



Pseudobulbar Affect

A Prevalent Yet Overlooked Disorder
in Neurological Injury & Disease



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White Paper**
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**Clinical
Neurological
Society of America**

About the Clinical Neurological Society of America

Established in 1974, the Clinical Neurological Society of America was created as an organization for neurologists practicing in clinical and academic settings. Since then, the society has grown into a nationwide organization of clinicians with a mission to improve clinical practice and patient care through education.

As a non-profit 501(c)(6) professional membership organization, CNSA is led by a volunteer board of directors who, like the society's professional members, hail from across the country and treat patients with a range of neurologic conditions.



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Introduction

Pseudobulbar affect is a disorder of emotional expression that occurs in conjunction with brain injury or neurodegenerative disease. Patients with pseudobulbar affect show frequent uncontrollable outbursts of laughing or crying that don't reflect their internal emotional state.¹

“Patients will often tell you that they feel some momentary emotion, for example, if they are watching the news and hear about a trauma victim. But instead of just being momentarily sad, they start crying and can't stop crying. That's pseudobulbar affect.”

– Howard S. Kirshner, MD

More than a third of patients with neurological injury or disease exhibit pseudobulbar affect, which most often manifests as crying rather than laughing.²

The condition occurs in amyotrophic lateral sclerosis, stroke, traumatic brain injury, brain tumors, Alzheimer's disease, Parkinson's disease and other movement disorders as well as multiple sclerosis.³ Pseudobulbar affect is more common after bilateral strokes, though it can occur even with unilateral strokes. The exact prevalence in these conditions is difficult to ascertain given that estimates in the literature have varied, possibly due to different methods of diagnosis.²

With the growing prevalence of age-related neurodegenerative conditions such as Alzheimer's⁴ and Parkinson's diseases,⁵ the prevalence of pseudobulbar affect is expected to increase over time.

Prevalence of Pseudobulbar Affect in Neurological Conditions

NEUROLOGICAL CONDITION	PREVALENCE* in largest published study ²
Traumatic brain injury	52%
Multiple sclerosis	46%
Amyotrophic lateral sclerosis	45%
Stroke	38%
Alzheimer's disease	29%
Parkinson's disease	26%
Across neurological conditions	37%

*(N=5290 patients) Diagnosis based on a score ≥ 13 on the Center for Neurologic Study-Lability Scale (CNS-LS).



Prevalence & Impact

Few factors are consistently related to the prevalence of pseudobulbar affect, and these may vary by neurological condition. Several studies found that symptoms of pseudobulbar affect were more common in women than men.^{2,6} The association depended on the neurological condition, however, and was not observed in most other studies.⁷⁻¹⁰

One large study of >8000 patients with multiple sclerosis found that pseudobulbar affect was more common in younger, non-white patients and was associated with more severe cognitive impairment;¹¹ another found an association with disease severity in Parkinson's disease.⁸ Depression has been associated with pseudobulbar affect in multiple sclerosis,¹¹ movement disorders¹² and stroke,⁸ although the finding is not universal.⁷

Pseudobulbar affect has a substantial negative impact on patients.

It is associated with a reduced quality of life,² as well as worse overall health status.^{13,14} A 2016 study of veterans with traumatic brain injury found that overall health status significantly decreased with increasing frequency and severity of pseudobulbar affect symptoms, which were also associated with pain, discomfort, anxiety and depression.¹³ Symptoms interfere with social and occupational functioning,¹⁵ often leading patients to leave their jobs.

“ I remember a case of a schoolteacher who had a stroke. He had good recovery from the motor and speech deficits but had quite a labile mood. When he went back to teaching, the students noticed that he had unpredictable episodes of crying and laughing. This was quite disturbing and he had to take disability leave from work. We saw him in the clinic, and I still remember how disturbing the disorder was for the patient and his family.”

– **Muhammad Farooq, MD, FAHA, FACP, RPNI**

“ One of my patients was a very successful young lawyer who developed multiple sclerosis. As the disease progressed, he began to show symptoms of uncontrolled laughter when things were not particularly funny and crying when things were not necessarily sad. It became embarrassing for him when dealing with clients.

When people came into his law office, they were often angry about a lawsuit or wanted to press charges and they expected to see a lawyer with a cool demeanor or affect. This person’s symptoms became so disruptive that he had to change his practice so that he worked from home, away from clients.”

