23NKG 2016
23RD NORDIC CONGRESS OF GERONTOLOGY

Cost and Quality of Home-Care for Older people, in Europe

Right Medication in Timely Manner

Davide L Vetrano

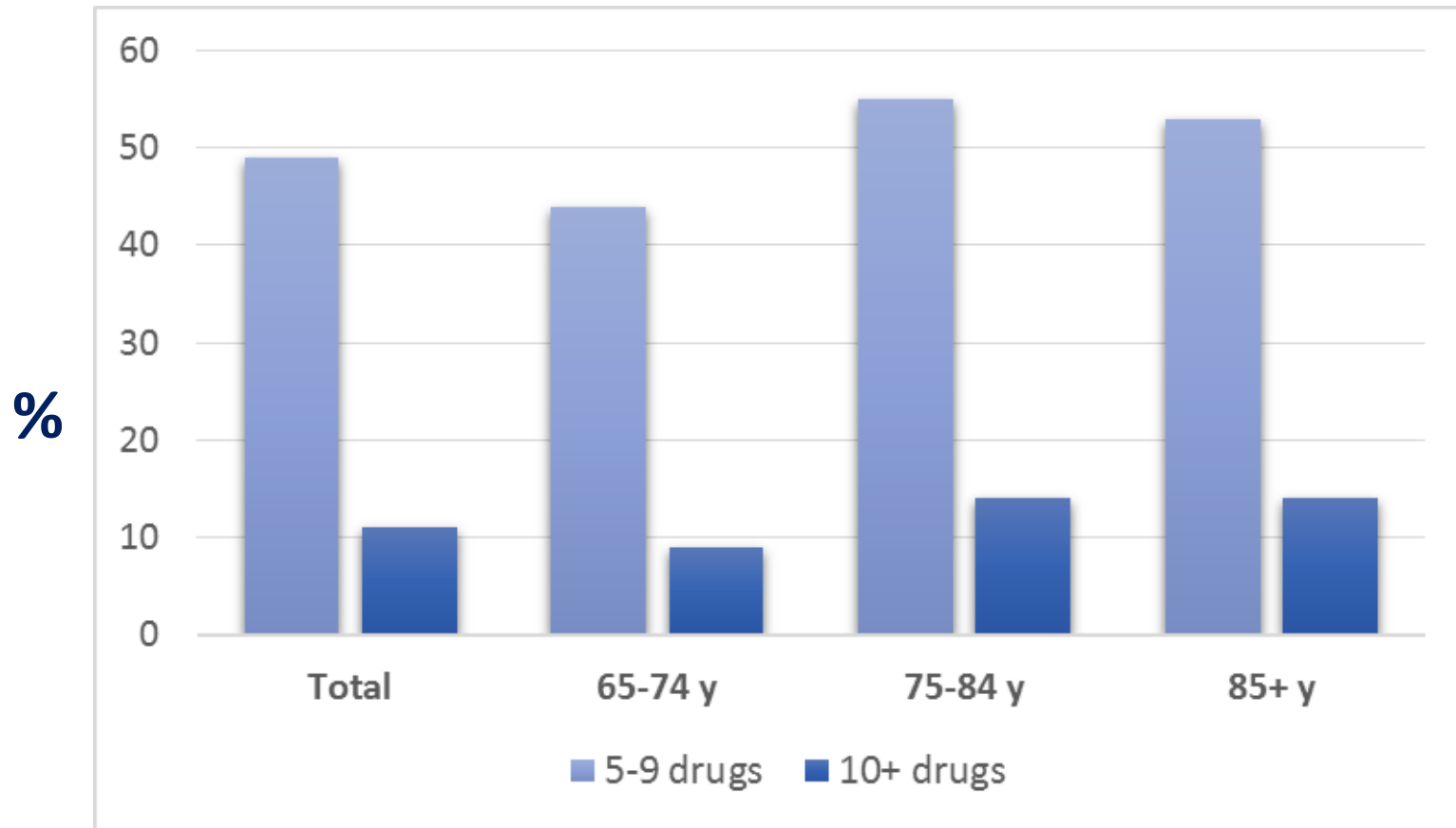*Dept. of Geriatrics, Catholic University - Rome, Italy*
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UNIVERSITÀ CATTOLICA del Sacro Cuore

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iBenC

Older Adults And Polypharmacy (Italy)

N=12.301.537

Onder G et al. J Gerontol A Biol Sci Med Sci. 2013

Polypharmacy in LTC

HC

NH
Services and Health for Elderly in Long TERm Care

N=1358

Excessive polypharmacy (≥10 drugs) in 13.0% clients

N=4023

Excessive polypharmacy (≥10 drugs) in 24.3% residents

#drugs 5.5

#drugs 7

Unpublished data

Onder, J Gerontol Med Sci. 2012

Polypharmacy in NH

Europe (SHELTER)

| Drug Class	All $n = 4{,}023$ (%)
Laxatives	1,680 (41.8)
Antiulcer drugs	1,645 (40.9)
Aspirin and antiaggregants	1,518 (37.7)
Benzodiazepines	1,448 (36.0)
Antidepressants	1,431 (35.6)
Diuretics	1,429 (35.5)
Analgesics	1,382 (34.4)
Antipsychotics	1,063 (26.4)
Angiotensine converting enzyme inhibitors	925 (23.0)
Beta blockers	910 (22.6)
Antiosteoporosis drugs (including vitamin D)	753 (18.7)
Calcium channel blockers	674 (16.8)
Statins	595 (14.8)
Antidementia drugs	429 (10.7)

Onder, J Gerontol A Biol Sci Med Sci. 2012

US

Therapeutic Class	Residents Taking Medication, %
Laxatives	47.5
Antidepressants	46.3
Nonnarcotic analgesics	43.6
Gastrointestinal agents for acid/ peptic disorders	43.3
Antipyretics	41.2
Diuretics	35.0
Antiarthritics	31.2
Replenishers/regulators of electrolytes/ water balance	31.2
Antipsychotics or antimanics	25.9
Angiotensin-converting enzyme inhibitors	23.6

