# Orthostatic Hypotension: An Update

tilda Staidéar Fadaimseartha na hEireann um Dhul in Aois The Irish Longitudinal Study on Ageing

FASU

Dr Robert Briggs

## Case Presentation

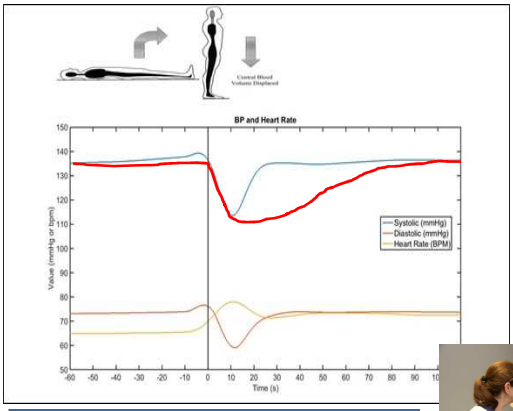
FASU

- 81 y/o man
- Syncope x1: Getting up to PU in morning, rose quickly, dizzy, fell back onto bed, ? LOC x seconds
- 'Muzzy' head, particularly in mornings
- Denies any dizziness
- 'Walking like I'm drunk' (No C2H5)

## Case Presentation, Cont'd

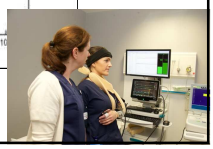
FASU

- PMHx: IHD, HTN, Depression, BPH
- Meds: Aspirin 75mg, Atorvastatin 40mg, Amlodipine 10mg, Bisoprolol 5mg, Citalopram 10mg, Tamsulosin 400 mcg
- BP 128/70
- ROS: decline in cognition in recent months, has been referred to Day Hospital




FASU

Sustained drop of ≥ 20 mmHg sBP or ≥ 10 mmHg dBP within 3 mins standing



## Orthostatic Hypotension: An Update

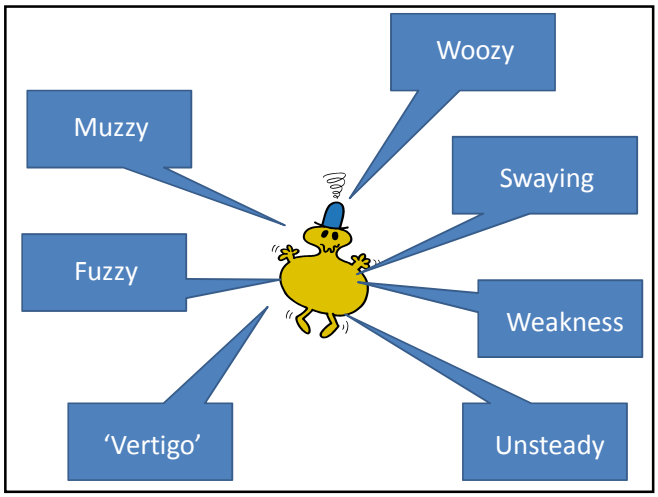
- Clinical Presentation of OH
  - OH & mobility
- How is OH linked with Cognition and Depression?
- Evidence –based OH management

