

Sincopi Ipotensive: diagnosi e terapia

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Disclosures: none

OUTLINE

- Definitions and Diagnosis
- Etiopathogenesis
- Clinical approach
- Causes
- Peculiar issues
- Therapy

Orthostatic Hypotension: decrease of systolic arterial pressure ≥ 20 mmHg or diastolic arterial pressure ≥ 10 mmHg after 3 minutes of standing (sphygmomanometer).

Initial Orthostatic Hypotension : transient decrease of blood pressure within 30 seconds from up-right position (beat by beat blood pressure device)

Delayed Orthostatic Hypotension: progressive decrease of blood pressure from 3 up to 30 minutes after standing (sphygmomanometer and beat by beat pressure devices)

***Orthostatic Intolerance:** Inability to maintain the upright posture because of the onset of physical signs and symptoms due to hypovolemia or occasional/stable abnormalities in the Autonomic Nervous System functioning.*

Orthostatic Intolerance physical signs and symptoms

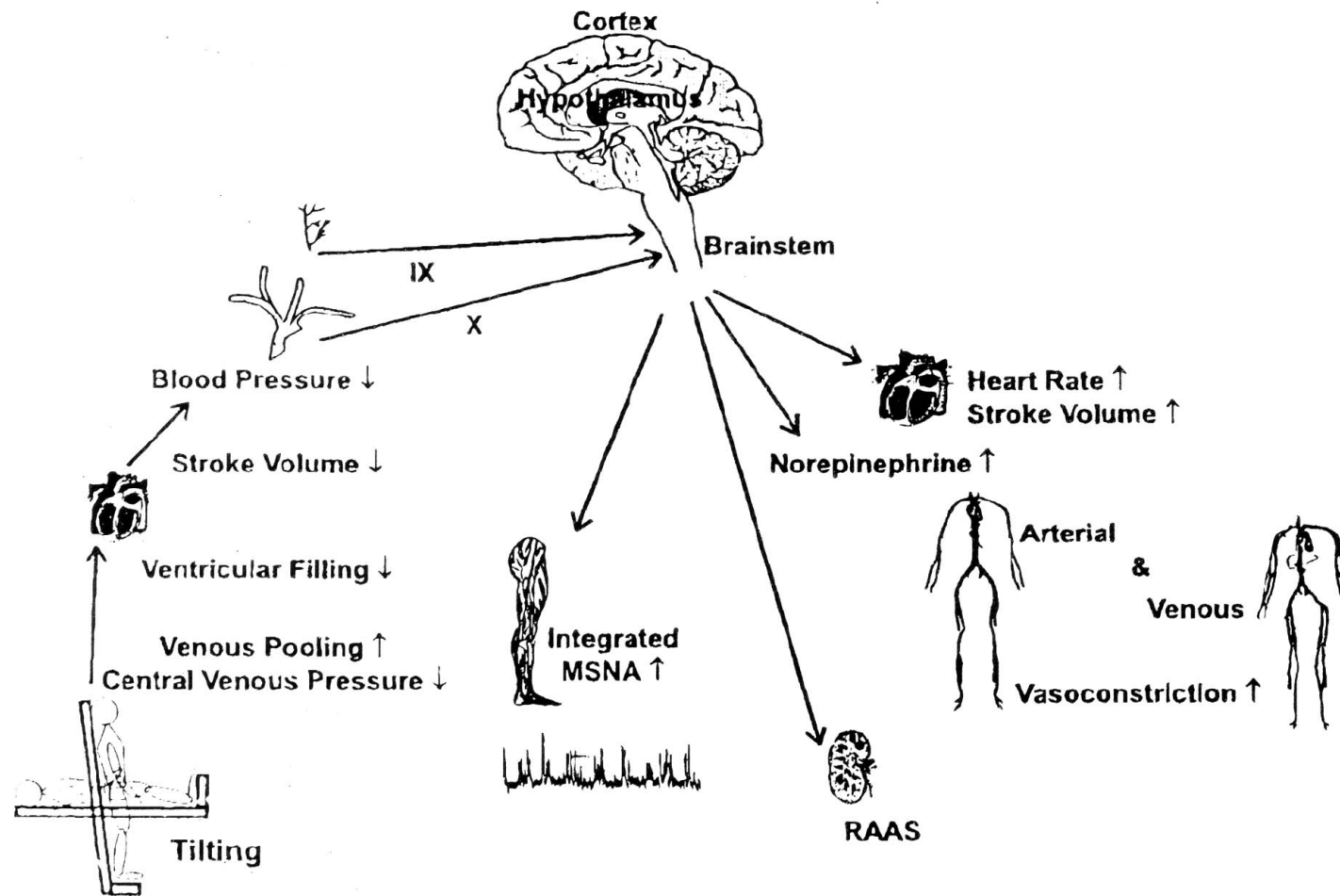
- vertigo
- lightheadedness
- “tunnel” vision
- palpitations
- astenia, fatigue
- sweating
- nausea
- pallor
- syncope
- interscapular pain