Dwyer, Am J Geriatr Pharmacother 2010

Polypharmacy In NH Residents With Dementia
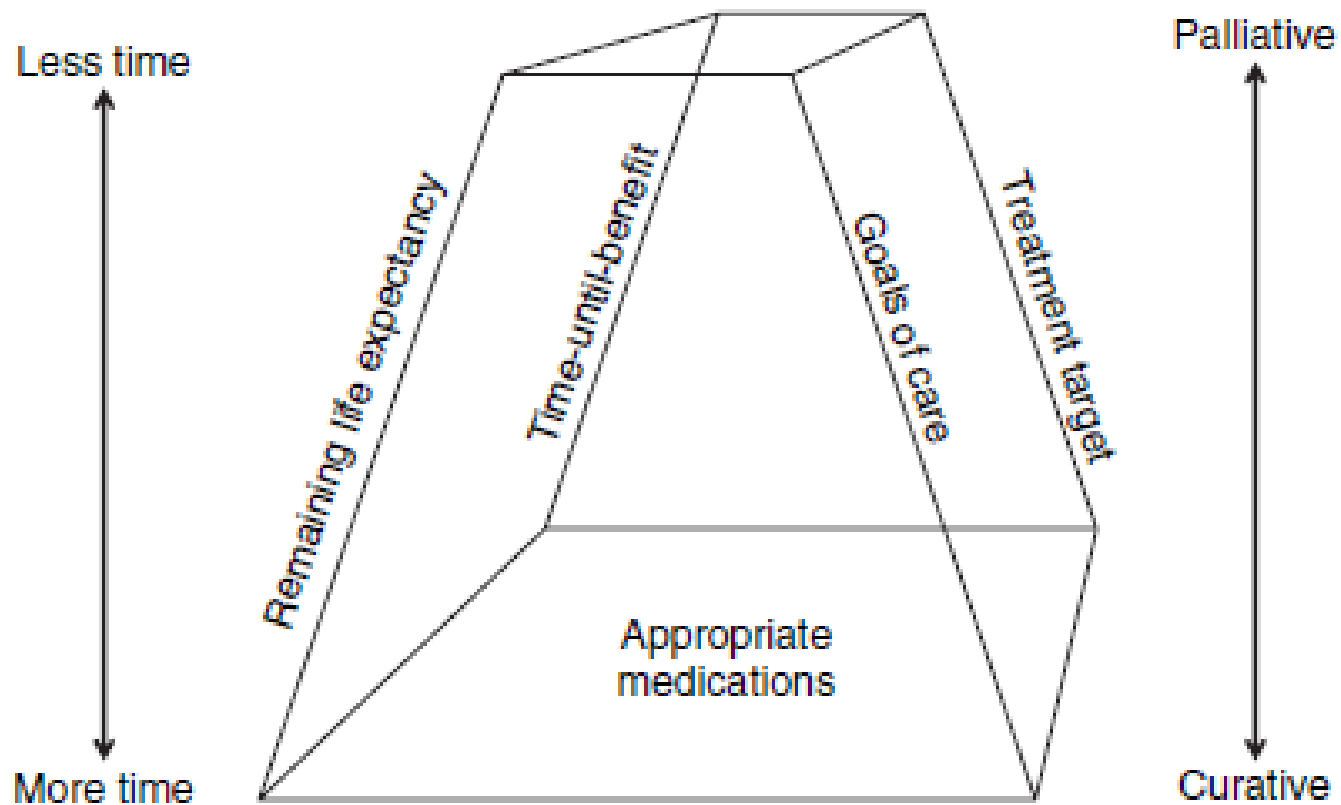

