

# TIGULLIO II Congresso Nazionale di 2024 ARITMOLOGIA

16-17 Aprile Sestri Levante (GE)

**Presidente del Congresso**

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**Sede Congressuale**

Hotel Vis a Vis \*\*\*\*

Sestri Levante



**Auxologico**  
Ricerca e cura per la tua salute IRCCS

## Diagnosi e terapia della sincope che rimane inspiegata al termine della valutazione iniziale

Michele Brignole

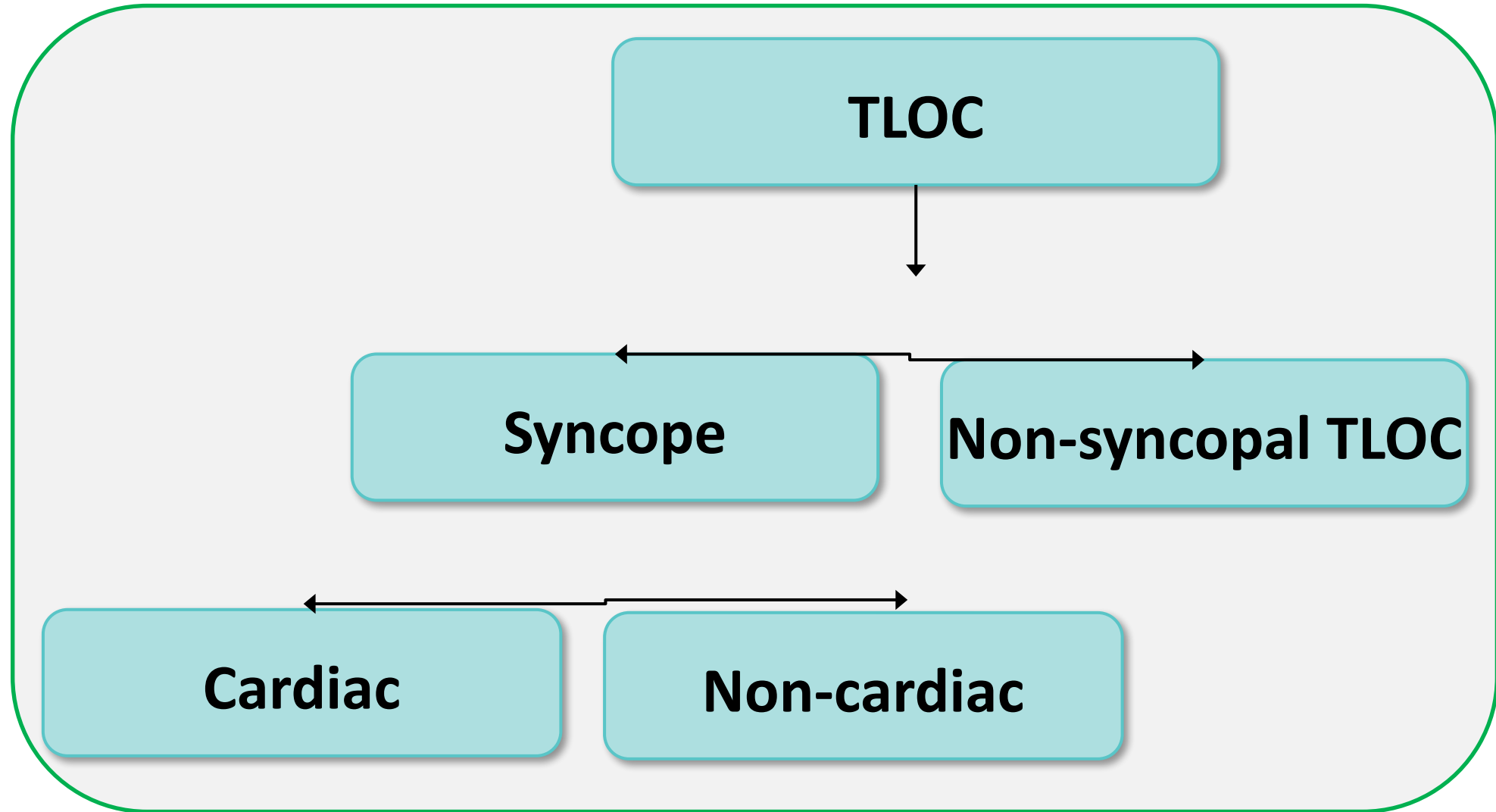
IRCCS Istituto Auxologico Italiano, Milano



- Il percorso diagnostico
- La terapia personalizzata



# Classification of TLOCs



Brignole M, Rivasi G. New insights in diagnostics and therapies in syncope: a novel approach to non-cardiac syncope. *Heart* 2021;107:864–873

## Classification

Conditions (of real or apparent LOC) which may be incorrectly diagnosed as syncope

- Generalized seizures, complex partial seizures, absence epilepsy.
- Psychogenic pseudosyncope.
- Falls without TLOC.
- Intracerebral or subarachnoid haemorrhage.
- Vertebrobasilar TIA.
- Carotid TIA.
- Subclavian steal syndrome.
- Cataplexy.
- Metabolic disorders including hypoglycaemia, hypoxia, hyperventilation with hypocapnia.
- Intoxication.
- Coma.
- Cardiac arrest.

# Cardiac likely

## Cardiac syncope established (immediate treatment)

### Arrhythmic syncope:

- Persistent sinus bradycardia <40 b.p.m. or sinus pause >3 s;
- Mobitz II second- and third-degree AV block;
- Alternating left and right BBB;
- VT or rapid paroxysmal SVT;
- Non-sustained episodes of polymorphic VT and long or short QT interval;
- Pacemaker or ICD malfunction with cardiac pauses

**Cardiac ischaemia-related syncope** when syncope presents with evidence of acute myocardial ischaemia

**Syncope due to structural cardiopulmonary disorders** when syncope presents in patients with prolapsing atrial myxoma, left atrial ball thrombus, severe aortic stenosis, pulmonary embolus, or acute aortic dissection

## Cardiac syncope possible (to be confirmed by tests)

### ECG findings suggesting arrhythmic syncope:

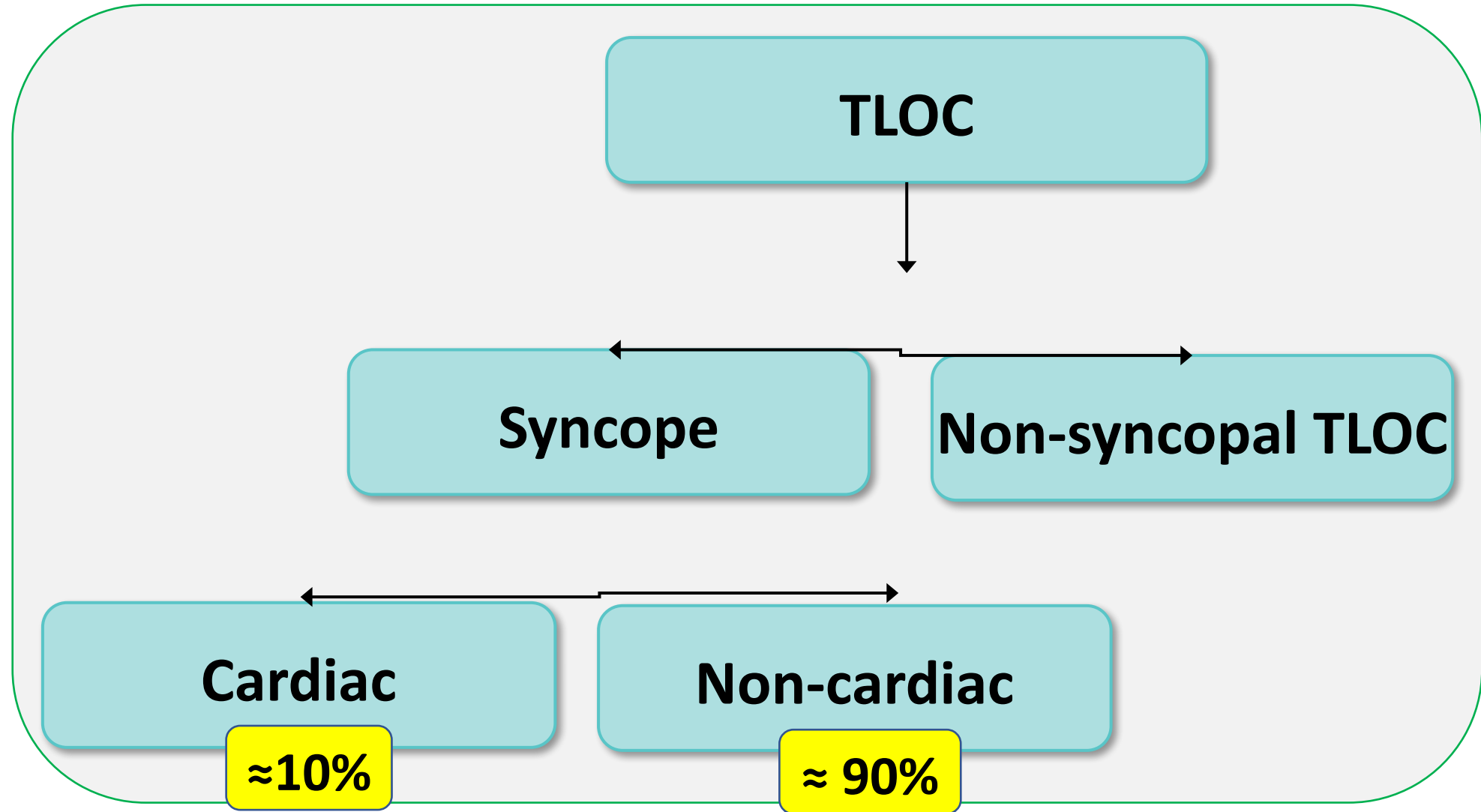
- Bifascicular block or other IVCD (QRS  $\geq 0.12$  s)
- Mobitz I second-degree or first degree AV block
- Asymptomatic sinus bradycardia (40–50 b.p.m.) or slow atrial fibrillation (40–50 b.p.m.)
- Non-sustained VT
- Pre-excited QRS complexes
- Long or short QT intervals
- ST-segment elevation with type 1 Brugada pattern
- Negative T waves, epsilon waves suggestive of ARVC

### Historical findings suggesting cardiac syncope:

- Syncope during exertion or when supine
- Sudden onset palpitation followed by syncope
- Family history of unexplained sudden death
- Presence of structural heart disease or coronary artery disease



# Classification of TLOCs



## Classification of non-cardiac syncope

### Non-cardiac syncope

#### By etiology and clinical forms

##### Reflex (neurally-mediated)

- Vasovagal
- Situational
- Carotid sinus
- Non-classical forms (including low-adenosine syncope)

##### Orthostatic hypotension

- Primary autonomic failure
- Secondary autonomic failure
- Drug-induced
- Volume depletion

