

# Systematic Review Snapshot

## TAKE-HOME MESSAGE

The San Francisco Syncope Rule is not sufficiently sensitive to exclude serious outcomes; however, if there is no identified cause for the syncope, the risk of serious short-term events is quite low.

## METHODS

### DATA SOURCES

The authors performed a systematic electronic search of MEDLINE, EMBASE, Med-Pilot, Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Register of Controlled Trials, ClinicalTrials.gov, and Web of Science from database inception through January 17, 2011. No language restriction was applied. Reference lists and bibliographies of review articles relating to risk stratification in syncope and UpToDate database entries relating to emergency department (ED) management of syncope were also searched.

### STUDY SELECTION

The authors included all primary studies, including abstracts, assessing the accuracy of the San Francisco Syncope Rule to predict the combined serious outcomes within 30 days in patients presenting to the ED with syncope.

### DATA EXTRACTION AND SYNTHESIS

Methodological quality was assessed with the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) tool and an extended checklist developed by

## Can the San Francisco Syncope Rule Predict Short-Term Serious Outcomes in Patients Presenting With Syncope?

### EBEM Commentators

Gregory R. Snead, MD

Lee G. Wilbur, MD

*Department of Emergency Medicine*

*Indiana University School of Medicine*

*Indianapolis, IN*

### Results

Meta-analysis results for the San Francisco Syncope Rule.

Analysis Group	Number of Studies	Number of Patients, N	Serious Outcomes, Prevalence (%)	Sensitivity (95% CI)	Specificity (95% CI)
Pooled analysis	12	5,316	596 (11)	0.87 (0.79–0.93)	0.52 (0.43–0.62)
Subgroup analysis*	5	2,955	245 (8)	0.88 (0.70–0.96)	0.54 (0.44–0.63)

CI, Confidence interval.

\*No cause of syncope identified.

The search identified 459 potential studies. Twelve trials met inclusion criteria and contained patient data that could be pooled. Of the 12 studies, 9 were prospective and 3 were retrospective. Among the prospective studies, 368 patients (6.5%; range 0% to 21%) were lost to follow-up, resulting in 5,316 total patients for the analysis. Serious outcome prevalence ranged from 5% to 26%. Nine trials included all patients presenting with syncope to the ED, whereas 3 selected patients after an identifiable cause for syncope was not found. Five trials included the definition of an abnormal ECG result as originally described in the San Francisco Syncope Rule derivation study, whereas 7 trials used an adapted or unclear definition of abnormal ECG. ECGs

were interpreted by the treating emergency physician in 4 trials and by other persons in 8. The outcome definition was consistent with the original derivation study in 9 of the trials, whereas adapted outcomes were used in 3 (range for outcome measures 7 to 30 days).

### Commentary

Syncope represents 1% to 6% of ED visits and up to 6% of hospital admissions and has an annual estimated cost of \$2.5 to \$6 billion.<sup>1</sup> There is a lack of evidence to support routine and costly admission.<sup>2</sup> Derived clinical decision rules attempt to differentiate patients with elevated risk who may benefit from further evaluation from those who may be safely dis-

the authors to explore potential biases in studies. Two reviewers independently extracted pre-defined study characteristics and abstracted data for 2×2 contingency tables. A bivariate random-effects model for diagnostic and prognostic meta-analysis was used. A priori specified subgroup analyses were conducted to investigate potential sources of differences in sensitivity. Receiver operator curves were plotted with a 95% confidence region for pooled estimates and a 95% prediction area to illustrate variability.

charged. The San Francisco Syncope Rule is based on the presence of any of 5 risk factors to predict patients at high risk of a serious outcome, which include history of congestive heart failure, hematocrit level less than 30%, an abnormal ECG result, history of shortness of breath, and systolic blood pressure less than 90 mm Hg.<sup>3</sup> The derivation study reported a sensitivity of 92%; however, subsequent studies have failed to replicate these results.

The systematic review authors report the probability of a serious outcome,

given the absence of all 5 San Francisco Syncope Rule risk factors to be approximately 5% and only 2% when the rule is applied to patients in whom no cause of syncope was identified. However, despite the authors' conclusions of relatively high overall quality of the included studies, the between-study differences were notable. When focusing on the larger validation studies, 1 study reported serious outcomes in 19% of patients at 7 days, whereas the original San Francisco Syncope Rule investigators reported a serious event rate of only 2% at 30 days. The 87% sensitivity for serious outcomes according to the pooled results must be questioned, given the broad range of false-negative rates among the included studies (range 0% to 48%). The review authors did not specify a priori analyses. No single variable was identified to account for the differences in results; however, ECG interpretation and cardiac arrhythmia definitions appeared to be the greatest contributors to the observed variability in sensitivity.

Subsequent studies of the San Francisco Syncope Rule fail to match the performance of the original derivation study for identifying patients at

elevated risk of serious short-term outcomes among those presenting with syncope, limiting its utility in aiding disposition decisions for the emergency physician.

*Editor's Note:* This is a clinical synopsis, a regular feature of the *Annals'* Systematic Review Snapshots (SRS) series. The source for this systematic review snapshot is: Saccilotto RT, Nickel CH, Bucher HC, et al. San Francisco Syncope Rule to predict short-term serious outcomes: a systematic review. *CMAJ*. 2011;183:E1116-1126.

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2. Brignole M, Ungar A, Bartoletti A, et al. Standardized-care pathway vs. usual management of syncope patients presenting as emergencies at general hospitals. *Europace*. 2006;8:644-650.
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Michael Brown, MD, MSc, Alan Jones, MD, and David Newman, MD, serve as editors of the SRS series.

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