

# PET CT in mild cognitive impairment and dementia

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# Focus on reporting:

Background

Normal scan

Common dementia syndromes

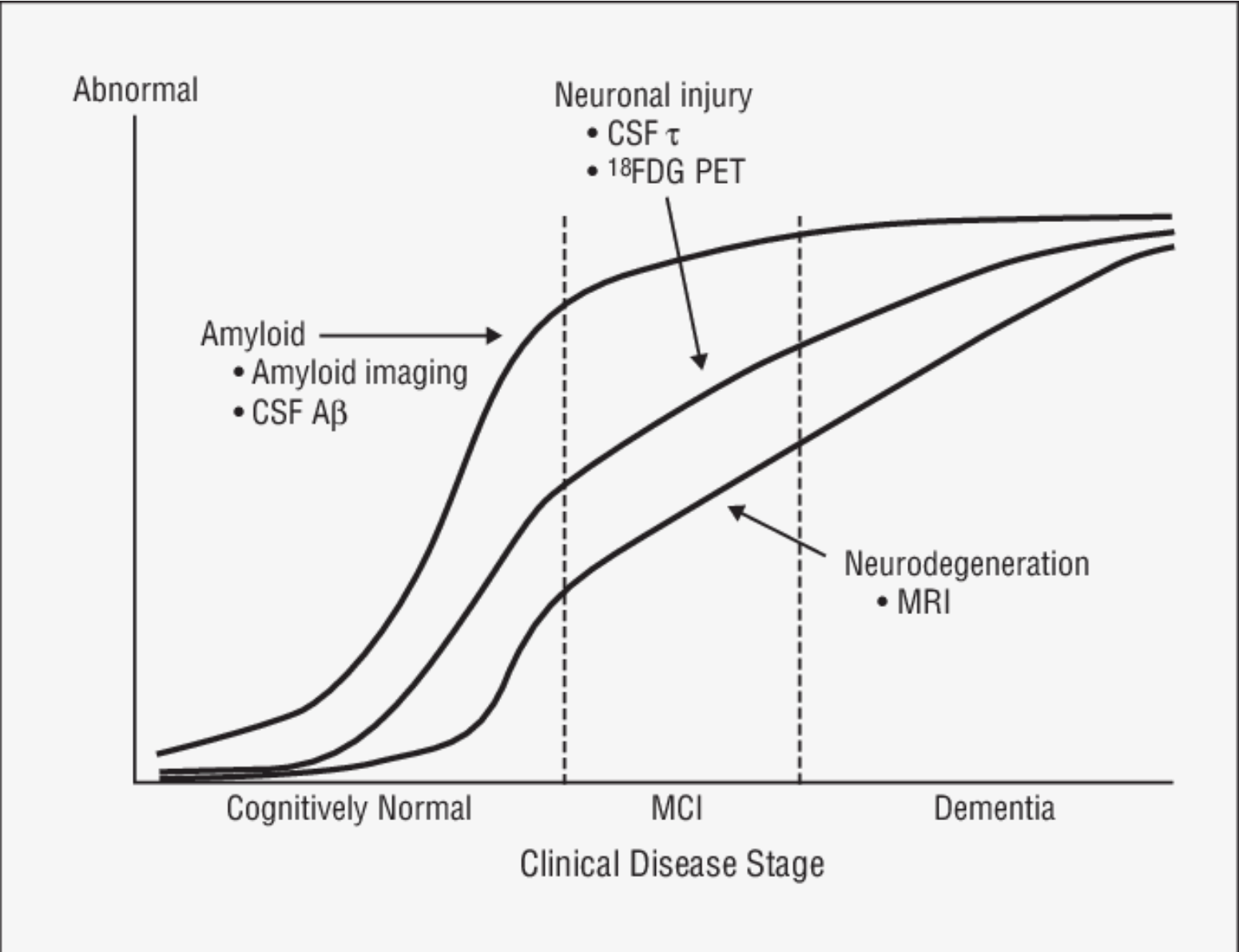
Tips in reporting

# What does a FDG PET scan show?

