A video guide to diagnosing Parkinson's and other movement disorders

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PDNSA

v2 September 2018

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Welcome

The Parkinson's Academy has worked together with MasterClass project award winner, Dr Frank Phelan, to compile this video guide to diagnosing Parkinson's and other movement disorders. Thank you to Frank and to everybody who contributed footage to help bring together what we hope is a valuable resource, not only in identifying the characteristics of Parkinson's but also in differential diagnosis.

About this guide

This interactive tool is easy to navigate and best used in electronic format. Simply use the menu on the left to explore the different sections. Click on the "next" buttons to progress within the section, or follow links in the text to other topics. Within each section we have compiled useful notes about the features and videos to illustrate them. Click on a video to open the video in your browser (you will need an internet connection). If you are viewing this guide in your browser, you may wish to right-click on the video to open the video in a new browser tab so that you can easily return to the guide. Each video is set to start at the correct place, and we have noted the end point of the relevant clip.

Contact us

We would love to know what you think of this video guide tool. Please get in touch with any comments, feedback or suggestions for new material we could add to it at: info@neurologyacademy.org or by completing our feedback form.

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Foreword

By Dr Frank Phelan

An article in the Guardian newspaper in June 2006, at the time when NICE guidance for Parkinson's disease was first launched, highlighted the fact that 47% of patients were misdiagnosed as having Parkinson's disease by GPs. More recently in August 2017, another article in the Daily Express raised ongoing concern that Parkinson's disease is commonly mistaken for Alzheimer's disease, stroke, stress, traumatic head injury and essential tremor.

Despite all the progress we have made in raising the profile of Parkinson's disease it appears that getting the diagnosis correct at the outset remains a significant challenge. A recent experience in my own Parkinson's disease clinic reinforces this notion. A lady in her sixties was referred by her general practitioner concerned that her Parkinson's disease tremor was now significantly disabling and wondered if we should start treatment. This lady was very anxious having been diagnosed with Parkinson's disease and had read up on the internet about all the potential problems she may run into. However, when I reviewed her I could find no features to support a diagnosis of Parkinson's and indeed she had all the characteristic findings in keeping with essential tremor and subsequently responded very well to treatment with propranolol.

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Foreword

It became clear to me that there is a need to provide better education for students, nursing staff and young doctors with regards to the diagnosis of Parkinson's disease and the other possible mimics such as multiple system atrophy, progressive supranuclear palsy, dementia with Lewy bodies, corticobasilar degeneration and essential tremor. When I reflect back to my own medical student days and my time as a junior doctor, I could not recall ever being told about the high prevalence of REM sleep behaviour disorder or anosmia predating the motor features of Parkinson's. Equally I do not recollect ever been shown how to assess bradykinesia, how one might differentiate the gait of someone with Parkinson's from that of progressive supranuclear palsy. I do not recall being informed about the subtle differences in cognitive problems experienced by patients with Parkinson's and Alzheimer's disease.

Therefore, in an effort to close what I considered to be quite a major gap in our teaching of movement disorder, I thought a description of the core features of Parkinson's disease and all of its mimics side by side, and supported by video clips demonstrating particular features of each of the conditions, would be helpful. Ultimately this would hopefully improve our subsequent diagnostic certainty and in so doing result in patients receiving a more accurate diagnosis and as a result better treatment.

Dr Frank Phelan
Consultant in Elderly Medicine, Mid Yorkshire Hospitals NHS Trust
Winner of the 2017 Parkinson's Academy MasterClass Project Award

