TIGULLIO 2024 II Congresso Nazionale di ARITMOLOGIA

16-17 Aprile Sestri Levante (GE)

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Il protocollo Fast del Tilt Test

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Shortened head-up tilt testing potentiated with sublingual nitroglycerin in patients with unexplained syncope

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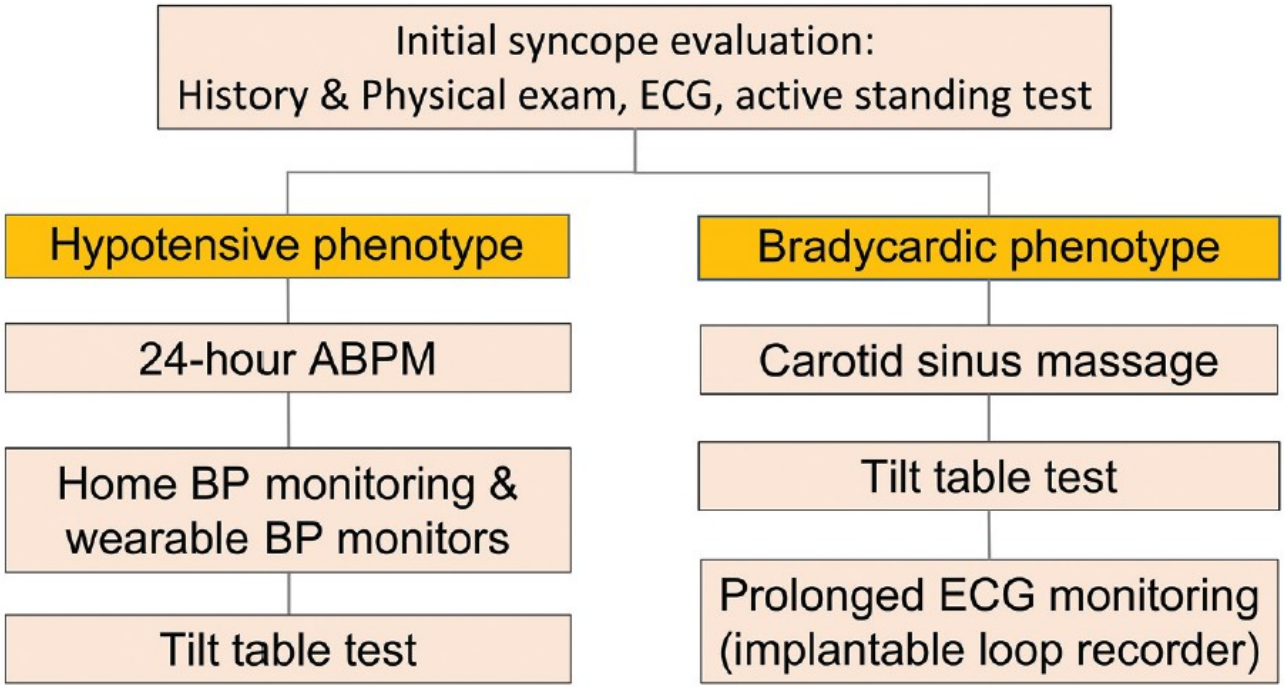
(Am Heart J 1998;135:564-70.)

Tests for the identification of reflex syncope mechanism

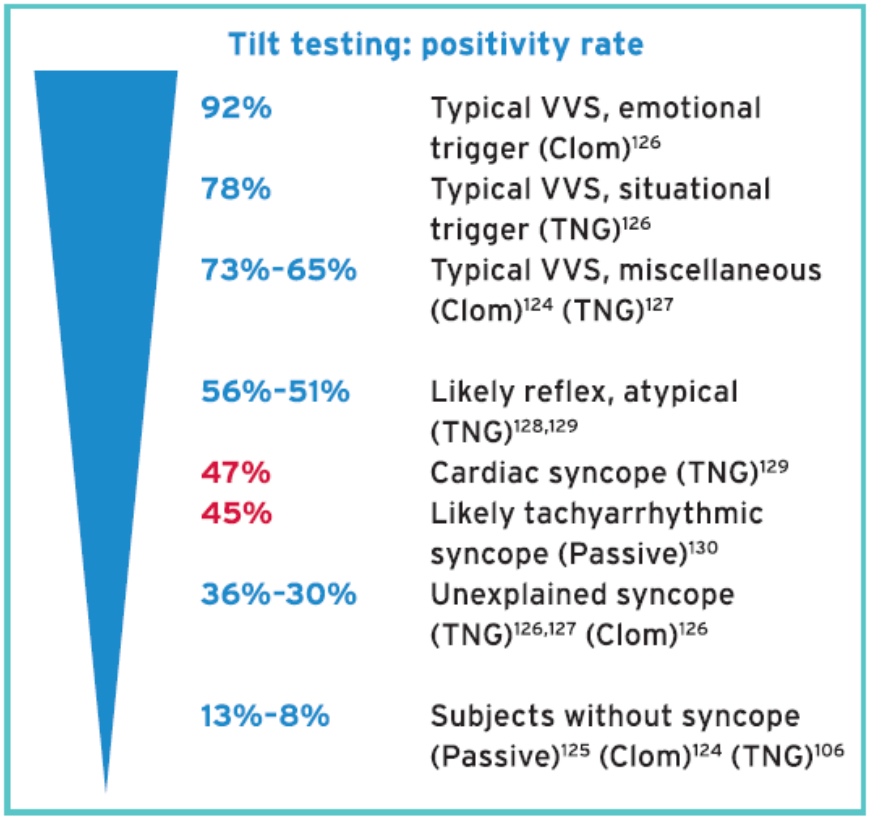


ESC European Society of Cardiology
European Heart Journal (2018) **39**, 1883–1948
doi:10.1093/eurheartj/ehy037

