STATE-OF-THE-ART PAPER

New Concepts in the Assessment of Syncope

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Significant progress has been made in the past 3 decades in our understanding of the various causes of loss of consciousness thanks to the publication of several important studies and guidelines. In particular, the recent European Society of Cardiology guidelines provide a reference standard for optimal quality service delivery. This paper gives the reader brief guidance on how to manage a patient with syncope, with reference to the above guidelines. Despite the progress made, the management of patients with syncope remains largely unsatisfactory because of the presence of a significant gap between knowledge and its application. Two new concepts aimed at filling that gap are currently under evaluation: syncope facilities with specialist backup and interactive decision-making software. Preliminary data have shown that a standardized syncope assessment, especially when coupled with interactive decision-making software, decreases admission rate and unnecessary testing and improves diagnostic yield, thus reducing cost per diagnosis. The long-term effects of such a new health care model on the rate of diagnosis and survival await future studies.   (J Am Coll Cardiol 2012;59:1583–91)
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Syncope and Its Context

Definition. Transient loss of consciousness (TLOC) or faint are generic terms that encompass all disorders characterized by transient, self-limited, nontraumatic loss of consciousness. The causes of TLOC include syncope, epileptic seizures, psychogenic, and other rare miscellaneous causes. What differentiates syncope from the other forms of TLOC is its unique pathophysiology (i.e., transient global cerebral hypoperfusion due to low peripheral resistances and/or low cardiac output) (1).

Epidemiology. TLOC events of suspected syncopal nature are extremely frequent in the general population (2). A recent epidemiological study performed in the state of Utah (3) showed that the yearly prevalence of fainting spells resulting in medical evaluation was 9.5 per 1,000 inhabitants, with 1 out of 10 patients hospitalized. The majority of patients did not seek medical help, and only a small fraction saw a specialist or presented to the emergency department (ED) (Table 1) (2,3). The first-time incidence of syncope by age is bimodal (1). Its prevalence is very high in patients between the ages of 10 and 30 years, is uncommon in adults with an average age of 40 years, and peaks again in patients older than 65 years. In the Framingham study (4), the 10-year cumulative incidence of syncope was 11% for both men and women aged 70 to 79 years and 17% and 19% for men and women, respectively, age ≥80 years.

Prognosis. The outcome in patients with syncope is often related to the severity of the underlying disease rather than the syncopal event itself. Structural heart disease and orthostatic hypotension in the elderly patient are associated with an increased risk of death due to comorbidities (1,5). In the EGSYS 2 (Guidelines in Syncope Study 2) follow-up study (6) including 398 patients who presented to the ED with syncope, death of any cause occurred in 9.2% of patients during a mean follow-up of 614 days. Among the patients who died, 82% had an abnormal electrocardiogram (ECG) and/or heart disease; conversely, only 6 deaths (3%) occurred in patients without abnormal ECG and/or heart disease, indicating a negative predictive value of 97%. Mortality was significantly worse in patients with structural cardiac or cardiopulmonary cause of syncope compared with that of patients with other causes of syncope.

Classification and Treatment

Traditionally, the causes of syncope are classified according to etiology and presumed pathophysiology. Figure 1, left column, shows the classification of syncope based on etiology as proposed by the European Society of Cardiology (ESC) guidelines (1). Because of recent advances in technology, our ability to make a diagnosis based on the documentation of spontaneous events has increased. This resulted in a new classification based on the underlying mechanism (7). Figure 1, right column, shows the classification of syncope based on mechanism. Classification based

on etiology does not always correlate with classification based on mechanism. The same mechanism of syncope is present in different etiologies, and any given etiology can cause syncope with different mechanisms.