Parkinson's: Core motor features

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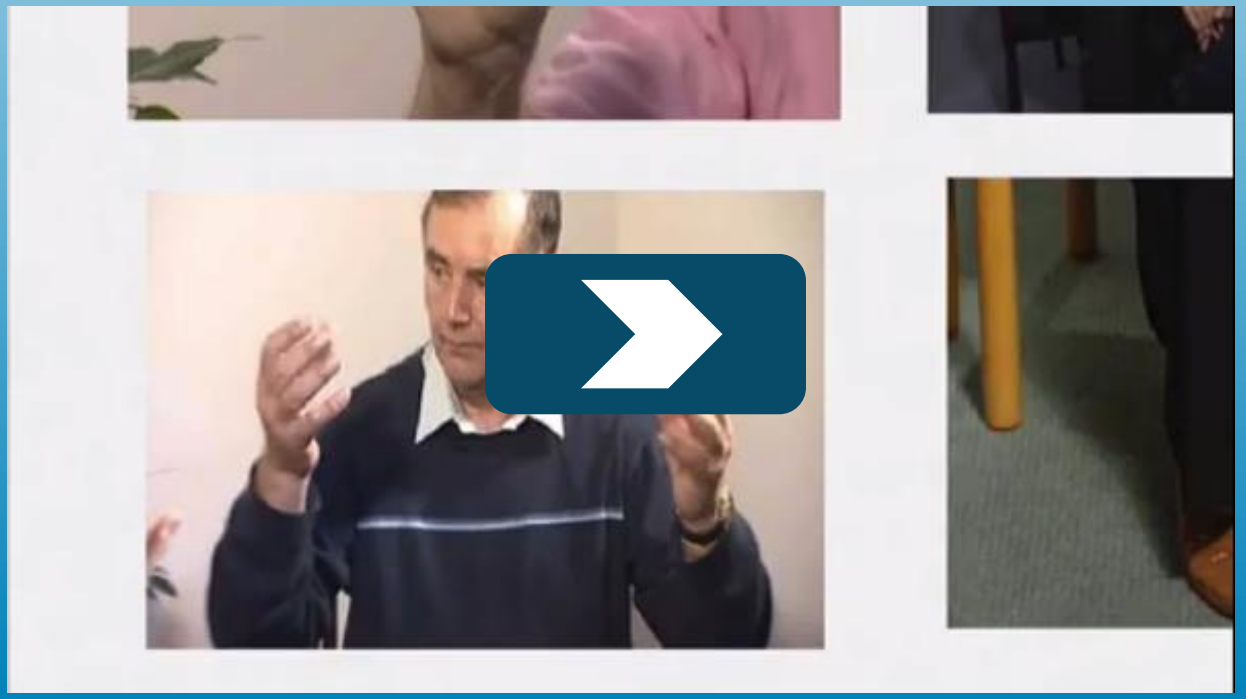
Bradykinesia (1)

- Generalised slowness of movement
- Usually starts with decreased manual dexterity of the fingers
- In the legs get dragging of feet, shorter shuffling steps or unsteadiness
- In examining assess the speed, amplitude and rhythm of finger tapping, hand gripping, pronation-supination of hand movements and heel and toe tapping

Clip ends at 21:11



Bradykinesia (2)

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Bradykinesia: Gait freezing & festination

As the disease progresses patients get gait freezing and festination (an irresistible impulse to take much quicker and shorter steps and therefore to adopt unwillingly a running pace)

