

Task Force on the Classification and Terminology of Transient Loss of Consciousness

Synopsis of the ESF meeting in Leiden, October 21-22 2005

J. Gert van Dijk

J. Gert van Dijk
Professor of Clinical Neurophysiology
Leiden University Medical Centre
PO Box 9600
2300 RC Leiden
The Netherlands
tel +31-71-526 3960
fax +31-71-5248 253
email j.g.van_dijk.neur@lumc.nl

Contents:

1. Executive summary
2. Scientific content
3. Assessment of results
4. Final programme
5. List of participants
6. Statistical information on participants

1. Executive summary

Attacks of transient loss of consciousness (TLOC) occur frequently, and some causes point to deadly diseases. In spite of their importance, the state of affairs concerning medical schooling, research, and not least patient care is far from satisfactory. This is due to the fact that patients are seen by a large variety of medical specialists, who have no common system to classify or understand such disorders. As outlined in the grant proposal, this meeting aimed to bring experts together as a Task Force (TF) to start building a remedy in the form of a classification system. The experts came from the fields of cardiology, internal medicine and various fields on neurology (epileptology, the autonomic nervous system, sleep medicine, psychogenic attacks, ventilation and child neurology), as well as the chairperson of a large UK-based patient organisation.

As such, the meeting broke new ground in firstly assembling these fields of expertise in one room and secondly in building a logical, and most importantly, practical classification and definition system from the ground up.

The meeting was successful: the TF first laid the groundwork in the form of definitions of LOC and TLOC, and set the emphasis of the classification as a document accessible to junior doctors. The next two levels, i.e. deciding what the main groups of TLOC are, and how they are to be subdivided, were also completed.

2. Scientific Content

Introduction

This document provides an overview of the discussions held on October 22 during the TF-TLOC meeting in Leiden, the Netherlands. No attempt will be made to provide detailed minutes of the meeting; instead, the emphasis will lie on the results of the discussion and an explanation of arguments raised in the discussions.

The meeting began with a discussion of the aim of the Classification, as discussed in the preliminary documents and the grant proposal. On the one hand it is possible to write a complete list of all possible causes of loss of consciousness first based on organ systems and then of the nature of the disorder (i.e., disorders of the kidney; tumours, infection, malformations, etc.). Such nosological systems abound and often form the core of preclinical training in medical school. Daily practice however forces trainees to reorder their knowledge completely, resulting in lists of disorders with a common presentation. A consensus was quickly formed that the Classification should be useful for junior doctors, GPs, ER physicians and residents, and should therefore have a strong bias towards clinically relevant disorders.

This choice brought with it a second choice: should the system not only be based on pathophysiology as outlined in the proposal, but also on clinical presentation? After going back and forth a consensus was reached that it would be impossible to provide one list that can be used both for a hierarchical pathophysiological classification system as well as for clinical decision making. As the TF-TLOC should provide help with both aims, which will require separate chapters for the two purposes. The decision was then made to spend the day on the first of these two aims.

- *The Classification system should be clinically useful for those with a fairly basic level of medical expertise*
- *The TF-TLOC will distinguish between the classification system and clinical guidelines*
- *The classification will be based on pathophysiology, but with a strong clinical emphasis*

Consciousness and the definition of TLOC

Before defining TLOC a discussion arose regarding the meaning of 'consciousness' as well as of 'loss of consciousness' (LOC). Plum and Posner's textbook on the diagnosis of stupor and coma distinguishes between the arousal and content aspects of consciousness: the first describes a state that ranges from being fully awake to sleep and unconsciousness in the sense of looking-asleep-but-without-the ability-of-being-woken. 'Content' describes more complex features such as self-awareness. Others may recognise these two aspects as 'quantitative' and 'qualitative' aspects of consciousness. Note that this distinction between the arousal and content parts of consciousness in Plum & Posner's book holds for consciousness but not for unconsciousness: the book only deals with patients in a sleep-like state of reduced reactivity, i.e., the term 'loss of consciousness' is completely limited to the arousal aspect of consciousness.