– **Philip B. Gorelick, MD, MPH**

Why is it called pseudobulbar affect?

The term pseudobulbar refers to a condition with symptoms similar to those caused by lesions of the medulla oblongata, a part of the brainstem.¹⁶ Today, pseudobulbar affect is viewed as a disorder of neuronal circuitry.

In the medical context, affect refers to emotional state or tone.



Lack of Recognition

Without treatment, patients are often embarrassed by pseudobulbar affect and limit their social interactions.¹⁷

Patients report getting “funny looks” or embarrassed laughter from family members in response to their symptoms, and people think that they are acting crazy.¹⁸ Even simply discussing pseudobulbar affect with patients and families can be helpful.

“ If someone is bursting into emotional displays all the time, it interferes with relationships. It’s an important symptom. Once people are told what it is, they feel much better because they understand it and can explain it to others.

They don’t really have these deep emotions; they just can’t keep their emotional expressions from coming out.”

– **Howard S. Kirshner, MD**

“ When you do bring up pseudobulbar affect and explain it to patients and their families, they have a huge sense of relief knowing that it’s part of their disease and can be treated. The look on their faces gives you a tremendous sense that you have done something for them that day.”

– **Yvonne Curran, MD**

Barriers to Diagnosis

Pseudobulbar affect is underrecognized and underdiagnosed. In a survey of 2,318 individuals with neurological injury or disease, only 41% of those who screened positive for pseudobulbar affect and had spoken to their physicians about their emotional responses were given a diagnosis.¹⁹ That diagnosis was most often depression.¹⁹



Lack of Screening

One of the main reasons for the underdiagnosis of pseudobulbar affect is that clinicians do not routinely screen for it. It is easily overlooked amid the many symptoms experienced by patients with serious neurological conditions.

“ Many of us don’t think about pseudobulbar affect. Unless you ask family members or patients, you can completely miss it. We tend to focus on other issues such as primary or secondary prevention of stroke and other neurodegenerative disorders and don’t think about whether any other symptoms can affect the patient’s social life.”

– **Muhammad Farooq, MD, FAHA, FACP, RPNI**

“ In my own practice as I think about the uptick of virtual care, I probably spend less time probing patients in the virtual setting about things that aren’t painful or physically debilitating. This is something to think about as virtual care grows – we may have an even bigger barrier to diagnosis of pseudobulbar affect with virtual care.”

– **Richard Zweifler, MD**

Clinicians may lack training and education on pseudobulbar affect. In qualitative interviews with 13 patients who had been diagnosed with pseudobulbar affect, most indicated that their health care providers knew little or nothing about the condition.¹⁸

“ In all the years of training and practice, I don’t recall any formal lectures on pseudobulbar affect. This is quite shocking when you think of how many disease states it encompasses.”

– **Yvonne Curran, MD**

“ Unless the patient has obvious affective symptoms in the office or the family asks about it, I think most clinicians are focused on other aspects of the underlying disease.”

– **Philip B. Gorelick, MD, MPH**



Misdiagnosis or Overlap with Other Conditions

Another reason that pseudobulbar affect goes unrecognized is its similarity to psychiatric symptoms that often accompany neurological injury and disease – primarily depression. A study of 100 patients with Parkinson’s disease found that 41% had scores on a screening test indicative of pseudobulbar affect.²⁰ A significant association was found among depression diagnosis, current antidepressant use and higher scores. The authors concluded that this association indicates misdiagnosis or co-diagnosis of pseudobulbar affect with depression. Additional studies have also found a relationship between depression and pseudobulbar affect in patients with stroke⁸ and movement disorders.¹²

“ Pseudobulbar affect is likely to be commonly misdiagnosed as depression because of how common depression is post stroke.”

– **Richard Zweifler, MD**

“ We may have developed a blind spot for this affective problem. Depression is what we are trained to think about. For example, the depression rate in stroke patients may be 30-40%.”

– **Philip B. Gorelick, MD, MPH**

Indeed, the differential diagnosis for pseudobulbar affect can be confusing, as it includes many underlying neurological injuries and diseases: major depressive disorder, frontal lobe disorders, behavioral disturbances associated with Alzheimer’s disease, stroke, epilepsy, and traumatic brain injury.¹⁷ Characteristics that can assist in distinguishing pseudobulbar affect from depression are listed in the table below.