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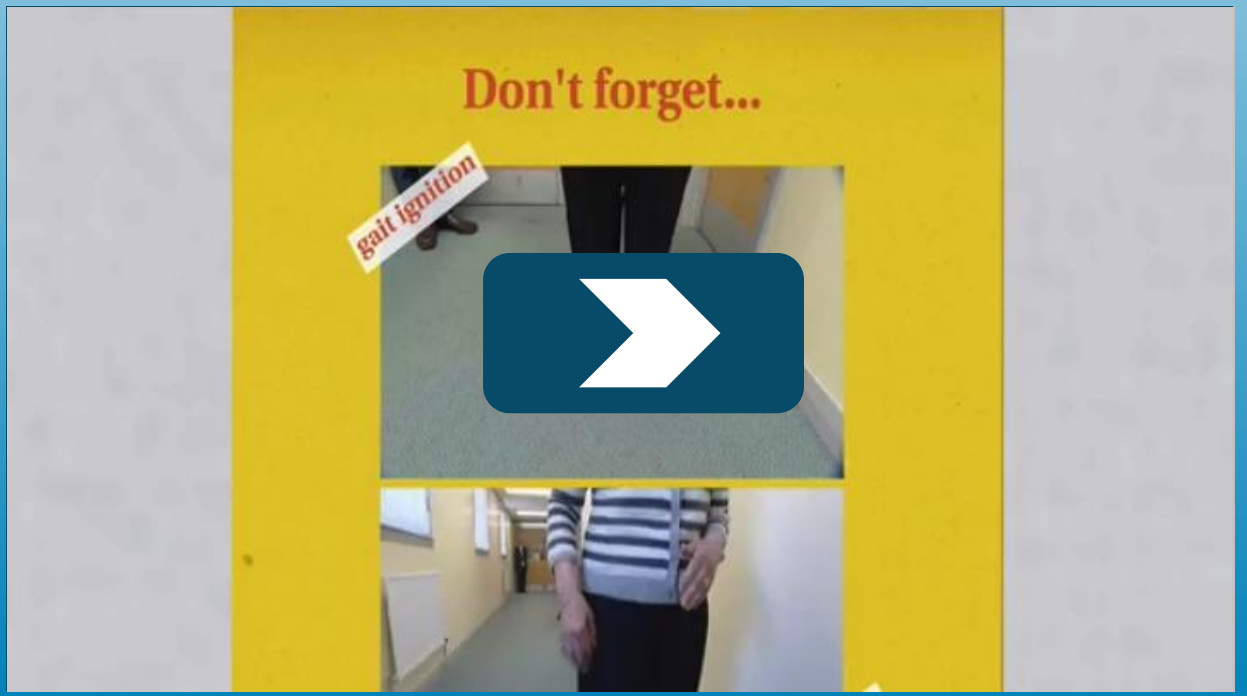

Rigidity (1)

- Increased resistance to passive movement
- Often begins unilaterally (on same side as the tremor (if present))
- Many patients develop cogwheel rigidity (a ratchety pattern of resistance and relaxation as the limb is moved through its full range of motion)
- Can affect any part of the body – striatal hand (extension of the proximal and distal interphalangeal joints and flexion of the metacarpophalangeal joints), decreased arm swing and stooped posture

Clip ends at 21:42

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Rigidity (2)

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Tremor (1)

- Pill rolling rest tremor most noticeable when tremulous limb is supported by gravity and not engaged in purposeful activities
- Can be present with action but generally more severe at rest
- Some have a re-emergent tremor when the tremor re-emerges after several seconds and has a frequency similar to the rest tremor

Clip ends at 21:59

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Tremor (2)

- In early Parkinson's the tremor is often intermittent, starting unilaterally and spreads contralaterally after several years
- Distracting the patient by asking to perform mental calculations or voluntary repetitive movements of the contralateral limb often accentuates the tremor
- Can also involve the legs, lips, jaw and tongue but rarely the head - contrast this tremor with that of essential tremor and dystonic tremor shown here.

Clip ends at 31:10

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Postural instability

Usually does not appear until later in the course of Parkinson's. Tested with the 'Pull – test'- patient with normal postural reflexes should be able to maintain balance and retropulse (step backwards) no more than one step. Patients with Parkinson's and postural instability are likely to fall or take multiple steps backwards.

Patients who fall earlier most likely have another Parkinsonian syndrome such as Progressive Supranuclear Palsy or Multisystem Atrophy.

Clip ends at 22:40

Pre-motor features

Some non-motor features of Parkinson's may present before motor ones and can predate motor features by as many as 10 to 15 years. The commonest such features are:

- Olfactory dysfunction
- Constipation
- Depression
- REM sleep behaviour disorder

No footage to show yet. Can you provide a video for this section? Read more

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Other Parkinson's motor features

- Craniofacial
- Visual
- Musculoskeletal

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Craniofacial

Craniofacial motor features:

- Hypommia – shown below
- Decreased spontaneous eye blinking
- Speech impairment
    - Hypokinetic dysarthria
    - Hypophonia
    - Palilalia
- Dysphagia
- Sialorrhoea

