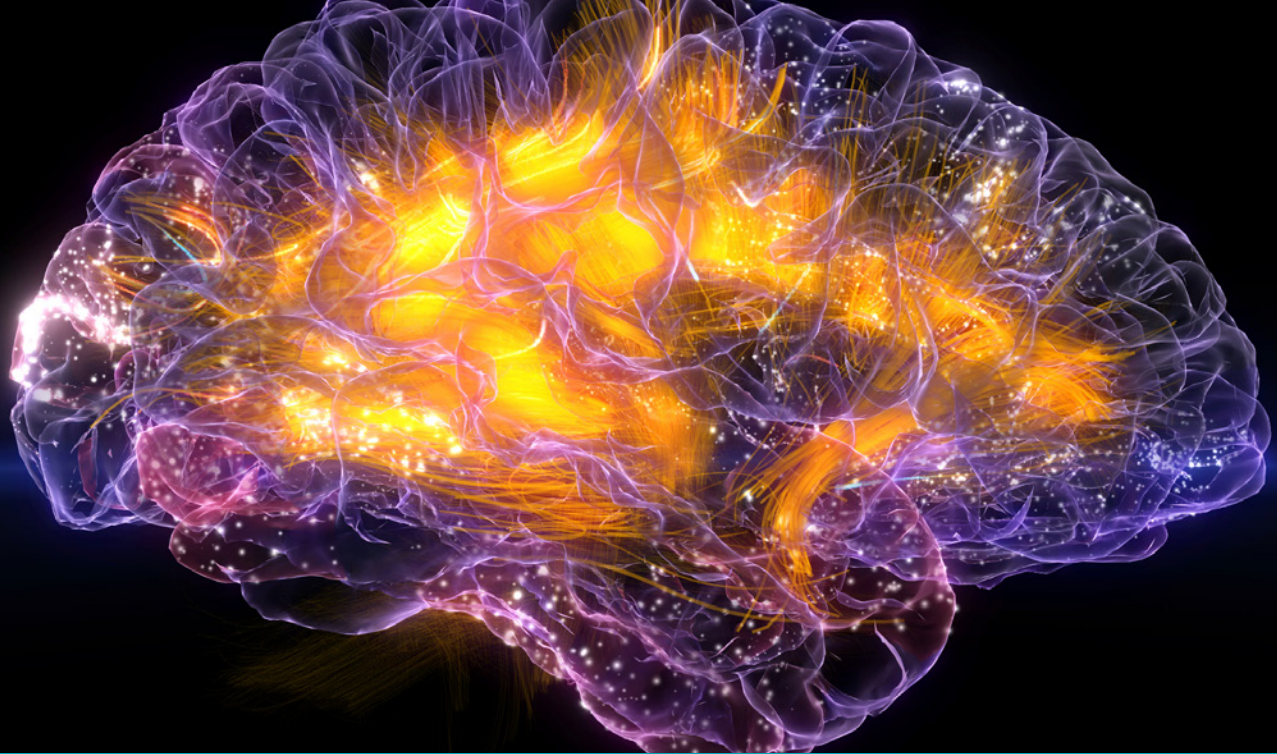


## A Healthcare Provider's Guide To Corticobasal Syndrome (CBS):

Diagnosis, pharmacologic management,  
non-pharmacologic management, and  
other considerations

This material is provided  
by UCSF Weill Institute  
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educational resource for  
health care providers.





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### Diagnosis

#### Definition

Corticobasal syndrome (CBS) is commonly considered part of the frontotemporal dementia (FTD) spectrum and is defined as progressive loss of motor function, usually on one side of the body, and which can involve apraxia, rigidity, dystonia, and in some cases, alien limb syndrome. This is to be distinguished from corticobasal degeneration (CBD), which is a tau related pathology that may present as CBS, but may also present as other clinical syndromes such as, behavioral variant FTD (bvFTD) and non-fluent variant primary progressive aphasia (nfvPPA).<sup>1,2</sup>

#### Epidemiology

The incidence and prevalence of CBS is unknown, but it is presumed to be underdiagnosed, due in part to the challenge of accurate antemortem diagnosis.<sup>2</sup> A study based in rural Japan reported prevalence rates of nine cases per 100,000 people.<sup>3</sup> The age of onset is typically between ages 50 and 70. Most patients do not report any family history of CBS.

#### Course

The clinical progression of CBS is variable. It presents as a progressive asymmetric movement disorder starting in one of the limbs. The underlying pathology can be CBD, but it can also be Alzheimer's disease or other neurodegenerative pathologies. Tremor is less common and gait abnormalities are variable.