2018 ESC Guidelines for the diagnosis and management of syncope

Tilt testing

Recommendations	Class[a]	Level[b]
Indications		
Tilt testing should be considered in patients with suspected reflex syncope, OH, POTS, or PPS.[23,24,105–109,111–117]	IIa	B
Tilt testing may be considered to educate patients to recognize symptoms and learn physical manoeuvres.[119–121]	IIb	B
Diagnostic criteria		
Reflex syncope, OH, POTS, or PPS should be considered likely if tilt testing reproduces symptoms along with the characteristic circulatory pattern of these conditions.[23,24,105–109,111–117]	IIa	B

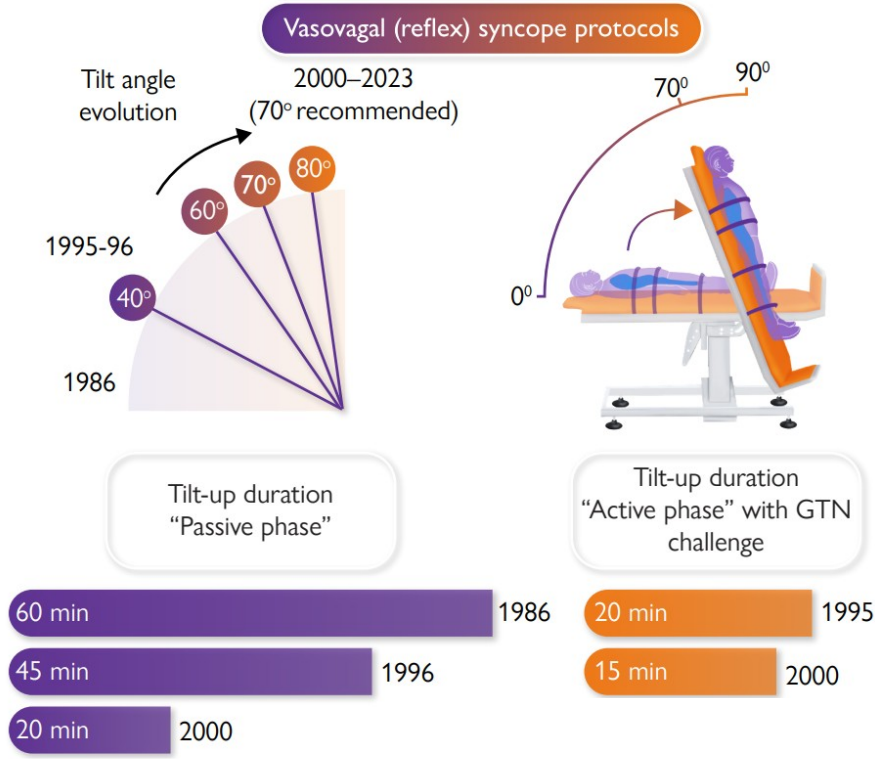


"Tilt testing should now be considered a means of exposing a hypotensive tendency rather than being diagnostic of VVS"

Tilt testing evolves: faster and still accurate

Artur Fedorowski [1,2]*, **Robert Sheldon** [3], **and Richard Sutton** [2,4]

Evolution of tilt test protocol for syncope and autonomic dysfunction



European Heart Journal (2023) **44**, 2480–2482

‘The Italian Protocol’: a simplified head-up tilt testing potentiated with oral nitroglycerin to assess patients with unexplained syncope

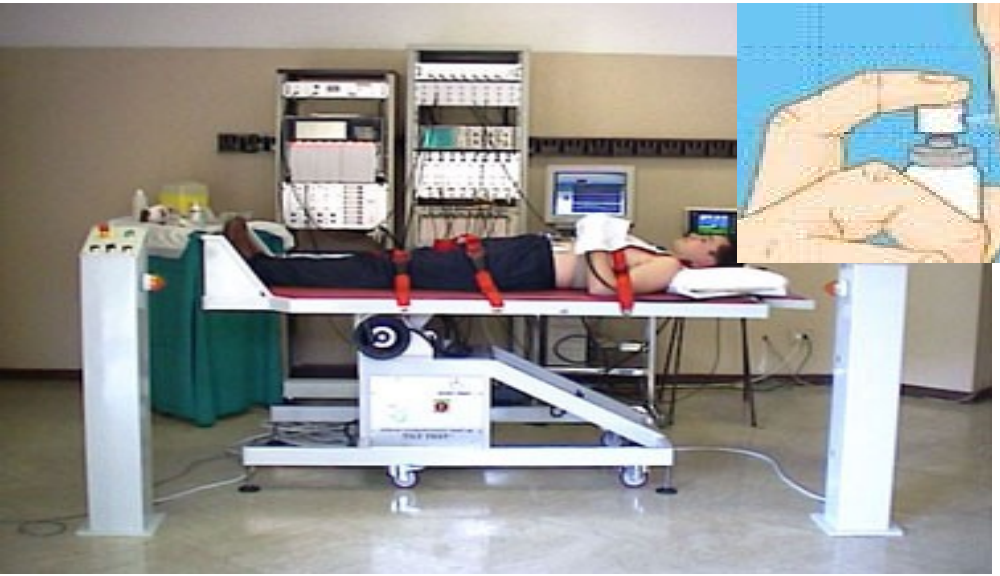
A. Bartoletti[1], P. Alboni[2], F. Ammirati[3], M. Brignole[4], A. Del Rosso[5], G. Foglia Manzillo[6], C. Menozzi[7], A. Raviele[8] and R. Sutton[9]