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Etiopathogenesis

- *Ipovolemia*
- *Alterations in the cardiovascular autonomic regulation*



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Panel 2: Orthostatic symptom score

The patient is instructed to select appropriate answer.

Frequency of orthostatic symptoms

- 0 I never or rarely experience orthostatic symptoms when I stand up
- 1 I sometimes experience orthostatic symptoms when I stand up
- 2 I often experience orthostatic symptoms when I stand up
- 3 I usually experience orthostatic symptoms when I stand up
- 4 I always experience orthostatic symptoms when I stand up

Schrezenmaier C, Gehrking JA, Hines SM, Low PA, Benrud-Larson LM, Sandroni P. Evaluation of orthostatic hypotension: relationship of a new self-report instrument to laboratory-based measures. *Mayo Clin Proc* 2005; 80: 330–34.

Orthostatic symptom score

Severity of orthostatic symptoms

- 0 I do not experience orthostatic symptoms when I stand up
- 1 I experience mild orthostatic symptoms when I stand up
- 2 I experience moderate orthostatic symptoms when I stand up and sometimes have to sit back down for relief
- 3 I experience severe orthostatic symptoms when I stand up and frequently have to sit back down for relief
- 4 I experience severe orthostatic symptoms when I stand up and regularly faint if I do not sit back down

Schrezenmaier C, Gehrking JA, Hines SM, Low PA, Benrud-Larson LM, Sandroni P. Evaluation of orthostatic hypotension: relationship of a new self-report instrument to laboratory-based measures. *Mayo Clin Proc* 2005; 80: 330–34.

Orthostatic symptom score

Conditions under which orthostatic symptoms occur

- 0 I never or rarely experience orthostatic symptoms under any circumstances
- 1 I sometimes experience orthostatic symptoms under certain conditions, such as prolonged standing, a meal, exertion (eg, walking), or when exposed to heat (eg, hot day, hot bath, hot shower)
- 2 I often experience orthostatic symptoms under certain conditions, such as prolonged standing, a meal, exertion (eg, walking), or when exposed to heat (eg, hot day, hot bath, hot shower)
- 3 I usually experience orthostatic symptoms under certain conditions, such as prolonged standing, a meal, exertion (eg, walking), or when exposed to heat (eg, hot day, hot bath, hot shower)
- 4 I always experience orthostatic symptoms when I stand up; the specific conditions do not matter

Schrezenmaier C, Gehrking JA, Hines SM, Low PA, Benrud-Larson LM, Sandroni P. Evaluation of orthostatic hypotension: relationship of a new self-report instrument to laboratory-based measures. *Mayo Clin Proc* 2005; 80: 330–34.

Orthostatic symptom score

Activities of daily living

- 0 My orthostatic symptoms do not interfere with activities of daily living (eg, work, chores, dressing, bathing)
- 1 My orthostatic symptoms mildly interfere with activities of daily living (eg, work, chores, dressing, bathing)
- 2 My orthostatic symptoms moderately interfere with activities of daily living (eg, work, chores, dressing, bathing)
- 3 My orthostatic symptoms severely interfere with activities of daily living (eg, work, chores, dressing, bathing)
- 4 My orthostatic symptoms severely interfere with activities of daily living (eg, work, chores, dressing, bathing). I am bed-bound or wheelchair-bound because of my symptoms

Schrezenmaier C, Gehrking JA, Hines SM, Low PA, Benrud-Larson LM, Sandroni P. Evaluation of orthostatic hypotension: relationship of a new self-report instrument to laboratory-based measures. *Mayo Clin Proc* 2005; 80: 330–34.