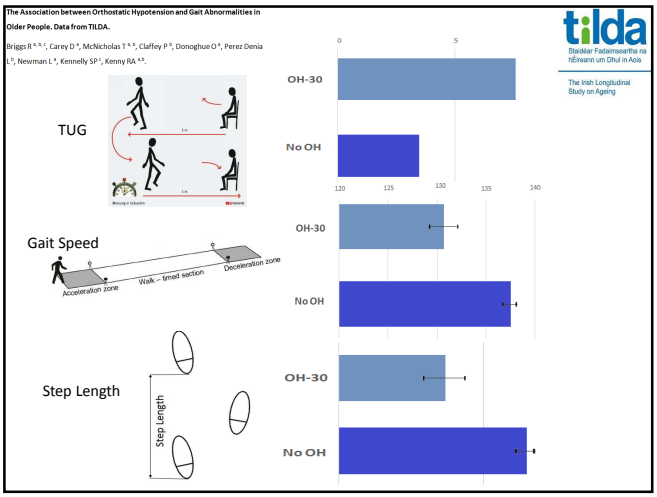
## Syncope due to OH

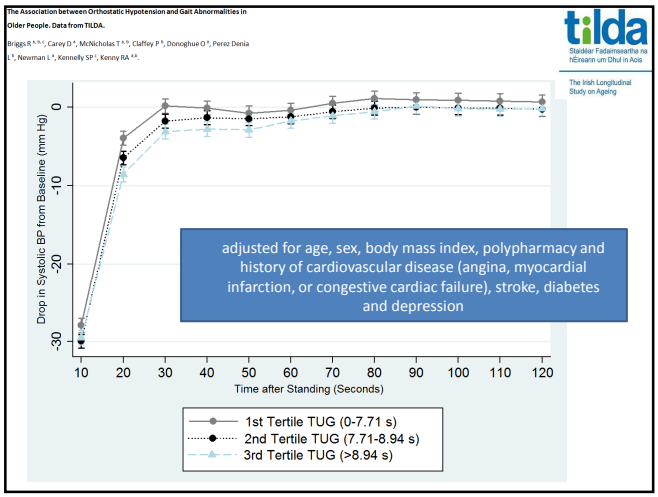
- After postural change
- Prolonged standing
- Standing after exertion
- Post-prandial
- Temporal relationship with BP meds
- Presence of Autonomic Neuropathy / PD

ESC European Society of Cardiology

European Heart Journal (2018) 39, 1883–1948
doi:10.1093/eurheartj/ehy037

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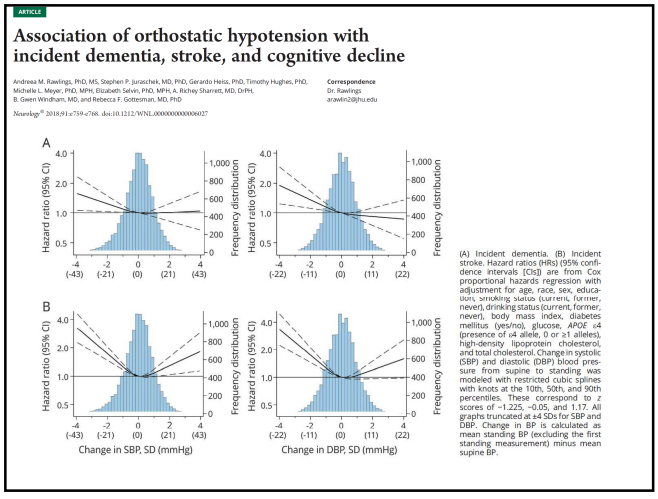

ARTICLE

**Association of orthostatic hypotension with incident dementia, stroke, and cognitive decline**

Andreea M. Rawlings, PhD, MS, Stephen P. Juraschek, MD, PhD, Gerardo Heiss, PhD, Timothy Hughes, PhD, Michelle L. Meyer, PhD, MPH, Elizabeth Selvin, PhD, MPH, A. Richey Sharrett, MD, DrPH, B. Gwen Windham, MD, and Rebecca F. Gottesman, MD, PhD

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*Neurology*® 2018;91:e759-e768. doi:10.1212/WNL.0000000000006027




(A) Incident dementia. (B) Incident stroke. Hazard ratios (HRs) (95% confidence intervals [CIs]) are from Cox proportional hazards regression with adjustment for age, race, sex, education, smoking status (current, former, never), drinking status (current, former, never), body mass index, diabetes mellitus (yes/no), glucose, *APOE* ε4 (presence of ε4 allele, 0 or ≥1 alleles), high-density lipoprotein cholesterol, and total cholesterol. Change in systolic (SBP) and diastolic (DBP) blood pressure from supine to standing was modeled with restricted cubic splines with knots at the 10th, 50th, and 90th percentiles. These correspond to *z* scores of −1.225, −0.05, and 1.17. All graphs truncated at ±4 SDs for SBP and DBP. Change in BP is calculated as mean standing BP (excluding the first standing measurement) minus mean supine BP.

