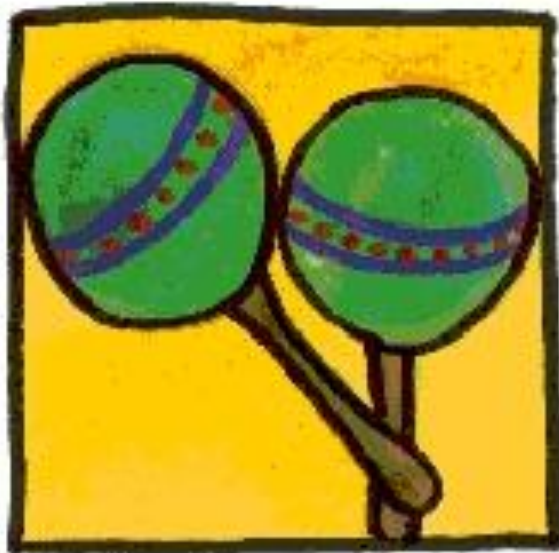


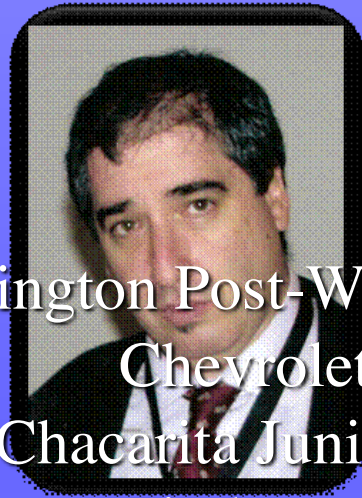
¿Cuándo usar Tilt, Loop o Marcapasos?



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Kingston, Ontario, Canada
Julio 2013

Conflicto de Interés

Dr. Adrian Baranchuk



Coca-Cola-Lee-Washington Post-Wilson-MEDTRONIC- Nike-
Chevrolet-

Asociación Amigos de Chacarita Juniors-Adidas-Pepsi-El Gráfico-
Pindapoy-

St JUDE-Amargo Serrano-Ford-Bic-Vip Vaporou-Flia. Baranchuk-
La Serenísima-BOSTON SCIENTIFIC-Mountain Dew-Noticias-Osde-

Yamaha-Asoc.Agencieros de Quiniela y Afines-ELA SORIN-

Gracias a MEDTRONIC por hacer posible mi participación

Puma-Hector Pérez Pícaro y el Trebol de la Buena Suerte-

en el Congreso
Alfajores Amaicha (de Amaicha del Valle para el Mundo)-Amsa-

Daktari-BIOTRONIK-Billiken-Pomelo Neuss-New York Times-

Sindicato Filatelistas Plaza Rivadavia-Canada Post-

y por motivos de espacio no menciono a contribuyentes menores

Porqué dar una conferencia?

1. Porque es una manera de contribuir científicamente?
2. Porque es una manera de ser reconocido entre pares?
3. Porque aumenta el ego del presentador?
4. Porque uno cree firmemente en poder hacer un aporte?
5. Porque a uno le han pagado, y de esa manera puede mantener a su familia?
6. Porque lo impone la industria?
7. Porque uno es feo y cree que de esta manera podrá seducir a una colega?
8. Porque es parte de un libreto de vida que todos los que estamos aquí seguimos sin mucho cuestionamiento?
9. Para hacer amigos?

Yo tengo solo una certidumbre...

Con esta charla...NO voy a ganar amigos...

Veamos como me va con el resto...

Mirada Crítica al Estudio del paciente con Síncope:

El Tilt Test NO es útil en el manejo clínico del Síncope
¿Porqué?

1. Baja Sensibilidad y Especificidad
2. Ausencia de “Gold Standard”
3. Pobrísima REPRODUCIBILIDAD
4. Ausencia de metodología standard universal
 - Duración del procedimiento
 - Angulo de Inclinación
 - Método de sensibilización (drogas, dosis, vías de admin., etc)
 - Interpretación de los resultados

(Básicamente, el Tilt Test es una gran bolsa de gatos)

¿Se necesita del Tilt Test para hacer diagnóstico de Síncope Vasovagal?

NO, el diagnóstico es CLINICO!!!

¿Se necesita del Tilt Test para enrolar pacientes en estudios randomizados de drogas en Síncope Vasovagal?

NO, el diagnóstico es CLINICO!!!

¿Se necesita del Tilt Test para hacer seguimiento del tratamiento del Síncope Vasovagal?

NO, el seguimiento es CLINICO!!!

¿Entonces me pregunto, porqué seguimos haciendo Tilt test?

La respuesta NO es sencilla pero podría incluir:

1. Porque es fácil de hacer?
2. Porque creemos mas en los resultados del Tilt que en nuestro interrogatorio?
3. Porque en caso de ser negativo descartamos origen vasovagal?
4. Porque en caso de ser positivo confirmamos origen vasovagal?
5. Porque nos permite entender el mecanismo fisiopatológico del síncope Vasovagal?
6. Porque es redituable economicamente?
7. Porque nos “hemos” convencido que es útil?

Tilt Test: para que sirve?

Tilt testing for syncope: a reappraisal

Robert Sheldon

Current Opinion in Cardiology 2005, 20:38–41

Is it tied to gold standard populations?
Does it have accurate sensitivity and specificity?
Is it simple and robust?
Is it reproducible?
Does it provide prognostic power?
Does it predict effective therapy?
Does its use change patient outcome?



