Reduction of Antihypertensive Treatment in Nursing Home Residents

- Source: The New England Journal of Medicine (NEJM), 2025
- Presenter: Parsa Sheviklou

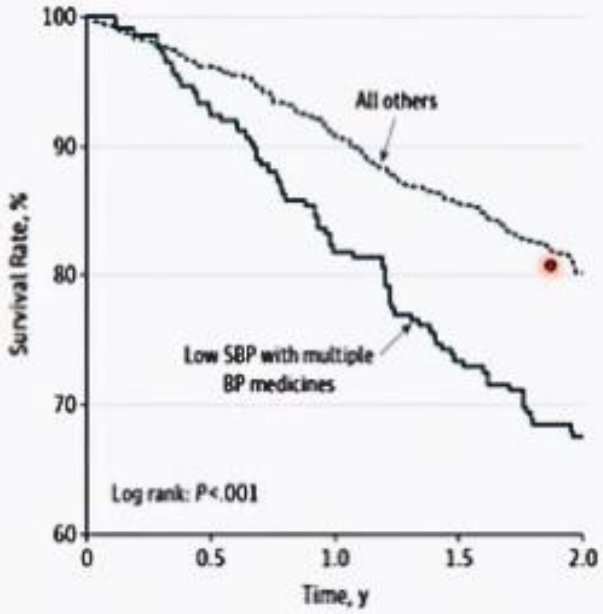
- A randomized, open-label clinical trial
  evaluating antihypertensive deprescribing in frail elderly patients.

Background

- Hypertension control reduces cardiovascular risk in general adults.
- Frail older adults are often excluded from major trials.
- Observational data (e.g., PARTAGE study) showed low BP (<130 mmHg) in frail elders increases mortality.

PARTAGE observational study: Patients aged 80+ living in Nursing Homes

Kaplan-Meier Survival Curves in Patients With Low Systolic Blood Pressure (SBP) Receiving Multiple BP Medicines and All Other Groups



Two-fold increase in mortality in the group with SBP<130mmHg with >1 antihypertensive medications

Benetos A. et al, *JAMA Int Med* 2015

Question

- ***Should we reduce antihypertensive therapy in nursing home residents with low BP?***

Objective

- **To determine whether progressive reduction of antihypertensive drugs lowers all-cause mortality compared with usual care in frail elderly patients**.

Study Design

- **Type:** Multicenter, randomized, open-label controlled trial.
- **Location:** 108 nursing homes in France.
- **Participants:** ≥80 years, frailty, SBP <130 mmHg, ≥2 antihypertensive drugs, resided in a nursing home
- **Groups**: Step-down vs. Usual Care.
- **Follow-up:** Up to 4 years.

Endpoints

- **Primary endpoint:** All-cause mortality
- **Secondary Endpoints**: major adverse cardiovascular events, the change from baseline in functional capacity , the number of fractures, the number of falls, the change from baseline to the last trial visit in the total number of medications, the change from baseline to the last trial visit in the number of antihypertensive drugs, COVID-19 death

Step-down Intervention Protocol

- Progressive discontinuation based on predefined algorithm.
- One drug withdrawn per visit (every 3–6 months).
- BP monitored closely; reintroduce last drug if SBP ≥160 mmHg.
- Beta-blockers and diuretics tapered gradually.

Statistical Analysis

- Sample size: 550 participants per group would provide at least 80% power to detect a 25% lower risk of a primary end-point event (hazard ratio, 0.75)
- General Principles: Intention to treat and hierarchical testing
- Primary End point: survival analysis based on a cox proportional-hazards regression model
- Secondary End points: Survival analysis with competing risk or mixed model repeated-measures analysis of variances

Participants (Baseline Data)

- **Total randomized:** 1,048 (528 step-down, 520 usual care).
- **Mean age:** 90 years; 80% women.
- **Mean SBP:** 113 mmHg.
- **Mean number of antihypertensive drugs**: 2.5
- 38% had severe or very severe frailty (CFS 7–8)