Vetrano DL et al, Alzh Dementia 2012
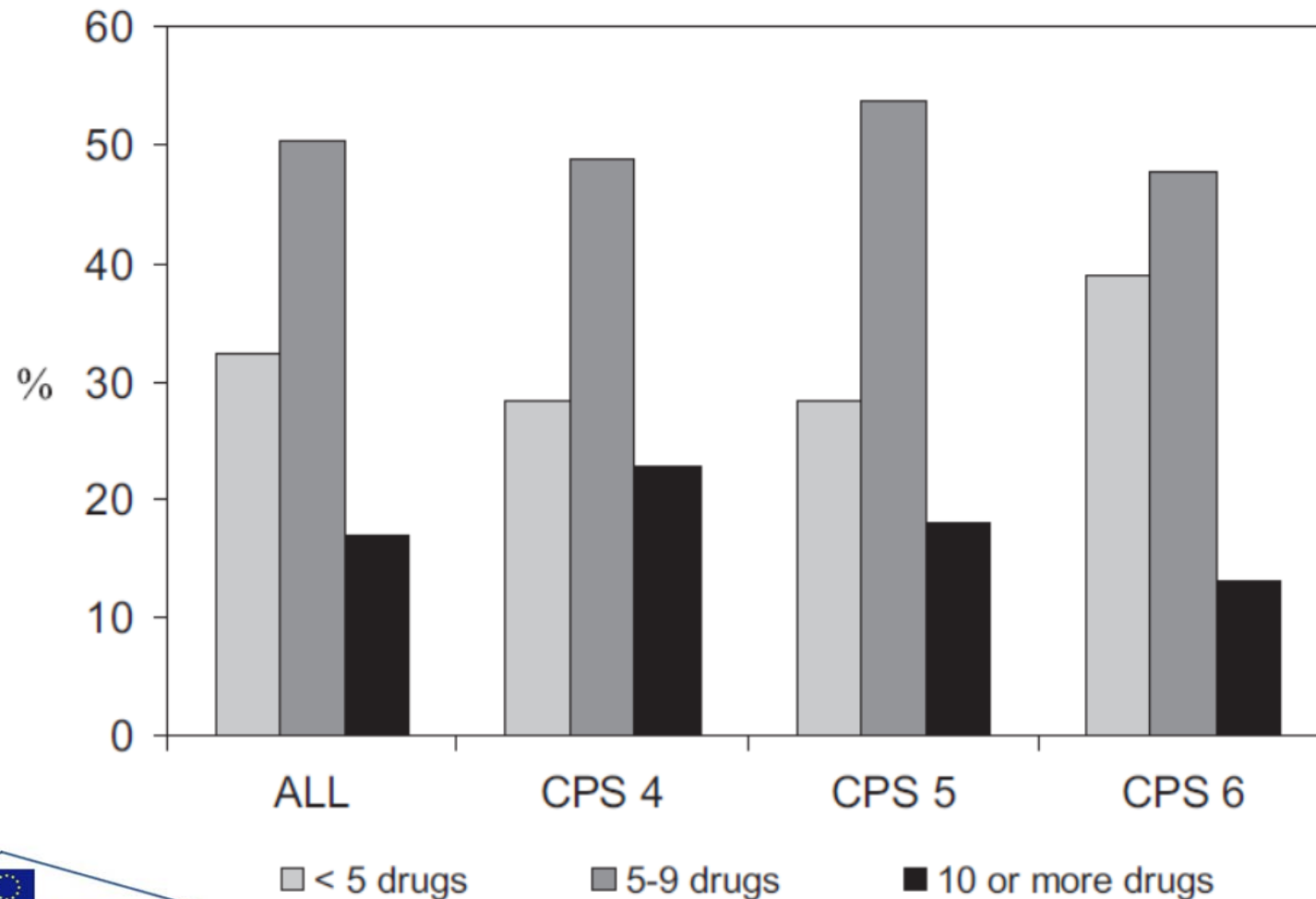
Inappropriate Medication Use In Home Care
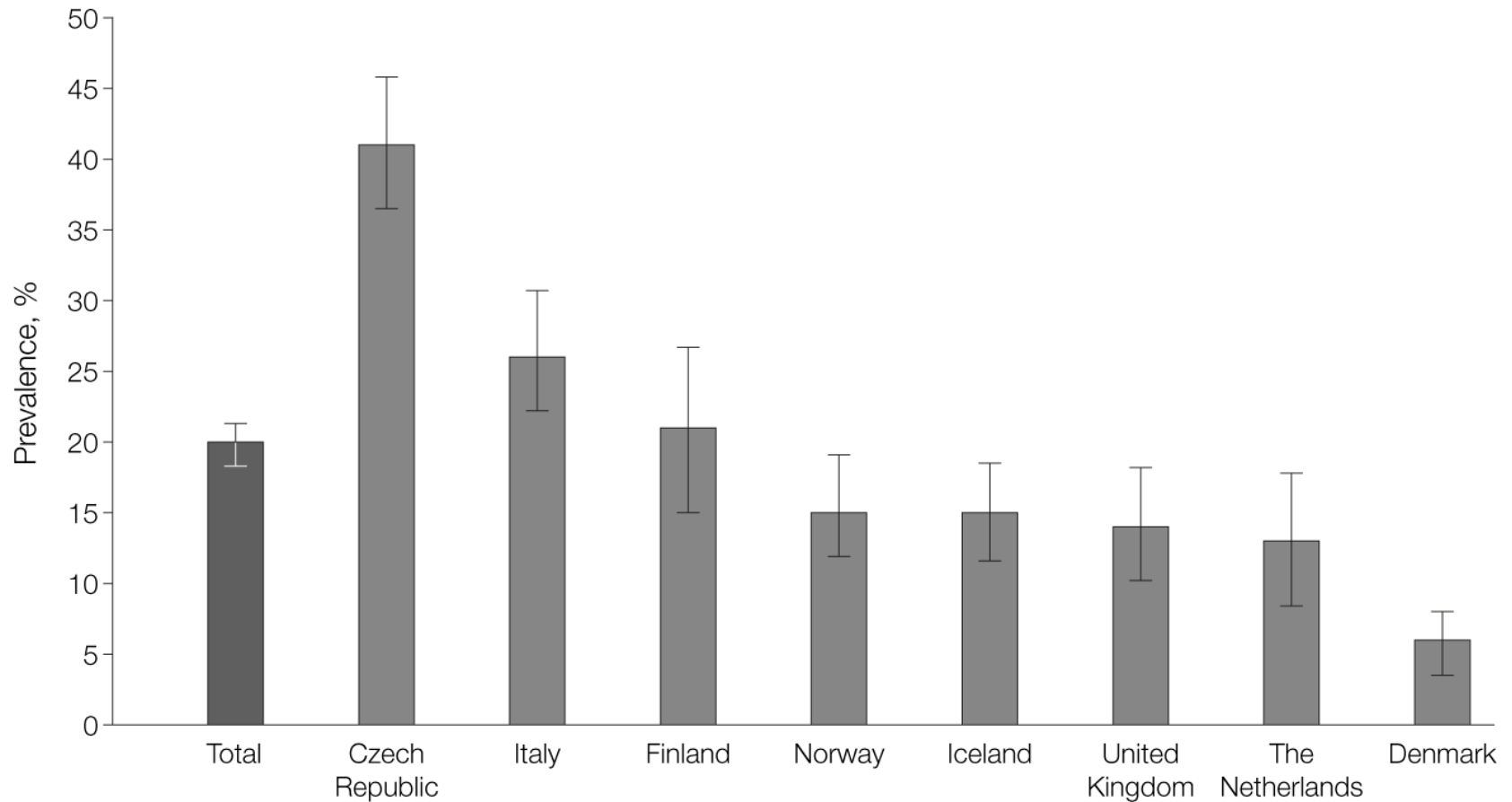
Fialova et al. JAMA 2005

Which Strategy to Improve Medication Use?