#### By mechanism (ECG/BP documentation)

##### Intermittent bradycardia

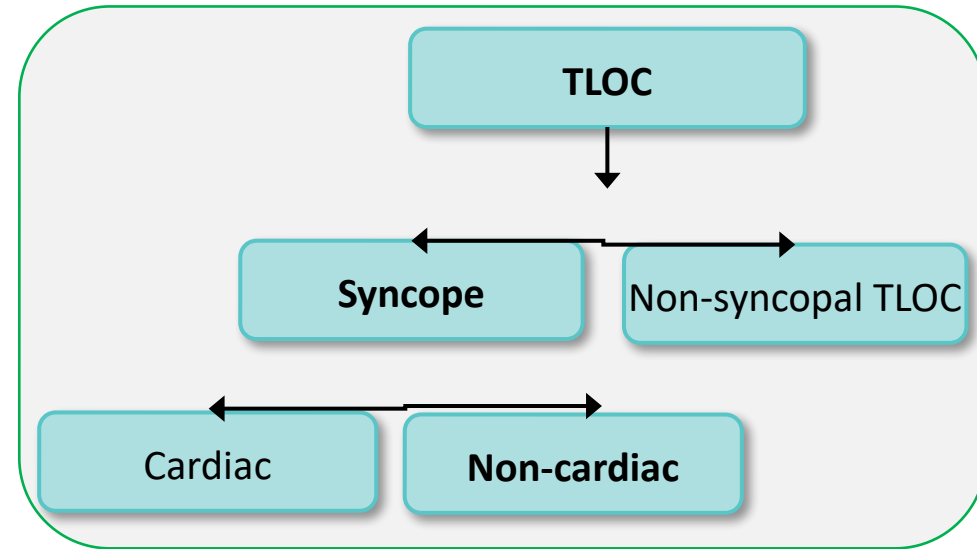
- Asystole:
- Sinus arrest
- Sinus bradycardia plus AVB
- Progressive (sinus) bradycardia

##### Intermittent tachycardia

- Progressive sinus tachycardia

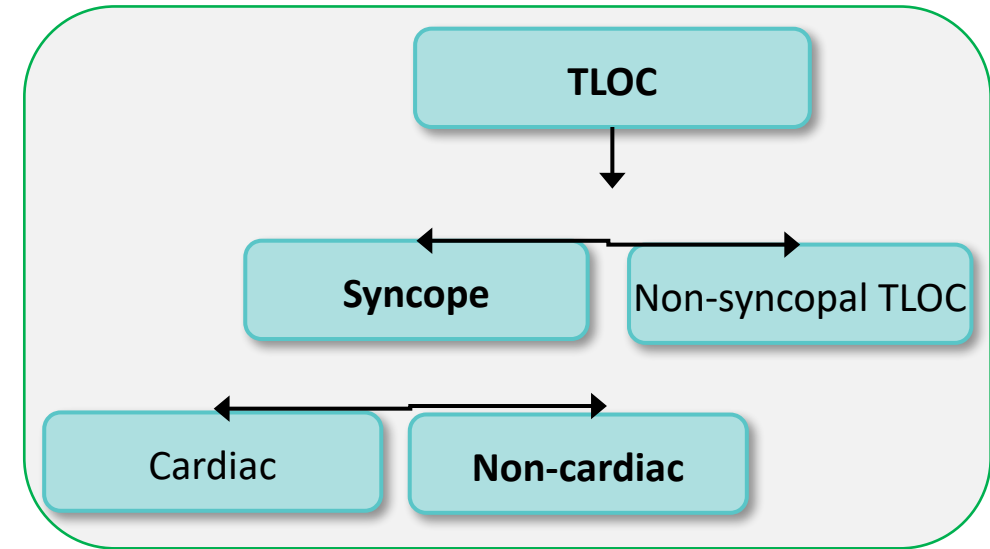
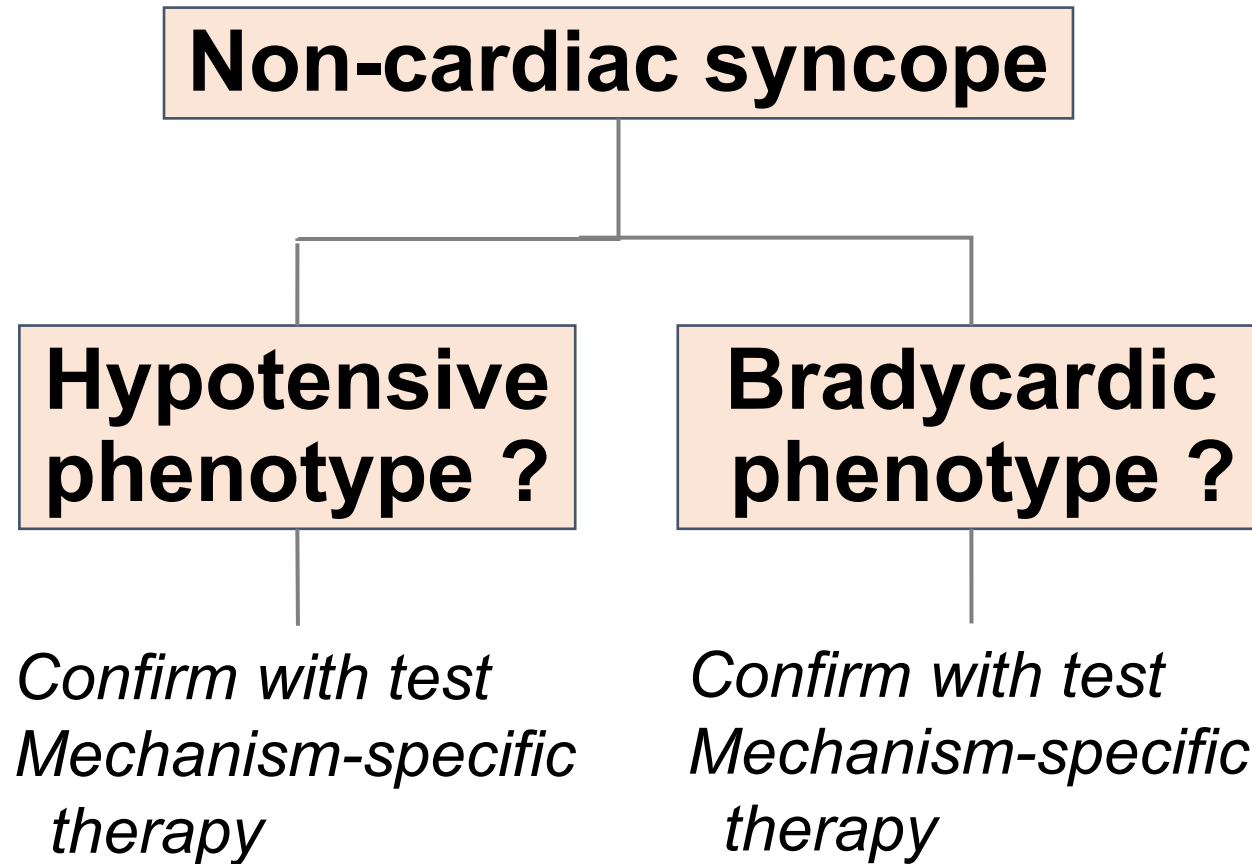
##### Intermittent hypotension

- Supine hypotension
- Orthostatic hypotension (early/classical or delayed)



*The efficacy of therapy is largely determined by the mechanism of syncope rather than its aetiology or clinical presentation*

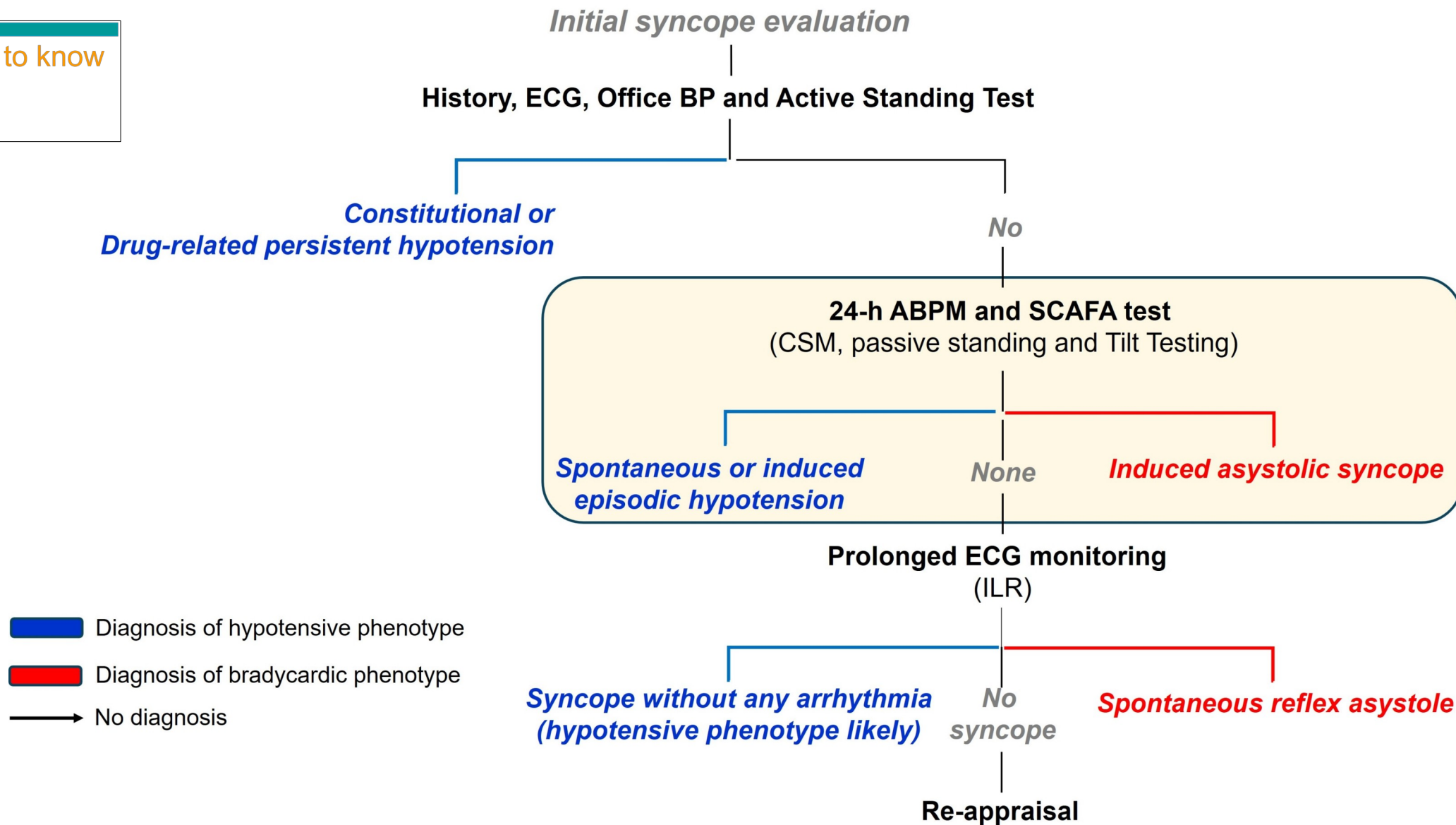
# Mechanisms of non-cardiac syncope





# Diagnosis of non-cardiac syncope by mechanism

2 steps to know



## The two steps of the Short CV autonomic Assessment (SCAFA)

### Step 1

Day 1

#### SCAFA ABPM

(24-h ambulatory blood pressure monitoring)

#### SCAFA ABPM

(24-h ambulatory blood pressure monitoring)

