

5. Etiologic classification of stroke

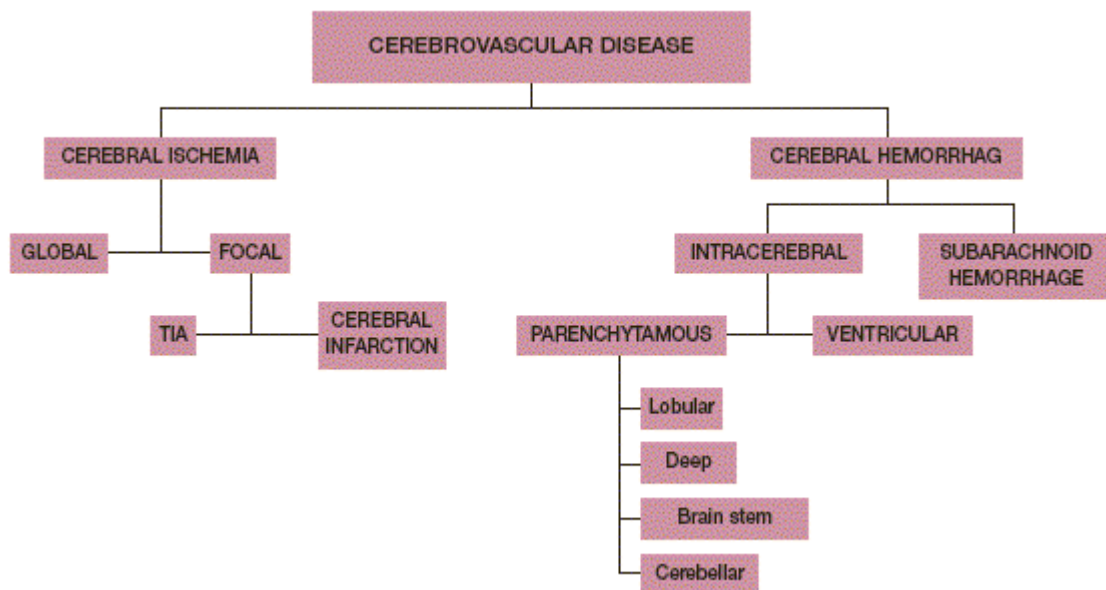
5.1. What is a stroke?

Cerebrovascular disease or stroke is caused by a circulatory brain disorder that transiently or permanently disrupts the functioning of one or more parts of the brain³⁶. There are several types of stroke, which, depending on the nature of the lesion produced, can cause cerebral ischemia or cerebral hemorrhage.

5.2. Types of stroke

Acute cerebrovascular disease is classified into two big groups: ischemic and hemorrhagic³⁶. Ischemic cerebrovascular disease can be global or focal; the latter can be divided into two other big groups: TIA and cerebral infarction. Treatment and prevention (primary and secondary) strategies and prognosis depend on the cause and localisation of these attacks (Figure 3).

Figure 3: Clinical classification of strokes based on their nature³⁶



Adapted from: Díez Tejedor E, Fuentes B, Gil Núñez AC, Gil Peralta A, Matías Guiu J, by the ad hoc committee of the SEN's (Spanish Society of Neurology) Study Group for Cerebrovascular Diseases. "Guía para el tratamiento preventivo de la isquemia cerebral". At: *Guía para el tratamiento y prevención del ictus*. Guidelines and protocols of the SEN. In Díez Tejedor (ed.). Ed. ISBN: 84-8124-225-X. Barcelona: Prous Science, 2006: 133-183.

Depending on the nature of the lesion, the two main types of stroke are:

- **Established ischemic stroke or cerebral infarction:** occurs when cerebral ischemia lasts long enough to produce an area of tissue necrosis³⁶. Sufficient duration is

deemed to be when neurologic deficit lasts longer than 24 hours. There are several types of cerebral infarction depending on their mechanism of production and topographic localisation³⁶.

- **TIA:** brief episode of focal cerebral ischemia that is caused by an interruption of blood supply to an area that is supplied by the arterial system. It is reversible and there is no neurologic damage after it occurs. The definition of TIA has been recently modified: acknowledging the limitations of the classic definition ('focal brain dysfunction that lasts less than 24 hours'), the TIA Working Group redefines TIA as a brief episode of neurologic dysfunction, with clinical symptoms that last less than an hour and with no evidence of stroke in neuroimaging techniques.
- **Hemorrhagic stroke:** is the extravasation of blood within the brain as a result of a ruptured blood vessel. Depending on its localisation it can be cerebral (intraparenchymatous or ventricular) or subarachnoid.

Depending on the etiologic cause, the different subtypes of ischemic stroke are³⁶:

- **Atherothrombotic ischemic stroke (TIA or cerebral infarction) due to large artery atherosclerosis:** it is generally a medium to large infarction, of cortical or subcortical topography and carotid or vertebrobasilar localisation, in which at least one of the following criteria are fulfilled:
 - Presence of atherosclerosis with stenosis: stenosis greater than or equal to 50% of the diameter of the vascular lumen or occlusion of an extracranial artery or a large calibre intracranial artery (middle cerebral artery, posterior cerebral artery or basilar stem), in absence of any another etiology causing the lesion.
 - Atherosclerosis without stenosis due to the presence of plaques or stenosis under 50% in the middle cerebral artery, cerebral posterior artery or basilar stem, in absence of any other etiology. At least two of the following cerebral vascular risk factors must coincide: person over the age of 50, HT, diabetes mellitus, smoking or hypercholesterolemia.
- **Cardioembolic ischemic stroke:** it is generally a moderate to severe intensity stroke, usually of cortical topography, for which there is evidence (in absence of an alternative etiology) of one of the following embolic cardiopathies: presence of a blood clot or intracardiac tumour, rheumatic mitral stenosis (MS), aortic or mitral prostheses, endocarditis, atrial fibrillation, sinus node disease, acute myocardial infarction in the previous three months with or without left ventricular aneurysm or extensive akinesia or presence of global cardiac hypokinesia or dyskinesia regardless of the underlying cardiopathy.
- **Small vessel arterial occlusive disease (lacunar stroke):** mild-intensity stroke (diameter less than 1.5 cm) of a brain penetrating artery that frequently causes a lacunar clinical syndrome (pure motor hemiparesia, pure sensory syndrome, sensorimotor syndrome, hemiparesia-ataxia or dysarthria – clumsy hand) in a patient with a history of HT or other vascular risk factors, in absence of another

etiology that is causing it.

- **Uncommon ischemic stroke:** mild, moderate or severe intensity stroke, of cortical or subcortical localisation, in carotid or vertebrobasilar territory in a patient where atherothrombotic, cardioembolic or lacunar causes have been ruled out. It can be caused by systemic diseases (metabolic disturbances, coagulation disorders, connectivopathies, myeloproliferative syndrome or infectious processes) or by other causes such as cerebral venous thrombosis, migraine, septum aneurysm, arterial dissections, fibromuscular dysplasia, arteriovenous malformation, angeitis, or by an iatrogenic cause.
- **Undefined ischemic stroke:** moderate to severe intensity stroke, of cortical or subcortical localisation, in carotid or vertebrobasilar territory, where a comprehensive diagnostic study rules out atherothrombotic, cardioembolic, lacunar and uncommon subtypes. It can also be considered undetermined if there is more than one possible etiology or in cases in which an incomplete or insufficient study is carried out to rule out other causes.