

Managing Peripheral Facial Palsy

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Editor's Note: The Expert Clinical Management series consists of shorter, practical review articles focused on the optimal approach to a specific sign, symptom, disease, procedure, technology, or other emergency department challenge. These articles—typically solicited from recognized experts in the subject area—will summarize the best available evidence relating to the topic while including practical recommendations where the evidence is incomplete or conflicting.

INTRODUCTION

Physicians frequently encounter patients with acute-onset peripheral facial palsy in the emergency department (ED). Although many cases are idiopathic (eg, Bell's palsy), others are associated with identifiable causes. Regardless of the cause, 85% of patients recover some function, with more than 70% achieving complete recovery.¹ The most appropriate treatment depends on the cause, which is often unknown at the ED evaluation. We discuss our approach to patients with peripheral facial palsy according to available evidence and, when the evidence is less clear, our expertise in this area (Figure 1 and Table 1).

HISTORY AND PHYSICAL EXAMINATION

The initial history and physical examination should focus on determining whether the patient has a peripheral or central cause for the facial nerve palsy. Because the forehead musculature receives innervation from both motor cortexes, a central facial palsy spares the forehead. A patient with peripheral facial palsy, however, will have involvement of the musculature of the upper and lower face (Figure 2). To discriminate between peripheral and central facial nerve palsy, emergency clinicians should assess the patient's ability to smile and close both eyes. The unaffected side of the face moves normally, magnifying whether the forehead musculature is involved. ED clinicians should also identify patients with severe facial palsy, defined as disfiguring asymmetry of a patient's face at rest or the inability of a

patient to completely shut the eyes despite maximal effort. These patients may benefit from antiviral treatment as outlined in the "Treatment" section.

In the remainder of the discussion, we focus on peripheral facial palsy (either unilateral or bilateral). A small proportion (approximately 8%) of patients with otherwise typical Bell's palsy will have additional cranial neuropathies.² The approach to patients with nonisolated facial nerve palsy is beyond the scope of this discussion.

IDENTIFIABLE CAUSES OF PERIPHERAL FACIAL NERVE PALSY

Once the clinician has diagnosed peripheral facial nerve palsy, he or she should next focus the history and physical examination to identify the causes. These include otitis media (especially in children), local trauma to the facial nerve, postsurgical complications, neoplasms, sarcoidosis, or reactivated varicella zoster virus infection of the geniculate ganglion (Ramsay Hunt's syndrome). Otitis media, local trauma, and postsurgical facial palsy will be apparent from a careful history and physical examination. Neoplasms and sarcoidosis are both uncommon conditions that rarely present with isolated facial palsy. Acoustic neuroma, a benign neoplasm that can cause facial palsy, should be suspected in patients who report hearing loss, tinnitus, or unsteady gait. Ramsay Hunt's syndrome presents with facial nerve palsy along with ipsilateral ear pain and vesicles.

Peripheral facial palsy can be a manifestation of early-disseminated Lyme disease and may be the first manifestation of infection. Lyme disease is the result of infection with *Borrelia* species transmitted by the bite of the *Ixodes scapularis* tick. In endemic areas (Figure 3), Lyme disease causes a significant proportion (up to 25%) of peripheral facial palsy, and treatment of these cases differs from the treatment of other causes of facial nerve palsy.³⁻⁶ Therefore, history taking should focus on clinical factors that increase the risk of Lyme disease, including presentation during peak season for the local geographic area, a clear history of an erythema migrans lesion, or the development of bilateral facial nerve palsy (simultaneous or

