ALGORITMI DIAGNOSTICI FINALIZZATI ALLA TERAPIA PERSONALIZZATA

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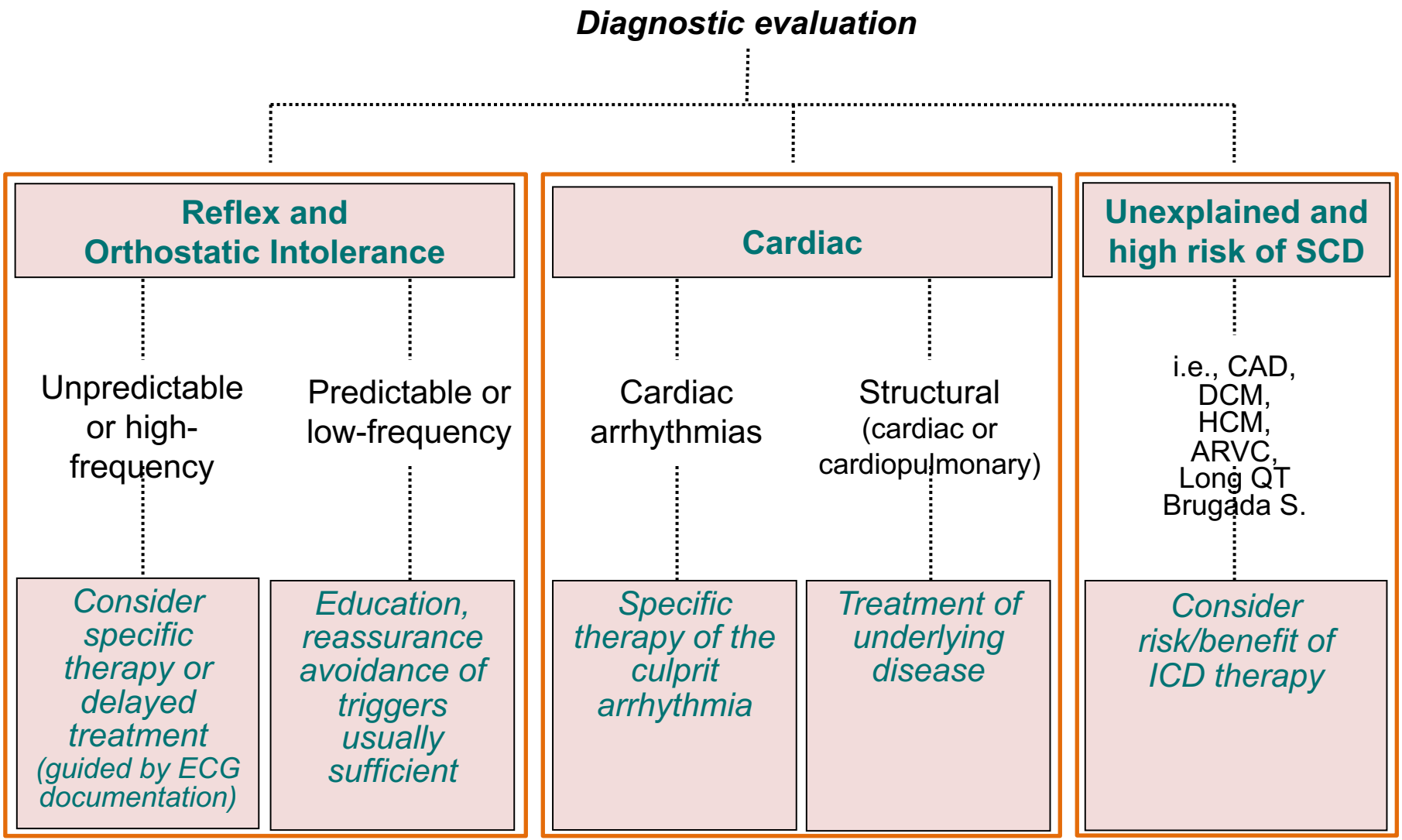
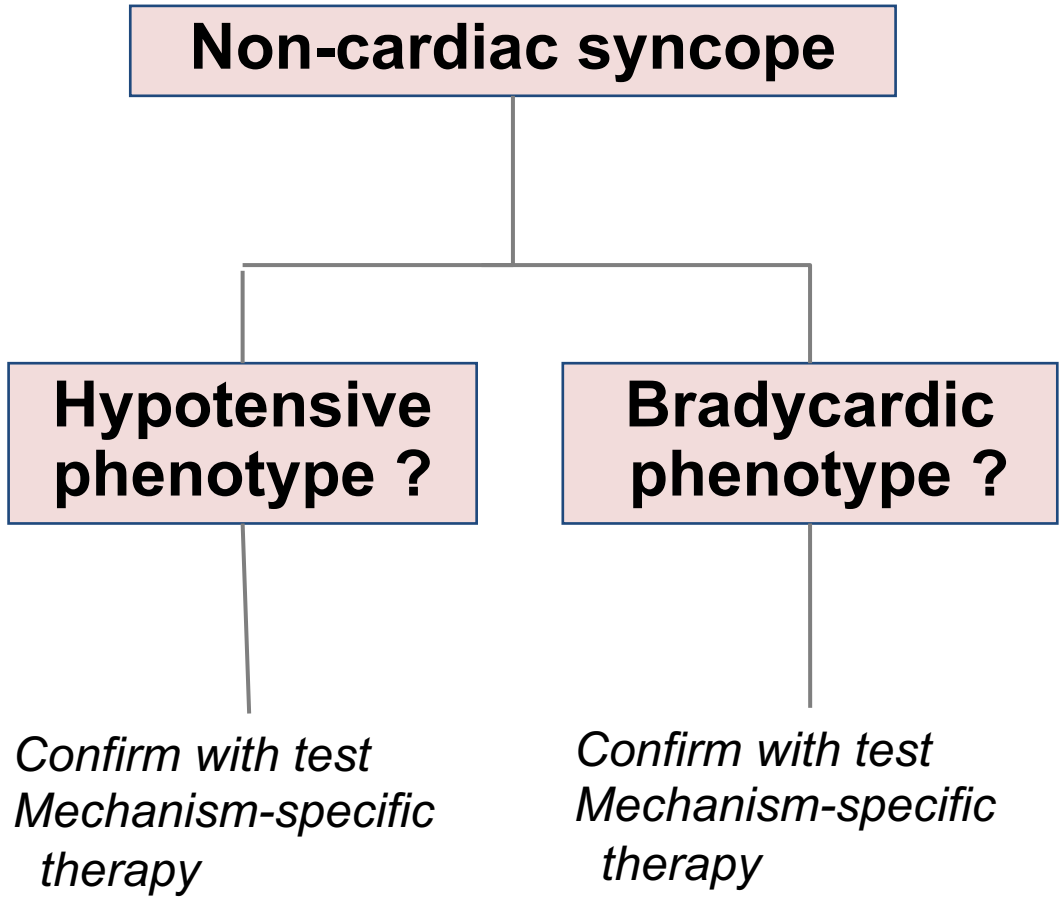
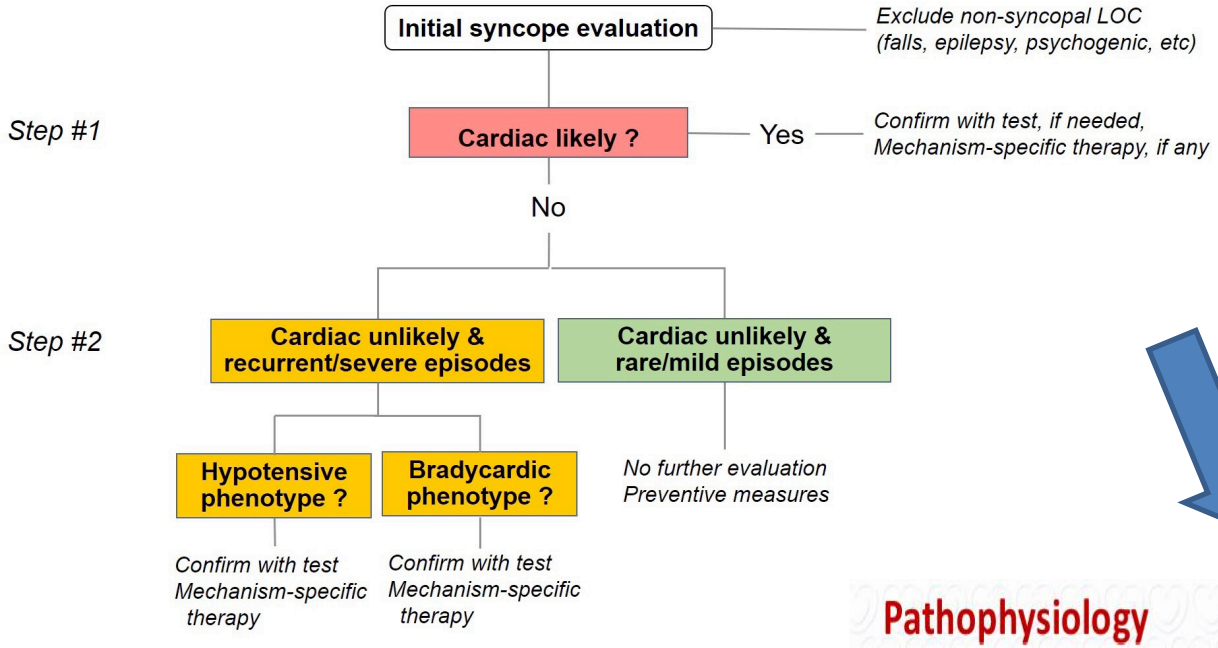
Divisione di Cardiologia
Ospedale Regionale di Bolzano