Age  $\geq 40$  yrs

Age  $< 40$  yrs

### Step 2

Day 2

#### SCAFA TILT TABLE

Supine 10s right CSM



Supine 10s left CSM



3-min Standing Test



Standing 10s right CSM



Standing 10s left CSM



Passive 10 min HUT



NTG 10 min HUT

#### SCAFA TILT TABLE

Passive 10 min HUT  
(that includes 3-min standing test)



NTG 10 min HUT



**ABPM:** the current standard for hypertension, underused in syncope patients

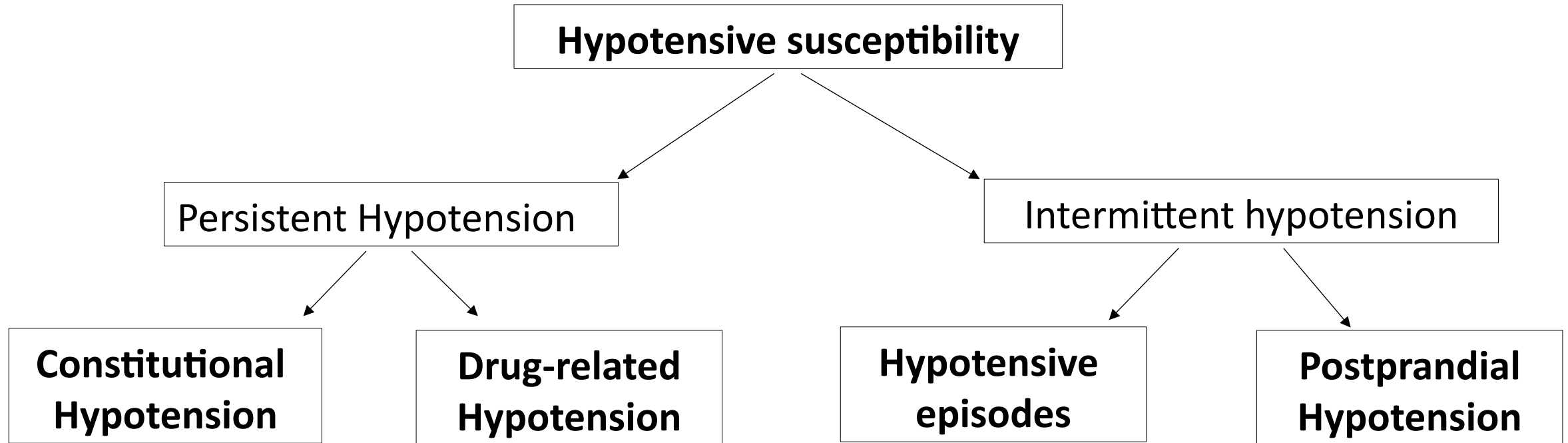
### Advantages

- Simple
- Easily available (even in Pharmacy!)
- Cheap

### Disadvantages

- Intermittent measurements
- Sometimes not tolerated (nighttime)
- Short monitoring (usually 24 hours)

# WHICH ABPM findings to look at



## Ambulatory Blood Pressure Monitoring

24-hr SBP <105 (M)  
24-hr SBP <98 (F)

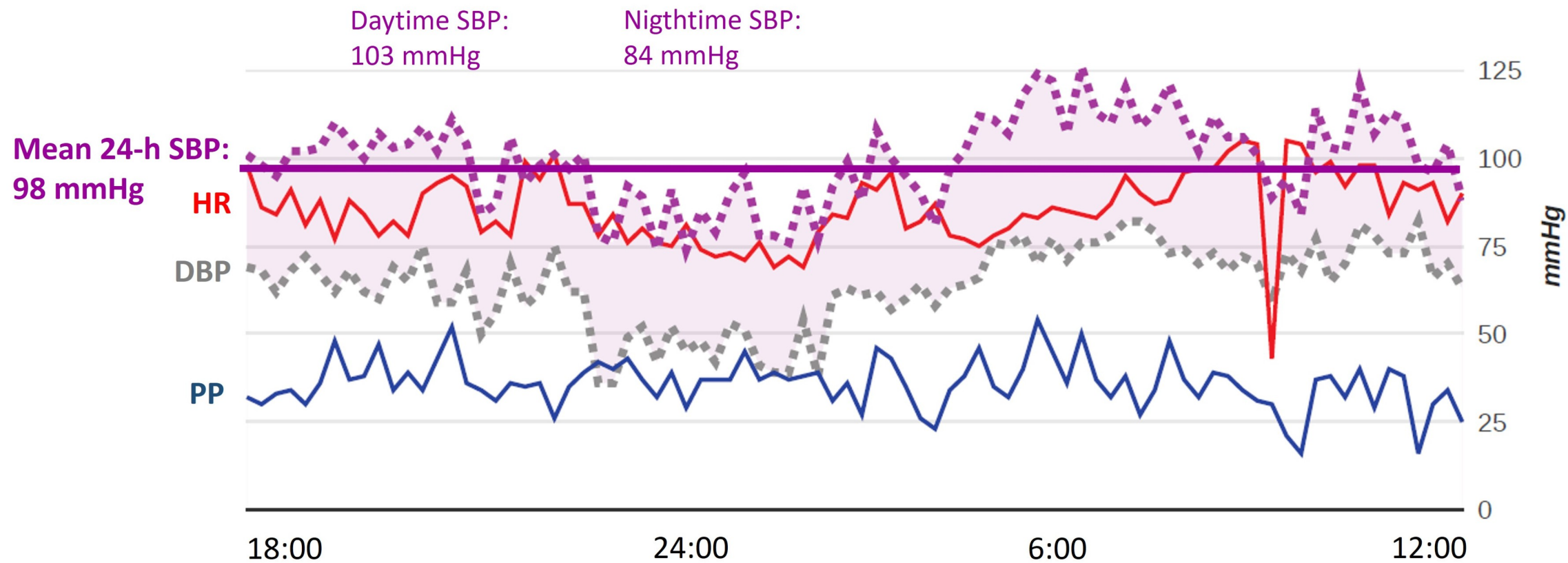
SBP <120 mmHg  
(<130 mmHg in  
older adults)

≥1 daytime SBP  
<90 mmHg  
≥2 daytime SBP  
<100 mmHg

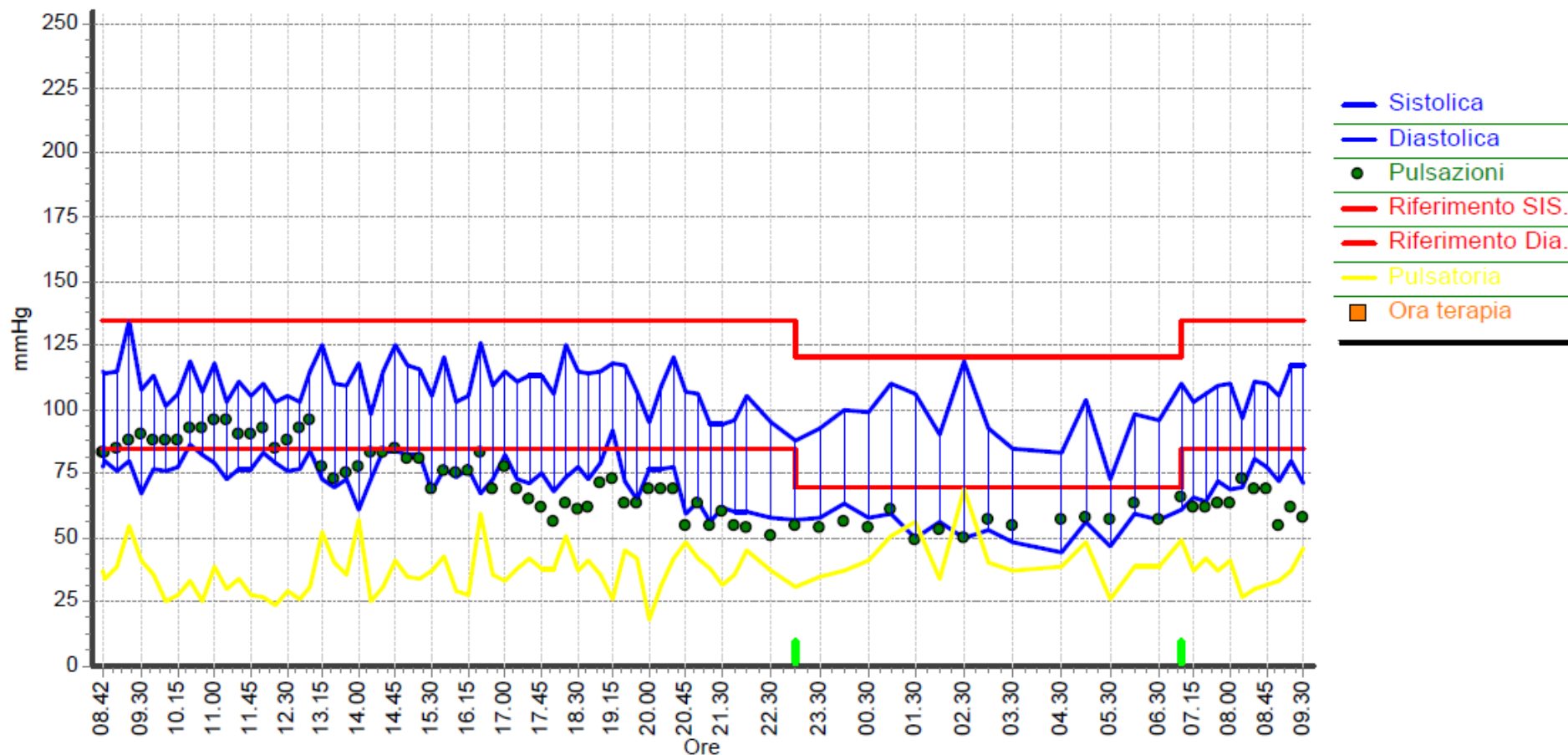
Symptomatic SBP  
fall >20 mmHg  
within 75 min of  
meals