Clip ends at 1:03:20

Visual

Visual motor features:

- Hypometric saccades
- Impaired vestibulocular reflex
- Impaired upward gaze and convergence
- Eye lid opening apraxia

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Musculoskeletal

Musculoskeletal motor features:

- Micrographia
- Dystonia
- Myoclonus
- Stooped posture
- Camptocormia
- Pisa syndrome
- Kyphosis and scoliosis
- Dyskinesia – shown below

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Parkinson's non-motor features

Cognitive dysfunction & dementia

- Approximately 80% will develop dementia during the disease
- Older age and severity of Parkinson's motor features are associated with an increased risk of developing dementia
- The dementia is classically considered a subcortical dementia
- Dementia usually occurs late in the course of Parkinson's (compare this with Dementia with Lewy Bodies)

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Cognitive dysfunction & dementia: Executive function

- Problems of executive function (decision making and multi-tasking) are often the first signs of disturbed cognition
- Clinically, patients are diagnosed with Parkinson's disease dementia if their illness begins with Parkinson's and they develop dementia at least one year after the onset of Parkinson's motor features

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Psychosis & hallucination (1)

- Visual hallucinations are the most common psychotic symptom
- Can be attributable to Parkinson's itself or to the anti-Parkinsonian treatment (more likely with dopamine agonists)
- Delusions area also prominent and are usually paranoid in nature

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Psychosis & hallucination (2)

- Visual hallucinations are the most common psychotic symptom
- Can be attributable to Parkinson's itself or to the anti-Parkinsonian treatment (more likely with dopamine agonists)
- Delusions area also prominent and are usually paranoid in nature

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Mood disorders

- Depression - very common and often predates the diagnosis
- Anxiety
- Apathy - less prevalent in those with higher levodopa equivalent dosage (mainly dopamine agonists)

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Sleep disturbance

- Insomnia
- Daytime sleepiness with sudden onset of sleep attacks
- Restless legs syndrome
- REM sleep behaviour disorder
- Fatigue

The most common causes for sleep awakenings in Parkinson's are nocturia, difficulty turning over in bed, cramps, vivid dreams or nightmares and pain. Tremor may also contribute as does painful dystonias in some.

Clip ends at 54:50

Autonomic dysfunction

- Postural hypotension
- Constipation
- Dysphagia
- Diaphoresis
- Urinary difficulties
- Sexual dysfunction

These features are also present in MSA but generally more severe than Parkinson's.

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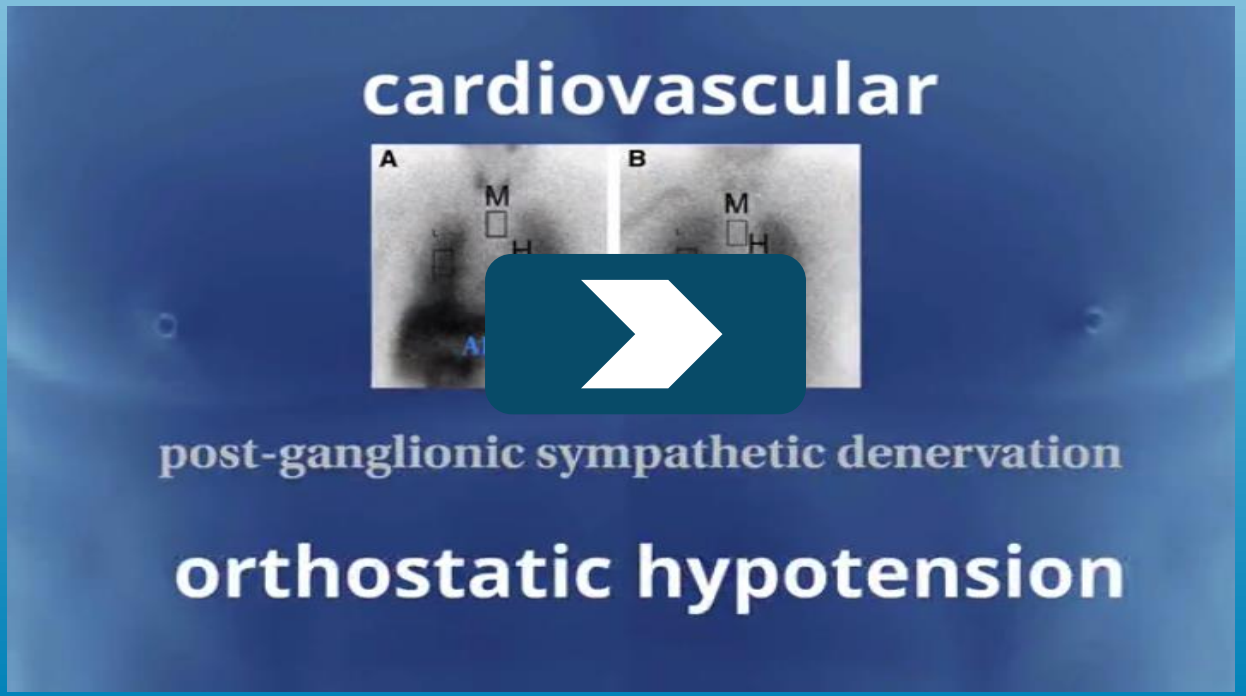
Autonomic dysfunction: Orthostatic hypotension