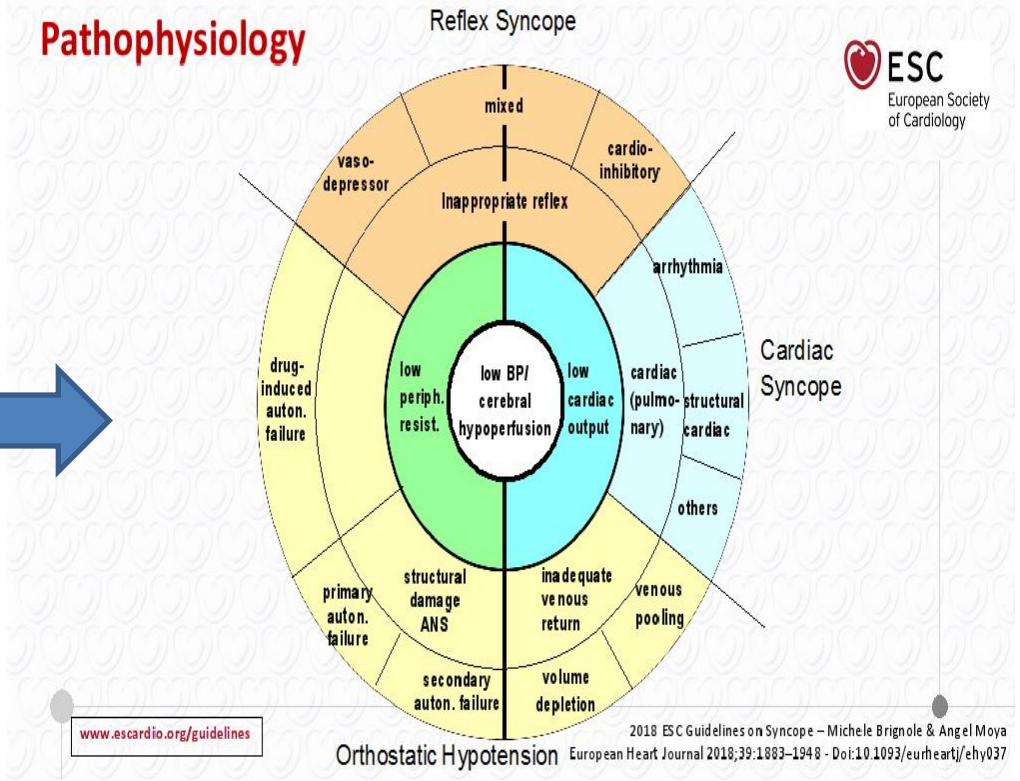
Treatment of syncope: **General principles**





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


Initial syncope evaluation
Exclude non-syncopal LOC
(falls, epilepsy, psychogenic, etc)
Step #1
Cardiac likely ?
Yes
Confirm with test, if needed,
Mechanism-specific therapy, if any
No
Step #2
Cardiac unlikely &
recurrent/severe episodes
Cardiac unlikely &
rare/mild episodes
Hypotensive
phenotype ?
Bradycardic
phenotype ?
No further evaluation
Preventive measures
Confirm with test
Mechanism-specific
therapy
Confirm with test
Mechanism-specific
therapy


