Diabetes Guidelines for the Frail Elderly

Intended for those with severe or very severe frailty according to the Clinical Frailty Scale. The guidelines advocate for more lenient blood glucose targets with frailty and make recommendations to avoid excessive blood glucose testing.

BLOOD GLUCOSE TARGETS, mmol/L	ACTION
Less than 7	Decrease diabetes treatment
7.0 – 9.9	May be acceptable. There is a risk for hypoglycemia with oral diabetes agents or insulin. If there is hypoglycemia, decrease treatment.
10 – 20	This range is acceptable if there are no reversible symptoms
Frequent Values Greater than 20	Increase treatment

HgbA1c TARGETS, %	ACTION
Less than 8	Decrease diabetes treatment
> 8 and < 12	Acceptable, if asymptomatic
More than 12	Increase treatment

Routine blood glucose testing is usually not necessary for those with stable BG measures that are within target range when using oral agents or stable doses of basal insulin without regular/rapid insulin.

CLINICAL PEARLS

- Consider that most oral medications decrease A1C by ≈1% when deciding whether and which medications can be stopped.
- Use NPH as basal insulin instead of long-acting insulin analogues such as glargine (Lantus™) or detemir (Levemir™), as NPH is less expensive with similar outcomes.
- Basal insulin alone (without regular or rapid insulin) may be preferable due to variations in oral intake that can lead to hypoglycemia.
- With consistent BG measures between 16 – 20mmol/L, an increase in treatment may be indicated.
- Do not stop insulin with type 1 diabetes.

Developed by the Diabetes Care Program of Nova Scotia [http://cme.medicine.dal.ca/ADS.htm] with the Palliative and Therapeutic Harmonization (PATH) Program [www.pathclinic.ca]. For rational behind guideline: see Mallery LH. J Am Med Dir Assoc. 2013 Nov;14(11):801–8.

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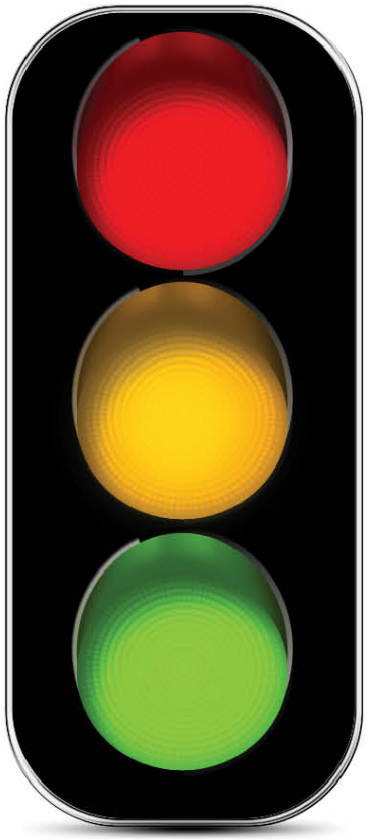
Treating Hypertension in Frailty



STOP

Taper and discontinue antihypertensives if sitting SBP is < 140 mmHg, but:

- It is not certain whether to discontinue treatment with a history of previous stroke (see full guideline)
- Before stopping, consider whether the medication is treating additional conditions such as atrial fibrillation or symptomatic heart failure

START

- Consider treatment when SBP is > 160 mmHg
- Aim for sitting SBP of 140 to 160 mmHg
  - Use seated (not supine) blood pressure to make treatment decisions
  - If there is symptomatic orthostasis or if standing SBP is < 140 mmHg, the seated SBP may need to be adjusted upwards
- In the severely frail nearing the end of life, a target SBP of 160 to 190 mmHg is reasonable
- In general, use no more than 2 medications

Intended for individuals who are severely frail, with a Clinical Frailty Scale score of 7 or higher—who require assistance performing basic ADLs, such as bathing or dressing

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Treating Hyperlipidemia in Severe and Very Severe Frailty