# ABPM

## Constitutional hypotension



Female, 31 yrs

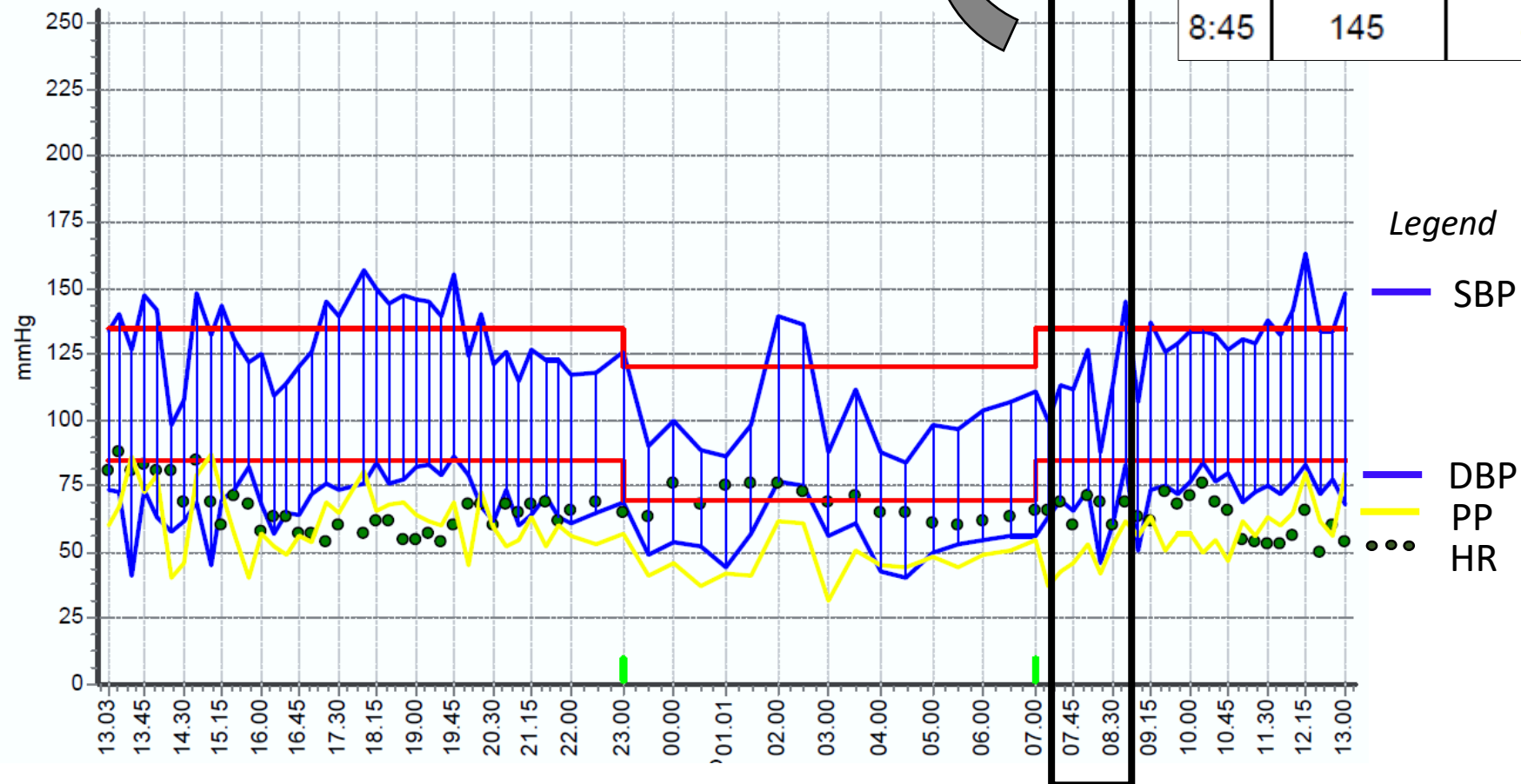




# ABPM

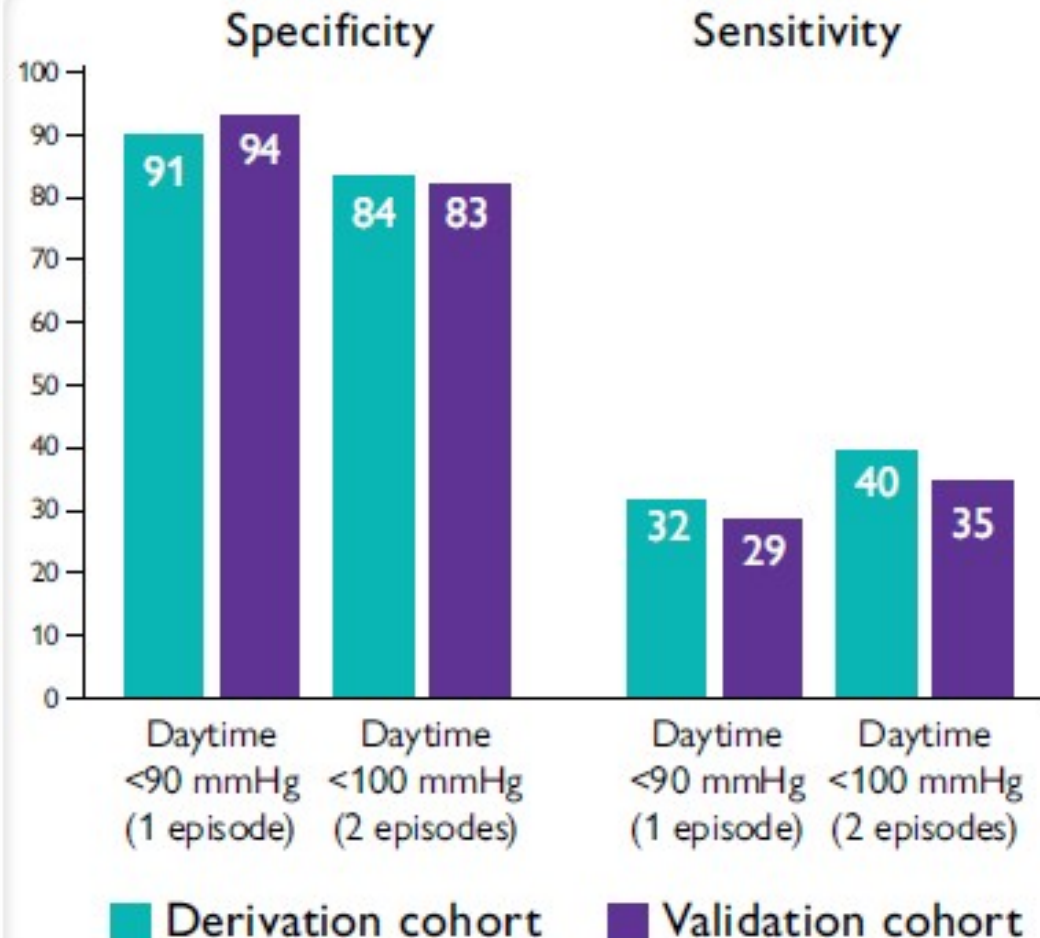
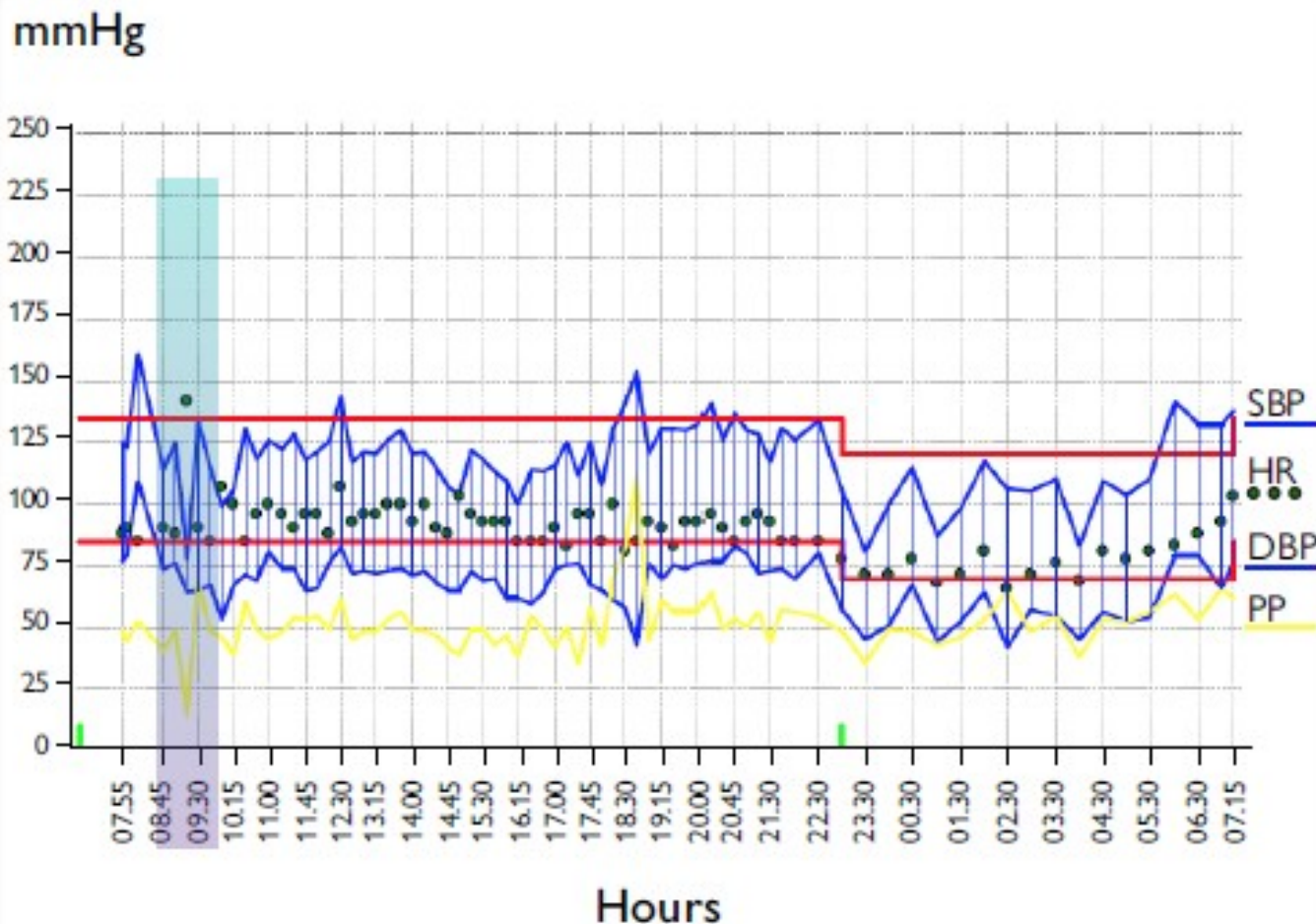
## Intermittent hypotension

	Systolic BP	Diastolic BP	Mean BP	Pulse Pressure	Heart Rate
7:45	112	66	81	46	60
8:00	127	74	91	53	71
8:15	88	46	60	42	69
8:30	114	61	78	53	60
8:45	145	83	103	62	69



# Association between hypotension during 24-hour ABPM and reflex syncope

Systolic blood pressure drops on ABPM may help to identify hypotensive susceptibility in reflex syncope patients

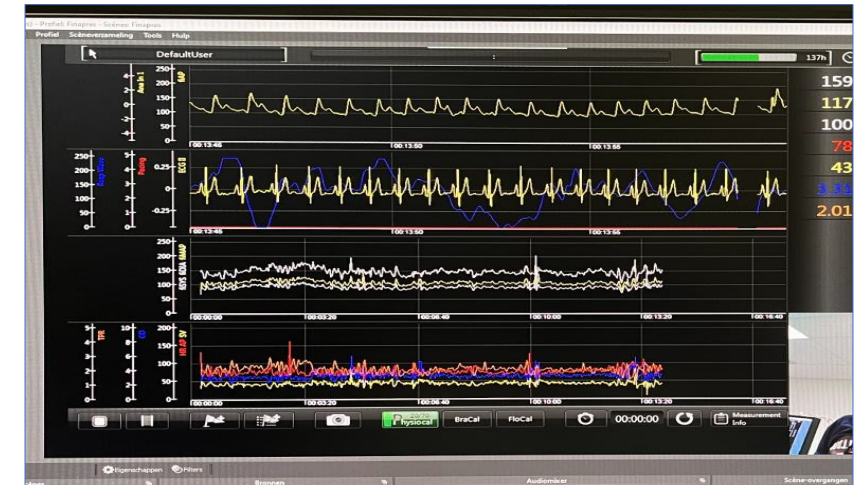


## Practical cut-off values of SBP achieving the best diagnostic value for hypotensive syncope

	<b>Sensitivity</b> (95% CI)	<b>Specificity</b> (95% CI)
Daytime SBP <90 mmHg, ≥1 episode	<b>32</b> (26-36)	<b>91</b> (88-93)
Daytime SBP <100 mmHg, ≥2 episodes	<b>40</b> (23-48)	<b>84</b> (81-87)