- **Guidelines**

- **Medication review**

- **Computer-based prescribing systems**

Less time

More time

Palliative

Curative

Remaining life expectancy

Time-until-benefit

Goals of care

Treatment target

Appropriate medications

Holmes, Clin Pharmacol Ther 2009

Which Strategy to Improve Medication Use?

- **Guidelines**

- **Medication review**

- **Computer-based prescribing systems**

- **Comprehensive Geriatric Assessment (CGA)**

CGA allows for the evaluation of several factors which may limit the use of beneficial drugs in the elderly:

1. Comorbidity – Polypharmacy

Antipsychotic Interactions

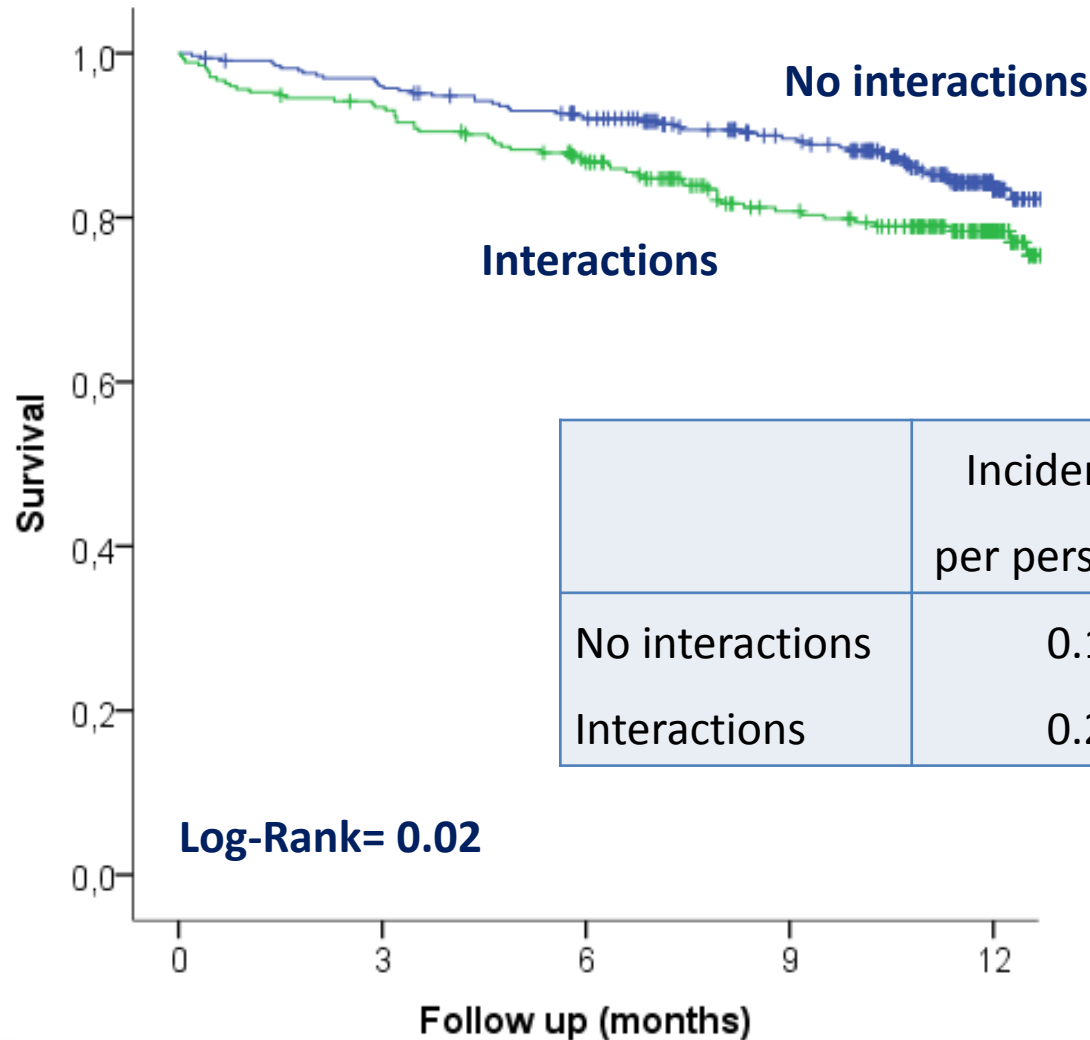| Potential Adverse Effects caused from interactions with antipsychotics	n (%)
• Decreased blood pressure and falls	210 (34.8%)
• QT prolongation	44 (7.3%)
• Sedation	43 (7.1%)
• Interactions with inhibitors of cytochrome p450	9 (1.5%)
• Anticholinergic effects	2 (0.3%)
All	**278 (46.0%)**

Antipsychotic Interactions

Liperoti et al. J Clin Psychiatry *in press*

CGA allows for the evaluation of several factors which may limit the use of beneficial drugs in the elderly:

1. Comorbidity – Polypharmacy
2. **Life expectancy**

Daily Medication Use in Nursing Home Residents with Advanced Dementia

Tija et al, J Am Geriatr Soc 2010

Polypharmacy And Survival In Dementia

ADEPT score < 13.5

ADEPT score ≥13.5 (Limited life expectancy)