This is important, as 'loss of consciousness' could logically be taken as applicable for both elements separately: someone with a concussion lying limply on the floor would be unconscious, as would someone in a partial complex seizure sitting upright and looking vaguely around. In fact, epileptologists, who are used to seeing both forms, commonly do describe the latter state as 'loss of consciousness'. The consensus of the group is to NOT follow this use, and to restrict loss of consciousness to the arousal aspect. In doing so LOC will be closer to the layman's view of what unconsciousness means: a lack of responsiveness in someone lying in a sleep-like state.

- *(Transient) Loss of Consciousness in the TF-TLOC context will refer exclusively to the arousal aspect of consciousness*

Apparent LOC

The preceding classification of the European Society of Cardiology distinguished between true and apparent loss of consciousness, in which apparent LOC included disorders such as cataplexy but also psychogenic disorders. The state of consciousness in some psychiatric disorders is clear: malingering is accompanied by normal consciousness. Expert opinion is less clear about the state of consciousness in somatoform disorders. Official psychiatric classifications discuss 'consciousness' in this context, but probably refer more to the 'content' than the 'arousal' aspect.

A consensus emerges in which TLOC should include all disorders presenting in the same way, i.e., the term should include all disorders in which the arousal aspect of consciousness *looks* lost. This can be made clear in the definition by stating so expressly. The group felt that the word 'apparent' might be confusing in this respect.

- *TLOC will refer to all disorders in which consciousness (as defined above) looks lost, until proven otherwise.*

The actual definition

Starting with the ESC definition, the following definition emerged:

- *TLOC = transient loss of consciousness (defined separately)*
- *The onset is seconds to minutes*
- *The duration is seconds to minutes*
- *The recovery of consciousness is spontaneous*

Notes:

- Each definition of an entity in the final document will be followed if necessary by an explanation clarifying things where necessary, and providing a clinical 'feel' of the disorder in question.

- The description of TLOC should fit all its forms, not merely syncope. Elements that need specification will be addressed in the explanatory headings of the various paragraphs. For instance, the usually abrupt nature of syncope will feature there, as will the often lengthy sequelae in epilepsy and syncope in children will be given attention in the appropriate sections.

- Note that the term 'recovery' refers exclusively to LOC itself and not to any other feelings of malaise, fatigue, etc. Again, their presence can be explained in the appropriate headers.

Dividing TLOC: first level

From there the group moved on towards the first level of dividing TLOC. The discussion was based on the scheme by Van Dijk sent out earlier. The following categories emerged:

Syncope

A considerable amount of discussion centred on the question whether or not syncope should be identified on the basis of cerebral hypoperfusion (global or regional) or hypoxia. An argument raised in favour of hypoperfusion was that it links up with the existing ESC classification; an argument in favour of hypoxia was that 'syncope' would then include more types of attacks with a similar presentation. However, it emerged that spells due to hypoxia without hypoperfusion are very rare: these include TLOC at high-altitude and suffocation. The decision was taken to keep the 'global hypoperfusion' element as the distinguishing pathophysiological element that turns TLOC into syncope. Regional hypoperfusion, as in the

steal syndrome, will feature in a 'miscellaneous' category, as will 'hypoxic TLOC' due to high-altitude or suffocation.

The usually sudden and abrupt features of the presentation of syncope will be highlighted in the explanation.

- *Syncope is TLOC due to global cerebral hypoperfusion*

Epileptic seizures

In view of the possible confusion that the word 'seizure' may cause, the group quickly settled on the consistent use of 'epileptic seizure' throughout the document. The reasons for doing so will feature in the explanatory text.

There is an existing international classification of epilepsy and epileptic seizures by the International League Against Epilepsy (ILAE), meaning that the TF-TLOC is not at liberty to do as it pleases. However, our document needs to be practical, so we need to distinguish between epileptic seizures that look like other forms of TLOC ('subject unconscious on the floor') and those that do not ('subject acts odd but is still upright'). The decision was taken to re-arrange the order of the types of epileptic seizures as defined by the ILAE along such lines. The TLOC-look-alikes will obviously be discussed, and the non-looklikes will also be mentioned, if only to stress why they do not belong in a TLOC diagnostic list.