Pathophysiology
Reflex Syncope
ESC
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mixed
vaso-
depressor
cardio-
inhibitory
Inappropriate reflex
arrhythmia
drug-
induced
auton.
failure
low
periph.
resist.
low BP/
cerebral
hypoperfusion
low
cardiac
output
cardiac
(pulmo-
nary)
structural
cardiac
Cardiac
Syncope
others
primary
auton.
failure
structural
damage
ANS
inadequate
venous
return
venous
pooling
secondary
auton. failure
volume
depletion
Orthostatic Hypotension
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2018 ESC Guidelines on Syncope – Michele Brignole & Angel Moya
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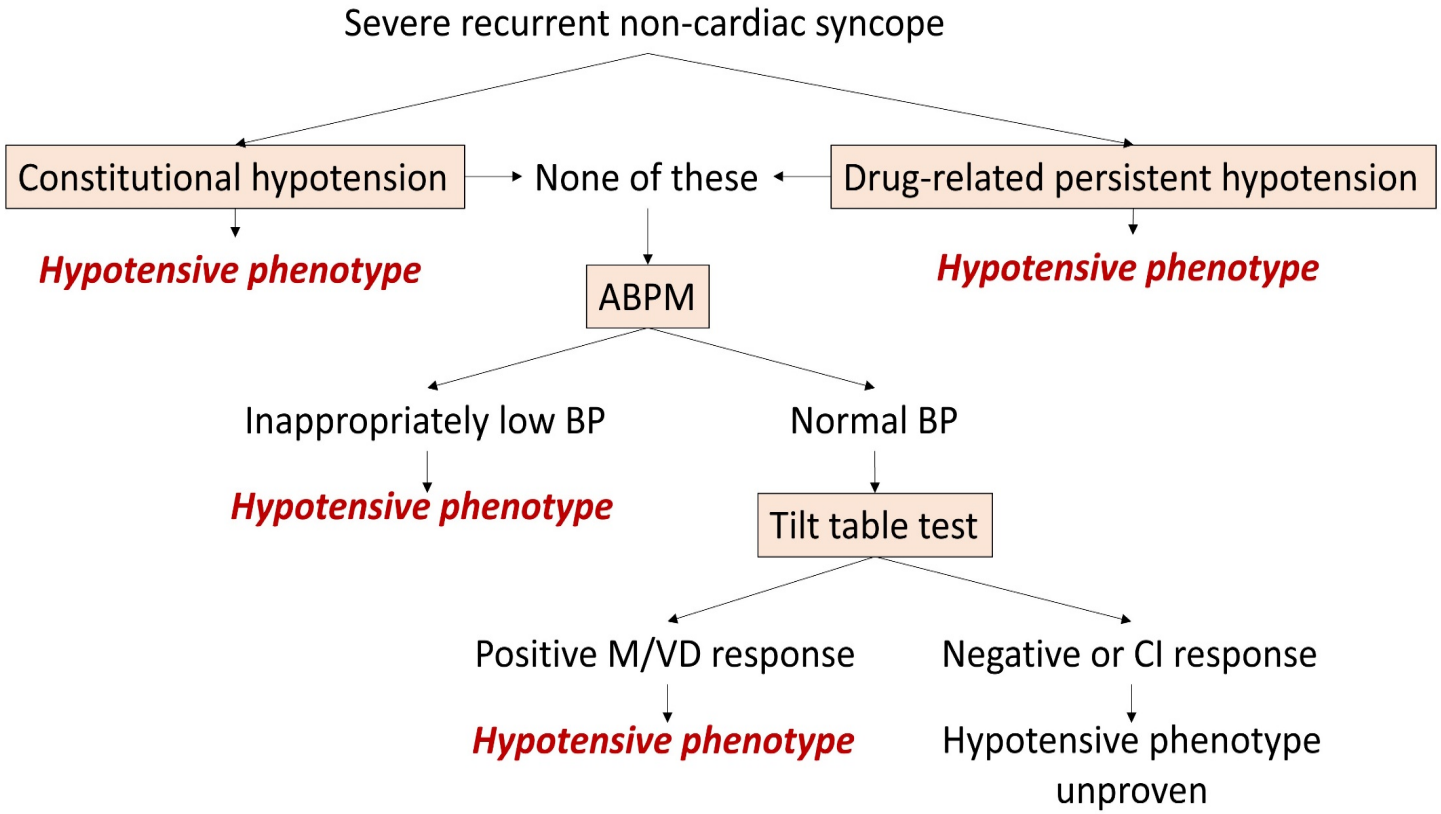
How to identify patients with Hypotensive Phenotype?



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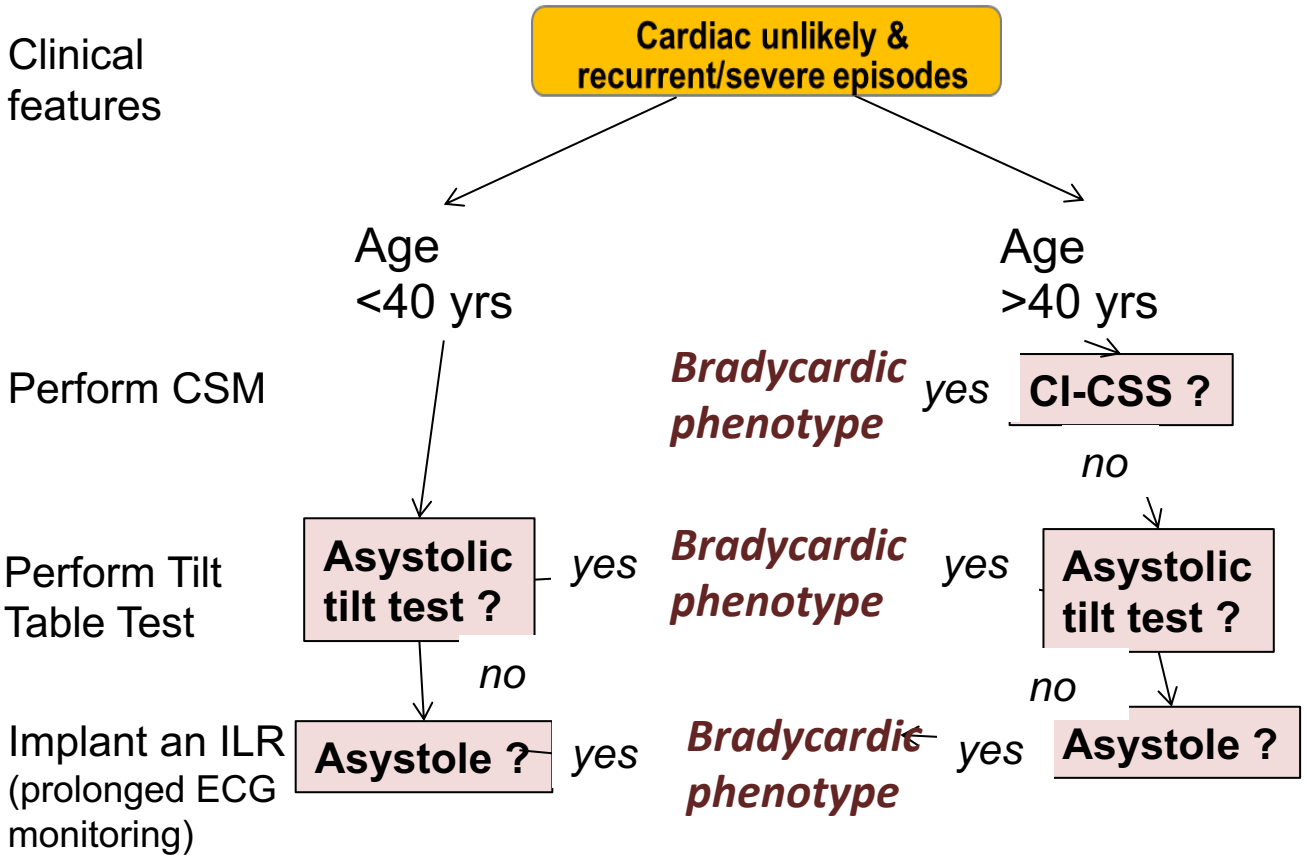
How to identify patients with non-cardiac syncope and *Bradycardiac Phenotype*?