Orthostatic symptom score

Standing time

- 0 On most occasions, I can stand as long as necessary without experiencing orthostatic symptoms
- 1 On most occasions, I can stand more than 15 min before experiencing orthostatic symptoms
- 2 On most occasions, I can stand 5–14 min before experiencing orthostatic symptoms
- 3 On most occasions, I can stand 1–4 min before experiencing orthostatic symptoms
- 4 On most occasions, I can stand less than 1 min before experiencing orthostatic symptoms

Schrezenmaier C, Gehrking JA, Hines SM, Low PA, Benrud-Larson LM, Sandroni P. Evaluation of orthostatic hypotension: relationship of a new self-report instrument to laboratory-based measures. *Mayo Clin Proc* 2005; 80: 330–34.

Orthostatic Symptoms Assessment

modified Vanderbilt *Orthostatic Symptoms Score*
mVOSS

Mental Clouding
Blurred vision
Shortness of breath
Rapid heartbeat
Tremulousness
Chest discomfort
Headache
Lightheadedness
Nausea
Total score

Bourne KM *et al.* Compression Garment Reduces Orthostatic Tachycardia and Symptoms in Patients With Postural Orthostatic Tachycardia Syndrome. *J Am Coll Cardiol* 2021;**77**:285-296. doi: 10.1016/j.jacc.2020.11.040

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Causes

- Aging
- Bed-confinement
- Drugs
- Autonomic Nervous System Dysfunction Syndromes
 - *with Central Nervous System involvement:* Parkinson's disease, Multiple System Atrophy (MSA), brain tumors (medulla, cerebellum, diencephalon)
 - *with Peripheral Nervous System involvement:* Diabetes Mellitus, Alcoholism, Uremic syndrome, Paraneoplastic Neuropathy, Amyloidosis
 - *with post-ganglionic sympathetic neuron involvement:* Pure Autonomic Failure (PAF) , autonomic ganglionopathy

