



# CPD4dentalnurses

YOUR FUTURE IN YOUR HANDS

## **Stroke Risk Factors, Symptoms and Management in an Emergency** **(Medical Emergencies)**

**Aims:** To give an overview of strokes including the aetiology, risk factors and prevalence. To give an outline of how to manage a patient with a suspected stroke in a medical emergency.

**Objectives:** On completion of this verifiable CPD article the participant will be able to demonstrate, through completion of a questionnaire, the ability to:

- Identify the prevalence of stroke in the UK
- Identify two different types of stroke
- Recognise the causes, signs, symptoms of a stroke
- Understand the key risk factors for stroke
- Know how to manage a suspected stroke in a dental practice emergency
- Demonstrate knowledge of the adult Basic Life Support sequence

### **Introduction**

A Cerebrovascular accident (CVA) or stroke is caused by the interruption of blood supply to a portion of the brain. Brain cells begin to die in minutes.<sup>1</sup> In 1970, the World Health Organisation defined a stroke as a “rapidly developing clinical signs of focal or global disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause apart that of vascular origin.” It is now recognised that the 24-hour inclusion criterion is inaccurate as permanent injury can occur much sooner. Although this definition is still widely used, it is now recognised that this definition is outdated since it does not take into consideration nature, timing, and clinical recognition of strokes and the advances in imaging techniques and diagnostics.<sup>2,3</sup>

Around 100,000 people have strokes in the UK each year. That is around one stroke every 5 minutes. There are 1.4 million stroke survivors in the UK<sup>4</sup>

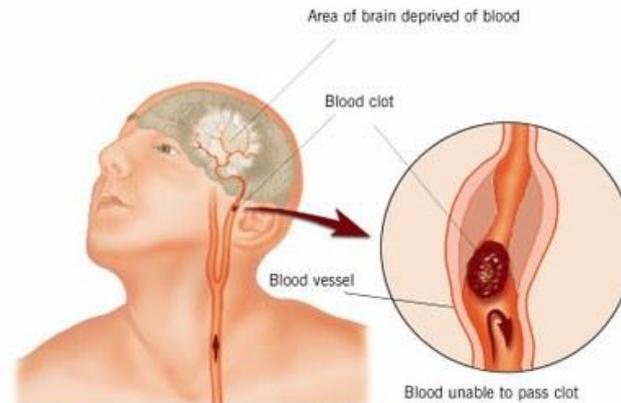
Although rare, medical emergencies can occur in the dental practice and it is important that dental team members are able to recognise the signs of a stroke and get the patient appropriate medical attention.

This article will provide a brief description of the types of stroke, the risk factors for a stroke and how to treat a patient with a suspected stroke in a medical emergency.

## Types of Stroke

There are two main types of stroke:

### 1) Ischaemic strokes

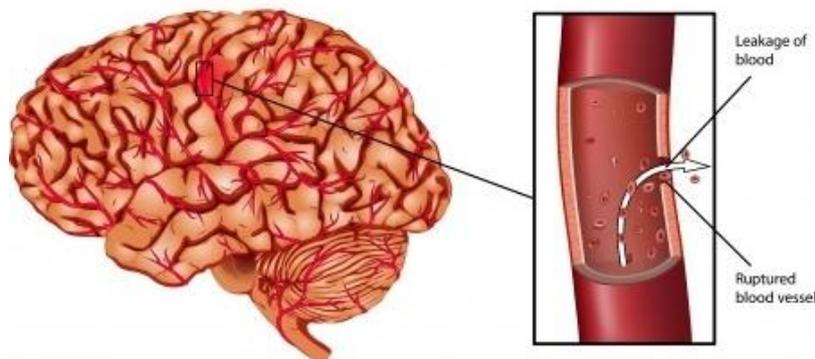


Ischaemic stroke <sup>5</sup>

Approximately 85% of all strokes are ischaemic and occur when the flow of blood to the brain is blocked. This can happen when the blood vessels to the brain become blocked or narrowed. Atherosclerosis can occur over a period of time when the arteries naturally begin to harden and get narrower. This process can be accelerated by plaque build-up (cholesterol, fatty substances) in the inner linings of an artery. Blocked or narrowed blood vessels can be caused by a blood clot or other matter (such as fatty deposits).<sup>1</sup>

