

Syncopedia: training a new generation of syncope specialists

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Syncopedia

Syncopedia is a free access educational website targeted at students, residents and physicians who want to learn more about syncope. The website is an initiative of the Syncopedia Foundation, a non-profit organization founded in 2014 in The Netherlands. The goals of the Syncopedia Foundation are: *“to improve medical knowledge, especially in the field of syncope, and to provide access to this knowledge by facilitating publications in digital or other forms, for example by building and maintaining websites”*. The goal of the Syncopedia website is to enhance physicians’ knowledge of syncope (or suspected syncope), and to reduce misdiagnosis, unnecessary testing and multiple specialist consultations.

Syncope is a symptom with many possible different causes, that requires all-round, rather than organ specific knowledge. Unfortunately, thorough history taking and knowledge of cardiovascular physiology are no longer included in the forefront of the core medical curriculum [1,2].

In this Perspective we address the importance of medical history taking in patients with suspected syncope and emphasize that knowledge of cardiovascular physiology is important, but deep understanding is even better.

Initial evaluation of patients with transient loss of consciousness

To start, we have to define transient loss of consciousness (T-LOC) [3]. T-LOC is defined as real or apparent self-limited loss of consciousness, irrespective of the cause. T-LOC is very common and caused by many disorders, all treated by different specialties, with consequences varying from benign to lethal (Figure 1). This necessitates an accurate, efficient diagnostic work-up.

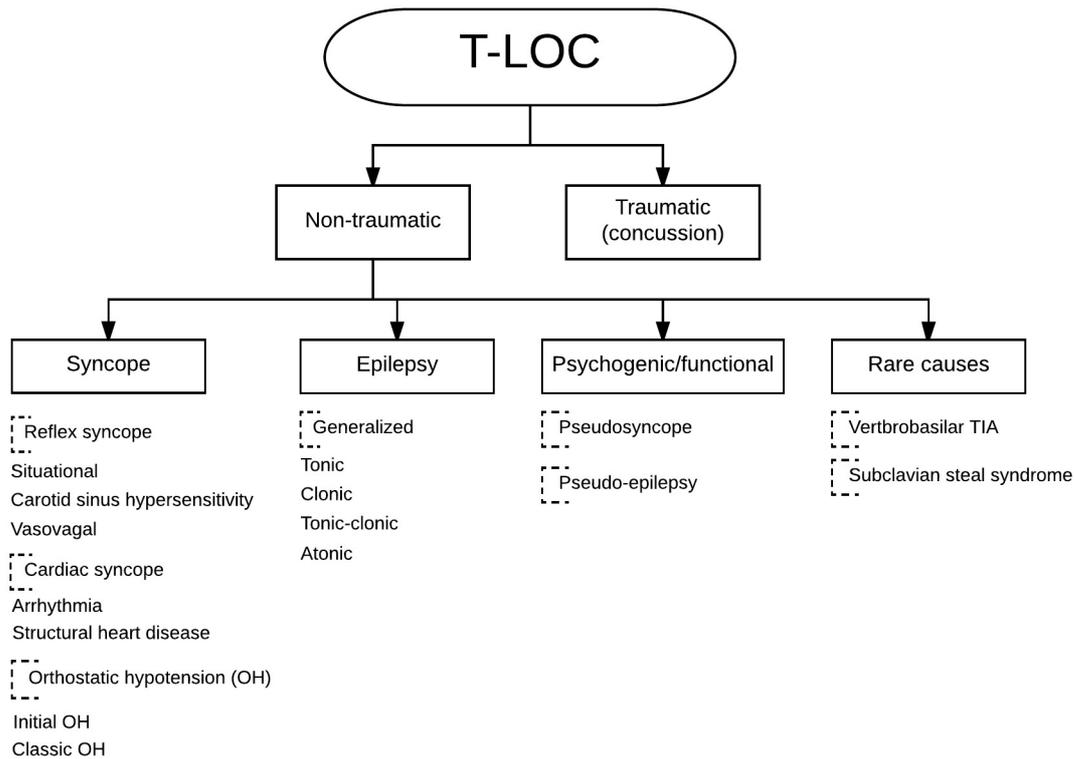


Figure 1. Causes of T-LOC

The European Society of Cardiology Guidelines on Syncope recommends that the initial work-up of T-LOC consists of history taking, a physical examination, and an ECG. The emphasis on taking a history is justified by its high diagnostic yield [3]. A ‘highly likely’ diagnosis can be made by a non-expert during the initial evaluation in about 60% of patients with T-LOC. With expert history taking focussed on the narrative, predisposing factors and physiological triggers that can elicit T-LOC, the yield is reported to rise to 90% [4].