These recommendations consider the significant impact and decreased life expectancy of severe and very severe frailty according to the Clinical Frailty Scale[1]

CLINICAL SCENARIO	RECOMMENDATION	THE DETAILS
PRIMARY PREVENTION: no history of stroke or ischemic heart disease	Do not start or continue statins	It is unlikely that statins provide benefit in applicable outcomes.
SECONDARY PREVENTION: prior history of stroke or ischemic heart disease	Probably not necessary to start or continue statins There may be extenuating circumstances that shift the risk/benefit ratio.	With severe frailty there is: • uncertainty about whether statin trial outcomes are clinically meaningful; • uncertainty about the magnitude of benefit conferred, partly because of the decreased life expectancy in severe frailty; • increased potential for adverse events. For the frail elderly, an important outcome is non-fatal stroke leading to disability. In some statin studies, the outcome of non-fatal stroke sometimes includes mild strokes and TIAs and the number of strokes leading to disability is not reported separately. In some studies, CHD events include those with asymptomatic heart disease such as silent MIs.
Patients with Congestive Heart Failure (CHF) only	Do not start or continue statins	There is evidence that statins are ineffective in improving clinical outcomes for older adults with CHF.
Patients on Ezetimibe	Stop Ezetimibe	There is no evidence that ezetimibe reduces cardiovascular events or mortality either alone or with statins.
Patients on combination lipid lowering therapy	Use statin only	There is no evidence of added benefit in clinical outcomes for combination therapies for either primary or secondary prevention.

We suggest doses no higher than at right and possibly lower; 2/3 of the lipid-lowering effect is realized at the starting dose. Consider a trial of statin discontinuation if there is concern about myalgias or other adverse effects.

Atorvastatin 10 mg	Rosuvastatin 10mg	Fluvastatin 80mg
Simvastatin 20 mg	Pravastatin 40mg	

Developed by Dalhousie University Academic Detailing Service [http://cme.medicine.dal.ca/ADS.htm] and the Palliative and Therapeutic Harmonization (PATH) Program [www.pathclinic.ca]

1. Rockwood, 2005 CMAJ, Aug 30;173(5):489-495.

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Treating Asymptomatic Bacteriuria: All harm, No Benefit

Asymptomatic bacteriuria is common

- In many elderly people, the bladder is colonized with bacteria
- A positive urinalysis or urine culture in the absence of symptoms suggests colonization
- Treatment of asymptomatic bacteriuria is NOT indicated in the elderly

Urine cultures should not be obtained without an indication or physician order

- Obtaining urine cultures when there are no localizing urinary tract symptoms drives the unnecessary prescription of antibiotics

Over prescribing antibiotics results in many adverse events

- Drug-drug interactions
- Renal & other complications
- * *C. difficile* infection
- * Multi-drug resistant bacteria

Asymptomatic bacteriuria (ASB) is a common condition in which bacteria are present in the urine but there are no symptoms of a urinary tract infection

Challenges	Strategies for practice change
The resident's family wants urine test and antibiotic treatment in the setting of asymptomatic bacteriuria	Educate the family about the prevalence of asymptomatic bacteriuria, and tell them you do not suspect UTI on clinical grounds. Emphasize the dangers of antibiotic overuse.
We've always ordered urine cultures when there is a baseline mental status change (either confusion or change in behavior)	DELIRIUM or CONFUSION ≠ UTI A change in mental status or delirium is non-specific and may accompany conditions such as dehydration or adverse drug effect. Diagnosing and treating UTIs based on non-localizing symptoms often results in inappropriate antibiotic use. More importantly, you may miss the complete clinical picture. Observe and problem solve for other causes of delirium using PRISME (found on the Delirium Care and Monitoring worksheet)
It is okay to give an antibiotic even if it may not be needed. Better safe than sorry.	Antibiotics can cause adverse drug reactions, *C.difficile* infection, and promote the emergence of multi-drug resistant organisms. Inappropriate antibiotic use now may cause future issues for your client.
It is hard to ignore a positive urine test even when done for no clearly apparent reason.	Residents in long-term care frequently have positive urine cultures, even when they are well.

