

Approach to Syncope in the Office

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Objectives

By the end of this session, you will be able to...

- 1) Understand the importance of clinical assessment in the evaluation of syncope
- 2) Appreciate the importance of cardiac etiologies
- 3) Focus your approach to the diagnosis of syncope
- 4) Make decisions on management (disposition) based on prognosis

Definition

- ❖ Greek origin “synkoptein” meaning “to cut short”, pause
- ❖ Sudden transient loss of consciousness with concurrent diminution in postural tone followed by spontaneous recovery, and absence of neurological sequelae.

vs pre-syncope (near-syncope)

Definition

Neurocardiogenic (neurally mediated) Syncope
due to reflex mechanism that is
associated with inappropriate
vasodilatation , bradycardia or both.

Vasovagal syncope, situational syncope, carotid
sinus syndrome

Sudden cardiac death

❖ Syncope/Presyncope

- ❖ Chest pain (exertional)
- ❖ Dyspnea (exertional)
- ❖ Heart murmur
- ❖ Family history

My Definition

A given opportunity to diagnose a potentially fatal disease and prevent sure death in a patient who is currently feeling well and unaware of his fate.

Epidemiology

- ❖ 3-5% of ED visits (1-2 million)
- ❖ 6% of hospital admissions
- ❖ Diagnosis in **only up to 70-80%**
- ❖ Most causes are benign
- ❖ Mortality low
 - Cardiac origin: **18-33%**

