



## Classifying syncope

Dirk P. Saal\*, J. Gert van Dijk



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### ABSTRACT

An unambiguous definition of syncope is important for care, research and teaching purposes. Unfortunately, many published definitions described 'syncope' as a broad category of transient loss of consciousness (TLOC) but still appeared to use a much narrower concept, creating confusion. The ESC-classification from 2001 and subsequently distinguished between 'transient loss of consciousness', i.e. disorders sharing unconsciousness of short duration with a rapid and spontaneous recovery and syncope, the form of TLOC that is due to cerebral hypoperfusion. Adding the cerebral hypoperfusion element sets syncope apart from other forms of TLOC, mostly epileptic seizures and psychogenic attacks. We provide short descriptions of different forms of syncope and other forms of TLOC.

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### 1. Why classify syncope?

Syncope is common; the causes vary from relatively harmless to deadly conditions; syncope may be mistaken for other disorders such as epilepsy; finally, it is associated with high costs. (Brignole et al. 2006; Kenny et al., 2002; Sun et al. 2005)

In view of all these factors, it is reasonable to expect that an unambiguous definition of syncope would have been formulated decades ago. However, a 2004 study showed that syncope and episodes of transient loss of consciousness (TLOC) were defined in top medical journals using variable definitions and a very inconsistent terminology (Thijs et al., 2004). As stated above, the diagnosis of syncope is often managed inefficiently. This may in part be due to definitions of 'syncope' that do not succeed in delineating it clearly from conditions with a similar presentation, so nonsyncopal conditions such as epileptic seizures and concussion may be included in a broad 'syncope' concept, in turn leading to the use of inappropriate diagnostic tests (Jhanjee et al., 2006).

Until 2001 the classification of TLOC and syncope was problematic because of the lack of a widely accepted and comprehensive classification and terminology aimed at aiding diagnosis. The decision by the ESC to distinguish between a wider concept of TLOC, bundling conditions that all cause a short-lived loss of consciousness, and a narrower one of syncope (Brignole et al., 2001, 2004; Thijs et al., 2004; Moya et al., 2009) was agreed on by many other professional societies, but not all. The American College of Cardiology and the American Heart Association used the term 'syncope' for the broad concept that would be labeled TLOC in ESC terms (Strickberger et al., 2006), but this approach was criticized subsequently (Benditt, 2006). At the time of writing of this chapter most papers on syncope adhere to the ESC definition,

but some still define 'syncope' as a broad concept, and others introduce forms of 'syncope' that do not feature in the ESC classification; continuing themes are the use of 'neurological syncope' and 'psychiatric syncope', terms that are usually not defined or specified in the papers using them.

The lack of a precise definition carries a risk of diagnostic confusion which may in turn may make it difficult to provide structured high quality care for patients with syncope, something necessary not just because of high costs but also because syncope can signify potentially lethal diseases, e.g. structural heart disease and arrhythmia. To establish the cause or causes of syncope serves two principal purposes (Jhanjee et al., 2006). First of all, an etiologic diagnosis permits estimation of prognosis and risk of recurrence. Secondly, identifying the etiological cause is the only way to provide a treatment recommendation with confidence.

The problems described above provided the impetus to create comprehensive guidelines for optimizing care of syncope patients by the European Society of Cardiology (ESC) (Moya et al., 2009), discussed in further detail in the following chapters.

### 2. Distinguishing TLOC and syncope

Many textbooks and papers defined 'syncope' using phrases such as 'transient loss of consciousness (LOC) with loss of postural control leading to falling', to which 'sudden' or 'self-limited' were sometimes added. Scrutinizing the result of studies using this type of definition commonly shows that the authors aimed to include arrhythmia, reflex syncope or syncope due to orthostatic hypotension, i.e. causes resulting in transient short-lived cerebral hypoperfusion, which are indeed comprised in this definition. The authors of such papers evidently did not wish to include other conditions even though these fell under this heading equally well. The reasons why such a definition is not sufficiently

\* Corresponding author. Tel.: +31 71 5266524; fax: +31 71 5264466.  
E-mail address: [d.p.saal@lumc.nl](mailto:d.p.saal@lumc.nl) (D.P. Saal).

restrictive are, firstly, that by not specifying the duration of 'transient' the duration of LOC might conform to that of a vasovagal episode, i.e. about 25 s, but will also encompass events lasting up to hours such as hypoglycemia, or even a coma lasting weeks. Secondly, there is no restriction as to the cause of LOC at all, so concussions, intoxications, epileptic seizures and other causes would all have to be inappropriately labeled 'syncope'.

The ESC solution to narrow this overly wide definition problem was to set a group of causes of LOC apart that are often mistaken for one another. This group is labeled 'transient loss of consciousness (TLOC)' and was defined as a transient loss of consciousness of short duration (minutes or less), rapid recovery (minutes or less) and spontaneous recovery (thereby excluding disorders that require resuscitation) (Fig. 1). In doing so LOC lasting minutes or longer was excluded, i.e. TLOC does not include intoxications, metabolic derangements and coma.