Urinary tract infections – diagnostic toolkit

Criteria for Urine Testing

Resident *without* Indwelling Catheter

•Fever (37.9 ºC)+ at least one of the symptoms below (new or increased) OR

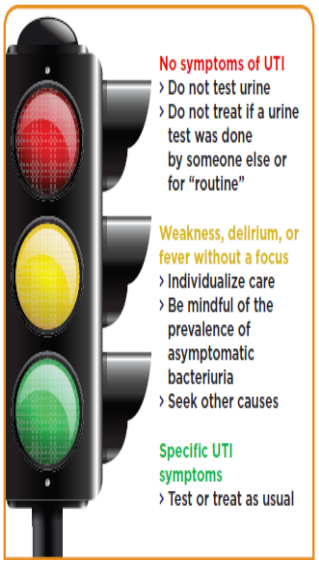
•If no fever, at least two of the following symptoms:

- Acute Dysuria
- Gross hematuria
- Urinary Incontinence
- Urinary Urgency/hesitancy
- Suprapubic pain
- Flank pain
- Urinary Frequency

Resident *with* Indwelling Catheter

•At least one of the following symptoms below (new or increased)

- Fever
- Pelvic Discomfort
- Flank pain (back, side pain)
- Malaise or lethargy with no other cause
- Costovertebral angle (CVA) tenderness
- Rigors (shaking chills)
- Delirium
- Gross hematuria



Adapted from Massachusetts Infection Prevention Partnership Asymptomatic Bacteriuria clinician handout

Stages of Dementia: (PATH)

	Mild Dementia (Frailty 5)	Moderate Dementia (Frailty 6)	Severe Dementia (Frailty 7)	Very Severe Dementia (Frailty 8)
Functional Deficit: (IRAN)	IADL's impaired: Can't make a complex meal Can't do taxes	Re-wearing clothes Trouble choosing appropriate clothes	ADL's impaired Difficulty dressing, bathing, toileting	Non-verbal, non-ambulatory Unable to smile, sit up Requires total care
Cognitive Deficit: Difficulty Remembering (CURE)	Current events, previous meal, Grandkids names	US President, Canadian PM (general common knowledge)	Relatives – spouse, children (deep, personal memory)	Everything – no recall of own life events
At Risk For	Medication non-compliance	Driving impairment	Behavioral problems; Falls, Wt loss	Swallowing dysfunction/pneumonia Death
Focus of Care Care Needs	Consider Trial ChEI Can stay alone	Evaluate Tx/Rx in context of Dementia At Home with support	Avoid intervention treatments Needs 24 Hour care	Needs 24 Hour care

Adapted from the Palliative and Therapeutic Harmonization model: Nova Scotia pathclinic.ca

Clinical Frailty Scale*

1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 **Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.

3 **Managing Well** – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.

4 **Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.

5 **Mildly Frail** – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 **Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

7 **Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9. **Terminally Ill** - Approaching the end of life. This category applies to people with **a life expectancy <6 months**, who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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The war against Polypharmacy: A New Cost-Effective Geriatric-Palliative Approach for Improving Drug Therapy in Disabled Elderly People

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Key words: polypharmacy, geriatric-palliative approach, nursing departments/nursing homes

Abstract

Background: The extent of medical and financial problems of polypharmacy in the elderly is disturbing, particularly in nursing homes and nursing departments.

Objectives: To improve drug therapy and minimize drug intake in nursing departments.

Methods: We introduced a geriatric-palliative approach and methodology to combat the problem of polypharmacy. The study group comprised 119 disabled patients in six geriatric nursing departments; the control group included 71 patients of comparable age, gender and co-morbidities in the same wards. After 12 months, we assessed whether any change in medications affected the death rate, referrals to acute care facility, and costs.