Table 1. Characteristics of the Patients at Baseline (Intention-to-Treat Population).*

Characteristic	Step-Down Strategy (N=528)	Usual Care (N=520)	Total (N=1048)
Age — yr	90.0±4.8	90.1±5.3	90.1±5.0
Female sex — no. (%)	423 (80.1)	423 (81.3)	846 (80.7)
Weight — kg†	64.9±14.8	65.2±15.0	65.1±14.9
Height — m‡	1.59±0.09	1.58±0.09	1.59±0.09
Body-mass index§	25.9±5.6	26.3±5.8	26.1±5.7
Systolic blood pressure — mm Hg¶	113±11	114±11	114±11
Diastolic blood pressure — mm Hg¶	65±10	65±10	65±10
Heart rate — beats/min¶	72±12	71±12	71±12
MMSE score‖	13.5±10.0	13.3±10.1	13.4±10.0
ADL score**	3.1±2.0	3.2±2.0	3.1±2.0
SPPB score††	1.2 ±1.9	1.2 ±2.0	1.2 ±1.9
EQ-5D-3L questionnaire score ‡‡	0.431±0.407	0.468±0.398	0.449±0.403
Peak muscular force — kg§§	11.7±6.4	12.0±6.8	12.0±6.8
Clinical Frailty Scale score — no./total no. (%)¶¶			
1, 2, or 3	47/525 (9.0)	52/514 (10.1)	99/1039 (9.5)
4 or 5	147/525 (28.0)	164/514 (31.9)	311/1039 (29.9)
6	118/525 (22.5)	111/514 (21.6)	229/1039 (22.0)
7 or 8	213/525 (40.6)	187/514 (36.4)	400/1039 (38.5)
Medications‖‖			
No. of list 1 and list 2 antihypertensive medications	2.6±0.7	2.5±0.7	2.5±0.7
No. of concomitant medications	6.7±3.2	6.7±2.8	6.7±3.0

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Clinical characteristics at baseline (2)

	Step-down strategy N=528	Usual care N=520	Total N=1048
Medical history and risk factors			
Atrial fibrillation — no. (%)	211 (40.0)	202 (38.8)	413 (39.4)
Peripheral arterial disease — no. (%)	52 (9.8)	49 (9.4)	101 (9.6)
Chronic heart failure — no. (%)	128 (24.2)	118 (22.7)	246 (23.5)
Coronary heart disease — no. (%)	100 (18.9)	101 (19.4)	201 (19.2)
Stroke — no. (%)	97 (18.4)	103 (19.8)	200 (19.1)
Transient Ischemic attack — no. (%)	30 (5.7)	35 (6.7)	65 (6.2)
Dementia — no. (%)	252 (47.7)	229 (44.0)	481 (45.9)
Parkinson's disease — no. (%)	14 (2.7)	20 (3.8)	34 (3.2)
Other neurological diseases — no. (%)	97 (18.4)	108 (20.8)	205 (19.6)
Severe mobility impairment* — no. (%)	238 (45.1)	237 (45.6)	475 (45.3)
Diabetes — no. (%)	123 (23.3)	122 (23.5)	245 (23.4)
Diabetic nephropathy — no. (%)	10 (1.9)	18 (3.5)	28 (2.7)
Severe renal insufficiency — no. (%)	25 (4.7)	29 (5.6)	54 (5.2)
Current smoker — no. (%)	19 (3.6)	5 (1.0)	24 (2.3)
Dyslipidemia — no. (%)	152 (28.8)	158 (30.4)	310 (29.6)
Cancer — no. (%)	133 (25.2)	121 (23.3)	254 (24.2)
Surgical history — no. (%)	435 (82.4)	422 (81.2)	857 (81.8)
Fracture previous 12 months — no./total no. (%)	28/515 (5.4)	33/506 (6.5)	61/1021 (6.0)

Results: BP and Medication Changes

- **Mean antihypertensive drugs**:

  Step-down: 2.6 → 1.5

  Usual care: 2.5 → 2.0

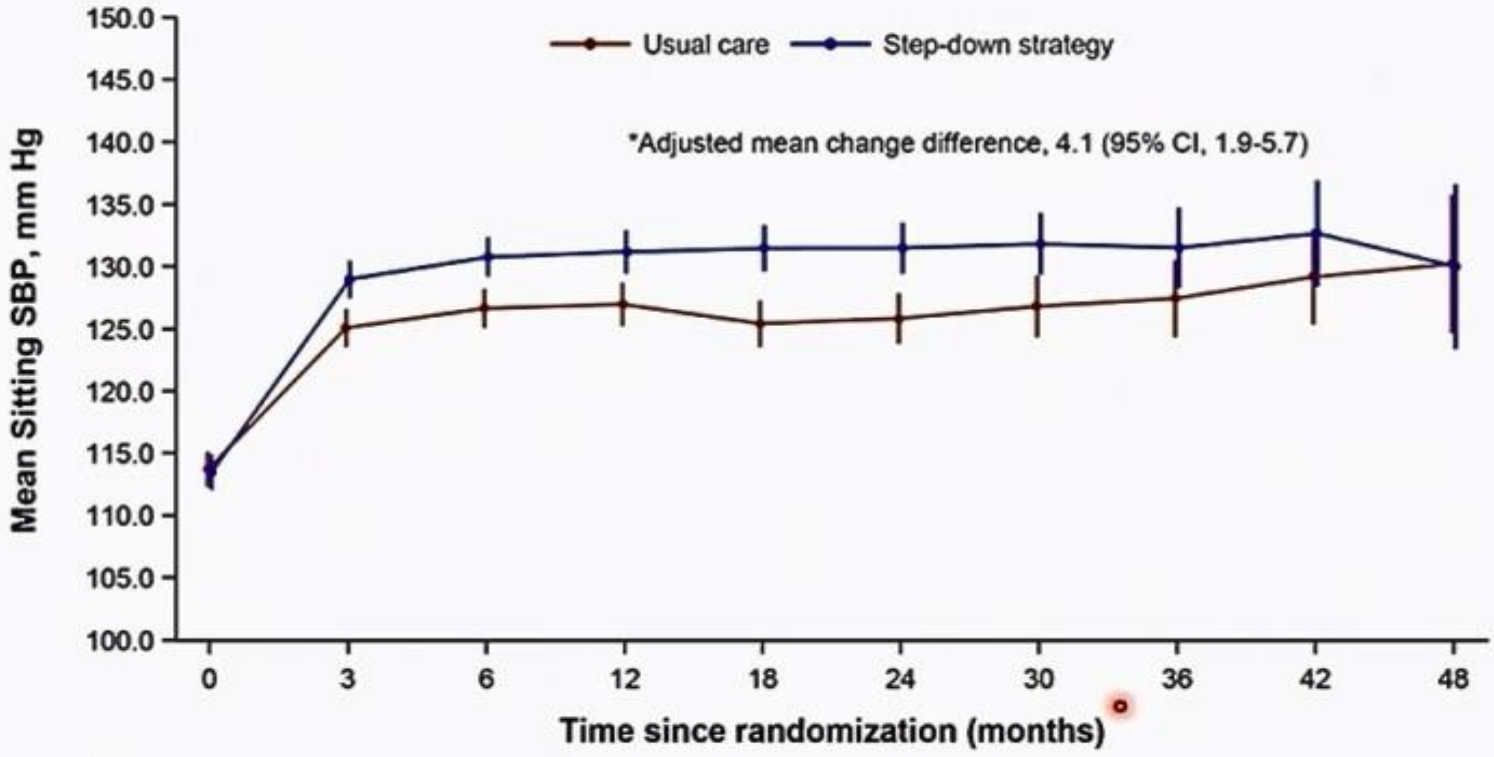
- **Mean SBP difference**: **+4.1 mmHg** (Step-down higher).
- Drug reduction achieved without major BP rebound.