Characteristics that Distinguish Pseudobulbar Affect from Depression¹⁻³

PSEUDOBULBAR AFFECT		DEPRESSION
Sudden, transitory, uncontrollable outbursts of emotion		Ongoing sadness, anhedonia, hopelessness that lasts weeks or months
Emotional display incongruent with mood		Emotional display congruent with mood
Lack of somatic symptoms		Often accompanied by somatic symptoms
Exaggerated emotional response		Emotional response not typically exaggerated
Tends to respond to pharmacotherapy within days		Tends to take weeks to respond to pharmacotherapy



Different Terms, Diseases and Methods of Diagnosis

Historically, many different terms have been used to describe pseudobulbar affect, including pathological crying and laughing, emotional lability, involuntary emotional expression disorder, emotional incontinence, emotionalism, excessive emotionality and others.^{2,21} The different nomenclature has led to confusion and lack of diagnostic standards.¹

The many different underlying conditions that cause pseudobulbar affect make it difficult to coordinate terminology and diagnostic criteria.¹ Moreover, the overlap between pseudobulbar affect and psychiatric conditions may not be the same across neurological conditions. One study, for example, found a relationship between depression and pseudobulbar affect in Parkinson's disease and atypical parkinsonism, but not in amyotrophic lateral sclerosis.²²

Diagnostic criteria for pseudobulbar affect are available today based on a list of signs and symptoms originally defined in 1969²³ and revised in 2006.²⁴ The Center for Neurologic Study-Lability Scale was the first validated clinical measurement scale for pseudobulbar affect symptoms.²⁵ A score of 13 or greater on this scale is often taken to indicate pseudobulbar affect, but a cutoff of 17 or greater has also been used.

The Pathological Laughing and Crying Scale is also used for diagnosis of pseudobulbar affect, with a cutoff score of 13 or higher.

“When we were participating in a pseudobulbar affect study and evaluating patients for enrollment, many more patients came out positive on the screening questionnaire than you would pick up just watching them emotionally. I think it's important to have an index of suspicion for this and to look for it and not just diagnose the obvious cases.”

– Howard S. Kirshner, MD



Patient Aphasia

Diagnosis of pseudobulbar affect can be particularly difficult in patients who are not able to accurately communicate their feelings due to their underlying neurological condition.

“If patients have significant aphasia, either expressive or receptive, that will only add to the challenge of diagnosing and treating pseudobulbar affect.”

– Yvonne Curran, MD



Treatment

Only one medication is approved by the United States Food and Drug Administration for the treatment of pseudobulbar affect, dextromethorphan/quinidine (Nuedexta®).²⁶ Dextromethorphan/quinidine significantly improves the symptoms of pseudobulbar affect, as shown in a randomized, controlled trial of 326 patients where it significantly reduced the number of daily pseudobulbar affect episodes by 47% compared with placebo.²⁷ It is recommended that health care providers review the FDA label for this drug before prescribing it.

Antidepressant medications, including selective serotonin reuptake inhibitors and tricyclic antidepressants, are frequently used off-label to treat pseudobulbar affect.^{21,28} Evidence supporting use of antidepressants in pseudobulbar affect comes from small randomized, controlled studies in stroke patients,²⁹⁻³⁴ but rigorous evidence in large studies and different neurological populations is lacking.

Although dextromethorphan/quinidine is the only approved treatment of pseudobulbar affect, it may not be the most commonly prescribed. Instead, many patients with neurological disease are treated with antidepressants.^{20,35}

“Some health care providers may not have familiarity with the combination drug dextromethorphan/quinidine and thus, may need to learn more about it before they consider prescribing it for a patient. Health care providers must understand the mechanism of action of a drug and be convinced of a drug’s effectiveness and safety profile. We’ve already heard that clinicians are using antidepressants for this condition with which they are generally more familiar.”

– Philip B. Gorelick, MD, MPH

Approximately half of patients with pseudobulbar affect do not receive treatment for their symptoms. In one study, only 52% of 671 patients who discussed their emotional symptoms with their physician received medication for their condition.¹⁹ As noted previously, many patients with pseudobulbar affect symptoms receive treatment for depression and it is unclear whether this is a misdiagnosis of pseudobulbar affect or a co-diagnosis of depression.²⁰



Costs of Untreated Pseudobulbar Affect

Only one published study has assessed the economic costs associated with pseudobulbar affect in the United States; it involved 215 veterans with traumatic brain injury.¹³ In this study, the mean total health care utilization costs of those with mild pseudobulbar affect were 32% higher than those with low or no symptoms and 102% higher for those with moderate to severe symptoms.