Results: A total of 332 different drugs were discontinued in 119 patients (average of 2.8 drugs per patient) and was not associated with significant adverse effects. The overall rate of drug discontinuation failure was 18% of all patients and 10% of all drugs. The 1 year mortality rate was 45% in the control group but only 21% in the study group ($P < 0.001$, chi-square test). The patients' annual referral rate to acute care facilities was 30% in the control group but only 11.8% in the study group ($P < 0.002$). The intervention was associated with a substantial decrease in the cost of drugs.

Conclusions: Application of the geriatric-palliative methodology in the disabled elderly enables simultaneous discontinuation of several medications and yields a number of benefits: reduction in mortality rates and referrals to acute care facilities, lower costs, and improved quality of living.

IMAJ 2007;9:430–434

The rate of drug-related problems and inappropriate medication use in the elderly is disturbing. The heavy use of medications in this population has increased the rate of drug interactions and hospitalizations secondary to drug-related problems [1,2]. The extent of the problem is even greater in nursing home and nursing department settings [3,4], and the financial consequences of the problem are enormous.

We introduced a geriatric-palliative approach and methodology to improve the quality of care in nursing home/nursing departments, assuming a priori that each patient in our nursing department suffered from some negative effects of polypharmacy. Our research hypothesis was that, in most patients, several drugs could be discontinued without significant negative effects on mortality, morbidity and quality of life, and with beneficial financial consequences. In the present study we discontinued as many drugs as possible while monitoring for clinical and laboratory changes, with the aim of improving quality of care.

Patients and Methods

The study was conducted at the Shoham Geriatric Medical Center in Israel. In early 2004, all patients in six nursing departments (study departments) were evaluated by one of the authors (D.G.) for all drugs consumed. An attempt was made to stop as many drugs as possible, using the criteria of our geriatric-palliative methodology [Figure 1]. The control group comprised patients hospitalized in the same departments and treated by the same team, in whom no change in drugs was made. The department physicians had complete authority to re-administer drugs whenever drug discontinuation was defined as "failure" (see below). The algorithm in Figure 1 summarizes our methodology for implementing the geriatric-palliative approach in nursing homes and nursing departments. It was used to reevaluate each medication for each patient, enabling us to decide whether to continue with the same dose, reduce it, or discontinue the drug completely. When no evidence-based data were available for answering the first statement, we based our answers solely on clinical judgment. If the indication seemed relevant in disabled elders, we would have nevertheless considered dose reduction or shift to a better drug while carefully monitoring for any change in symptoms, signs or relevant tests.

Discontinuation of nitrates was tried in patients who had no chest pain for 3 months; failure was defined as the return of symptoms or electrocardiographic changes. H_2 blockers were stopped in patients with no proven peptic ulcer, gastrointestinal bleeding or dyspepsia for 1 year; failure was defined as the return of upper gastrointestinal symptoms. Discontinuation of potassium and iron supplements was tried in patients with serum concentrations above 4.0 mEq/L or 80 µg/dl, respectively. Failure was defined as a reduction in serum potassium below 3.5 mEq/L and that of iron below 50 µg/dl. When several antihypertensive drugs were consumed, we would try to remove only one while maintaining the dosage of other antihypertensive drugs. Failure was defined as an increase in diastolic blood pressure above 90 mmHg and/or systolic blood pressure above 140 mmHg. If successful, other antihypertensive drugs would be stopped according to the same principles. Whenever a specific drug discontinuation was defined as "failure," the drug was re-administered. The success rate was determined 12 months after the intervention.