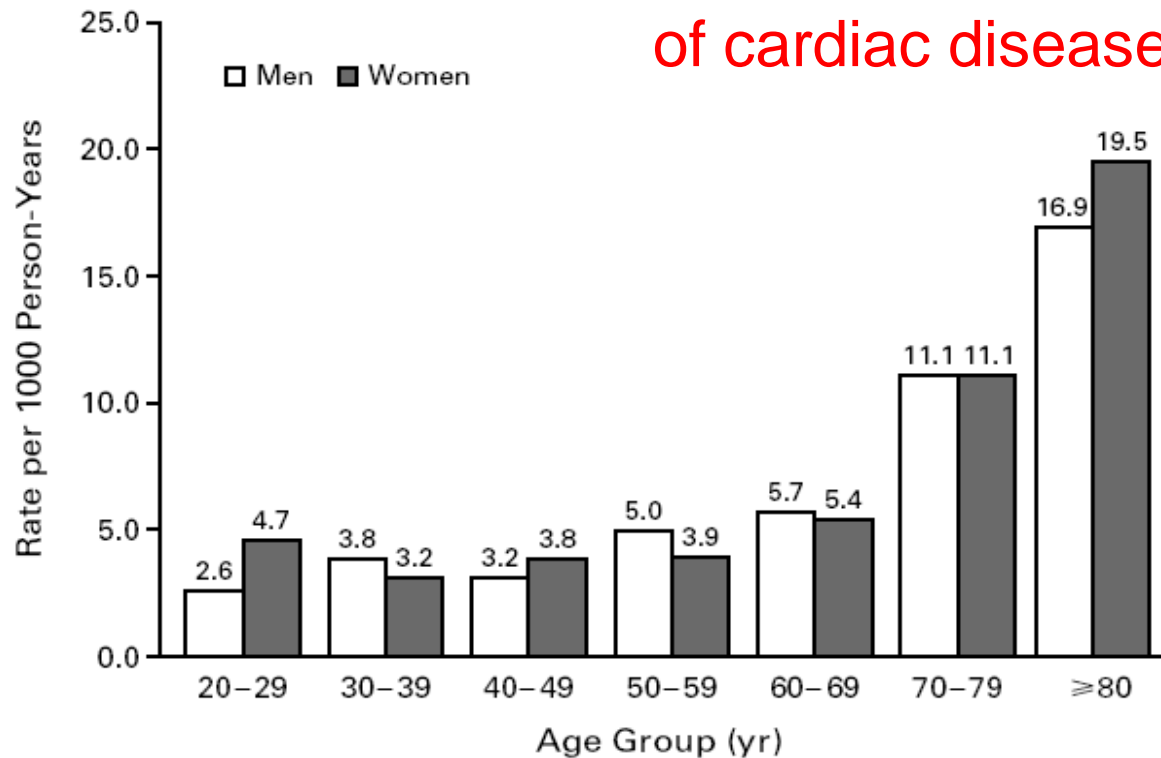
Incidence

- ❖ 6.2/1000 person-years
- ❖ Rates increase with age (sharp rise at 70 yo)
- ❖ Lifetime cumulative incidence (subjects > 65yo): 35-39%
- ❖ 80% have their first episode before age of 30y

7814 participants

Incidence

Incident doubles with Hx
of cardiac disease



In General Practice

- ❖ Prevalence is 2-9 per 1000 encounters
- ❖ Peak ages
 - 10-30yo (women)
 - Age > 65 (both men and women)
- ❖ Only a subgroup presents to a medical doctor
 - 44% did not seek medical advice
 - Event rate is 2-4 times higher in the general population than the presentation rate

In General Practice

- ❖ 9.3 visits at the GP per 1000 person-years
 - ❖ 0.7 visits at the ED per 1000 person years
- } **13.3 times more**
- ❖ More frequent in women
 - ❖ Young men tend not to visit their GP
 - Trend disappear with higher age
 - ❖ Elderly tend to visit their GP in relation to the younger patient (22 vs 2 visits/1000pt-years)

Etiologies

❖ Vasovagal	20%
❖ Cardiac	13%
❖ Orthostatic hypotension	9%
❖ Medications	7%
❖ Stroke	4%
❖ TIA	4%
❖ Other	10%
❖ Unknown	31%

Etiology

- ❖ A suspected cause was found in 69% (evaluation in the ED)
- ❖ After full investigation, 39% of patients are still undiagnosed
- ❖ Unexplained syncope was found in 14-17% of patients in two European studies

Challenge

Syncope is a symptom,
not a disease

- ❖ Multiple causes
- ❖ Sporadic
- ❖ Causes range from benign to lethal
- ❖ Occur in the young and old

“Low-risk, high stake”

Who is at high risk of death?

Challenge

- ❖ Patients are asymptomatic when they arrive to your office
- ❖ In-patient evaluation can be
 - Expensive (\$2 billion annually)
 - Unfocused (4.6+/- 2.6 tests required, range 0-16)
 - Unrevealing and non-productive (16% have specific tests performed beyond monitoring)
- ❖ No uniform strategy for evaluation
- ❖ Failure to diagnose an arrhythmic cause can be fatal

First step

- ❖ History, physical exam, and ECG form the cornerstone of initial evaluation
- ❖ Diagnostic yield of 45-50%

History

- ❖ Plays a key role in the initial evaluation of syncope
 - Prodromal symptoms
 - Family history
 - Triggers and context
 - Medications

Historical independent predictors of an abnormal EPS

- ❖ Age
- ❖ LVEF < 0.40 (CHF)
- ❖ Structural heart disease

Final word on History

Repeated findings of bad outcomes

Age over 65

Congestive heart failure

Existing heart disease

Family history of SCD

Abnormal ECG

ECG

- ❖ Low diagnostic yield: 5%
- ❖ A normal ECG is highly predictive of benignity
- ❖ ECG are non-invasive, easy to perform, and inexpensive

ECG as an independent predictor

Table 5. Independent Predictors of Abnormal EPS, after Logistic Regression

	OR	CI	P Value
ECG + Holter+	35.94	10.14–127.36	<0.001
ECG + Holter–	17.83	4.82–65.87	<0.001
ECG – Holter+	3.45	0.92–12.88	0.064
ECG – Holter–	0.07	0.02–0.23	<0.001
Age	1.02	1.007–1.033	0.002
LVEF	0.97	0.95–0.99	0.013
OHD	3.13	1.52–6.46	0.002

Basic laboratory testing

❖ RBW

- Diagnostic yield: 2-3%
- usually confirms a clinical suspicion
- not recommended, should be guided by clinical evaluation