Tilt-table tests have provided mixed benefits in the field of vasovagal syncope. Unquestionably, they have greatly improved informed care of syncope patients and have led to a revived interest in the field. They have provided the inclusion criteria for study populations for diagnostic studies, long-term observational studies, and randomized clinical trials. Tilt tests have been used as platforms for physiologic studies and pilot treatment studies. However, more specific benefits have proven illusive. The main problem is that the syndrome is defined by the test, rather than by evidence-based and widely accepted clinical criteria. Tilt tests have a complex mix of significant methodological variables, have not been validated against gold standard populations, are only moderately reproducible, do not provide prognostic predictive power, and have not been shown useful in selecting efficacious therapies. It may be difficult to achieve important advances in the field until a clinical reflex syncope syndrome is defined by evidence-based diagnostic criteria, perhaps from studies that provide quantitative, clinically descriptive symptom scores [28–30].



¿Qué nos recomiendan los expertos?

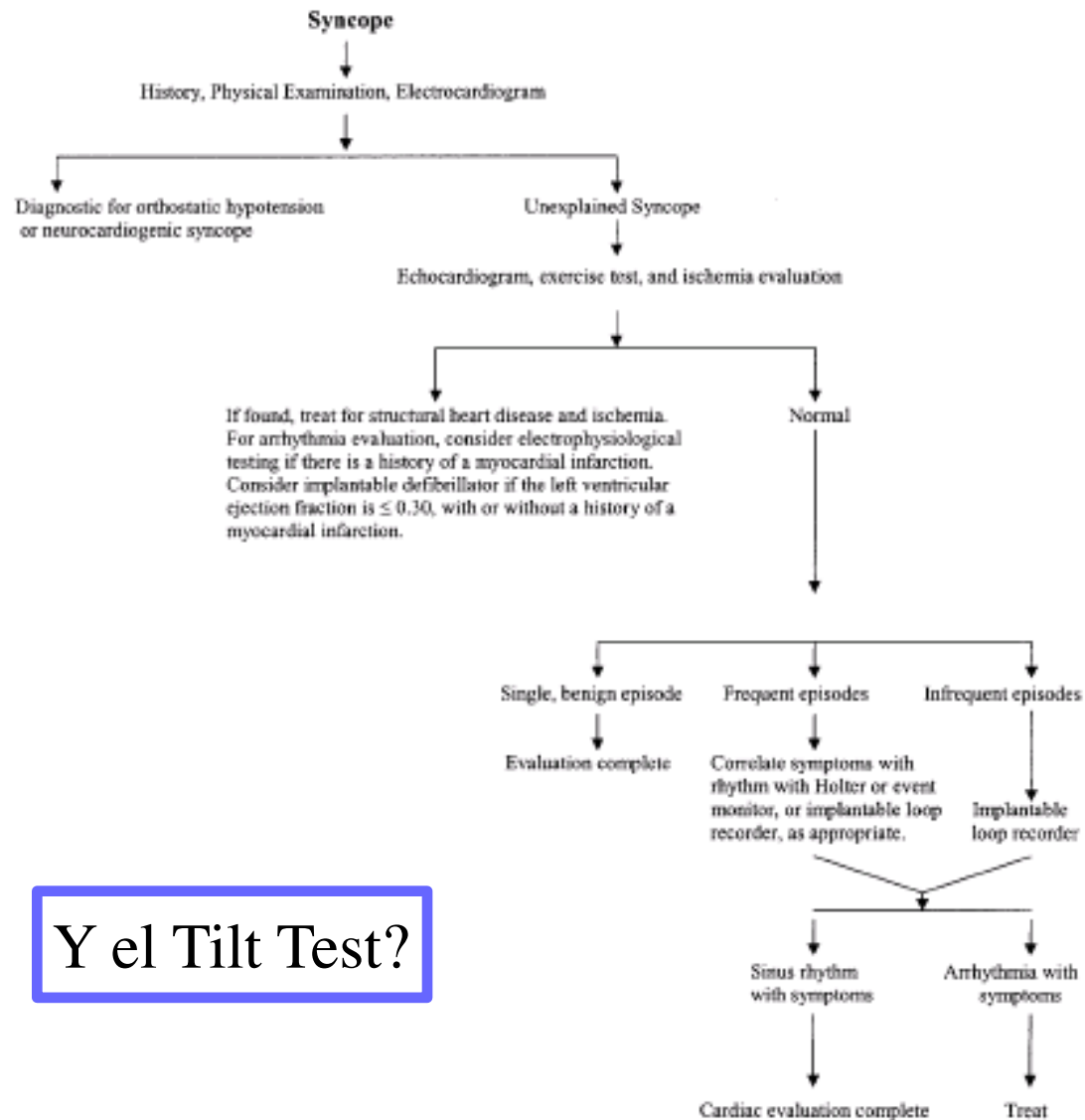
AHA/ACCF Scientific Statement of Syncope

From the American Heart Association Cardiovascular Nursing, Cardiovascular Disease and the Quality of Care and Outcome Working Group; and the American College of Cardiology

In Collaboration With the Heart Failure Society of America

Endorsed by the American Academy of Cardiology

S. Adam Strickberger, MD; D. Woodrow Benson, MD; David J. Callans, MD; Mitchell I. Cohen, MD; Kenneth A. Ellenbogen, MD; Paul Friedman, MD; Jeffrey Goldberger, MD; Paul A. Heidenreich, MD; Bradley P. Knight, MD; Carlos A. Morillo, MD; Robert J. Myerburg, MD



Arrhythmia Service

Circulation January 17, 2006



Queen's
UNIVERSITY

¿Qué nos recomiendan los expertos?