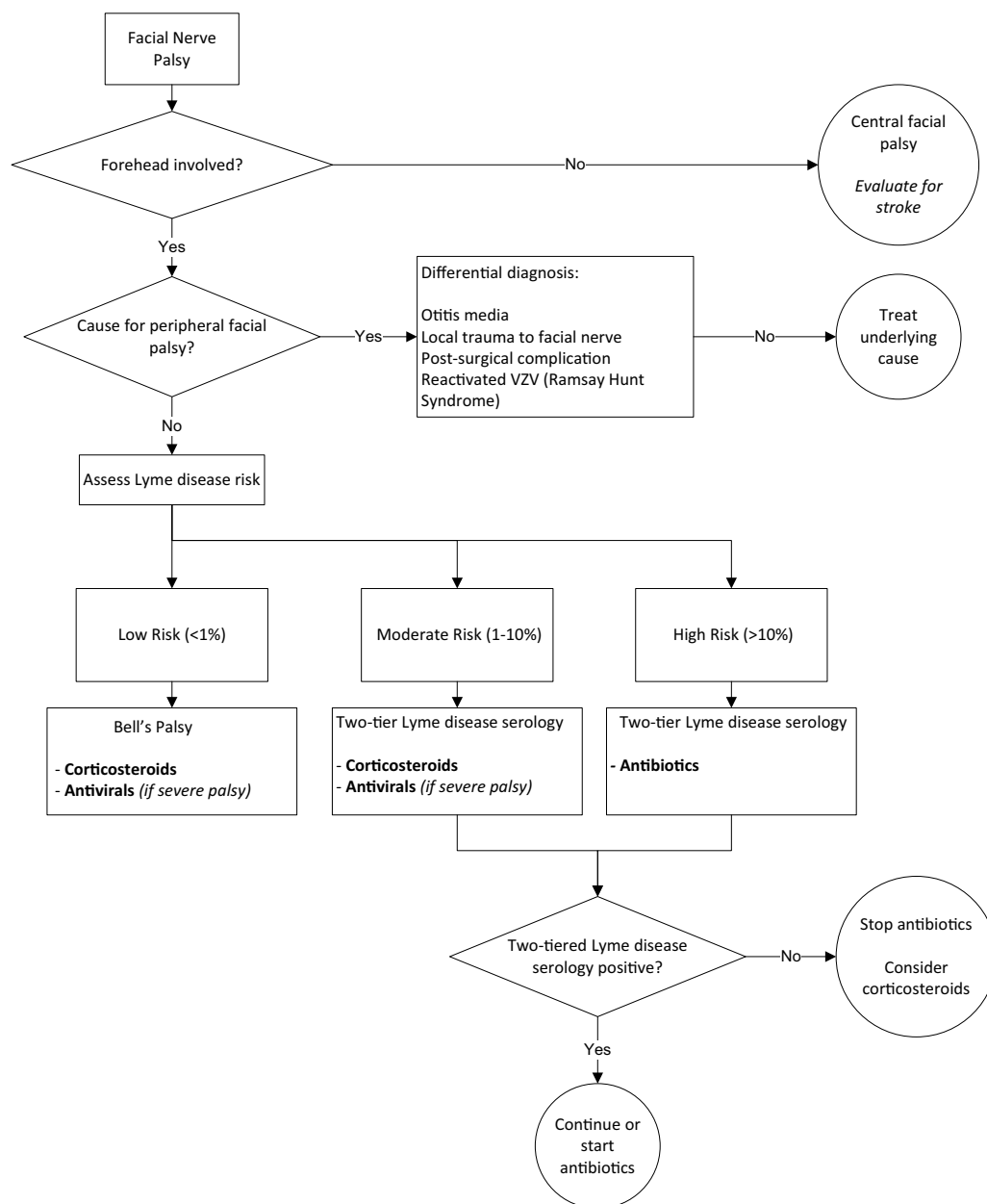


Figure 1. Approach to facial nerve palsy. VZV, Varicella zoster virus; BID, twice a day.

sequential), which is highly suggestive of Lyme disease in endemic regions.^{3,7} Most patients with Lyme disease do not report a preceding tick bite and some may have a preceding febrile illness.⁸

If a cause can be immediately identified, then targeted therapy should be initiated. If no definite cause can be identified, then the emergency physician must consider other causes that are not diagnosed by initial history and physical examination (eg, Lyme disease), as well as idiopathic facial palsy (ie, Bell's palsy). Physicians must make empiric treatment decisions for a patient with peripheral facial palsy based on the best available evidence

and before results of diagnostic tests such as Lyme disease serology.

