

LA TERAPIA IN BASE AL FENOTIPO E ALL'ETÀ

FENOTIPO BRADICARDICO

Marco Tomaino

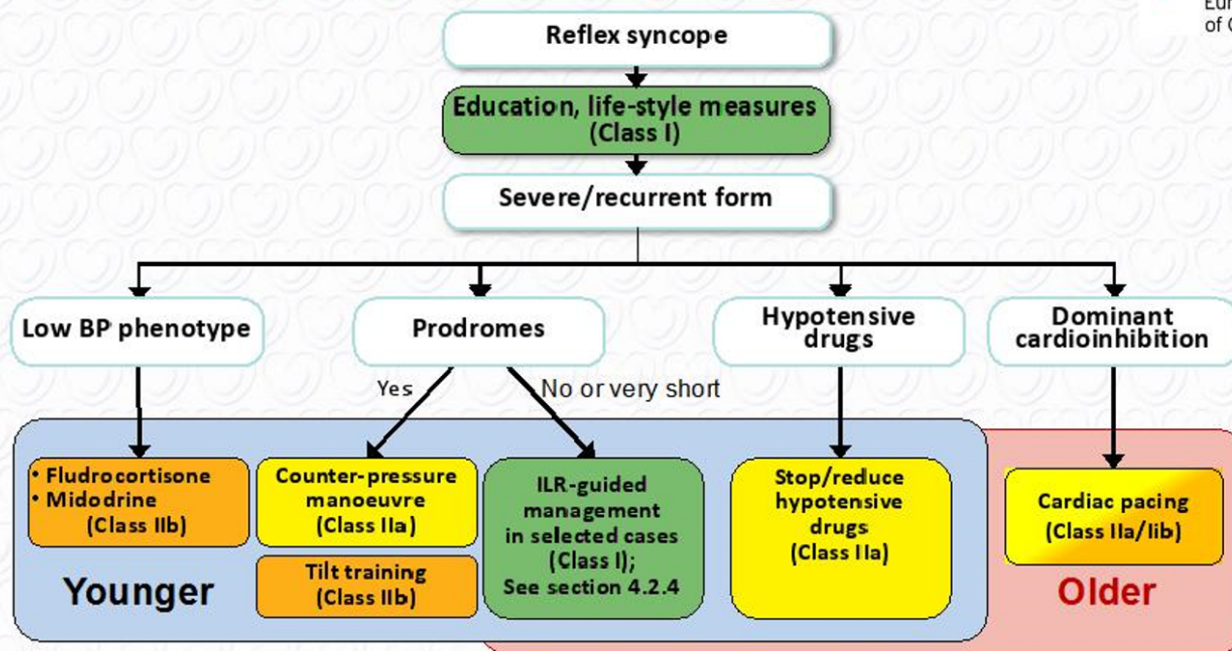
Arrhythmologic Diagnostic Center and "Syncope Unit"