Guidelines for the diagnosis and management of syncope (version 2009)

European Heart Journal (2009) 30, 2631–2671

The Task Force for the Diagnosis and Management of Syncope European Society of Cardiology (ESC)

External Contributors, Haruhiko Abe (Japan), David G. Benditt (USA), Horacio Kaufmann⁹ (USA), Carlos Morillo (Canada), Brian Olshansky (USA), Robert Sheldon (Canada), Win K. Shen (USA)

Tilt testing is not usually needed in patients whose reflex syncope is already diagnosed by clinical history and in patients with single rare syncope unless special situations (e.g. injury, anxiety, or occupational implications such as aircraft pilots, etc.). In patients with

Tilt testing has no value in assessing the treatment efficacy. However tilt table testing is widely accepted as a useful tool to demonstrate susceptibility of the patient to reflex syncope, and thereby initiate treatment (e.g. physical manoeuvres, see Part 3).^{94–96} ?

vasodepressor, or mixed.⁹⁷ A negative tilt table response does not exclude the diagnosis of reflex syncope. The clinical signs

Indications

- | | | |
|--|-----|---|
| • Tilt testing is indicated in the case of an unexplained single syncopal episode in high risk settings (e.g. occurrence of, or potential risk of physical injury or with occupational implications), or recurrent episodes in the absence of organic heart disease, or in the presence of organic heart disease, after cardiac causes of syncope have been excluded | I | B |
| • Tilt testing is indicated when it is of clinical value to demonstrate susceptibility to reflex syncope to the patient | I | C |
| • Tilt testing should be considered to discriminate between reflex and OH syncope | IIa | C |
| • Tilt testing may be considered for differentiating syncope with jerking movements from epilepsy | IIb | C |
| • Tilt testing may be indicated for evaluating patients with recurrent unexplained falls | IIb | C |
| • Tilt testing may be indicated for evaluating patients with frequent syncope and psychiatric disease | IIb | C |
| • Tilt testing is not recommended for assessment of treatment | III | B |
| • Isoproterenol tilt testing is contraindicated in patients with ischaemic heart disease | III | C |

Tilt Test: falta de homogeneidad en los protocolos

Autor/Año	Angulación	Duración (min)	Sensibilización
Almquist (1987)	80°	10	Isoproterenol
Fitzpatrick (1991)	60°	45	Isoproterenol
Raviele (1995)	60°	45 +20	Nitroglycerine
Bartoletti (2000)	60°	20 + 15	Nitroglycerine
Morillo (2004)	60-70°	15-20	Isop < 55 años NTG > 55 años

Tilt Test: pobre reproducibilidad

CONTEMPORARY REVIEW

Evidence-based treatment for vasovagal syncope

Vikas Kuriachan, MD, Robert S. Sheldon, MD, PhD, Michael Platonov, MD

Heart Rhythm, Vol 5, No 11, November 2008

Treatment	Senior author	Sites, n	Subjects, n	Mean age	Clinical outcome	Effect	P
Physical counterpressure	Van Dijk ⁹	15	223	39	Syncope recurrence	51% control, 32% PCM	.005
Home orthostatic	Foglia-Manzillo ¹³	8	68	40	Positive tilt test	60% controls vs. 59% training	NS
Home orthostatic	Duygu ¹⁴	1	82	41	Syncope recurrence	56% control, 37% training	.1
Home orthostatic	On ¹⁵	1	42	39	Syncope or presyncope recurrence	47% control, 42% training	.82
Metoprolol	Sheldon ¹⁶	14	208	42	Syncope recurrence	36% controls, 36% metoprolol	.99
Fluoxetine, propranolol	Theodorakis ¹⁷	1	96	42	Syncope or presyncope recurrence	41% controls, 51% propranolol, 22% fluoxetine	<.05
Midodrine	Qingyou ¹⁸	1	26	12	Syncope recurrence	80% controls, 22% midodrine	.023
Fludrocortisone	Salim ¹⁹	1	33	14	Syncope or presyncope recurrence	36% controls, 55% fludrocortisone	<.04
Pacemakers	Connolly ²¹	15	100	49	Syncope recurrence	40% controls, 31% pacing	.14
Pacemakers	Raviele ²²	7	29	53	Syncope recurrence	38% controls, 50% pacemakers	NS

Conclusiones

1. El Tilt Test tiene baja sensibilidad y especificidad, bajo valor predictivo positivo y negativo
2. El Tilt Test tiene BAJA reproducibilidad y no tiene “gold standard”
3. No es útil para reclutar ni seguir pacientes en protocolos científicos
4. NO es necesario para hacer el diagnóstico de síncope vasovagal