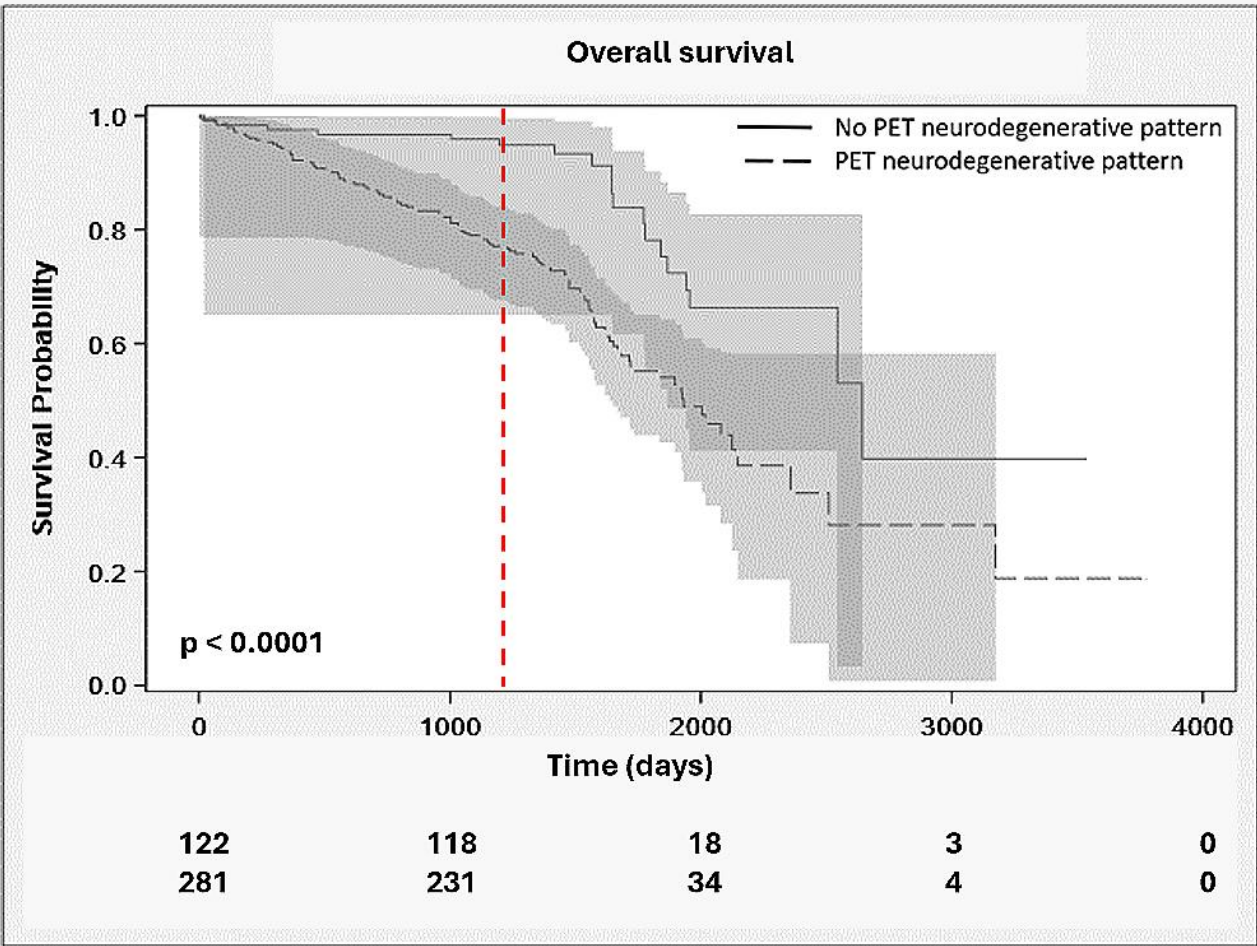
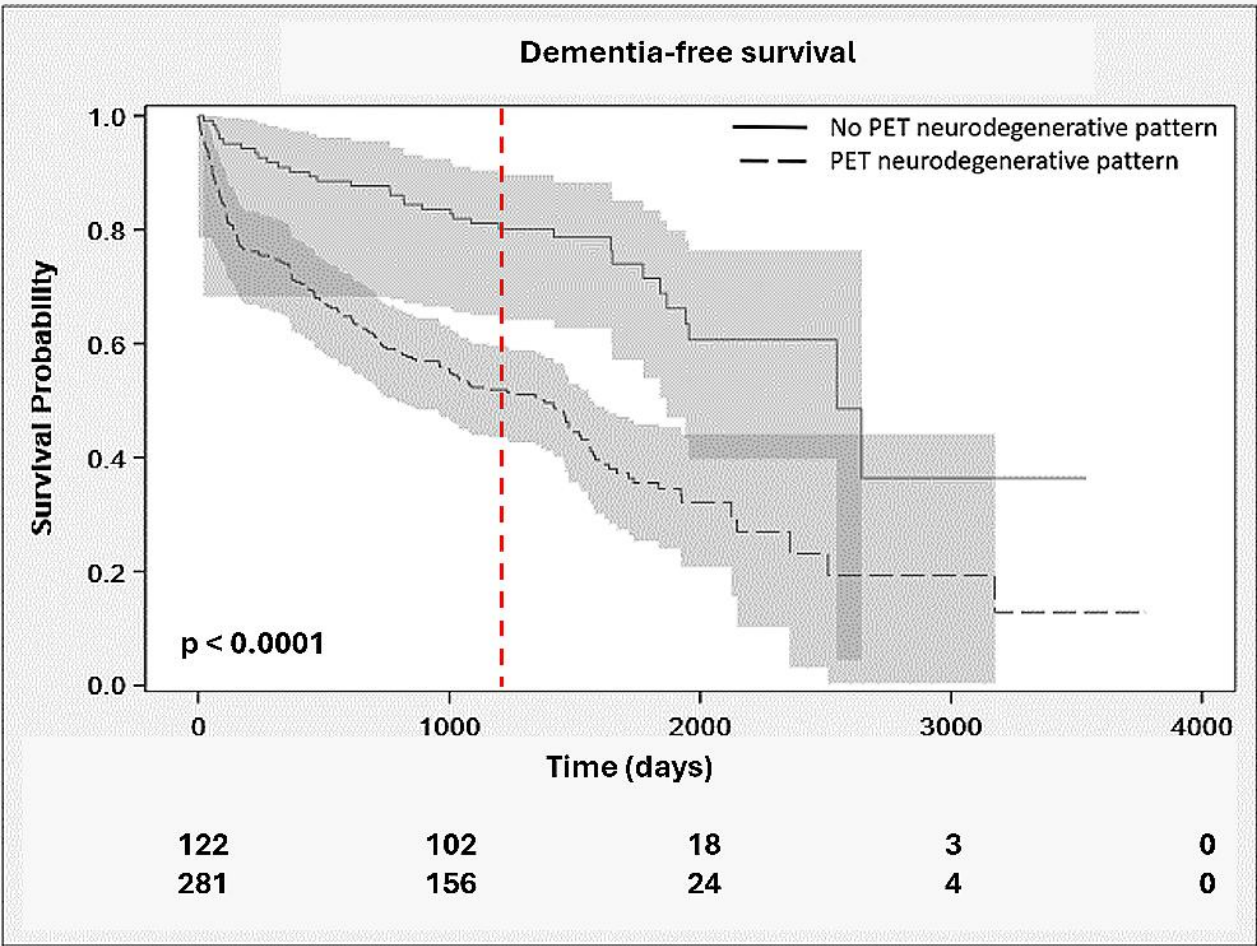
Glucose activity within the brain