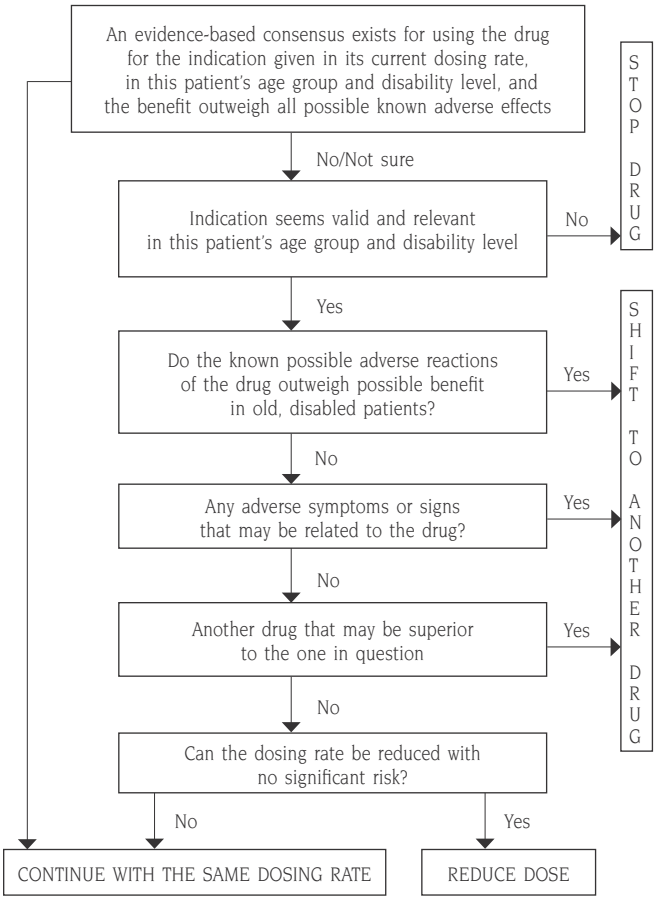

Figure 1. Improving drug therapy in disabled/frail elderly patients – an algorithm

At that time, the annual incidence of deaths and referrals to hospitals was determined in both the study and control groups.

All data were analyzed by the chi-square test. The average age was analyzed using Student's *t*-test. Unfortunately, we could not reliably compare the cost of drugs for patients in whom drug discontinuation was and was not performed in the same six nursing departments. We therefore compared the cost of drugs in the six study departments (both study and control groups) to that of another four nursing departments in the same medical center (control departments), between January and July one year earlier, and the same period after the intervention (chi-square test).

Results

We evaluated the use of medications in 190 patients in the six study nursing departments. Drugs were discontinued in 119 (63%); there was no change of medications in 71. The groups were comparable for age, gender and major co-morbidities [Table 1]. The average number of medications consumed was 7.09. Altogether, 332 different drugs were discontinued (an average of 2.8 drugs per patient). The rate of successful drug discontinuation decreased as the number of discontinued drugs in one patient increased; the overall failure rate was 18% of all patients and 10% of all drugs [Table 2].

Table 3 presents the annual rate of success by different drug types. The discontinuation of nitrates in 22 patients was not associated with any clinical or ECG changes; discontinuing H_2 blockers did not cause upper gastrointestinal symptoms in 94% of patients; and discontinuation of antihypertensive drugs did not cause an increase in blood pressure in 42 of 51 patients (82%). Furthermore, in nine patients defined as "failures," the number of antihypertensive medications or their dosage was reduced. The success rate for pentoxyfyllin, potassium and iron supplements was also remarkable. The failure rate of the geriatric-palliative approach was highest for antidepressants and psychotropic drugs [Table 3]. Other drugs were discontinued (e.g., non-steroidal anti-inflammatories, analgesics, statins, oral hypoglycemics, amantadine, carbamazepine and digoxin), with no adverse findings that could be attributed to drug discontinuation. Due to the