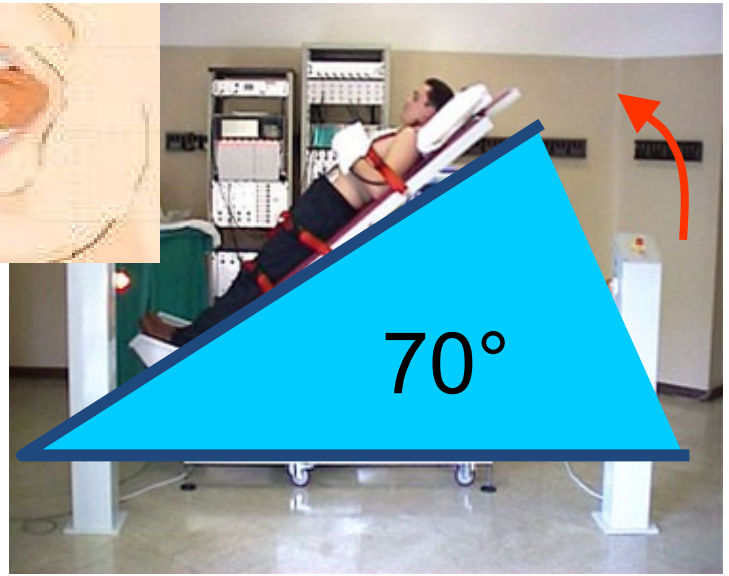
Methodology of the nitroglycerin-head-up tilt according to ‘The Italian Protocol’:

Stabilization phase: 5 min in the supine position
Passive phase: 20 min of passive tilt at 60°
Provocation phase: further 15 min after sublingual spray of nitroglycerin 400 µg at 60°
Test interruption: (1) Completion of the protocol in the absence of symptoms
(2) Syncope
(3) Progressive (>5 min) symptomatic orthostatic hypotension.

Europace (2000) **2**, 339–342

Il tilt test





Fase di stabilizzazione: 5 minuti

Fase passiva: 20 minuti

Fase farmacologica: 15 minuti (nitroglicerina sl 300 µg)

Management e qualità

Costi sociali della sincope

Attilio Del Rosso, Marta Bernardeschi*, Aldo Ieri

*Divisione di Cardiologia, Ospedale "S. Pietro Igneo", Fucecchio (FI), *U.O. Epidemiologia, Azienda USL 11, Empoli (FI)*

Tabella II. Costo delle singole procedure diagnostiche nella Divisione di Cardiologia dell'Ospedale di Fucecchio (FI).

Test diagnostico	Costo (£)
Anamnesi ed esame clinico	47 268
ECG	27 510
Tilt test e massaggio dei seni carotidei	401 643
ECG dinamico per 24 ore	193 482
Test ergometrico	149 635
Eco-stress	407 219
Ecocardiogramma	154 565
Studio elettrofisiologico endocavitario	2 591 080
EEG	64 131

Ital Heart J Suppl 2000; 1 (6): 772-776

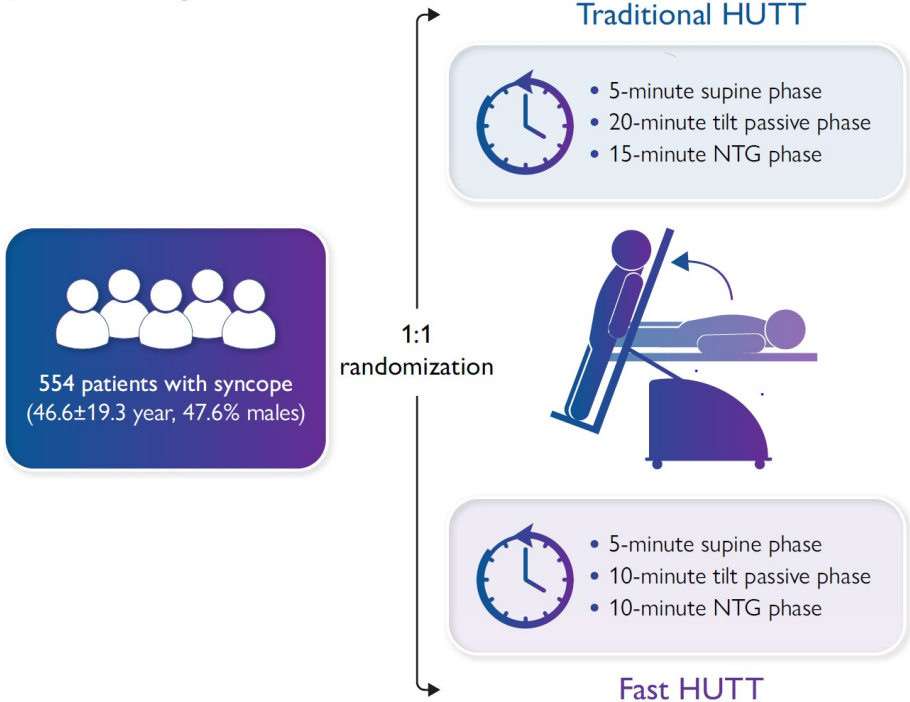
Results of head-up tilt potentiated by nitroglycerin sublingual spray 400 μg