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**Table 2** HR (95% CI) for OH with incident dementia and incident ischemic stroke

| | Events/No. (%) | Unadjusted | Model 1 | Model 2 |
|---|---|---|---|---|
| **Dementia** | | | | |
| No OH | 999/11,156 (9.0) | 1 (reference) | 1 (reference) | 1 (reference) |
| OH | 69/552 (12.5) | 2.29 (1.79–2.92)[a] | 1.64 (1.28–2.09)[a] | 1.54 (1.20–1.97)[a] |
| **Ischemic stroke** | | | | |
| No OH | 758/11,157 (6.8) | 1 (reference) | 1 (reference) | 1 (reference) |
| OH | 84/552 (15.2) | 3.14 (2.50–3.93)[a] | 2.43 (1.93–3.05)[a] | 2.08 (1.65–2.62)[a] |
| **Censoring stroke events** | | | | |
| No OH | 866/11,156 (7.8) | 1 (reference) | 1 (reference) | 1 (reference) |
| OH | 57/552 (10.3) | 2.21 (1.69–2.89)[a] | 1.55 (1.18–2.03)[a] | 1.45 (1.10–1.90)[a] |

Abbreviations: CI = confidence interval; HR = hazard ratio; OH = orthostatic hypotension.
Model 1: adjusted for age, race-center, sex, education. Model 2: model 1 plus adjustment for smoking status (current, former, never), drinking status (current, former, never), body mass index, diabetes mellitus (yes/no based on self-reported diagnosis, medication use, or fasting glucose ≥126 mg/dL), glucose, hypertension status (no hypertension, prehypertension, and hypertension), *APOE* ε4 (presence of ε4 allele, 0 or ≥1 alleles), total cholesterol, and high-density lipoprotein cholesterol. $p < 0.0001$ for all likelihood ratio tests comparing model 1 nested within model 2.
[a] $p < 0.01$.

## Is Baseline Orthostatic Hypotension Associated With a Decline in Global Cognitive Performance at 4-Year Follow-Up? Data From the Irish Longitudinal Study on Ageing (TILDA)

Triona McNicholas, MB, BCH, BAO; Katy Tobin, PhD; Daniel Carey, PhD; Susan O'Callaghan, MB, BCH, BAO; Rose Anne Kenny, MD

**Table 3.** Change in Global Cognition Between Waves for All Ages Based on Baseline OH40 and OH110

| | OH40 | | OH110 | |
|---|---|---|---|---|
| | IRR (95% CI) | *P* Value | IRR (95% CI) | *P* Value |
| Full cohort, N=3338 | | | | |
| Model A | 1.12 (1.04, 1.21) | 0.004* | 1.17 (1.04, 1.31) | 0.007* |
| Model B | 1.05 (0.97, 1.14) | 0.205 | 1.11 (0.99, 1.25) | 0.065* |
| Model C | 1.09 (0.99, 1.20) | 0.067 | 1.17 (1.02, 1.33) | 0.028* |
| Age 50 to 64 y, N=2267 | | | | |
| Model A | 1.09 (0.96, 1.24) | 0.170 | 1.22 (1.01, 1.47) | 0.038* |
| Model B | 1.09 (0.96, 1.24) | 0.197 | 1.22 (1.02, 1.48) | 0.034* |
| Model C | 1.13 (0.98, 1.31) | 0.104 | 1.25 (1.01, 1.57) | 0.048* |
| Age ≥65 y, N=1071 | | | | |
| Model A | 1.05 (0.95, 1.17) | 0.306 | 1.06 (0.92, 1.22) | 0.441 |
| Model B | 1.02 (0.92, 1.13) | 0.688 | 1.05 (0.90, 1.21) | 0.549 |
| Model C | 1.05 (0.92, 1.19) | 0.459 | 1.09 (0.91, 1.30) | 0.370 |

Model A—Univariate; Model B—Controls for age, sex, and education; Model C—Controls for all covariates—age, sex, education level, self-reported cardiovascular conditions, diabetes mellitus, alcohol use, smoking status, medications, depression, frailty, mean blood pressure, pulse pressure height, and baseline heart rate. CI indicates confidence interval; IRR, incidence rate ratio; OH110, orthostatic hypotension sustained to 110 s; OH40, orthostatic hypotension sustained to 40 s.
*Statistically significant *P* values.