In the emergency setting, T-LOC accounts for 1–2% of all presentations and 40% of these are diagnosed as reflex syncope. In dedicated facilities, an even higher percentage (46-68%) are diagnosed as reflex syncope [3,4]. Orthostatic hypotension, another disorder of blood pressure regulation, is another common (about 10%) cause of syncope [3,4].

T-LOC has never been claimed by any specialty, so it has become an “orphan” condition that falls “in between disciplines”. As a result, it is not optimally taught in the specialty training programs [5,6]. Specialisation with fragmentation of knowledge also results in a decrease in the broad skills of history taking and physical examination [1,7]. As a result, specialists fall back on attempts to rule out causes in their own field. This involves applying tests with a low diagnostic yield merely aimed at ruling out rather than ruling in diagnoses, resulting in redundant testing and high costs [4,5]. While it is critical that causes of T-LOC with serious

prognostic implications have been ruled out, this is not perceived to be of great value by the patient who simply wants an explanation and to receive treatment. They are not interested in a “you do not have” approach [4].

The great importance of re-institution of narrative-based medicine and the healing effects of stories along with a thorough physical exam in the present highly technical medical world has been emphasized by Verghese [1] and Sanders [7]. We need a narrative approach including contextual psychodynamic/ psychosocial factors to build a medical history in patients with suspected syncope.

Physiological reasoning: noninvasive continuous monitoring of finger arterial pressure

With the rapid expansion in technical advances, molecular biology, genetics, clinical epidemiology and evidence based medicine, and the wide institution of electronic health record systems, the interest in basal bedside medicine and clinical physiology has decreased. Young doctors are more likely to diagnose patients using a monitor to see laboratory results and radiological images, instead of bedside medicine and the building of a comprehensive history by asking questions and applying physiological reasoning [1,8,9]. However, one should realize that pathophysiology is the platform on which modern medicine is built. In the diagnosis and treatment of syncope it often plays a decisive role. The strength of integrative physiology as a “bridge” between reductionism and epidemiology, along with its unparalleled ability to generate therapeutic insights and opportunities [2] justifies attention and emphasis on this discipline for a doctor that wants to become a syncope specialist. Because reflex syncope and orthostatic hypotension are related to abnormal control of arterial blood pressure, physicians caring for patients with suspected reflex syncope or orthostatic hypotension should have an in-depth understanding of circulatory physiology and pathophysiology. The clinician and scientist Sharpey-Schafer was the first to couple clinical observations of provoked syncope to continuous intra-arterial blood pressure monitoring and cardiac output measurements. His clinical observations and astute clinical reasoning were fundamental. His article in the BMJ from 1956 is a pearl that should be read by all doctors that want to become syncope specialists [10]. He wrote “it is difficult to take an intelligent history, conduct a proper physical examination, or explain the occurrence to a worried patient without knowledge of the mechanisms involved”.

Today doctors interested in syncope are fortunate to have the availability of continuous non-invasive measurement of finger arterial pressure (FinAP) and pulse wave analysis to study the hemodynamics underlying syncope [11]. However, the required knowledge of integrative

cardiovascular physiology to apply the new technologies is no longer taught in the medical curriculum and information that syncope doctors need for their training is not available in an easy format [2]. Deep understanding of cardiovascular physiology is needed to analyse FinaP tracings.

Training a new generation of syncope specialists

A syncope specialist is a physician with sufficient knowledge of historical clues and physical findings to recognize major causes of T-LOC (including mimics) and syndromes of orthostatic intolerance [6]. The physician most likely to see a patient with suspected syncope is a general internist, neurologist, cardiologist or geriatrician. However, a syncope specialist is often a cardiologist with interest in electrophysiology and pacing, a neurologist with special interest in autonomics and epilepsy, or an internist with interest in cardiovascular physiology. The specialty training programs do not thoroughly cover the physiology and historical clues needed to recognize major causes of T-LOC.

Using Syncopedia, we are trying to fill these knowledge gaps. The scheme at the top of the website entitled “initial evaluation of patients with suspected syncope” is a diagnostic algorithm that can be used in the emergency department, outpatient office or syncope unit setting (Figure 2).