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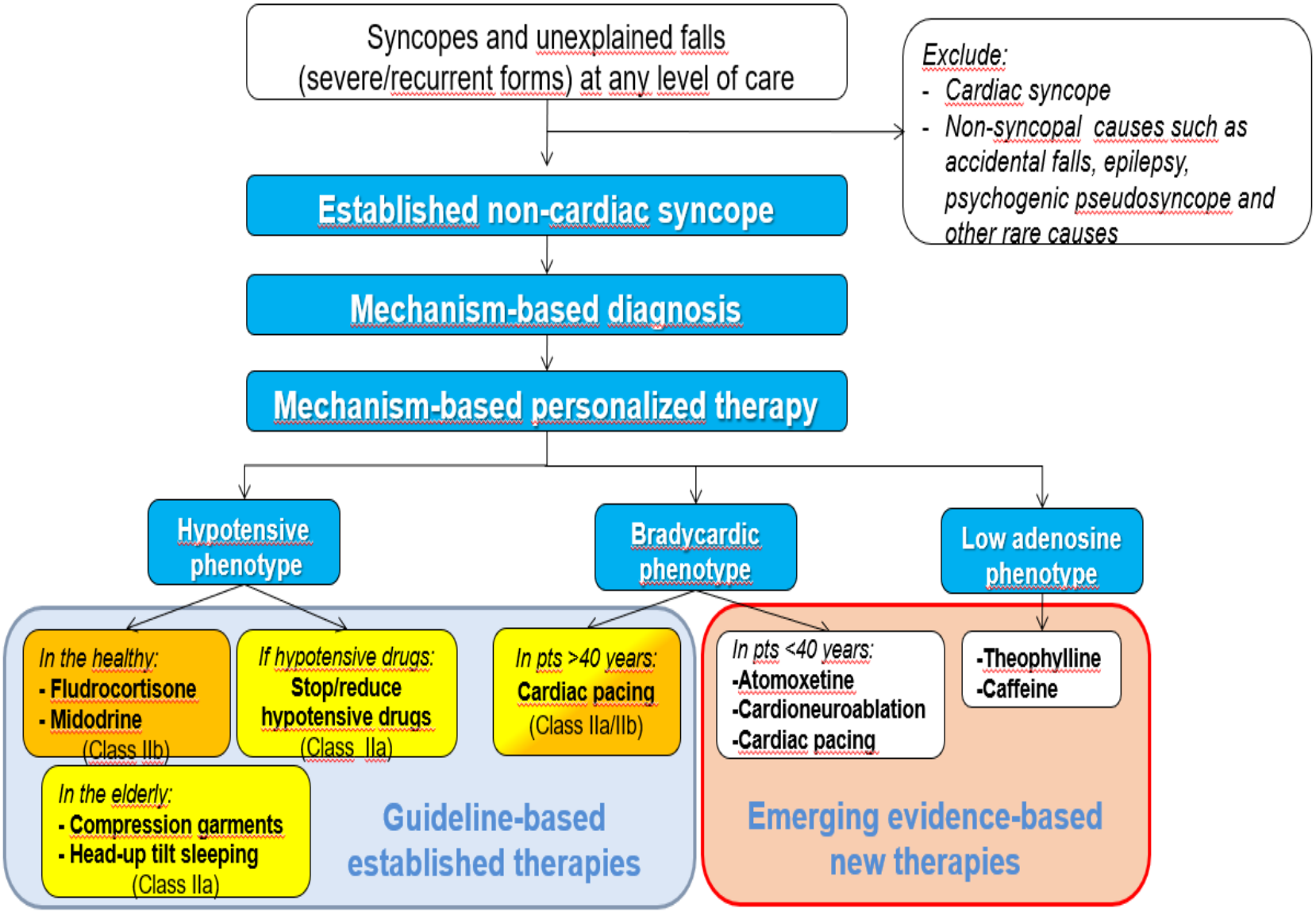
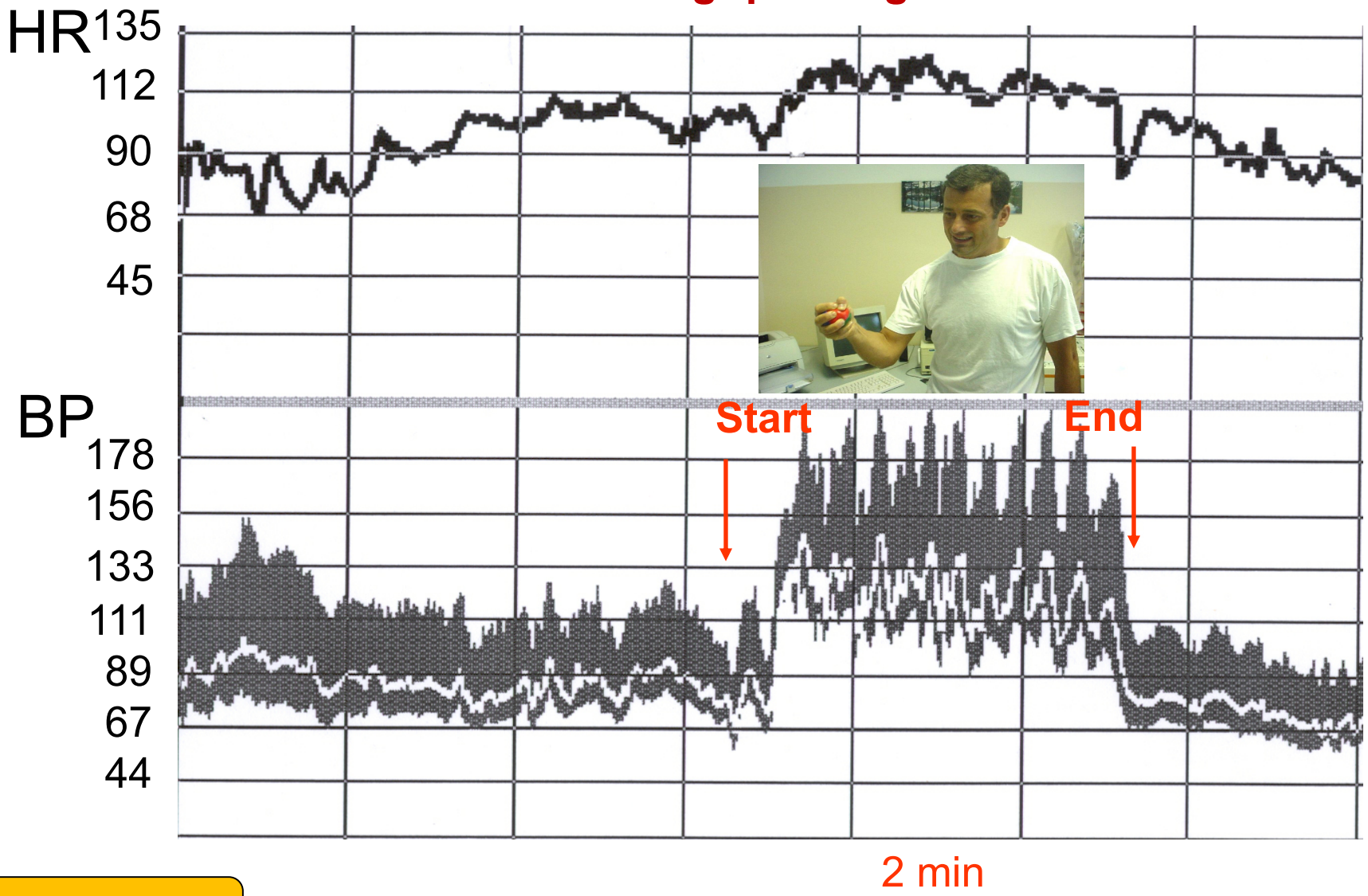

