Gruppo Italiano Multidisciplinare per lo Studio della Sincope

Corso Avanzato GIMSI sulla Sincope

Il nuovo ruolo del tilt test

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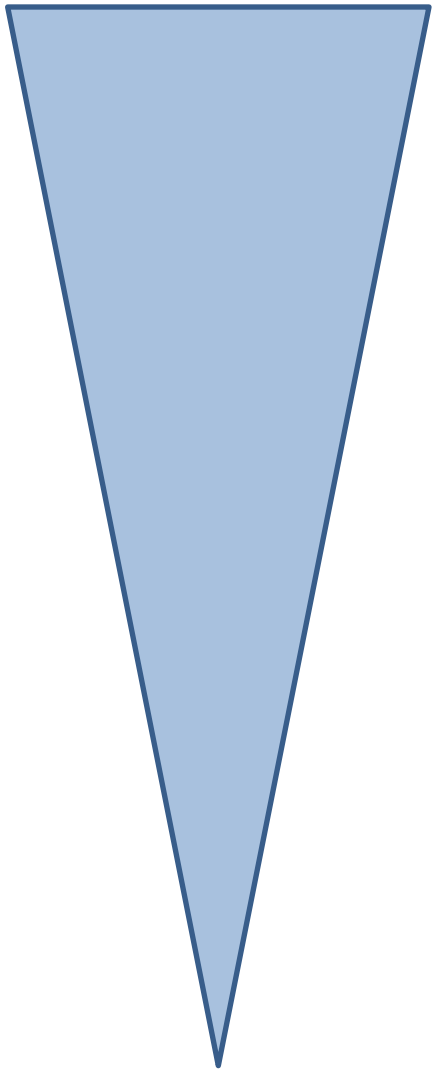
www.gimsi.it

Tilt table testing: limitations

- **Too often negative in pts with likely VVS *("low sensitivity")***
- **Too often positive in pts without VVS syncope *("low specificity")***
- **No value in assessing efficacy of treatment with drugs or pacemaker**

Someone stopped to perfom it
("clinical history better than tilt table testing")

Tilt testing: positivity rate



92%	Typical VVS, emotional trigger (Clom)
78%	Typical VVS, situational trigger (TNT)
73%-65%	Typical VVS, miscellaneous (Clom) (TNT)
56%-51%	Likely reflex, atypical (TNT)
47%	Cardiac syncope (TNT)
45%	Likely tachyarrhythmic syncope (Passive)
36%-30%	Unexplained syncope (TNT) (Clom)
13%-8%	Subjects without syncope (Passive) (Clom) (TNT)[8]

Sutton & Brignole. Eur Heart J 2014; 35: 2211-12

European Heart Journal (2014) **35**, 2211–2212
doi:10.1093/eurheartj/ehu255

CURRENT OPINION

Twenty-eight years of research permit reinterpretation of tilt-testing: hypotensive susceptibility rather than diagnosis

Richard Sutton[1]* and Michele Brignole[2]

A positive tilt test suggests the presence of a **hypotensive susceptibility**, which plays a role in causing syncope irrespective of the etiology and mechanism of syncope.

Changed indications for Tilt Table Testing

Old (initial) indications	New indications
Diagnosis of VVS	Susceptibility to orthostatic stress, irrespective of the etiology of syncope

Sutton & Brignole. Eur Heart J 2014; 35: 2211-12

ISSUE 3

SYNCOPE

Study design

ILR screening phase

Pts affected by **severe, recurrent** reflex syncopes, **aged >40 yrs**

↓

Tilt Table Testing (Passive + TNT)

↓

ILR implantation (Reveal DX/XT)

↓

ILR follow-up (max 2 yrs)

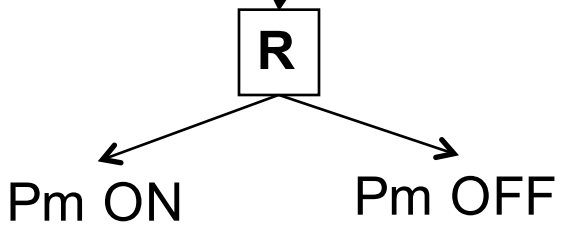
↓

ISSUE 3 therapy phase

ILR eligibility criteria:

- *Asystolic syncope ≥3 s, or*
- *Non-syncopal asystole ≥6 s*

↓

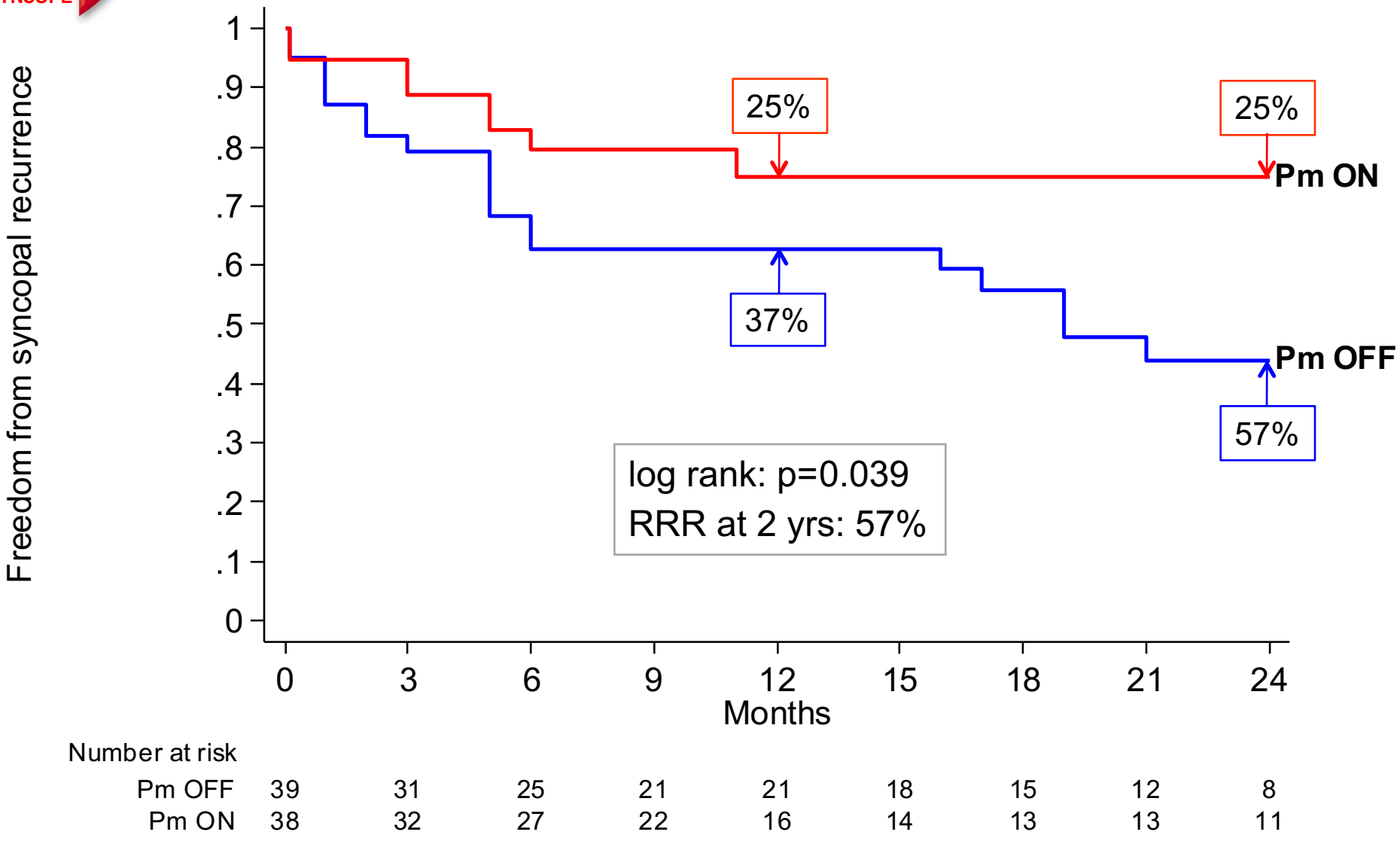


ISSUE 3

SYNCOPE

First syncope recurrence

(intention-to-treat)



Number at risk									
Pm OFF	39	31	25	21	21	18	15	12	8
Pm ON	38	32	27	22	16	14	13	13	11

Brignole et al. Circulation 2012;125:2566-2571

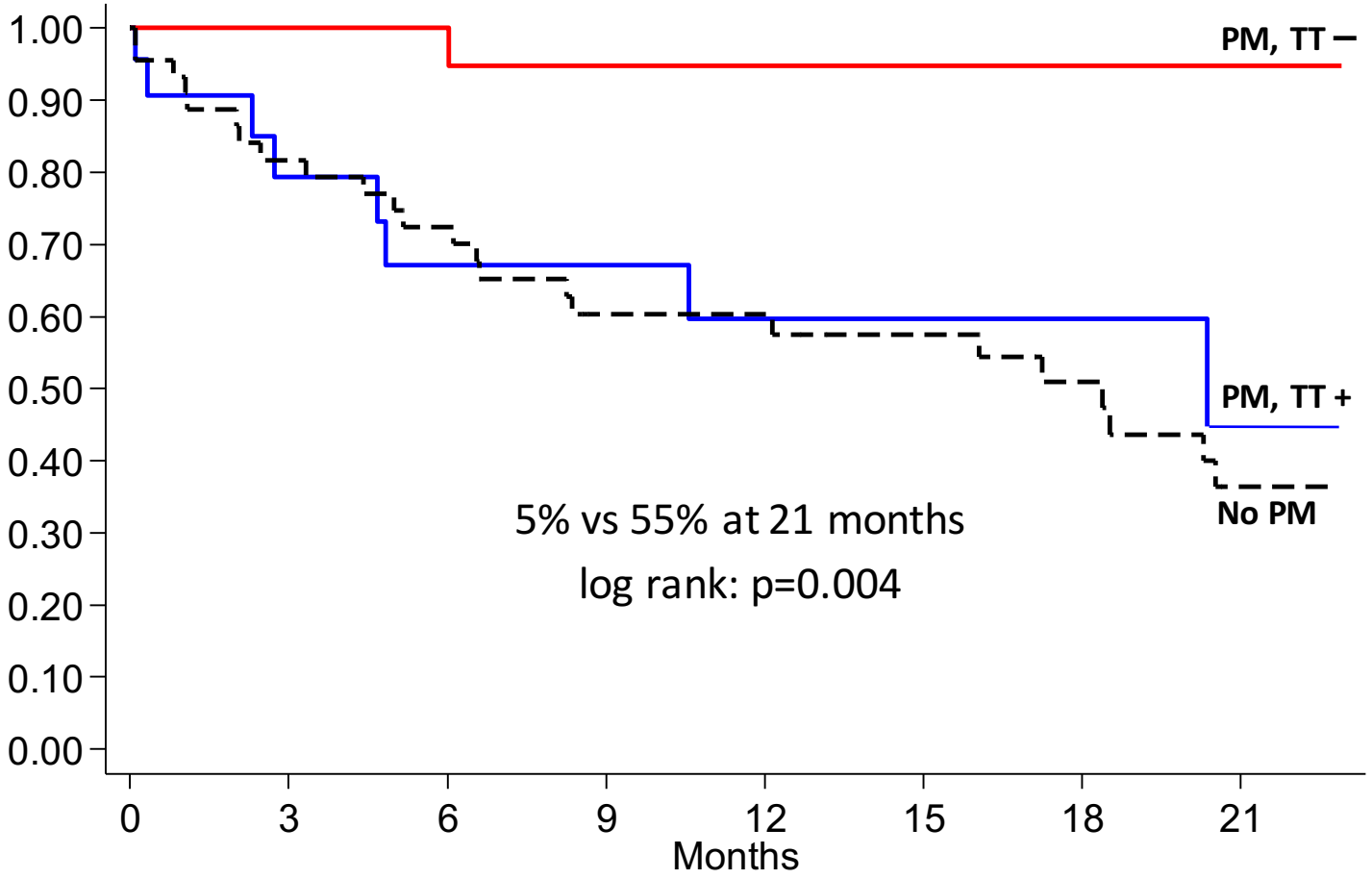
Factors predicting recurrence of syncope after pacemaker therapy (II)