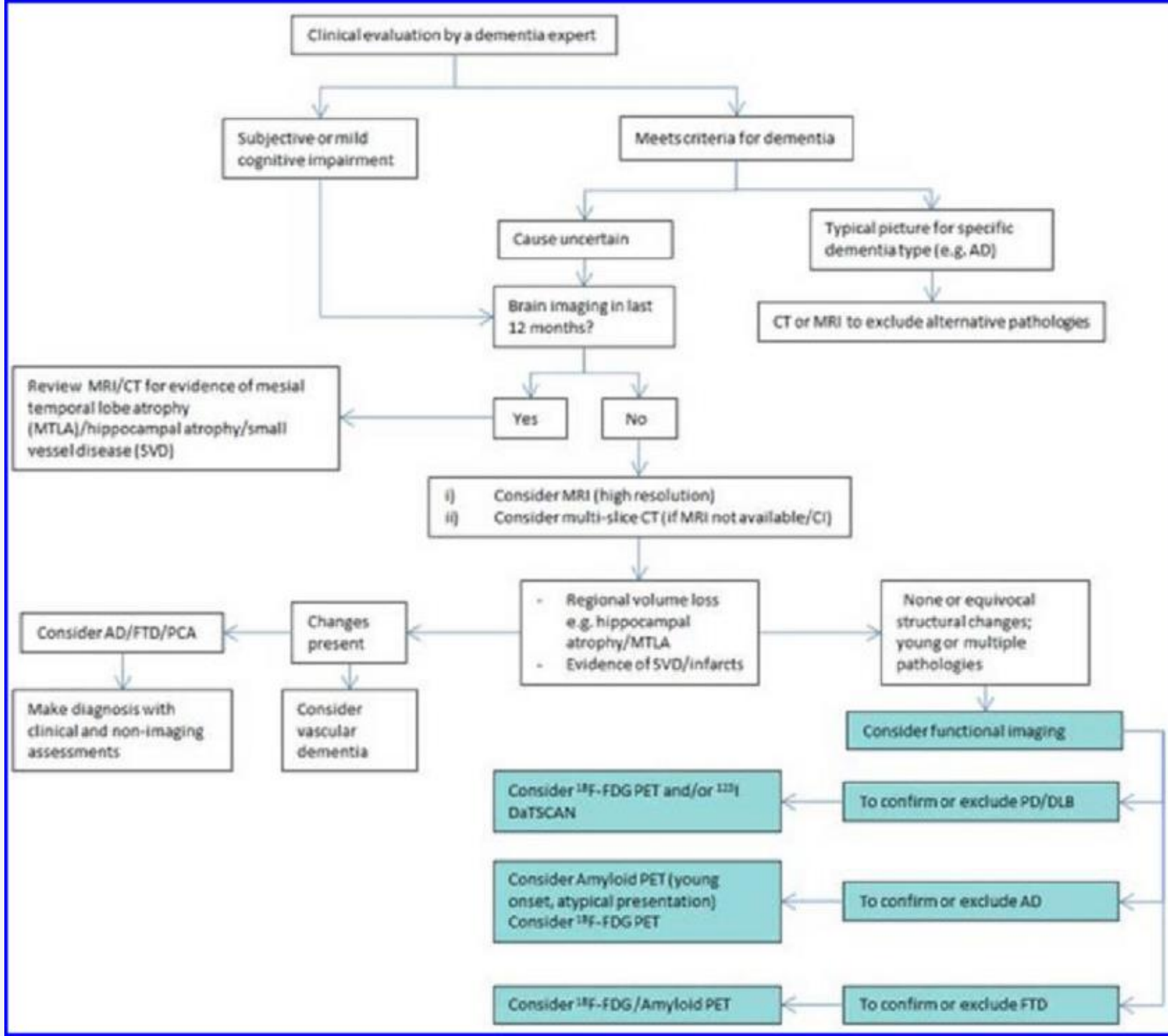
Areas of neuronal loss

Not a specific tracer for dementia pathologies



