A Proposed International Classification of Epileptic Seizures

Current classifications of epileptic seizures vary considerably, and the need for a standardized and uniform system of grouping is very apparent. For this purpose, one hundred and twenty members of several European branches of the *International League Against Epilepsy* (*ILAE*) met in Marseilles, April 1–2, 1964, to discuss a possible international classification. After two days of lively discussion, H. Gastaut (chairman), H. Landolt, D. A. Pond, A. Subirana and R. Vizioli, in the names of the French, German, Swiss, English, Spanish and Italian branches of the ILAE presented a preliminary classification.

This classification was submitted to a Commission on Terminology consisting of representatives of the American and European Branches of the ILAE and of representatives of the *World Federation of Neurology* and of the *International Federation of Societies for Electroencephalography and Clinical Neurophysiology* (*IFSECN*). This Commission met at "Meer en Bosch", Heemstede (The Netherlands), May 11–13, 1964, with Professor Henri Gastaut as chairman, and discussed the Marseilles proposal, taking into account the principal previous classifications and the electroencephalographic terms as proposed by the Terminology Committee of the IFSECN and avoiding neologisms as far as possible and points of view too new or outrageous.

After the meeting, the Commission on Terminology proposed the following scheme of classification (Table I) for general adoption by neurologists in the hope that it will bring some measure of uniformity in the use of diagnostic terms and will facilitate the comparison of cases, improve methods of evaluating therapy, and will eventually further our understanding of the causes of epileptic seizures.

It is appreciated by the Commission that all attempts at classification of seizures are hampered by our limited knowledge of the underlying pathological processes within the brain and that any classification must of necessity be a tentative one and will be subject to change with every advance in scientific understanding of epilepsy.

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Epilepsia, 5 (1964) 297–306

TABLE

CLASSIFICATION OF

Clinical seizure type	*Electroencephalographic expression*	
	Ictal rhythmic discharge of spikes and/or of more or less slow waves during each seizure (with rare exceptions)	*Interictal* Sporadic discharges of spikes and/or more or less slow waves; only in some patients
1. Partial seizures	discharge more or less localized over one or, sometimes, both hemispheres	local discharges, generally over one hemisphere only
A. With Elementary Symptomatology	local contralateral discharge starting over the corresponding area of cortical representation (not always recorded on the scalp)	local contralateral discharges
1. With motor symptoms (i) focal motor (without march) (ii) jacksonian (iii) adversive (iv) postural (v) somatic inhibitory (vi) involving speech (including vocalization and arrest of speech)		
2. With special sensory or somato-sensory symptoms (i) somato-sensory (ii) visual (iii) auditory (iv) olfactory (v) gustatory (vi) vertiginous		
3. With autonomic symptoms		
*4. Compound forms**		
*B. With Complex Symptomatology** (which may sometimes begin with elementary symptomatology)	unilateral or bilateral discharge, diffuse, or focal in temporal or fronto-temporal regions	unilateral or bilateral, generally asynchronous, focus; usually in the temporal region(s)
1. With impaired consciousness alone		
2. With intellectual symptomatology (i) with dysmnesic disturbances (including amnesia, déjà vu, déjà vécu) (ii) with ideational disturbances (including "forced thinking")		

* Complex *vs.* elementary, implies an organized, high-level cerebral activity. Compound implies a joining

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EPILEPTIC SEIZURES

Anatomical substrate	*Etiology*	*Age*
various cortical and/or subcortical regions corresponding with functional representation in one hemisphere	usually related to a wide variety of local brain lesions (cause known, suspected or unknown). Constitutional factors may be important	possible at all ages but more frequent with increasing age
usually in the cortical region of one hemisphere corresponding to functional representation	as above	as above
usually cortical and/or subcortical temporal or frontotemporal regions (including rhinencephalic structures), unilateral or bilateral	as above	as above

together of elementary or (and/or) complex symptoms.