El futuro del Tilt Test



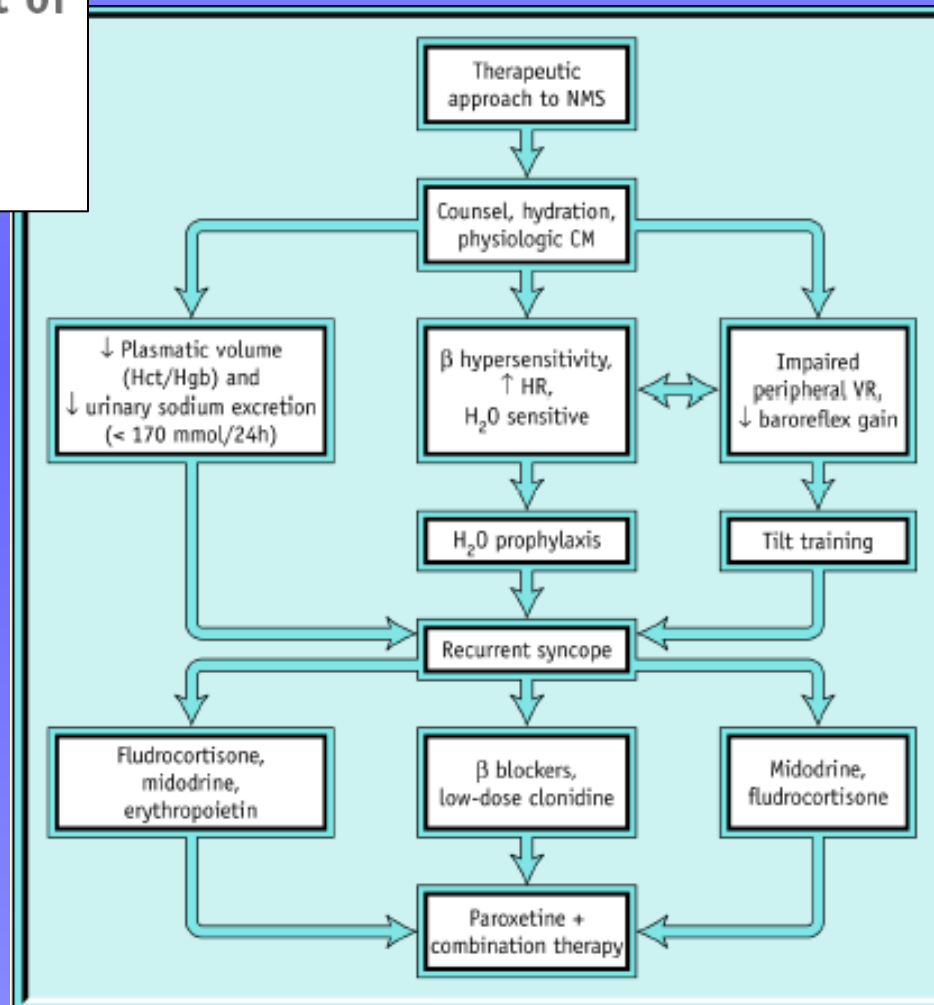
Pero es todo negativo como muestra esta foto?

Aportes del Tilt Test

1. Mejor entendimiento fisiopatológico: esto requiere de alta tecnología

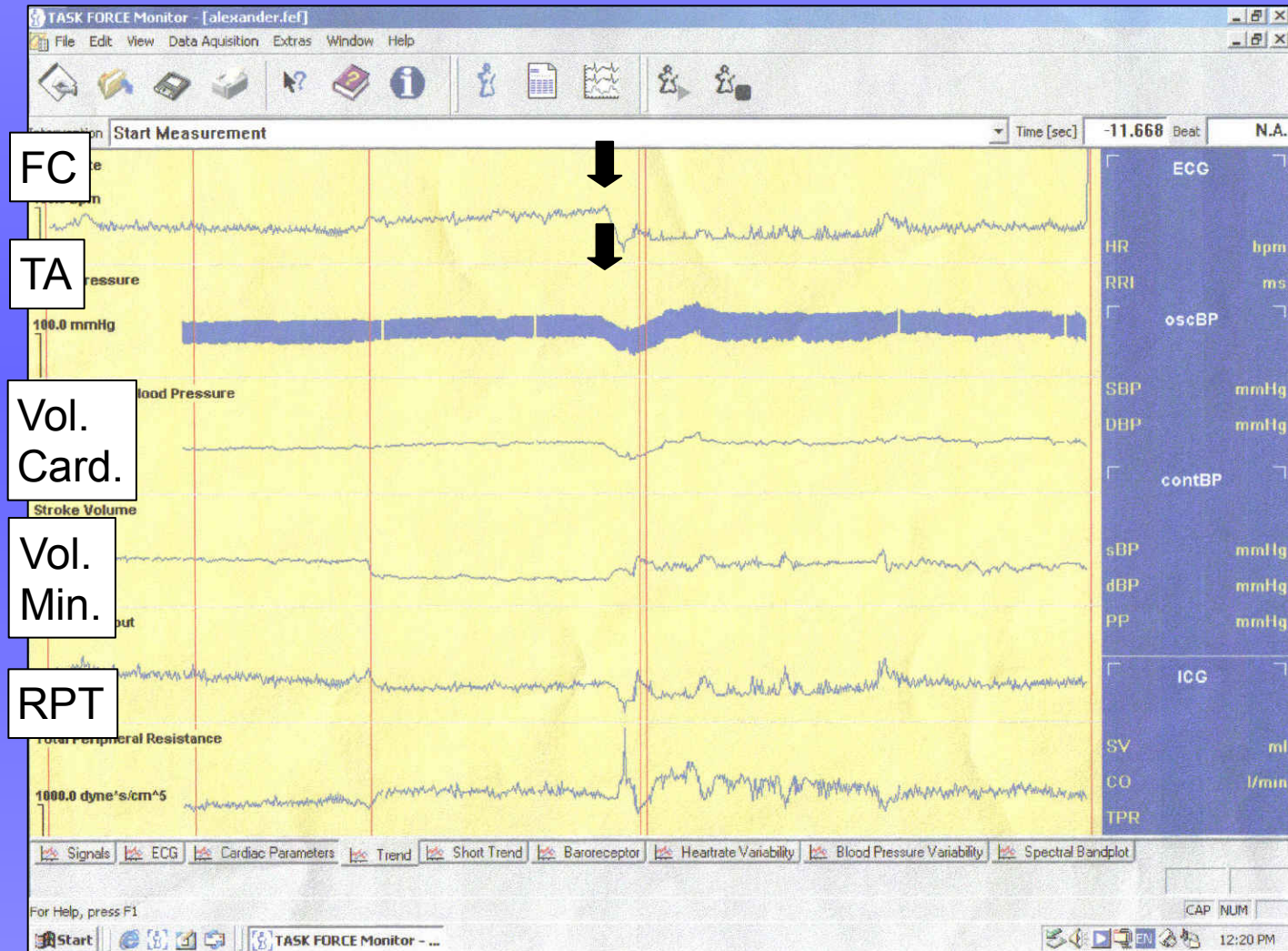
Current Management of Syncope: Treatment Alternatives