Author	Patients number	Passive phase duration (min)	Passive phase positivity (%)	Nitroglycerin phase positivity (%)	Total positivity (%)	Exaggerated responses
Bartoletti, 1999[7]	84	5	1 (1)	28 (33)	29 (35)	12 (14)
Natale, 1998[4]	33	20	4 (12)	22 (67)	26 (78)	
Del Rosso, 1998[5]	202	20	22 (11)	119 (59)	141 (70)	8 (4)
Del Rosso, 1999[8]	69	20	7 (10)	36 (52)	43 (62)	3 (4)
Total passive phase 20 min	304	20	33 (11)	177 (58)	210 (69)	23 (8)*
Bartoletti, 1999[7]	84	45	15 (18)	28 (33)	43 (51)	18 (21)
Foglia Manzillo, 1999[13]	48	45	9 (19)	25 (52)	34 (71)	2 (4)
Del Rosso, 2000[8]	31	45	3 (10)	21 (68)	24 (77)	2 (6)
Total passive phase 45 min	163	45	27 (17)	74 (45)	101 (62)	22 (13)

*Total of 271 patients.

Short-duration head-up tilt test potentiated with sublingual nitroglycerin in suspected vasovagal syncope: the fast Italian protocol

Vincenzo Russo [1]*, Erika Parente[1], Marco Tomaino[2], Angelo Comune[1], Antonella Sabatini[2], Nunzia Laezza[1], Domenico Carretta[3], Gerardo Nigro [1], Anna Rago[1], Paolo Golino [1], and Michele Brignole [4]



Total time = 40 min

Total time = 25 min

European Heart Journal (2023) **44**, 2473–2479

554 patients with syncope
(46.6±19.3 year, 47.6% males)

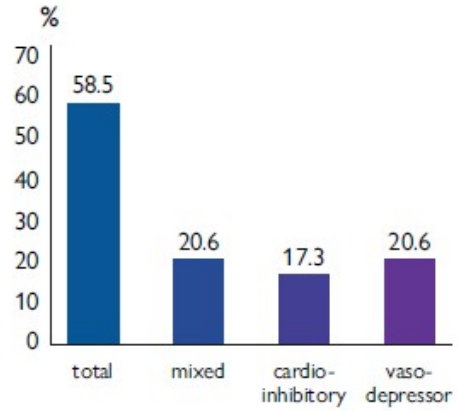
1:1
randomization

Traditional HUTT

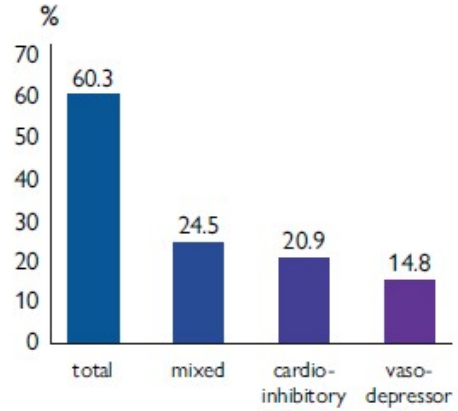
- 5-minute supine phase
- 20-minute tilt passive phase
- 15-minute NTG phase