Clinical seizure type	*Electroencephalographic expression*	
	Ictal	*Interictal*
3. With affective symptomatology		
4. With "psychosensory" symptomatology (illusions, hallucinations)		
5. With "psychomotor" symptomatology (automatisms)		
6. Compound forms		
C. Secondarily Generalized (all forms of partial seizures, with elementary or elaborated symptomatology, can develop into generalized seizures, sometimes so rapidly that the focal features may be unobservable. These generalized seizures may be symmetrical or asymmetrical, tonic or clonic, but most often tonic–clonic in type)	above discharge becomes secondarily and rapidly generalized	←
2. Generalized seizures		
	bilateral, essentially synchronous and symmetrical discharge from the start	bilateral, essentially synchronous and usually symmetrical discharges
A. Non-convulsive Seizures		
1. With impairment of consciousness only		
(a) Brief duration (beginning and ending abruptly)		
(i) typical "absence"	rhythmic 3 c/s spike and wave discharge	spike and waves and/or polyspike and wave discharges
(ii) atypical "absence"	(i) low-voltage fast activity or rhythmic discharge at 10 or more c/s, or (ii) more or less rhythmic discharge of sharp and slow waves, sometimes asymmetrical	more or less rhythmic discharges of sharp and slow waves, sometimes asymmetrical
(b) Long duration ("absence status")	more or less continuous activity of: (i) rhythmic spike and waves at 3 c/s or slower, (ii) pseudo-rhythmic spike and waves or sharp and slow waves, or (iii) fast (10 c/s or more) and slow rhythms with occasional spike and wave patterns	spike and waves and/or polyspike and wave discharges

Anatomical substrate	*Etiology*	*Age*
——refer to partial seizures in general—→		
unlocalized (? meso-diencephalon)	no cause found or: (i) diffuse or multiple bilateral lesions, or: (ii) toxic and/or metabolic disturbances (constitutional factors may be important)	all ages
as above	as above (organic etiology is unusual)	especially in children
as above	as above (organic etiology is usual)	especially in children
as above	as above	all ages

Clinical seizure type	*Electroencephalographic expression*	
	Ictal	*Interictal*
2. *With other phenomena associated with impairment of consciousness* Absences, typical or atypical, and the absence status can occur: (i) with mild clonic components (myoclonic absences) (ii) with increase of postural tone, symmetrical or asymmetrical (absences with retropulsion or gyration) (iii) with diminution or abolition of postural tone ("drop attacks" or atonic seizures of longer duration) (iv) with automatisms (v) with autonomic phenomena (some forms of abdominal seizures, absences associated with sphincter incontinence, etc.) (vi) as mixed forms		
B. Convulsive Seizures		
1. *Myoclonic jerks*		
(i) generalized (including the shortest "infantile spasms")	polyspike and waves or, sometimes, spike and waves or sharp and slow waves (flattening in case of infantile spasms)	polyspike and waves, or spike and waves, sometimes sharp and slow waves. "Hypsarhythmia" in case of infantile spasms.
(ii) fragmentary	poor or no correspondence between discharges (polyspikes, polyspike and waves or spike and waves) and jerks	polyspikes, polyspike and waves, or spike and waves
2. *Clonic seizures*	mixture of fast (10 c/s or more) and slow waves with occasional spike and wave patterns	spike and waves and/or polyspike and wave discharges
3. *Tonic seizures* (including the longest "infantile spasms")	low voltage fast activity during the seizure or a fast rhythm (10 c/s or more) decreasing in frequency and increasing in amplitude	more or less rhythmic discharges of sharp and slow waves, sometimes asymmetrical. "Hypsarhythmia" in case of infantile spasms
4. *Tonic–clonic seizures*	rhythm at 10 or more c/s, decreasing in frequency and increasing in amplitude during the tonic phase, interrupted by slow waves during the clonic phase	polyspike and waves and/or spike and waves or, sometimes, sharp and slow wave discharges

Anatomical substrate	*Etiology*	*Age*
as above	as above	all ages (except for infantile spasms)
as above	as above (generally associated with diffuse brain lesions)	all ages
as above	as above	especially in children
as above	as above (organic etiology is usual)	especially in children
as above	as above	less frequent in young children than other forms of generalized seizures. All ages except infancy