DIAGNOSIS

ED clinicians accurately diagnose isolated Bell's palsy,⁹ and neither blood tests nor neuroimaging is required for these patients. Lyme disease is evaluated with 2-tier serology testing. The first tier is a sensitive enzyme-linked immunoassay test. If the test is positive or equivocal, the patient requires a second-tier confirmatory immunoblot, which most laboratories perform automatically in accordance with the enzyme-linked immunoassay results. A

Table 1. Peripheral facial palsy medications and eye care.

	Adult dosing	Pediatric dosing
Corticosteroids	Methylprednisilone Dose Pack	Prednisone/prednisolone 2 mg per kg x 10d
Lyme disease antibiotics	Doxycycline: 100mg BID x 14d	Children (all ages): Doxycycline 4 mg/kg (max 100mg) BID x 14d or Amoxicillin 50 mg/kg (max 500mg) TID x 14d
Antivirals		
Valacyclovir	1 g q8hr x 7d	20 mg/kg q8h x5d
Acyclovir	400mg 5 mes QD x 7d	<12 years: 40 to 80 mg/kg/day divided 3 times a day x 7d Max: 1000 mg/day ≥12 years: 200 mg 5 times a day OR 400 mg orally 3 times a day for 7d
Eye care for all patients:		
- Artificial tears		
For patients unable to close eye		
- encourage manual closing of eye at regular intervals		
- at night, wear a patch after applying lubricant		

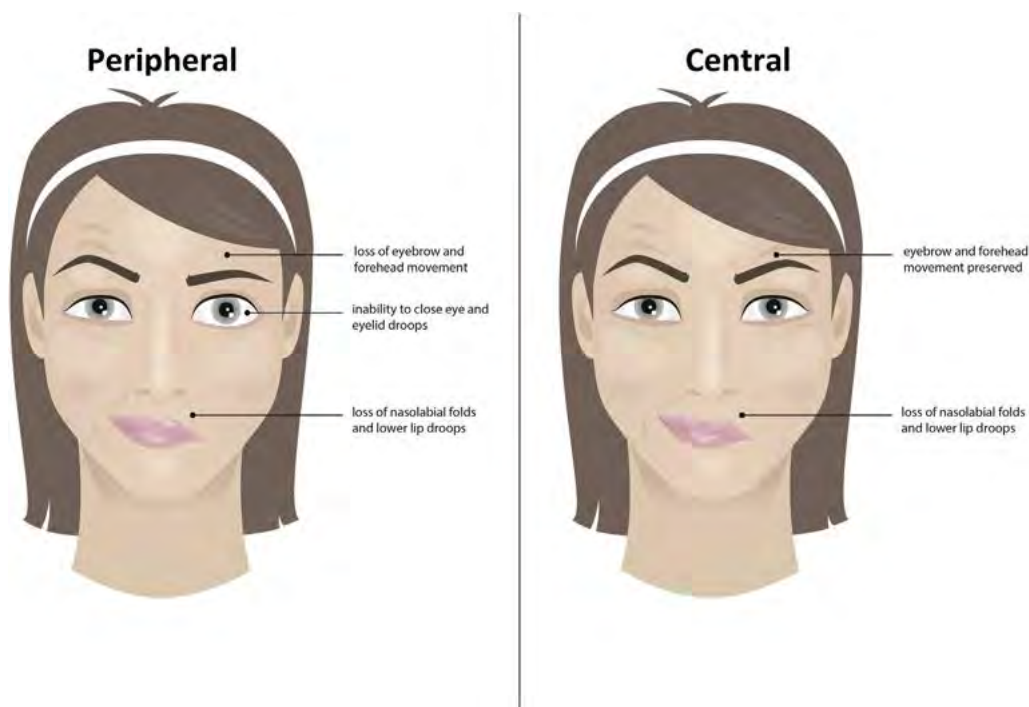
minority of patients with Lyme disease facial palsy will have initially negative Lyme disease serology and will require repeated testing in 1 to 2 weeks to document seroconversion.¹⁰

TREATMENT

Therapies for peripheral facial palsy should be targeted to maximize return of facial nerve function according to the most likely cause, as well as the severity. Patients with facial palsy need close clinical follow-up with frequent reassessment to ensure appropriate treatment because the palsy may improve or become more severe.