Although reflex syncope is the most frequent etiology, accounting for approximately two-thirds of cases, long asystolic pauses due to sinus arrest, atrioventricular block, or a combination of the two are the most frequent mechanism of unexplained syncope occurring in more than one-half of patients (8–21). The efficacy of therapy is largely determined by the mechanism of syncope rather than its etiology. Therapy based on etiologic diagnosis gave partially unsatisfactory results in one study (6), showing syncope recurrence in 16.5% of patients during 614 ± 73 days of follow-up regardless of etiology. Conversely, in the randomized Eastbourne Syncope Assessment Study (20), patients who received a specific treatment based on the findings derived from implantable loop recorders (ILRs) demonstrated a significant reduction in syncopal recurrences. In several open or uncontrolled studies, permanent cardiac pacing was highly effective in preventing syncopal recurrences when an asystolic pause could be documented at the time of syncope occurrence regardless of pathophysiology (i.e., intrinsic sinus node disease or extrinsic autonomic changes) (8,22–24). Given the better outcome with mechanism-specific therapy, it is the authors' opinion that the classification of syncope based on mechanism is likely to become the most widely used approach in patients presenting with syncope.

Diagnostic Algorithm

There are 2 main reasons for evaluating a patient with syncope: 1) to assess the prognostic risk, including death, severe adverse events, and syncope recurrence; and 2) to identify the specific cause of the loss of consciousness to apply an effective mechanism-specific treatment strategy. Defining the mechanism is a prerequisite for finding a specific therapy to prevent recurrences. The ESC guidelines, which are summarized in the algorithm shown in Figure 2, address both issues.

Initial evaluation: the value of history taking and standard ECG. The first step in the evaluation of a patient presenting with TLOC of suspected syncopal nature consists of obtaining a detailed history and conducting a physical examination including orthostatic blood pressure (BP) measurements and standard ECG. In selected cases, the initial evaluation may also include echocardiography and in-hospital ECG monitoring (i.e. telemetry) neurological consultation, and blood tests (1). The initial evaluation may lead to a certain diagnosis in the situations listed in Table 2.