Department of Cardiology

Central Hospital of Bolzano, Italy



Treatment syncope: **Reflex syncope**



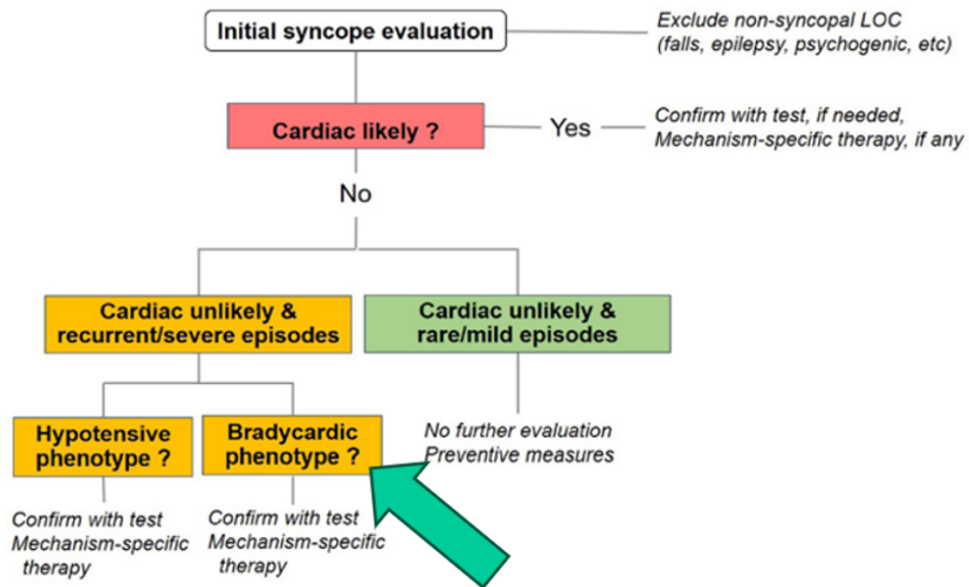
www.escardio.org/guidelines

2018 ESC Guidelines on Syncope – Michele Brignole & Angel Moya
European Heart Journal 2018;39:1883–1948 - Doi:10.1093/eurheartj/ehy037

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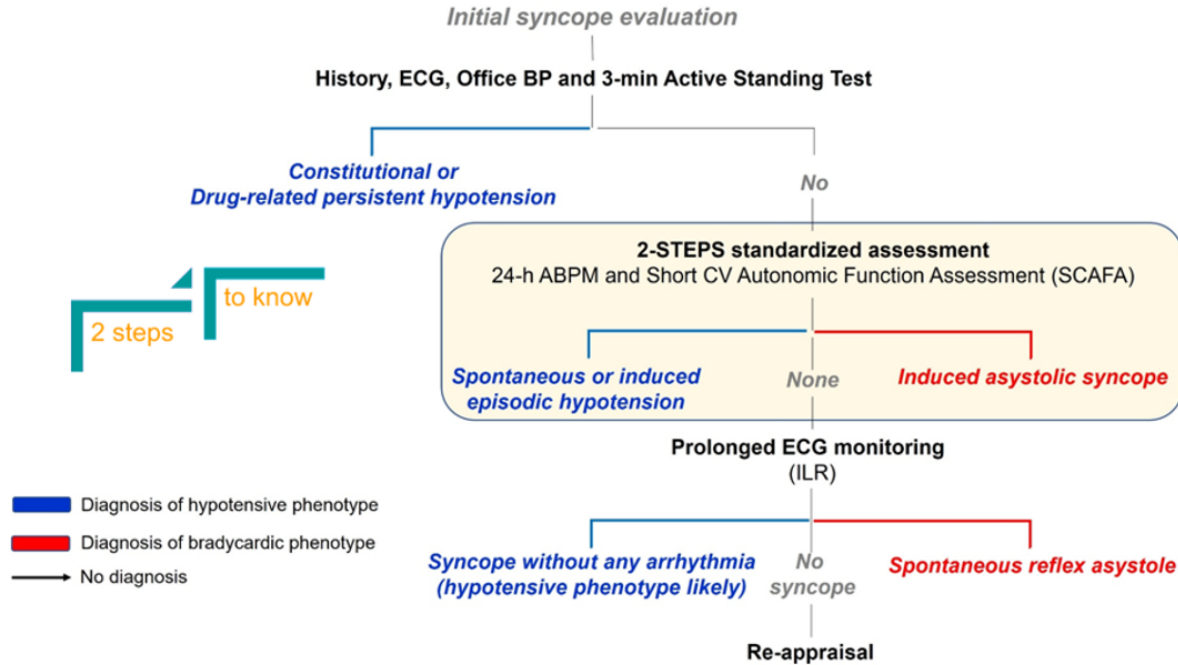
Assessment of the mechanism of non-cardiac syncope



Brignole M, Rivasi G. Heart 2021



Diagnosis of autonomic syncope by mechanism



Brignole M, Rivasi G, Fedorowski A. Mechanism-based therapy of non-cardiac syncope: a practical guide. *Europace* 2024; 26, euae073



Therapeutic implications of 2-step assessment

**Hypotensive
phenotype**

- Education and lifestyle measures
- Deprescribing of hypotensive medications
- Prescription of vasoactive drugs