Log rank=0.24

Log rank=0.02
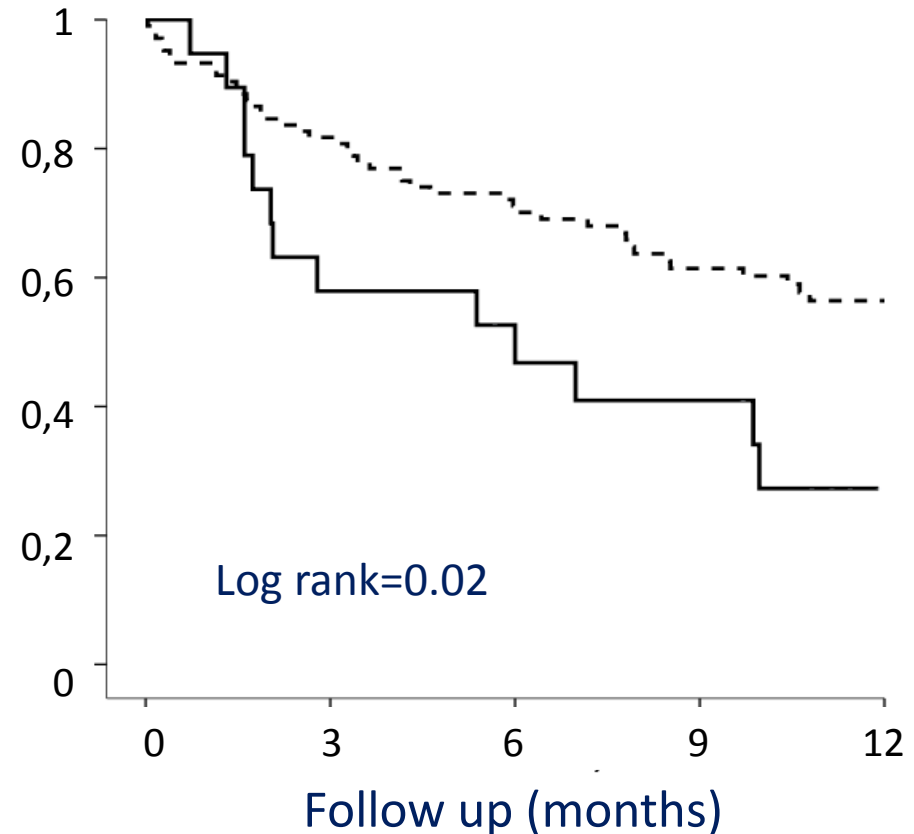
Polypharmacy   - - - - No polypharmacy

Onder G et al. JAMDA 2013

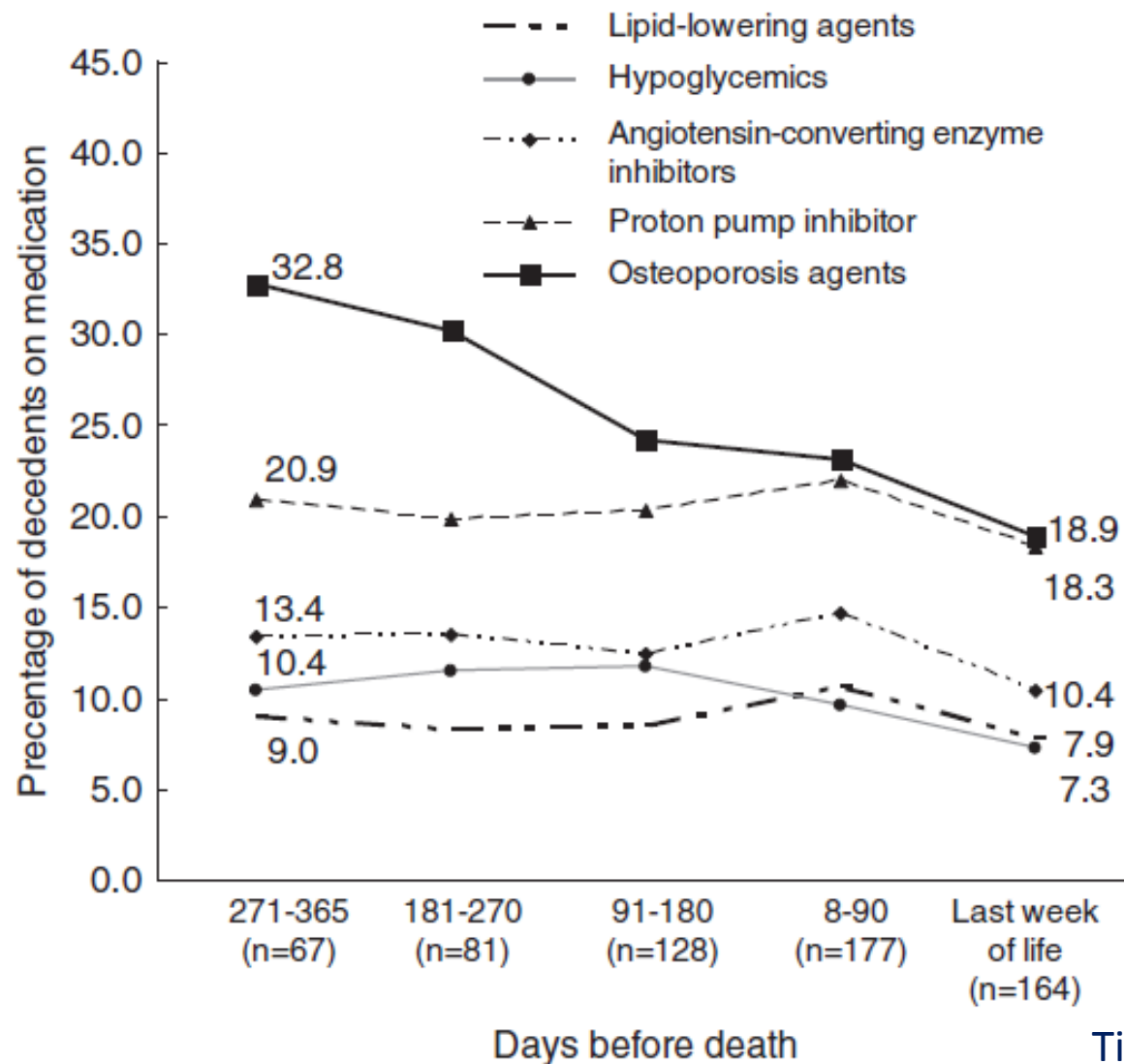# CGA allows for the evaluation of several factors which may limit the use of beneficial drugs in the elderly:
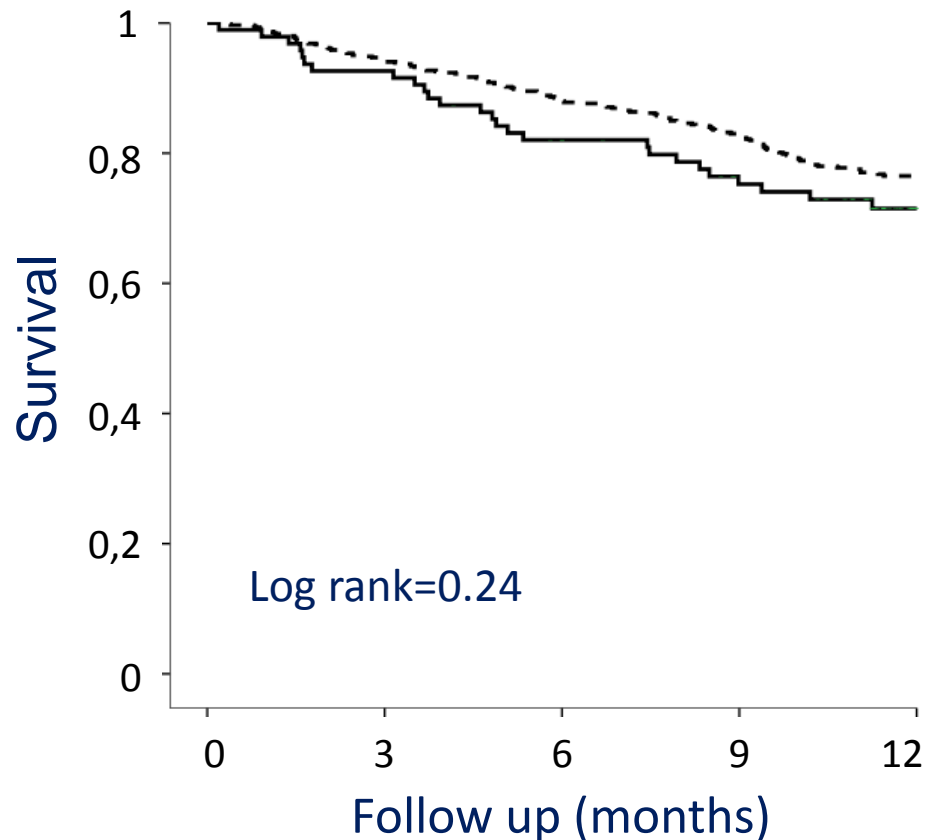
1. Comorbidity – Polypharmacy
2. Life expectancy
3. **Functional and cognitive limitations**

