

# How to Survive Syncope

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#### Syncope: Economics

- Emergency Department visits
  - Primary diagnosis ~1.13 million
  - Among all listed diagnoses >1.35 million
- Hospital admission rate ~36%
- 23-hour observation ~4%
- Transfer to different facility ~1.4%
- Approximately 0.1% of US healthcare budget

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#### Syncope and Collapse: Avoiding Inappropriate Admissions

- 2011 study found that 58% of admissions inappropriate
- Only 6% (8/136) discharges inappropriate
- 52% reduction in admission with guideline-based criteria (no increase in serious events)
- Utah clinic (FF) had 4% admissions with guideline versus 20% without
- Careful evaluation produced higher rate of diagnosis: 57% vs 39%



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#### What to Do When They Come to You

#### • History (continued)

- Any predisposition to "motion sickness"?
- Any issues with blood draws or donation?
- Did you sustain any injury with an episode?

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- How did you feel when you awakened?
- Was there any urinary or fecal incontinence?



- · History of Witness also of benefit
  - Were any symptoms noted prior to LOC?
  - How did the patient appear?
  - How long did the episode last?
  - Did the patient demonstrate any seizure-like activity?
  - Was the patient stiff or flaccid during event?
  - Did the patient utter any involuntary sounds?





#### Why is the History so Important?

- Diagnostic Features (continued)
  - Arrhythmic
    - Older onset (usually >50yo)
    - History of heart disease
    - Abrupt loss of consciousness
    - Bodily injury
    - Brief duration (<30-45 sec) with spontaneous recovery

Syncope:	Clinica	l Feati	ires
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Feature	NMS		Cardiac		
	<65	≥65	<65	≥65	
Injury	34%	48%	44%	42%	
Any Prodrome	84%	59%	63%	53%	
Myoclonic jerks	16%	1%	14%	9%	
Feeling 'cold'	26%	8%	11%	1%	
Del Rosso, Alboni et al Am J Cardiol 20	005				=

**Differences in Older & Younger Patients** 

#### **Physical Exam**

- Orthostatic BP with HR
  - Lying
  - Seated
  - Standing for at least 3 minutes
- BP in both arms
- Carotid sinus massage
- Cardiac exam
  - Valvular stenosis
  - Pulmonary HBP
  - Obstructive lesions (myxoma)