Clip ends at 57:53



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Autonomic dysfunction: Constipation

Clip ends at 1:01:37

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Olfactory dysfunction

- Common and may precede motor features or occur relatively early in the course of Parkinson's
- May not be noticed by patients

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Pain

- Painful sensory symptoms are common
- Lancinating, burning, tingling, generalised or localised
- Tends to correlate with motor fluctuations
- Dystonia which is often painful can occur in early Parkinson's or when levodopa wears off
- Morning dystonia affecting the foot is a common 'off' response to abstinence from levodopa during sleep

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Progressive supranuclear palsy

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PSP overview

Main features:

- Progressive supranuclear ophthalmoplegia
- Gait disorder, postural instability and falls
- Dysarthria
- Dysphagia
- Rigidity
- Frontal cognitive disturbance

Mean age of onset 65 years which is older than Parkinson's and almost no cases under 40 years

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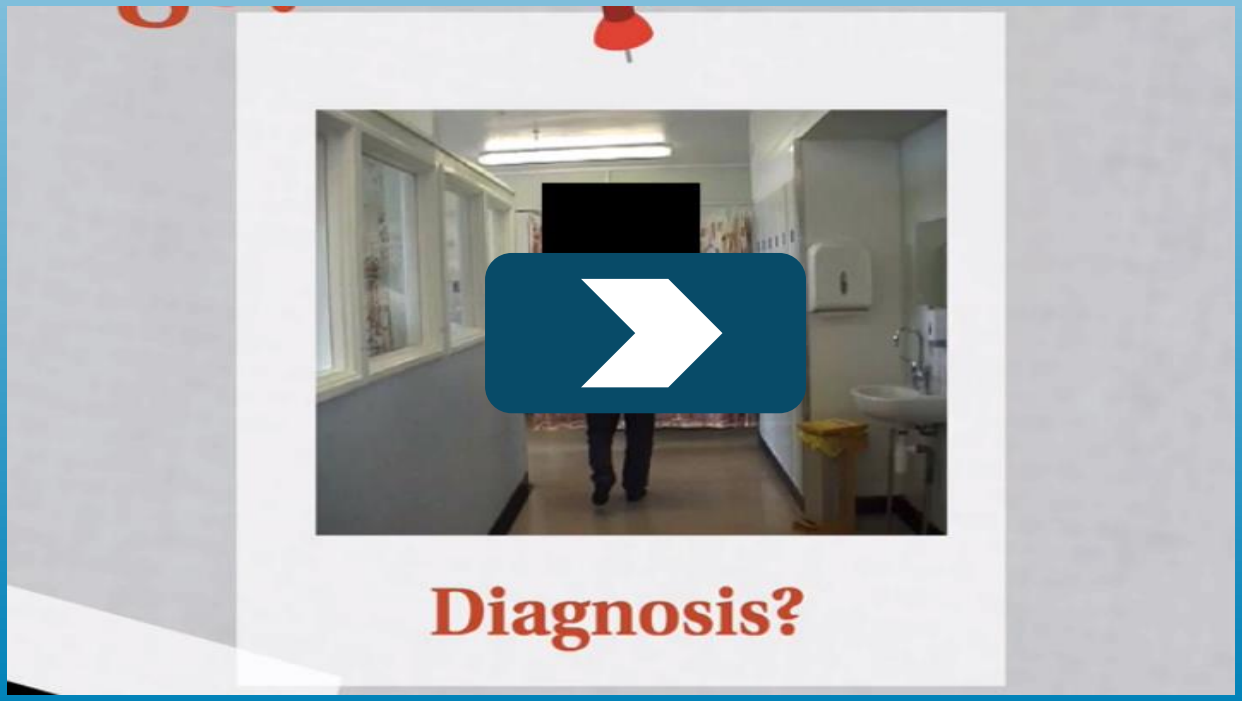

