential
- Osteoporosis: it is recommended to withdraw treatment with calcium supplements (except in cases where symptomatic hypocalcemia is being treated), vitamin D or antiresorptive drugs [15] in patients identified as at the end-of-life.

Sample size: To calculate sample size, IP in the overall elderly frail population was estimated at 43% [26]. With a 95% confidence level and 5% accuracy, it was estimated that 410 people should be included.

Data analysis: Statistical analysis was performed with IBM SPSS Statistics v27.0 statistical software. The results for categorical variables were expressed as absolute and relative frequencies and results for continuous variables were presented as means and standard deviations (SD). The Chi-square test or Fisher's exact test (in 2x2 tables where the expected frequencies were lower than 5) were used to evaluate the relationship between qualitative variables and the patients' place of residence. Student's t-test was used to analyze the relationship between quantitative variables and the patients' place of residence. Statistical significance was declared when the value of p was less than 0.05.

Results

428 patients were recruited (66.6% women. Mean age 85.5 years (SD 7.67)). 218 patients (50.9%) lived in nursing homes (table 2).

Table 2 – Baseline data

Baseline data		Home N=210 (49.1%)	Nursing home N=218 (50.9%)	P
Age (years), mean (SD*)		85.74 (6.74)	85.31 (8.48)	>0.05
Gender	Men	83 (39.5%)	60 (27.5%)	0.09
	Women	127 (60.5%)	158 (72.5%)	
Medication management		57 (27.1%)	1 (0.5%)	<0.001
Barthel Index (BI), mean (SD)		65.21 (28.08)	35.21 (28.79)	<0.001
Functional status, BI [†] degrees	Independence: BI ≥ 95	46 (21.9%)	5 (2.3%)	<0.001
	Mild dependence: BI 90-65	75 (35.7%)	45 (20.6%)	
	Mod. dependence: BI 60-25	70 (33.3%)	59 (27.1%)	
	Severe dependence: BI ≤ 20	19 (9.0%)	109 (50.0%)	
Cognitive status	No dementia	75 (35.7%)	37 (17.0%)	<0.001
	Mild dementia (GDS 4)	29 (13.9%)	33 (15.1%)	
	Moderate dementia (from GDS 5 to GDS 6B)	66 (31.4%)	46 (21.1%)	
	Advanced dementia (from GDS 6C)	40 (19.0%)	102 (46.8%)	
Emotional status	Euthymic	102 (48.6%)	82 (37.6%)	0.02
	Depressive syndrome	93 (44.3%)	105 (48.2%)	>0.05
	Anxiety syndrome	19 (9.0%)	16 (7.3%)	>0.05
	Other psychiatric disorders	5 (2.4%)	29 (13.3%)	<0.001
Frailty Index (FI): VIG-Frail index, mean (SD)		0.34 (0.13)	0.43 (0.11)	<0.001
VIG-Frailty index degrees	No frailty (0-0.19)	30 (14.3%)	2 (0.9%)	<0.001

	Mild frailty (0.20-0.35)	69 (32.9%)	44 (20.2%)	
	Moderate frailty (0.36-0.50)	86 (41.1%)	115 (52.8%)	
	Severe frailty (0.51-1.0)	25 (11.9%)	115 (52.8%)	
End- of-life patients	No	168 (80.0%)	105 (48.2%)	<0.001
	Yes	42 (20.0%)	113 (51.8%)	
	Number of geriatric syndromes, mean (SD)	2.78 (1.50)	3.07 (1.53)	0.047
Type of geriatric syndrome	Falls	76 (36.2%)	68 (31.2%)	>0.05
	Dysphagia	36 (17.1%)	48 (22.0%)	>0.05
	Pain	47 (22.4%)	52 (23.9%)	>0.05
	Pressure ulcers	10 (4.8%)	10 (4.6%)	>0.05
	Constipation	67 (31.9%)	68 (31.2%)	>0.05
	Insomnia	106 (50.5%)	123 (56.4%)	>0.05
	Malnutrition	16 (7.6%)	25 (11.5%)	>0.05
	Incontinence	79 (37.6%)	153 (70.2%)	<0.001
	Previous delirium	32 (23.4%)	23 (44.2%)	0.007
Morbidities	Number of morbidities, mean (SD)	5.51 (2.21)	4.32 (1.94)	<0.001
	Charlson Index, mean (SD)	3.37 (2.38)	3.15 (2.17)	0.33
Main therapeutic aim	Survival	31 (14.8%)	10 (4.6%)	<0.001
	Functional	128 (61.0%)	95 (43.6%)	
	Symptomatic	51 (24.3%)	113 (51.8%)	
Mortality		41	35 (16.1%)	0.348