# SCAFA TILT TABLE

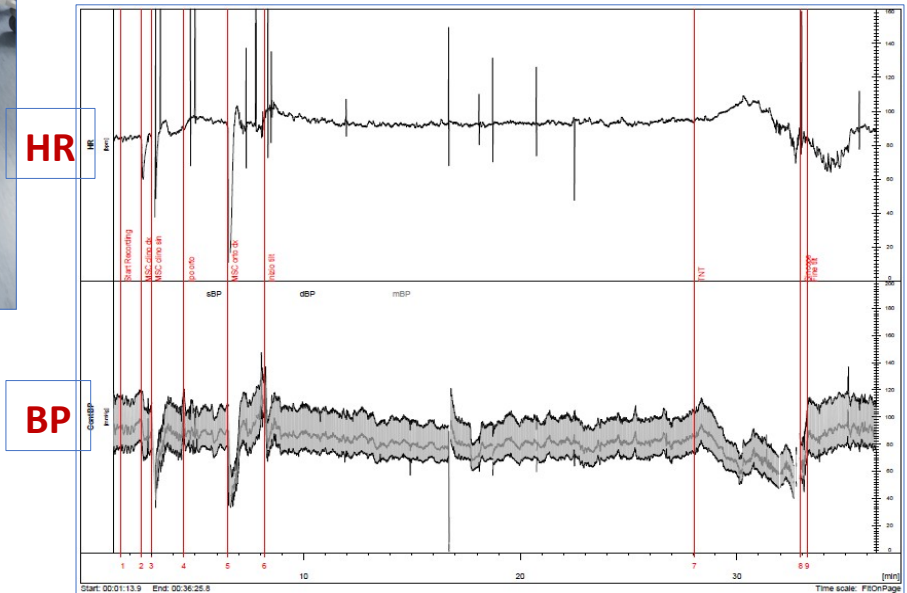


**Carotid sinus  
massage**

**Fast HUTT**



**10 min passive + 10 min  
NTG**



## SCAFA

(Short CV Autonomic  
Function Assessment)