Under these circumstances, no further testing is required, and treatment can be initiated as needed. It is important to recognize that the diagnostic yield of the initial evaluation depends on the clinical setting in which the patient is being evaluated. In 2 large multicenter trials, a diagnosis was established in 50% of patients evaluated in the ED (25) and in 21% of the more "difficult" patients referred to specialized syncope units (26). Reflex syncope (vasovagal, situational) accounted for approximately two-thirds of the diagnoses in both settings. Arrhythmic syncope was the second most frequent cause of syncope, accounting for 10% of the cases. **Assessment and management of patients with a high short-term risk.** The second step in the evaluation of a patient presenting with TLOC is to assess the probability of developing serious clinical events within days or weeks of the index presentation. This risk assessment will determine the need for immediate hospitalization and early intensive evaluation (Fig. 2, Table 3).
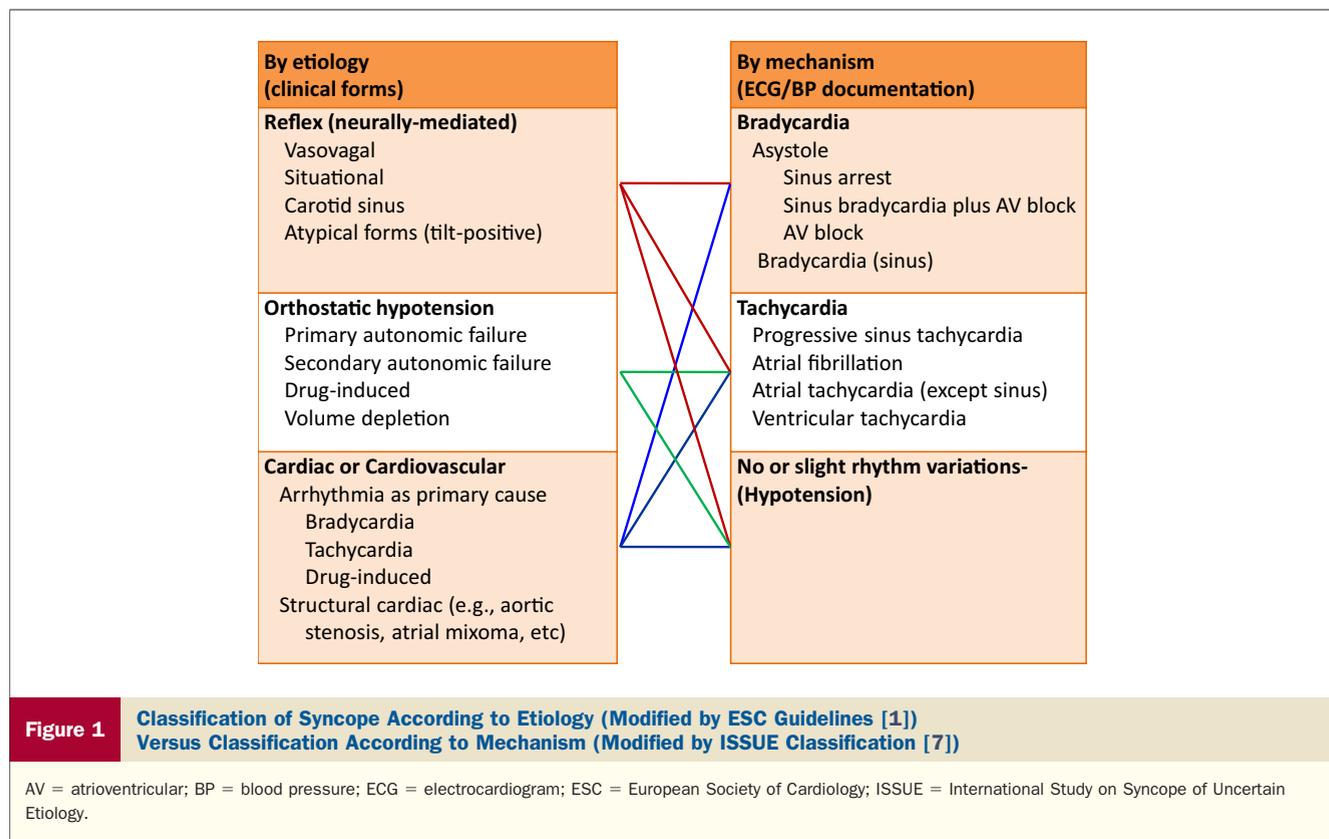
A recent literature review performed by a task force of the Canadian Cardiovascular Society (27) showed that on average 7.5% of patients referred to the ED had nonfatal severe outcomes while in the ED and 4.5% had nonfatal severe outcomes in the subsequent 7- to 30-day period. Severe outcome was defined as new diagnosis, clinical deterioration, syncope recurrence with serious injury, or significant therapeutic intervention. Furthermore, only 0.7% of patients died within the same time period. Thus, only a small minority of patients referred to the ED is likely to benefit from urgent assessment, and even a smaller subset requires hospitalization. The challenge resides in accurately identifying patients with high short-term risk. Table 3 summarizes the recommendations of the ESC and the Canadian Cardiovascular Society regarding the immediate need for hospitalization or urgent evaluation. In 3 validation studies that used the ESC criteria (25,28,29), the admission rate ranged between 38% and 42%. These admission rates remained significantly higher than the rate of developing a serious event shortly after the index presentation. Syncope facilities have been introduced to decrease the number of hospitalizations by offering the patient a well-defined rapid alternative evaluation pathway.

Outpatient evaluation and management of patients with a low short-term risk. When the preceding high-risk features are absent, or when they are present with a subsequent negative workup, the risk of developing a life-threatening event is low. Indeed, in most of these cases, the

Table 1	Syncope Frequency Depends on the Setting in Which the Measurement Is Made

Setting	Incidence (per 1,000 patient-years)	Ratio
General population	18–40	1
Seeking medical evaluation	9.3–9.5	1:2–1:4
Referred for specialty evaluation	3.6	1:5–1:10
Referred to emergency department	0.7–1.8	1:10–1:50

Adapted from Olde Nordkamp et al. (2) and Malasana et al. (3).

Figure 1   Classification of Syncope According to Etiology (Modified by ESC Guidelines [1]) Versus Classification According to Mechanism (Modified by ISSUE Classification [7])