- *TLOC of an epileptic nature will be referred to as 'epileptic seizure'*
- *Epileptic seizures will be rearranged according to the nature of the disturbance of consciousness, i.e., those not allowing the patient to remain upright and those that do*

'Functional'

The decision earlier on to include everything that looks like 'subject unconscious on the floor' means that psychogenic spells will feature as a main category of TLOC. The name of this category presented difficulties. Some argued in favour of 'psychogenic' or 'psychiatric', which has the advantage of pointing towards those who should be seeing the patient. However, breaching the cause of such spells to patients is often not helped by using terms that are often felt to be pejorative. Currently, 'dissociative' and 'functional' appear acceptable, in spite of, or possibly thanks to, the obfuscation they may cause.

- *The TLOC category dealing with disorders originating in the psyche will be labelled 'functional'.*

Miscellaneous

The word 'miscellaneous' caused some debate, as it implied to some that the disorders included might not be important, whereas others saw this as an advantage in a classification that should help junior doctors. Disorders to be included cataplexy, states of excessive daytime sleepiness, anoxic TLOC and the vertebrobasilar steal syndrome. This summary makes it clear that this category bundles disorders with a very different pathophysiology. If we were to keep strictly to a pathophysiological classification, we would have to give all these disorders their own separate place, on the same level as syncope or epilepsy. Bundling them will probably convey the message to most readers that these disorders are not important.

The consensus was that the number of categories should be limited, and that their order should reflect a clinical emphasis. The TF-TLOC will have to stress that the only reason for bundling these disorders together is that they feature fairly rarely in the differential diagnosis of TLOC, either because they occur rarely (cataplexy, steal), or because they are not rare but seldom resemble other TLOC causes (excessive daytime sleepiness).

- *The category miscellaneous will include entities of differing pathophysiological nature, that do not often feature in the differential diagnosis of TLOC*

Uncategorised

This category is reserved for individual cases in which TLOC was established, but could not be delineated further.

During the discussions, the place of concussion crept up repeatedly. As it was not specifically excluded from the TLOC definition, it should become a form of TLOC, and should therefore be given its own place. Still, the group felt that it should also be apart from the other categories, for the same reason it was excluded in the ESC classification: the presence of a head trauma is most often so abundantly clear that no diagnostic confusion arises. The decision was taken to divide TLOC into two main categories: traumatic and non-traumatic. This will provide the opportunity to explain the reasoning, while also allowing complex cases to be included (i.e., someone with a bump on the head found at the bottom of the stairs).

Dividing TLOC: second level

This level concerned the subdivision of the main TLOC categories. In part, the subdivision was touched upon above; the only subdivision that was discussed at any length was that of syncope. Van Dijk's scheme was used as a basis for the discussion.

Cardiac syncope. The TF kept the division into arrhythmia and structural cardiac diseases. The latter form often occurs during exercise. It is very likely that reflex actions play a part in the actual genesis of such episodes, so they could in fact also be listed under a heading 'combined pathophysiology', to emphasise that both a diminished cardiac output as well as a reflex part play a role. This was generally felt to be unwise, as it would detract from the more important lesson that doctors should search first and search hard for a cardiac cause. For this reason, the name 'primary cardiac syncope' was preferred over simply 'cardiac syncope', and such considerations will be explained in the text.

- *We will use 'primary cardiac syncope' for syncope originating through heart disease, even if reflex mechanisms play a part in the genesis of syncope.*

Insufficient vascular tone. This category was meant to include all disorders in which the vascular system does not manage to keep blood in the parts of vascular bed vessels where it belongs. A number of possible divisions were discussed, including one dividing the group in neurogenic and non-neurogenic ones. After a debate we retained the main elements of the scheme as can be found in Bannister and Mathias' classification of autonomic failure, i.e., primary, secondary and drug-induced, as well as a category 'others/unexplained'. The phrase 'leading to orthostatic hypotension' was added to the title to emphasise the importance of this feature to recognise this group.