Syncopes and unexplained falls (severe/recurrent forms) at any level of care
Exclude:
- Cardiac syncope
- Non-syncopal causes such as accidental falls, epilepsy, psychogenic pseudosyncope and other rare causes
Established non-cardiac syncope
Mechanism-based diagnosis
Mechanism-based personalized therapy
Hypotensive phenotype
Bradycardic phenotype
Low adenosine phenotype
In the healthy:
- Fludrocortisone
- Midodrine
(Class IIb)
If hypotensive drugs:
Stop/reduce hypotensive drugs
(Class IIa)
In the elderly:
- Compression garments
- Head-up tilt sleeping
(Class IIa)
In pts >40 years:
Cardiac pacing
(Class IIa/IIb)
Guideline-based established therapies
In pts <40 years:
-Atomoxetine
-Cardioneuroablation
-Cardiac pacing
-Theophylline
-Caffeine
Emerging evidence-based new therapies

Treatment syncope: **Counterpressure manoeuvres**

Counter-pressure manoeuvres
(Class IIa)

Treatment syncope: **Counterpressure manoeuvres**

Hand-grip Tilting



Tilt training
(Class IIb)

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

PI	Site	City	Country
Dr. Michele Brignole (study coordinator)	Ospedali del Tigullio	Lavagna	IT
Dr. Marco Tomaino (study coordinator)	Ospedale di Bolzano	Bolzano	IT
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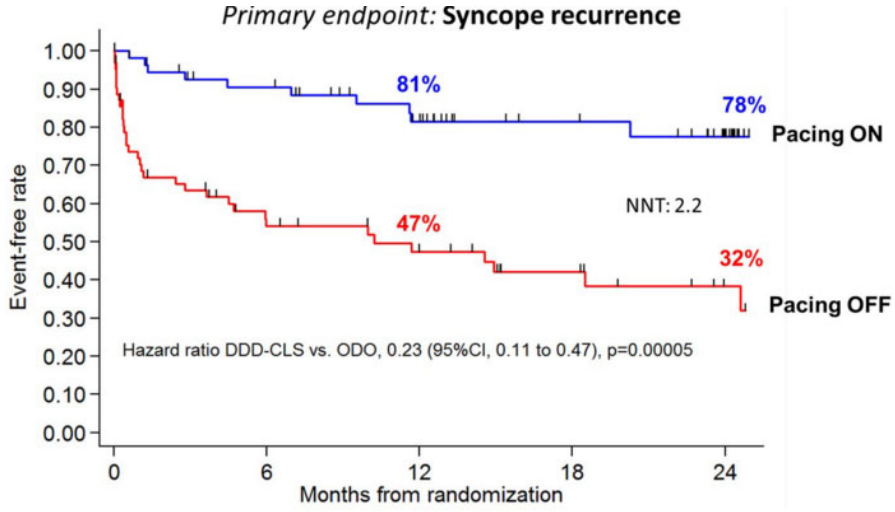
Dr. Fabrizio Ammirati	Ospedale G.B. Grassi	Ostia	IT
Prof. Jean Claude Deharo	Timone University Hospital	Marseille	FR
Mohamed Hamdan	University of Wisconsin	Madison	US
Dr. Maurizio Lunati	Ospedale Niguarda	Milano	IT
Dr. Angel Moya	Hospital Universitario Vall d'Hebrón	Barcelona	ES
Dr. Felix Ayala-Paredes	CHUS - Centre hospitalier universitaire de Sherbrooke	Sherbrooke	CA