Fast HUTT

- 5-minute supine phase
- 10-minute tilt passive phase
- 10-minute NTG phase



Positive rate



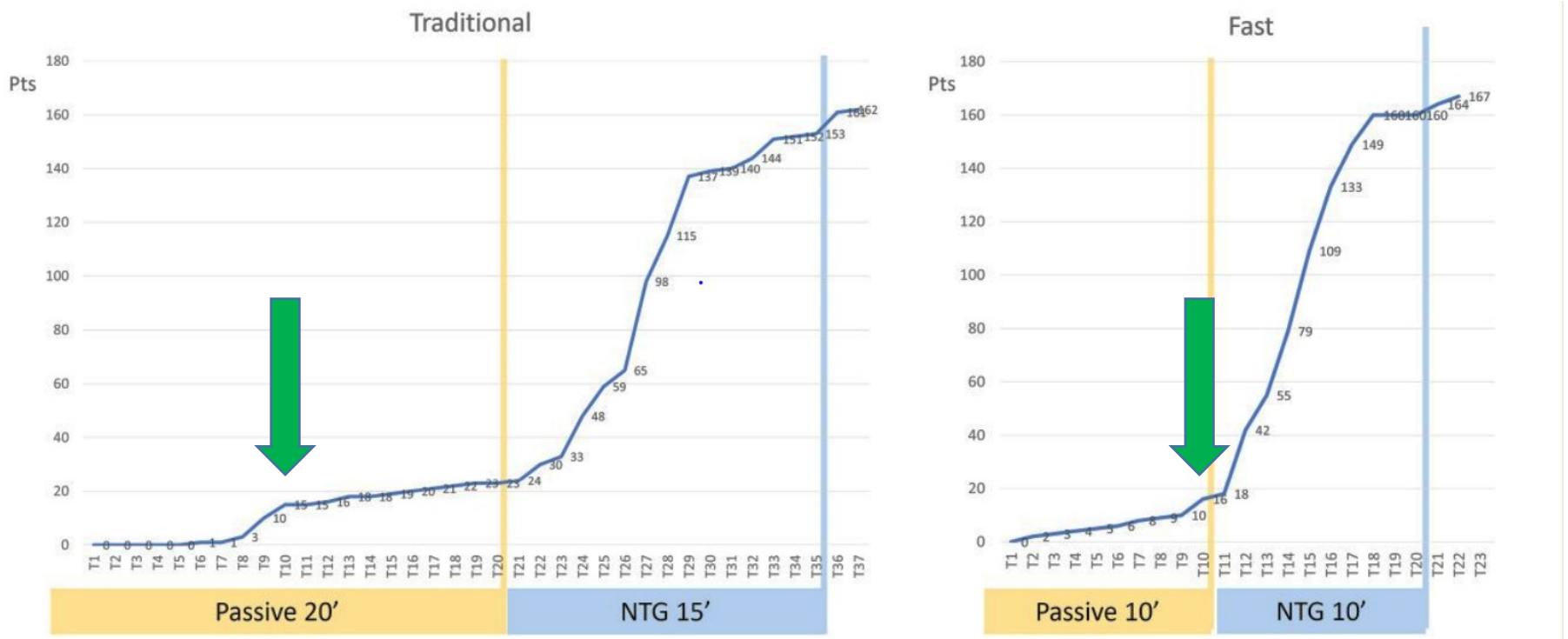


Figure 1 Cumulative number of patients with positive HUTT response (by 1 min time frame) during both passive and NTG phases in the two groups. Pts: patients; T: time

a total of 16 (5.8%) and 26 (9.4%) patients had syncope during the passive phase (P = 0.07).

The effect of orthostatic stress was maximum at the 10th minute

The hemodynamic effect of NTG was more powerful and rapid when administered in an already predisposed critical situation

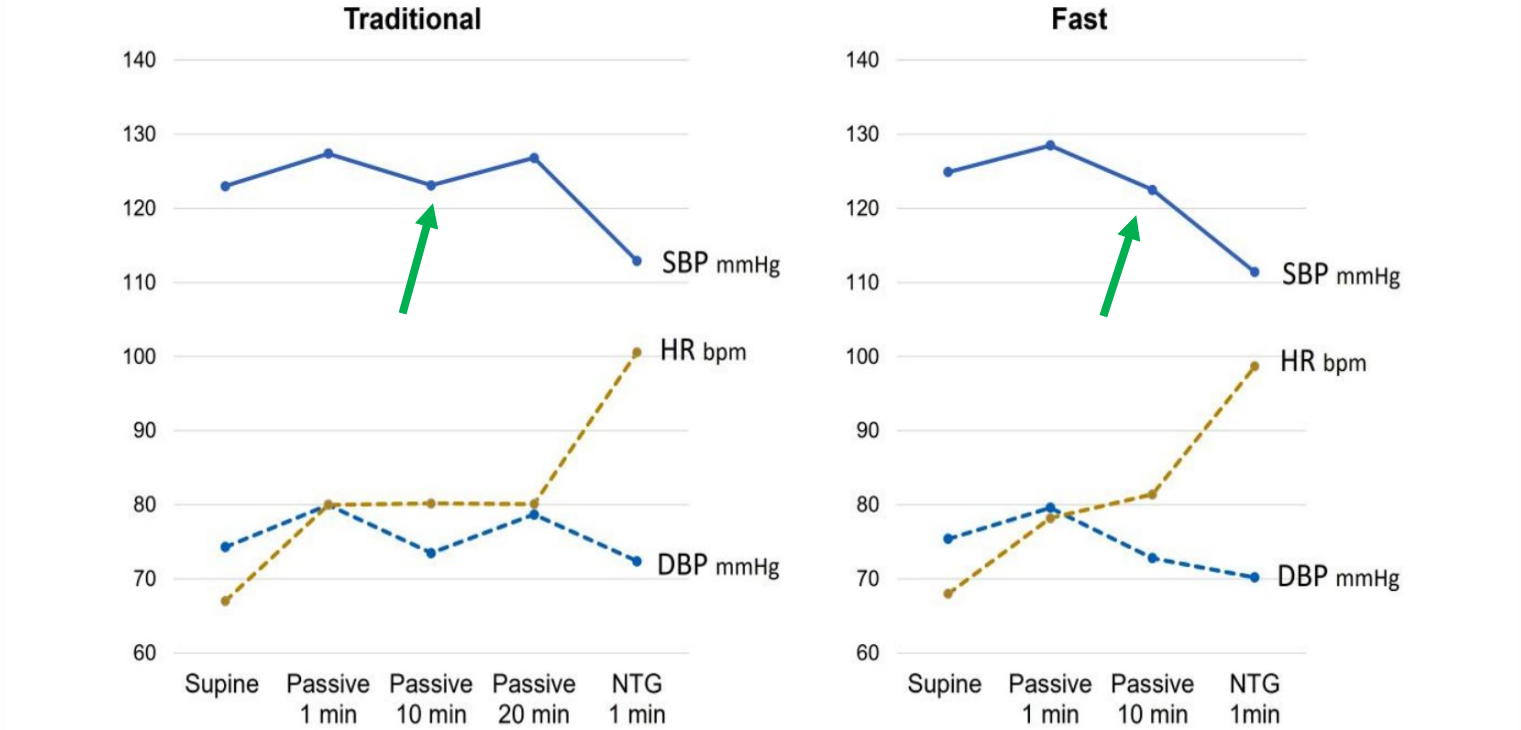


Figure 2 Pattern of blood pressure and heart rate changes observed during both passive phase in the two groups. SBP: systolic blood pressure; DPB: diastolic blood pressure; HR: heart rate

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NTG PHASE DURATION

The boost effect of NTG administration at the 10th minute of the passive phase was able to speed up and facilitate the vasovagal reflex in the Fast group which showed a shorter time to syncope. Indeed, we showed a significantly increased HUTT positivity during the 10 min NTG phase in the Fast group compared to the first 10 min of NTG phase in the Traditional group (151 vs. 101 patients, $P = 0.0001$). As a consequence, the duration of the NTG phase could be reduced from 15 min in the Traditional to 10 min in the Fast protocol.