An approach to the evaluation and management of syncope in adults

Steve W Parry, Maw Pin Tan

BMJ | 27 FEBRUARY 2010 | VOLUME 340

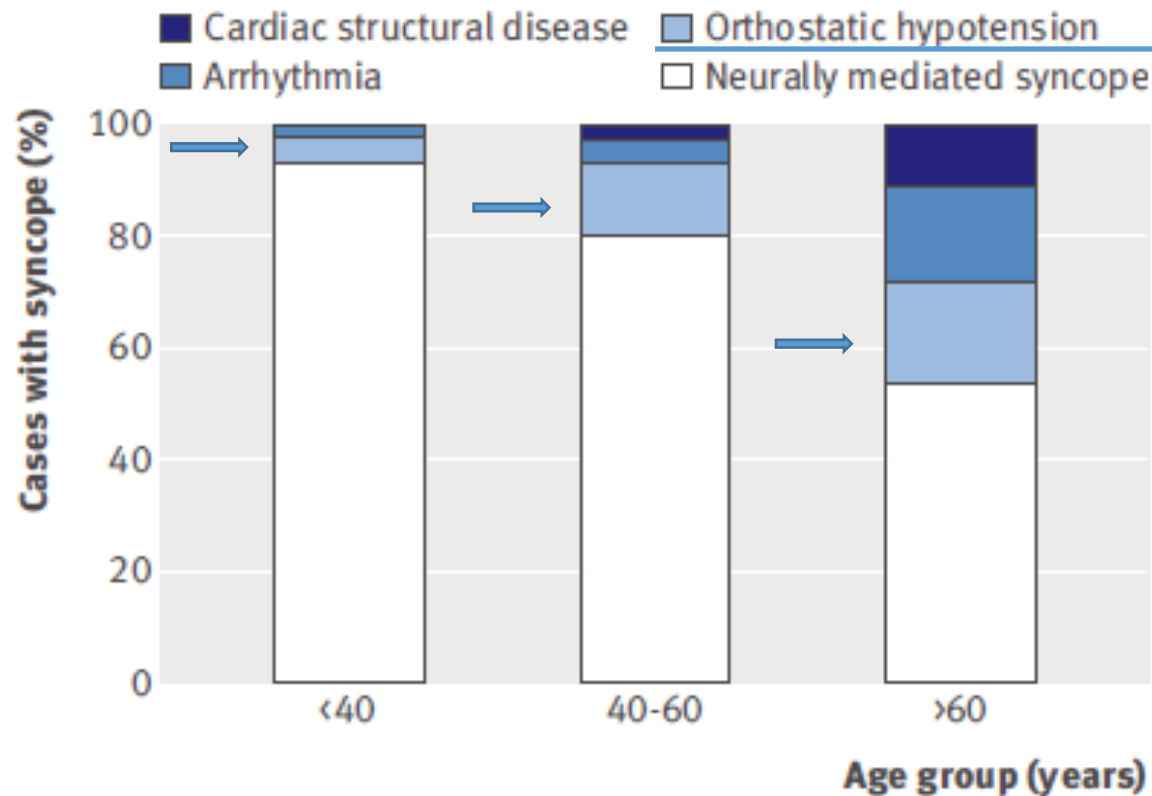


Fig 1 | Causes of syncope by age

Aging

- Orthostatic Hypotension in 7% of normotensive elderly and 30% of aged people suffering from multiple diseases
- Pathophysiological mechanisms
 - left ventricle filling alterations (diastolic dysfunction)
 - alteration in the mechanisms counteracting a reduction in the intravascular volume (renin, aldosterone, angiotensin, vasopressin and feeling of thirsty, atrial natriuretic peptide)
 - ↓
 - reduced baroreceptor sensitivity (↓ chronotropic and vascular α -adrenergic response)
 - cerebral vascular autoregulation abnormalities

Bed Confinement

- Effective plasma volume decline due to its redistribution in the central cardiopulmonary district (pre-load increase, right atrium distension and ANP release)
- Left ventricle remodelling (decrease in left ventricle dimension and cardiac output)
- Legs muscle mass reduction (particularly in the elderly)

Drugs

- Mechanisms

- hypovolemia
- by hampering the sympathetic nervous system vasoconstrictor activity
- by a direct vasodilation (TPR decrease)