Background



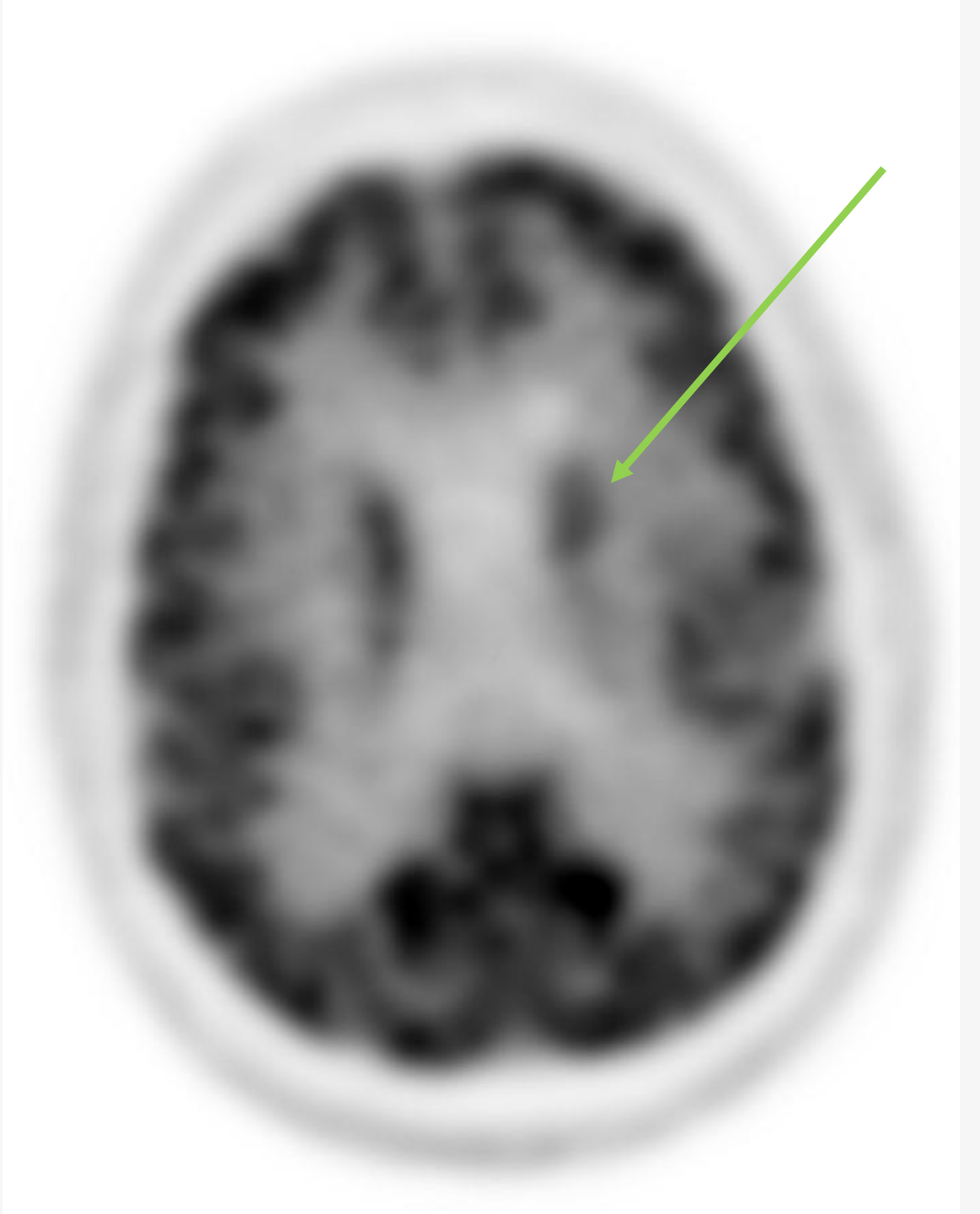


Normal scan

Check Cerebellum