Characteristics	**Recurrence** n=9	**No recurrence** n=43	**P value**
Tilt testing: positive	89%	42%	0.0004
- Asystolic (Vasis 2B)	44%	23%	ns
- Non-asystolic	44%	19%	ns
ILR findings (asystole)			
- Asystole duration, sec	9	8	ns
- Type 1A (sinus arrest)	44%	63%	ns
- Type 1B (sinus brady + AV block)	33%	14%	ns
- Type 1C (AV blocK)	22%	24%	ns
Systolic blood pressure			
- Supine, mmHg	135	130	ns
- Standing, mmHg	127	118	ns

ISSUE 3

SYNCOPE

Syncope recurrence after PM therapy according to tilt test results



Number at risk

PM TT+	26	14	10	9	8	6	4	3
PM TT-	26	19	19	15	11	10	9	9
NO THER	45	35	31	22	22	18	14	9

Brignole M et al. Circ Arrhythm Electrophysiol 2014;7:10-16

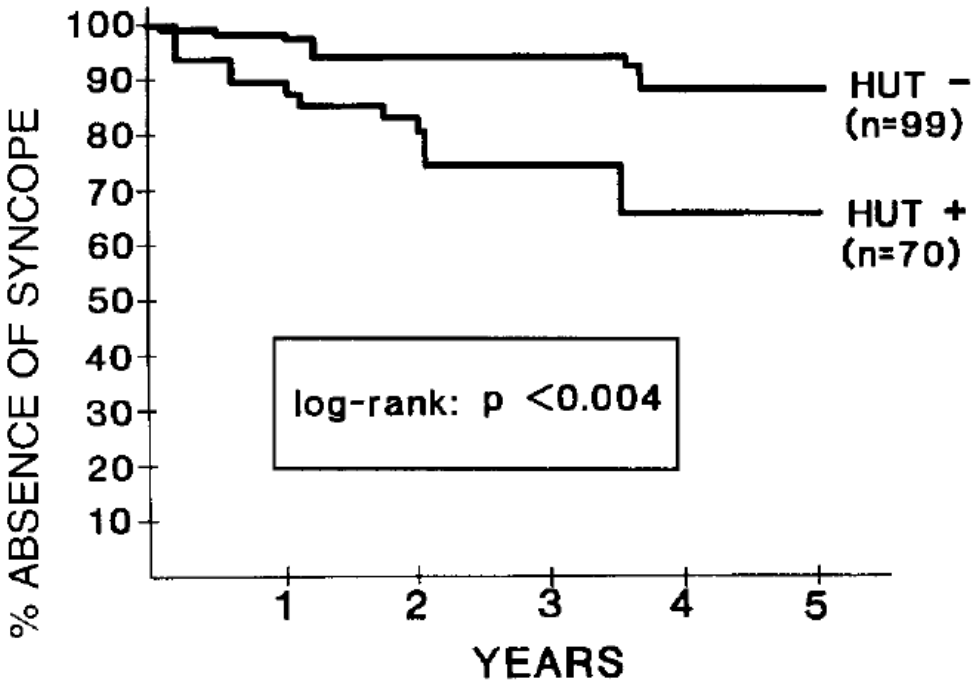
A Positive Response to Head-Up Tilt Testing Predicts Syncopal Recurrence in Carotid Sinus Syndrome Patients With Permanent Pacemakers

Germano Gaggioli, MD, Michele Brignole, MD, Carlo Menozzi, MD, Gianluigi Devoto, MD, Daniele Oddone, MD, Lorella Gianfranchi, MD, Enrico Gostoli, MD, Nicola Bottoni, MD, and Gino Lolli, MD

Am J Cardiol 1995; 76: 720

TABLE I Comparison Between Patients With and Without Syncopal Recurrence at Follow-Up