❖ Pregnancy test is recommended in all women of child-bearing age

Echocardiography

- ❖ Low yield 5-7%
- ❖ Important if presence of structural heart disease or abnormal ECG
- ❖ No cost-effectiveness studies
 - But cost 7 times more than an ECG

Exercise stress testing

- ❖ Low yield: < 1%
- ❖ Indicated in:
 - Ischemic heart disease
 - Exertional syncope*

24 Holter

- ❖ Yield of 19%
- ❖ Holter 24-h,
 - 4% correlation of symptoms with arrhythmia
 - 15% have symptoms without arrhythmia
 - 14% have asymptomatic arrhythmia
- ❖ Causal relation between most of these arrhythmias and syncope is uncertain
- ❖ A negative holter does not r/o arrhythmogenic etiology

Loop recorder

Yield	24-47% (highest in patients with palpitations)
Indications	<ol style="list-style-type: none">1) Frequent episodes with normal heart2) Recurrent events

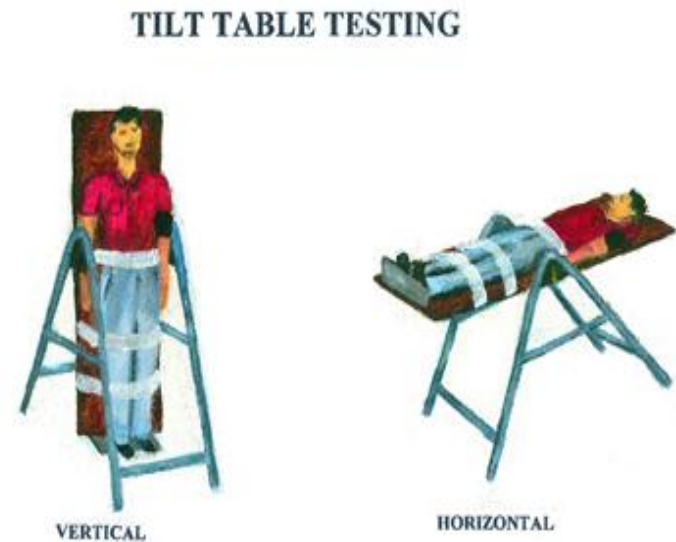
Electrophysiology Study

Goals	VT, VF, SVT
Risks	PE Cardiac perforation MI
Drawbacks	A negative study does not exclude arrhythmogenic cause Insensitive to detect bradyarrhythmias
Overall	Invasive Expensive

Tilt Table Test

❖ Indications:

- 1) Unremarkable history and physical, normal ECG, no structural heart disease
- 2) Non-diagnostic loop recorder Holter
- 3) Recurrent syncope of unexplained origin



Tilt Table Test

- ❖ Yield 60%
- ❖ Sensitivity 63-83%
- ❖ Specificity 90% (0-100%)
- ❖ More false-positives in the young

Positive test does not exclude
cardiac cause

Neurological testing

- ❖ Low yield 2-6%
- ❖ Useful if patients have neurological symptoms/signs or carotid bruits
 - Seizures
 - Focal neurological signs

Neurological testing

EEG	Studies showed little use in the unselected patient with syncope Not recommended as routine workup
CT and MRI	Yield of 4% No use if no neuro symptoms
Carotid doppler	Usefulness is unknown
Transcranial doppler	Usefulness in drop attack is unknown