**Bradycardic
phenotype**

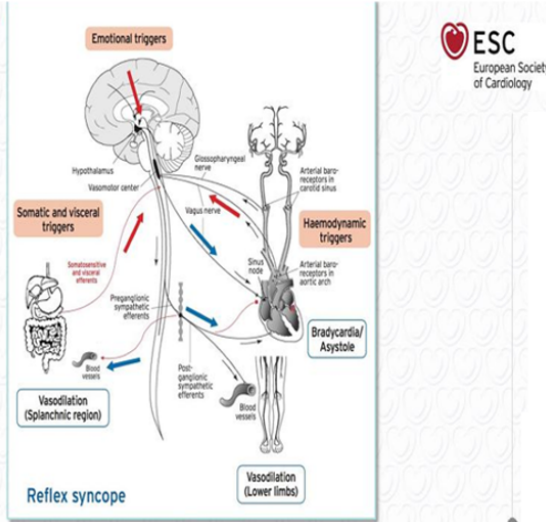
- Cardiac pacing (age >40-60 years) 
- Cardioneuroablation

**Mixed
phenotype**

Dual therapy



Pathophysiology



www.escardio.org/guidelines

2018 ESC Guidelines on Syncope – Michele Brignole & Angel Moya
European Heart Journal 2018;39:1883–1948 • Doi:10.1093/eurheartj/ehy037

PATIENTS SELECTION

Patients must have a sufficiently **severe clinical presentation** to warrant specific treatment

High frequency or risk provided by guidelines:

- invalidated quality of life
- unpredictable syncope
- syncope exposing patients to risk of trauma
- occurrence of syncope during “high risk activity”

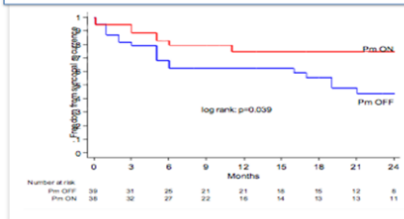


ISSUE 3 International Study on Syncope of Uncertain Etiology 3

Context and Background

M.Brignole, C.Menozzi, A.Moya, D.Andresen, J.J.Blanco, A.D.Krahn, W. Wieling, X.Beiras, J.C. Deharo, V.Russo, M.Tomaino, R.Sutton

Pacing is effective in reducing recurrence of syncope in patients >40 years with severe asystolic NMS (ILR). There was 32% absolute risk reduction and 57% relative risk reduction



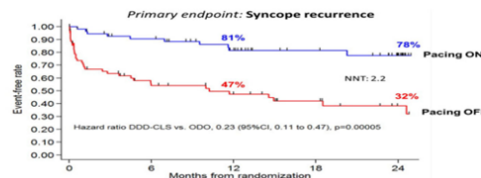
**25%
Recurrence of
syncope despite PM
Implantation**

Circulation May 7, 2012

BioSync CLS

Benefit of dual-chamber pacing with Closed Loop Stimulation (CLS) in tilt-induced cardio-inhibitory reflex syncope.
A randomized double-blind parallel trial

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European Heart Journal (2022) 43, 1-9
European Society
of Cardiology

FASTTRACK CLINICAL RESEARCH
Arrhythmias

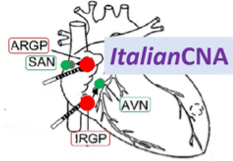
Cardiac pacing in severe recurrent reflex syncope and tilt-induced asystole

Michele Brignole^{1,2,3}, Vincenzo Russo¹, Francesco Arabia¹, Mario Oliveira⁴, Alonso Pedrote⁵, Arnaud Aerts⁶, Antonio Rapacciuolo⁷, Serge Boveda^{8,9,10}, Jean Claude Deharo¹¹, Giampaolo Maglia¹², Gerardo Nigro¹³, Daniele Giacomelli¹⁴, Alessio Gargaro¹⁵, and Marco Tomaino¹⁶, for the BioSync CLS trial Investigators¹