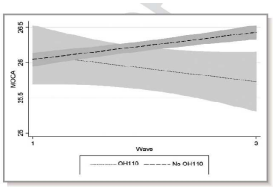
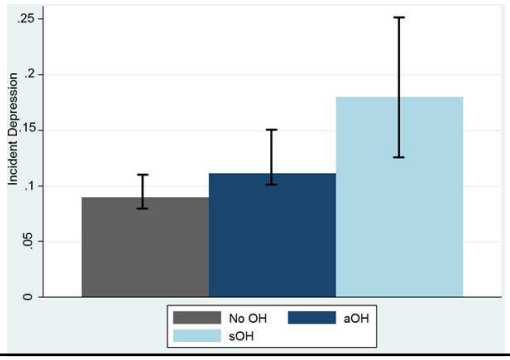



**Figure 2.** MOCA at wave 1 and wave 3 with 95% CI by presence of OH110 at wave 1. CI indicates confidence interval; MOCA, Montreal Cognitive Assessment; OH110, orthostatic hypotension sustained to 110 s.

## Original Article

### Longitudinal Association Between Orthostatic Hypotension at 30 Seconds Post-Standing and Late-Life Depression

Robert Briggs, Daniel Carey, Sean P. Kennelly, Rose Anne Kenny

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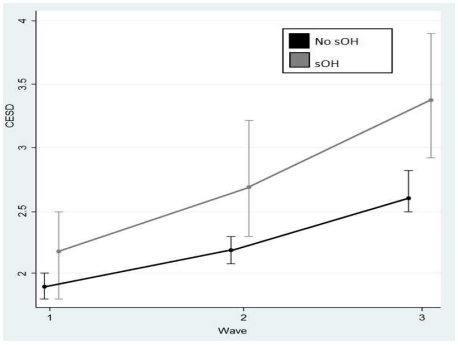


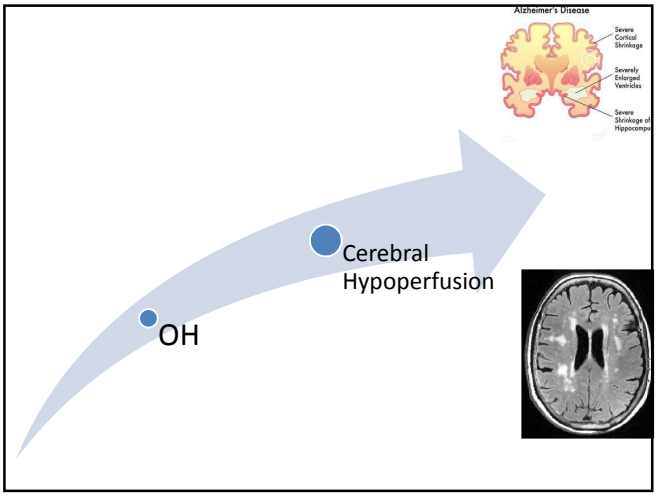


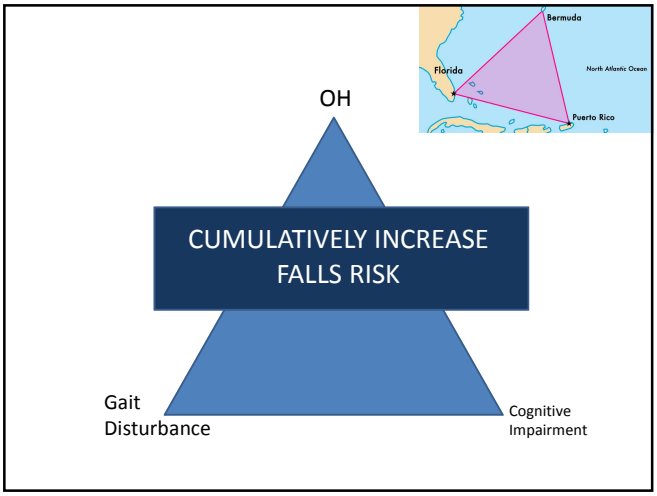


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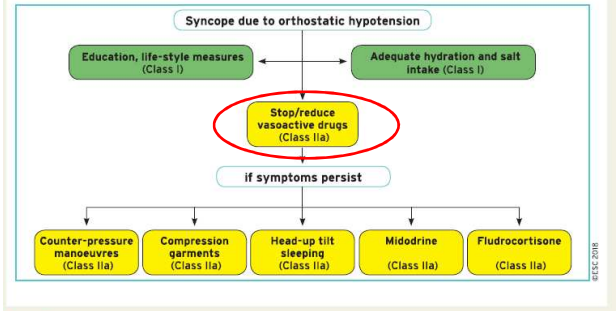