Research has shown that COVID-19 is a risk factor for acute ischaemic stroke. One study showed that the risk of stroke was 10 times higher in the first 3 days and that the risk may be elevated for several months after.<sup>6</sup>

### 2) Haemorrhagic Strokes



Haemorrhagic stroke <sup>7</sup>

Approximately 15% of all strokes are haemorrhagic and are caused when a blood vessel bursts within or on the surface of the brain. The pressure from the leaked blood damages the brain cells. This type of stroke is more severe and is associated with a greater risk of death.<sup>4</sup> Two types of weakened blood vessels usually cause

haemorrhagic stroke: aneurysms and arteriovenous malformations. <sup>8</sup> There are two main types of haemorrhagic strokes:

- Intracerebral haemorrhage: This is when an artery in the brain bursts, causing bleeding within the brain.
- Subarachnoid haemorrhage: This is due to bleeding on the surface of the brain, causing bleeding into the fluid filled space between the brain and skull.

### Transient Ischaemic Attack (TIA)

TIA (also known as a mini stroke) is the same as a stroke, except the symptoms last less than 24 hours. It is important that they are taken seriously, since full strokes often happen after a TIA. Approximately half of all strokes that occur after a TIA, happen within 24 hours. 1 in 12 people with a TIA will have a full stroke within a week. <sup>4</sup>

### Risk Factors of Stroke



Anyone can have a stroke, however there are certain risk factors that present a greater risk:

**Age** - Statistics show that a stroke is more likely over the age of 55. This is because arteries naturally narrow and become harder with age. <sup>10</sup>

**Family history** - If a family member has had a stroke, especially before the age of 65, then the risk is higher. Sometimes strokes are also caused by genetic disorders. <sup>10,11</sup>

**Ethnicity** - Strokes are more common in people from African, Caribbean, and South Asian ethnic backgrounds.

**Gender** - Strokes are more common in women and kill more women than men. Risks include pregnancy history of preeclampsia/eclampsia or gestational diabetes, oral contraceptive use (especially when combined with smoking) and post-menopausal hormone therapy. <sup>11</sup>

**Certain medical conditions** - Certain medical conditions increase the risk of stroke. These include:

**Hypertension** - High blood pressure is one of the main causes of a stroke. It is a contributing factor in approximately half of all strokes.<sup>10,11</sup>

**Diabetes** - Diabetes almost doubles the risk of having a stroke. Many people with diabetes may also have high blood pressure, high blood cholesterol and may be overweight which will increase their risk even more. However, individuals with diabetes can reduce their stroke risk through appropriate management and lifestyle changes.<sup>10,11</sup>

**Atrial fibrillation** - Atrial fibrillation is an irregular heartbeat. Atrial fibrillation puts an individual at a five times greater risk of a stroke. As the heartbeat may be irregular and abnormally fast, the heart may not empty itself of blood at every beat which may lead to a clot forming in the blood left behind. Atrial fibrillation contributes to just under 20% of all strokes in the UK.<sup>10</sup>

**High LDL cholesterol** - Having high cholesterol can increase the risk of atherosclerosis which can increase the risk of a stroke.<sup>10</sup>

**Lifestyle factors** - Lifestyle factors have a large impact on increasing stroke risk. These include drinking too much alcohol, smoking, being overweight and not eating a healthy diet.<sup>10</sup>

**COVID-19 infection** - Some very early research has indicated that COVID-19 may be a risk factor for acute ischaemic stroke.<sup>6</sup>

## Recovery

Injury to the brain caused by a stroke can lead to widespread and long-lasting problems. Some people may recover quickly, but others may need long term support to help them regain as much independence as possible.

Strokes can have a psychological impact and can contribute to depression and anxiety. Cognitive functions can be impaired by a stroke which can affect communication, spatial awareness, memory, concentration, executive function, and the ability to carry out skilled physical activities. Movement can be affected as strokes can cause paralysis on one side of the body. In addition, some people have difficulty in swallowing (dysphagia). This can lead to lung damage which may trigger pneumonia.