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Right atrial cardioneuroablation of asystolic reflex syncope

To evaluate the efficacy and safety of right atrial CNA

Eligibility

Clinical features

- Established reflex syncope
- Age 18-60 yrs
- ≥ 2 episodes/last year or ≥ 3 last 2 years
- No SA or AV disease
- No SHD

ILR Tilt testing

- ≥ 2 asystolic episodes > 3 sec with or w/o syncope
- Asystolic syncope induced by tilt testing

Right atrial CNA

- Acute success criteria:
- AH shortening $> 25\%$
 - Sinus rate $> 20\%$

Study

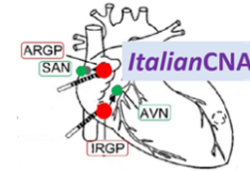
ILR and patient's outcome

- Burden of asystolic episodes
- Burden of syncopal episode
- HR and HRV
- Adverse events

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Published on-line on May 14, 2025

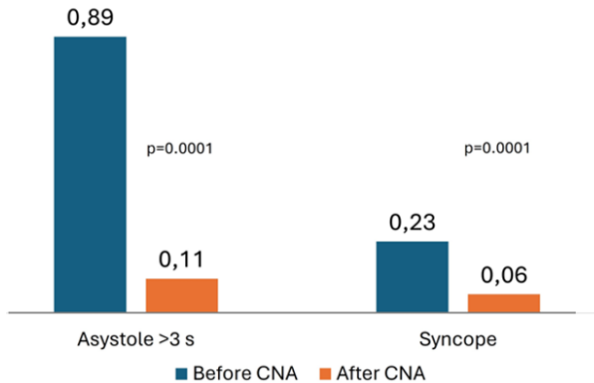


Right atrial cardioablation of asystolic reflex syncope

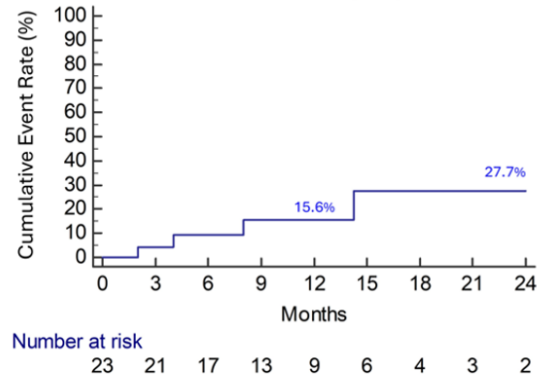
Leonardo Calò, MD,¹ Marco Rebecchi, MD,¹ Ermenegildo De Ruvo, MD,¹ Domenico Giamundo, MD,¹ Antonella Sette, MD,¹ Marco Tomaino, MD,² Matthias Hunteruber, MD,² Nicola Bottoni, MD,³ Matteo Iori, MD,³ Paolo Donateo, MD,⁴ Roberto Maggi, MD,⁴ Attilio Del Rosso, MD,⁵ Martina Rafanelli, MD,⁶ Vincenzo Russo, MD,⁷ Stefano Strano, MD,⁸ Michele Brignole, MD⁹

<https://doi.org/10.1016/j.hrthm.2025.05.038>

Episodes per month



Recurrence of syncope



CONCLUSIONS

- Right atrial CNA reduced asystolic episodes by 88% and syncopal episodes by 76% during the mid-term follow-up.
- Adverse events were infrequent and mild.



Right atrial CNA

Italian CNA. Heart Rhythm 2025

Adverse event	Population (n=28)
Redo CNA	1 (4%)
Pacemaker implantation	2 (7%)
Transient dyspnoea	1 (4%)
Chronic chest pain	0 (0%)
Decreased exercise capacity	0 (0%)
Transient palpitations (<3 mos)	3 (11%)
<u>Persistent palpitations</u>	0 (0%)

