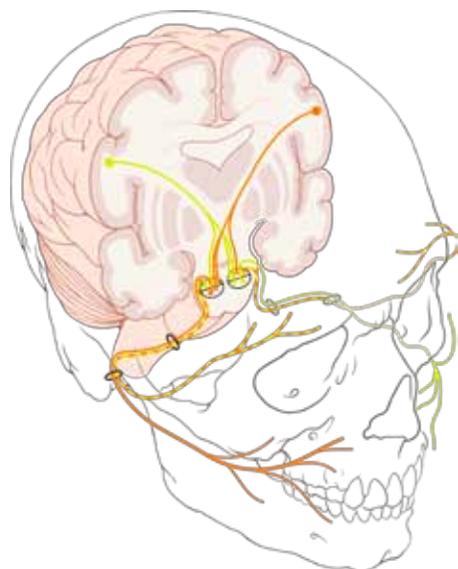


# Bell's palsy: A common cause of facial paralysis

By Jolene E. Cormier, EMT-P, CHT



*Facial nerve: the facial nerve's nuclei are in the brainstem. Orange: nerves coming from the left hemisphere of the brain. Yellow: nerves coming from the right hemisphere of the brain. Creative credits; Patrick J. Lynch, medical illustrator; C. Carl Jaffe, MD, cardiologist.*

## Introduction

Idiopathic facial paralysis, commonly known by the term Bell's palsy, is the most common cause of facial paralysis, affecting approximately 40,000 Americans annually according to the National Institute of Neurological Disorders and Strokes.<sup>1</sup> The condition is named for the Scottish surgeon who first described it in the 1800s, Sir Charles Bell.<sup>1,2</sup> Bell's palsy can occur suddenly and produces stroke-like symptoms by causing unilateral or bilateral facial paralysis. The acute onset of facial paralysis, and its resemblance to stroke, is likely to cause high anxiety among people who develop the disorder. This may precipitate a call to EMS for medical assistance. There are many differences between Bell's palsy and a stroke; a basic knowledge of the disease process and how it affects the face will help paramedics recognize this condition and differentiate between the two neurological disorders.

## Etiology

The VII cranial nerve (really a pair of nerves) is a facial nerve that originates in the brain stem between the pons and the medulla. This cranial nerve has both sensory and motor functions, but it is primarily a motor nerve responsible for controlling the muscles in the face. The right side of the face is controlled by one of the paired nerves and the left side by the other. Inflammation or trauma to the facial nerve appears to be the cause of the paralysis seen in Bell's palsy. It is very unlikely that both nerves will be affected—63 percent of the time the paralysis is seen only in the right side.<sup>2</sup>

The definitive cause of Bell's palsy remains unknown but ongoing research continues to provide clues. Many specialists believe a virus is to blame; often patients have reported having a viral infection prior to the onset of symptoms. Viruses possibly linked to the disorder include syphilis, herpes zoster, Lyme disease, HIV, Epstein-Barr, influenza and even the common cold.<sup>1,2</sup> Some studies point to a correlation between Bell's palsy and the herpes simplex virus type 1 (HSV-1) which has been found postmortem in a collection of cranial nerve fibers called the geniculate ganglion.<sup>2,3</sup> Another hypothesis points to edema and ischemia caused by compression of the facial nerve as the causative factor. The facial nerve travels through the temporal bone via a small canal called the facial or fallopian canal (known by both terms); compression of this nerve within that bony canal has been identified with the aid of MRI scans in patients suffering from Bell's palsy.<sup>2</sup>

Although the cause of the neurological disorder is unknown, research and tracking data do show certain populations to be at a higher risk of developing the disorder than others. These include women who are pregnant (who are over three times more likely to develop the disorder), diabetics and people older than 65 years of age. Besides a greater propensity for developing the neurological

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condition, diabetics are also more likely to be the ones who will not have a complete resolution of symptoms, and they are more likely to experience a recurrence of the disorder.<sup>1,2</sup> The peak age for Bell's palsy onset is during the third and fourth decades of life (between 20 and 40 years of age). A person with a recent history of the flu, a cold or an upper respiratory tract infection is also more likely to develop Bell's palsy; this is consistent with the theory that Bell's palsy is linked to a viral infection.<sup>1</sup> Finally, the disorder is more likely to manifest in the winter months, which could be due to the increased diagnosis of influenza during this same time period.<sup>2</sup>

## Signs and symptoms

Bilateral paralysis due to Bell's palsy is very rare. Only 1 percent of Bell's palsy patients will have bilateral facial paralysis; also, out of all cases of bilateral facial paralysis only 23 percent can be attributed to Bell's palsy.<sup>1,2</sup> The most common presentation for Bell's palsy is unilateral facial paralysis affecting the upper and lower portions of the face. The fact that it affects the forehead, eyes and mouth are important and will help with differentiating Bell's palsy from a cerebrovascular accident (CVA). This occurs because with Bell's palsy the peripheral facial nerve is damaged, not the central nerve. During a CVA the central nerve, the nerve running from the cortex to the brain stem, is damaged, resulting in only the lower half of the face being affected. To simplify matters, think of the brain being divided into left and right halves, then divide those halves again into top left, bottom left, top right and bottom right. The motor neuron tracts that control the forehead muscles originate from the brain stem; they divide and only one branch crosses over to the other side of the body just prior to leaving the brain. The tracts that control the lower half do not divide in this manner. This means motor control of the forehead is supplied by tracts coming from both sides of the brain. Injury in the brain to the central nerves will manifest as paralysis on the lower portion of the opposite side of the face; a CVA in the left hemisphere causes lower facial paralysis on the contralateral (right) side. If the injury is to the peripheral nerves, the crossover

and division has already occurred and the nerves serving that side of the face will be affected no matter which side of the brainstem they originated from. This is what happens with Bell's palsy, and it explains why the paralysis occurs on the same side as the lesion or injury and involves the entire side of the face (forehead included). This nerve structure also explains why a patient suffering from a CVA will typically not have trouble closing both eyes and frowning the brow—the nerve damage affects only the lower half.