**Risk stratification
based on prognostic
factors**

Risk stratification 1

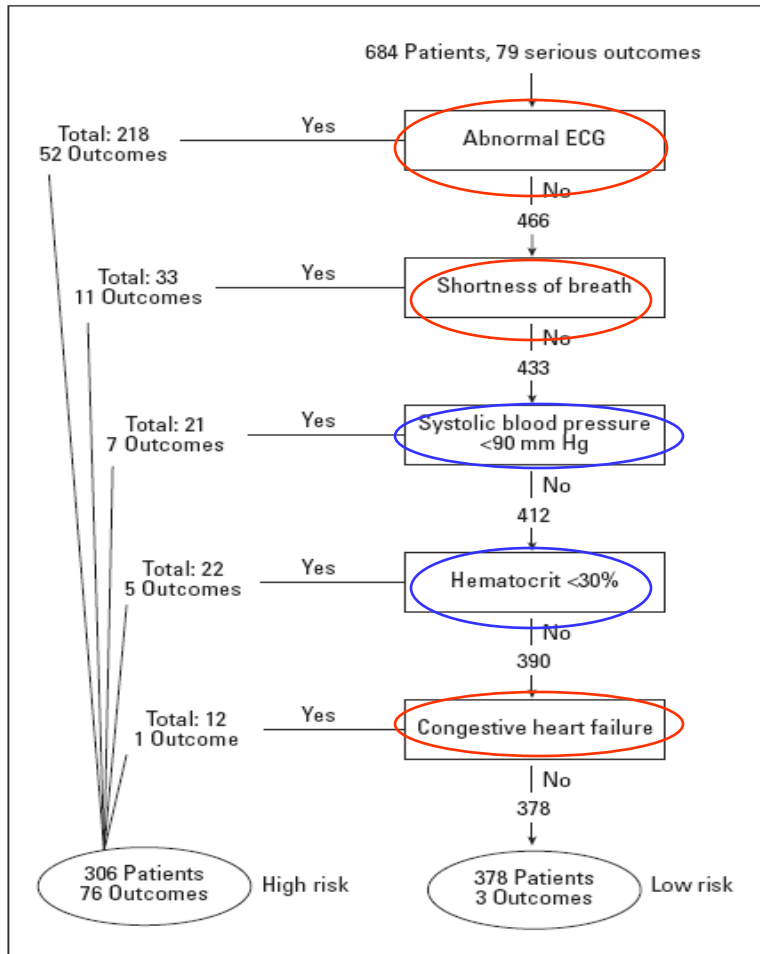
TABLE 3. Predictors of Cardiac Arrhythmias in Patients with Unexplained Syncope

Variables	Univariate Analysis			Multivariate Analysis		
	OR	95% CI	p	OR	95% CI	p
Abnormal ECG	11.6	4.6-29.5	<0.001	8.1	3.0-22.7	<0.001
Age ≥65 years	13.4	3.0-58.5	<0.001	5.4	1.1-26.0	0.03
History of congestive heart failure	8.6	3.5-21.1	<0.001	5.3	1.9-15.0	0.002
History of myocardial infarction	4.3	1.7-10.9	0.003			
History of cardiac disease (any type)	4.3	1.8-10.1	0.001			

Overall arrhythmogenic syncope 17-18%

San Francisco Syncope Rule

Figure.
Decision tree to derive the San Francisco Syncope Rule.



7-days outcome study

- ❖ Sensitivity 96.2%
- ❖ Specificity 62%
- ❖ NPV 99.2%
- ❖ PPV 24.8%
- ❖ Decrease admission rate by 10%

San Francisco – Validation

Internal

30-days outcome study

- ❖ Sensitivity 98%
- ❖ Specificity 56%
- ❖ Potentially decreasing admission by 7%

External

7-days outcome study

- ❖ Sensitivity 89%
- ❖ Specificity 69%

“should use as a risk stratification...as opposed to traditional rules used to replace judgment”

San Francisco – Elderly patients

Application of the rule for pts > 65yo
7-days outcome study

- ❖ Sensitivity 76.5%
- ❖ Specificity 36.8%
- ❖ NPV 87%
- ❖ PPV 22.1%

San Francisco vs clinical judgment

Clinical judgment

Sensitivity 94%

Specificity 54%

ROC (AUC) 0.83

San Francisco

Sensitivity 96%

Specificity 62%

ROC (AUC) 0.92

OESIL risk score

Independent Predictors	Risk ratio
Age > 65	1.42
CVD on history	1.34
Abnormal ECG	1.29
Syncope without prodrome	1.13