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PSP gait

- Stiff and broad based
- Tendency to have their knees and trunk extended (as opposed to flexed posture of Parkinson's)
- Arms slightly abducted
- Impulsivity (probably from frontal lobe involvement)
- Tend to pivot quickly rather than turn en block
- Usually fall backwards

Clip ends at 7:40

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PSP oculomotor findings (1)

- Supranuclear ophthalmoplegia may take as long as 10 years to develop
- Get a slowing of vertical saccades followed by a limitation of saccadic range
- Slowing and limitation of horizontal saccades may develop later
- Pursuit movements of the eyes are slow, jerky, and hypometric with unstable fixation
- The ophthalmoparesis is initially overcome by the oculocephalic (doll's eyes) manoeuvre

Clip ends at 9:10

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PSP oculomotor findings (2)

- Blepherospasm
- Eye lid opening apraxia

The combination of rare blinking, facial dystonia, and gaze abnormalities leads to the development of a classical facial expression of perpetual surprise or astonishment, shown below.

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PSP motor involvement

- Bradykinesia with marked micrographia
- Axial rigidity more apparent especially neck and upper trunk
- Retrocollis in some patients
- Spastic dysarthria, dysphonia and dysphagia are profound in the middle to later stages
- Stuttering and palilalia

Clip ends at 11:50

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PSP cognitive abnormalities

- Early and severe frontal (executive) deficits is a common finding
- Pseudobulbar palsy is another characteristic feature
- Hoarse groaning voice
- REM sleep behaviour disorder is only infrequently seen in PSP and this combined with intact olfaction can help differentiate PSP from Parkinson's and MSA

Clip ends at 13:12

Essential tremor

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Essential tremor (1)

- Most often affects the hands and arms bilaterally but can be asymmetric
- Can also affect the head and voice and uncommonly the face, legs and trunk
- Varies from a low amplitude, high frequency postural tremor of the hands to a much larger amplitude tremor that is attenuated by particular postures and actions
- Becomes immediately apparent in the arms when they are held outstretched and typically increases at the very end of goal directed movements

Clip ends at 30:30

Essential tremor (2)

- Tremor of the legs unusual and Parkinson's more likely
- Head tremor may be 'yes-yes' or horizontal 'no-no' and is usually associated with tremor of the hands or voice
- By definition tremor should be the only neurological manifestation of essential tremor
- Can get cog-wheeling but without rigidity
- Some patients develop enhanced physiological tremor due to anxiety
- A positive family history (autosomal dominant) is supportive of the diagnosis
- There may be a beneficial response to alcohol
- DAT scan can reliably distinguish Parkinson's and other Parkinsonian syndromes (MSA, PSP and CBD) from essential tremor

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Dystonic tremor

Dystonic tremor is tremor in parts of the body affected by dystonia.

