

## **Comments on ILAE's "Draft guideline: Minimum Standards for Long-term Video-EEG Monitoring"**

Juan Moya Vilches  
Child Neurologist  
President, Chilean Society of Epileptology  
Chilean Chapter of ILAE

First, I would like to thank everyone that has worked in or has been involved in the process of generating this proposal. At the same time, reading all the interesting, diverse comments from our colleagues has been an enjoyable learning experience, as well as a motivation for thinking about our own perspective.

There is a great amount of workload behind this document, and a comprehensive review of published evidence was made. Therefore, the following comments are just an opinion regarding some issues that could emerge when these recommendations get to be implemented in clinical practice.

### **3. Indications**

#### **3.1. Differential diagnosis**

*Recommendation: LTVEM monitoring should be used to differentiate between epileptic and non-epileptic events, in patients where the diagnosis is in question (strong recommendation).*

- I think this is one of the strongest points of this proposal. A great amount of evidence has been published in this matter (mostly related to psychogenic nonepileptic seizures), but the latter clinical studies using LTVEM have focused strongly in presurgical assessment of structural epilepsies. Many Latin American countries do not have widespread (if any) access to a LTVEM facility, and this resource has been limited to epilepsy surgery centers. Emphasizing the role of LTVEM as a relevant data source that could avoid unnecessary therapies and/or studies, may help in convincing our authorities about its value.

#### **3.2. Classification**

*Recommendation: LTVEM may help classify patients with epilepsy in whom the seizure type or epilepsy syndrome is undetermined (weak recommendation).*

- I would mention the importance of a good training protocol for patients and their caregivers prior to the exam. If they can take notes about subjective symptoms or subtle signs that may not be detected by video only, the seizure sequence can be described with greater accuracy. This information could make the difference for proper characterization of ictal phenomena detected during the EEG review.

#### **3.3 Seizure Quantification**

*Recommendation: The usefulness of LTVEM to quantify seizures in patients with epilepsy is weak.*

- Since the main objective of LTVEM is to obtain an accurate description of episodes, there is no need to record dozens of events (just a few typical episodes could be enough). I would like to connect this item with the recommendations given in 5.4.4.

### **3.4 Seizure Characterization for Surgical Management**

*Recommendation: LTVEM must be used in the presurgical evaluation in drug resistant TLE patients (strong recommendation). There is neither evidence for nor against LTVEM to characterize patients with drug-resistant extra temporal epilepsy in the presurgical evaluation (weak recommendation).*

- Nothing to comment.

### **4. Yield of LTVEM**

*Recommendation: LTVEM must be used in the presurgical evaluation in drug resistant TLE patients (strong recommendation). There is neither evidence for nor against LTVEM to characterize patients with drug-resistant extra temporal epilepsy in the presurgical evaluation (weak recommendation).*

- I know that the usefulness of LTVEM for differential diagnosis has been mentioned before by the experts themselves, but, since we talk about *yield* in this item, maybe it should include differential diagnosis as well (if *yield* is specifically oriented to surgical candidates, please ignore this commentary).

## **5. Technical standards**

### **5.1. Electrode array and EEG recording**

- Some of the colleagues have mentioned it, and I must agree: an “electrode array recommendation” seems to be missing (it is understood that not every single item can lead to a formal recommendation, but this is an important one). Its implications go further beyond the number of electrodes or the arrangement system being used, since LTVEM need to be faithful studies. Some requirements that may be minimal for many of us, are neither practiced nor well-executed in some clinical environments (i.e: distance between electrodes is not always measured, electrode adherence to scalp may be difficult, etc.). Therefore, I believe that it would not be exaggerated to include a recommendation for this.

### **5.2. Video**

*Recommendation: video should be combined with EEG during the use of LTVEM (strong recommendation).*

- Nothing to comment.

### **5.3. Safety**

#### **5.3.1. Clinical safety**

*Recommendation: The safe, maximal patient to nurse ratio may be 1:4 (weak recommendation).*

- This may seem like an obviosity, but I think that the need for LTVEM to be performed in an intensive or (at least) intermediate care unit should be addressed. In settings

with limited resources, EMU facilities can be scarce or non-existent, so LTVEM are frequently performed in general ICUs or PICUs. Obtaining admission in advanced care units can be particularly challenging, given that the considerable risks of lowering antiseizure drugs in a basic care unit are not always recognized by colleagues non familiarized with it. Ergo, even if it looks obvious, it is an aspect that needs to be clarified.