# Treatment of Non Dementia Illness in Patients with Dementia

Problems	Consequences	Responses
Cognition and language	Decreased decision-making capacity Increased caregiver burden Increased risk of diagnostic procedures Adherence problems Difficulty reporting adverse effects Difficulty titrating medicines based on reporting by patient	Consider altered risk-benefit ratio balancing safety and autonomy Adjust communication strategies
Decreased life expectancy	Decreased potential benefit	Consider altered risk-benefit ratio Reserve therapy/screening for those with sufficient life expectancy to realize benefit
Exclusion from studies	Increased uncertainty about effects of therapy in this group	Policy changes to include patients with dementia in appropriate studies

Brauner et al. JAMA 2000

FULL text at JAMA

Inappropriate Prescribing in Advanced Dementia: SHELTER study

Drug class	n= 1449	
Rarely Appropriate		
Antispasmodics	100 (6.9%)	
Digoxin	77 (5.3%)	
Warfarin	71 (4.9%)	
Heparin and Low-weight heparins	43 (3.3%)	**Overall 45%**
Alpha Bockers	41 (2.8%)	
Biphosphonates	40 (2.8%)	
Antiarrhythmics	33 (1.5%)	
Never Appropriate		
Lipid-lowering Medications	143 (9.9%)	
Antiplatelets Agents (excluding ASA)	143 (9.9%)	
Acetylcholinesterase inhibitors	104 (7.2%)	
Memantine	77 (5.3%)	