AV = atrioventricular; BP = blood pressure; ECG = electrocardiogram; ESC = European Society of Cardiology; ISSUE = International Study on Syncope of Uncertain Etiology.
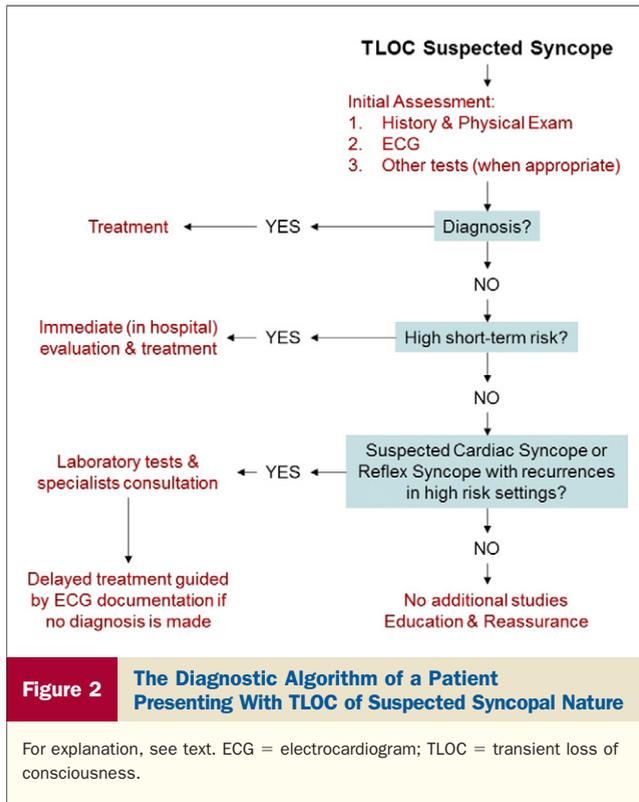
events are reflex mediated and the prognosis is good. In patients at low risk with suspected cardiac syncope or reflex syncope with severe presentation due to the unpredictable nature of the events or their occurrence in high-risk settings, outpatient evaluation with referral to a specialized syncope facility is preferred. In patients with suspected reflex syncope with rare or mild symptoms, no further investigation is generally warranted. In these instances, patients can be educated and reassured about the benign nature of their symptoms (Fig. 2). In patients at low risk with severe presentation due to the unpredictable nature of the events or their occurrence in high-risk settings, outpatient evaluation with referral to a specialized syncope facility is preferred.

Laboratory Provocative Tests Versus Documentation of Spontaneous Events

Provocative tests are aimed at reproducing syncope or related abnormalities in an artificial setting (i.e., laboratory). The assumption is that a positive response to a test reproduces the mechanism of a spontaneous episode. The most useful tests and their diagnostic yield are listed in Table 4. Tilt-table testing and carotid sinus massage are indicated when reflex syncope is suspected in the setting of an atypical presentation. Electrophysiological study is indicated when cardiac arrhythmic syncope is suspected such as in patients with previous myocardial infarction, nondiagnostic sinus bradycardia, bundle branch block, or history of sudden and brief episodes of palpitations preceding the

syncopal event. Exercise testing is indicated in patients who experience syncope during or shortly after exertion and in patients with chest pain suggestive of coronary artery disease. The sensitivity and specificity of any of these tests are difficult to measure because of the lack in most cases of a reference or "gold standard." Therefore, it is important for the physician to weigh the pre-test probability in his or her interpretation of a positive response.

Short-term monitoring is useful soon after the index episode in selected patients who have frequent symptoms such as weekly occurrences. A generalized use of these tools in patients with less frequent symptoms is not useful because of the low probability to record a diagnostic episode. Because the vast majority of patients with syncope have infrequent symptoms recurring over months or years, ILRs are frequently necessary to establish a diagnosis. Pooled data from 14 studies (8–21) including a total of 1,598 patients showed an average diagnostic yield of 32% over an observation period of 18 months and 43% (20), 49% (8), and approximately 50% (21) when the monitoring period was up to 2 years. In a recent study (22), extending the monitoring period up to 4 years safely increased the diagnostic yield of ILRs up to 80%, with one-quarter of the diagnoses requiring more than 18 months of follow-up (Fig. 3). As a consequence, when a strategy of prolonged monitoring is chosen, monitoring should be maintained up to several years until a diagnosis has been established. In 2 randomized studies evaluating patients with unexplained syncope, more

Figure 2   **The Diagnostic Algorithm of a Patient Presenting With TLOC of Suspected Syncopal Nature**

For explanation, see text. ECG = electrocardiogram; TLOC = transient loss of consciousness.

with the indication estimated to be 4 times greater than what has been observed in current practice (30).