Carlos A. Morillo, MD, FRCPC*
Adrián Baranchuk, MD



Aportes del Tilt Test

2. Mejor entendimiento fisiopatológico: esto requiere mayores costos

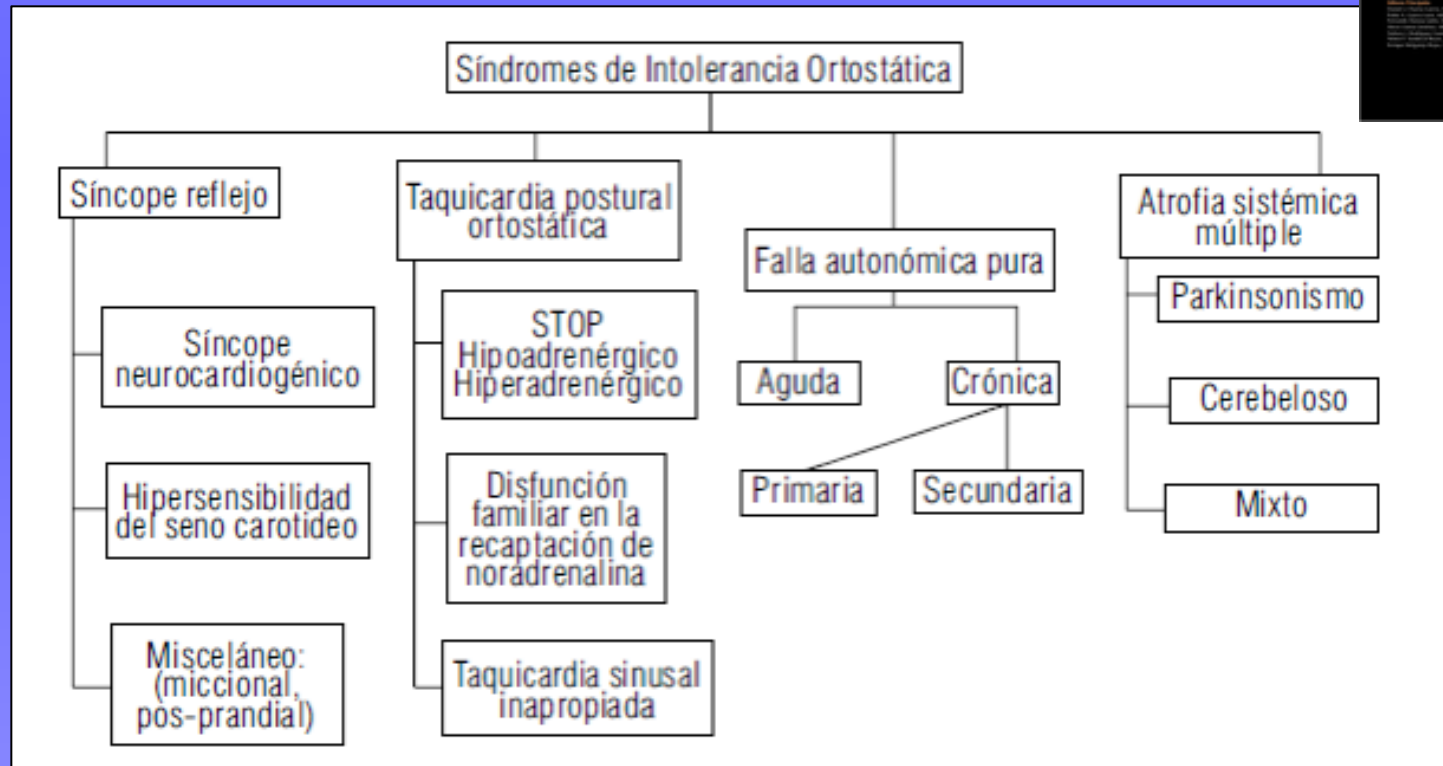


Aportes del Tilt Test

3. Mejor entendimiento fisiopatológico: esto requiere manejo global de las disautonomías

Síndromes de intolerancia ortostática crónica

CARLOS A. MORILLO ZÁRATE, MD, FRCPC, FACC