- Usually a postural or task-specific tremor
- Can occur at rest but if occurs then often a jerky and irregular tremor
- Can sometimes be alleviated by sensory manoeuvres such as rubbing the face or part of a limb
- Maintaining certain postures can often exacerbate the tremor.

Clip ends at 46:10

Multiple system atrophy

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MSA overview

Main features:
- Akinetic-rigid Parkinsonism
- Autonomic failure
- Cerebellar ataxia
- Pyramidal signs
- Rapid progression regardless of dopaminergic treatment

Two phenotypes:
- MSA - P (Parkinsonism) and MSA - C (Cerebellar)

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MSA – P (1)

- Akinesia/bradykinesia
- Rigidity
- Postural instability and falls (usually within three years of motor onset)
- Irregular, jerky postural and action tremor
- Can get a rest tremor in up to one third of patients

Clip ends at 50:17

MSA – P (2)

Also can get:

- Stimulus-sensitive cortical myoclonus
- Hemiballism and chorea
- Dystonia unrelated to dopaminergic treatment
- Orofacial dystonia or dyskinesia
- PISA syndrome
- Camptocormia
- Speech – increased in pitch and quivering, strained element

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MSA – C

- Gait ataxia
- Limb ataxia
- Ataxic dysarthria
- Cerebellar dysfunction of eye movements
- Cerebellar scanning dysarthria

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MSA dysphagia

Dysphagia common in both types

↓

Dysautonomia is a feature of both (urinary dysfunction, orthostatic hypotension)

↓

Nearly all men develop early erectile dysfunction

↓

Also early features (and earlier and more severe than PD) get:

- Urinary frequency & urgency
- Incontinence
- Incomplete bladder emptying

↓

Sleep and breathing disorder:

- At least 1/3 get RBD
- 1/3 develop nocturnal and diurnal laryngeal stridor (and a risk for sudden death)

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MSA cognitive function

- Relatively well preserved compared with Parkinson's and other atypical Parkinsonian syndromes
- Can develop emotional incontinence (pseudobulbar affect) – crying inappropriately without sadness or laughing inappropriately without mirth

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MSA levodopa

- Have an association with Raynaud's phenomenon
- Usually there is a poor or un-sustained response to levodopa
- Levodopa-induced unilateral facial dystonic spasms are particularly suggestive of MSA

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Dementia with Lewy bodies

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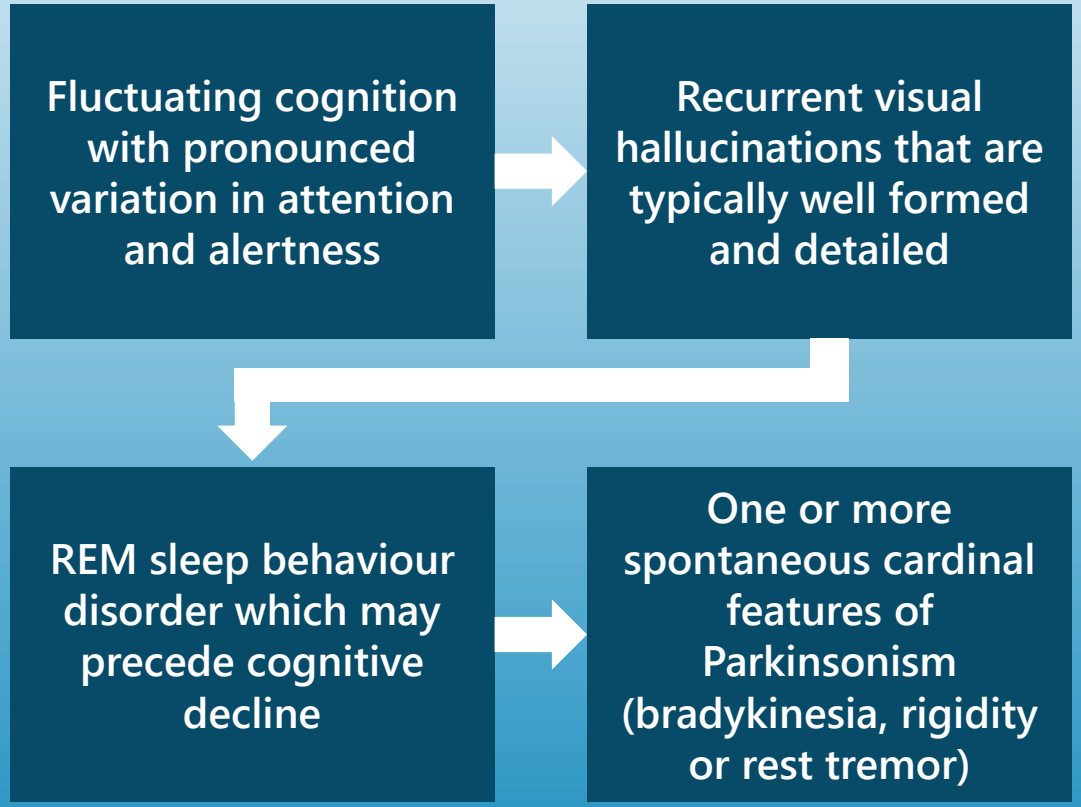
Dementia with Lewy bodies (1)