In conclusion, the strategy of laboratory tests has the advantage of providing an immediate diagnosis but is hampered by a significant risk of misdiagnosis. Conversely, the strategy of prolonged monitoring provides reliable evidence of the syncope mechanism but has 2 important disadvantages: 1) diagnosis and therapy are delayed often for a long time until an arrhythmic event can be documented; and 2) hypotensive events in the absence of an arrhythmia cannot be confirmed given the limitations of the current monitoring technology.

The Magnitude of the Care Gap in the Evaluation of Patients With Syncope

Despite the development of guidelines based on the best available scientific evidence, the dissemination of these concepts into clinical practice remains a challenge. Educating every physician who is likely to be involved in the care of patients presenting with syncope is virtually impossible. As a result, we see inappropriate use of diagnostic tests, a high number of patients with misdiagnoses or without a diagnosis, and excessive use of health care resources. Indeed, several studies have shown great interhospital and interdepartmental heterogeneity regarding the incidence of emergency admissions, in-hospital diagnostic pathways, and rate of diagnosis (2,31–37). For example, in the EGSYS 1 trial (31) including 996 consecutive patients who presented to the ED with syncope, carotid sinus massage and head-up tilt tests were performed in 0% to 58% and 0% to 50% of the

diagnoses were achieved with a monitoring strategy compared with a laboratory approach: 50% versus 20% in one (12) and 43% versus 6% in the other (20). Despite this evidence, ILRs are still largely underused in clinical practice,

Table 2	**Established Diagnosis at Initial Evaluation: Commonly Accepted Diagnostic Criteria**

Reflex syncope

- Classical vasovagal syncope is diagnosed if syncope is precipitated by emotional distress (such as fear, severe pain, instrumentation, blood phobia) or prolonged standing and is associated with typical prodromal symptoms due to autonomic activation (intense pallor, sweating, nausea, feeling of warmth, odd sensation in the abdomen, and lightheadedness or dizziness).
- Situational syncope is diagnosed if syncope occurs during or immediately after specific triggers:

  Gastrointestinal stimulation (swallow, defecation, visceral pain)

  Micturition (post-micturition)

  Post-exercise

  Post-prandial

  Cough, sneeze

  Others (e.g., laughing, brass instrument playing, weightlifting)

Orthostatic syncope is diagnosed when the history is consistent with the diagnosis and there is documentation of orthostatic hypotension during an active standing test (usually defined as a decrease in systolic blood pressure ≥20 mm Hg or a decrease of systolic blood pressure to <90 mm Hg) associated with syncope or pre-syncope (a fall >30 mm Hg is needed in hypertensive subjects).

Arrhythmia-related syncope is diagnosed by ECG (including ECG monitoring) when there is:

- Sinus bradycardia <40 beats/min or repetitive sinoatrial blocks or sinus pauses >3 s
- Second-degree Mobitz II or third-degree atrioventricular block
- Alternating left and right bundle branch block
- Paroxysmal supraventricular tachycardia or ventricular tachycardia
- Pacemaker or ICD malfunction with cardiac pauses

Cardiac ischemia-related syncope is diagnosed when symptoms are present with ECG evidence of acute ischemia with or without myocardial infarction

Cardiovascular syncope is diagnosed by echocardiography performed at initial evaluation when syncope presents in patients with prolapsing atrial myxoma or other intracardiac tumors, severe aortic stenosis, pulmonary hypertension, pulmonary embolus or other hypoxic states, acute aortic dissection, pericardial tamponade, obstructive hypertrophic cardiomyopathy, and prosthetic valve dysfunction

ECG = electrocardiogram; ICD = implantable cardioverter-defibrillator.