Welcome to Syncopedia,
 a free syncope tutorial and textbook,
 Syncopedia is targeted at students, residents and physicians that want to learn more about syncope.

Initial evaluation of patients with suspected syncope

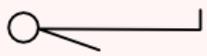
<p style="text-align: center; background-color: #e0e0e0; padding: 5px;">The Syncope Tutorials</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center; background-color: #e0e0e0; padding: 5px;">E-learning modules</p> <ul style="list-style-type: none"> • Getting started as a syncope specialists • E-learning module for medical students • E-learning module for internists • E-learning module for transfusion doctors <p style="text-align: center; background-color: #e0e0e0; padding: 5px;">Instruction video's</p> <ul style="list-style-type: none"> • Instruction videos for prevention and treatment • Instruction for blood donors ↗ 	<p style="text-align: center; background-color: #e0e0e0; padding: 5px;">Cases and Examples</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center; background-color: #e0e0e0; padding: 5px;">Videos</p> <ul style="list-style-type: none"> • Videos <p style="text-align: center; background-color: #e0e0e0; padding: 5px;">Cases</p> <ul style="list-style-type: none"> • Case reports • Interactive Cases with MC Questions • Medical images: what is the diagnosis? 	<p style="text-align: center; background-color: #e0e0e0; padding: 5px;">The Syncope Textbook</p> <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> • Physiology <ul style="list-style-type: none"> • Blood pressure • Epidemiology • Diagnostics • Reflex syncope • Initial orthostatic hypotension • Treatment
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Figure 2. Main page www.syncopedia.org

In the emergency setting standardized approaches, including algorithms, guideline pathways, risk rules and checklists can be very helpful to identify or exclude causes of T-LOC that may have serious prognostic implications. Diagnosing the underlying cause of an episode of T-LOC (after exclusion of dangerous causes such as cardiac syncope or epileptic seizures) is considered less important in the frenetic emergency environment that is characterized by a ‘do-more, do-it-faster, do-it-standardized, multitask’ approach with constant interruptions

[4,5]. The end products in the emergency setting are 'you have' or 'you do not have' a dangerous type of T-LOC. Patients in whom dangerous underlying pathology is highly unlikely are often diagnosed as a "common faint" or "orthostatic hypotension" and sent home or advised to see their GP without further instructions. Often no attempt is made to tease out these two conditions, which are sometimes lumped together as a single entity despite different pathophysiology, and with different prognostic implications and management strategies.

The scheme at the top of the Syncopedia website is also an effective management strategy for patients in an outpatient office or syncope unit. However, for patients with recurrent and problematic suspected syncope, knowledge of other causes of T-LOC and comprehensive training in relevant aspects of physiology, cardiology, neurology, internal medicine, emergency medicine, pediatrics, geriatrics and psychiatry is required [5].

The educational material consisting of Syncope Tutorials, Cases and Examples, and the Syncope Textbook is meant to enhance basic knowledge of medical students, residents and doctors and to train a new generation of syncope doctors. The Syncope Modules are based on adult learning theory and subdivided into several modules providing information for different levels of expertise.

Subjects of the modules include the physiology of short term blood pressure regulation, causes of reflex syncope, orthostatic hypotension, how to perform autonomic function tests and how to interpret the results.

The value of history taking will become clear in the educational cases of patients presenting with T-LOC. The cases are built in a narrative fashion, and one learns what information in the history is important to differentiate between the causes of T-LOC, and what diagnostic and treatment options should be considered.

Because building a history with a patient is the most important tool of the diagnostic workup of T-LOC, knowledge of the physiology and pathophysiology, cases and clinical findings alone is not enough to become a syncope specialist. To become a specialist it is particularly important to see a large number of patients suffering from episodes of T-LOC through deliberate practice, and preferably under the direct guidance of an expert [4,5].

Work in progress

Syncopedia is a work in progress, where all the information necessary to learn about suspected syncope will become available over time. If you think important information is missing, or you would like information on a specific subject not yet covered, please let us know using the forum on www.syncopedia.org, or by contacting the corresponding author.

Conflict of interest

JSY de Jong works as webmaster of www.syncopedia.org and received funding from Stichting Syncopedia

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Appendix 1

This manuscript was written on behalf of the Syncopedia editorial board

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