ESC European Society of Cardiology
European Heart Journal (2020) 00, 1–9
doi:10.1093/eurheartj/ehaa936
FASTTRACK CLINICAL RESEARCH
Arrhythmias

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

Michele Brignole[1,2]*, Vincenzo Russo[3], Francesco Arabia[4], Mario Oliveira[5], Alonso Pedrote[6], Arnaud Aerts[7], Antonio Rapacciuolo[8], Serge Boveda[9,10], Jean Claude Deharo[11], Giampiero Maglia[4], Gerardo Nigro[3], Daniele Giacopelli[12], Alessio Gargaro[12], and Marco Tomaino[13]; for the BioSync CLS trial Investigators†

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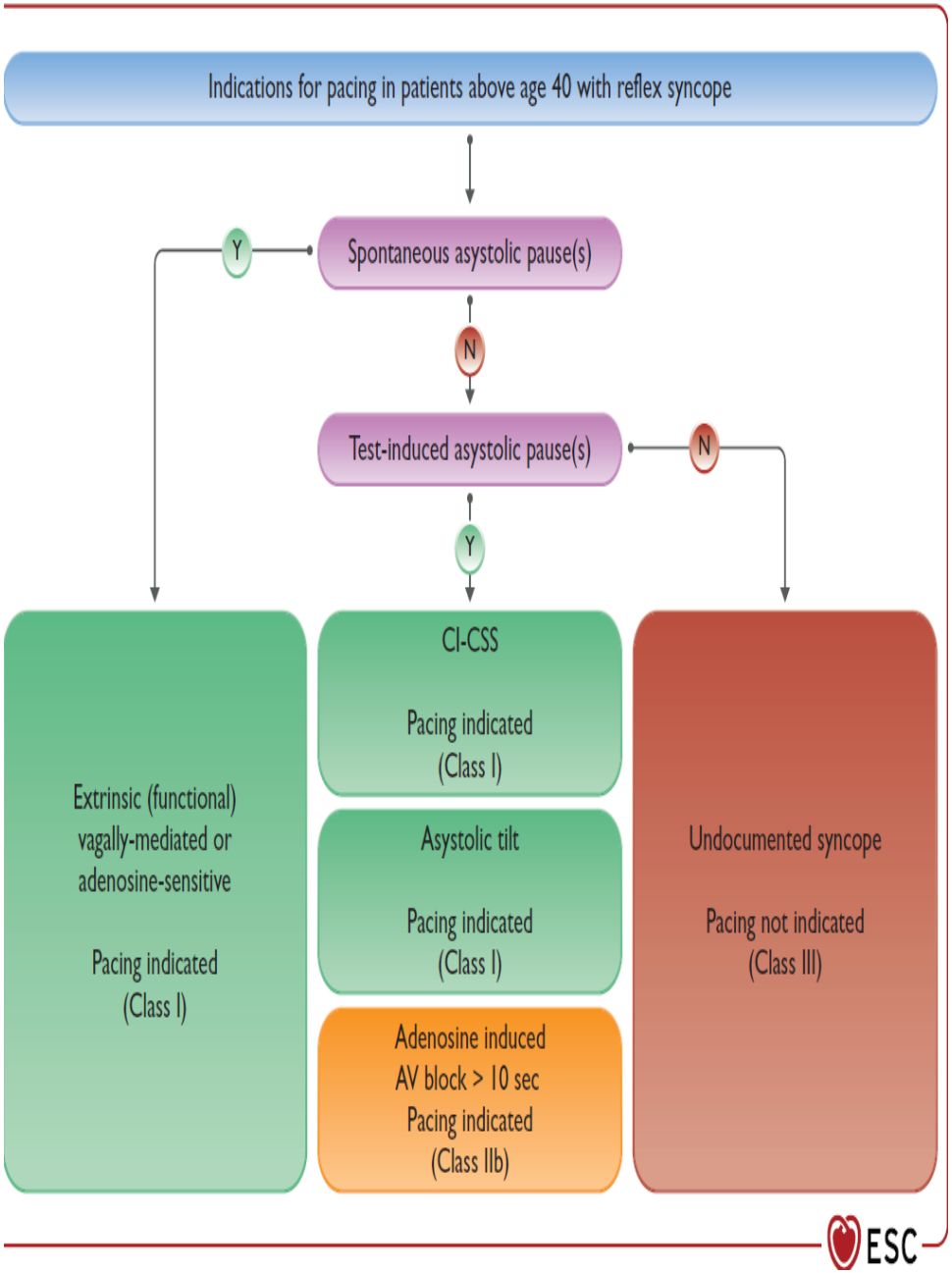
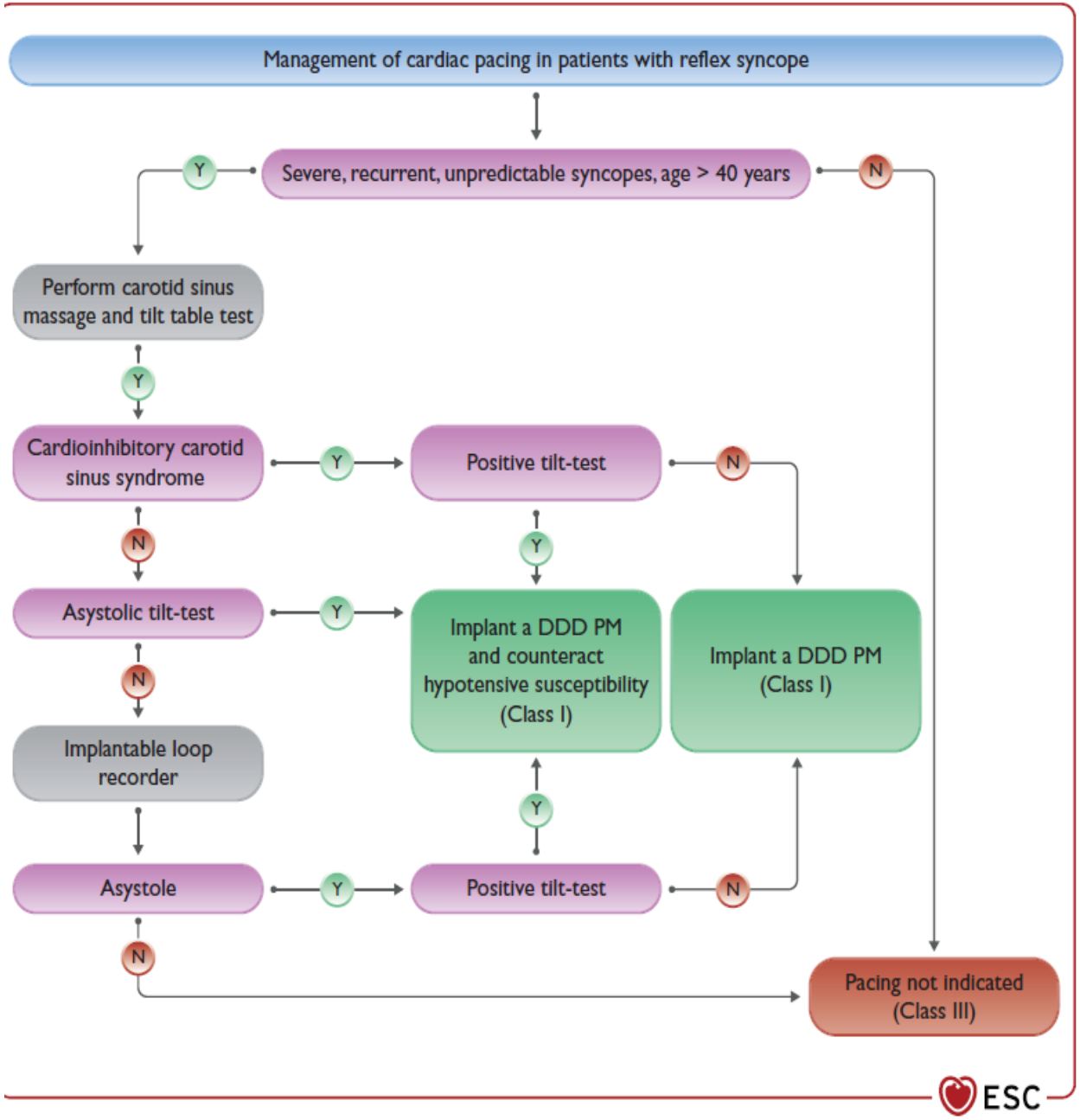