Table 1. Demography and co-morbidities

	Study group (n=119)	Control group (n=71)	*p*
Female/Male	87/32	44/27	NS
Age (yrs) (mean ± SD) *	81.2 ± 8.3	82 ± 8.7	NS *
Dementia **	112)94%)	66 (93%)	NS
Double incontinence	111 (93%)	66 (92%)	NS
Indwelling urinary catheter	21 (18%)	10 (14%)	NS
Hypertension	55 (46%)	29 (41%)	NS
Congestive heart failure	12 (10%)	5 (7%)	NS
Previous myocardial infarction	6 (5%)	9 (13%)	NS
Chronic atrial fibrillation	16 (13%)	14 (20%)	NS
Diabetes mellitus	36 (30%)	17 (24%)	NS
Chronic obstructive lung disease	6 (5%)	9 (13%)	NS
Previous stroke	45 (38%)	28 (39%)	NS
Hypo-albuminemia (serum albumin < 3.0 g/dl)	29 (24%)	18 (25%)	NS
Recurrent infections ***	35 (29%)	13 (18%)	NS

All parameters except age, in both the study and control groups, were analyzed by the chi-square test.

* Student's t-test

** Mini Mental State Examination (MMSE) 14/30 or less.

*** At least two proven infections in one year (urinary tract infection, pneumonia, skin infections etc.)

Table 2. Success rate following 1 year of follow-up according to number of drugs discontinued

		Failure rate: re-administration	
No. of drugs discontinued	No. of patients	No. of patients	No. of drugs
7	2	2/2	3/14
6	4	2/4	5/24
5	13	5/13	13/65
4	15	5/15	5/60
3	29	4/29	5/87
2	26	1/26	1/52
1	30	2/30	2/30
Total	119	21/119	33/332
Percent	100%	18%	10%

Table 3. Success rate after 1 year of follow-up according to types of drugs discontinued

Drug group	No. of patients with drug discontinuation	Recurrence of symptoms/signs* (failures)	Success rate (%)
Nitrates	22	0	100%
H_2 blockers	35	2	94%
Antihypertensives	51	9	82%
Diuretics (furosemide)	27 (25)	4 (4)	85%
Pentoxifylline	15	0	100%
Potassium supplement	20	0	100%
Iron supplement	19	1	95%
Sedatives & tranquilizers	16	2	88%
Antidepressants	19	5	74%
Antipsychotics	13	4	69%

* See text for further explanations

small number of patients, statistical analysis was not performed for these drugs. In some patients in the study group, the staff reported decreased agitation, increased alertness and even an amelioration of disability, but we did not quantitatively assess these parameters.

The 1 year mortality rate was 45% in the control group and 21% in the study group ($P < 0.001$). The annual referral rate to acute care facilities was also significantly lower in the study group as compared to the control group (11.8% vs. 30% respectively, $P < 0.002$).

There was an overall decrease in the cost of drugs in all departments. This improvement was represented by a $0.26 decrease in the average daily cost of drugs per patient in 132 patients in the four control departments (from $1.65 before to $1.39 after the intervention period). This change did not reach statistical significance ($P = 0.07$). However, a statistically significant decrease of $0.46 in the average daily drug cost per patient (from $1.74 to $1.28, $P = 0.02$, chi-square test) was shown in 190 patients in the six study nursing departments following the intervention (119 patients in the study group + 71 patients in whom no change in drugs was made).

Discussion

There is an alarming increase in the number of people who suffer from disabling, non-curable diseases, which create exponentially increasing medical, economic and social age-related problems [5]. The more years a person lives, the more age-related diseases will be acquired and the more drugs consumed. Polypharmacy, an age-related "geriatric syndrome," is a significant predictor of malnutrition, hospitalization and nursing home placement; it impairs mobility and leads to morbidity and death [6].

For professionals in palliative medicine and particularly those working in hospices, stopping drugs other than those used for symptom control is obviously a common practice. Nevertheless, polypharmacy represents a problem also in palliative care settings [7,8]. However, in geriatrics, there is less awareness and attempts to combat polypharmacy are much less aggressive.