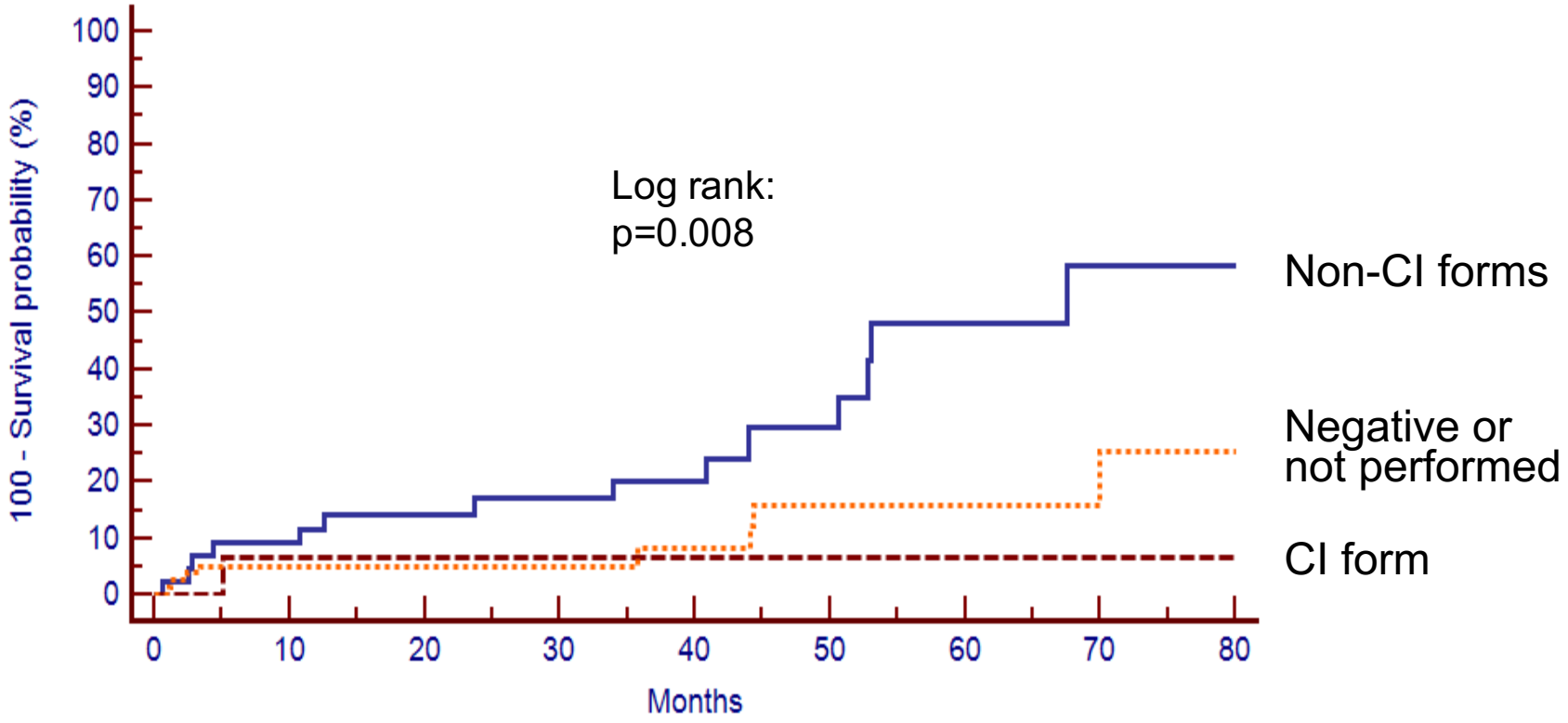
Factors	Syncope (n = 24)	No Syncope (n = 145)
Head-up tilt test		
Positive	15 (63)*	55 (38)*
Negative	9 (38)*	90 (62)*
Underlying heart disease		
Yes	12 (50)	88 (61)
No	12 (50)	57 (39)
Age		
>70 yr	15 (63)	92 (63)
≤70 yr	9 (38)	53 (37)
Pacemaker mode		
Dual-chamber	14 (58)	96 (66)
VVI	10 (42)	49 (34)
Type of carotid sinus syndrome		
Cardioinhibitory	13 (54)	83 (57)
Mixed	11 (46)	62 (43)
Gender		
Male	19 (79)	107 (74)
Female	5 (21)	38 (26)
Number of syncopal episodes		
>3	14 (58)	61 (42)
≤3	10 (42)	84 (58)



Clinical context and outcome of carotid sinus syndrome diagnosed by means of the 'method of symptoms'