- *'Insufficient vascular tone leading to orthostatic hypotension' was kept as a category of syncope*

Hypovolemia There was a discussion on whether hypovolemia should be included as a category at all. An argument in favour was that it can act as a primary mechanism, and against it that it is rare as such. It is quite likely that syncope in the context of an acute gastrointestinal bleeding is due to a reflex, so it might be logical to include it under reflex syncope. The situation therefore closely mimicked that for structural heart disease, where we chose to stress the primary cause. For that reason, hypovolemia was kept as a category, but it was placed last among subcategories of syncope.

Subgroups of hypovolemia will include those due to intake problems and those due to fluid loss problems.

- *Hypovolemia was recognised as a subgroup of syncope*

Reflex syncope / neurally mediated The term neurally-mediated appeared to be preferred over reflex syncope. 'Neurally mediated' stresses the role of the nervous system, while reflex implies afferent and efferent pathways as well as central activity. In view of its common nature it will be the first syncope category. The difference with autonomic failure will be stressed in the text.

The discussion on the subdivision of neurally mediated syncope was complex. Several features emerged as a consensus:

- The TF should emphasise that the efferent pathway consists of cardioinhibitory as well as vasodilatory branches, and that the reflex can be triggered by a multitude of triggers, that cannot always be identified.
- Several types should receive special status in the classification, if only to stress their importance. These will include carotid sinus hypersensitivity/syndrome, along with its spontaneous and induced forms. Syncope in children will also be a separate group, even if this will clash with a strict pathophysiological classification, in that pallid breath-holding spells may hardly differ in pathophysiology from syncope induced by pain/emotions in older subjects. The complex and in part unknown pathophysiology of 'cyanotic breath holding spells' will be acknowledged. The terminology of syncope in children also needs consideration: terms used at present, such as 'breath holding spells' have disadvantages; terms such as infantile and juvenile syncope might be worthwhile.
- The TF should acknowledge the presence of a variety of triggers that can evoke syncope to make readers aware of their existence, such as miction syncope and cough syncope.

Elements that require further discussion are the meaning of 'situational', a term that is commonly reserved for a few forms while excluding others for no good reason, and the use of vasovagal. 'Vasovagal' is a useful term to use for the afferent part of the reflex, but is also used for a specific trigger, i.e. syncope brought about by pain and/or emotions.

- *Neurally mediated syncope was preferred over reflex syncope*
- *The subdivisions of neurally-mediated syncope need further discussion*

Classification Outline of TLOC

The following classification contains the elements discussed at the meeting. Many categories require later subdivision and elaboration.

1 Non-traumatic TLOC

- 1.1 Syncope
 - 1.1.1 Neurally-mediated / reflex
 - 1.1.1.1 Carotid Sinus Syndrome
 - 1.1.1.2 'forms due to various triggers'
 - 1.1.1.3 Syncope in children
 - 1.1.2 Primary cardiac
 - 1.1.2.1 Arrhythmia
 - 1.1.2.2 Structural
 - 1.1.3 Insufficient vascular tone, leading to orthostatic hypotension
 - 1.1.3.1 Primary AF
 - 1.1.3.2 Secondary AF
 - 1.1.3.3 Drug-induced
 - 1.1.3.4 Others / unexplained
 - 1.1.4 Hypovolemia
 - 1.1.4.1 Intake problems
 - 1.1.4.2 Fluid loss (vomiting, haemorrhage, diuresis, diarrhoea, etc)
- 1.2 Epileptic seizures
 - 1.2.1 Causing loss or arousal and falling
- 1.3 Functional
- 1.4 Miscellaneous
 - 1.4.1 Subclavian steal syndrome
 - 1.4.2 Anoxic TLOC
 - 1.4.2.1 high altitude
 - 1.4.2.2 suffocation
 - 1.4.3 Cataplexy
 - 1.4.4 Excessive daytime sleepiness