SHELTER
Services and Health for Elderly in Long TERm Care

Hypertension, Functional Status and Mortality
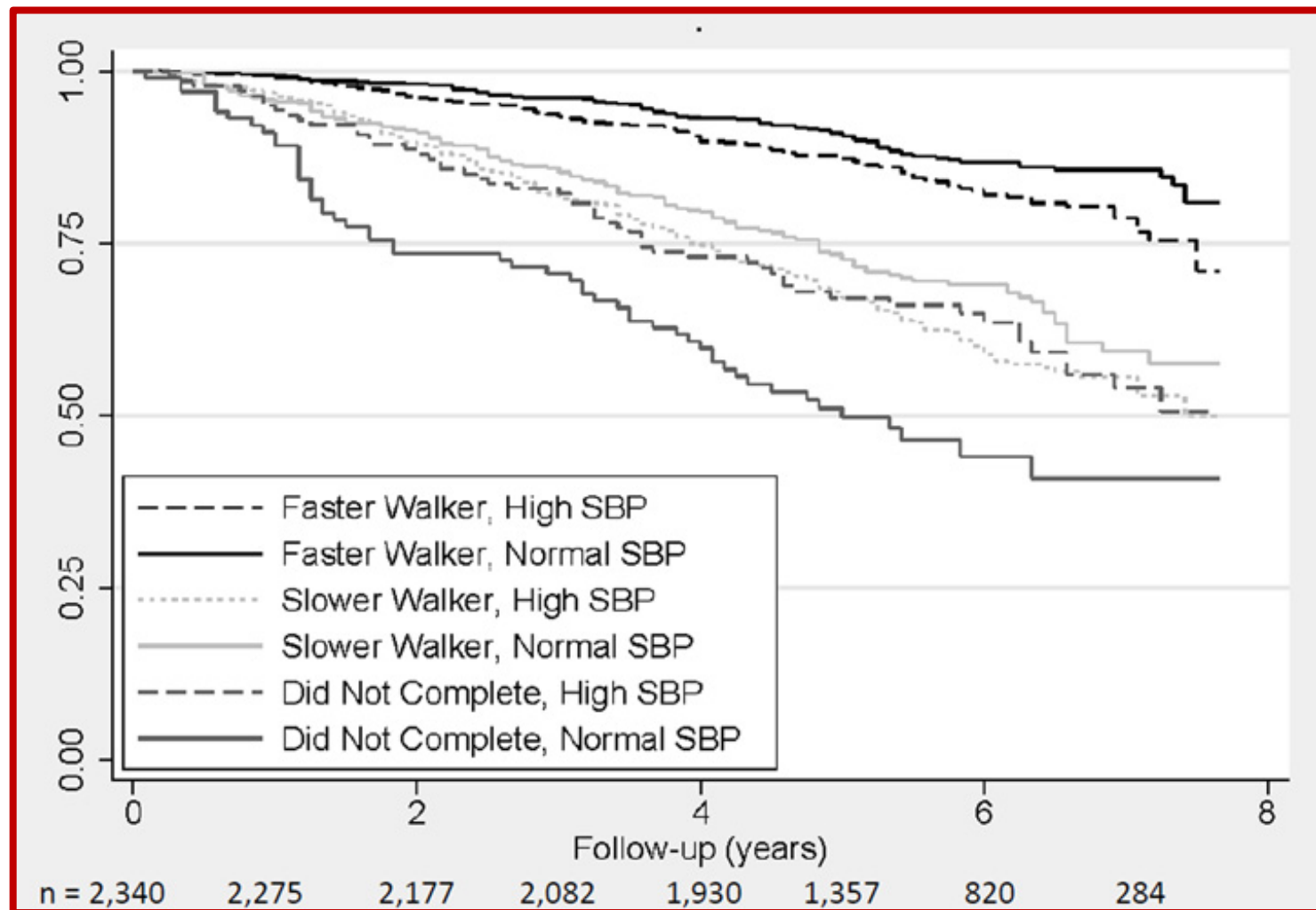
Odden et al Arch Intern Med 2012

CGA allows for the evaluation of several factors which may limit the use of beneficial drugs in the elderly:

1. Comorbidity – Polypharmacy
2. Life expectancy
3. Functional and cognitive limitations
4. **Geriatric syndromes**

	Pain	Urinary Incontinence	Disability	Falls	Dizziness	Weight Loss	Pressure Ulcers	Delirium	n° Syndromes	Total n° Diseases
Hypertension	51	46	28	35	22	9	5	4	2	3.2
Osteoarthritis	63	49	25	34	25	11	3	3	2.1	3.2
Diabetes	49	48	28	35	25	9	6	4	2	3.4
Dementia	32	55	40	34	16	8	6	10	2	2.9
Heart Failure	47	49	31	29	27	11	6	6	2.1	3.4
Cerebrovascular Disease	44	55	41	37	25	10	7	7	2.3	3.3
COPD	54	48	26	33	26	12	5	4	2.1	3.4
Ischemic Heart Disease	53	47	27	39	27	11	6	4	2.1	4.3
Atrial Fibrillation	52	46	27	35	27	14	5	4	2.1	3.7
Thyroid Disfunction	54	47	26	37	21	12	2	4	2	3.5
Cancer	50	40	29	28	22	19	5	5	2	2.9
Peripheral Artery Disease	57	49	26	34	30	11	7	6	2.2	3.8
Glaucoma	53	49	23	36	29	11	3	4	2.1	3.3
Parkinson's Disease	43	60	51	41	25	10	9	8	2.5	3.0
> 1 disease									2	2.6
> 2 diseases									2.1	3.1