The 'loss of postural tone' in the commonly found definition may have been added as a help in describing or recognizing LOC, but it is doubtful whether it has the intended effect. It may be argued that loss of postural control is an integral part of LOC that does not need to be emphasized over other items that also help describe LOC. If a more detailed description of LOC is needed, adding 'loss of postural tone' alone is not enough. In the TLOC context LOC is usually over when patients see a doctor, meaning the presence of LOC has to be established after the fact, by taking a history from patients and eyewitnesses. Useful descriptors of LOC that can be established after the fact are, firstly, a loss of normal motor control. This is established through the absence of normal movement, the presence of abnormal tone (stiffness or flaccidity), through abnormal movements or through the absence of any movement at all. Secondly, patients later have amnesia for the event. Thirdly, unconsciousness causes unresponsiveness, so there was an absence of normal responses to touch or being spoken to during the event.

The causes of TLOC are divided into traumatic and non-traumatic forms, and the non-traumatic form is further divided into major groups of which syncope is the most common one (Fig. 2, Table 1). Syncope as defined by the ESC is that form of TLOC that is due to cerebral hypoperfusion. The use of a pathophysiological criterion – cerebral

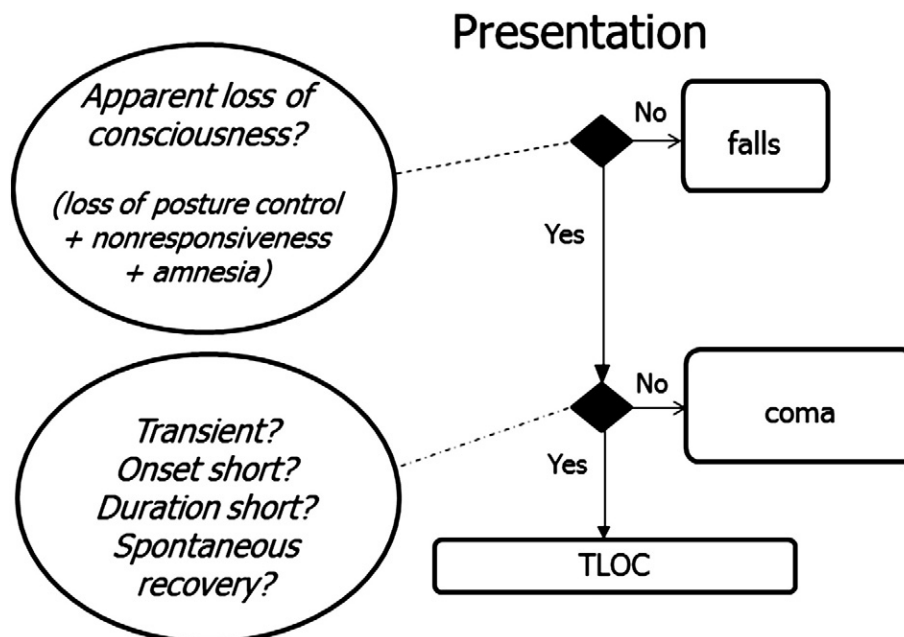
hypoperfusion – in defining a clinical entity may appear counterproductive, but is essential. The main reason is that a putative concise clinical definition would on the one hand have to encompass all expressions of syncope, while on the other hand also excluding epileptic seizures, psychogenic attacks, and some minor causes. Syncope is too variable clinically to be defined in such a way: items such as warning symptoms, pallor, nausea, opening of the eyes, incontinence, myoclonic jerks, stiffness and many others may all be present or absent in syncope. The only criterion shared by all forms of syncope and by no other form of TLOC is a pathophysiological one; no clinical criterion fits the bill. (van Dijk and Wieling, 2013).

Note that epilepsy is also defined on pathophysiological grounds for similar reasons: it is also a heterogeneous group of disorders with a remarkably variable clinical expression. An argument sometimes raised against the pathophysiological criterion of syncope is that it cannot be applied clinically in a direct manner. This is true in the sense that the definition is not the type of checklist definition containing major and minor clinical criteria. In fact, the ESC only defined TLOC clinically, not syncope. Those seeking a clinical aid to describe syncope can implement the ESC definition in a manner based on the following:

Suspected syncope is operationally described as transient loss of consciousness of short duration, rapid onset and spontaneous recovery (i.e. minutes or less) with at least one of the two elements:

1. *clinical features specific for reflex syncope, syncope due to orthostatic hypotension or cardiac/cardiopulmonary syncope*
2. *the absence of clinical features specific for another form of transient loss of consciousness.*

TLOC can be operationally defined using history taking to seek for amnesia, abnormal motor control and lack of normal responsiveness as outlined above. Note that such a description rests on recognition of forms of syncope or of other disorders on clinical grounds that are not specified in the description; as such, the implementation is incomplete, somewhat academic and has aspects of circular reasoning, but it does offer an aid for those seeking an implementation.



**Fig. 1.** Main features of TLOC and differential diagnosis. Deviation from any of the cardinal features of TLOC (apparent loss of consciousness, transient nature, short duration, spontaneous recovery) suggests a diagnosis other than TLOC. (TLOC = transient loss of consciousness).

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