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Syncope Risk Stratification in the ED: Another Step Forward

Bret A. Nicks, MD, MHA and Brian Hiestand, MD, MPH

Department of Emergency Medicine, Wake Forest School of Medicine, Winston-Salem, NC 27106

Syncope, defined as a transient loss of consciousness attributable to global cerebral hypoperfusion, remains a common and complex chief complaint in emergency departments (ED).¹ Although accounting for <2% of all ED presentations, roughly 40% of such patients are subsequently admitted costing more than \$2.4 billion in the US alone.^{2,3,4} Currently, there is no evidence that current admission patterns improve long-term quality-of-life or survivability, furthering the concern over economic cost with low diagnostic and therapeutic benefit.^{1,4–7}

Clinical decision making can be challenging in the ED management of patients with syncope.¹ Often, a definitive diagnosis cannot be determined during the initial ED evaluation. Because syncope may potentially be a harbinger of sudden death among patients with increased risk of cardiac syncope, admission of the high- and intermediate-risk patients remains common practice.^{1,2–6} This can also result in patients with any more than ‘no-risk’ being hospitalized. Although the rationale of this zero-miss approach can conceptually be appealing, the presumption that in-hospital evaluation improves a patient’s clinical outcome has never been validated.

As a result, an international interest has developed to improve risk stratification tools and diagnostic algorithms for syncope.^{4–12} Commonly cited as perhaps one of the first and best known decision aides, the “San Francisco Syncope Rule” (SFSR) identified five predictors of adverse outcome after syncope (SBP<90 mm Hg, shortness of breath, ECG: non-sinus or new changes, Hx of CHF, Hct < 30%), and whose absence aligns with very low risk (98%, 56% Sens, Spec).⁹ Although multiple decision guides, like SFSR, provide a framework for risk stratification, variation in definitions, accuracy and clinically coherent outcome categories limit uniform adoption.

In this issue of AEM, Numeroso et al present the Intermediate-Risk Syncope study (IRiS), focusing on short term prognosis and management of syncope with those determined to have intermediate or high risk of poor outcomes associated with cardiogenic syncope.^{1,12–14} Patients were only classified as high risk if they presented with classic “red flags” for severe disease – family history of sudden cardiac death, exertional syncope, active chest pain or palpitations, or ECG evidence of conduction abnormalities. In the IRiS study, 347 patients (185 male and 162 female, average age 73) with undetermined syncope were classified as intermediate (250) or high (97) risk. Low risk patients were systematically identified with

well-described criteria and excluded from the study, as were patients with defined etiologies of their syncope present upon ED evaluation. Intermediate-risk patients were identifiably younger with less frequent comorbidities and with a drastically lower incidence of serious adverse events (0.8% versus 27.8%, $p < 0.001$). Intermediate-risk patients were generally admitted (62.8%) to a hospital floor or into an Emergency Department Observation Unit. For hospital admissions, the authors reported a mean prolonged hospitalization (8.8 days), elevated costs (\$270,183) and a high rate of unexplained syncope (51%). Those characteristics leading to stratification as high risk were the only covariates statistically associated with serious events.

The main finding of this study is the surprisingly low incidence of adverse events observed in the intermediate-risk group (2/250) compared to high-risk patients (27/97, including 3 deaths). Based on their findings, the authors believe that intermediate-risk patients could be safely discharged, with potentially significant costs saving. Per this study, the goal should be evaluating for risk factors for cardiogenic syncope. Ascribing too much importance to advanced age, stable heart disease, or comorbidities, while previously described as markers of increased risk, likely leads to inappropriate hospitalization. Although in general cardiogenic syncope continues to be associated with a significantly worse prognosis when compared to non-cardiogenic syncope, this study challenges conventional wisdom and suggests that pre-existing coronary artery disease and heart failure does not automatically confer high risk in the absence of decompensation.^{6–12,14}

This study represents a welcome advance in refining risk profiles of patients with undifferentiated syncope. Practice guidelines tend to be conservative and risk averse by nature, frequently resulting in more diagnostic workup (and therefore resource consumption) rather than less. As clinical decision making remains challenging in the ED management of patients with recent syncope, appropriate risk stratification and evidence-based care pathways differentiating low, intermediate and high risk are essential. In many circumstances of undifferentiated syncope, intermediate risk patient assessments may occur in a specialized evaluation unit, such as an emergency department-based clinical decision unit.^{15–17} This may allow for the typical ED dyad of ‘admit or discharge’ to become more nuanced. Admit those that are obviously ill, send home those who obviously aren’t, and briefly observe those who are neither.

While it has been suggested that current guideline ambiguity with risk stratification may account for sub-optimal study and outcome comparisons, both the SEEDS and EDOSP studies identified that syncopal patients at intermediate risk could be safely discharged after a period of observation with appropriate outpatient follow-up, ensuring improved resource utilization, reduced length of stay and hospitalizations. Further supporting this division between moderate and high risk, the IRiS study intimates this as an essential division point with those at high risk for adverse outcomes remaining in a more traditional inpatient care pathway. As has been shown in other medical conditions, when integrating current and future best practices, a syncope protocol in such a unit may provide a reduction in hospital admissions, costs while improving outcomes for patients with syncope.^{18–21} It remains to be seen, and an opportunity for future research, that given the low rate of adverse events in the intermediate risk group in IRiS, whether even a brief observation stay might be overkill.

Despite substantial research efforts, uncertainty remains in the decision-making for patients with syncope. Although this study presents another step toward defining the appropriate management of syncopal patients in the ED, further prospective studies are needed. There remains continued interest among clinicians and researchers to improve diagnostic algorithms and optimize care and resource utilization for this clinical entity.