Number of medications at baseline and at the last follow-up visit

Table 2. Medications at Baseline and at the Last Follow-up Visit.*

Medications	Step-Down Strategy (N=528)	Usual Care (N=520)	Total (N=1048)
At baseline — no.			
List 1 antihypertensive medications	1.8±0.8	1.8±0.7	1.8±0.8
List 2 antihypertensive medications	0.7±0.7	0.7±0.7	0.7±0.7
List 1 and list 2 antihypertensive medications	2.6±0.7	2.5±0.7	2.5±0.7
Concomitant medications	6.7±3.2	6.7±2.8	6.7±3.0
All medications	9.3±3.4	9.3±2.9	9.3±3.2
At last follow-up visit — no.			
List 1 antihypertensive medications	0.5±0.7	1.2±0.9	0.8±0.9
List 2 antihypertensive medications	1.1±1.0	0.8±0.9	0.9±0.9
List 1 and list 2 antihypertensive medications	1.5±1.1	2.0±1.1	1.8±1.1
Concomitant medications	6.8±3.7	6.6±3.5	6.7±3.6
All medications	8.3±4.1	8.6±3.8	8.5±3.9

SBP over the follow-up period



Number of Patients										
Usual care	520	446	408	338	284	230	149	92	59	27
Step-down strategy	528	463	409	353	290	237	147	86	47	19

Primary Outcome: Mortality

- **Death from any cause:**

  Step-down: 61.7%

  Usual care: 60.2%

- **Adjusted Hazard Ratio**: 1.02 (95% CI, 0.86–1.21; P=0.78).
- → ***No significant difference in mortality***

Secondary Outcomes

- **No difference** in:
  - Major cardiovascular events (HR 1.15; CI 0.84–1.56)
  - Falls (~50% both groups)
  - Fractures (8% vs 9%)
  - Cognitive and functional scores
- **COVID-19** deaths **fewer in step-down group** (6 vs 16).

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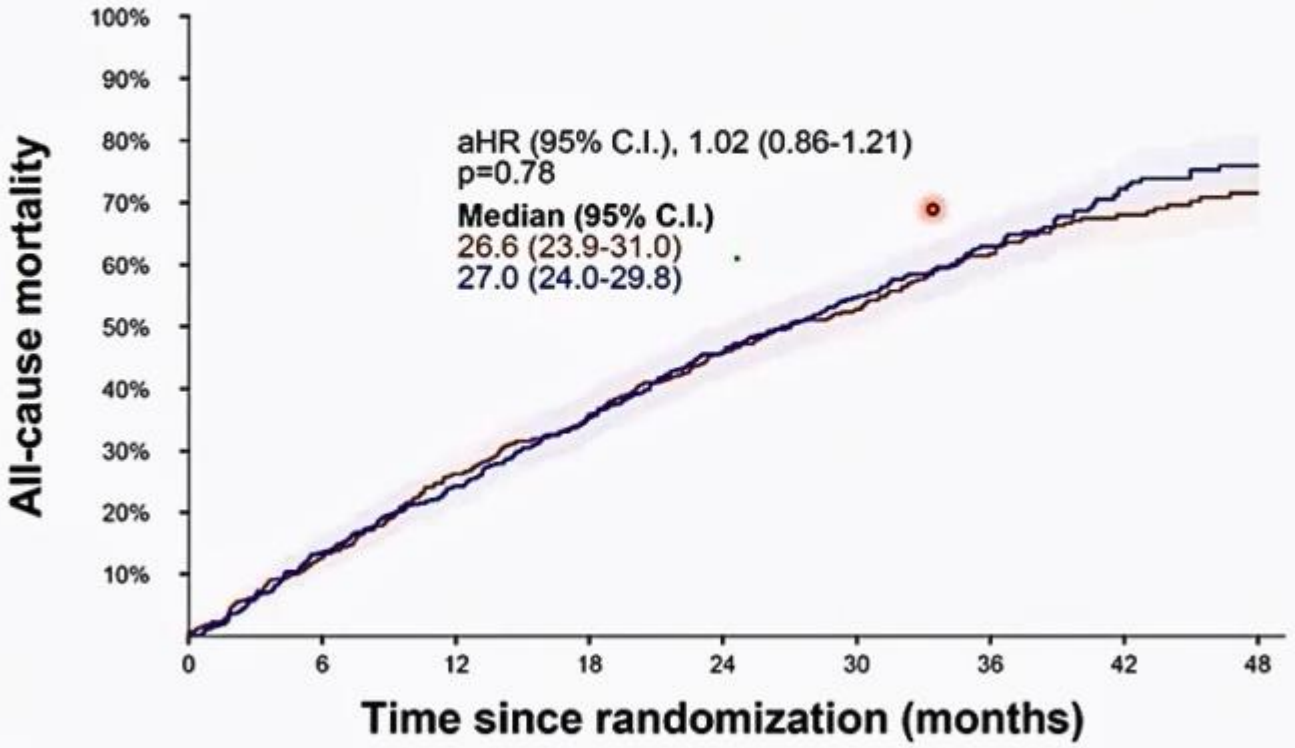
Time-to-event analysis of the primary end point.

