

Syncope

Subjects: Clinical Neurology

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Syncope is a common yet complex presenting symptom and requires thoughtful and efficient evaluation to determine its etiology. Estimates indicate that one-half of all Americans will experience loss of consciousness during their lives, with recurrence rates as high as 13.5%. The incidence of syncope is roughly bimodal, with a peak in late adolescence to early adulthood, typically vasovagal in origin, and a second peak in older age, with a sharp rise after age 70 years.

Keywords: syncope ; emergency department ; diagnosis ; risk stratification

1. Introduction

Approximately 1% to 3% of all emergency department (ED) visits, as many as atrial fibrillation, and up to 6% of all hospital admissions are due to syncope ^{[1][2][3]}. Though vasovagal reflex-mediated syncope and orthostatic hypotension are the two most common types with benign courses ^[4], a cardiac etiology of syncope is associated with significantly higher rates of morbidity and mortality ^[5].

Patients who present to the ED tend to be older and are more likely to have a cardiac etiology ^[6]. Notably, experiencing syncope affects patients' quality of life (QoL), and those with more frequent syncope report overall lower physical and mental health and impairment in activities of daily living ^{[7][8][9][10][11][12]}. The QoL among patients with recurrent syncope appears equivalent to those with severe rheumatoid arthritis or chronic lower back pain ^[9]. Recurrent syncope can also lead to long-term facility stay and a devastating loss of independence ^[13]. In addition to the negative effects on QoL, syncope also has an economic impact. The U.S. Healthcare Utilization Project has estimated total annual hospital costs of greater than \$4.1 billion in 2014 dollars with a mean cost of \$9400 per admission ^[14]. One 2017 article showed that, after adjusting for inflation, the median hospital charge for a single admission for syncope increased by 1.5 times from the preceding decade ^[15].

Due to concerns that patients presenting with syncope are at risk for an impending catastrophic event, overuse and inappropriate use of testing and hospital admission are common ^{[16][17][18][19]}. Indisputably, among patients who present with syncope, clinicians must identify those at high risk of adverse outcomes. Nonetheless, the majority are at low risk. To assist clinicians in assessing patient risk, several syncope risk stratification calculators have been developed over the last 20 years; however, one study found that the concordance between different risk scores was only moderate and the application of both decision rules and clinical judgement may lead to some clinical benefit ^[20]. A body of literature documents under-utilization of efficient tests, over-utilization of unnecessary tests, excess rates of admissions with limited diagnostic or therapeutic yield, over-expenditure associated with syncope management, and heightened risk to patients due to unnecessary tests and hospitalizations, including iatrogenic harms such as medication errors and in-hospital delirium ^{[16][17][18][21]}. Given the frequency of syncope as a symptom, the cumulative cost and burden to the healthcare system and patients is substantial.

Aiming to provide guidance on optimizing the evaluation and management of syncope, a collaboration of the American College of Emergency Physicians, Society for Academic Emergency Medicine, American College of Cardiology (ACC), American Heart Association (AHA) and Heart Rhythm Society (HRS) issued a Guideline for the Evaluation and Management of Patients With Syncope in 2017 ^[14]. The 2017 Syncope Guideline represents an effort to standardize clinical practice and reduce unnecessary services. However, the mere existence of a guideline does not guarantee effective use. Evidence shows that the development of clinical guidelines alone is often not sufficient, even if recommendations in the guideline have been demonstrated to be effective on the structure, process and/or outcomes of patient care ^{[22][23][24][25][26]}. Indeed, one recent study suggested that the current clinical guidelines have not significantly impacted resource utilization surrounding ED evaluation of syncope, and novel strategies are keenly needed to change ED practice patterns for such patients ^[27]. Matching implementation strategies to barriers and facilitators for the use of the syncope guideline and tailoring strategies to local context hold significant promise for a successful implementation ^{[28][29]} ^[30]. However, evidence on effective implementation strategies for syncope care in the ED is scarce. Project MISSION,

leveraging an engaged interdisciplinary team, aimed to facilitate the efficient and systematic implementation of high-value care to patients presenting to an ED with syncope.