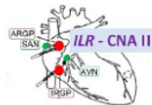
Bi-atrial CNA

Kulakowski P. Heart Rhythm 2023

Adverse event	Population (n=115)
Redo CNA	3 (3%)
Pacemaker implantation	5 (4%)
Transient dyspnoea	6 (5%)
Chronic chest pain	4 (3%)
Decreased exercise capacity	14 (12%)
Transient palpitations (<3mos)	31 (27%)
<u>Persistent palpitations</u>	8 (7%)

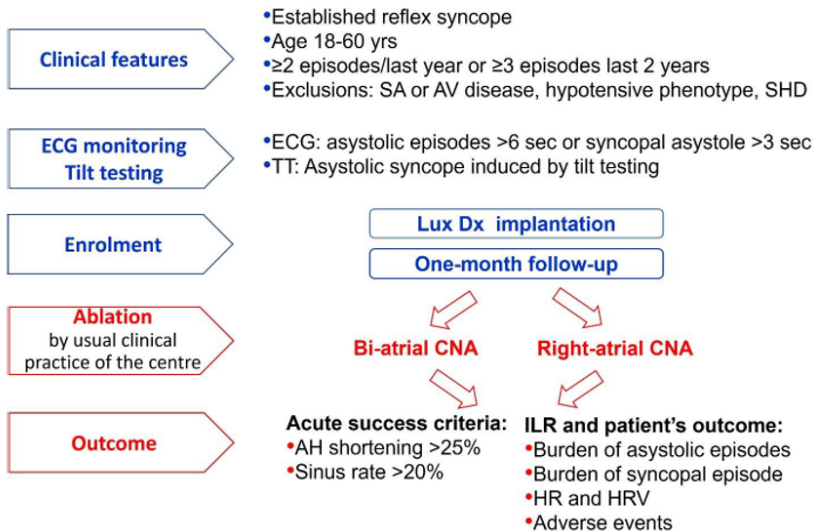
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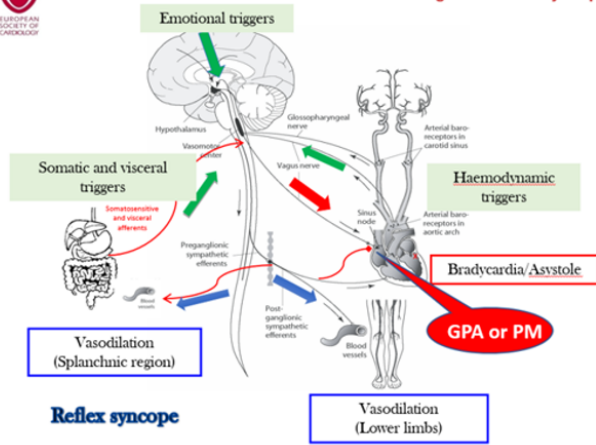


Comparative study of right atrial versus bi-atrial cardioneuroablation of asystolic reflex syncope verified by implantable loop recorder

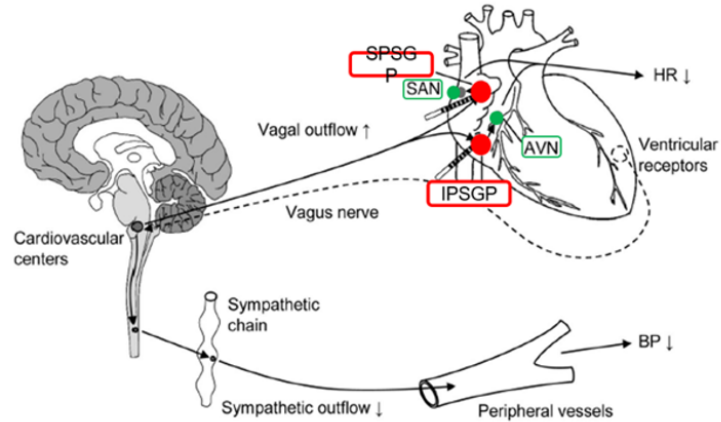
Study design



2018 ESC guidelines on syncope



The rationale for GP ablation: vagal denervation of SAN and AVN



Wang X et al. Selective ablation of atrial GP attenuates VV reflex in a canine model. PACE 2019; 42: 13-19