OESIL risk score

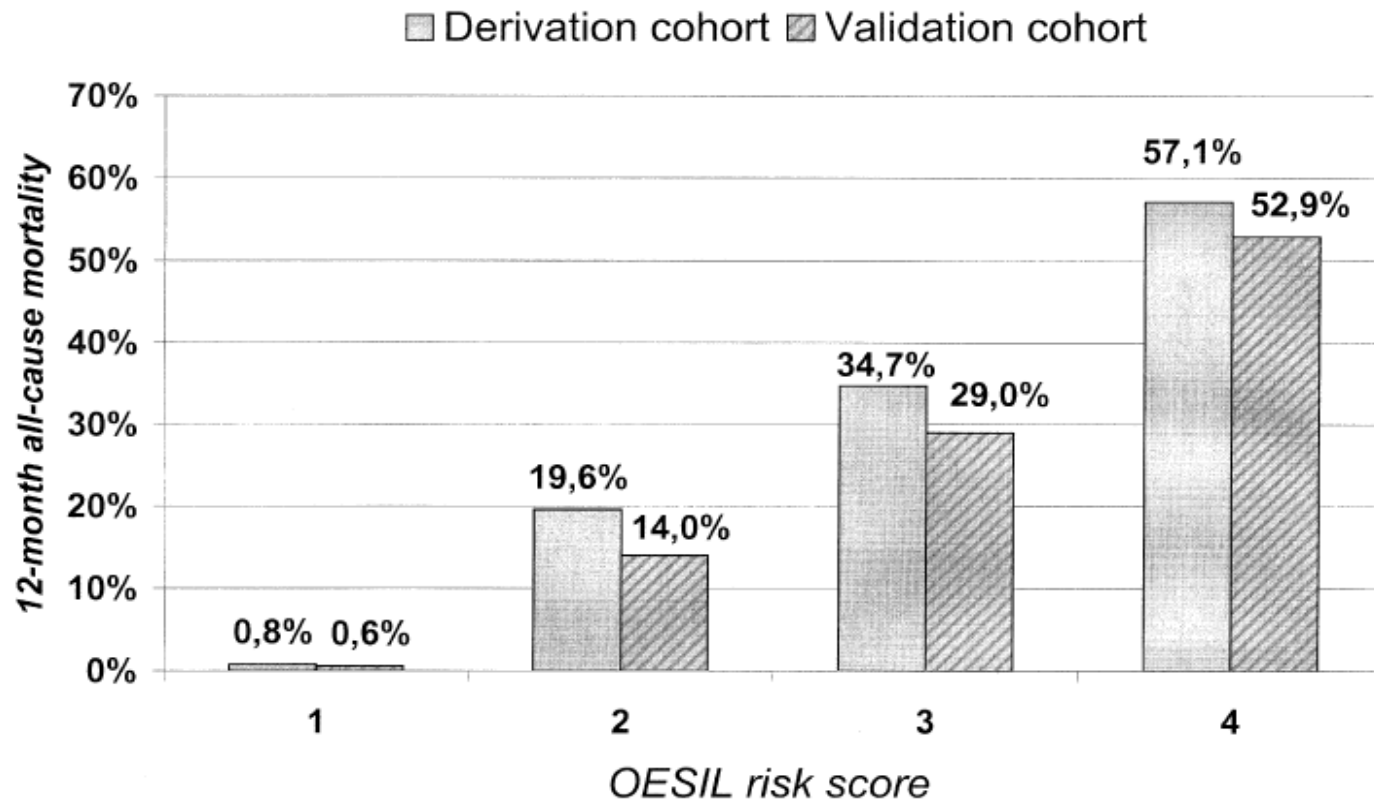


Fig. 2 Rates of 12-month all-cause mortality according to the OESIL score in the derivation and validation cohorts.