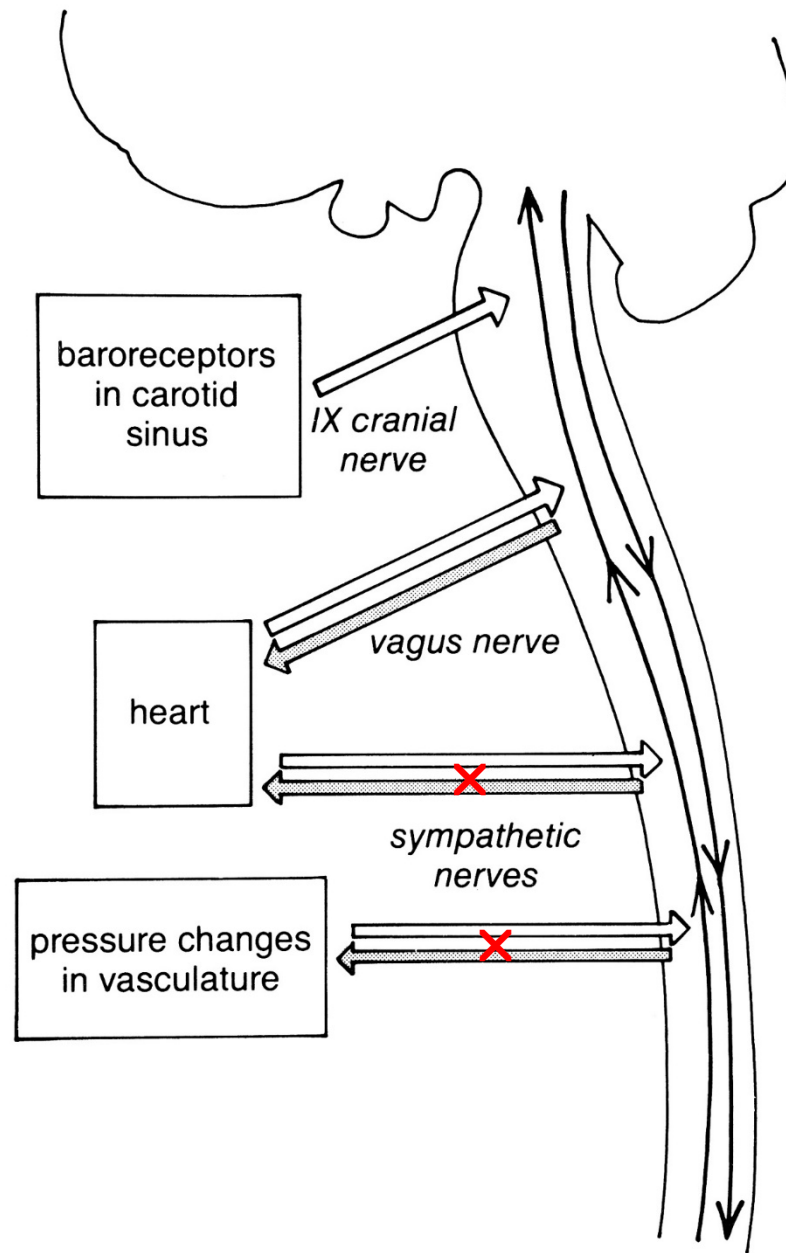
- Classes

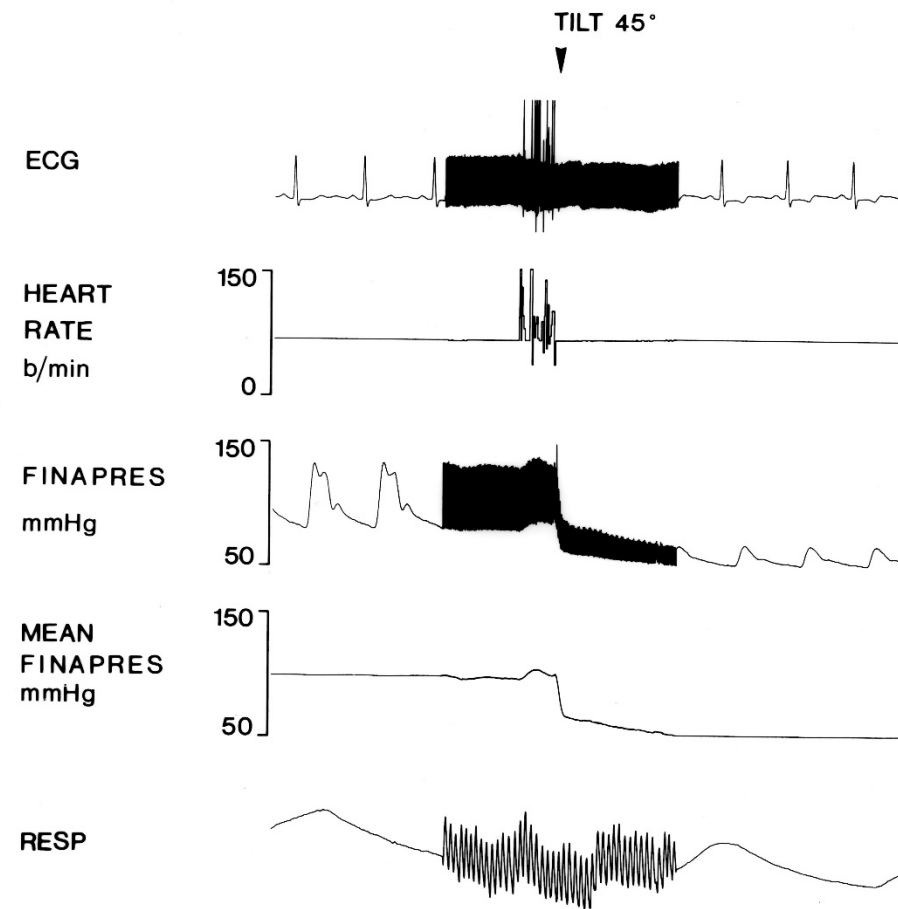
- diuretics
- α -adrenergic blockers, calcium channel blocking agents, nitrates
- tricyclic antidepressants
- levo-Dopa