* SD: Standard Deviation

† BI: Barthel Index

Nursing homes showed a higher proportion of women. A higher prevalence of patients with functional dependence and cognitive impairment was also detected in nursing homes. Overall, the degree of frailty was also higher among institutionalized patients, and they presented an increased mean number of geriatric syndromes. EOL patients were specially represented in nursing homes (51.8% versus 20.0% at home) ($p < 0.05$).

Regarding the number of morbidities, patients who lived at home presented a higher number of morbidities ($p < 0.05$) but, regarding the Charlson index, there were no significant differences.

Concerning baseline pharmacological data, patients living at home had a higher mean number of chronic medications (8.84(SD 3.93) versus 7.45(SD 3.70)) ($p < 0.001$), presented higher excessive polypharmacy (40.0% versus 27.1% ($p = 0.04$)) and therapeutical complexity (25.9% had high complexity versus 19.7%) ($p = 0.006$). Otherwise, DBI was higher in patients living in nursing homes (20.6% had high DBI versus 11.9%) ($p < 0.009$) (Table 3).

Table 3.- Baseline pharmacological data

Baseline pharmacological data		Home N=210 (49.1%)	Nursing home N=218 (50.9%)	P
N° of med [†] .	Mean (SD*)	8.84 (3.93)	7.45 (3.70)	<0.001
Polypharmacy	No polypharmacy: 0-4 med [†]	29 (13.8%)	51 (23.4%)	0.04
	5-9 med [†]	97 (46.2%)	108 (49.5%)	
	≥ 10 med [†]	84 (40.0%)	59 (27.1%)	
MRCI	Mean	33.12 (16.83)	28.44 (15.39)	0.03
MRCI degree	0-19.99	45 (21.4%)	64 (29.4%)	0.007
	20-39.99	101 (47.6%)	111 (50.9%)	
	≥ 40	64 (30.5%)	43 (19.7%)	
DBI	Mean (SD)	1.08 (0.84)	1.26 (0.83)	0.031
DBI degree	0-0.99	107 (51.0%)	90 (41.3%)	0.009
	1-1.99	78 (37.1%)	83 (38.1%)	
	≥ 2	25 (11.9%)	45 (20.6%)	
IP [‡]	Mean (SD)	3.31 (2.42)	2.97 (2.10)	>0.05
IP [‡]	0 IP	25 (11.9%)	18 (8.3%)	0.209
	1 or more IP [‡]	185 (88.1%)	200 (91.7%)	
IP [‡]	0-1 IP [‡]	49 (23.3%)	57 (26.1%)	0.500
	2 or more IP [‡]	161 (76.7%)	161 (73.9%)	
IP [‡]	0-2 IP [‡]	81 (38.6%)	101 (46.3%)	0.105
	3 or more IP [‡]	129 (61.4%)	117 (53.7%)	

* SD: Standard Deviation

† med: medications

‡ IP: Inappropriate Prescription

Although nursing-home patients took fewer medications, there were no significant differences regarding IP according to the place of residence (88.1% of patients living at home had one or more IP, versus 91.7%

of nursing-home patients ($p = 0.209$)).