OESIL risk Score

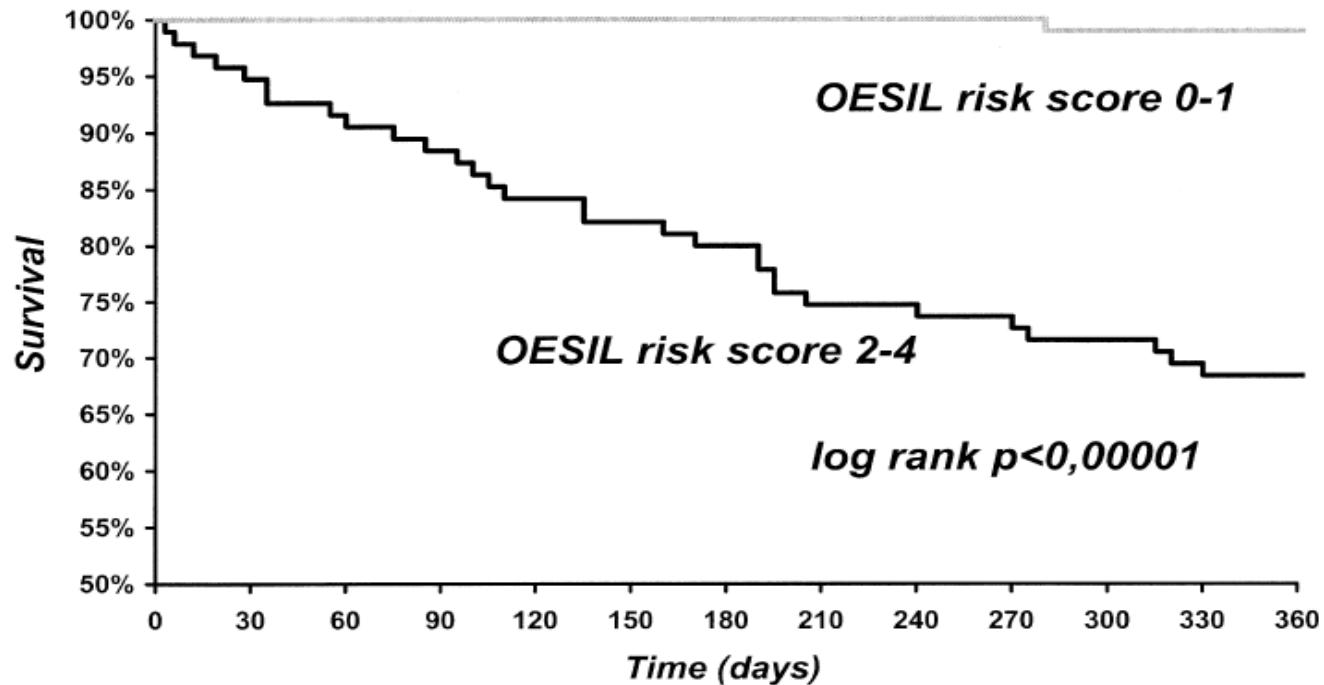


Fig. 4 Kaplan-Meier survival curves according to the score at presentation in patients included in the derivation cohort.

OESIL score > 1 is predictive of mortality

Management should be...