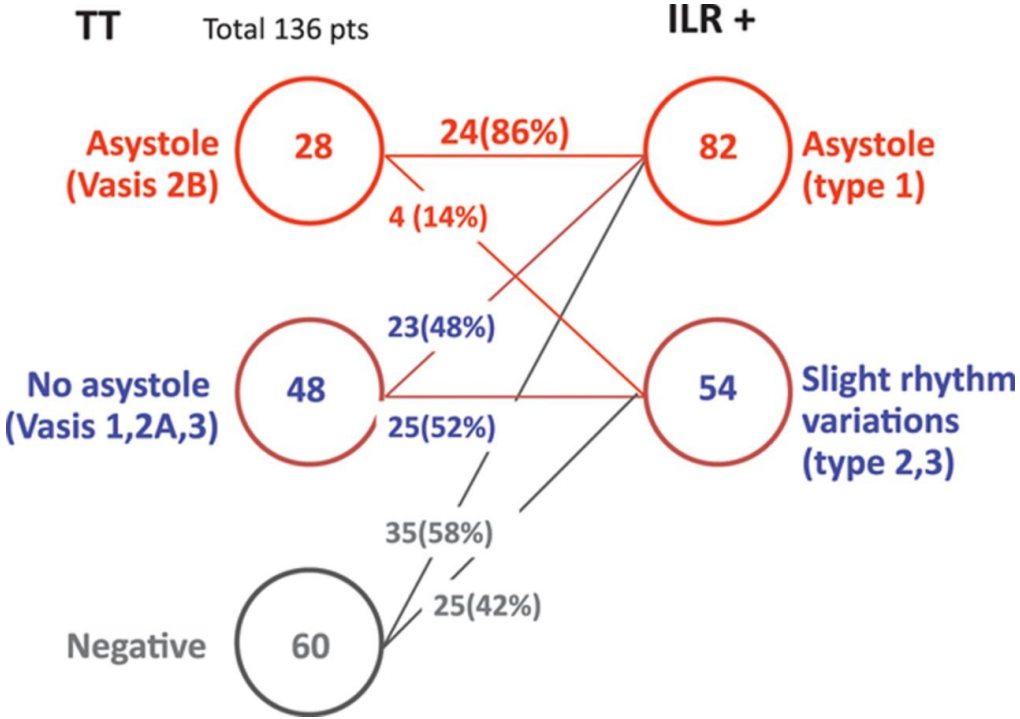
European Heart Journal (2023) **44**, 2473–2479

Results of nitroglycerin-head-up tilt in control subjects

Author	Number	Age	Head-up tilt protocol	Positivity (%)
Raviele, 1995[1]	35	54 ± 19	60° × 45+20 min NTG 0·3 mg	2 (6)
Aerts, 1997[11]	20	27 ± 4	70° × 45+15 min ISDN 5 mg	6 (30)*
Natale, 1998[4]	16	67 ± 9	70° × 20[5]+15 min NTG 0·4 mg	2 (12)
Del Rosso, 1998[5]	34	45 ± 17	60° × 20+25 min NTG spray 0·4 mg	2 (6)
Ammirati 1998[6]	23	36 ± 12	60° × 30+15 min ISDN 1·25 mg	0 (0)
Bartoletti, 1999[7]	25	49 ± 17	60° × 5+20 min NTG spray 0·4 mg	1 (4)
Del Rosso, 2000[8]	47	52 ± 20	60° × 20+20 min NTG spray 0·4 mg	2 (4)
Raviele, 2000[9]	30	44 ± 10	60° × 20+20 min NTG 0·3 mg	3 (10)
Total	230			18 (8)

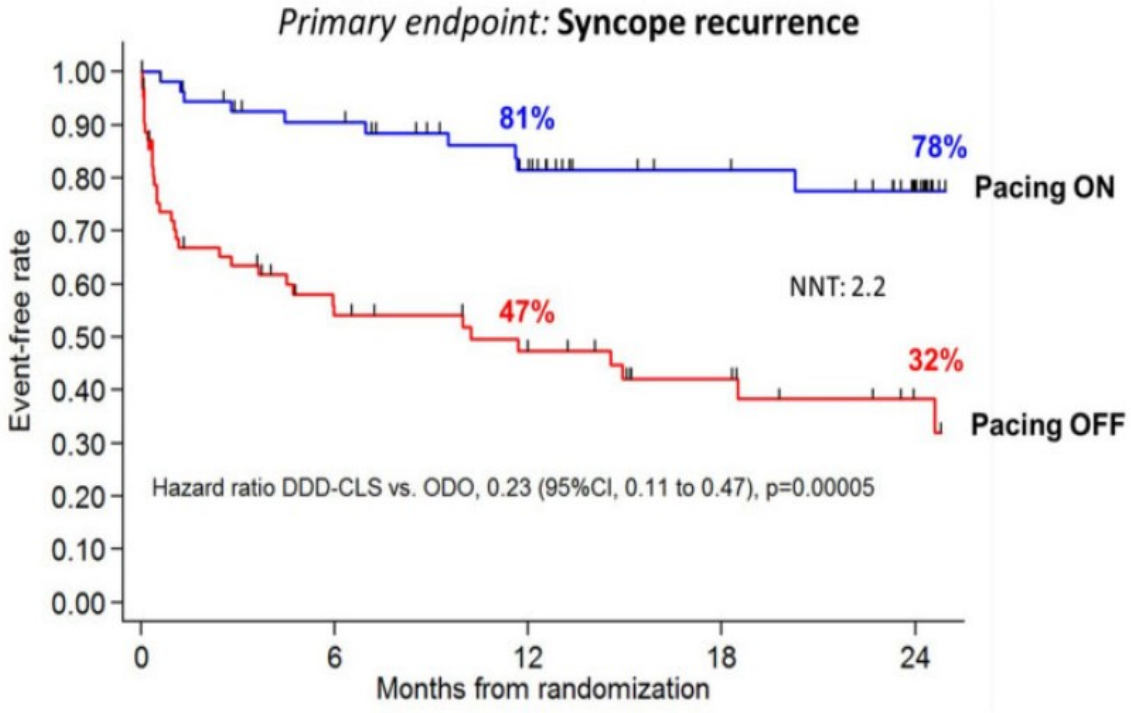
NTG=nitroglycerin; ISDN=isosorbide dinitrate.
*Exaggerated responses included.