Dystonia and apraxia are considered core features of CBS. Alien limb is a striking sign when present but may not be specific to CBS. Cognitive impairment and behavioral changes, particularly in the executive functions, are common findings. Patients with CBS may live anywhere from five to eight years, though the progression is variable.<sup>2</sup>

#### Etiology and Differential Diagnosis

Several different underlying pathology may be found in patients with clinical CBS. These include:

- A. Tau-related pathologies such as corticobasal syndrome or progressive supranuclear palsy
- B. TAR DNA-binding protein 43 (TDP-43) related pathology, specifically TDP-43 type A or B
- C. Alzheimer's disease pathology, which is defined by evidence of amyloid plaques and tau tangles
- D. Alpha synuclein pathologies such as Lewy body disease

#### Diagnostic Criteria for Clinical Syndromes Associated with CBD

Accurate antemortem diagnosis of corticobasal degeneration (CBD) pathology is difficult.<sup>2,4</sup> In 2013, the criteria for clinical phenotypes associated with CBD pathology were revised by an international consortium.<sup>5</sup>

Syndrome	Features
Probable corticobasal syndrome (CBS)	Asymmetric presentation of 2: <ul style="list-style-type: none"> <li>• Limb rigidity or akinesia</li> <li>• Limb dystonia</li> <li>• Limb myoclonus</li> </ul> Plus 2 of: <ul style="list-style-type: none"> <li>• Orobuccal or limb apraxia</li> <li>• Cortical sensory deficit</li> <li>• Alien limb phenomena (more than simple levitation)</li> </ul>
Frontal behavioral-spatial syndrome (FBS)	2 of: <ul style="list-style-type: none"> <li>• Executive dysfunction</li> <li>• Behavioral or personality changes</li> <li>• Visuospatial deficits</li> </ul>
Nonfluent/agrammatic variant of primary progressive aphasia (nfvPPA)	Effortful, agrammatic speech plus at least 1 of: <ul style="list-style-type: none"> <li>• Impaired grammar/sentence comprehension with relatively preserved single-word comprehension</li> <li>• Groping, distorted speech production (speech apraxia)</li> </ul>
Progressive supranuclear palsy syndrome (PSPS)	3 of: <ul style="list-style-type: none"> <li>• Axial or symmetric limb rigidity or akinesia</li> <li>• Postural instability or falls</li> <li>• Urinary incontinence</li> <li>• Behavioral changes</li> <li>• Supranuclear vertical gaze palsy or decreased velocity of vertical saccades</li> </ul>

## Pharmacologic Management

### Medications to Use

Currently, there are no disease-modifying agents available for any of the underlying pathologies of CBS and the treatment approach is currently symptomatic. There are several classes of medications used to treat different disease symptoms.

Selective serotonin reuptake inhibitors (SSRIs), atypical antipsychotics, and gabapentin may be helpful for managing different behavioral problems. Patients with CBS often experience severe depression with intact insight to their disease. Rigorous treatment with antidepressants is recommended for these patients. Levodopa/carbidopa may be tried for the parkinsonian symptoms,

but it may not be effective for patients with CBS. Treating the myoclonus with clonazepam and levetiracetam may help patients. Botulinum toxin can relieve the rigidity and pain of dystonia. Balfolen and Tinazidine are also sometimes used to help with dystonia and rigidity. Physical therapy can improve gait problems and other motor functions.

It is advised to review expected and realistic goals of treatment with patients (e.g., treatment is for symptomatic improvement and not a cure or reversal of disease). Expected benefits may be mild improvement in motor function, mood, and alertness. If the patient has vascular disease or mixed dementia, they should receive management and education regarding modification of cardiovascular risk factors.

### Medications to Avoid

Medications with strong anticholinergic side effects, such as sedating antihistamines, barbiturates, narcotics, benzodiazepines, gastrointestinal and urinary antispasmodics, CNS stimulants, muscle relaxants, and tricyclic antidepressants should be avoided. Antipsychotics should be used with caution. If used, carefully evaluate effectiveness of medication and consider discontinuing if there is no improvement in six weeks.<sup>6,7,8</sup>

## Non-Pharmacologic Management

### Healthy Lifestyle

There are lifestyle habits that promote health and well-being. Research suggests that the combination of good nutrition, physical activity, and mental and social engagement may provide benefit in promoting health although more study is needed to determine the actual mechanisms.<sup>9,10</sup> A heart-healthy diet (lower in sugar and fat and higher in vegetables and fruit) is considered to be good for both the body and the brain. An example is the Mediterranean diet that promotes nutrition based on fruit, vegetables, nuts and grains with limits on consumption of red meat and saturated fats. Physical exercise has been associated with improvement of mood and mobility, and a decrease in the risk for falls.<sup>11,12</sup> Physical activities that are socially engaging (walking or swimming with a friend and participating in exercise groups) can be especially enjoyable. Engagement in activities that are mentally stimulating (crossword puzzles, sudoku, computer games) is encouraged as long as the activity is enjoyable.

The Alzheimer's Association has more information on tips for maintaining your health: [alz.org/we-can-help-brain-health-maintain-your-brain.asp](http://alz.org/we-can-help-brain-health-maintain-your-brain.asp).

