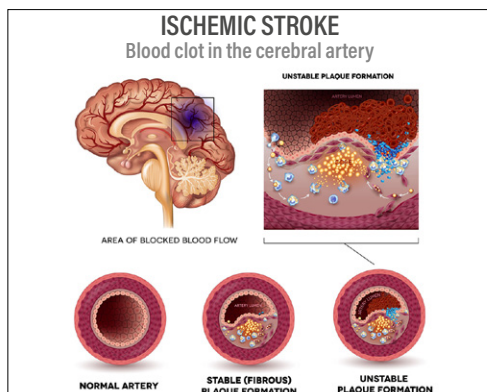


# Did You Know? Stroke

## Take-home message

- Stroke is the second most common cause of morbidity worldwide
- Ischemic stroke is the most common type of strokes
- MRI has significantly higher sensitivity and specificity than CT in the diagnosis of acute ischemic infarction in the first few hours after onset (Ref. 3)



■ A stroke is an acute episodic neurological deficit caused by ischemia or hemorrhage in brain. Stroke is the second most common cause of morbidity worldwide (after myocardial infarction) (Ref. 1)

There are different types of stroke:

- **Ischemic stroke:** accounts for about 87% of all strokes, it occurs when a blood vessel carrying blood to the brain is blocked by a blood clot.

- **Hemorrhagic stroke:** is less common but it is responsible for about 40 percent of all stroke-related deaths.

- **Transient ischemic attack (TIA) or mini-stroke** (Ref.2) that usually lasts a few minutes and produces similar symptoms as stroke.

The symptoms of ischemic stroke depend upon the region of the brain that is affected by the loss of blood supply and can include changes in sensation or motor control, loss of strength and control of movement, memory loss and language deficits (aphasia). **A stroke mimic is defined as a nonvascular disease that presents with stroke-like symptoms**, often indistinguishable from an actual stroke. In rare cases, a tumor, an infection, or brain swelling due to an injury or illness can cause a stroke.

## Possible complications

- Problems with speech and comprehension
- Paralysis or numbness of the face, or different parts of the body
- Vision problems
- Headache
- Trouble with moving and walking
- Severe disability
- Death

## Possible treatment

- The administration of intravenous recombinant tissue-type plasminogen activator (rt-PA)
- The deliverance of medication directly to the brain with the help of a catheter through an artery in the groin
- Mechanical clot removal (thrombectomy): clot removal with the help of a catheter
- To minimize the risk of stroke or TIA it is possible to make a procedure to open up an artery that's narrowed by fatty deposits (plaques): endarterectomy

## In Olea Sphere®?

Olea Sphere® is a recognized software imaging that, based on validated thresholds, makes it possible to estimate volumes of interest (Fig. 1) including:

- The volume of the region where **ADC** is lower than a given threshold
- The volume of the region where **Tmax** is greater than a given threshold

Olea Sphere® makes it easy to visualize these two volumes as well as their mismatch (Fig. 2).

Olea Sphere® features various advanced post-processing options including:

- Automatic Arterial Input Function (AIF) selection which can nevertheless be selected manually (Fig. 3).
- The MIP reconstruction of images acquired in TOF (Time Of Flight) in Olea Vision® is particularly adapted to visualize the cerebral vasculature.
- Different deconvolution methods based on the **SVD** technique including the **oSVD** method which is among them the most adaptive and delay-insensitive
- In neuro-vascular emergencies, Olea Sphere® saves time by providing access to all the information the clinician needs for decision making in less than a minute.



- Olea Nova Move™ allows the visualization of the contrast agent arrival and its kinetics in the brain tissue.
- A proprietary more accurate and robust Bayesian method implemented only by Olea Medical®. A study suggests that this method could even allow halving the dose of gadolinium (Ref. 4).
- The longitudinal module allows to load and visualize CT or MR follow-up scans within the same user interface.



Fig. 1

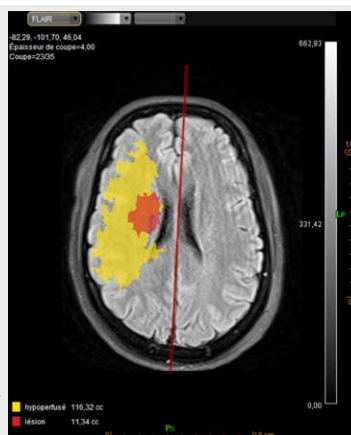


Fig. 2

Fig. 3



**Sources:** Ref. [1] <https://radiopaedia.org/articles/ischaemic-stroke> ■ Ref. [2] <http://www.stroke.org/understand-stroke/what-stroke/what-is-a> ■ Ref. [3] <https://www.ncbi.nlm.nih.gov/pubmed/15628251> ■ Ref. [4] Nael K, Mossadeghi B, Boutelier T, Kubal W, Krupinski EA, Dagher L, Villablanca JP. Bayesian Estimation of Cerebral Perfusion Using Reduced-Contrast-Dose Dynamic Susceptibility Contrast Perfusion at 3T. *AINR Am J Neuroradiol*. 2015 Apr;36(4):710-5 ■ <https://www.ncbi.nlm.nih.gov/pubmed/26748672> ■ <https://www.mayoclinic.org/diseases-conditions/transient-ischemic-attack/symptoms-causes/syc-20355679> ■ <https://www.mayoclinic.org/diseases-conditions/stroke/symptoms-causes/syc-20350103> ■ <https://www.stroke.org.uk/what-is-stroke/types-of-stroke> ■ <https://www.webmd.com/stroke/ss/slideshow-stroke-overview> ■ <https://emedicine.medscape.com/article/115506-overview> ■ <https://radiopaedia.org/articles/ischaemic-stroke> ■ <http://www.heartandstroke.ca/stroke/what-is-stroke/types-of-stroke> ■ [https://www.emedicinehealth.com/stroke/article\\_em.htm](https://www.emedicinehealth.com/stroke/article_em.htm) ■ <http://stroke.ahajournals.org/content/strokeaha/41/9/95.full.pdf>

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