The Kaplan–Meier curves for the primary end point (all-cause mortality) show a median survival of 27.0 (24.0-29.8) months in the step-down strategy group and 26.6 (23.9-31.0) months in the usual care group.



No. at Risk

Usual care	520	446	374	325	266	175	107	62	8
Step-down strategy	528	446	387	330	267	172	101	51	8

Table 3. Primary and Secondary End Points.

End Points	Step-Down Strategy (N=528)	Usual Care (N=520)	Adjusted Effect Measure (95% CI)*	P Value†
Primary end point: death from any cause				
Intention-to-treat analysis — no. (%)	326 (61.7)	313 (60.2)	1.02 (0.86–1.21)‡	0.78
Per-protocol analysis — no./total no. (%)§	311/499 (62.3)	305/497 (61.4)	1.04 (0.87–1.23)‡	
Secondary end points				
Death from noncardiovascular causes — no. (%)	284 (53.8)	278 (53.5)	1.00 (0.83–1.19)¶	
Acute heart failure — no. (%)	67 (12.7)	57 (11.0)	1.19 (0.80–1.78)‖	
No. of falls	0.81 (2.08)	0.71 (2.21)	1.14 (0.84–1.51)**	
No. of fractures	0.03 (3.71)	0.04 (3.32)	0.80 (0.51–1.26)**	
Death from Covid-19 — no. (%)	6 (1.1)	16 (3.1)	0.38 (0.10–1.00)††	
Composite of major adverse cardiovascular events — no. (%)‡‡	102 (19.3)	90 (17.3)	1.15 (0.84–1.56)§§	

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Number of serious adverse events (SAE)

	Step-down strategy N=528	Usual care N=520	Total N=1048
Total number of SAE * — no.	**132**	**128**	**260**
Infectious diseases	45	49	94
Pulmonary and respiratory diseases (other than infectious)	21	21	42
Cancers	14	16	30
Alteration of general health status and anemias (not bleeding-related)	17	15	32
Bleeding	12	13	25
Gastrointestinal diseases	14	7	21
Neurological diseases	5	2	7
Other	4	5	9

Strengths & Limitations

- Strengths:
  - Large, multicenter RCT
  - Real-world frail population
  - Long follow-up

- Limitations:
  - Conducted only in France
  - Open-label design
  - Potential crossover in control group.

Conclusion

- Step-down antihypertensive therapy ***did not reduce mortality***.
- Trial suggest that step-down strategy is unlikely to have a clinically relevant effect on functional capacity and all-cause mortality.
- Clinical decisions should be individualized based on frailty and quality of life.

Thank you for your attention.

“Deprescribing is safe — but not necessarily lifesaving.”