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Dementia with Lewy bodies (2)

Supportive clinical features
- Severe sensitivity to anti-psychotic agents
- Postural instability and repeated falls
- Syncope or other transient episodes of unresponsiveness
- Severe autonomic dysfunction
- Hypersomnia
- Hyposmia
- Delusions
- Hallucinations
- Apathy, anxiety and depression

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DLB cognitive dysfunction (1)

- Often the presenting symptom
- Early impairment in attention and executive function (unlike Alzheimer's disease when memory loss is the first feature)
- Early features include driving difficulty, misjudging distances, impaired job performance
- Early appearance of impaired figure copying (overlapping pentagons), clock drawing and serial 7's (or spelling WORLD backwards)

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DLB cognitive dysfunction (2)

- Fluctuation in cognition and level of alertness may occur early in the course of DLB
- There may be a brief decline in ability to perform an ADL and may be dramatic enough to raise the possibility of a stroke or seizure
- Patients can appear to 'black out' or lose consciousness, become confused or behave in a bizarre manner
- Can become excessively somnolent

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DLB cognitive dysfunction (3)

- Visual hallucinations are an early sign in DLB and may precede Parkinsonism
- RBD commonly associated with DLB often early in the course of the disease. Can precede the diagnosis of DLB by 20 years

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Corticobasal degeneration

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Corticobasal degeneration (1)

- Progressive asymmetric movement disorder
- Symptoms initially affect one limb
- Various combinations of:
    - akinesia, extreme rigidity, dystonia, focal monoclonus, ideomotor apraxia and alien limb phenomena
- Cognitive impairment
- Parkinsonian features may present later
- Cognitive features include executive dysfunction, aphasia, apraxia, behavioural change and visuospatial dysfunction with relatively preserved episodic memory

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Corticobasal degeneration (2)

- Rigidity can be profound in the limb (and less so axially)
- Dystonia involves abnormal posturing of the hand and foot (toe curling and foot inversion) that quickly become fixed
- Along with apraxia the affected limb is rendered useless
- Gait is variable and can be similar to Parkinson's or be a wide based 'frontal lobe' or freezing gait
- Tremor less frequent than Parkinson's and more postural irregular and jerky
- Language problems may present early in the disease course

No footage to show yet. Can you provide a video for this section? Read more

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Corticobasal degeneration (3)

Oculomotor dysfunction
- Abnormal eye movements in around a third at presentation
- Pursuit eye movements slow and saccadic
- Vertical saccades usually normal (unlike PSP)

Cortical dysfunction
- Characteristic of CBD
    - Cognitive impairment and behavioural changes
    - Limb apraxia and alien limb
    - Aphasia
    - Depression

No footage to show yet. Can you provide a video for this section? Read more

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Can you provide a video for this resource?

We are still looking for more video footage to improve this video guide.

If you can help by contributing a video we would be delighted to hear from you!

Please contact us at: info@neurologyacademy.org

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Consent form

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