Solari D et al. Europace 2013

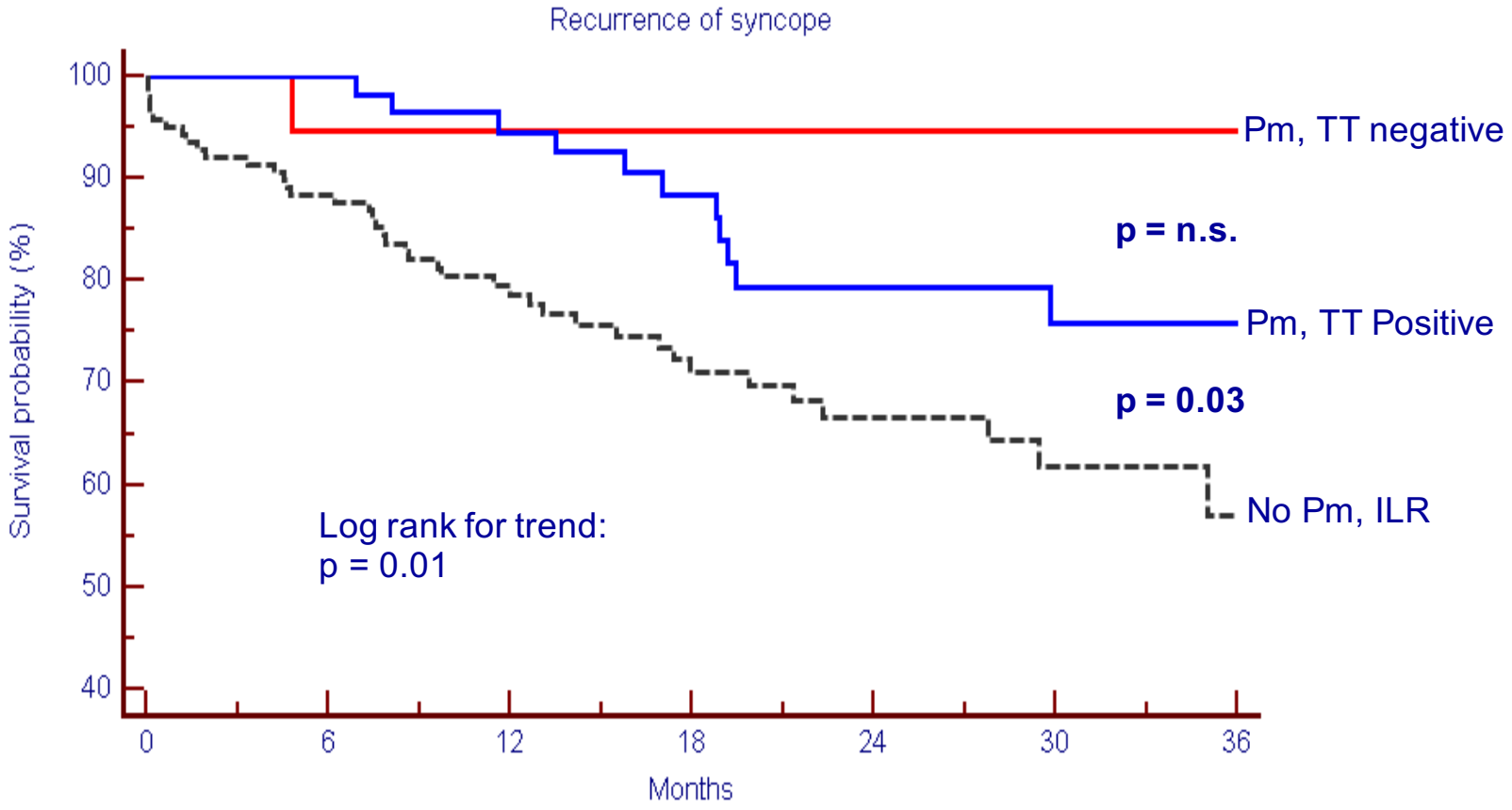
Recurrence of syncope according to tilt test results



Number at risk

Group: 1	44	37	31	28	22	13	6	2	2
Group: 2	15	14	13	12	8	8	6	2	1
Group: 3	82	63	51	35	27	17	13	8	5