Correlation between tilt test (TT) responses and the mechanism of syncope, as documented by implantable loop recorder (ILR) (Brignole 2014)



ESC European Society of Cardiology
European Heart Journal (2021) **42**, 508–516
doi:10.1093/eurheartj/ehaa936

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



ESC European Society of Cardiology
European Heart Journal (2023) **44**, 2473–2479
https://doi.org/10.1093/eurheartj/ehad322

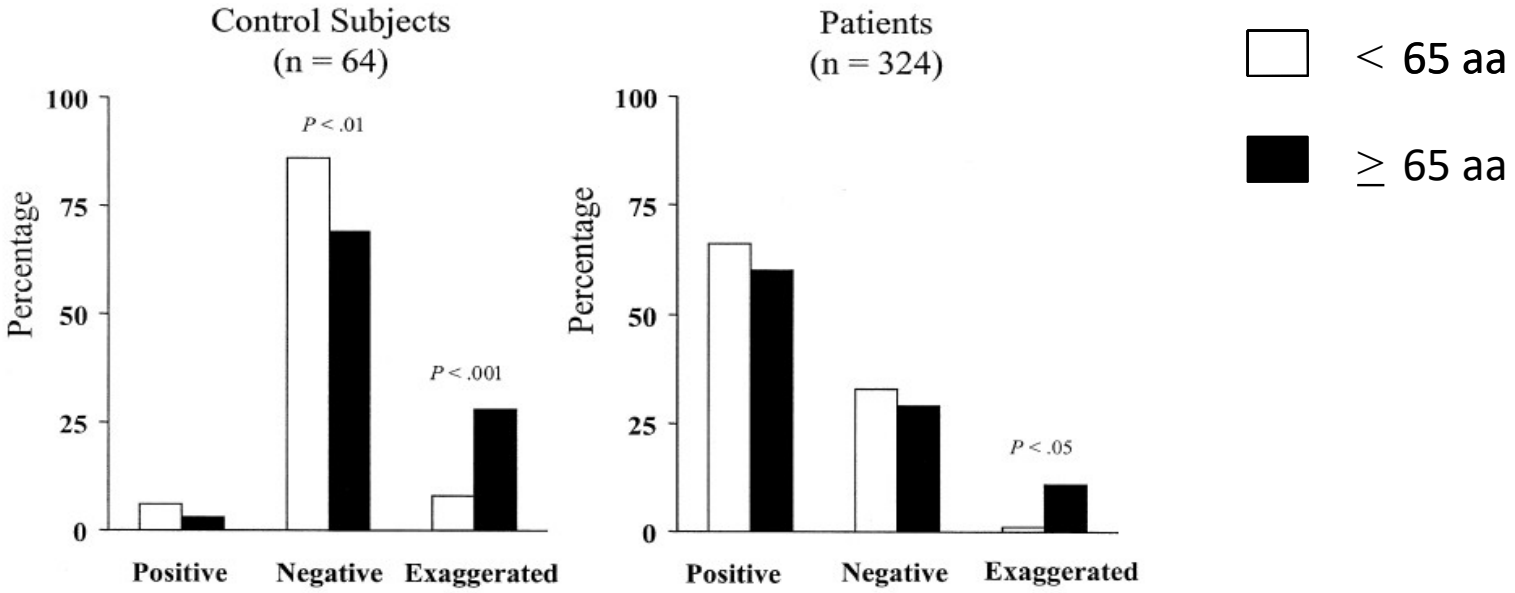
Short-duration head-up tilt test potentiated with sublingual nitroglycerin in suspected vasovagal syncope: the fast Italian protocol