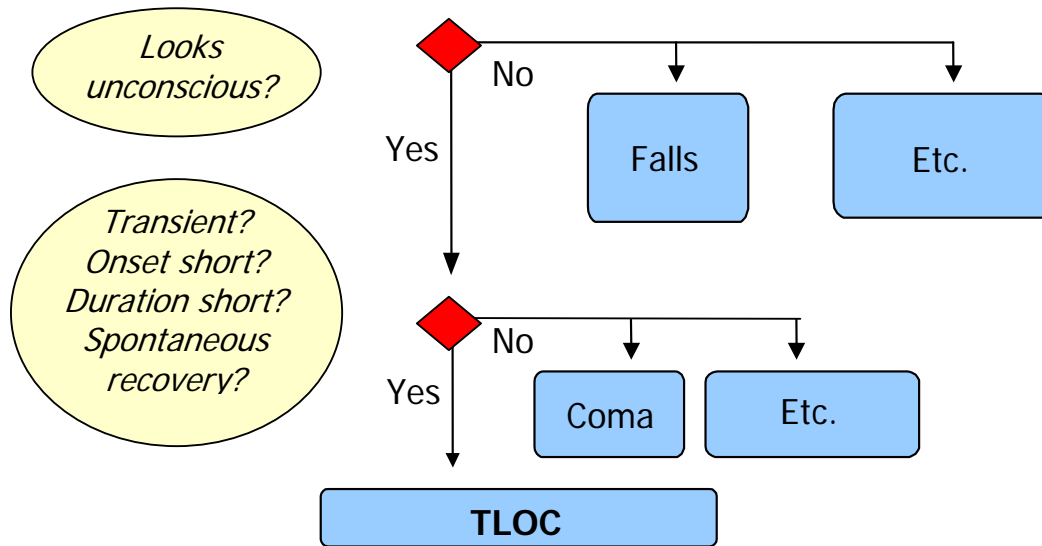
2. Traumatic TLOC

- 2.1 Concussion

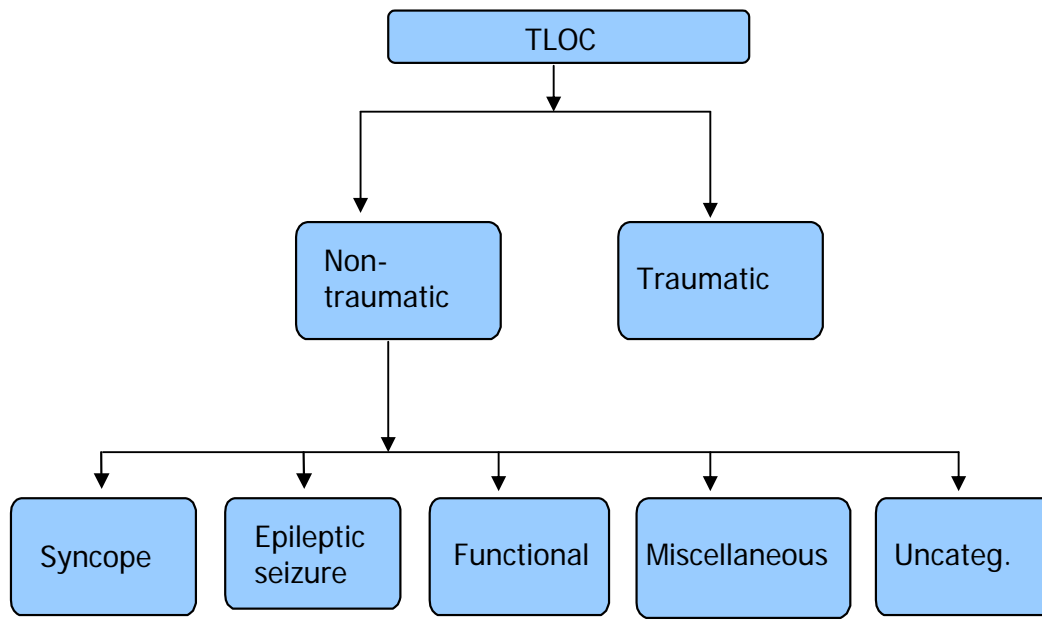
3. Disorders mistaken for TLOC

This category was not detailed during the meeting, but there was a strong consensus that we need to highlight what TLOC is NOT.

Presentation



This figure serves as an indication of TLOC in the larger scheme of things.