Indications for pacing in patients above age 40 with reflex syncope
Y
Spontaneous asystolic pause(s)
N
Test-induced asystolic pause(s)
N
Y
Extrinsic (functional) vagally-mediated or adenosine-sensitive
Pacing indicated (Class I)
CI-CSS
Pacing indicated (Class I)
Asystolic tilt
Pacing indicated (Class I)
Adenosine induced AV block > 10 sec
Pacing indicated (Class IIb)
Undocumented syncope
Pacing not indicated (Class III)
ESC

Pacing 202


Management of cardiac pacing in patients with reflex syncope
Severe, recurrent, unpredictable syncopes, age > 40 years
Y
N
Perform carotid sinus massage and tilt table test
Y
Cardioinhibitory carotid sinus syndrome
Y
Positive tilt-test
N
N
Y
Asystolic tilt-test
Y
Implant a DDD PM and counteract hypotensive susceptibility (Class I)
Implant a DDD PM (Class I)
N
Implantable loop recorder
Y
Asystole
Y
Positive tilt-test
N
N
Pacing not indicated (Class III)
ESC

Treatment of syncope: **Cardiac arrhythmias**

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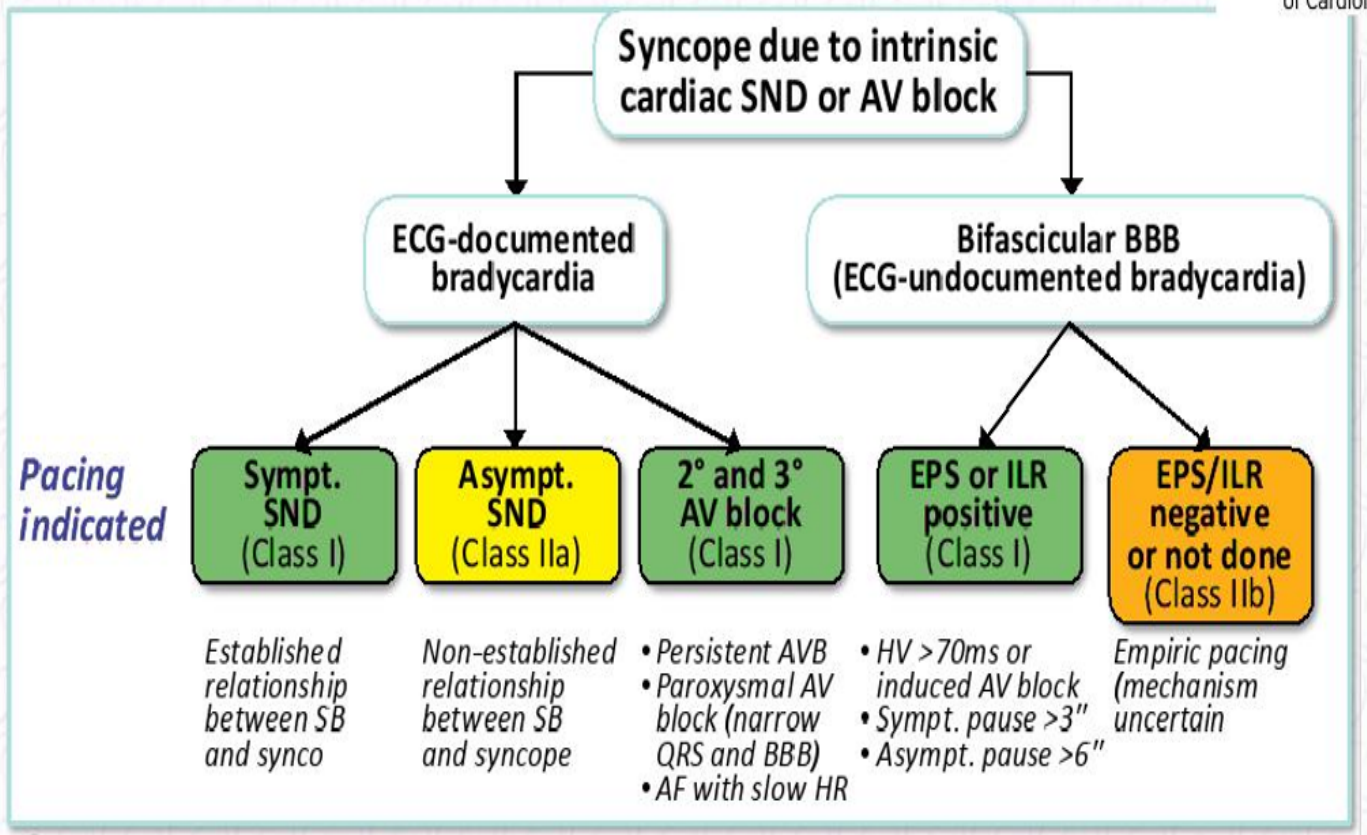