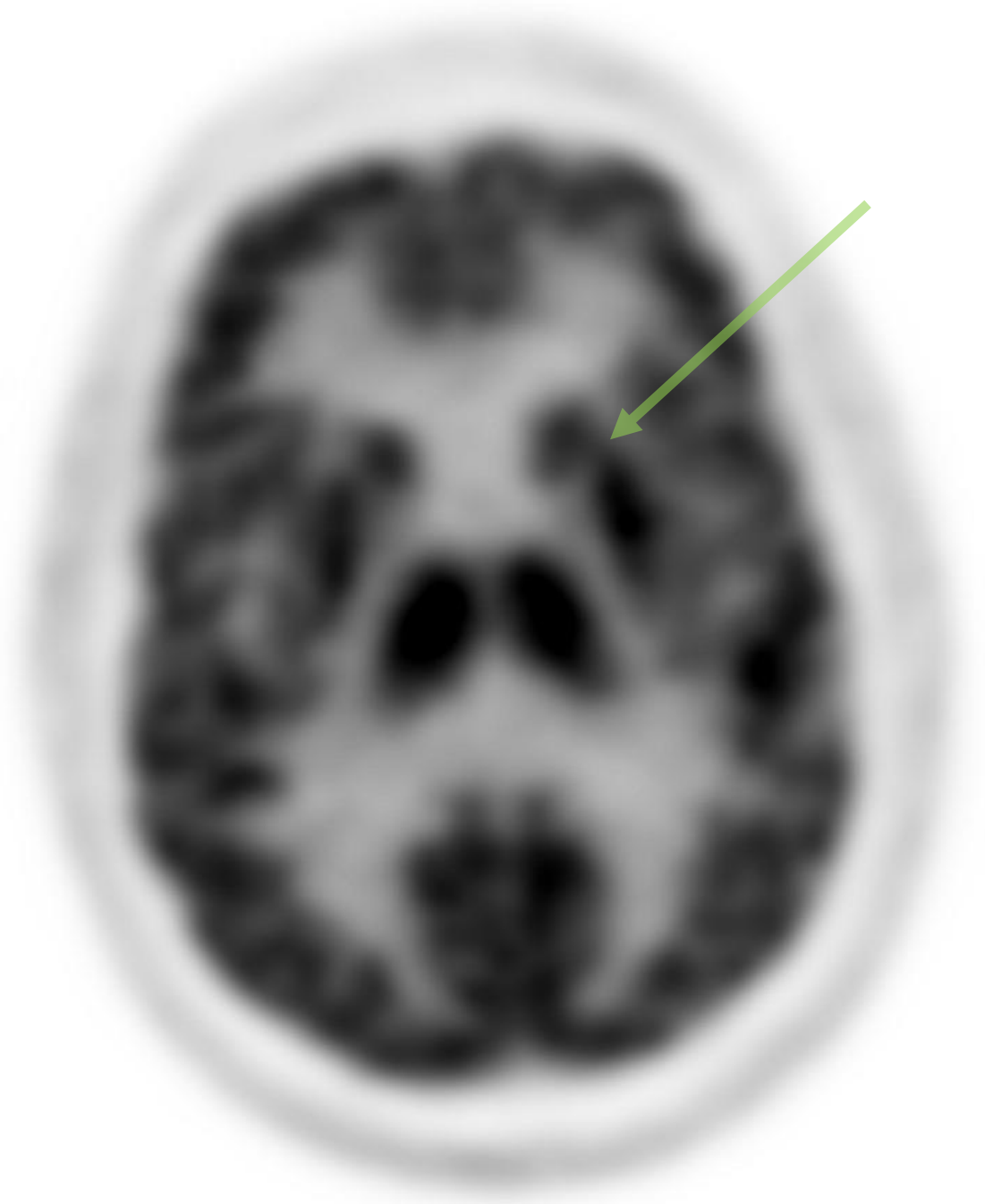
Adjust windowing to maximum  
contrast

Include 20 step colour windowing



