

# WORLD STROKE DAY 29TH OCT

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## What is a Stroke?

The World Health Organization (WHO) defines stroke as *“rapidly developing clinical signs of focal or global disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin.”*

It is the loss of cerebral blood supply caused by one or more of the following factors:

- stenosis (atherosclerosis)
- emboli (arterial bifurcation)
- brain hemorrhage (aneurysm)
- expanding tumour

A THROMBOTIC STROKE occurs when a blood clot or thrombus blocks the flow of blood to the brain. An EMBOLIC STROKE occurs when fatty plaque or blood clot/ embolism breaks away and flows to the brain where it blocks an artery. Whilst, a CEREBRAL HAEMORRHAGE is due to a break in blood vessel (aneurysms) in the brain which leads to bleeding in the brain.

According to a publication by K. Mungrue et al in 2014, there are two Ischemic stroke subtypes: atherothrombotic brain infarction (ABI) and cardiometabolic infarction. There are also two hemorrhagic stroke subtypes: intra-cerebral hemorrhages and subarachnoid hemorrhages.

## **RISK FACTORS**

- Age
- More common in men
- Afro-Caribbean
- Hypertension
- Diabetes
- High cholesterol
- Heart Disease
- Smoking, excessive alcohol, obesity
- History of stroke or Transient Ischemic Attacks (TIAs)
- Atherosclerosis

## **SIGNS & SYMPTOMS**

- Sudden numbness or weakness in the face, arm, leg especially on one side of the body.
- Sudden confusion, trouble speaking or difficulty understanding speech
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance and lack of coordination
- Sudden severe headaches with no known cause

Signs and Symptoms vary depending on the location of the stroke. Thus it is important for one to note the layout of the Brain and the Circle of Willis as it pertains to the brain. The blood supply to the brain divides into an anterior and posterior circulation. The anterior circulation supplies blood to the majority of the cerebral hemisphere: frontal lobes, parietal lobes, lateral temporal lobes and anterior part of the deep cerebral hemisphere. Whilst the posterior circulation supplies the brainstem, cerebellum, occipital lobes, medial temporal lobes and posterior part of the deep hemisphere.

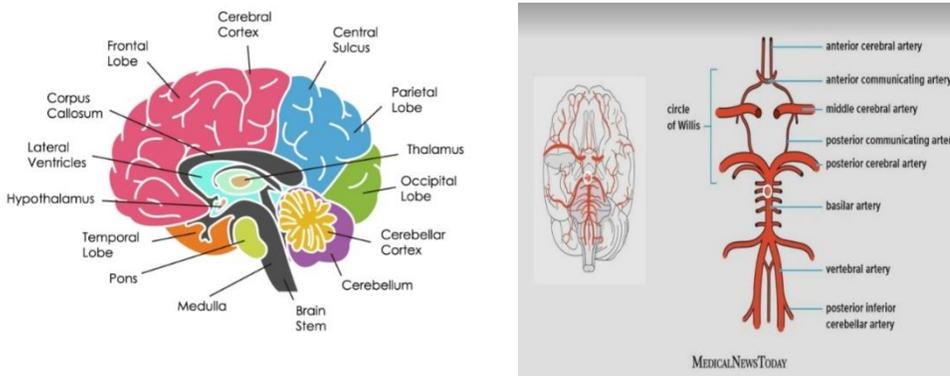


Figure 1:Diagram of the Brain and Circle of Willis

The anterior and the posterior circulation of the brain are connected by a ring of vessels know as the Circle of Willis, located at the inferior side of the brain. The Circle of Willis acts to provide collateral blood flow between the anterior and posterior circulation of the brain, protecting against ischemia in the event of vessel disease or damage in one or more areas.

When a Stroke occurs signs and symptoms experienced depends on its location.

A Stroke affecting:

1. The Posterior Cerebral Artery may cause:
  - Homonymous Hemianopia
  - Disturbance of visual recognition
  
2. Basilar Artery may cause:
  - Dizziness, diplopia, vertigo, nystagmus, "drop attack"
  
3. Middle Cerebral Artery may cause:
  - Homonymous hemianopia – involving fixation
  - Hemiplegia (paralysis of one side), hemiparesis (temporary paralysis)
  - Hemiparesthesia of contralateral hand, arm, face (loss of sensation)
  
4. Anterior Celebral Artery
  - Hemiplegia
  - Hemiparesthesia of the contralateral lower limbs
 (Relatively uncommon)
  
5. Ophthalmic Artery
  - Unilateral loss of vision

According to the World Stroke Organization there are 13.7 million new stroke cases annually.