Residents in nursing homes or nursing departments use an average of 6 to 9.7 medications daily (7.09 in our study) and over 20% receive more than 10 medications daily [9,10]. The rate of drug-related problems in these settings is significantly higher than in community-dwelling elders [4,11,12]. Polypharmacy is preferably defined as "The administration of more medications than are clinically indicated" [13]. Another term is "inappropriate medication use" – medication use that has a greater potential risk for harm than benefit, is less effective or more costly than available alternatives, or does not agree with accepted medical standards. However, there is still considerable disagreement among experts regarding what exactly is inappropriate medication use and how it can be determined [14].

Beers et al. [10,15] tried to establish criteria for defining groups of drugs or specific medications that should be regarded as "potentially inappropriate" and should not be given to elders in nursing homes or nursing departments. Chutka and colleagues [16] claimed that there was insufficient evidence to conclusively defend or refute the use of most medications listed by Beers. This uncertainty may explain the different incidence of inappropriate medication use reported by many researchers in the community [1,3,14,17-19] and in nursing homes/nursing departments [4,20]. It also justifies the continuous attempts to reevaluate, modify and refine Beers' criteria and expand them to include community-dwelling elders as well [3,17-19].

The updated Beers criteria may serve as an alarm system to increase physician alertness and avoid specific drugs in nursing homes/departments. We suggest that not only should we be aware of the high incidence of specific drug-related problems, but we should thoroughly reevaluate the indications for each drug. In this subpopulation, the sum total of the negative effects of a variety of drug combinations may outweigh the sum total of beneficial effects of the specific drugs. While comparing risks versus benefits of drug withdrawal in this subpopulation, one should remember that the rate of drug interactions is age-related, the odds of inappropriate medication use are higher as the absolute number of medications prescribed increases, and the risk of hospitalization secondary to inappropriate medication use is much greater in these facilities than in the general population [1,2,11,21]. Furthermore, the validity of indications and benefits of specific medications in this subpopulation is not always evidence-based.

Most guidelines for treating human maladies represent good evidence-based medicine in middle-age patients. However, they may be inappropriate, with greater risks and lower benefits, for institutionalized patients [22]. A well-accepted indication in adults may be unclear, no longer in existence, or irrelevant in the elderly, particularly in nursing facilities. For example, a patient who has received an antihypertensive or nitrates when still independent and active may not need these drugs years later when already disabled and exerting minimal physical effort. Patients may also have a life expectancy that is shorter than the time needed to benefit from any specific drug prescribed.

A similar approach has been adopted for disabled elders with diabetes [23]. In the absence of proven data for determining

optimal glycemic control in frail elders, a panel of experts made recommendations based on clinical judgment only. For the frail elderly, those with short life expectancy and others in whom the risks of intensive glycemic control outweigh the benefit, the panel did not adopt the general recommendations of the American Diabetes Association for lowering HbA1C to 7% and suggested a less stringent target of 8%. This approach should be expanded to include other clinical guidelines in an attempt to be less aggressive in reaching rigid target goals (for example, blood pressure, serum lipid concentrations), focusing rather on quality of life and patient/family preferences. In line with this perception, our approach aims at improving the quality of care in all 190 patients in the nursing department by reducing polypharmacy. We have proven our hypothesis that several widely used types of drugs are not necessarily needed in nursing home or nursing department patients [Table 3].

P*rimum non nocera*, our second hypothesis, was that our intervention would not have deleterious outcomes. Our findings that both mortality and referrals to hospitals decreased significantly in the study group are intriguing. The explanation that these findings are bias-related seems unlikely. Based on clinical judgment only, physicians in the nursing departments decided whether to re-administer drugs or send patients to an acute care facility. For reasons of good medical practice, some patients in the study group were monitored more frequently than those in the control group (e.g., more blood pressure assessments, ECGs, laboratory tests). However, as this mainly occurred in the first weeks and the study was 12 months long, it does not explain the significant annual differences in favor of the study group.