In nursing homes, at three months follow-up, a higher number of implemented optimization proposals was detected (in nursing-home patients 474, out of 581 initial proposals were implemented after three months (81.6%) versus 393 out of 598 in patients living at home (65.7%) ($p < 0.001$)). Consequently, post-MR, nursing-home patients had a greater decrease in their mean number of medications (from 7.45 (SD 3.70) to 5.66 (SD 3.58) versus from 8.84 (SD 3.94) to 7.75 (SD 3.58)) in patients living at home ($p < 0.001$)). Therapeutic complexity (MRCI) also showed a greater decline among nursing-home patients (from a mean of 28.4 (SD 15.4) to 21.7 (SD 14.4) versus from 33.1 (SD 16.8) to 28.7 (SD 14.9) in patients living at home ($p < 0.001$)). However, post-MR, DBI decreased in both settings without significant differences (table 4).

Globally, the median of the prescription cost decreased by up to 20.1% (from 57.61€ to 46.03€/month post-MR) with the application of the PCP model. However, nursing-home patients showed a larger difference between pre- and post-MR cost (from €51.81 to €36.46/month versus from 71.24€ to 60.59€/month in patients living at home) ($p < 0.001$).

Table 4 – Pharmacological data, pre- and post-MR

			Home	Nursing home	p
Medication number, mean (SD*)	Pre-MR		8.84 (3.94)	7.45 (3.70)	<0.001
	Post-MR		7.75 (3.58)	5.66 (3.58)	<0.001
	Difference		-1.20 (2.07)	-1.68 (1.84)	0.020
Polypharmacy N (%)	Pre-MR [†]	No polypharmacy	29 (13.8%)	51 (23.4%)	0.004
		5-9 medications	97 (46.2%)	108 (49.5%)	
		≥ 10 medications	84 (40.0%)	59 (27.1%)	
	Post-MR	No polypharmacy	28 (16.6%)	77 (42.1%)	< 0.001
		5-9 medications	91 (53.8%)	80 (43.7%)	
		≥ 10 medications	50 (29.6%)	26 (14.2%)	
MRCI [‡] , mean (SD)	Pre-MR		33.1 (16.8)	28.4 (15.4)	0.003
	Post-MR		28.7 (14.9)	21.7 (14.4)	<0.001
	Difference		-4.8 (8.9)	-6.9 (7.4)	0.016
MRCI degree N (%)	Pre-MR	0-19.99	45 (21.4%)	64 (29.4%)	0.021
		20-39.99	101 (48.1%)	111 (50.9%)	
		≥ 40	64 (30.5%)	43 (19.7%)	
	Post-MR	0-19.99	49 (29.3%)	96 (53.9%)	<0.001
		20-39.99	80 (47.9%)	63 (35.4%)	
		≥ 40	38 (22.8%)	19 (10.7%)	
DBI , mean (SD)	Pre-MR		1.08 (0.84)	1.26 (0.84)	0.031
	Post-MR		1.01 (0.78)	1.17 (0.86)	0.079
	Difference		-0.09 (0.35)	-0.13 (0.35)	0.359
DBI N (%)	Pre-MR	0-0.99	107 (51.0%)	90 (41.3%)	0.027
		1-1.99	78 (37.1%)	83 (38.1%)	
		≥ 2	25 (11.9%)	45 (20.6%)	
	Post-MR	0-0.99	89 (53.0%)	82 (46.1%)	0.083

	1-1.99	66 (39.3%)	69 (38.8%)	
	≥ 2	13 (7.7%)	27 (15.2%)	
Monthly medication expenditure, median (Q1;Q3)	Pre-MR	71.24 (29.6;130.5)	51.81 (25.3;99,1)	0.012
	Post-MR	60.59 (26.3;122.2)	36.46 (17.7;83,0)	<0.001
	Dif MR	-2.17 (-16.3;2,0)	-6.41 (-16.9;-1.9)	<0.001

* SD: Standard Deviation

† MR: Medication Review

‡ MRCI: Medication Regimen Complexity Index

|| DBI: Drug Burden Index

Discussion

The study describes a sample of elderly patients from a specific health region. Globally, the feminization of old age shown in this study, and its rising emphasis as age increases, is a trend described worldwide [27].