Normal scan

Check for movement

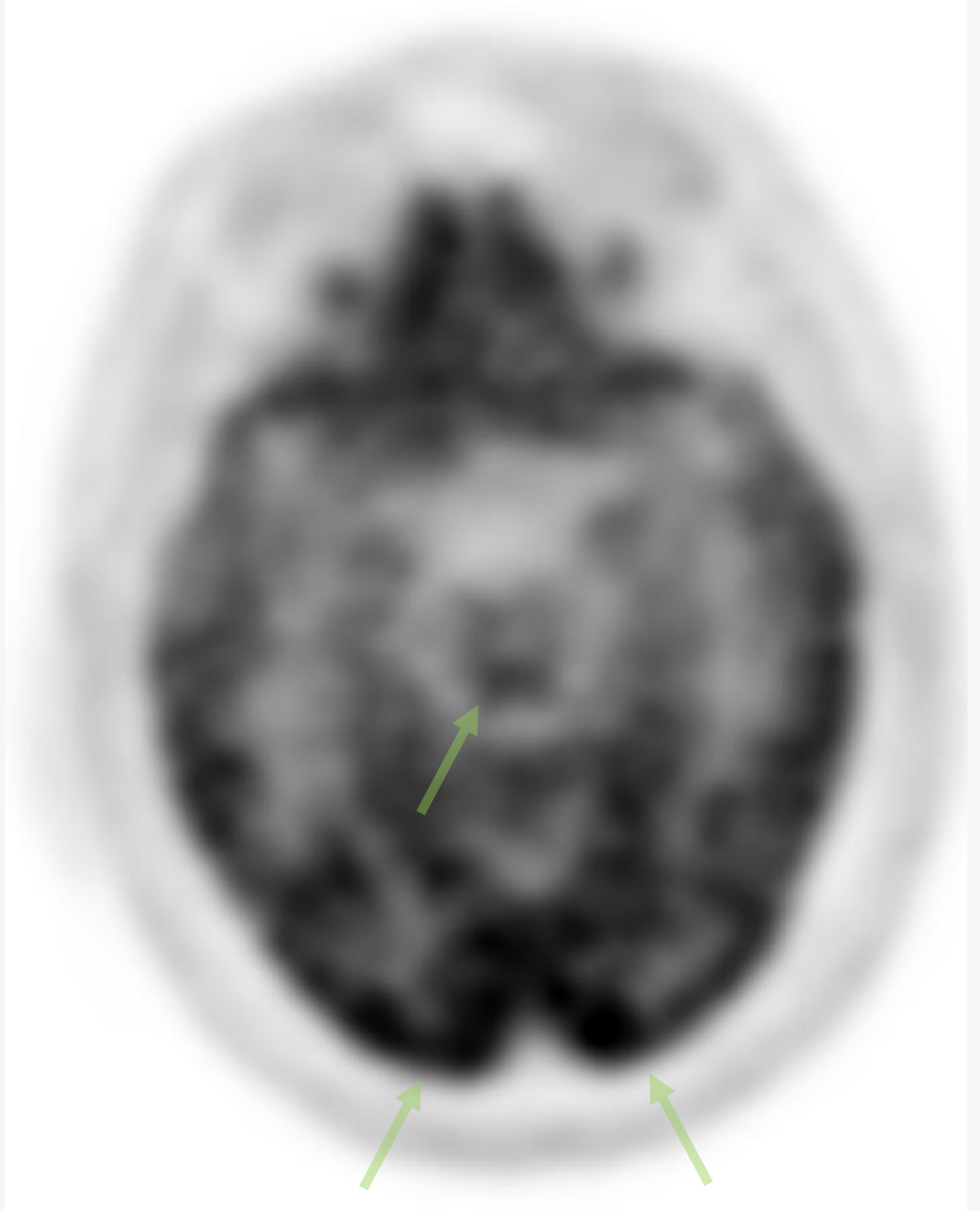




Normal scan