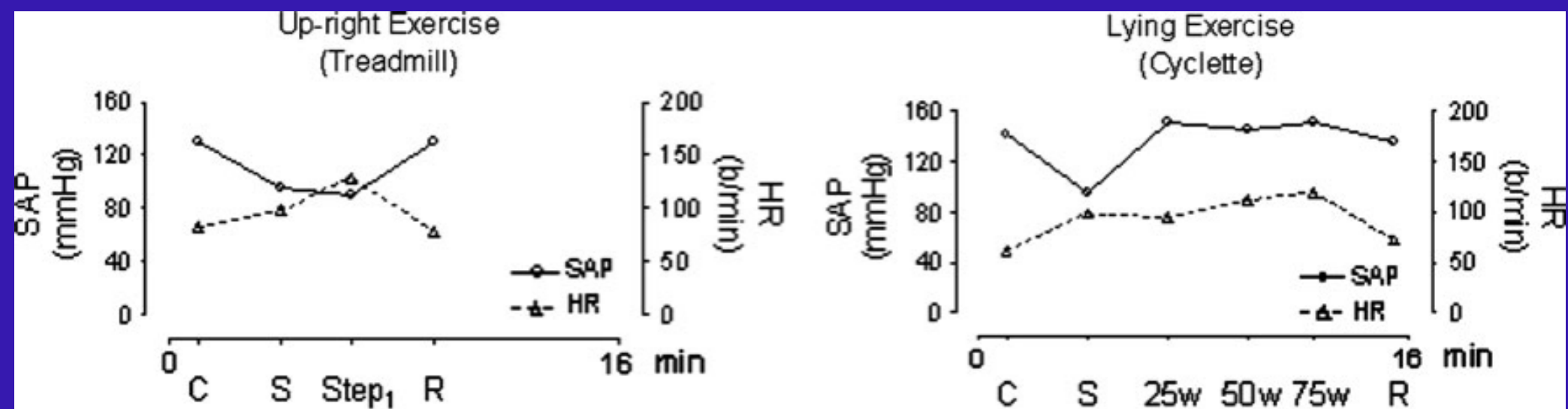
Autonomic Nervous System Dysfunction Syndromes

- *with Central Nervous System involvement:* Parkinson's disease, Multiple System Atrophy (MSA), brain tumors (medulla, cerebellum, diencephalon)
- *with Peripheral Nervous System involvement:* Diabetes Mellitus, Alcoholism, Uremic syndrome, Paraneoplastic Neuropathy, Amyloidosis
- *with post-ganglionic sympathetic neuron involvement:* **Pure Autonomic Failure (PAF)**

PAF



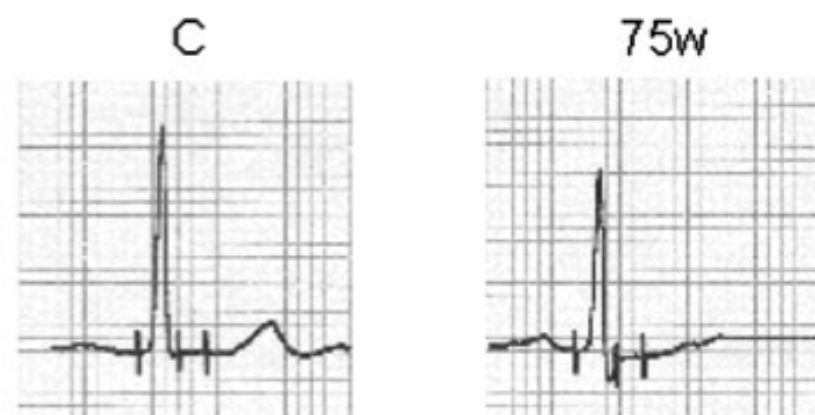
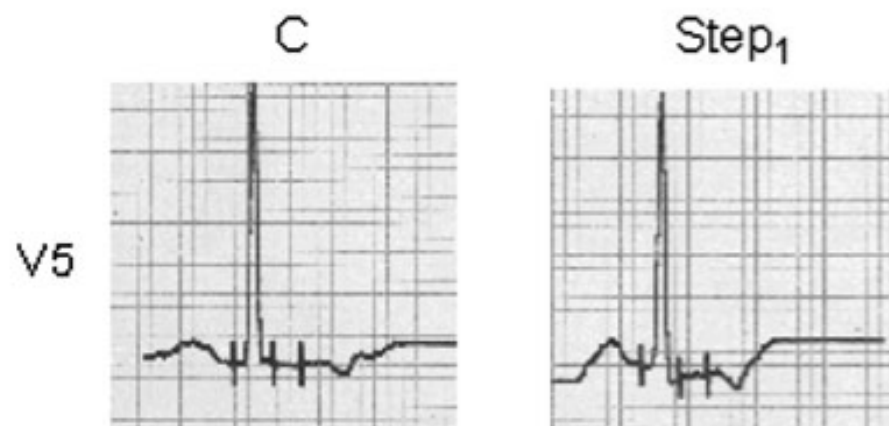