The differences detected in the baseline status in institutionalized patients compared to those living at home are similar to those described in other studies [14,28]. It is remarkable that more than half of the people living in nursing homes are identified as end-of-life, a higher proportion than that observed in other national and international studies [29,30]. The finding of a higher number of comorbidities in patients living at home is not shared with the rest of the literature [29]; it can be related to less clinical data collection among nursing-home patients than people living at home. However, this data supports the accepted concept that the biggest difference between patients living in nursing homes and those living at home is not the number of diagnoses but the fact that they all present dependence and frailty, which are the characteristics that most determine a high degree of difficulty to continue living at home [29].

In accordance with higher degree of frailty detected in the nursing-home setting, a higher proportion of people needed to prioritize a conservative therapeutic aim.

Regarding baseline pharmacological data, contrary to known evidence [26], greater polypharmacy was detected in patients living at home. This can be explained by the fact that these nursing homes had had the possibility of requesting a support work from the territorial geriatrics service in previous years, prior to consultant team (geriatrician and a clinical pharmacist) for this current research. Therefore, although

there might had been a turnover of residents during this period, these nursing homes present better figures in terms of polypharmacy than those usually documented in the bibliography.

Regarding DBI, the highest DBI detected in nursing homes does coincide with the rest of the studies [29], and can be explained by the higher prevalence of patients with some degree of cognitive impairment. Post-MR DBI shows a relevant decrease in both settings, with no statistical differences. This is likely to be related to the higher prevalence of patients with cognitive impairment in nursing homes [14,29].

Post-MR outcomes are especially remarkable, because despite nursing-home residents having a lower average of chronic medications, they presented the same proportion of IP as patients living at home. Other studies conducted in the nursing home setting have also detected a prevalence of around 90% of IP [14]. Overall, this could suggest that MR in the frailest patients is a beneficial practice, regardless of their average of chronic medications.

It is important to note that a greater number of proposals for pharmacological optimization had been implemented to nursing-home patients than to patients living at home. As a result, there was a greater decline in data related to polypharmacy and therapeutic complexity among nursing-home patients.

Overall, it is important to highlight that the PCP model leads to an increase in the prescription quality with a lower cost -as a result. Thus, the PCP model could be a value-based care, especially in nursing homes. Two main reasons could justify nursing homes as a suitable setting for promoting proper medication optimization: the higher prevalence of patients in end-of-life situation in nursing homes, which is the period of life with most evidence of medication optimization, and the close relationship between physicians, nurses, caregivers and family members that exists in nursing homes, which facilitates the progressive implementation of pharmacotherapeutic proposals and also enables a closer clinical follow-up.

Conclusions

We can conclude that up to 90% of older people with multimorbidity presented at least one IP, regardless of their place of residence. However, after an individualized medication review, nursing-home patients presented a greater decrease in polypharmacy and therapeutic complexity compared to those living at home.

List Of Abbreviations

ADA: American Diabetes Association

ADR: Adverse Drug Reactions

BI: Barthel Index

CGA: Comprehensive Geriatric Assessment

DBI: Drug Burden Index

EOL: End-Of-Life

FI: Frailty Index

GDS: Global Deterioration Scale

HbA1c: Glycosylated Haemoglobin

IP: Inappropriate Prescription

MR: Medication-Review

NSAID: Non-Steroidal Anti-Inflammatory Drugs (NSAID)

PCP: Patient-Centered-Prescription

SBP: Systolic Blood Pressure

SD: Standard Deviation

SPSS: Statistical Package for the Social Sciences

TC: Total Cholesterol

T2DM: Type 2 Diabetes Mellitus

Declarations

Ethics approval: The study was approved by two local Scientific Ethics and Clinical Research Committees: IDIAP Jordi Gol (19/206-P) and FORES (Fundació d'Osona per la Recerca Educació Sanitàries) (2019-106/PR237). Authors certify that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent to participate and consent for publication: Informed consent was obtained from all individual participants included in the study.

Conflicts of interest / Competing interest: all authors declare that they have no conflicts of interest relevant to the content of this manuscript.