Antibiotics

Patients with peripheral facial palsy who present during endemic seasons in geographic areas where Lyme disease incidence is high should be treated with empiric antibiotics while awaiting Lyme serology results (Figure 3).^{11,12} Doxycycline should be the first-line antibiotic, given its high efficacy and excellent central nervous system penetration. Although clinicians have been cautioned against use of doxycycline in children younger than 8 years, the risk from a short course appears minimal,¹³⁻¹⁵ and the potential treatment benefits may outweigh the risks. For patients with doxycycline allergy or intolerance, a β -lactam antibiotic (eg, amoxicillin) should be used.

**Figure 2.** Illustration of differences used to distinguish peripheral from central facial nerve palsy.

Each dot represents one case of Lyme disease and is placed randomly in the patient's county of residence. The presence of a dot in a state does not necessarily mean that Lyme disease was acquired in that state. People travel between states, and the place of residence is sometimes different from the place where the patient became infected.

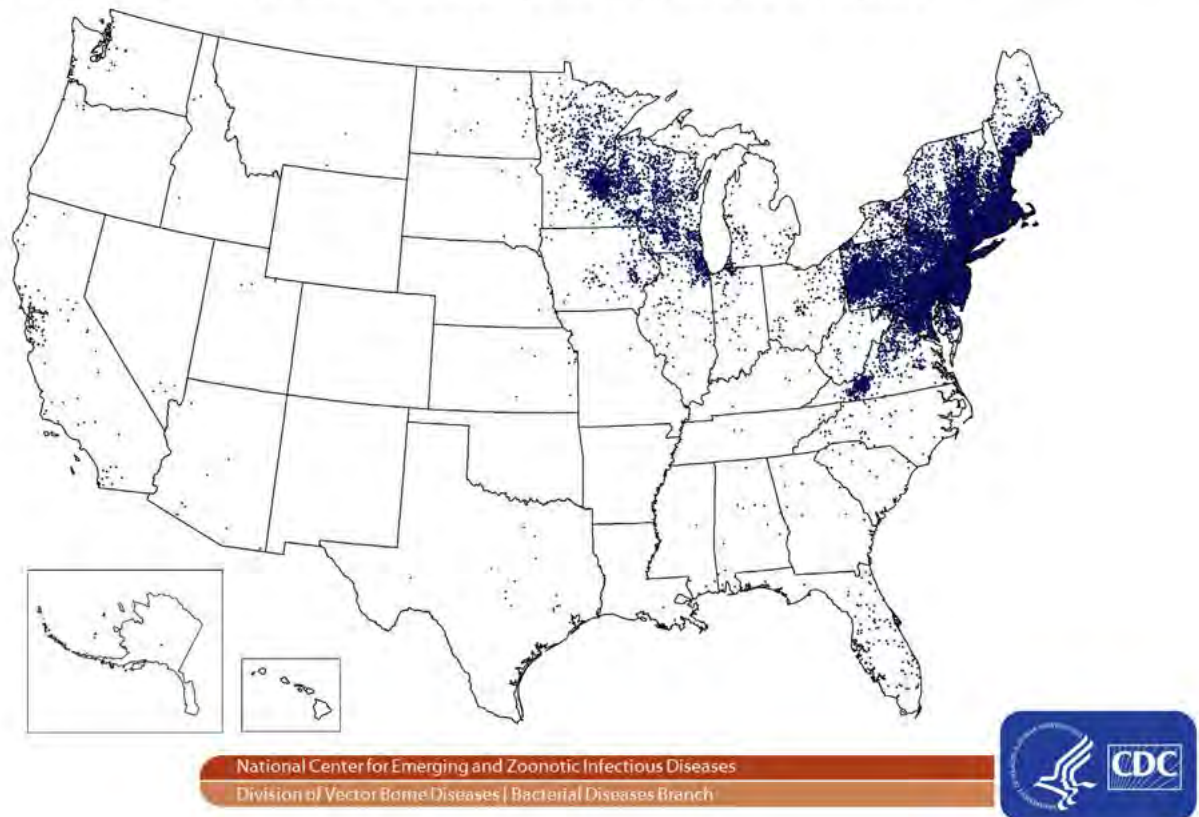


Figure 3. Reported cases of Lyme disease—United States, 2015.