Supine 10s right CSM



Supine 10s left CSM



3-min Standing Test



Standing 10s right CSM



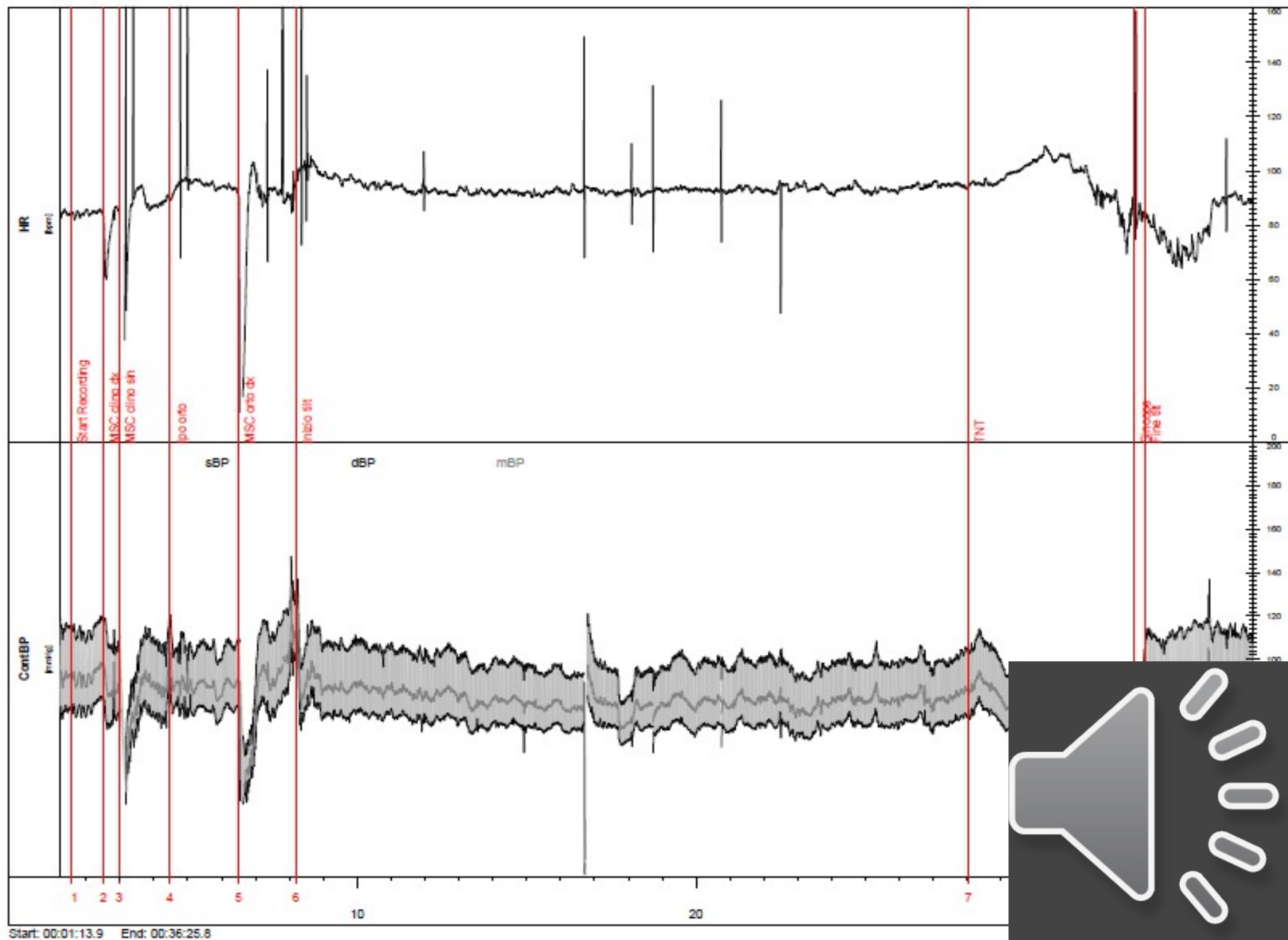
Standing 10s left CSM



Passive 10 min HUT

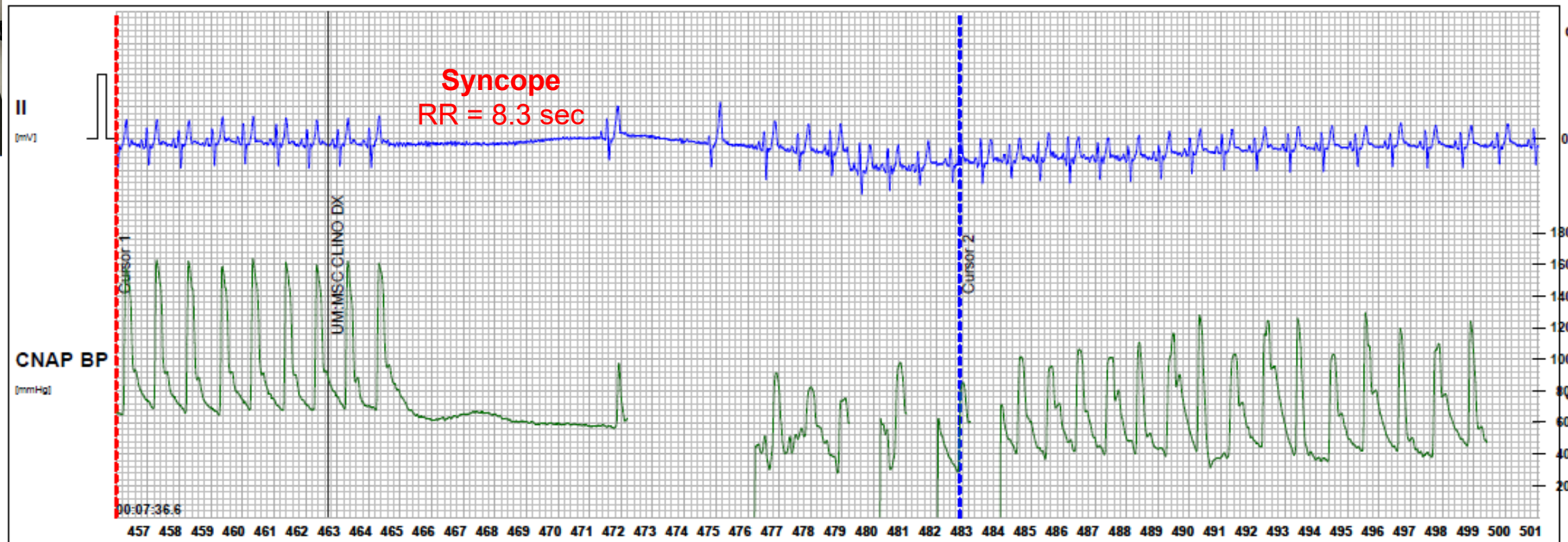


NTG 10 min HUT



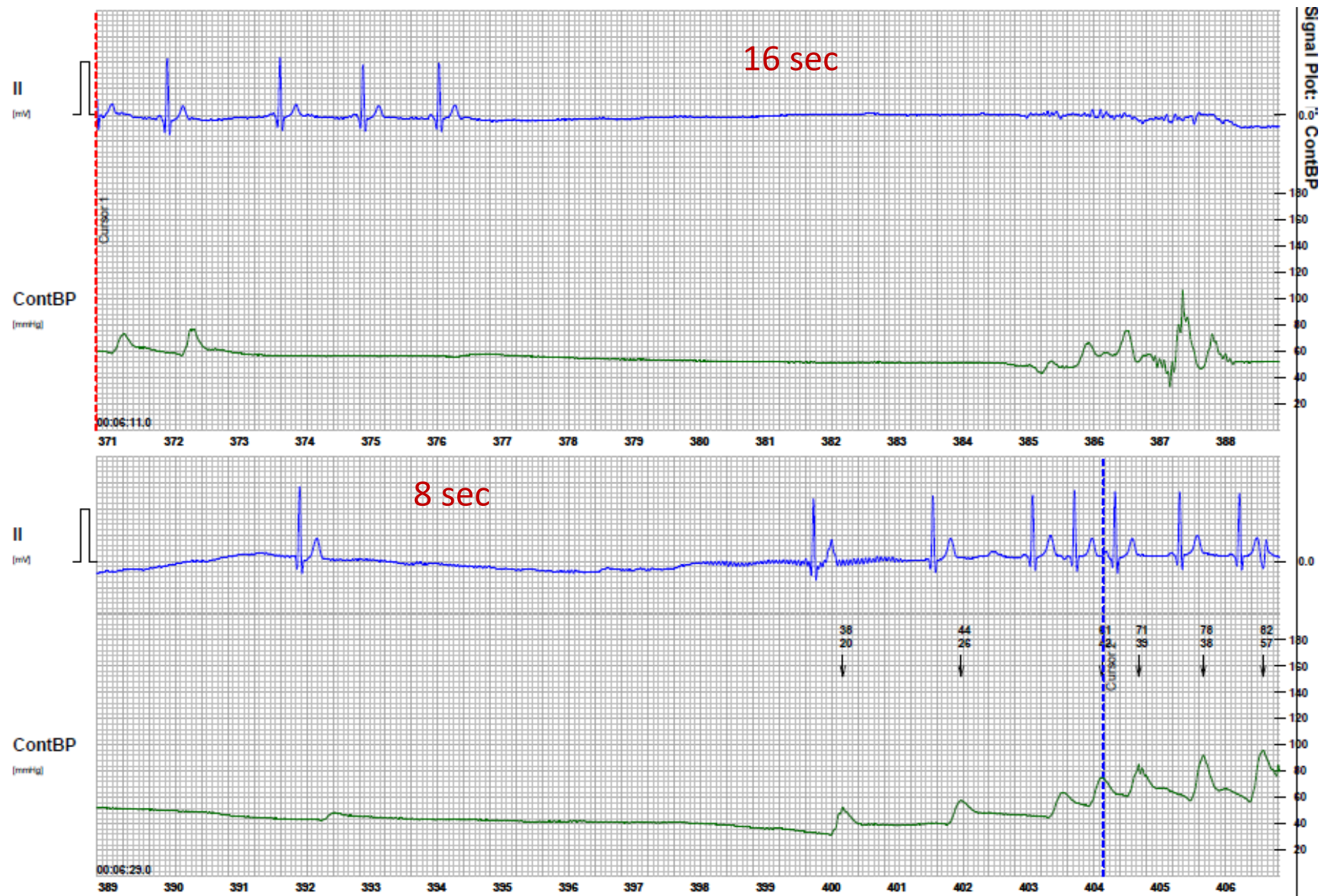


## SCAFA: Carotid sinus massage

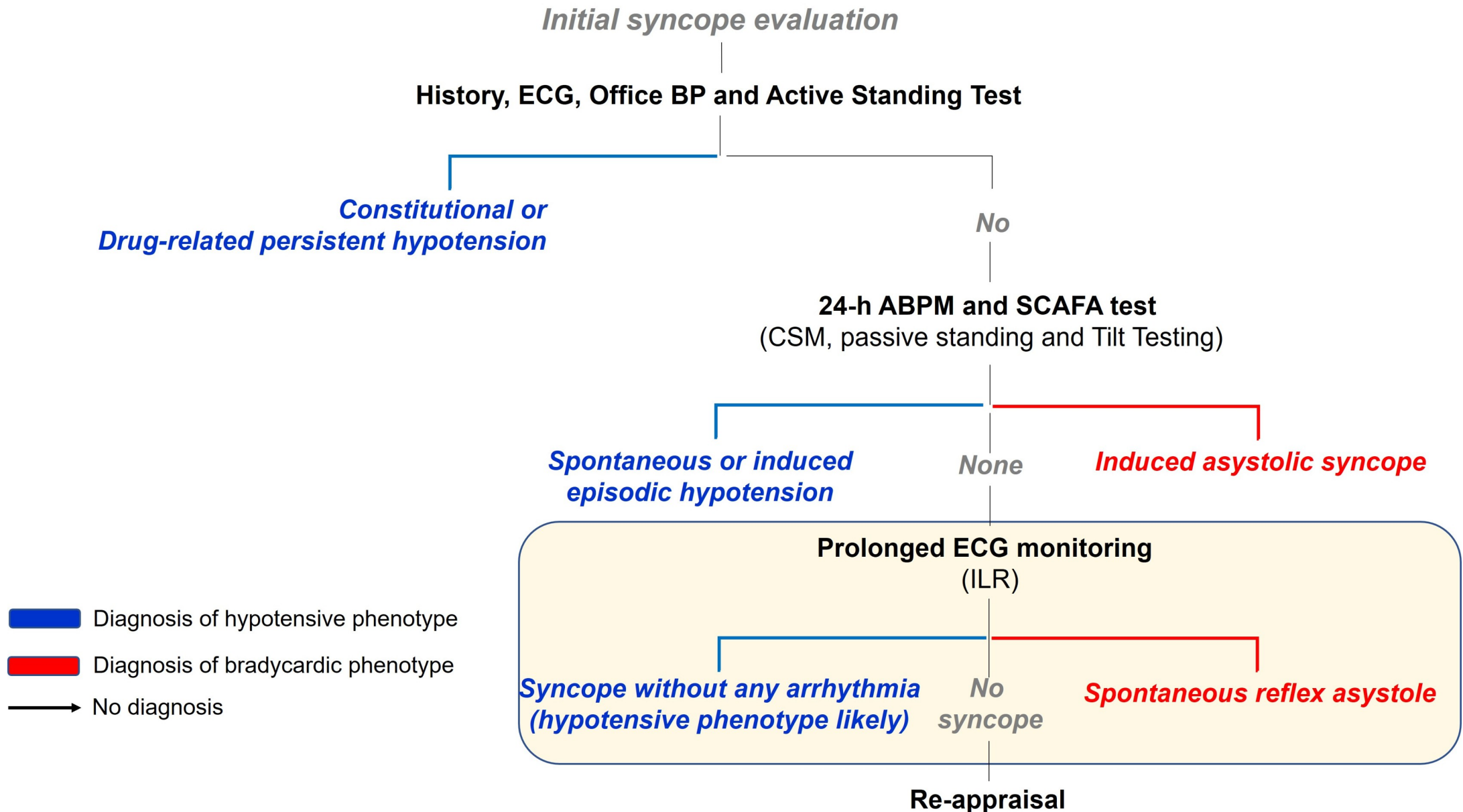




# SCAFA: tilt testing



# Diagnosis of non-cardiac syncope by mechanism

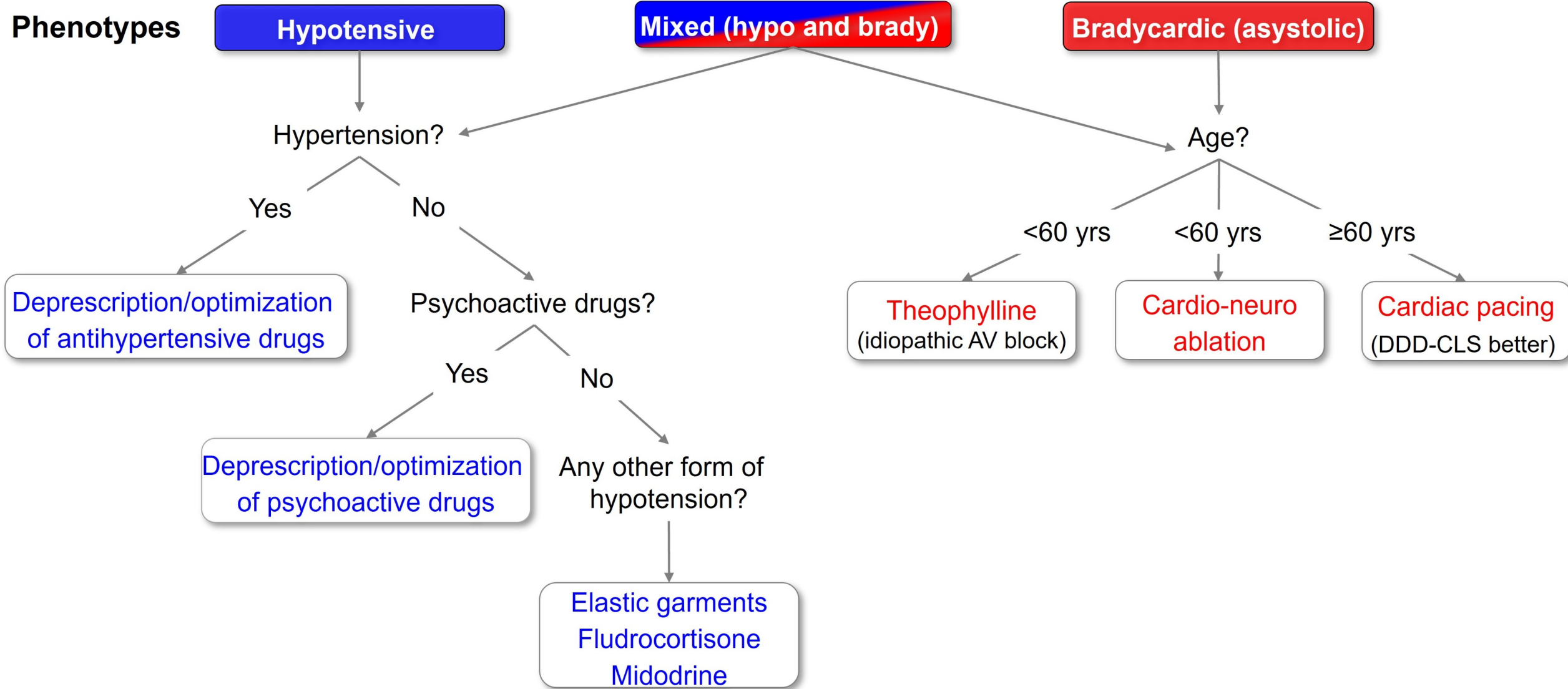




- Il percorso diagnostico
- La terapia personalizzata



# Practical guide for personalised mechanism-based therapy of non-cardiac syncope



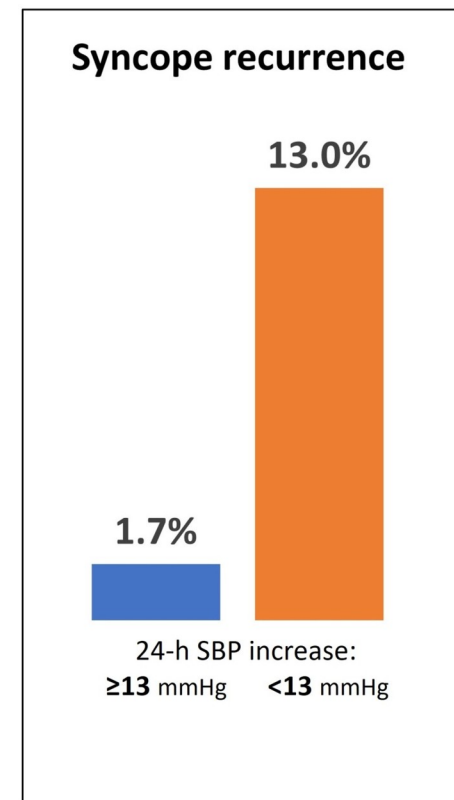
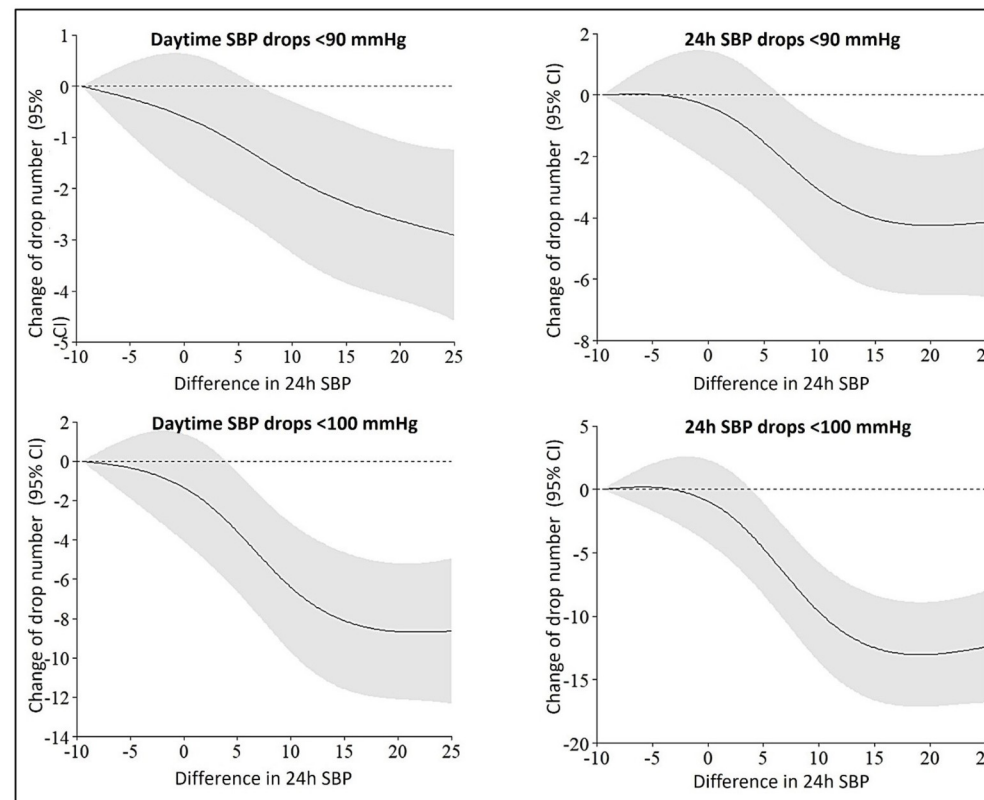
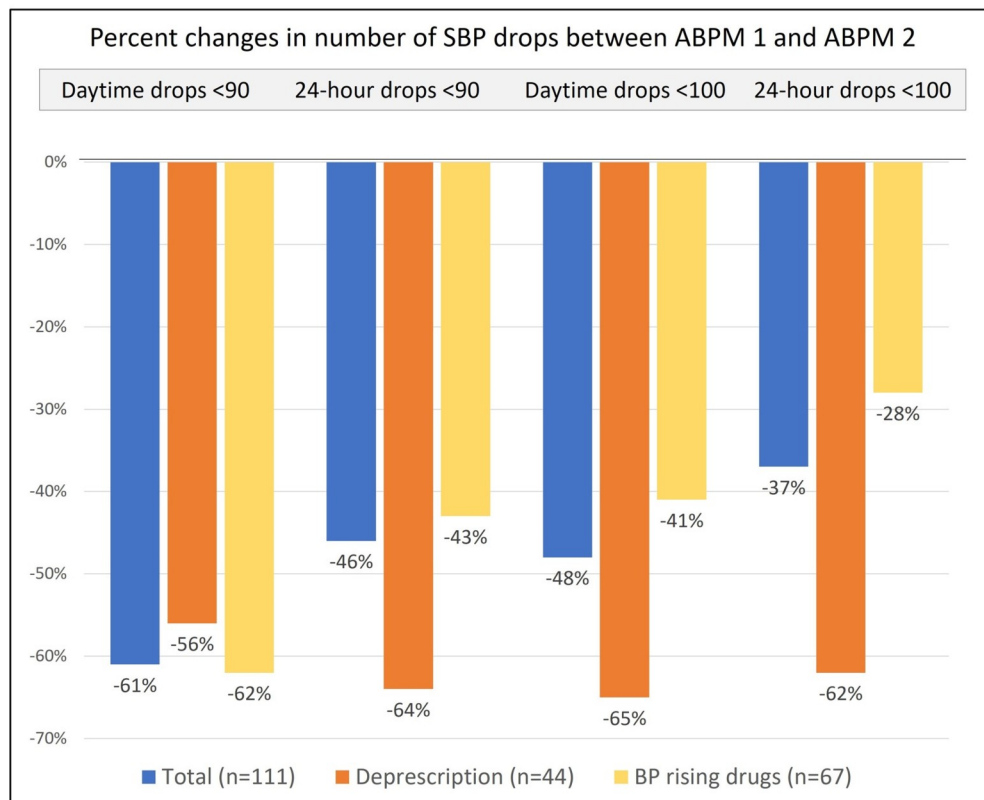


**24h ABPM 1: 111 patients  
with hypotensive episodes**  