Based on risk and prognosis

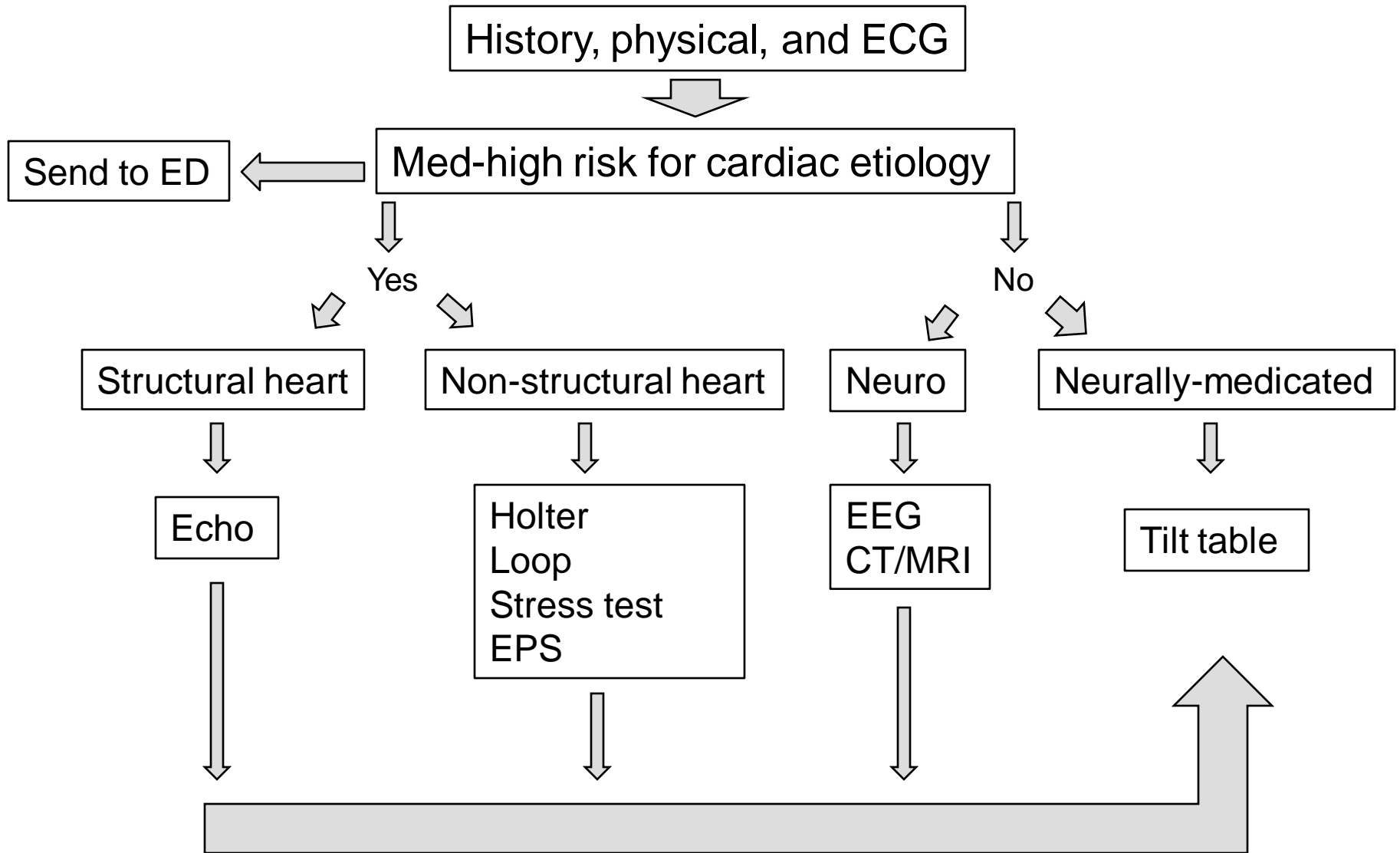
and not on diagnosis

(which is often difficult to make)

Summary of risk stratification

Sarasin et al.	San Francisco	OESIL	Miscellaneous
<ul style="list-style-type: none">❖ Abnormal ECG❖ Age > 65❖ Hx of CHF	<ul style="list-style-type: none">❖ Abnormal ECG❖ SOB❖ SBP < 90❖ Hct < 30%❖ CHF	<ul style="list-style-type: none">❖ Abnormal ECG❖ Age > 65❖ Cardiovascular disease on Hx❖ Syncope without prodrome	<ul style="list-style-type: none">❖ Exertional syncope❖ Family history of premature sudden death❖ Drugs that prolong QT

Approach in the office



Summary

- ❖ History, physical examination, and ECG form the cornerstone of the syncope work-up
- ❖ Neurological testing is rarely helpful unless neurological symptoms or signs are present
- ❖ Patients whom heart disease is known or those with exertional syncope should get cardiac testing

Summary

- ❖ EPS in patients with organic heart disease
- ❖ Holter for patients with heart disease
- ❖ Loop monitoring in patients with frequent events and normal hearts
- ❖ Tilt table in patients with infrequent or neurocardiogenic events