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Code availability: Not applicable

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Figures

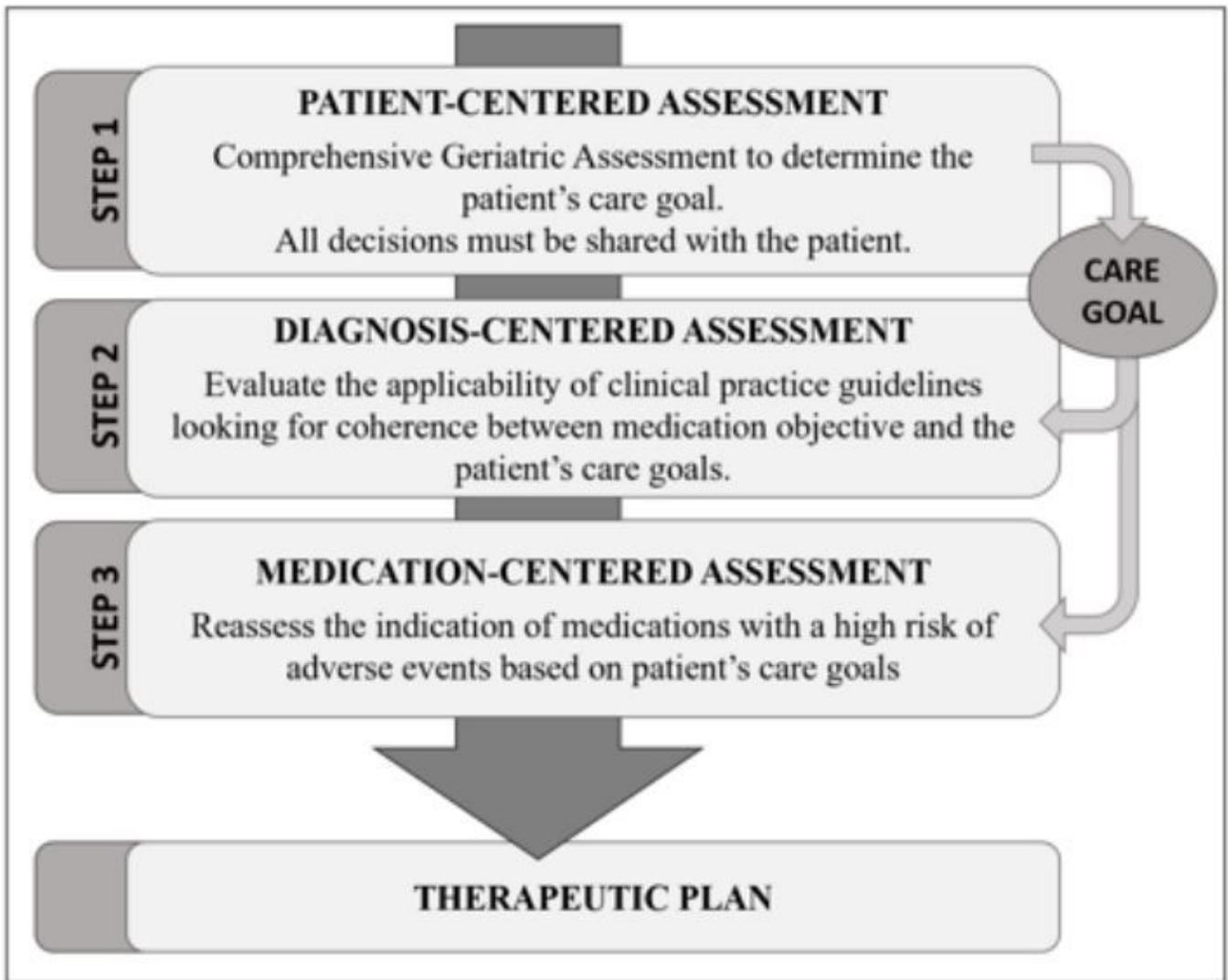


Figure 1

Patient-Centered-Prescription (PCP) model.