Table 1 Clinical characteristics of the study population

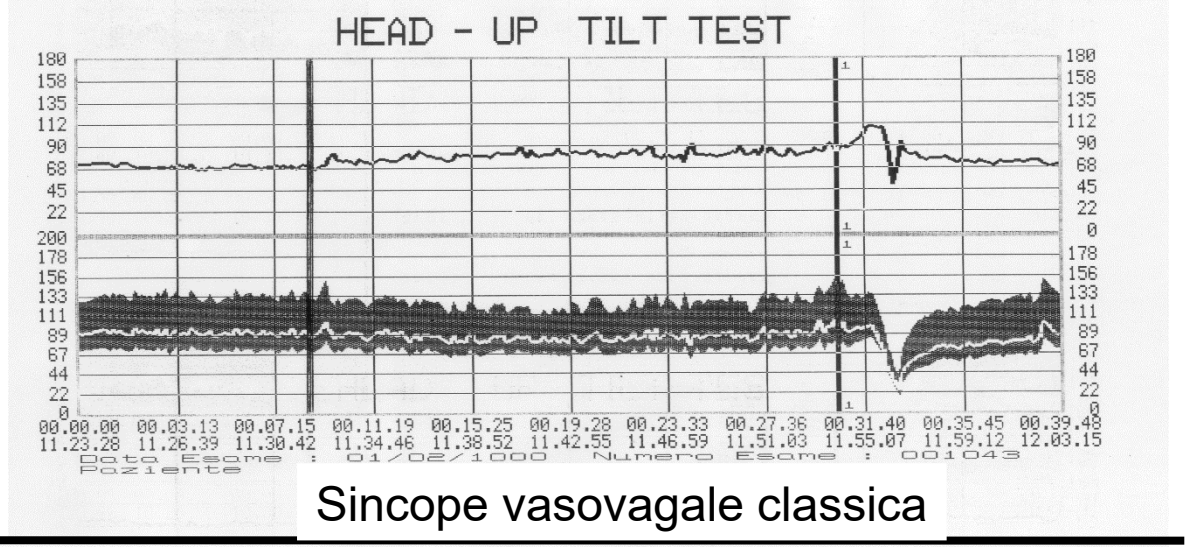
	Overall Population *n.* 554	Fast HUTT *n.* 277	Traditional HUTT *n.* 277
Age (years), mean ± SD	46.6 ± 19.3	47.2 ± 20.7	46 ± 18
Male sex, *n* (%)	264 (47.6)	135 (48.7)	129 (46.6)
Smoke, *n* (%)	141 (25.4)	74 (26.7)	67 (24.2)
Heart rate (b.p.m.), mean ± SD	73.5 ± 14.2	73.8 ± 14.5	72.2 ± 13.4
Systolic BP (mmHg), mean ± SD	125.5 ± 18.9	128.4 ± 18.6	125.4 ± 18.1
Diastolic BP (mmHg), mean ± SD	76.1 ± 12.3	77.3 ± 13.1	76.9 ± 11.6

Usefulness and Safety of Shortened Head-Up Tilt Testing Potentiated with Sublingual Glyceryl Trinitrate in Older Patients with Recurrent Unexplained Syncope

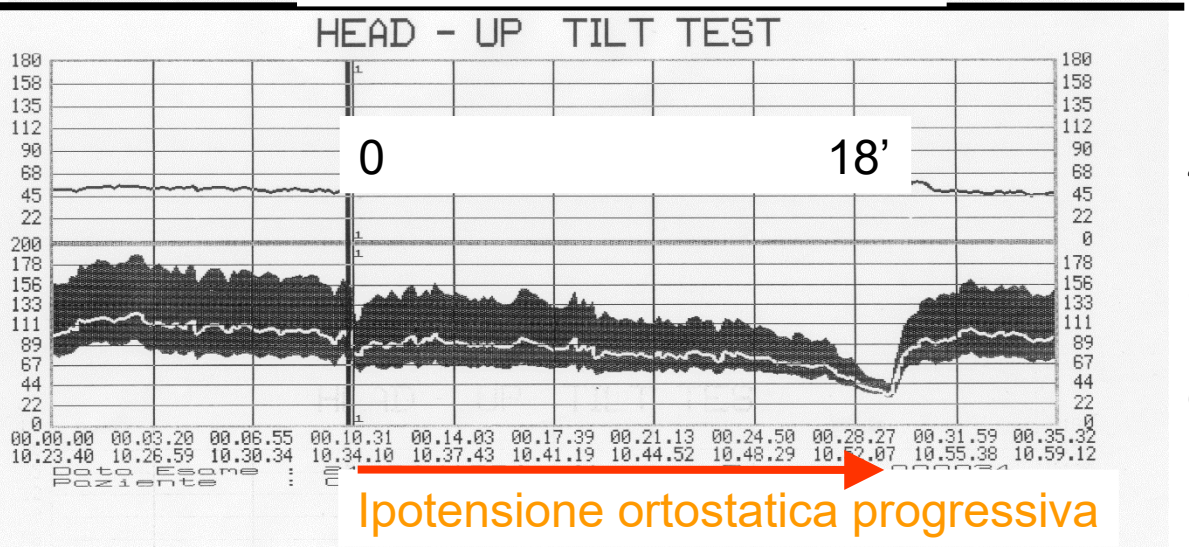
Attilio Del Rosso, MD, Andrea Ungar, MD,† Paolo Bartoli, MD,* Tommaso Cellai, MD,† Chiara Mussi, MD,‡ Niccolò Marchionni, MD,† Giulio Masotti, MD† and The Gruppo Italiano di Studio della sincope dell'anziano*



JAGS 50:1324–1328, 2002



Sincope vasovagale classica



Ipotensione ortostatica progressiva

N=236

46% had OH within 3 min. of HUT
15% had OH between 3 and 10 min.
39% had OH only after 10 min.

Gibbons 2006

Take home message

1) il tilt fast presenta un tasso di positività simile a quello del test tradizionale

2) occorre valutare la specificità del nuovo protocollo

3) è auspicabile verificare la correlazione tra risposte asistoliche tilt indotte e meccanismo emodinamico della sincope spontanea

4) cautela nell'utilizzo del tilt fast quando si sospetti clinicamente una sincope su base disautonomica