SUP 2 study: 3-years extended follow-up



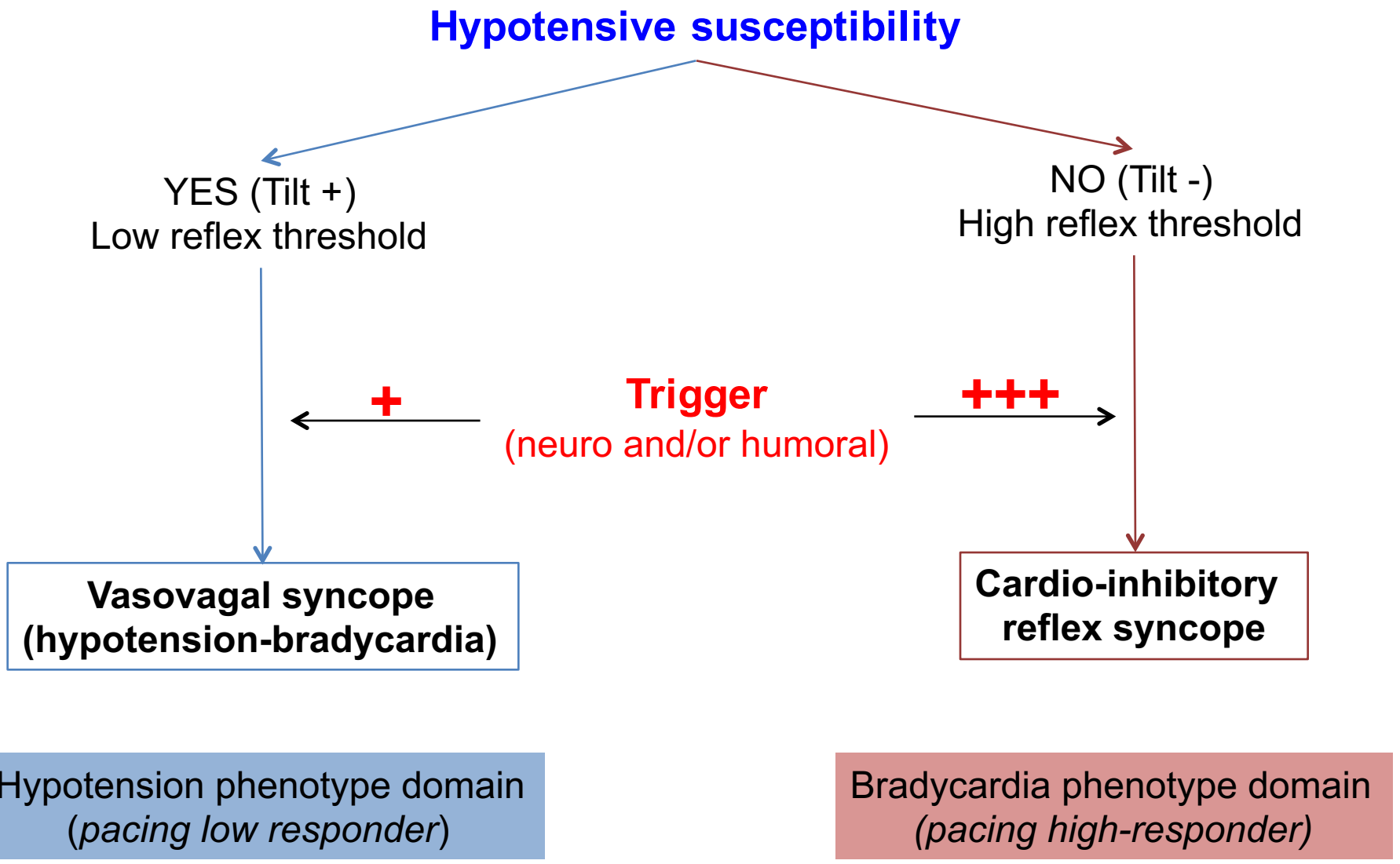
Europace 2016

Changed indications for Tilt Table Testing

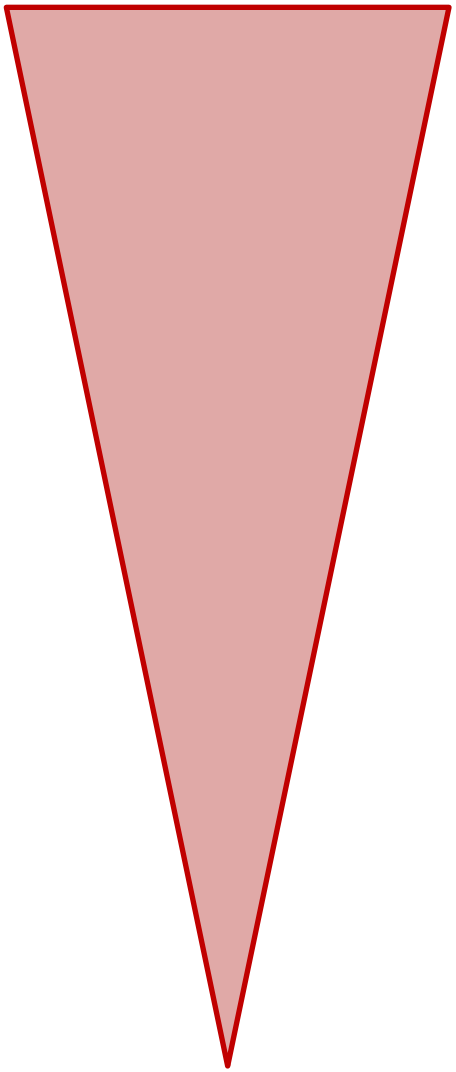
Old (initial) indications	New indications
Diagnosis of VVS	Susceptibility to orthostatic stress, irrespective of the etiology of syncope
Identification of candidates for permanent pacing (CI form)	Identification of non-responder to cardiac pacing (any positive response)

Sutton & Brignole. Eur Heart J 2014

Reflex syncope: **Dual-action model**



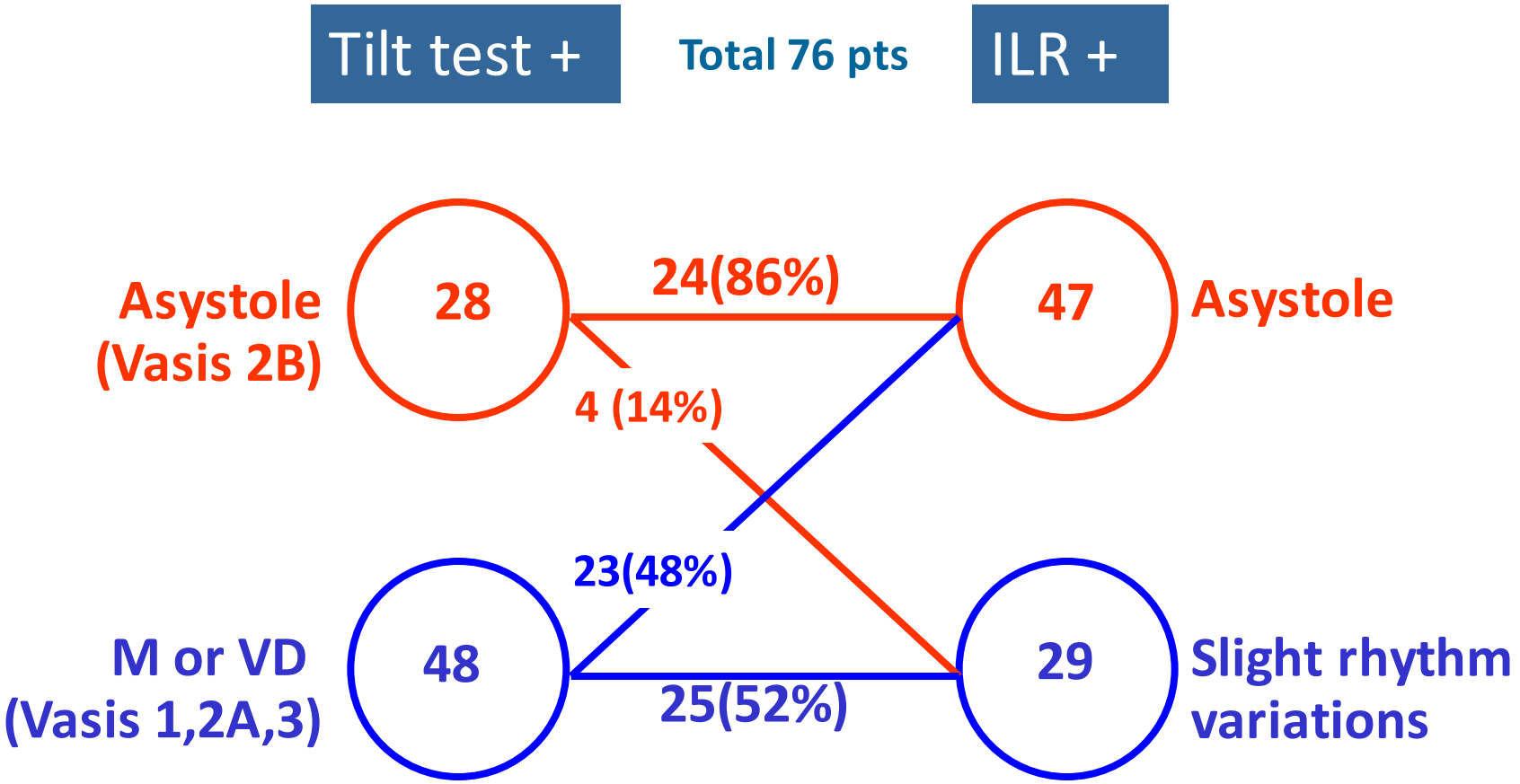
Tilt table testing: asystolic form (VASIS 2B)