- 60% of cases occur in under 70 year olds
- 8% of cases occur in under 44 year olds
- 52% of cases are male
- 48% of cases are female

A 2018 publication by the World Health Organization stated that there are 1101 stroke related deaths in Trinidad per year, which accounts for 10% of total mortality. A study conducted during the period 2000-2009 at the San Fernando General Hospital and published in 2014 revealed the following:

1. There is an overall increase in stroke with time (Figure 2).
2. Ischemic stroke was the most frequent (48%). Intracerebral hemorrhagic strokes 15% prevalence and 37% of strokes were undetermined
3. There is a higher prevalence of strokes in males in the 69 and under age group than females (Figure 3)
4. Strokes were more common in the South East Asian population than in Africans

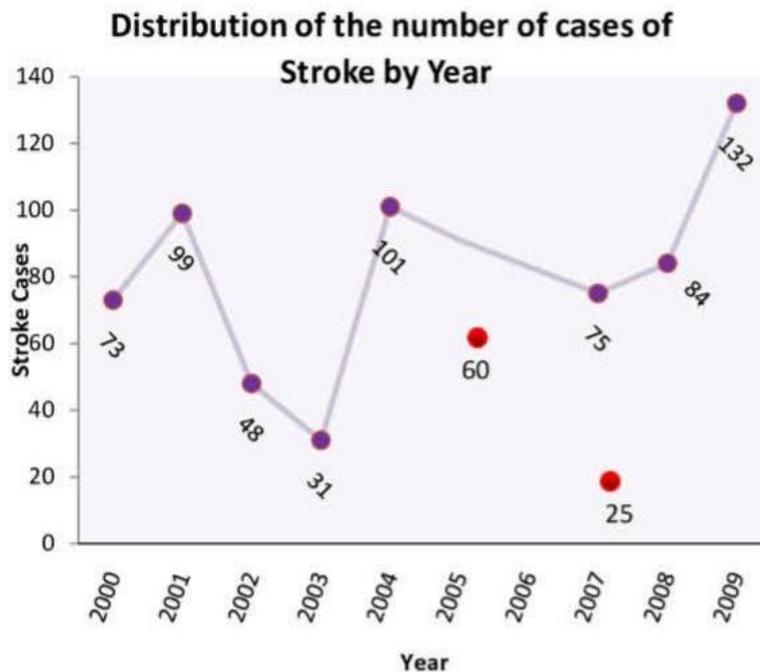


Figure 2: The distribution of the number of cases of Stroke by year

	Males (n = 369 )	Female (n = 359 )
	(%)	(%)
Age Group		
20 - 29	1(0.3)	1(0.3)
30 - 39	4(1.1)	7(1.9)
40 - 49	27(7.3)	24(6.7)
50 - 59	81(22.0)	58(16.2)
60 - 69	115(31.2)	100(27.9)
70 - 79	80(21.7)	94(26.2)
>80	61(16.5)	75(20.9)
Total	369(100)	359(100)
Ethnic Groups		
Africans	101(27.4)	96(26.7)
South-East Asians	193(52.3)	193(53.8)
Mixed	32(8.7)	31(8.6)
Unknown	43(11.7)	39(10.9)
Total	369(100)	359(100)
Survival to Discharged		
Yes	281(76.2)	271(75.5)
No	85(23.0)	86(24.0)
Unknown	3(0.8)	2(0.6)
Total	369(100)	359(100)
Type of Stroke		
Ischemic	164(44.4)	188(52.4)
Hemorrhagic	42(11.4)	65(18.1)
Unknown	163(44.2)	106(29.5)
Total	369(100)	359(100)

Figure 3: Characteristics of patients admitted to the San Fernando General Hospital, by gender. Mungrue, K. et al (2014)