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Treatment of syncope:
Cardiac tachyarrhythmias

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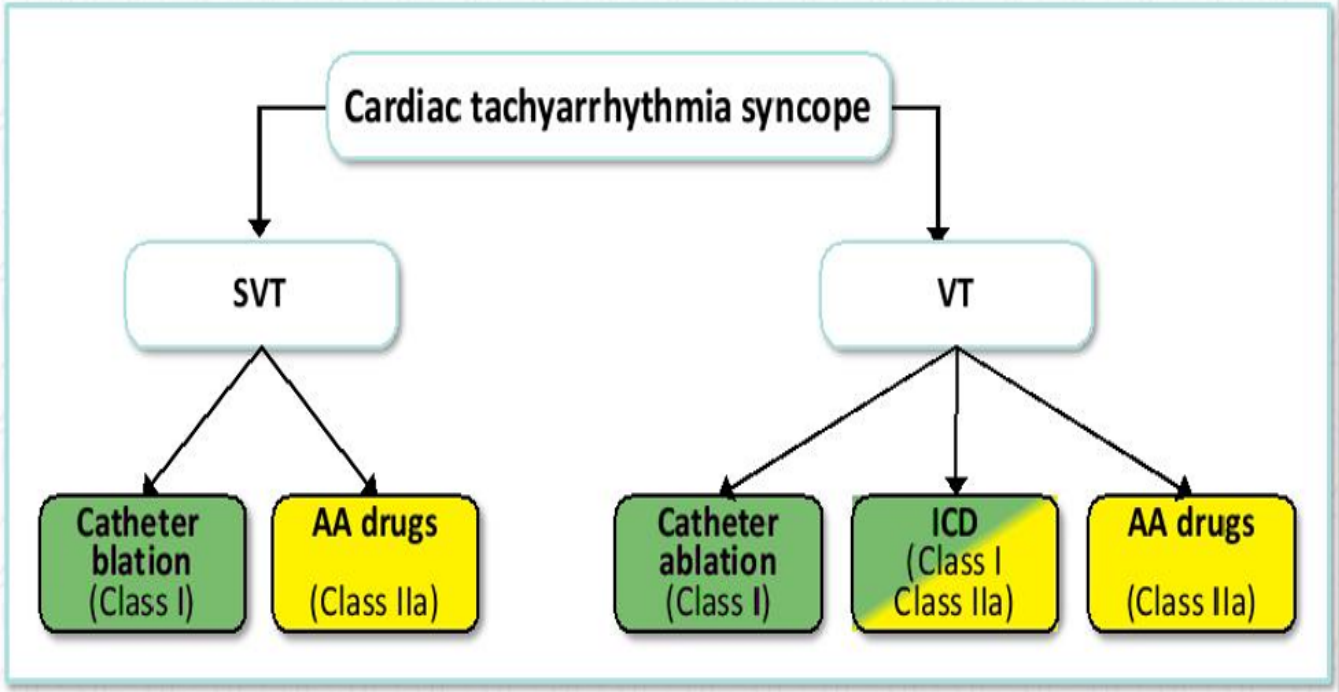

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Treatment of syncope: Unexplained syncope in patients at high risk of SCD (I)

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Recommendations	Class	Level
Left ventricular systolic dysfunction		
1. ICD therapy is recommended to reduce SCD in patients with symptomatic heart failure (NYHA class II–III) and LVEF ≤35% after ≥3 months of optimal medical therapy who are expected to survive for at least 1 year with good functional status	I	A
2. An ICD should be considered in patients with unexplained syncope with systolic impairment but without a current indication for ICD to reduce the risk of sudden death	IIa	C
3. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD	IIb	C
Unexplained syncope is defined as syncope that does not meet a Class I diagnostic criterion defined in the tables of recommendations. In the presence of clinical features described in this section, unexplained syncope is considered a risk factor for ventricular tachyarrhythmias		

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Treatment of syncope: Unexplained syncope in patients at high risk of SCD (II)

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Recommendations	Class	Level
Hypertrophic cardiomyopathy		
1. It is recommended that the decisions for ICD implantation in patients with unexplained syncope are made according to the ESC HCM Risk-SCD score http://www.doc2do.com/hcm/webHCM.html	I	B
2. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD.	IIa	C
Arrhythmogenic right ventricular cardiomyopathy		
3. ICD implantation may be considered in patients with ARVC and a history of unexplained syncope.	IIb	C
4. Instead of an ICD, an ILR should be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD.	IIa	C
Unexplained syncope is defined as syncope that does not meet a Class I diagnostic criterion defined in the tables of recommendations. In the presence of clinical features described in this section, unexplained syncope is considered a risk factor for ventricular tachyarrhythmias.		

Treatment of syncope: Unexplained syncope in patients at high risk of SCD (III)

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Recommendations	Class	Level
Long QT syndrome		
1. ICD implantation in addition to beta-blockers should be considered in LQTS patients who experience unexplained syncopea while receiving an adequate dose of beta-blockers.	IIa	B
2. Left cardiac sympathetic denervation should be considered in patients with symptomatic LQTS when: (a) beta-blockers are not effective, not tolerated, or are contraindicated; (b) ICD therapy is contraindicated or refused; or (c) when patients on beta-blockers with an ICD experience multiple shocks.	IIa	C
3. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD.	IIa	C
Unexplained syncope is defined as syncope that does not meet a class I diagnostic criterion defined in the tables of recommendations. In the presence of clinical features described in this section, unexplained syncope is considered a risk factor for ventricular tachyarrhythmias.		

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Treatment of syncope: Unexplained syncope in patients at high risk of SCD (IV)

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Recommendations	Class	Level
Brugada syndrome		
1. ICD implantation should be considered in patients with a spontaneous diagnostic type I ECG pattern and a history of unexplained syncope.	IIa	C
4. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD.	IIa	C
Unexplained syncope is defined as syncope that does not meet a Class I diagnostic criterion defined in the tables of recommendations. In the presence of clinical features described in this section, unexplained syncope is considered a risk factor for ventricular tachyarrhythmias.		

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