Nearly 75% of patients with Lyme disease facial palsy who have a lumbar puncture performed will have evidence of meningitis (ie, cerebrospinal fluid pleocytosis).^{16,17} The purpose of a lumbar puncture is to differentiate patients with and without Lyme meningitis to help guide treatment decisions. Importantly, complications have been reported in more than one quarter of children with Lyme meningitis treated with parenteral antibiotics, mostly related to the indwelling catheter placed for medication delivery.¹⁸ Clinical trials in Europe, where *Borrelia* species differ, demonstrate that oral doxycycline is equivalent to parenteral antibiotics.^{19–28} There is variation in the use of parenteral versus oral antibiotics because clinical trials of doxycycline have not been conducted in the United States or in children. Nevertheless, many Lyme disease experts suggest that oral doxycycline can safely be used as initial treatment in most Lyme meningitis cases.^{29,30} Therefore, we do not recommend a lumbar puncture for patients with suspected Lyme disease facial palsy unless the ED clinician is concerned about bacterial meningitis (ie, not Lyme meningitis). We instead recommend initially treating all

patients with suspected Lyme facial palsy with doxycycline, regardless of the age or the presence of associated headache.

Corticosteroids

Corticosteroids initiated within 3 days of facial palsy onset in adults increase the likelihood of recovery, shorten the time to recovery, and reduce synkinesis (involuntary movements).^{31–34} In clinical trials in adults, 8 patients with severe facial palsy and 50 with mild to moderate facial palsy would need to be treated with corticosteroids for each additional patient attaining a full clinical recovery.³³ For adults who have an incomplete recovery, corticosteroids reduce the severity of residual palsy.^{34,35} An ongoing multicenter randomized trial will determine the clinical effect in pediatric patients with facial palsy.³⁶ In the meantime, we recommend applying the adult data pertaining to corticosteroids for children with isolated facial palsy (Table 2).

Corticosteroids should ideally be started within 3 days of peripheral facial palsy onset. The benefit of corticosteroids after 3 days is unclear,³⁷ but given the

Table 2. Design characteristics and outcomes in class 1 randomized controlled trials of steroids versus placebo for treatment of Bell's palsy.

Study	Ages Included	Maximum Duration of Illness for Trial Inclusion, Days	Medication/Dosing	Primary Outcome
Sullivan et al, 2007 ³¹	Adults	3	Prednisolone 25 mg twice daily×10 days	Complete recovery from facial palsy favored prednisolone: At 3 mo, AOR=2.44 (95% CI 1.55–3.84) At 9 mo, AOR=3.32 (95% CI 1.73–6.44)
Engstrom et al, 2008 ³²	Adults	3	Prednisolone 60 mg/day×5 days, followed by taper	Time to recovery favored prednisolone: HR 1.40 (95% CI 1.18–1.64)

AOR, Adjusted odds ratio; CI, confidence interval; HR, hazard ratio.

favorable safety profile and possibility of benefit, clinicians should administer corticosteroids for patients with severe facial palsy of more than 3 days' duration. Although various corticosteroid medications and dosing regimens have been studied, we recommend a methylprednisolone dose packs for adults. For children, use prednisone or prednisolone at 2 mg/kg for 10 days.

Corticosteroids should not be used for patients when Lyme disease facial palsy is strongly suspected. Three studies have examined the effect of corticosteroids in patients with Lyme disease facial palsy, with 2 showing that corticosteroids are not beneficial^{38,39} and 1 showing harm in patients with Lyme disease facial palsy.⁴⁰ When Lyme disease is suspected, ED clinicians should obtain Lyme disease serology and begin doxycycline treatment. If Lyme disease serology is

negative, then corticosteroids can be reconsidered when results are available.