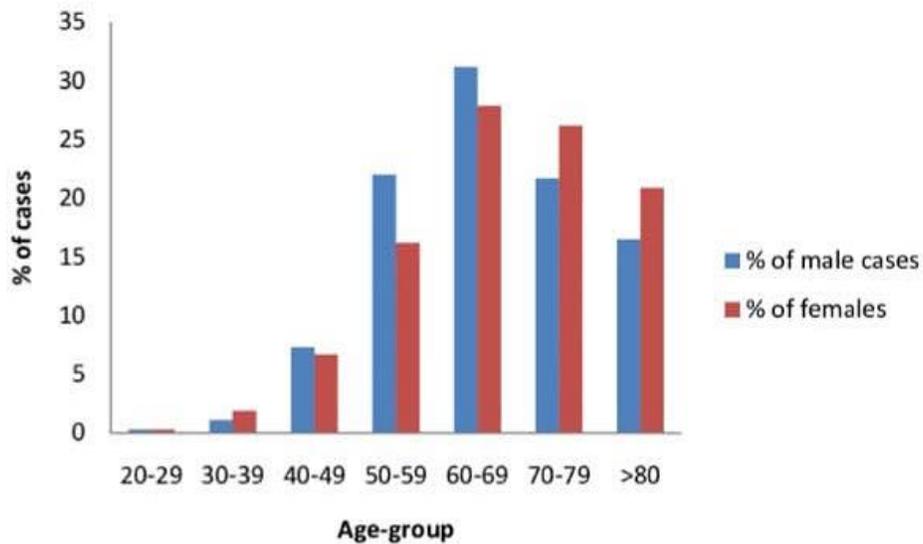


Figure 4: The percentage of stroke cases by age-group and gender

The main question is how many of these incidences were patients whose stroke affected their vision only. Approximately 2 years ago I had an experience with patient X. Patient X is an afro-Trinidadian male in his late 60s who suffers from type 2 diabetes and hypertension which are both well controlled. Patient X called me early one morning and said that he thought that his cataract was getting worse. I asked him to describe in his own words what he was experiencing. To which he replied, "When I am reading the newspaper and I get to the end of a sentence I cannot see." Patient X was able to see an Ophthalmologist later that day and a Visual Field Test was done (See Figure 5):

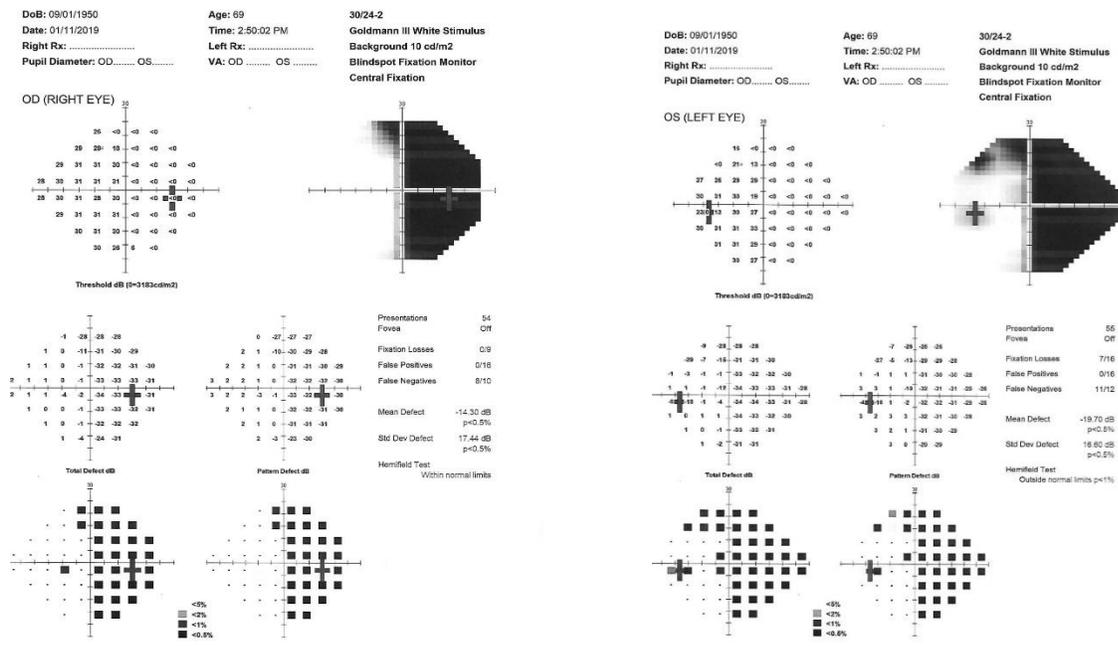


Figure 5: Patient X's Visual Field results illustrating a Homonymous Hemianopia

The patient had a right homonymous hemianopia. He was then referred to a Neurologist who confirmed that Patient X had a stroke, a Subacute infarct in the left occipital lobe. He was also seen by a Cardiologist who managed the underlying cause of the stroke with medication, change in diet and an increase in physical activity. The visual field test was repeated 5 months later and the results showed that Patient X regained a portion of his Field of vision. Please view the Visual Field results in Figure 6.