Clinical seizure type	*Electroencephalographic expression*	
	Ictal	*Interictal*
3. Unilateral or predominantly unilateral seizures in children		
Characterised by clonic, tonic or tonic–clonic convulsions, with or without an impairment of consciousness, expressed only or predominantly in one side. Such seizures sometimes shift from one side to the other but usually do not become symmetrical	(i) partial discharge very rapidly spreading over only one hemisphere (corresponding with only contralateral seizures), or	focal contralateral discharges
	(ii) discharges generalised from the start but considerably predominant over one hemisphere, susceptible to change from one side to the other at different moments (corresponding to alternating seizures)	bilateral and synchronous symmetrical or asymmetrical discharges of spike and waves and/or polyspike and waves
4. Erratic seizures in new-born		
With variable tonic and/or clonic convulsions, generally unilateral, sometimes alternating or generalized	various patterns often localized but variable from time to time and from area to area	variable
5. Unclassified epileptic seizures		
Includes all seizures which cannot be classified because of inadequate or incomplete data		

ADDENDUM

Epileptic seizures have just been considered in the light of clinical, electroencephalographic, anatomical and etiological factors. They may also be classified according to their frequency.

(*1*) *Isolated seizures.* Examples: convulsions in children with hyperthermia, eclamptic convulsions in pregnancy. While these are epileptic phenomena, in every day usage they are not referred to as forms of epilepsy.

(*2*) *Repeated seizures* occur under a variety of circumstances:

(i) as fortuitous attacks, coming unexpectedly and without any apparent provocation;

Anatomical substrate	*Etiology*	*Age*
cortical and/or sub-cortical region in one hemisphere	wide variety of focal, unilateral lesions, generally in immature brain (constitutional factors may be important)	
unlocalized (? meso-diencephalon)	no cause found, or (i) diffuse or multiple bilateral lesions, or (ii) toxic metabolic perturbations, generally in immature brain (constitutional factors may be important)	almost exclusively in very young children
cortical and/or subcortical region in one or both hemispheres, or unlocalized	focal or diffuse lesions of diverse aetiology or metabolic and/or toxic. Constitutional factors and cerebral immaturity are important	limitated virtually to the newborn

(ii) as cyclic attacks, at more or less regular intervals (*e.g.*, in relation to the menstrual cycle, or the sleep–waking cycle);

(iii) as attacks provoked by: (a) non-sensory factors (fatigue, alcohol, emotion, etc.) or (b) sensory factors, and sometimes referred to as "reflex seizures".

(*3*) *Prolonged or repetitive seizures* (status epilepticus). One speaks of "status epilepticus" whenever a seizure persists for a sufficient length of time or is repeated frequently enough to produce a fixed and enduring epileptic condition. ("Status" implies a fixed or enduring state). Status epilepticus may be divided into partial (*e.g.* jacksonian), or generalized (*e.g.* abscence status or tonic–clonic status), or unilateral (*e.g.* hemiclonic) types.

SUMMARY FORM OF CLASSIFICATION

1. Partial seizures or seizures beginning locally

A. With elementary symptomatology (motor, sensory or autonomic symptoms);

B. With complex symptomatology (automatism, ideational, psychosensory, psychomotor, etc. symptoms);

C. Generalized seizures with local onset. (*N.B.*: All partial seizures can develop into generalized seizures, sometimes so rapidly that the local features may not be observable).

2. Generalized seizures or seizures without local onset

A. Absences of differing form and duration, including "absence status". Absences may occur alone, or in combination with myoclonic jerks, or with increase or loss of postural tone, or with automatisms.

B. Generalized convulsive seizures, in the form of tonic, clonic, tonico–clonic and/or myoclonic attacks.

3. Unilateral or predominantly unilateral seizures (tonic and/or clonic) in children

4. Erratic seizures in new-born

5. Unclassified seizures

This includes all seizures which cannot be classified because of inadequate or incomplete data.

The above classifications will be presented at the quadrennial meeting of the International League Against Epilepsy, at Vienna, September 1965. It is hoped that the Members of the ILAE will send comments and proposals for modification to Professor Gastaut, Secretary-General of the International League Against Epilepsy (87, Boulevard Périer, Marseille-9, France), so that they may be studied prior to the presentation.

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