Antivirals

Antiviral therapy has been used to treat peripheral facial palsy because of the association with herpes simplex virus infection, which cannot be distinguished from other forms of peripheral facial palsy according to clinical presentation. Antivirals should be prescribed in addition to corticosteroids for patients with severe Bell's palsy, according to recent evidence (Table 3).⁴¹ Antiviral therapy alone has not shown a treatment benefit for adults, but addition of an antiviral to corticosteroids was beneficial in 6 trials.^{31-34,42,43} A 2009 meta-analysis found a number needed to treat of 20 adults for 1 adult to have complete recovery from facial palsy when treated with antivirals and corticosteroids compared with corticosteroids alone.³³

Table 3. Design characteristics and outcomes in class 1 randomized controlled trials of antivirals in addition to glucocorticoids versus glucocorticoids alone for treatment of Bell's palsy.

Study	Ages Included	Maximum Duration of Illness for Trial Inclusion, Days	Antiviral/Dosing	Primary Outcome
Hato et al, 2008 ⁴³	Adult	7	Valacyclovir 1,000 mg/day×5 days	Complete recovery favored use of antivirals with glucocorticoids vs glucocorticoids alone for patients with severe or complete palsy (95.7% vs 86.6%, respectively; $P<.05$); no benefit for moderate palsy
Sullivan et al, 2007 ³¹	Adult	3	Acyclovir 2,000 mg/day×10 days	No benefit of antivirals with glucocorticoids vs glucocorticoids alone for complete recovery from facial palsy: At 3 mo, AOR=0.86 (95% CI 0.55–1.34) At 9 mo, AOR=0.61 (95% CI 0.33–1.11)
Engstrom et al, 2008 ³²	Adult	3	Valacyclovir 3,000 mg/day×7 days	No benefit of antivirals with glucocorticoids vs glucocorticoids alone for time to recovery from facial palsy: HR 1.01 (95% CI 0.85–1.19)
Lee et al, 2013 ⁴⁹	Adult	7	Famciclovir 750 mg/day×7 days	Only enrolled patients with severe or complete palsy; recovery (to House-Brackmann grade 1 or 2) ³ favored use of antivirals with glucocorticoids vs glucocorticoids alone (82.8% vs 66.4%; $P=.01$)

Subsequent analyses demonstrated a more modest benefit⁴⁴ or no benefit of combining antivirals with steroids.⁴⁵ A 2015 Cochrane systematic review found a benefit when antivirals were used in addition to corticosteroids compared with corticosteroids alone, but the authors conceded the limitations of the low-quality evidence.⁴⁶⁻⁴⁸ Studies have consistently shown that treatment benefits are greatest for patients with severe facial nerve palsy.^{43,49} We recommend use of antivirals only for patients with severe facial palsy, for whom the adverse effects and costs of the antiviral medication are mitigated by higher risk of incomplete recovery. Clinicians should prescribe valacyclovir or famciclovir over acyclovir whenever possible because less frequent dosing can improve medication adherence.

Eye Care

Peripheral facial palsy impairs the patient's normal ability to blink. As a result, the cornea can become dry, risking injury, including corneal ulceration. Therefore, all patients with peripheral facial palsy should be instructed to use artificial tears every hour when awake to keep the cornea moist to prevent injury. If patients cannot close one of their eyes, they should be instructed to manually close it at regular intervals to simulate blinking and to wear a patch at night after applying lubricant to keep the eye shut while sleeping.

CONCLUSION

Patients with acute-onset peripheral facial palsy commonly present to the ED for evaluation and treatment. ED clinicians should promptly initiate appropriate therapy to improve long-term recovery. For patients with high risk for Lyme disease facial palsy, we recommend empiric antibiotics while awaiting Lyme disease test results. All other patients should be treated with corticosteroids, and those with severe facial palsy should also be treated with antivirals.

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