ADRIAN BARANCHUK, MD
JUAN C. GUZMÁN ORDUZ, MD

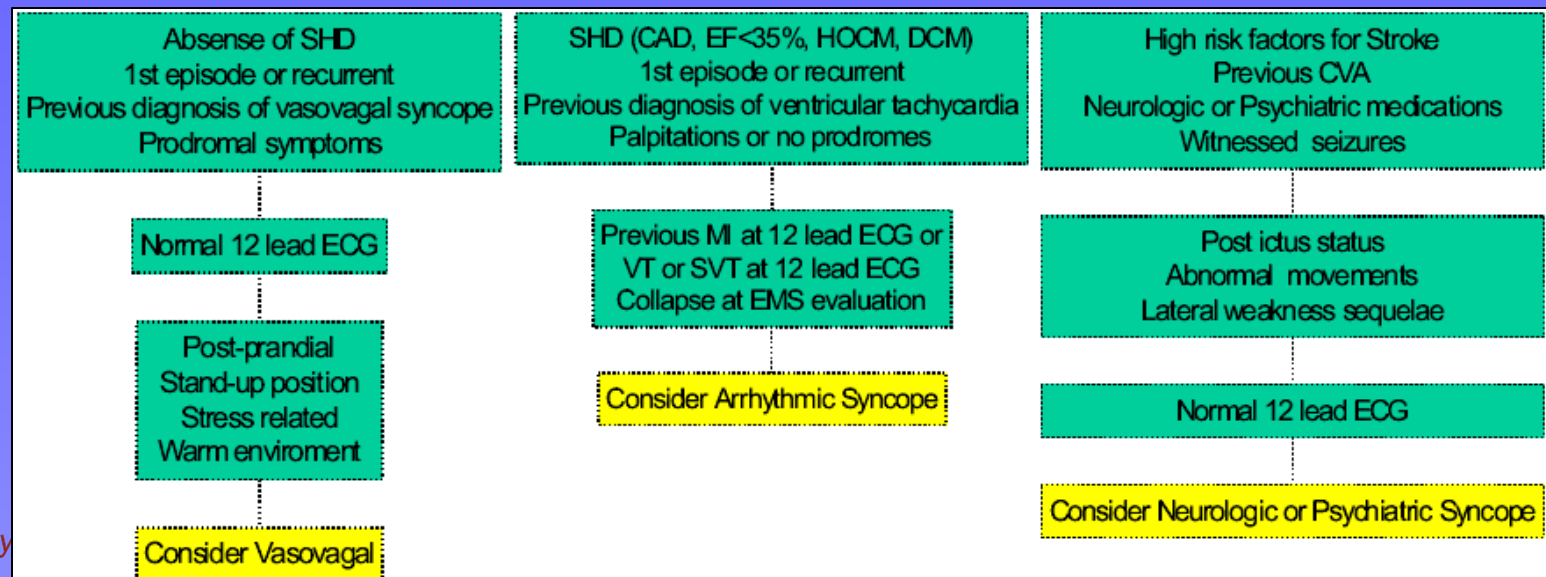


Registry on the Evaluation of Syncope Assessment Strategy in The Emergency Room (RESASTER Study)

Adrian Baranchuk, Sue Morgan, Andrew Krahn*, Cathy Bentley*,
Sebastian Ribas, Juan Camilo Guzman, Jeff Healey, Girish Nair,
Stuart J. Connolly, Carlos A. Morillo.