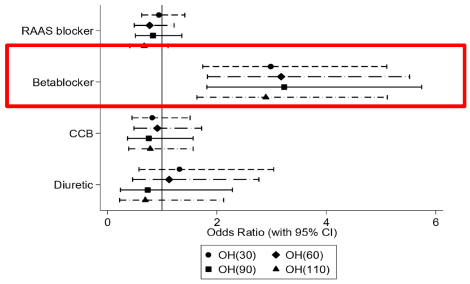

Figure 12 Schematic practical guide for the treatment of orthostatic hypotension.

RESEARCH ARTICLE

## Single Agent Antihypertensive Therapy and Orthostatic Blood Pressure Behaviour in Older Adults Using Beat-to-Beat Measurements: The Irish Longitudinal Study on Ageing

Mark Canney[1,2*], Matthew D. L. O'Connell[1], Catriona M. Murphy[1], Neil O'Leary[1], Mark A. Little[3], Conall M. O'Seaghdha[3], Rose Anne Kenny[1]

1 The Irish Longitudinal Study on Ageing, Trinity College Dublin, Dublin, Ireland, 2 Trinity Health Kidney Centre, Trinity College Dublin, Dublin, Ireland, 3 Department of Renal Medicine, Beaumont Hospital, Dublin, Ireland

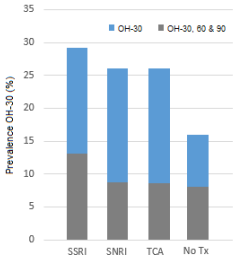


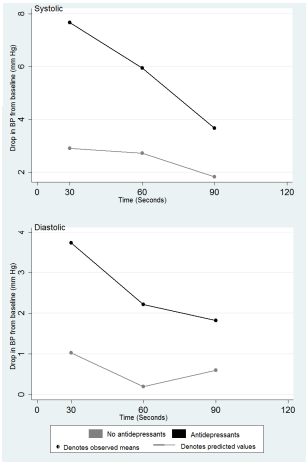

Journal of the American Society of Hypertension ■■ (2018) 1–8

Research Article

## The association between antidepressant use and orthostatic hypotension in older people: a matched cohort study

R. Briggs, MB, BCH, BAO[1,2,3,*], D. Carey, PhD[2], T. McNicholas, MB, BCH, BAO[2,3], P. Claffey, MB, BCH, BAO[2], H. Nolan, PhD[2], S.P. Kennelly, PhD[2], and R.A. Kenny, MD[2,3]




## The efficacy of nonpharmacologic intervention for orthostatic hypotension associated with aging

Julia L. Newton, PhD, and James Frith, PhD

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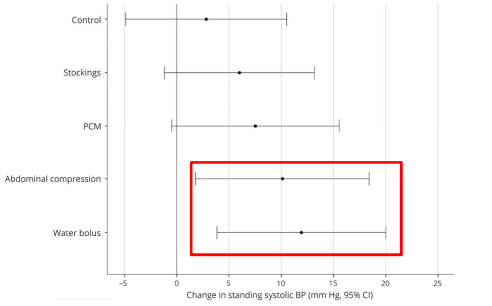
Neurology® 2018;0:1-5. doi:10.1212/WNL.0000000000005994

Figure 2 Change in standing systolic BP




## Back to the case...

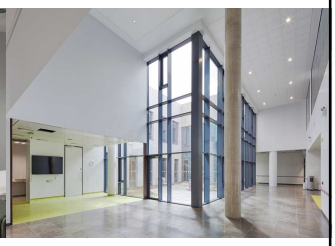
FASU

- Advised increased water and salt intake
- Stopped beta-blocker, aim to titrate down SSRI
- Water bolus in mornings before rising
- Follow-up with BPM

## Conclusion

- Common cause of syncope, clinical pointers to detect
- Longitudinal association with brain health outcomes, cerebral perfusion
- Management: water, salt, rationalise meds in first instance, B-blockers / Antidepressants

# Thank You



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