For patients who are still working despite their neurological condition, pseudobulbar affect can impact employment and have ensuing economic consequences. For instance, the presence of pseudobulbar affect is associated with reduced work productivity and increased work absenteeism.¹⁵

For many patients, pseudobulbar affect contributes to major adverse life events, such as quitting or being fired from a job, getting a divorce, ending a significant relationship or becoming housebound.¹⁵ Caregivers of patients with pseudobulbar affect also report more impairment at work, reduced work productivity and a higher burden than caregivers of patients with the same neurological conditions but without pseudobulbar affect.¹⁵

“The financial costs of pseudobulbar affect in the working population can be substantial, for example if you lose your job or income. For people who are already retired, the personal costs are often much higher. People are afraid to go out to be with their friends or family and are embarrassed by their condition.”

– Yvonne Curran, MD

Indeed, the personal costs of pseudobulbar affect are important for patients who already suffer from the many challenges caused by their underlying neurological condition. Patients with pseudobulbar affect describe having to accept or adapt to their symptoms given that many clinicians lack knowledge about the condition. They describe their emotional outbursts as “the new normal” and that they are “hustling through” the episodes, “hanging in there” or “getting through.”¹⁸

Role of Health Care Professionals in Diagnosis

The neurological conditions that underlie pseudobulbar affect are typically life altering and involve many different bodily systems. These conditions are often treated by a multidisciplinary team involving primary care physicians, neurologists, psychiatrists, nurses, and physical and occupational therapists as well as other professionals.

Given the numerous demands on physicians' time in busy clinical practices, it can be difficult to address all but the most disabling symptoms.

“ We see these patients once or twice a year. Primary care providers see these patients more often, so I think it's critical to involve them and create awareness with them.”

– Muhammad Farooq, MD, FAHA, FACP, RPNI

“ The physical and occupational therapists spend more time with patients and may experience the behaviors more than other medical professionals. It might be helpful to educate these professionals more about pseudobulbar affect.”

– Yvonne Curran, MD

Multidisciplinary Treatment Team



Primary Care Physicians



Neurologists



Psychiatrists



Nurses



Physical & Occupational Therapists



Other Professionals

“For many stroke patients, we have home-based strategies where nurses or other team members go into the home to provide care. The idea is to pivot and help patients adhere to medical strategies, mitigate risk factors and address social determinants.

These home-based teams may be another target audience for education about pseudobulbar affect, particularly as such teams may grow over time.”

– **Richard Zweifler, MD**

Strategies for improving diagnosis of pseudobulbar affect include improving education for both clinicians and patients, and providing a checklist for the condition in patient materials.

“Unless you have pseudobulbar affect on a checklist, it will continue to be underreported. Currently, every patient leaving a stroke unit receives an education pamphlet on what to expect.

Even just placing a description of pseudobulbar affect in the pamphlet would be a huge step forward.”

– **Yvonne Curran, MD**

“It may be possible to create one screening question that would trigger a follow-up questionnaire.”

– **Philip B. Gorelick, MD, MPH**



Conclusion

Pseudobulbar affect is a disorder of emotional expression that affects more than a third of patients with brain injury or neurodegenerative diseases. Patients with pseudobulbar affect show frequent uncontrollable outbursts of laughing or crying that don't reflect their internal emotional state. The emotional episodes are disturbing and embarrassing and interfere with the ability to work, maintain relationships and participate in social activities.

Despite the frequency of pseudobulbar affect across neurological conditions, it is underdiagnosed. Simply recognizing this disorder can give patients and their families a sense of relief and may be facilitated by providing information as part of patient education packets. Education on pseudobulbar affect is also needed for the clinicians across different specialties who interact with neurological patients to enhance identification of this disturbing but treatable condition.

CNSA's Clinical Proceedings

The Clinical Neurological Society of America has nearly 50 years of experience bringing together leading experts and clinical neurologists for educational programming. With the launch of CNSA's Clinical Proceedings – a white paper series – the organization is expanding its educational resource offerings while raising awareness about unmet needs in neurology.

CNSA recognizes the expert panel members who contributed to the development of this white paper about pseudobulbar affect.



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