Heart Rate - Systolic Arterial Pressure Product ($HR \times SAP \times 10^{-2}$)

C Step₁
107 116 $\Delta +9$

C 75w
84 178 $\Delta +94$

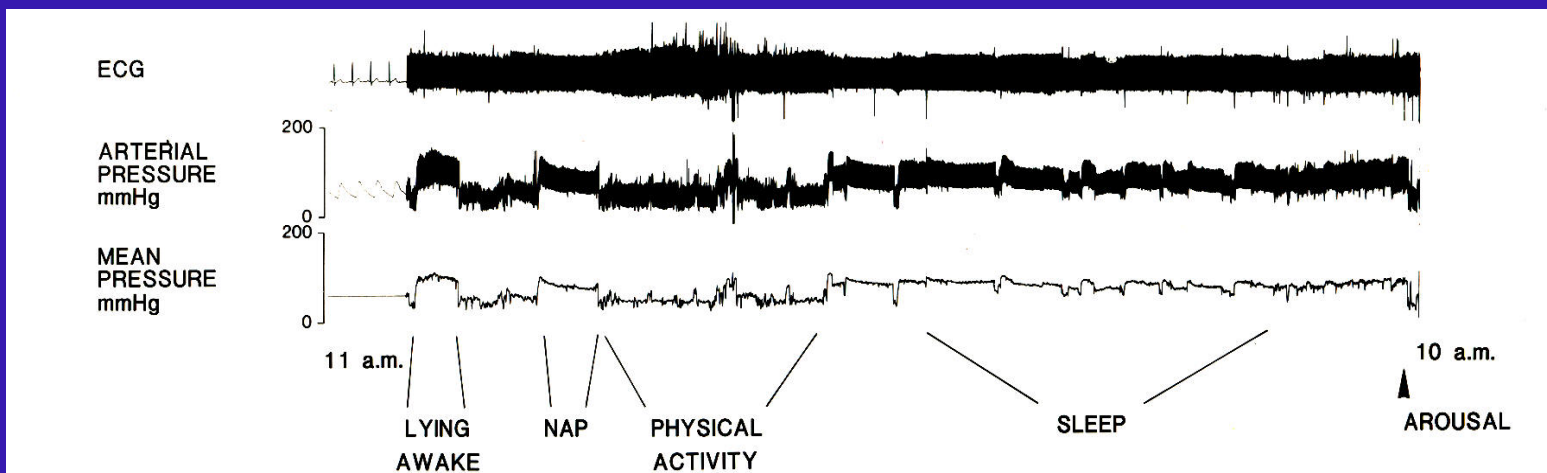


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Orthostatic Hypotension and Clinostatic Hypertension