2. Planning Implementation Success of Syncope Clinical Practice Guidelines in the Emergency Department Using CFIR Framework

2.1. Evaluation of Barriers Is a Necessity in Planning CPGs Implementation

Despite substantial efforts by medical researchers and professional societies [14][31][32], overuse and inappropriate use of testing and hospital admission are common in patients presenting with syncope. The most efficient solution to improve patient outcomes is most likely to adopt standardized criteria for evaluation and treatment administration based on the recommendations contained in guidelines. However, the uneven implementation of evidence-based CPGs is widely recognized as a continuing challenge to improving healthcare delivery and public health [33][34]. Implementation science provides an empirical base for promoting adoption of CPGs and its research is dedicated to accelerating the pace of implementing evidence-based interventions in real-world healthcare settings. What determines the rate and extent of adoption is the interaction among characteristics of the CPG, the intended users, and a particular context of care setting. As part of the clinical guideline implementation planning process, a more detailed evaluation of underlying barriers and facilitators and how these determinants can be addressed by strategies is needed.

2.2. Local Context Tailored Implementation Strategy Is Essential

While tailoring to local context seems intuitive, most studies have not tailored implementation strategies to context. Healthcare delivery settings influence every step of how care is given, yet far more work is needed to effectively describe and link these structural and process characteristics to outcomes and to develop setting-changing interventions to improve care. Numerous conceptual frameworks (e.g., CFIR) have been developed to guide the identification and systematically assess potential determinants within local settings. Project MISSION was the first effort that specifically applied IS principles and methods to develop strategies and plan implementation processes to overcome multilevel barriers to deliver guideline-recommended, high-value care to patients presenting with syncope in the ED. It integrated behavioral interventions and healthcare process redesign, used stakeholder-engaged and local-context congruent approaches, and fostered a learning health system approach spanning an academic medical center and community hospitals. Development of MISSION ensured tailoring of implementation strategies in the local setting to accommodate variations and to sustain improved syncope care through tailored implementation. For example, patient educational videos can be edited by inserting a tailored intro and outro delivered by a recognizable, local clinician to enhance patient buy-in. In addition, the video can be presented in various ways based on each system's infrastructure: via its system-wide patient education platform (either standalone or part of electronic health record-EHR), through a QR code to play on patients' smartphones, or through an iPad in patient rooms. Another example, supported by an external implementation mentor, is that the local implementation team can use local detailed process maps to systematically identify process steps with opportunities, and test and refine strategies to increase guideline-recommended syncope care delivery through iterative test cycles.

3. Conclusions

Effective multifaceted implementation strategies targeting individuals, teams, and healthcare systems should be employed to plan successful implementation and promote adherence to CPGs. MISSION, developed by following implementation science principles, can optimize syncope care and translate CPGs into widespread clinical practice.

References

1. Sun, B.C.; Emond, J.A.; Camargo, C.A., Jr. Characteristics and admission patterns of patients presenting with syncope to US emergency departments, 1992–2000. *Acad. Emerg. Med.* 2004, 11, 1029–1034.
2. Costantino, G.; Sun, B.C.; Barbic, F.; Bossi, I.; Casazza, G.; Dipaola, F.; McDermott, D.; Quinn, J.; Reed, M.J.; Sheldon, R.S.; 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.* 2016, 37, 1493–1498.
3. Rui, P.; Kang, K.; Albert, M. National Hospital Ambulatory Medical Care Survey: 2014 Emergency Department Summary Tables; Centers for Disease Control and Prevention: Washington, DC, USA. Available online: (accessed on 15 February 2018).
4. Shen, W.K.; Decker, W.W.; Smars, P.A.; Goyal, D.G.; Walker, A.E.; Hodge, D.O.; Trusty, J.M.; Brekke, K.M.; Jahangir, A.; Brady, P.A.; et al. Syncope Evaluation in the Emergency Department Study (SEEDS): A multidisciplinary approach to