Another differentiating factor is that Bell's palsy is a condition only of the VII nerve—no other area of the body should be affected. Gait, grip strength, pronator drift and other tests used to determine weakness should be normal for that patient. The patient history will include an acute onset of the paralysis. Facial drooping should be evident and patients may complain of pain. The muscles controlling the mouth will be affected; this may lead to drooling and a loss of taste. Since the facial paralysis includes the muscles surrounding the eye, patients will often not be able to close their eyes. This leads to dryness, irritation and possible corneal abrasions. However, fluid may be coming from the eye because patients are unable to blink and hold back the normal fluid. Besides the acute onset of unilateral facial paralysis, patients with Bell's palsy may complain of pain behind the ear on the affected side.<sup>4</sup>

## Diagnosis

Bell's palsy is a diagnosis of exclusion; all other possible causes of facial paralysis must be ruled out. These include Lyme disease, Guillain-Barré syndrome, Ramsay Hunt syndrome, meningitis and sarcoidosis. Ramsay Hunt syndrome is caused by an infection of the cranial nerves by the varicella zoster virus. Symptoms include a painful rash around the ears. A thorough patient history and assessment will help rule out many of these other possibilities and should include discussion of recent exposure to ticks, rash, fever, history of viral infection and the presence of ear pain.

## Treatment

Bell's palsy is usually a transient condition that begins suddenly and whose symptoms

peak within 48 hours. After two weeks the symptoms will typically begin to subside and most completely resolve within six months; however, 10 to 20 percent of patients with Bell's palsy will have no resolution of their symptoms and the paralysis will be permanent.<sup>1,2</sup> Patients are typically treated with a course of corticosteroids started within the first week after the onset of symptoms. Ideally, treatment should be started within 72 hours of onset.<sup>4</sup> This may be combined with a round of antiviral drugs, such as acyclovir or valacyclovir, based on the theory that Bell's palsy may be linked to a viral infection. There is some evidence that prednisone may be more beneficial than acyclovir (which is used for the herpes virus) at treating the disorder and decreasing the amount of nerve degeneration.<sup>5</sup> Artificial tears and an eye patch may also be prescribed to relieve eye dryness and irritation and to provide protection. There is no evidence to support the use of physical therapy, electrostimulation, heat pack or massage in the treatment of Bell's palsy.<sup>6</sup> Studies supporting the use of acupuncture for treatment have been flawed in both study design and reporting.<sup>4</sup>

## EMS

Because the disease symptoms are similar to that of a transient ischemic attack (TIA) or cerebrovascular accident, it is likely that many patients will call 9-1-1 when the symptoms appear. Most of these patients will be concerned that they are having a stroke, and they will be scared and anxious. As you respond, remember that Bell's palsy is the most common cause of lateral facial paralysis.

Upon arrival, note that the loss of motor control can affect the patient's airway, making him or her more susceptible to choking or aspiration from fluid or foods. Monitor the patient's airway and suction if required. As stated previously, to distinguish Bell's palsy from other causes of facial paralysis it is important to obtain a thorough patient history. Onset is typically acute; a slow onset of more than two weeks may suggest a mass lesion.<sup>7</sup> Since Lyme disease can cause facial paralysis, it would be important to ask the patient about any possible tick exposure. Also ask them about exposure to the influenza vaccine; there is evidence the vaccine can also cause facial paralysis.<sup>7</sup> Make note of any history involving

a rash, fever or any recent ear pain, as otitis media can lead to unilateral facial paralysis.

Most of these patients will also be experiencing discomfort because they are unable to close the eye on the affected side. If available, on-scene lubrication of the affected eye with artificial tears is important and can help comfort the patient.

Remember, Bell's palsy affects only the VII cranial nerve; the patient should not exhibit any pronator drift, and strength in the extremities should be normal and equal bilaterally. Pronator drift can be assessed by asking the patient to hold his or her arms at shoulder height with palms facing upwards. If one arm drifts downward, this is a positive test and is indicative of a central nervous system motor neuron lesion like that seen in CVA patients. Asking the patient to close his or her eyes while performing the test will exacerbate a positive result, making it more noticeable. Tapping the patient's palms in a downward motion toward the floor will make a positive result even more obvious. As with any patient presenting with neurological symptoms, a complete neurological assessment should be conducted. Even if Bell's palsy is suspected, any patient presenting with acute onset of facial paralysis should be transported to the emergency room for further evaluation.

## Conclusion

Bell's palsy is the most common cause of facial paralysis around the world.<sup>2</sup> While certain patient populations are more at risk, it can affect people from any socioeconomic background, of any ethnicity or living in any area of the world. As a result, there is a strong likelihood emergency personnel will come into contact with someone suffering from this disease process. Due to its close resemblance to a cerebrovascular accident it is important for EMS personnel to have a familiarity with the disease process. Although every patient presenting with acute unilateral facial paralysis should be transported to the emergency room, knowledge of Bell's palsy may help paramedics better serve their patients by aiding in an early diagnosis.

**This article is provided for education only. Always consult with your medical director and follow your local protocols in making treatment decisions.**

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## About the author

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