Avorn and co-workers [22] concluded that drug discontinuation should be done selectively, altering one drug at a time. However, in nursing department patients, who have the shortest life expectancy and the worst quality of life, time is critical and they may suffer further deterioration due to drug-related problems from the remaining medications. We therefore chose to withdraw several drugs simultaneously, while carefully monitoring for any clinical or laboratory adverse effects.

Our study was not a randomized control trial. Nevertheless, it provides evidence for the efficacy of our geriatric-palliative approach. We recommend that randomized control trials be designed to conclusively assess our approach. However, performing such trials on multi-drug discontinuation in the complex nursing department/home subpopulation, while adhering to traditional rules of such trials, may be neither practical nor ethical. For example, it would require not only discontinuation of three to four specific drugs with no change in these same drugs in a comparable control group, but also continuation of the same drugs that are not withdrawn in both study and control groups. One may argue that we have not provided direct evidence for a higher rate of drug-specific problems in the control group (e.g., higher incidence of orthostatic hypotension or hypoglycemia in patients taking an antihypertensive or oral hypoglycemic, respectively). However, orthostatic hypotension is not relevant in disabled patients who cannot stand up. As for a possible beneficial decrease in hypoglycemic events, due to the small number of patients in whom hypoglycemic medications were discontinued, statistical analysis was not relevant.

Globally, physicians are increasingly exposed to patients suffering from a complexity of non-curable diseases. Nursing home/department patients may be treated by specialists who may work there part time while devoting the bulk of their time elsewhere, or by less costly non-specialists, who usually represent the preferred choice of the nursing home/department management. These patients may be taking medications that might have been given at some point in their lives by physicians of different specializations who prescribed the medication for a specific problem in their field of expertise. However, when policies were determined by specialists, the nursing department physician may be reluctant to discontinue drugs even when a long time has elapsed, new problems or medications accumulated, or physical changes occurred in the patient. Sometimes, neither specialists nor the nursing physicians review all drugs in a search for interactions with drugs prescribed by other doctors; therefore, a scheduled, formal drug reevaluation like ours may never be performed.

We have chosen the term "geriatric-palliative" to describe our methodology for combating polypharmacy, because it is based on premises in both fields. All our patients suffer from non-curable diseases [Table 1] and our main goal is to relieve suffering using good palliative care medicine. The risk of polypharmacy may outweigh the combined benefits of all drugs, and drug discontinuation in itself should be regarded as one of our highest therapeutic priorities. At least in this subpopulation, the well-accepted geriatric guideline "start low, go slow," should be changed to "stop most, reduce dose."

In the USA, for every dollar spent on medications used in nursing homes, $1.33 is spent to manage drug-related problems [24]. Apart from the medical benefits, the financial benefits of our geriatric-palliative approach are considerable. Although it was performed in only 63% of patients in the study departments, the saving was still more pronounced than in the four control departments. Using this minimal estimate after correcting for the general saving represented by the control departments, the annual savings resulting from our approach would be $69 per patient. This estimate is much lower than that found by Trygstad et al. [12], who showed a relative annual cost reduction of $228 per patient. Suppose our approach or that of Trygstad et al. was implemented in at least 1.5 million nursing home patients in the USA and assuming the same cost of drugs, we would be looking at an annual saving of 103 to 343 million dollars in the U.S. alone, not including hospitalization savings.

Although the average number of medications consumed by our patients was comparable to that reported by others, one may argue that the success of our approach stems from the fact that our patients were inadequately treated before the study. The situation may be better or worse in other countries or specific nursing homes/departments [25], but we believe that the extent of the problem is a global one. Therefore, using our approach to confront polypharmacy can help improve the health of patients and economies all over the world. In any case, the methodol-

ogy adopted can provide a useful checklist for even the best administration programs.

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