- o syncope management. *Circulation* 2004, 110, 3636–3645.
5. Soteriades, E.S.; Evans, J.C.; Larson, M.G.; Chen, M.H.; Chen, L.; Benjamin, E.J.; Levy, D. Incidence and prognosis of syncope. *N. Engl. J. Med.* 2002, 347, 878–885.
6. D'Ascenzo, F.; Corleto, A.; Biondi-Zoccai, G.; Anselmino, M.; Ferraris, F.; di Biase, L.; Natale, A.; Hunter, R.J.; Schilling, R.J.; Miyazaki, S.; et al. Which are the most reliable predictors of recurrence of atrial fibrillation after transcatheter ablation?: A meta-analysis. *Int. J. Cardiol.* 2013, 167, 1984–1989.
7. Anderson, J.B.; Czoszek, R.J.; Knilans, T.K.; Marino, B.S. The effect of paediatric syncope on health-related quality of life. *Cardiol. Young* 2012, 22, 583–588.
8. Giada, F.; Silvestri, I.; Rossillo, A.; Nicotera, P.G.; Manzillo, G.F.; Raviele, A. Psychiatric profile, quality of life and risk of syncopal recurrence in patients with tilt-induced vasovagal syncope. *Europace* 2005, 7, 465–471.
9. Linzer, M.; Pontinen, M.; Gold, D.T.; Divine, G.W.; Felder, A.; Brooks, W.B. Impairment of physical and psychosocial function in recurrent syncope. *J. Clin. Epidemiol.* 1991, 44, 1037–1043.
10. Rose, M.S.; Koshman, M.L.; Ritchie, D.; Sheldon, R. The development and preliminary validation of a scale measuring the impact of syncope on quality of life. *Europace* 2009, 11, 1369–1374.
11. Santhouse, J.; Carrier, C.; Arya, S.; Fowler, H.; Duncan, S. A comparison of self-reported quality of life between patients with epilepsy and neurocardiogenic syncope. *Epilepsia* 2007, 48, 1019–1022.
12. Faddis, M.N.; Rich, M.W. Pacing interventions for falls and syncope in the elderly. *Clin. Geriatr. Med.* 2002, 18, 279–294.
13. Forman, D.E.; Rich, M.W.; Alexander, K.P.; Zieman, S.; Maurer, M.S.; Najjar, S.S.; Cleveland, J.C., Jr.; Krumholz, H.M.; Wenger, N.K. Cardiac care for older adults. Time for a new paradigm. *J. Am. Coll. Cardiol.* 2011, 57, 1801–1810.
14. Shen, W.-K.; Sheldon, R.S.; Benditt, D.G.; Cohen, M.I.; Forman, D.E.; Goldberger, Z.D.; Grubb, B.P.; Hamdan, M.H.; Krahm, A.D.; Link, M.S. 2017 ACC/AHA/HRS guideline for the evaluation and management of patients with syncope: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *J. Am. Coll. Cardiol.* 2017, 70, e39–e110.
15. Joy, P.S.; Kumar, G.; Olshansky, B. Syncope: Outcomes and conditions associated with hospitalization. *Am. J. Med.* 2017, 130, 699–706.e696.
16. Probst, M.A.; Kanzaria, H.K.; Gbedemah, M.; Richardson, L.D.; Sun, B.C. National trends in resource utilization associated with ED visits for syncope. *Am. J. Emerg. Med.* 2015, 33, 998–1001.
17. Huff, J.S.; Decker, W.W.; Quinn, J.V.; Perron, A.D.; Napoli, A.M.; Peeters, S.; Jagoda, A.S. Clinical policy: Critical issues in the evaluation and management of adult patients presenting to the emergency department with syncope. *J. Emerg. Nurs.* 2007, 33, e1–e17.
18. Canzoniero, J.V.; Afshar, E.; Hedian, H.; Koch, C.; Morgan, D.J. Unnecessary hospitalization and related harm for patients with low-risk syncope. *JAMA Intern. Med.* 2015, 175, 1065–1067.
19. Thiruganasambandamoorthy, V.; Taljaard, M.; Stiell, I.G.; Sivilotti, M.L.; Murray, H.; Vaidyanathan, A.; Rowe, B.H.; Calder, L.A.; Lang, E.; McRae, A. Emergency department management of syncope: Need for standardization and improved risk stratification. *Intern. Emerg. Med.* 2015, 10, 619–627.
20. Dipaola, F.; Costantino, G.; Perego, F.; Borella, M.; Galli, A.; Cantoni, G.; Barbic, F.; Casella, F.; Duca, P.G.; Furlan, R. San Francisco Syncope Rule, Osservatorio Epidemiologico sulla Sincope nel Lazio risk score, and clinical judgment in the assessment of short-term outcome of syncope. *Am. J. Emerg. Med.* 2010, 28, 432–439.
21. Smyth, S.; Gupta, V.; Williams, M.; Cowley, A.; Sirrine, M.; Surratt, H.; Chadha, R.; Stearley, S.; Bhalla, V.; Li, J. Identifying guideline-practice gaps to optimize evaluation and management for patients with syncope. *Can. J. Cardiol.* 2020, 37, 500–503.
22. Bero, L.A.; Grilli, R.; Grimshaw, J.M.; Harvey, E.; Oxman, A.D.; Thomson, M.A. Closing the gap between research and practice: An overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ* 1998, 317, 465–468.
23. Grimshaw, J.M.; Russell, I.T. Effect of clinical guidelines on medical practice: A systematic review of rigorous evaluations. *Lancet Lond.* 1993, 342, 1317–1322.
24. Grol, R.; Grimshaw, J. From best evidence to best practice: Effective implementation of change in patients' care. *Lancet* 2003, 362, 1225–1230.
25. Grol, R.; Wensing, M.; Eccles, M.; Davis, D. Improving Patient Care: The Implementation of Change in Health Care; John Wiley & Sons: Hoboken, NJ, USA, 2013.