Table 3	Short-Term High-Risk Criteria That Require Prompt Hospitalization or Early Intensive Evaluation	
	ESC Guidelines (1)	**Canadian Cardiovascular Society Position Paper (29)**
	Severe structural or coronary artery disease (heart failure, low ejection fraction, or previous myocardial infarction)	Heart failure and history of cardiac disease (ischemic, arrhythmic, obstructive, valvular)
	ECG features suggesting arrhythmic syncope (nonsustained ventricular tachycardia, bifascicular block, inadequate sinus bradycardia (<50 beats/min) or sinoatrial block, pre-excited QRS complex, ECG findings suggesting an inherited disease)	Abnormal ECG (any bradyarrhythmia, tachyarrhythmia, or conduction disease; new ischemia or old infarct)
	Clinical features suggesting arrhythmic syncope (syncope during exertion or supine position, palpitations at the time of syncope, family history of sudden cardiac death)	Hypotension (systolic blood pressure <90 mm Hg)
	Important comorbidities: • Severe anemia • Electrolyte disturbance	Minor risk factors deserving urgent specialist assessment: age >60 years, dyspnea, anemia (hematocrit <0.30), hypertension, cerebrovascular disease, family history of sudden death <50 years, syncope while supine, syncope during exercise, syncope with no prodromal symptoms

ECG = electrocardiogram; ESC = European Society of Cardiology.

patients, respectively. Prolonged ECG monitoring was performed in 3% to 90% of patients. Consequently, the final diagnosis of reflex-mediated syncope ranged from 10% to 79%. In a recent study performed at the University of Utah (38), we also found important discrepancies between clinical practice and the recommended guidelines. In some instances, tests were performed in the absence of clear indications, and conversely in other instances, many tests should have been performed and were not; 36% of admissions did not meet the indications suggested by the ESC guidelines, and 38% of the final diagnoses were not sufficiently supported.

How to fill the gap? The need to adopt a standardized approach in clinical practice. To maximize implementation of the guidelines, it is essential that standardized models of care for the assessment and management of syncope are in place. In the next section, we describe 2 new concepts aimed at filling the gap between science and clinical practice: syncope facilities and interactive decision-making software.

Syncope Facilities, Algorithms, and Interactive Decision-Making Software

The introduction in clinical practice of syncope facilities and standardized guideline-based algorithms coupled with on-line decision-making software bring promise and hope to our struggle to improve patient care.

Specialized syncope facilities: "the right physician, in the right place, at the right time." It was the view in the 2004 ESC syncope guidelines that a cohesive structured care pathway delivered either within a single syncope facility (i.e., syncope unit) or a multifaceted service is needed to optimize the quality of service delivered to patients with syncope (39). The ESC guidelines did not provide concrete recommendations but only a framework of the general standards. The goals of syncope facilities are to: 1) provide a standardized assessment by a syncope specialist and continuity of care starting with the initial evaluation and including therapy and follow-up; and 2) reduce the rate of hospitalization by offering the patient a well-defined rapid alternative evaluation pathway.
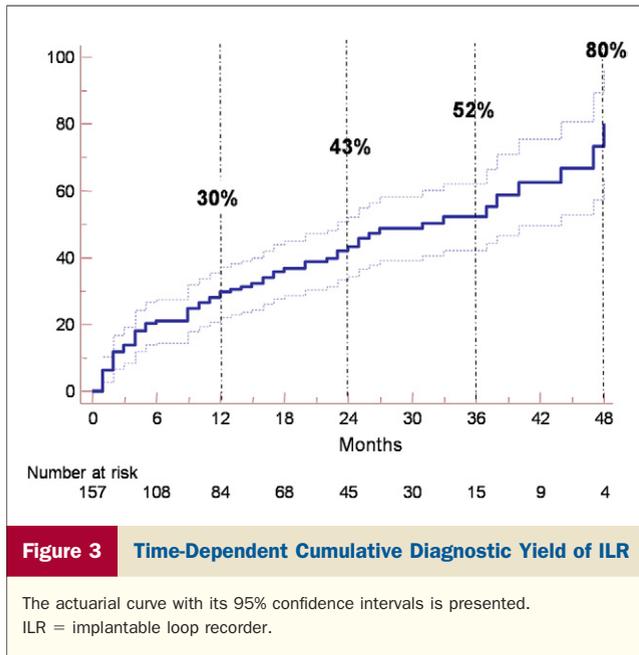
In general, a syncope facility should be led by a syncope specialist, who is a single physician or a team of physicians that should manage all aspects of patient care, including the initial diagnosis, risk assessment, therapy, and follow-up. He or she should perform the core laboratory tests and must have access to hospital beds, diagnostic tests, and therapeutic procedures. The syncope facility should be multidisciplinary with access to physicians and nurses experienced in key components of cardiology, neurology, emergency, and geriatric medicine. A syncope facility should have:

- Core equipment: ECG recorders, continuous BP monitors, tilt table, external and implantable ECG monitoring systems, 24-h ambulatory BP monitoring,

Table 4	Diagnostic Yield of the Most Used Tests for Diagnosis of Uncertain Syncope After Initial Evaluation in 2 Different Clinical Settings					
	Emergency Department* (n = 175)			**Syncope Unit† (n = 673)**		
	Performed, Patients	Diagnostic, Tests	NND	Performed, Patients	Diagnostic, Tests	NND
Tilt testing	76 (43%)	46 (61%)	1.6	443 (66%)	237 (53%)	1.9
Carotid sinus massage	65 (37%)	18 (28%)	3.6	509 (76%)	62 (12%)	8.2
Prolonged ECG monitoring (Holter, telemetry, external loop recorder)	16 (9%)	5 (31%)	3.2	175 (26%)	15 (9%)	12.0
Exercise test	10 (6%)	3 (30%)	3.3	41 (6%)	1 (2%)	41.0
Electrophysiological study	15 (9%)	3 (30%)	3.0	40 (6%)	14 (35%)	2.9
Coronary angiography	8 (5%)	5 (62%)	1.6	14 (2%)	1 (7%)	14.0

Values are n (%). *EGSYS 2 (Evaluation of Guidelines in Syncope Study 2) (25). †SUP (Syncope Unit Project) study (26).
NND = number needed for diagnosis; other abbreviation as in Table 1.

Figure 3   **Time-Dependent Cumulative Diagnostic Yield of ILR**

The actuarial curve with its 95% confidence intervals is presented.
ILR = implantable loop recorder.

and autonomic function testing should be available. Algorithms coupled with interactive decision-making software (see next section) and dedicated rooms for assessment and investigation are also recommended.

- Fast track access with a separate waiting list and scheduled follow-up visits.
- On-site preferential access to specialized tests: echocardiography, invasive electrophysiological testing, coronary angiography, stress testing, computed tomography, magnetic resonance imaging, and electroencephalography should be available to the caring physician. Easy access to hospital beds for dedicated therapeutic procedures (e.g., pacemaker, defibrillator implantation, catheter ablation) is essential.

Since the publication of the ESC document, many investigators have shown in uncontrolled studies that the use of specialized syncope facilities led to an improvement in diagnostic yield and cost effectiveness (i.e., cost per reliable diagnosis) (28,29,40–43). In a randomized controlled study, Shen et al. (44) found that a designated syncope unit in the ED significantly improved diagnostic yield, reduced hospital admissions, and reduced total length of hospital stay without affecting recurrent syncope and all-cause mortality when compared with standard care. Probably the largest reported real-world experience is that of the SUP (Syncope Unit Project) study (26). This prospective multicenter study documented the current practice of 9 syncope units in Italy. The study enrolled 941 consecutive patients affected by unexplained TLOC from March 15, 2008, to September 15, 2008. The majority of patients (60%) were referred from out-of-hospital services, 11% and 13% were immediate and delayed referral, respectively, from the ED (so-called "protected discharge" with an appointment for early assessment), and 16% were hospitalized patients. A

diagnosis was established on initial evaluation in 191 patients (21%) and early by a mean of 2.9 ± 1.6 tests in 541 patients (61%). A likely reflex cause was established in 67%, orthostatic hypotension in 4%, cardiac in 6%, and nonsyncopal in 5% of the cases. The cause of syncope remained unexplained in 159 patients (18%), despite a mean of 3.5 ± 1.8 tests per patient.

Algorithms coupled with interactive decision-making software. A web-based online interactive decision-making algorithm is another promising tool that could help physicians in their attempts to follow the guidelines. In addition to posting educational material, such access could also help provide suggestions regarding the most appropriate evidence-based therapy. Because such software were never intended to be surrogates to a physician's skills and judgment, use of the software would still require a physician expert in the field who can take care of and manage these patients.