### Sleep

Disrupted sleep can negatively impact memory and thinking, though the mechanisms are not well understood.<sup>13</sup>

Components of sleep hygiene include:

- Avoid napping during the day
- Avoid stimulants such as caffeine, nicotine, and alcohol too close to bedtime
- Get regular exercise

- Avoid eating right before sleep
- Ensure adequate exposure to natural light,
- Establish a regular relaxing bedtime routine.
- Associate your bed with sleep. It's not a good idea to use your bed to watch TV, listen to the radio, or read.

For more details on sleep hygiene, you can refer to the National Sleep Foundation at [sleepfoundation.org/ask-the-expert/sleep-hygiene](https://sleepfoundation.org/ask-the-expert/sleep-hygiene).

## Other Considerations

### Support Resources

Alzheimer's Association: [alz.org](https://alz.org)

Family Caregiver Alliance: [caregiver.org](https://caregiver.org)

National Institute of Health/National Institute on Aging: [nia.nih.gov/alzheimers](https://nia.nih.gov/alzheimers)

The Association for Frontotemporal Degeneration: [theaftd.org/](https://theaftd.org/)

NINDS Corticobasal Degeneration Information Page: [ninds.nih.gov/disorders/corticobasal\\_degeneration/corticobasal\\_degeneration.htm](https://ninds.nih.gov/disorders/corticobasal_degeneration/corticobasal_degeneration.htm)

CurePSP: [psp.org](https://psp.org)

### Research and Clinical Trials

The National Institutes of Health maintains an extensive listing of clinical trials at [clinicaltrials.gov](https://clinicaltrials.gov). Academic medical centers may be engaged in research and clinical trials.

### Safety

Loss of balance leading to falls is a common symptom of CBS. If the patient is impulsive and not likely to wait for help when getting up, supervision may be necessary. Good lighting and removing throw rugs and clutter from living areas can help reduce tripping hazards. Ensure that shoes and clothes fit well and don't add to the risk of falling. Grab bars and hand railings may also help, especially in bathrooms. An occupational therapist can help with a home safety evaluation. A physical therapist can train the caregiver in assisted falls, how to help without getting hurt, and getting help if the person with CBS has already fallen and can't get up. The Clinical Excellence Commission (CEC) NSW Falls Prevention Program provides best practices for fall prevention and management.<sup>14,15</sup>

Patients with CBS don't typically wander. However, if wandering or getting lost is a concern, refer the patient and family to the MedicAlert +Alzheimer's Association Safe Return program (operated by the Alzheimer's Association) [alz.org/care/dementia-medic-alert-safe-return.asp](https://alz.org/care/dementia-medic-alert-safe-return.asp). Other strategies for ensuring safety concerns may include door alarms and increased supervision.

### Driving

Depending on cognitive and motor findings, the patient may be requested to stop driving, complete test of driving abilities through the Department of Motor Vehicles (DMV), or be referred to a driver's



safety course that will assess driving ability. Reporting to the department of motor vehicles should be consistent with state laws. Some states have mandatory reporting requirements: the diagnosis is reported to local health departments who then report to the DMV. Individual state requirements can be found at [dmvusa.com](https://dmvusa.com).

### Living Situation and Environment

It is important to determine if the patient's residential setting best meets his or her functional and cognitive abilities. Areas of concern may include personal safety (ability to manage medications safely, ability to manage nutritional requirements, ability to manage personal hygiene) and quality of life (activities and engagement that match the person's needs and abilities).

Types of living situations range from living at home alone or living at home with supervision, to board and care, assisted living, or memory care units.

### Elder Abuse

Patients with dementia and their caregivers are vulnerable to abuse. Refer to Adult Protective Services (APS) if there is concern for the well-being of the patient or the caregiver.

To locate an APS office in your state, see: [napsa-now.org/get-help/help-in-your-area/](https://napsa-now.org/get-help/help-in-your-area/)



### Legal Planning

Provide information about advance directives and durable power of attorney while the patient is in the early stages of disease and able to articulate his or her wishes. Make referrals for legal and financial advice, especially if there are concerns about the patient's judgment, decision-making, or vulnerability. A formal evaluation for capacity may be warranted. The Alzheimer's Association provides a [brochure that covers legal planning](#).

### Advanced Directives

These documents allow individuals to state their preferences for medical treatments and to select an agent or person to make health care decisions in the event they are unable to do so or if they want someone else to make decisions for them.

### Power Of Attorney

A Power of Attorney (POA) is a legal document that gives someone of an individual's choosing the power to act in their place. POAs can be for medical or financial matters.

### Living Will

A living will is a written, legal document that spells out medical treatments that an individual would and would not want to be used to keep them alive, as well as other decisions such as pain management or organ donation.

### Teaching Video for Providers

An example of a physician telling a patient she has dementia: [alz.org/health-care-professionals/dementia-diagnosis-diagnostic-tests.asp#alzheimers\\_diagnosis](http://alz.org/health-care-professionals/dementia-diagnosis-diagnostic-tests.asp#alzheimers_diagnosis).



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