The main categories of TLOC

3. Assessment of results

The meeting achieved its aim of laying the groundwork for a classification system. The phases envisaged earlier are underway at the time of writing (December 2005). These phases include the following: the scientific content as given in this document is first sent to the TF-TLOC members, both those present at the meeting and those absent. The next phase includes sending it for discussion to a wider circle of TF-TLOC Advisors. This group includes additional experts in various countries as well the USA, all of whom had been asked to participate in the discussion (through email) before and after the meeting. This phase may see some minor changes to the framework decided on during the meeting. Afterwards, members and advisors will write their respective sections on the various disorders.

4. Final Programme

Friday October 21

Arrival and dinner

Saturday October 22

09:30 Janna de Boer (ESF Representative):
Presentation of the European Science Foundation

09:50 Gert van Dijk:
Discussion of guidelines and working principles

Coffee

11:00 Gert van Dijk:
Preliminary outline of classification

Lunch

13:30 Chris Mathias:
Continuation of discussion

Tea

15:30 Chris Mathias
Continuation of discussion

15:50 Gert van Dijk
Summary and closing remarks

16:00 *End of the meeting*

5. Final list of participants

J. Gert van Dijk, professor of Clinical Neurophysiology
Department of Neurology and Clinical Neurophysiology, Leiden University Medical Centre,
PO Box 9600, 2300 RC Leiden, The Netherlands
j.g.van_dijk.neur@lumc.nl

Christopher Mathias, Professor of Neurovascular Medicine
Autonomic Unit, Division of Clinical Neurology, National Hospital for Neurology and
Neurosurgery and Institute of Neurology, University College of London, Queen Square,
London WC1N 3BG, United Kingdom.
c.mathias@ic.ac.uk

Pietro Cortelli, Professor of neurology
Alma Mater Studiorum-Universita'di Bologna, Dipartimento di Scienze Neurologiche
Via Ugo Foscolo, 7, 40123 Bologna (Italy)
e-mail: pietro.cortelli@unibo.it

Michele Brignole, cardiologist
Arrhythmologic Centre, Department of Cardiology, Ospedali del Tigullio, via don Bobbio 25,
16033 Lavagna, Italy
mbrignole@asl4.liguria.it

Wouter Wieling, internal medicine
Academic Medical Center/University of Amsterdam, Dept. of Internal Medicine, F4-222,
Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands
w.wieling@amc.uva.nl

William Whitehouse,
Academic Division of Child Health, Department of Paediatric Neurology, Queen's Medical
Centre, Nottingham University, E Floor East Block, Nottingham NG7 2UH, UK
toni@wwhitehouse.freeserve.co.uk

Markus Reuber,
Academic Neurology Unit, University of Sheffield, Royal Hallamshire Hospital, Glossop
Road, SF10 2JP, UK
Markus.Reuber@sth.nhs.uk

Claudio Bassetti,
^aDepartment of Neurology, University Hospital, Frauenklinikstrasse 26, 8091 Zürich,
Switzerland
Claudio.Bassetti@usz.ch

Sean Savitz,
Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School,
Boston, MA 02215, USA. ssavitz@bidmc.harvard.edu
ssavitz@bidmc.harvard.edu

Anton Grad,
Medical Center Ljubljana, Department of Neurology, SI – 1525 Ljubljana, Slovenia
anton.grad@kclj.si

Trudie Lobban
Syncope trust and reflex anoxic seizures
PO Box 175, Stratford-upon-Avon, Warwickshire, CV37 8YD United Kingdom
trudie@stars.org.uk

Roland Thijs
Department of Neurology and Clinical Neurophysiology, Leiden University Medical Centre,
PO Box 9600, 2300 RC Leiden, The Netherlands
r.d.thijs@lumc.nl

Janna O. de Boer,
ESF representative
ZONMW, Laan van Nieuw Oost Indië, 2593 CE Den Haag, PO Box 93245, 2509 AE Den
Haag, The Netherlands

6. Statistical information

Countries of origin:

| | |
|------------------|-------------------|
| United Kindgdom: | 3 |
| Netherlands: | 3 |
| Italy | 2 |
| Germany | 1 (Markus Reuber) |
| Switzerland | 1 |
| Slovenia | 1 |
| USA | 1 |

Estimated age bracket:

2 people in their thirties; half of the rest in their thirties and half in their fifties (it was an expert meeting)