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References

1. Moya A, Sutton R, Ammirati F, Blanc JJ, Brignole M, Dahm JB, Deharo JC, Gajek J, Gjesdal K, Krahn A, Massin M, Pepi M, Pezawas T, Ruiz, Granell R, Sarasin F, Ungar A, van Dijk JG, Walma EP, Wieling W. Guidelines for the diagnosis and management of syncope (version 2009). *European Heart J*. 2009; 30:2631–2671. [PubMed: 19713422]
2. Sun BC, Emond JA, Camargo CA Jr. Characteristics and admission patterns of patients presenting with syncope to US Emergency departments, 1992–2000. *Acad Emerg Med*. 2004; 11:1029–34. [PubMed: 15466144]
3. Sun BC, Emond JA, Camargo CA Jr. Direct medical costs of syncope-related hospitalizations in the United States. *Am J Cardiol*. 2005; 95:668–71. [PubMed: 15721118]
4. Sheldon RS, Morillo CA, Krahn AD, et al. Standardized approaches to the investigation of syncope: Canadian Cardiovascular Society position paper. *Can J Cardiol*. 2011; 27(2):246–253. [PubMed: 21459273]
5. Probst MA, Sun BC. How can we improve management of syncope in the Emergency Department? *Cards Jour*. 2014; 21(6):643–650.
6. Costantino G, Sun BC, Barbic F, et al. Syncope clinical management in the emergency department: a consensus from the first international workshop on syncope risk stratification in the emergency department. *Eur Heart J*. 2015 Aug 4.
7. Costantino G, Perego F, Dipaola F, et al. Short- and long-term prognosis of syncope, risk factors, and role of hospital admission: results from the STePS (Short-Term Prognosis of Syncope) study. *J Am Coll Cardiol*. 2008; 51:276–83. [PubMed: 18206736]
8. Reed MJ, Newby DE, Coull AJ, Prescott RJ, Jacques KG, Gray AJ. The ROSE (risk stratification of syncope in the emergency department) study. *J Am Coll Cardiol*. 2010; 55:713–21. [PubMed: 20170806]
9. Quinn J, McDermott D, Stiell I, Kohn M, Wells G. Prospective validation of the San Francisco Syncope Rule to predict patients with serious outcomes. *Ann Emerg Med*. 2006; 47:448–54. [PubMed: 16631985]
10. Birnbaum A, Esses D, Bijur P, Wollowitz A, Gallagher EJ. Failure to Validate the San Francisco Syncope Rule in an Independent Emergency Department Population. *Ann Emerg Med*. 2008
11. Cosgriff TM, Kelly AM, Kerr D. External validation of the San Francisco Syncope Rule in the Australian context. *CJEM*. 2007; 9:157–61. [PubMed: 17488574]
12. Shen WK, Decker WW, Smars PA, et al. Syncope Evaluation in the Emergency Department Study (SEEDS): a multidisciplinary approach to syncope management. *Circulation*. 2004; 110(24):3636–3645. [PubMed: 15536093]
13. Huff JS, Decker WW, Quinn JV, et al. American College of Emergency Physicians. Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with syncope. *Ann Emerg Med*. 2007; 49(4):431–444. [PubMed: 17371707]
14. Numeroso F, Mossini G, Giovanelli M, Lippi G, Cervellin G. Short term prognosis and current management of syncopal patients at intermediate-risk. Results from the IRiS (Intermediate-Risk Syncope) Study. *Acad Emerg Med*. 2016

15. Sun B, Constantino G. Syncope risk stratification in the ED: Directions for future research. *Acad Emerg Med*. 2013 May; 20(5):503–506. [PubMed: 23672365]
16. Viqar-Syed M, Bradley DJ, Shen WK. Syncope units: impact on patient care and health-related costs. *Cardiol Clin*. 2013 Feb; 31(1):39–49. [PubMed: 23217686]
17. Sun BC, McCreath H, Liang LJ, et al. Randomized clinical trial of an emergency department observation syncope protocol versus routine inpatient admission. *Ann Emerg Med*. 2014 Aug; 64(2):167–75. [PubMed: 24239341]
18. Mahler SA, Burke GL, Duncan PW, Case LD, Herrington DM, Riley RF, Wells BJ, Hiestand BC, Miller CD. HEART Pathway Accelerated Diagnostic Protocol Implementation: Prospective Pre-Post Interrupted Time Series Design and Methods. *JMIR Res Protoc*. 2016 Jan 22.5(1):e10. [PubMed: 26800789]
19. Nahab F, Leach G, Kingston C, Mir O, Abramson J, Hilton S, Keadey M, Gartland B, Ross M. Impact of an emergency department observation unit transient ischemic attack protocol on length of stay and cost. *J Stroke Cerebrovasc Dis*. 2012 Nov; 21(8):673–8. [PubMed: 21482142]
20. Stopyra JP, Miller CD, Hiestand BC, Lefebvre CW, Nicks BA, Cline DM, Askew KL, Riley RF, Russell GB, Burke GL, Herrington D, Hoekstra JW, Mahler SA. Chest Pain Risk Stratification: A Comparison of the 2-Hour Accelerated Diagnostic Protocol (ADAPT) and the HEART Pathway. *Crit Pathw Cardiol*. 2016 Jun; 15(2):46–9. [PubMed: 27183253]
21. Parry SW, Frearson R, Steen N, et al. Evidence-based algorithms and the management of falls and syncope presenting to acute medical services. *Clin Med*. 2008; 8:157–162.