26. Lugtenberg, M.; Burgers, J.; Westert, G. Effects of evidence-based clinical practice guidelines on quality of care: A systematic review. *BMJ Qual. Saf.* 2009, 18, 385–392.
27. Chou, S.-C.; Nagurney, J.M.; Weiner, S.G.; Hong, A.S.; Wharam, J.F. Trends in advanced imaging and hospitalization for emergency department syncope care before and after ACEP clinical policy. *Am. J. Emerg. Med.* 2019, 37, 1037–1043.
28. Chambers, D.A.; Glasgow, R.E.; Stange, K.C. The dynamic sustainability framework: Addressing the paradox of sustainability amid ongoing change. *Implement. Sci.* 2013, 8, 117.
29. Wensing, M. The Tailored Implementation in Chronic Diseases (TICD) project: Introduction and main findings. *Implement. Sci.* 2017, 12, 5.
30. Baker, R.; Camosso-Stefinovic, J.; Gillies, C.; Shaw, E.J.; Cheater, F.; Flottorp, S.; Robertson, N.; Wensing, M.; Fiander, M.; Eccles, M.P. Tailored interventions to address determinants of practice. *Cochrane Database Syst. Rev.* 2015.
31. Brignole, M.; Moya, A.; de Lange, F.J.; Deharo, J.C.; Elliott, P.M.; Fanciulli, A.; Fedorowski, A.; Furlan, R.; Kenny, R.A.; Martin, A.; et al. 2018 ESC Guidelines for the diagnosis and management of syncope. *Eur. Heart J.* 2018, 39, 1883–1948.
32. Brignole, M.; Moya, A.; de Lange, F.J.; Deharo, J.C.; Elliott, P.M.; Fanciulli, A.; Fedorowski, A.; Furlan, R.; Kenny, R.A.; Martín, A.; et al. Practical Instructions for the 2018 ESC Guidelines for the diagnosis and management of syncope. *Eur. Heart J.* 2018, 39, e43–e80.
33. Kruk, M.E.; Gage, A.D.; Arsenault, C.; Jordan, K.; Leslie, H.H.; Roder-DeWan, S.; Adeyi, O.; Barker, P.; Daelmans, B.; Doubova, S.V.; et al. High-quality health systems in the Sustainable Development Goals era: Time for a revolution. *Lancet Glob Health* 2018, 6, e1196–e1252.
34. Correa, V.C.; Lugo-Agudelo, L.H.; Aguirre-Acevedo, D.C.; Contreras, J.A.P.; Borrero, A.M.P.; Patiño-Lugo, D.F.; Valencia, D.A.C. Individual, health system, and contextual barriers and facilitators for the implementation of clinical practice guidelines: A systematic metareview. *Health Res. Policy Syst.* 2020, 18, 74.

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