Hamilton Health Sciences, McMaster University, Hamilton,

*London Health Sciences, University of Western Ontario, Canada

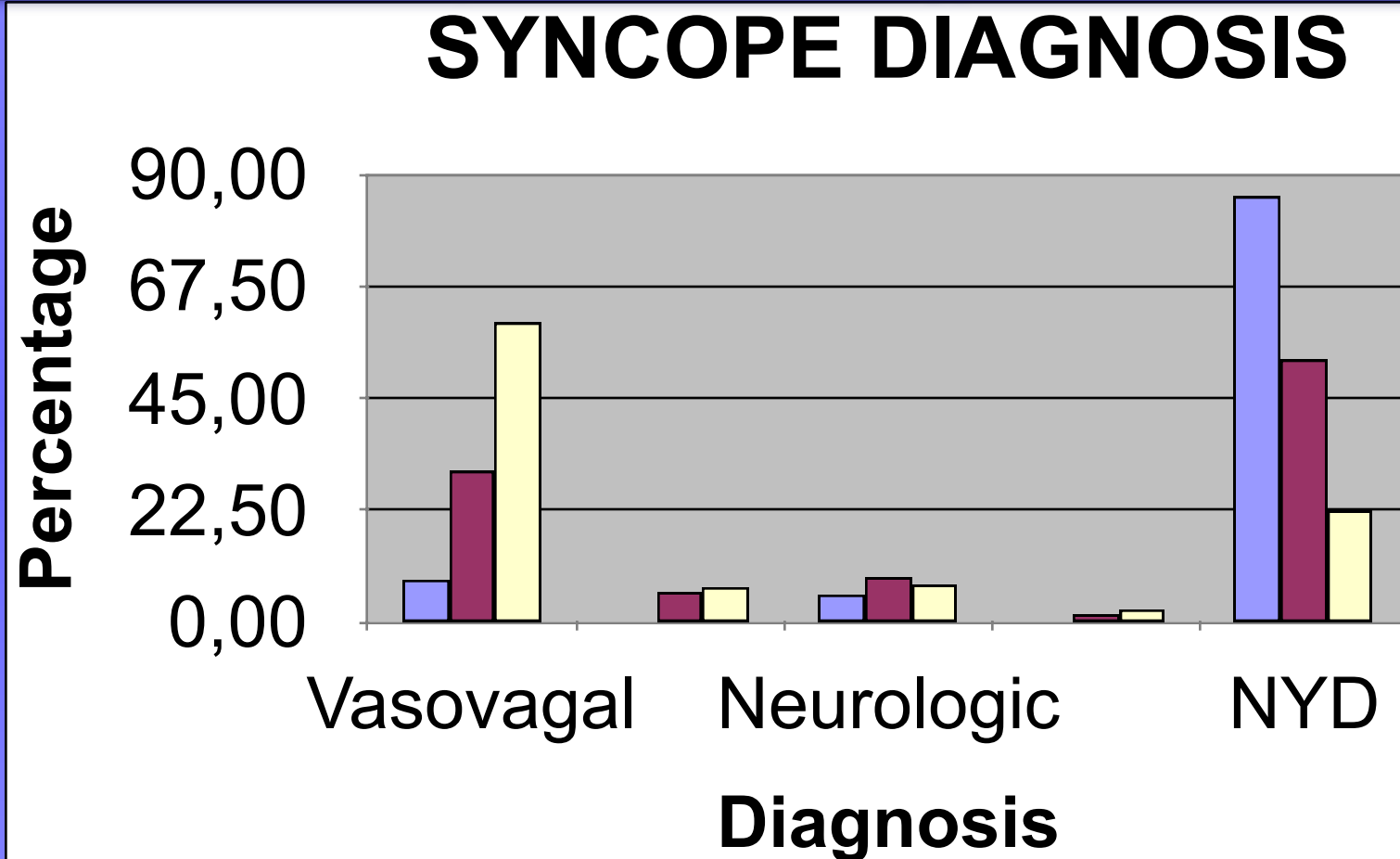


Registry on the Evaluation of Syncope Assessment Strategy in The Emergency Room (RESASTER Study)



- 23701 patients were seen in the ER (3 months period)
- Syncope was the primary diagnosis in 438 (1.84%)
 - Syncope 318 (72%)
 - Presyncope 120 (28%)
- Mean age of patients with syncope: 56 ± 23.5 years
- Female: 50%
- Structural heart disease: 20%
 - CAD 69%
- 123 patients with syncope were admitted (0.51% of all ER visits)
- The average length of stay was 7.4 ± 9.8 days

Registry on the Evaluation of Syncope Assessment Strategy in The Emergency Room (RESASTER Study)



Conclusiones finales sobre el Tilt Test

1. No hagamos Tilt Test con el objetivo de hacer diagnóstico
2. El diagnóstico es clínico
3. No hagamos Tilt Test con el objetivo de seguir a los pacientes
4. El seguimiento es clínico
5. No hagamos Tilt Test para probar la eficacia del tratamiento
6. Si tenemos la tecnología, hagamos Tilt en casos dudosos, con trauma, con otros tests negativos
7. Hagamos Tilt como parte de la evaluación global del Sistema Nervioso Autónomo

Entonces, cuando usar Tilt y cuando usar Loop?

Case 1: Mrs BR

- 32 y/o primary teacher
- 3 syncopal episodes in the last 6 months
- Last episode happened while teaching her class (23 students, 3rd grade)
- Dizzy, lightheaded, nauseated
- No family history, no CV history, no drugs
- Ph exam: normal, no orthostatic hypotension, csm negative
- ECG & chest x-ray were normal. Pregnancy test normal

Pregunta 1: Haría Ud. un Tilt Test?

A= SI

B= No

The “Mini-Sheldon” book of “Syncope: the art of interrogation”

Historical Criteria That Distinguish Syncope From Seizures

Criteria	Regression Coefficient (SE)	P Value	Points
Waking with cut tongue	6.85 (2.03)	0.001	2
Abnormal behavior noted*	3.82 (1.37)	0.005	1
Loss of consciousness with emotional stress	3.97 (1.30)	0.002	1
Postictal confusion	3.52 (1.33)	0.008	1
Head turning to one side during loss of consciousness	3.67 (1.43)	0.010	1
Prodromal déjà vu or jamais vu	2.75 (1.43)	0.055	1
Any presyncope	-4.70 (1.34)	< 0.001	-2
Loss of consciousness with prolonged standing or sitting	-5.37 (1.71)	0.002	-2
Diaphoresis before a spell	-5.73 (1.80)	0.001	-2