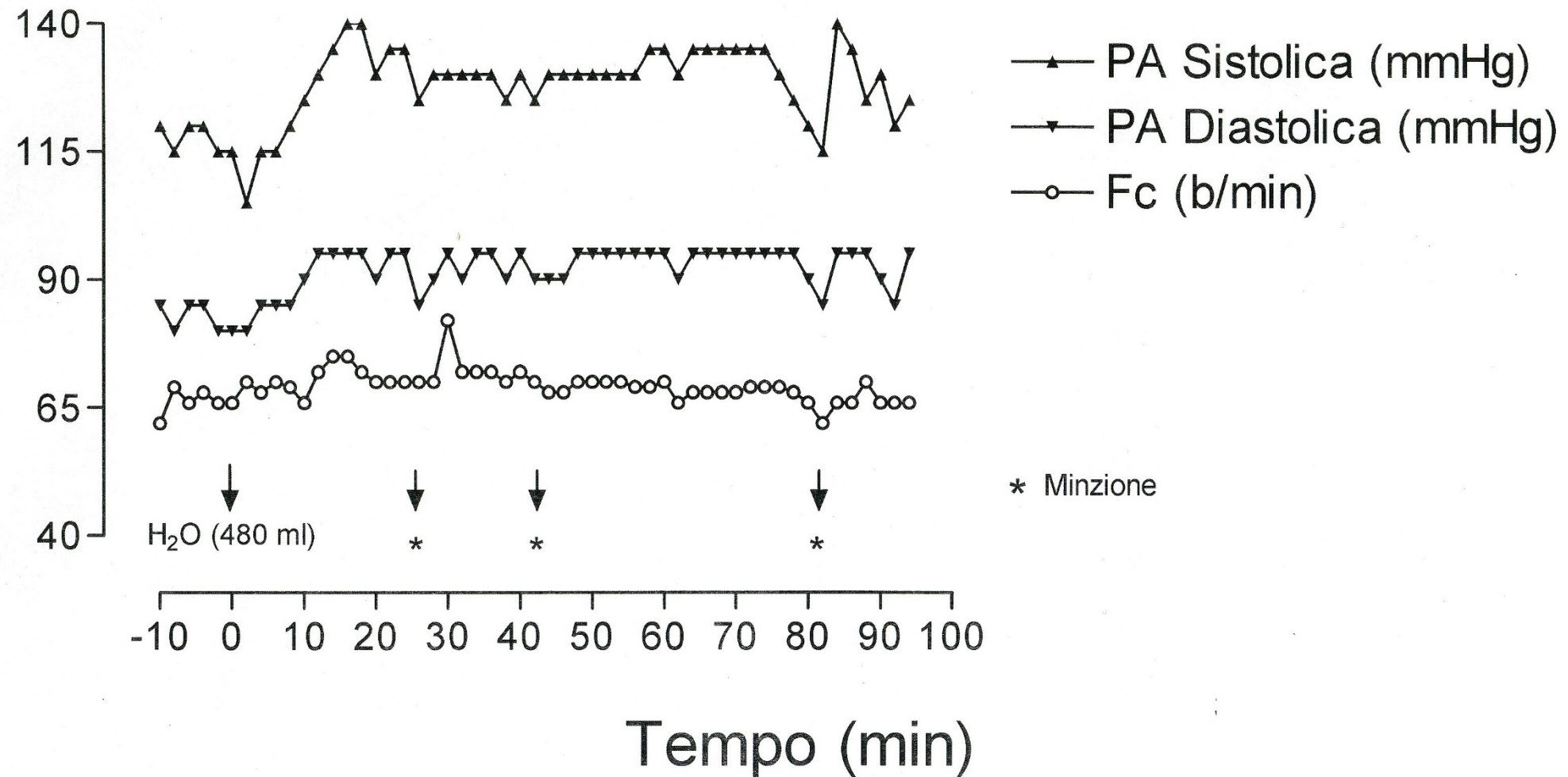
- 50% of patients with neurogenic Orthostatic Hypotension suffer from Clinostatic Hypertension
- Mechanisms underlying Clinostatic Hypertension:
 - Arterial Baroreceptor alterations
 - Denervation α -adrenergic Hypersensitivity
 - Increase of TPR
- Clinical issues related to Clinostatic Hypertension
 - limits the use of pressor drugs
 - may induce target organ damage
 - may induce nocturnal pressor diuresis



Therapy (non-pharmacological)

- Control hypovolemia by abolishing factors that induced liquid loss and provide intravascular fluids (saline iv; H₂O and NaCl orally)
- Early mobilization and motor physical therapy
- Physical maneuvers based on limbs isometric contractions
- Elastic stockings
- In Pts with concomitant Clinostatic Hypertension, elevate the head of the bed by 6 inches (Fan CW et al. Age Aging 2011;40:187)
- H₂O as a pressor agent in patients with dysautonomia

Effetti della somministrazione di H₂O per os in clinostatismo



Therapy

- Midodrine (α 1-agonist) effective on neurogenic Orthostatic Hypotension (JAMA 1997;277:1046)
- Fludrocortison/Acetate Cortone
- Piridostigmine (acetylcholinesterasi inhibitor, promotes ganglionic neural transmission), effective on neurogenic Orthostatic Hypotension (Arch Neurol 2006;63:513)
- In Pts with concomitant Clinostatic Hypertension, anti-hypertensive compounds have to be given late in the evening (use Ace-inhibitors, Angiotensine receptor blockers, transdermal Nitrates to be taken off in the mornig before getting up from bed) (Hypertension 1997;30:1062)

Therapy (Ganglionopathy, PAF)

- plasma antibodies to the nicotinic acetylcholine receptor (nAChR) of autonomic ganglia. The reduction of anti-nAChR antibodies produced by immunoadsorption was associated with a diminished orthostatic hypotension, a restored capability to increase LF/HF, LFSAP and norepinephrine in upright position, a decline in the intensity of autonomic symptoms and an improvement of life quality.

Barbic et al. J Hypertens 2017;35(7):1513