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eTable A. Majo	or Clinical Decision Ru	iles for Syncope				
Study	Population	Predictor variables	Outcome measured	Score results	Validation	Comments
Boston Syncope Rule, 2007 (short-term risk)	Derivation: a priori Validation: 362 ED patients with syncope	Signs of volume depletion Persistent abnormal vital signs in the ED Signs and symptoms of acute coronary syndrome Signs of conduction disease Worksome cardiac history Family history of sudden death Primary central nervous system event Valvalar heat disease from history or physical examination)	Critical intervention or adverse outcome at 30 days	Consider admission for one or more variables	Internal: 97% sensitivity, 62% specificity External: none	25 variables in eight categories make it less practical
Canadian Syncope Risk Rule, 2016 (short-term risk)	Derivation: 4,030 ED patients with syncope Validation: pending	Predisposition to susceptly syncope (prodome/rigger) History of heart disease Synthic blood pressure < 00 mm Hg or > 180 mm Hg Elevated topornin herei Anormañ QRS said (< 20 or > 110 degrees) ORS durator > 130 milliseconds Contreted QT interval > 480 milliseconds ED diagnosis of extrades, yncope Di diagnosis of extrades, yncope	Serious event at 30 days: death, arrhythmia, MI, PE, and tassection, CVA, or procedural intervention for syncope	Estimated risk of serious adverse event at 30 days	Pending	Largest prospective study, outcomes consistent with guidelines, clarifles abnormal ECG Indings, pending volidation to support use of rule
EGSYS score, 2008 (short- and long-term risk)	Derivation: 260 ED patients with syncope Validation: 258 ED patients with syncope	Palpitations preceding syncope (4 points) Abnormal ECG findings* or history of heart disease (3 points) Syncope during effort (3 points) or when supine (2 points) Autonomic prodomes (~1 point) Precipitating and/or predisposing factors (~1 point)	Probability of cardiogenic syncope at two years	Consider admission for score of 3 or higher	Internal: 92% sensitivity, 69% specificity External: 56% sensitivity, 84% specificity	Mortality at two years was 2% in patients with scores < 3 and 21% for scores ≥ 3
OESIL risk score, 2003 (long-term risk)	Derivation: 270 ED patients with syncope Validation: 328 ED patients with syncope	Abnormal ECG findings* Absence of prodrama syndrome Age > 65 years History of cardiac disease	Mortality at one year	Consider admission for one or more variables	Internal: 100% sensitivity, 22% specificity External: 95% sensitivity, 31% specificity	Positive variables: 0: 0% mortality 1: 0.0% mortality 2: 14% mortality 3: 20% mortality 4: 53% mortality
ROSE study, 2010 (short-term risk)	Derivation: 550 ED patients with syncope Validation: 550 ED patients with syncope	Anemia hemoglobin < 9 gp er: dl (30 gp er: Ll) Brain natrivelic pecidie > 300 gp er: nL (300 ng per L) Chet pain vith synope EGG showing 0 wwws (secept in lead III) Oxygen saturation - 94% on room <i>air</i> Rectal examination showing occult blood (if gistronitestinal bleeding suppected)	Serious events at one month: death, acute MI, FE, CVA, antrythmis, hemorrhage requiring translosion of two or more units, subarachnoid hemorrhage, acute procedure, need for pacemaker in first month	Consider admission for one or more variables	Internal: 87% sensitivity, 66% specificity One-year outcomes: 72% sensitivity, 71% specificity External: none	Not useful for predicting outcomes at one year, first study to use a biomarker in risk strabification
San Francisco Syncope Rule, 2004 (short- term risk)	Derivation: 684 ED patients with syncope or near syncope Validation: 791 ED patients with syncope or near syncope	Abnormal ECG findings* Congestive heart falure Hematocrit < 30% Shortness of breath Systolic blood pressure < 90 mm Hg	Serious events at seven days: acute MI, PE, CVA, anrhythmias, subarachnoid hemorrhage, return ED visit, readmission	Consider admission for one or more variables	Internal: 98% sensitivity. 56% specificity External: 87% sensitivity, 52% specificity	First tool for short-term events (seven days) inconsistencies in validation scores, but the most studied decision tool
Information from: Col ment and prospective Def Rosso A, Ungar A 2008;94(12):1620-16 Ebell MH. Risk stratifi Ebell MH. Risk stratifi Grossman SA, Babine Sun BC, Castantina G Thriuganasambandan assessment of syncop	Nicchi F, Ammirati F, Melina D e validation of a risk stratificatis L Maggi R, et al. Clinical predi- izte. Sation of patients presenting Is intal evaluation and prognosis au M, Burke L, et al. Do outco B, Barbic F, et al. Priorities for e monthy V, Kwong K, Wells Ga are CIMAJ. 2016;188(12):E289-	Guido V. Imperail G. Santhi M. QESI. ("Desivulants guidemologica on pather for placetors: with placeae in the emergency departments" for the or dracks charges and think evaluation on pathers interest agree with gencoge A. M. Tem Thysica. 2012;857(1):1047-052. Ama of new process punched placeae 2014. M. Energ Med. 2012;80(1): mes of new process punched placeae 2014. M. Energ Med. 2012;80(1): energency department groups ensemble. Am of Intel AL 2014;64( et al.) Development of the Canadia Sprocee RNA. Score Burgets 2018.	unda Sincape nel Lario) Study Investigatora. Develop- te CESC nol: score. Eur Heart I. 2002;24(9):811-819. tily to a general hospital: the EGSY'S score. Heart. 209-206. 6):649-655 a.2. articus adverse events after emergency department	CVA = cerebrovascular accide of Guidalines in Syncope Stud nel Lazio; PE = pulmonary em *—Abnormal ECG definitions	nt; ECG = electrocardiography; y; MJ = myocardial infarction; G bolsm; ROSE = Risk Stratificatio varied with each study:	D = emergency department: EGSYS = Evaluation ESS = Oscinatorio Epótemiologico sulti Sincope no of Sincape in the Emergency Department.



### High Risk Patients

- Clinical history consistent with arrhythmic syncope
- Comorbidities
- ECG suggestive of arrhythmic syncope
- Family history of sudden death
- Hypotension
- Older age
- Severe structural heart disease

#### **Specialized Diagnostic Tests:**

Selected Use Based on Initial Examination and Risk Stratification

- Head-Up Tilt Test (usually combined with CSM)
- Event Monitoring
  - External
    - "Loop" Holter
  - Internal
    - Implantable loop recorder (ILR)
- Electrophysiologic Testing (EPS)

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### Head-Up Tilt Test (HUT)

- Protocols vary
- Performed with or without provocative drugs
- Goals:
  - Unmask VVS susceptibility
  - Reproduce symptoms
  - Patient learns VVS warning symptoms
  - Patient more confident of diagnosis
- Not useful for predicting treatment benefit





# **Event Monitoring-External**

- Used for extended period (30 days)
- Can be removed for bathing/sleep
- Capable of autotrigger/patient activation
- Reasonable option if episodes not rare



# **Event Monitoring-Internal**

- Requires minimal surgical implant ("Injectable")
- Capable of beat-to-beat monitoring for at least 3 years
- Data like external shared via Internet link





## **Recommendations for Neuro Testing**

Recommendation	Sponsoring organization
Avoid computed tomography of the head in asymptomatic adult patients in the emergency department with syncope, insignificant trauma, and a normal neurologic evaluation.	American College of Emergency Physicians
n the evaluation of simple syncope and a normal neurologic evaluation, do not obtain brain imaging studies (computed tomography or magnetic resonance imaging).	American College of Physicians
Do not perform imaging of the carotid arteries for simple syncope without other neurologic symptoms	American Academy of Neurology