Seizure = > 1 point

Diagnostic criteria for vasovagal syncope based on a quantitative history

	Regression coefficient (SE)	P-value	Points
Any one of bifascicular block, asystole, supraventricular tachycardia, diabetes	-4.93 (0.76)	<0.001	-5
Blue colour noted by bystander	-4.19 (1.26)	<0.001	-4
Age at first syncope ≥35 years	-2.61 (0.63)	<0.001	-3
Remembers something about the spell	-1.80 (0.53)	<0.001	-2
Pre-syncope or syncope with prolonged sitting or standing	0.95 (0.49)	0.05	1
Sweating or warm feeling before a spell	1.95 (0.56)	<0.001	2
Pre-syncope or syncope with prolonged sitting or standing or medical procedure			3

Syncope and Structural Heart Disease: Historical Criteria for Vasovagal Syncope and Ventricular Tachycardia

Criteria	Regression Coefficient	P-Value	Points
Age at first spell ≥35 years	4.22	0.0019	3
Male gender	1.62	0.1368	1
Syncope or presyncope with prolonged sitting or standing	-2.16	0.0067	-1
Recurrent headaches	-2.53	0.0420	-2
Presyncope with stress	-2.69	0.0734	-2
Tiredness that lasts > 1 minute after syncope	-2.81	0.0033	-2

Tilt-p

Sheldon et al. JACC 2002
Sheldon et al. Eur Heart J 2006
Sheldon et al. JCE 2010

VT = ≥ 1 point

European Guidelines 2009

Guidelines for the diagnosis and management of syncope (version 2009)

The Task Force for the Diagnosis and Management of Syncope of the European Society of Cardiology (ESC)

Developed in collaboration with, European Heart Rhythm Association (EHRA)¹, Heart Failure Association (HFA)², and Heart Rhythm Society (HRS)³

Endorsed by the following societies, European Society of Emergency Medicine (EuSEM)⁴, European Federation of Internal Medicine (EFIM)⁵, European Union Geriatric Medicine Society (EUGMS)⁶, American Geriatrics Society (AGS), European Neurological Society (ENS)⁷, European Federation of Autonomic Societies (EFAS)⁸, American Autonomic Society (AAS)⁹

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External Contributors, Haruhiko Abe (Japan), David G. Benditt (USA), Wyatt W. Decker (USA), Blair P. Grubb (USA), Horacio Kaufmann⁹ (USA), Carlos Morillo (Canada), Brian Olshansky (USA), Steve W. Parry (UK), Robert Sheldon (Canada), Win K. Shen (USA)

Case 2: Mr BC

- 52 y/o guitar player
- 3 syncopal episodes in the last 18 months
- Last episode happened immediately after a concert
- No prodroms, no palpitations, facial trauma
- No family history, borderline HTN, no drugs
- Ph exam: normal, no orthostatic hypotension, csm negative
- ECG IRBBB (No Brugada pattern) - Chest x-ray normal. Lab normal

Pregunta 2: Implantaría Ud. un Loop?

A= Si

B= No

ILR: Indications

European Guidelines 2009

○ ILR is indicated in:		
☐ An early phase of evaluation in patients with recurrent syncope of uncertain origin, absence of high risk criteria listed in <i>Table 11</i> and a high likelihood of recurrence within battery longevity of the device	I	B
☐ High risk patients in whom a comprehensive evaluation did not demonstrate a cause of syncope or lead to a specific treatment	I	B
○ ILR should be considered to assess the contribution of bradycardia before embarking on cardiac pacing in patients with suspected or certain reflex syncope presenting with frequent or traumatic syncopal episodes	IIa	B
○ External loop recorders should be considered in patients who have an inter-symptom interval ≤ 4 weeks	IIa	B

Society Position Statement

Standardized Approaches to the Investigation of Syncope: Canadian Cardiovascular Society Position Paper

Robert S. Sheldon, MD, PhD, FRCPC,^a Carlos A. Morillo, MD, FRCPC,^b

Andrew D. Krahn, MD, FRCPC,^c Blair O'Neill, MD, FRCPC,^d

Venkatesh Thiruganasambandamoorthy, MBBS, CCFP-EM,^e Ratika Parkash, MD, FRCPC,^f

Mario Talajic, MD, FRCPC,^g Jack V. Tu, MD, PhD, FCAHS, FRCPC,^h

Colette [redacted] FRCPC,^d

Perform a comprehensive history and physical examination using evidence-based tools

Routinely obtain an ECG

Utilize electroencephalography and brain CT or magnetic resonance imaging only with clinical suspicion of focal neurologic deficit or seizure disorder

Utilize cardiac imaging only with clinical suspicion of structural or valvular heart disease

Perform invasive electrophysiologic stimulation only with clinical suspicion of a tachyarrhythmia

Obtain a tilt test only for diagnostic dilemmas, and if it will affect treatment and/or outcome

Consider Holter monitoring, event recorders, or implantable loop recorders if an arrhythmia is suspected, depending on the frequency of the events

Management for cases 1 & 2

- **Case 1:** Tilt Test was not done and managed as vasovagal syncope. No recurrences in the last 8 months.
- **Case 2:** ILR was implanted. At 1-year follow-up there were no events

Cuándo implantar Marcapasos?

Marcapasos

- Síncope y Bloqueo de Alto grado
- Síncope/ mareos y disfunción sinusal
- Síncope e HSC
- Síncope y bloqueo bifascicular

ESTUDIO SRPITELY!!!!

(Bob Sheldon)

Gracias por su Atención