(mean 24h SBP=114.1 ± 12.1 mmHg)

**Lifestyle measures +  
deprescribing / BP rising drugs**

**24h ABPM 2 (reassessment)**  
(mean 24h SBP=121.4± 14.5 mmHg)

**Average 24-hr SBP increase = +7.3 ±11.2 mmHg**



Groppelli A et al. *Interventions aimed to increase average 24-hour systolic blood pressure reduce blood pressure drops in patients with reflex syncope and orthostatic intolerance.* Europace 2024, 26: 1-9. doi.org/10.1093/europace/euae026

## ABPM

### Goal: Zero drops

	Daytime drops <90 mmHg	Daytime drops <100 mmHg
Pts with no SBP drop at ABPM2, no. (%)	26 (65%)	20 (50%)
24-hour SBP, mmHg	133±13	134±13
Difference in 24-hour SBP between ABPM 1 and ABPM2, mmHg (IQR)	12 (6 to 18)	12 (5 to 20)

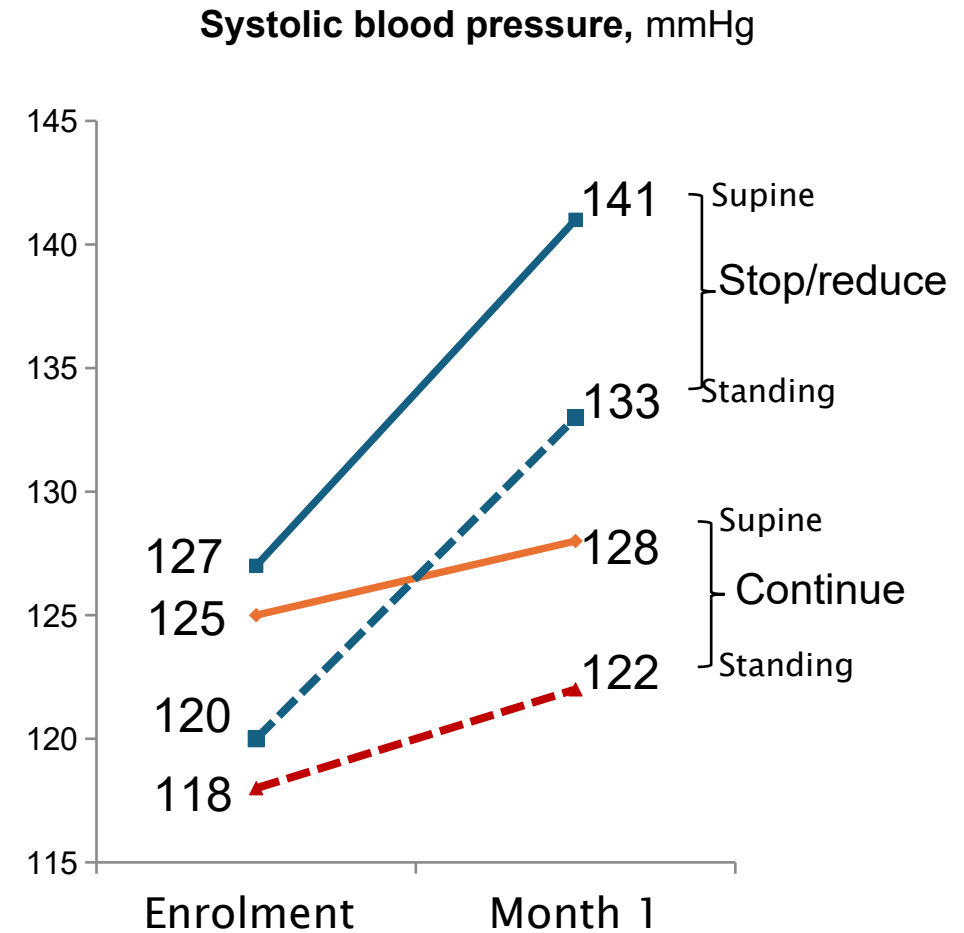
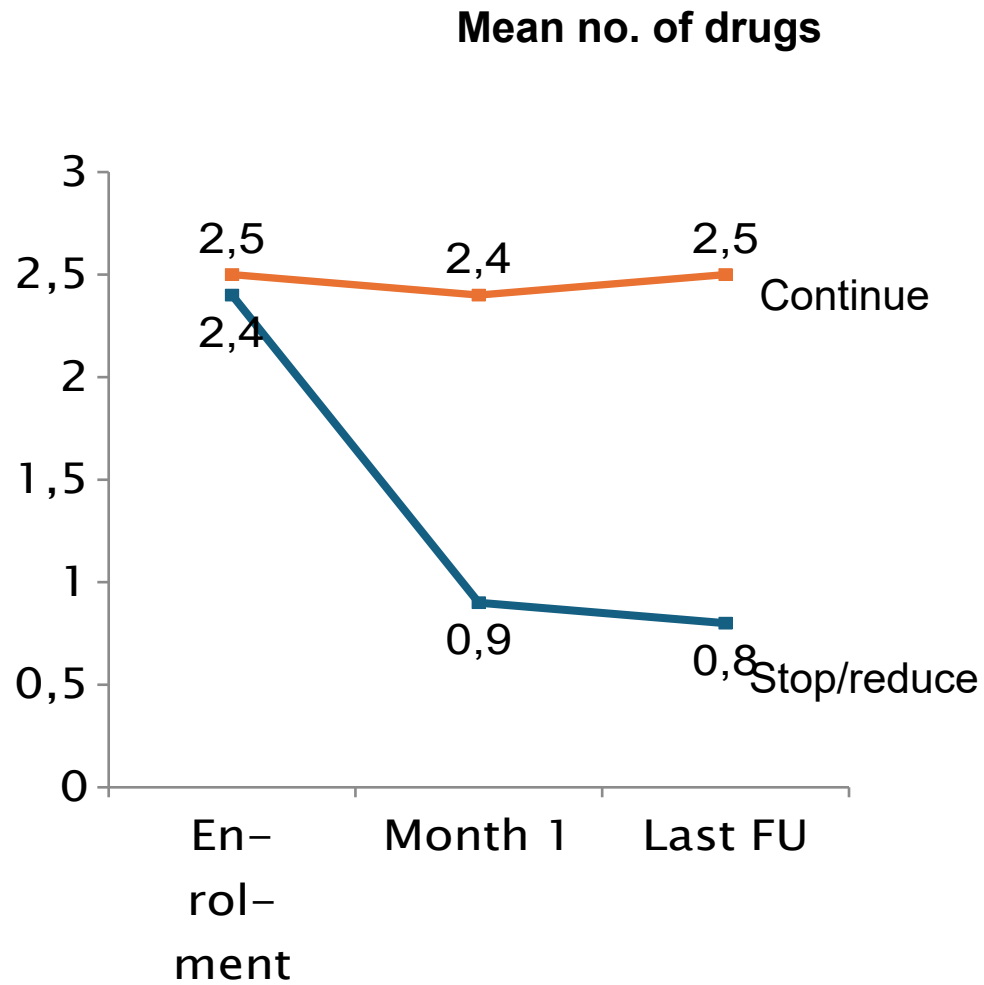
*Groppelli et al. 2024*