The software concept was first tested in the EGSYS 2 study (25). Keeping with the requirements, the authors used decision-making software based on the ESC guidelines and ensured the presence of a trained physician at each of the participating hospitals. The designated physician was granted access to a specialist who is knowledgeable about the management of patients with syncope. The strategy led to adherence to a guideline approach in 86% of 541 patients and yielded a diagnosis in 98% of cases. Important limitations included the exclusion of outpatients and the required availability of a "syncope expert" by phone to provide advice. In another study, a direct but nonrandomized comparison was made between 745 patients from 18 hospitals that adopted the same standardized care model and 929 patients from another 28 hospitals that used the conventional method (45). The standardized care strategy resulted in improved diagnostic yield (95% vs. 80%), reduced admission rate (39% vs. 47%), shorter in-hospital stay (7.2 vs. 8.1 days), fewer tests performed per patient (median 2.6 vs. 3.4), and 19% reduction in cost.

Recently we developed at the University of Utah a faint algorithm that incorporated the most recent ESC guidelines (Fig. 4). The software was validated in 2 studies. In the first study (46), we found that 6% of the discharges and 58% of the admissions from the ED were not in accordance with the ESC guidelines. The adoption of the faint algorithm would have resulted in a 52% reduction in admission rate without a significant difference in the prevalence of serious events in the discharged group. In the second study, we evaluated prospectively the incremental value of the faint algorithm in the outpatient setting. We found that the use of such an algorithm resulted in a significant decrease in the number of admissions (2% vs. 16%; p < 0.001) and a significant increase in the number of diagnoses during the first 45 days of workup (57% vs. 39%; p = 0.02). In addition, the number of tests or consultations resulting in additional charges was significantly lower when compared with conventional methods (1.9 ± 1.0 vs. 2.6 ± 1.2; p =

Figure 4   **The Faint-Algorithm as Currently Used at the University of Utah**

The case of a patient referred for unexplained syncope without ECG abnormalities or structural heart disease is shown. After all of the essential information obtained from history, physical examination, 12-lead ECG, echocardiogram, and appropriate blood tests was entered, the software determined the short-term risk and need for admission **(A, red arrow)**. If the decision is made not to admit the patient, the software uses the available information to verify whether a certain diagnosis can be made or not as defined in the recent ESC guidelines. If no diagnosis can be made, the software suggests the most likely diagnosis **(B, red arrow)** and recommends the appropriate tests to be performed in a sequential manner, resulting in cost-effective practices **(C, red arrow)**. At any step, the health care provider is given the opportunity to agree or disagree with the software recommendation. In addition, he or she has access to the most recent educational material, including the guidelines, by clicking on the "?" button. AHA = American Heart Association; TIA = transient ischemic attack; other abbreviations as in Figure 1.

0.001). This latter finding was primarily the result of a less frequent use of brain computed tomography and magnetic resonance imaging scans and a more frequent use of orthostatic BP measurements, tilt-table testing, and carotid sinus massage. Not surprisingly, the cost per diagnosis also decreased.

In conclusion, we would like to quote a recent document published by the Canadian Cardiovascular Society (28) in which the authors concluded that after a thorough review of the available English, Italian, and American experiences, formal syncope facilities increased diagnostic yield, prevented unnecessary admissions and tests, and reduced costs. This fact may be explained by the adoption of standardized diagnostic pathways, increased ease of access to specialists and related tests, and provision of an online prompting tool.

Conclusions

Significant progress has been made in the past 3 decades in our understanding of the various causes of loss of consciousness. Nevertheless, the management of these patients is still largely unsatisfactory because of the presence of a significant gap between knowledge and its application to practice. Preliminary data have shown that a standardized syncope assessment, especially when coupled with interactive decision-making software decreases admissions and unnecessary testing and improves diagnostic yield, thus reducing cost per diagnosis. Indeed, the presence of a syncope specialist ("the right physician"), adequate equipment including online prompting tools and logistics ("the right place"), and optimal organization ("the right time"), as exemplified in a syncope facility, have been shown to improve at least short-term outcomes. Their relative contribution to the care of the patient is difficult to ascertain. The long-term effects of such a new health care model on the rate of diagnosis and survival awaits future studies. Regardless of the structure and facility, a standardized approach is undoubtedly the most important prerequisite for the delivery of the best and most cost-effective therapy in patients presenting with syncope.

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Key Words: algorithm ■ emergency department ■ software ■ syncope ■ transient loss of consciousness.