44%	**Typical emotional VVS** (Clom)
24%	**Typical emotional VVS** (TNT)
21%	**Likely reflex, no trigger** (TNT)
17%	**Typical peripheral trigger VVS** (Clom)
10%	**Typical peripheral trigger VVS** (TNT)
8%	**Unexplained syncope**(Clom)
7%	**Unexplained syncope** (TNT)
6%	**Subjects w/t syncope** (Passive)
0 %	**Cardiac syncope (TNT)**
0%	**Subjects w/t syncope** (TNT)

Sutton & Brignole. Eur Heart J 2014; 35: 2211-12

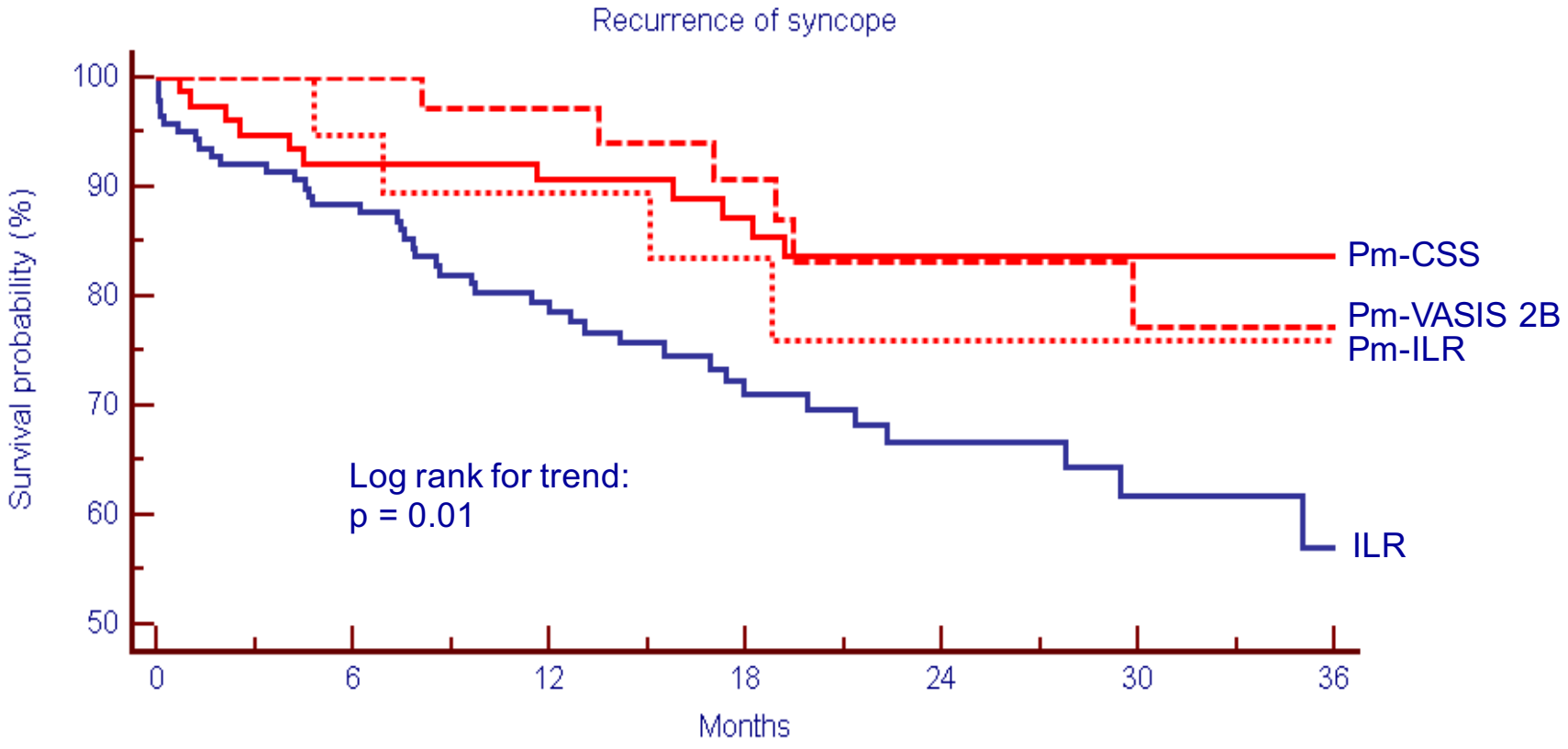
Correlation between tilt test responses and ILR-documented mechanism