# Stop vasodepressor drugs in reflex syncope: a randomised controlled trial

Diana Solari,<sup>1</sup> Francesca Tesi,<sup>2</sup> Matthias Unterhuber,<sup>3</sup> Germano Gaggioli,<sup>4</sup>  
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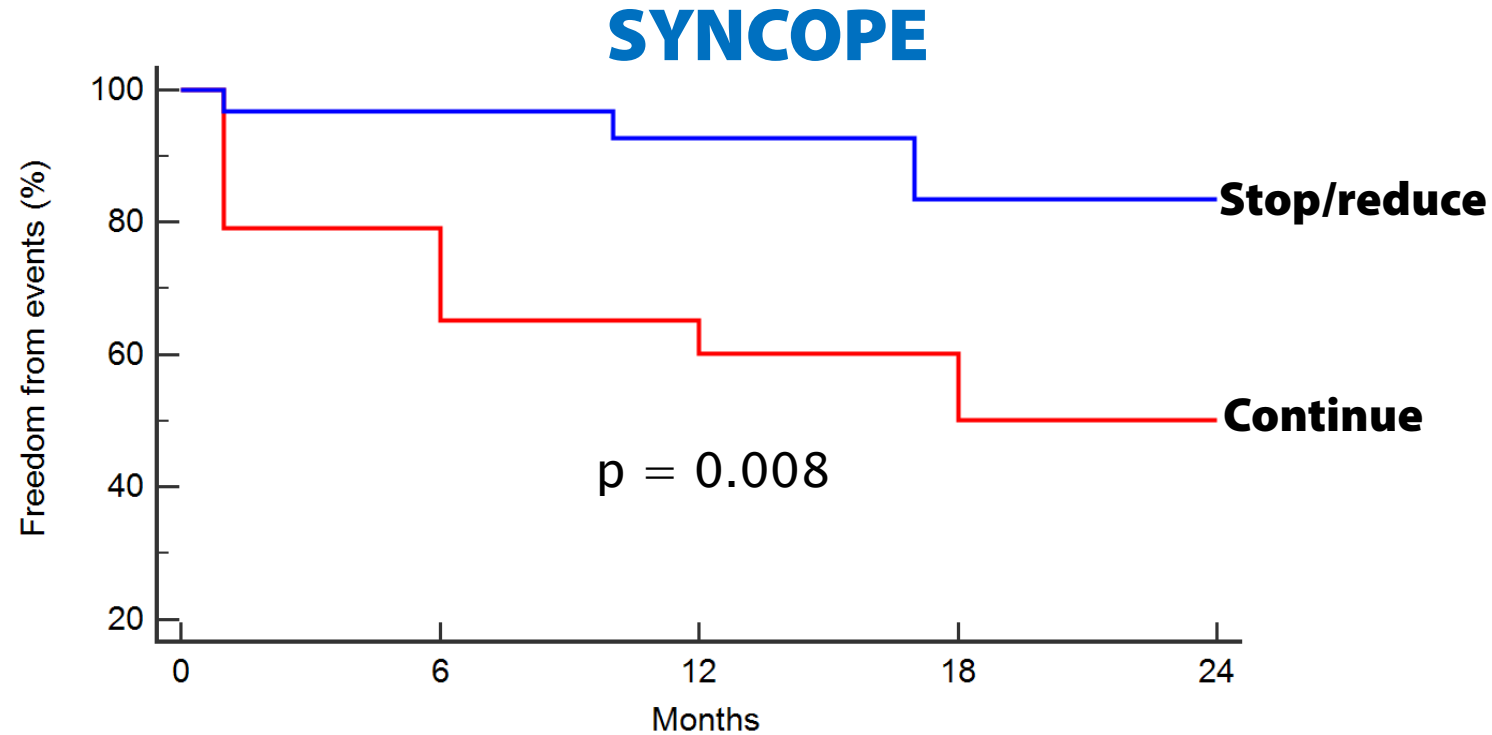
**Heart 2017; 103: 449-455**



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**Heart 2017; 103: 449-455**



## Number at risk

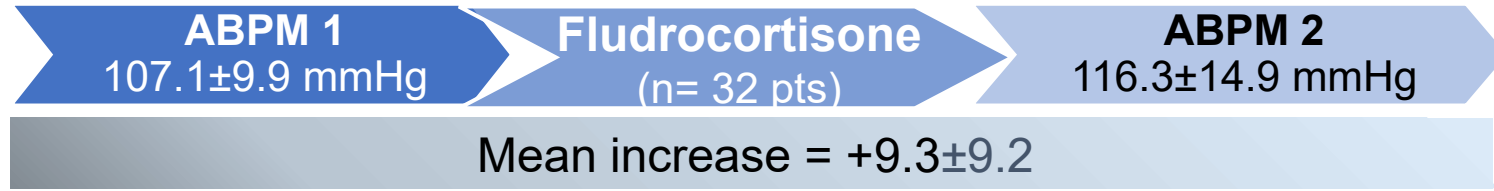
Continue vasoactive drugs

Months	0	6	12	18	24
Continue vasoactive drugs	24	14	12	4	1
Stop/reduce vasoactive drugs	31	25	14	6	2

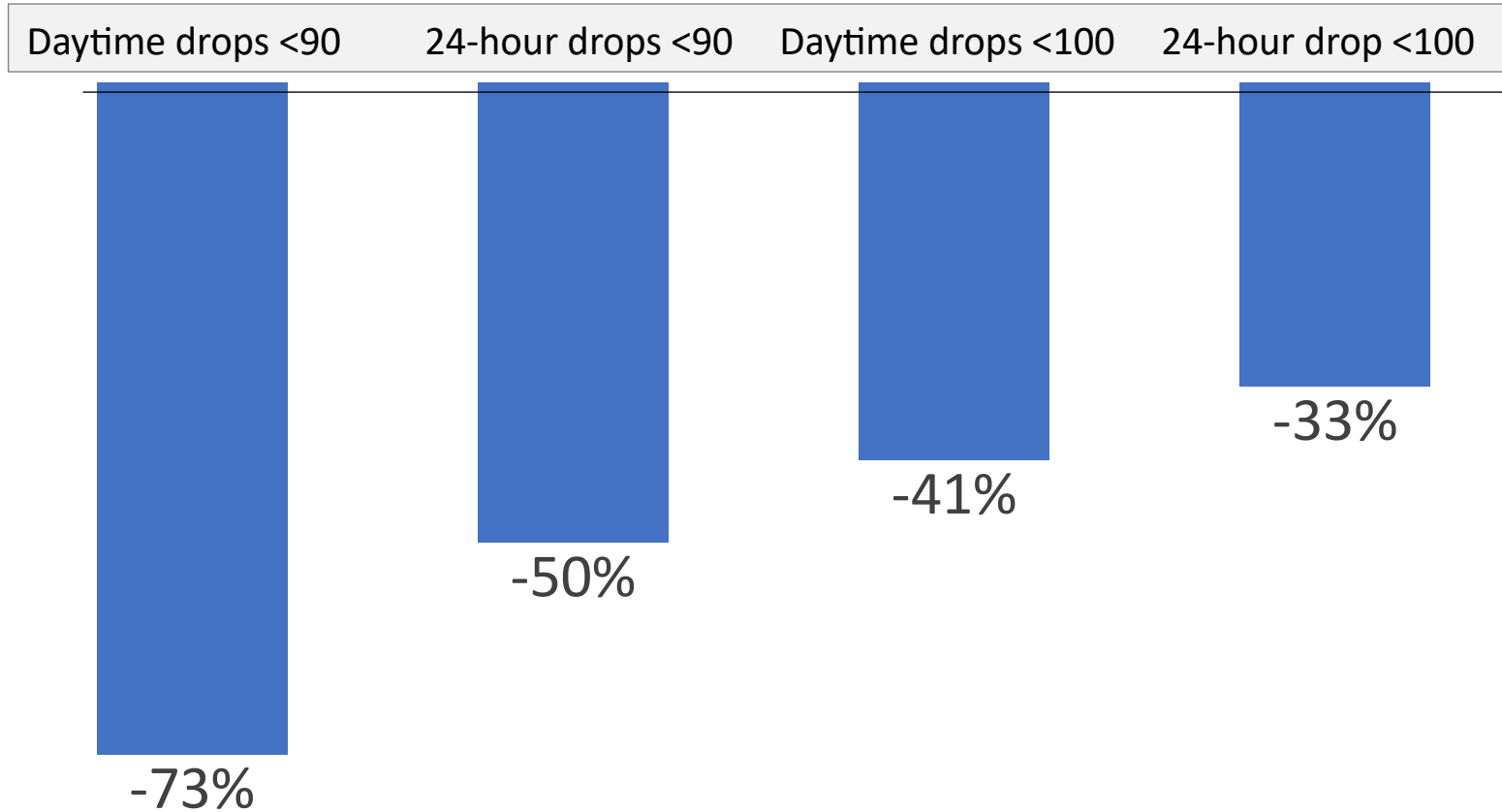
Stop/reduce vasoactive drugs

Months	0	6	12	18	24
Continue vasoactive drugs	24	14	12	4	1
Stop/reduce vasoactive drugs	31	25	14	6	2

# ABPM



Percent changes in number of SBP drops between ABPM 1 and ABPM 2



*De Lange F et al 2024*

*Goal:* to increase average 24-hour SBP and prevent SBP drops on ABPM

### Drug-related hypotension

Deprescription  
of antihypertensive  
and psychoactive drugs

Targets:  
24-h SBP  $\geq 134$  mmHg  
and/or  
increase of  $\geq 12$  mmHg

### Drug-unrelated hypotension

Elastic garments  
Fludrocortisone  
Midodrine

Targets:  
24-h SBP  $\geq 116$  mmHg  
and/or  
increase of  $\geq 9$  mmHg

*Goal: to prevent asystolic episodes*

### Theophylline

Idiopathic AV block

Intervention:  
300 mg b.i.d.  
(range 100 mg b.i.d.  
to 300 mg t.i.d.)

### Cardio-neuro-ablation

Ablation of the superior and  
inferior paraseptal ganglia,  
age < 60 years

Target:  
Increase in heart rate,  
shortening of AH interval  
and of Wenckebach cycle

### Cardiac pacing

DDD-CLS pacing,  
age ≥ 60 years

CLS programming:  
Basic rate of 50 bpm,  
max CLS rate 120 bpm,  
CLS response “Medium”,  
resting rate control OFF

## Therapy of mixed (hypotensive and bradycardiac) phenotype

Goal: to increase average 24-hour SBP, to prevent SBP drops on ABPM and to prevent asystolic episodes

Interventions and target: the most appropriate among dual (antihypotensive and antibradycardiac) therapies



## Priorities in Diagnosis and Treatment of Syncope

**Our patients seek solutions, not only explanations**