Drug-Geriatric Syndrome Interactions

NH SHELTER *N=4023*   *Interacting drugs*
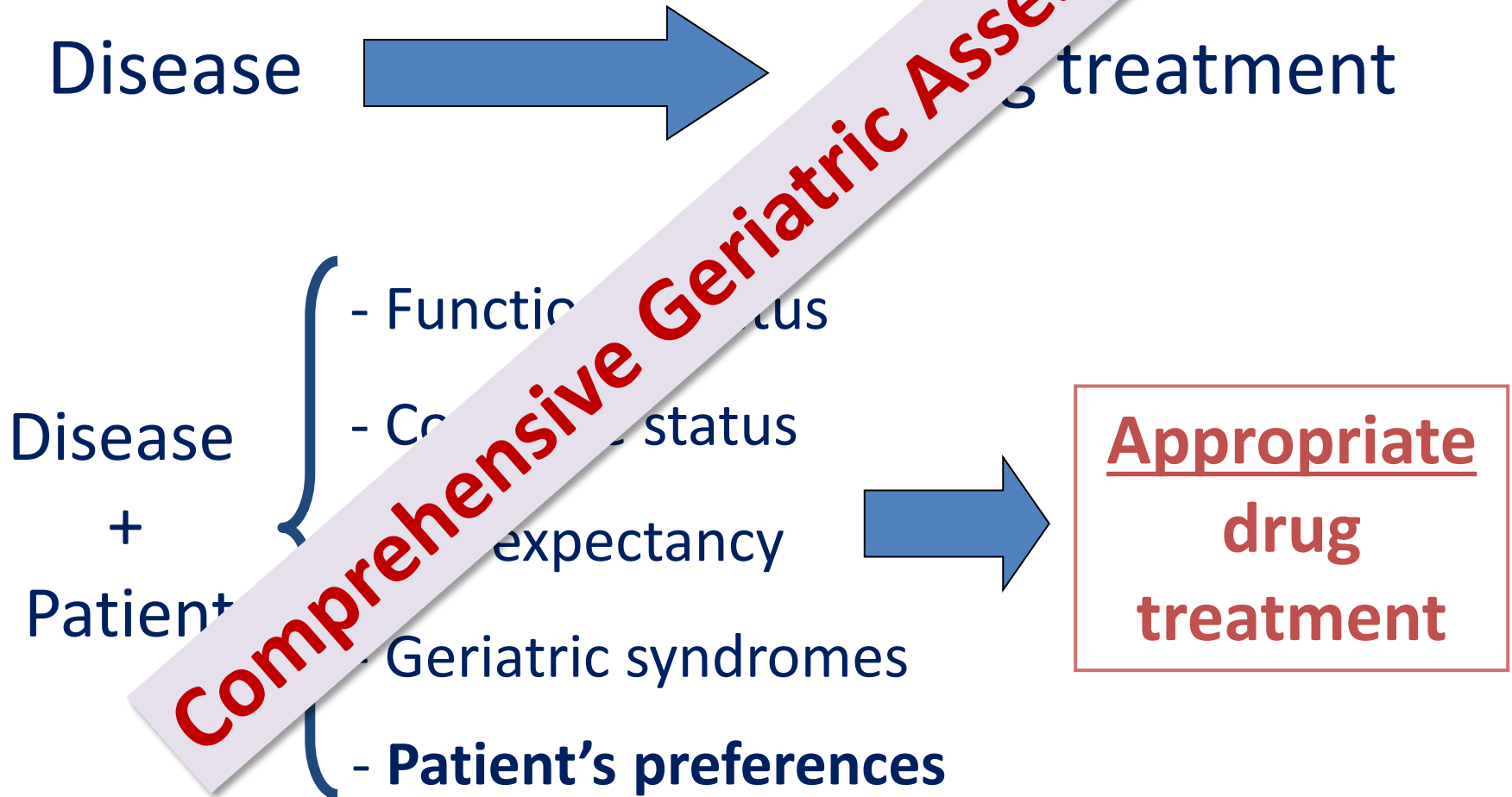
Delirium (n=691)   **65.7%**

Falls (n=774)   **79.1%**

Incontinence (n=3098)   **72.2%**

Malnutrition (n=391)   **66.8%**

HC iBenC *N=1778*

Delirium (n=252)   **77.8%**

Falls (n=372)   **36.3%**

Incontinence (n=806)   **60.4%**

Malnutrition (n=161)   **37.9%**

Prescribing

Disease → treatment

Disease
+
Patient
- Functional status
- Cognitive status
- expectancy
- Geriatric syndromes
- **Patient's preferences**

Comprehensive Geriatric Assessment

→ **Appropriate drug treatment**

CGA and Appropriate Medication Use

Author	Population	Intervention	Results
Owens (1990)	436 hospitalized older adults	Multidisciplinary team approach	Patients in the intervention group took fewer medications than controls (5.3 vs. 5.9) and fewer inappropriate medications (20% vs. 37%).
Schmader (2004)	834 frail hospitalized patients	CGA and management	35% reduction in the risk of a serious adverse drug reaction compared with usual care. Inpatient geriatric unit care reduced unnecessary and inappropriate drug use and underuse significantly.
Crotty (2004)	154 nursing home residents	Multidisciplinary case conferences	Medication appropriateness improved in the intervention group compared with the control group.
Saltvedt (2005)	254 hospitalized patients	Geriatric evaluation and management	Fewer intervention than control group patients had potential drug-drug interactions
Lampela (2010)	644 older adults living in the community	Comprehensive geriatric assessment and management	Reduction in the prescription of CNS active drugs and inappropriate drugs in the intervention group.

Onder et al. Curr Drug Metabolism 2011

RCT on Pharmacists Working in the GEMU → Meds Review + CGA

Author	Population	Design	Intervention	Results
Klopotowska et al. [16]	115 patients in ICU (mean age 63 years)	RCT	Hospital pharmacist reviewed medication orders for patients admitted to the ICU and discussed those during patient review meetings with the attending ICU physicians	Preventable adverse drug events were reduced from 4.0 per 1,000 monitored patient-days during the baseline period to 1.0 per 1,000 monitored patient-days during the intervention period ($P = 0.25$).
Schnipper et al. [17]	322 in-hospital patients (62% age >60 years)	RCT	Computerised medication reconciliation tool and process redesign involving physicians, nurses and pharmacists	Adverse drug events rate was 1.44 per patient among control patients and 1.05 per patient among intervention patients (adjusted relative risk, 0.72; 95% CI: 0.52–0.99)
Kucukarslan et al. [18]	165 in-hospital patients (mean age 55 years)	RCT	Rounding team including a pharmacist	Rate of preventable adverse drug events was reduced by 78%, from 26.5 per 1000 hospital days to 5.7 per 1,000 hospital days
Leape et al. [19]	75 patients in ICU	RCT	A senior pharmacist made rounds with the ICU team and remained in the ICU for consultation in the morning and was available on call throughout the day	The rate of preventable ordering adverse drug events decreased by 66%, from 10.4 per 1,000 patient-days (95% confidence interval CI: 7–14) before the intervention to 3.5 (95% CI: 1–5; $P < 0.001$) after the intervention. In the control unit, the rate was essentially unchanged during the same time periods: 10.9 (95% CI: 6–16) and 12.4 (95% CI: 8–17) per 1,000 patient-days

Onder G et al. Age Ageing 2013

Conclusion

1. Polypharmacy is common in LTC

2. Lack of indications for the treatment of complex older adults

3. CGA and management is a valuable instrument to improve quality of prescribing and reduce polypharmacy

4. Patient´s preferences should be included in the prescribing process (therapeutic alliance)

Your numerous prescriptions really have improved my love life. I'm dating my pharmacist!

Thank you