Positive predictive value of asystolic tilt: 0.86 (95% CI 0.70-0.95)

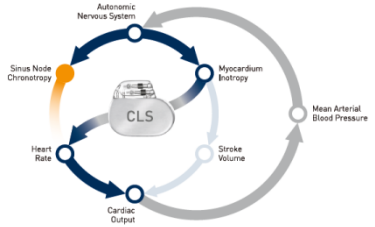
Brignole M et al. Circ Arrhythm Electrophysiol 2014;7:10-16

SUP 2 study: 3-years extended follow-up



Number at risk						
Group: ILR						
142	115	90	58	37	22	10
Group: PM-CSS						
78	69	61	51	40	26	17
Group: PM-ILR						
21	18	17	11	8	6	1
Group: PM-VASIS 2B						
38	37	32	26	21	13	6

BioSync



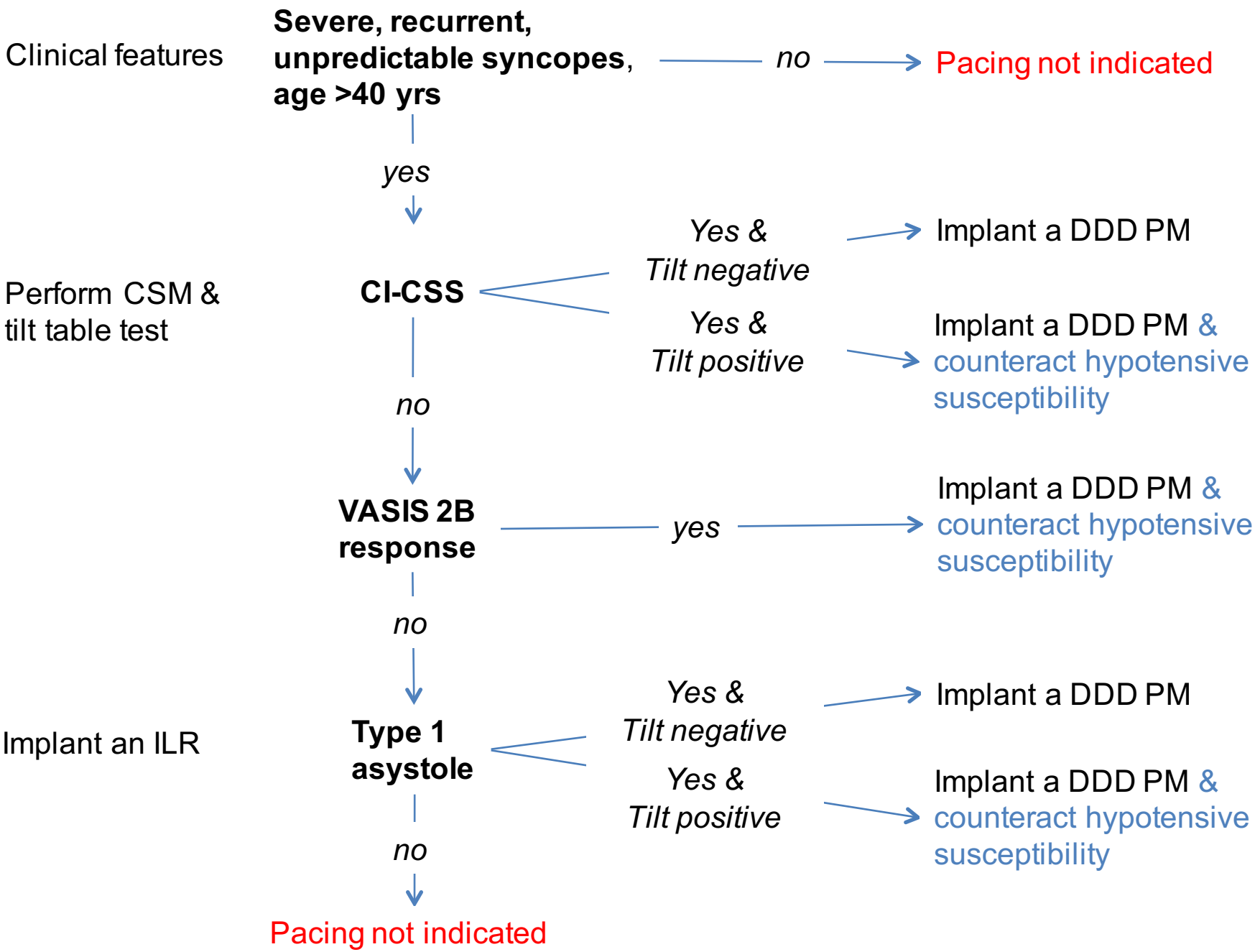
Benefit of dual-chamber pacing with Closed Loop Stimulation (CLS) in tilt-induced cardio-inhibitory reflex syncope.

A randomized double-blind parallel trial

M. Brignole (PI) - M. Tomaino (Co-PI)

BIOTRONIK
excellence for life

Pacing for neurally-mediated syncope: decision tree



Gruppo Italiano Multidisciplinare per lo Studio della Sincope

Italian Multidisciplinary Group for the Study of Syncope:

Established in 2003 by 5 national societies:

- arrhythmology,
- internal medicine,
- emergency medicine,
- geriatrics
- neurology

www.gimsi.it