## Symptoms of a Stroke

The signs and symptoms of a stroke vary but usually have a sudden onset. The main symptoms of a stroke can be remembered with the acronym FAST:

**Face:** Can the person smile? Has their face fallen on one side?

**Arms:** Can the person raise both arms and keep them there?

**Speech problems:** Can the person speak clearly and understand what you say? Is their speech slurred?

**Time:** If you see any of these signs. It is time to dial 999

# Act **FAST** and call 999.



**Facial**  
weakness



**Arm**  
weakness



**Speech**  
problems



**Time**  
to call 999

In addition to the FAST test, other symptoms that should also be taken seriously include:

- Sudden weakness or numbness on one side of the body, including legs, hands or feet.
- Difficulty finding words or speaking in clear sentences.
- Sudden blurred vision or loss of sight in one or both eyes.
- Sudden memory loss or confusion, and dizziness or a sudden fall.
- A sudden, severe headache.<sup>13</sup>

The expanded acronym BE FAST aims improve detection of strokes, especially in the fast recognition of acute ischaemic stroke, by including balance and vision problems:

**Balance:** Sudden loss of balance or coordination.

**Eyes:** Sudden vision changes in one or both eyes.

**Face:** Can the person smile? Has their face fallen on one side?

**Arms:** Can the person raise both arms and keep them there?

Speech problems: Can the person speak clearly and understand what you say? Is their speech slurred?

**Time:** If you see any of these signs, it is time to dial 999.

B	E	F	A	S	T
Balance	Eyes	Face	Arm	Speech	Time
Sudden changes in balance	Sudden vision changes	Face looks uneven, or one side droops	One arm or leg feels weak or numb	Speech is slurred	Call 911 now

## Medical Emergencies

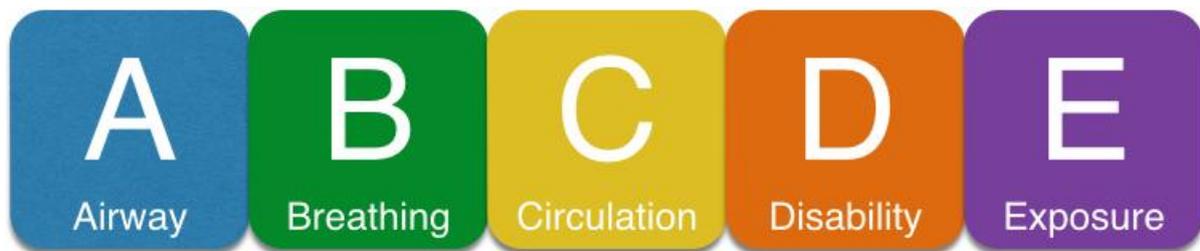
All registrants must follow guidance on medical emergencies and training updates issued by the Resuscitation Council UK. The General Dental Council state that “A patient could collapse on any premises at any time, whether they have received treatment or not. It is therefore essential that all registrants must be trained in dealing with medical emergencies, including resuscitation, and possess up to date evidence of capability.”<sup>14</sup>

In addition:

- There must be at least two people available to deal with potential medical emergencies when treatment is planned to take place.
- All members of staff, not just the registered team members, know their role if a patient collapses or if there is another kind of medical emergency.
- All members of staff who might be involved in dealing with a medical emergency are trained and prepared to deal with such an emergency at any time, and practise together regularly in a simulated emergency so they know exactly what to do.<sup>15</sup>

## Management of a Patient with a Suspected Stroke

An updated medical history should be taken from the patient at each appointment. This may help the dental team to identify any predisposing factors that may put the patient at an increased risk of a stroke. If a patient has had a CVA or TIA within the past 6 months there is a greater risk of them having another.



A patient with a suspected stroke should be assessed and monitored using the ABCDE approach and an ambulance should be called. High flow oxygen (15 litres per minute) may be required. The patient should be sat with head and shoulders raised, the airway should be maintained, and the patient carefully monitored for signs of deterioration until the ambulance arrives.

If the patient is unconscious and breathing normally, they should be placed into the recovery position.

If the patient is not breathing, or not breathing normally then CPR should be started immediately. A summary of the adult basic life support protocol is detailed below.

## Adult Basic Life Support Recap

**Danger:** Check for danger: sight, sound, and smell. Is there anything that may be dangerous to you, the person, or bystanders?

**Response:** Speak loudly to the person and gently shake/tap the shoulders if there is no response to your voice. Shout for help, but do not leave the person yet.

**Airway:** Open the airway using a head tilt and chin lift. Place two fingers under the point of the chin gently and lift, whilst placing the other hand on the person's forehead and gently tilting the head back.