- Something else: aside from the systemic comorbidities mentioned in the document, I would aggregate the local side effects of long-term electrode use. One of the first publications regarding pressure ulcers caused by cEEG electrodes was published by Moura et al. ([Neurol Clin Pract](#). 2017 Feb; 7(1): 15–25).

### **5.3.2. Electrical safety**

- Nothing to comment.

## **5.4. Practice and Personnel**

### **5.4.1. Seizure monitoring**

*Recommendation: A written, standardized protocol may be used in each LTVEM unit for managing and testing patients during seizures (conditional recommendation).*

- This is a major issue, because protocols help us “speak the same language” in academic, research, and clinical fields. I am aware that many centers have their own protocols, and it is difficult to show preference or “favoritism” for one of them over the rest; nevertheless, I think that some minimal conditions could be mentioned. Some of them that come to mind, are prior training of caregivers, sequency of stimuli during testing, preferred sensory inputs, site of application, etc. Besides, in my opinion, visual elements might be included in any protocol, to prevent misinterpretation of response patterns in patients with aphasic seizures, anarthria, etc.

### **5.4.2. Services**

- Nothing to comment.

### **5.4.3. Staffing**

- I know that this comment may exceed the scope of this proposal, but I believe it is worth mentioning. Minimal competencies required for both epileptologists and EEG technicians are not defined completely in many countries, and they rely on standards determined by academic institutions (universities, institutes), which may differ significantly. The ILAE Roadmap will probably change the sometimes-diffuse definition of what an epileptologist is, and the same kind of standardization is needed for technicians (the ASET statement posted previously represents a remarkable effort in this matter).
- However, we need to spread awareness about the necessity of qualified technicians in epilepsy healthcare. It is not a rare thing to hear conceptions of an EEG technician as *someone who places electrodes, ensures they are fixed, and then removes them* when the exam has finished. Theoretical and clinical knowledge is fundamental for

the technician's performance; besides, detection and interpretation of many critical events that occur during a LTVEM depend on the technician's ability (timely annotations, correct activation protocols, removal of artifacts, etc.). The relevance of their role needs to be put on view.

#### **5.4.4. Duration of recording**

*Recommendation: The duration of LTVEM will vary relative to the indication for performance and number of seizures and events captured (conditional recommendation).*

- We know that the aim of LTVEM in most cases is to record a typical episode, be it epileptic or not. But it is important to address this additional issue: how many seizures have to be recorded before deciding that a LTVEM has fulfilled its purposes? Do we need to extend the recording period if we have detected one seizure only, but its description is quite precise and relatable to the patient's typical events? Should we get two, or three of those episodes first? Should we keep lowering dosage of antiseizure drugs anyway? I know that there may be no correct answer for this... but when there is not a unique way of proceeding, you use recommendations!

#### **5.4.5. Activation**

*Recommendation: patients with GGE should undergo hyperventilation in conjunction with ASM withdrawal as an effective activating procedure (strong recommendation).*

No comments in this item.

#### **5.4.6. Drug reduction**

*Recommendation: in patients without a history of status epilepticus or frequent daily seizures a taper of 30-50% daily should be considered (strong recommendation).*

It is a major requirement if we want a LTVEM to be informative. Just one comment related to what I mentioned in 5.3.1: it is essential to make clear that drug tapering must be done in a critical/intermediate care unit, not in a basic one.

#### **5.4.7. Automated Analyses**

*Recommendation: Automated algorithms for spike and seizure detection may provide complementary aid to expert assessment (weak recommendation).*

Algorithms will surely become a strong complementary aid in the next few years (some teams have been working on this area since long time ago, now I remember the group of D. Goldenholz and coworkers, but there are more). My only concern is about seizure information that can be recorded manually: it is also a great tool for the clinician, and both registering systems (automated and physical) complement well. Patients and their families need to know how important the information they can share with us during a LTVEM recording is.

#### **5.4.8. Rescue medication**

No comments on this item (again, we are assuming an ICU setting).

### **5.5. Reporting**

I am aware of the differences that may arise from the guidelines/consensus/glossaries under current use. In my opinion, they are not contradictory, but complementary. A possible approach towards integrating concepts could be the design of a comparative chart that depicts the equivalent terms when linking one classification system to another. For example, the term “moderate epileptiform activity” shares some similarity to the expression “frequent epileptiform activity”.

I believe that sometime in the future this kind of unified terminology shall be achieved. It will take loads of efforts and debating to do so, but I am sure that it can be accomplished successfully. The ILAE 2017 classifications of seizures and epilepsies has been accepted widely and its use became a rule in a short period of time.

Thank you