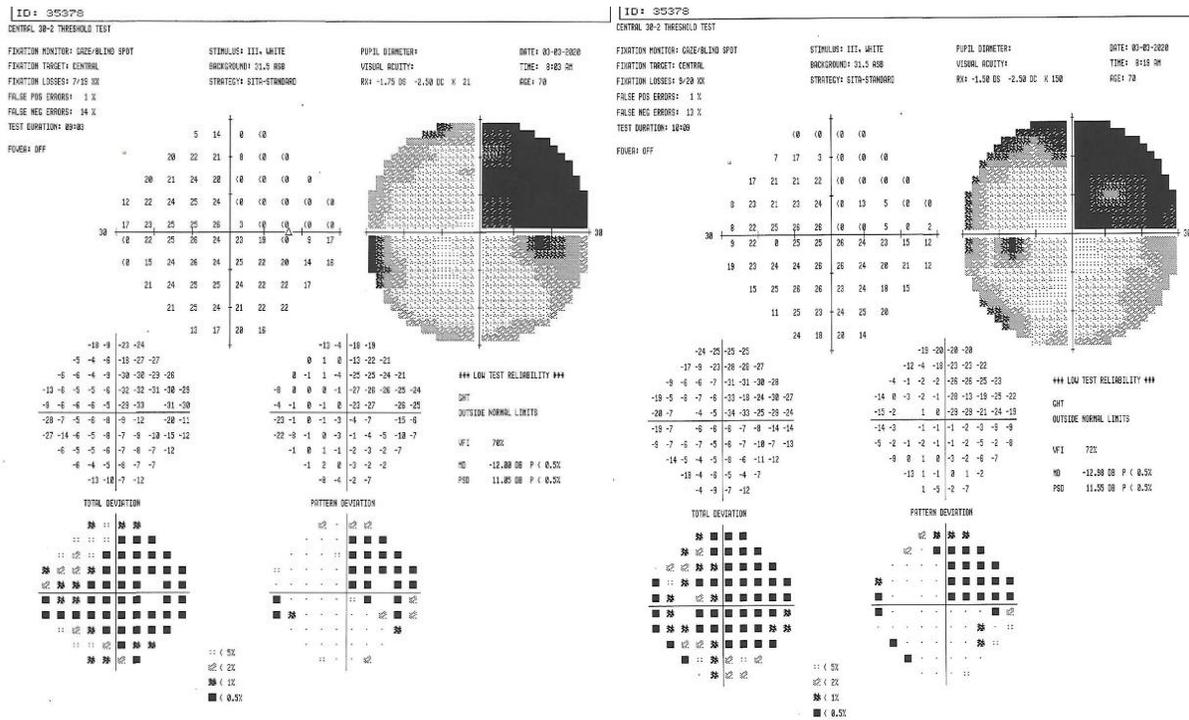


Figure 6: Patient X's Visual Field results illustrating a Homonymous Quadrantanopia

You may have heard your Optometrist make reference to the term visual field test or field of vision. The term Visual field refers to portion of visual space which is visible to an individual at any given moment. It can be compared to an island of vision in a “sea of blindness”. A visual field test is used to measure your peripheral vision. Visual field loss may occur due to other pathology not only strokes. If you are experiencing visual field loss do not hesitate to consult your Optometrist who will refer you to an Ophthalmologist or see an Ophthalmologist directly. Most importantly, in the event that you begin to experience any signs or symptoms associated with strokes seek medical attention immediately.

If you think someone may be having a stroke, act F.A.S.T., that is, do the following simple test:

1. **F- Face:** Ask the person to smile. Does one side of the face droop?
2. **A-Arms:** Ask the person to raise both arms. Does one arm drift downward?
3. **S-Speech:** Ask the person to repeat a simple phrase. Is the speech slurred or strange?
4. **T- Time:** If you see any of these signs, call 811 for an ambulance right away



## REFERENCES:

- Choplin, Neil et al. Visual Fields. John H. Bond, 1998
- Lindsay, Patrice et al. (2020) World Stroke Organization: Global Fact Sheet 2019. 1-22 <https://www.world-stroke.org/publications-and-resources/international-journal-of-stroke>
- Mungrue, K., et al. (2014) The Epidemiology and Spatial Analysis of Stroke in Trinidad and Tobago in the First Decade of the 21<sup>st</sup> Century (2000-2009). Health, 6, 729-737. <http://dx.doi.org/10.4236/health.2014.68094>
- [http://www.cdc.gov/stroke/signs\\_symptoms.htm](http://www.cdc.gov/stroke/signs_symptoms.htm)
- <https://www.theheartfoundation.org/stroke>
- <https://www.worldlifeexpectancy.com/Trinidad-Tobago-stroke>
- First and Last pictures sourced from World Stroke Organization website: <https://www.world-stroke.org/world-stroke-day-campaign/world-stroke-day>

## About the Author:

Mrs. Candace Tuitt-Solomon is the holder of a Bachelor of Science Degree in Optometry from Cardiff University and has been employed with Ferreira Optical Limited for 7 years.

She grew up in Central Trinidad where she completed her secondary level education at Holy Faith Convent, Couva. She is also the holder of a degree in Chemistry from UWI St. Augustine.

Her professional goal is to continue to deliver a high standard of eye care to all and to promote eye health awareness.

Mrs. Tuitt-Solomon together with a colleague coordinated the Trinidad and Tobago Optometrists Association's Fun Day on three occasions.

This former teacher was also the coordinator of multiple science fairs and year group orientation activities. Her current hobbies includes running and cooking. Along with mastering the art of cooking local trini cuisines, she enjoys trying new recipes. She also enjoys supporting local artists.



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