**Breathing:** Look for signs of life such as movement, coughing, or normal breathing. Take no more than *ten seconds* to do this. If you do not think the person is breathing normally, or you do not think the person is breathing at all, treat this as a cardiac arrest.

**Circulation:** Begin chest compressions whilst asking someone else to **call the ambulance service**. If you are alone, you will need to leave now and make the call yourself before starting chest compressions. If an AED is available, send somebody to get it- do not delay starting chest compressions in order to get an AED.

Perform high quality, uninterrupted cardiopulmonary resuscitation (CPR). Deliver chest compressions on the lower half of the sternum (the centre of the chest). The compression rate is 100-120 per minute, with a compression depth of 5-6cm. Allow an equal amount of time for compression and release, ensuring the chest rises fully after each compression.

Give 30 compressions then two gentle rescue breaths sufficient to make chest rise as in a normal breath. The breaths must not be forceful or rapid and should take one second each to deliver. If either or both rescue breaths do not result in chest movement, return immediately to chest compressions. Continue chest compressions and rescue breaths at a ratio of 30:2. If you are unable or unwilling to provide ventilations, give continuous chest compressions. **80% of the CPR cycle should comprise of chest compressions.**

## Resuscitation Council UK Statement on COVID-19 in relation to CPR and resuscitation in first aid and community settings

The Resuscitation Council UK Statement was updated in August 2022 and is as follows:

“Recently published evidence suggests that COVID-19 is predominantly transmitted via the aerosol route as opposed to direct contact and via fomites. With this in mind, we have amended our guidance for health care staff to prioritise protection against the aerosol route of transmission.

The risk associated with COVID-19 has decreased because the majority of the population have been immunised, and more effective treatments and less virulent strains of COVID-19 now predominate. Widespread community testing programmes

have stopped, making it less likely that members of the public will know if someone has COVID-19.

New evidence has emerged suggesting a low likelihood that airway management manoeuvres are aerosol generating, leading to the removal of airway management manoeuvres from the list of aerosol generating procedures (AGP).

We await further evidence on whether chest compressions generate aerosol. Until such evidence emerges we remain concerned that the provision of chest compressions and the proximity of the rescuer to the patient may constitute a risk of aerosol transmission.

In light of this new information, we recommend:

- the curriculum for training members of the public and healthcare professionals reverts to the guidance set out in our quality standards
- members of the public and healthcare professionals follow our 2021 guidelines for resuscitation
- for those working in healthcare settings, the use of FFP3 masks or respirators as well as eye protection is still recommended when performing chest compressions for patients with suspected or confirmed COVID-19. AGP PPE, in particular FFP3 mask/respirator and eye protection, should be donned as swiftly as possible to avoid any delays in treatment.”<sup>16</sup>

## Conclusion

A Cerebrovascular accident (CVA) or stroke is caused by the interruption of blood supply to a portion of the brain. Brain cells begin to die in minutes, and it is therefore important that the dental team are able to recognise the signs and symptoms of a stroke so that rapid medical attention can be sought.

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We would like to thank Jon Andersen for his valuable input into this CPD article.

Jon Andersen is the sole proprietor of ST4 Training and has personally delivered over 2000 courses to a range of organisations. Previously, Jon was a Paramedic, Operational Station Officer, Aircrew Paramedic (one of the first six in Sussex), Advanced Exercise Referral Instructor, and Phase IV Cardiac Rehabilitation Exercise Specialist. Jon delivers training in Basic Life Support, Defibrillation using an AED, Dental Medical Emergencies, Fire Safety Awareness and The Role of a Fire Marshal.

## **Personal Development Plan and Reflective Learning**

This CPD is linked to the following GDC Enhanced CPD Development Outcomes:

**C. Maintenance and development of knowledge and skill within your field of practice.**  
**D. Maintenance of skills, behaviours and attitudes which maintain patient confidence in you and the dental profession and put patients' interests first.**

Reflective learning is now a requirement of the GDC Enhanced Professional Development Scheme. As such, you will now be given the option to answer some reflective learning questions, before your certificate is generated.

### **Further Reading**

[The Stroke Association](#)

[Download Link for a FAST information pack](#)

[Resuscitation Council UK Quality Standards](#)

[Resuscitation Council UK 2021 Resuscitation Guidelines](#)

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