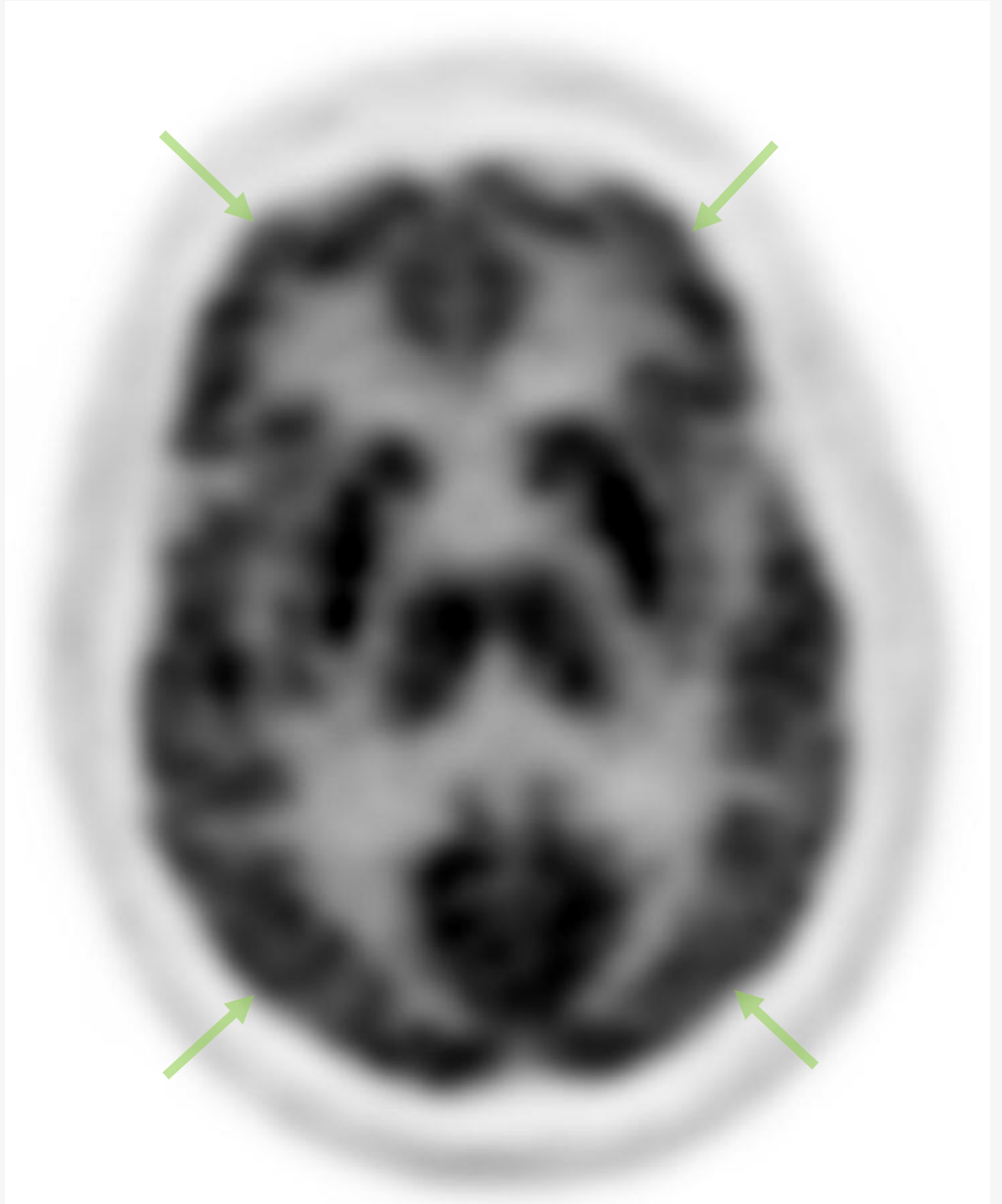
Check colliculi for movement

Occipital lobe activity = basal ganglia activity



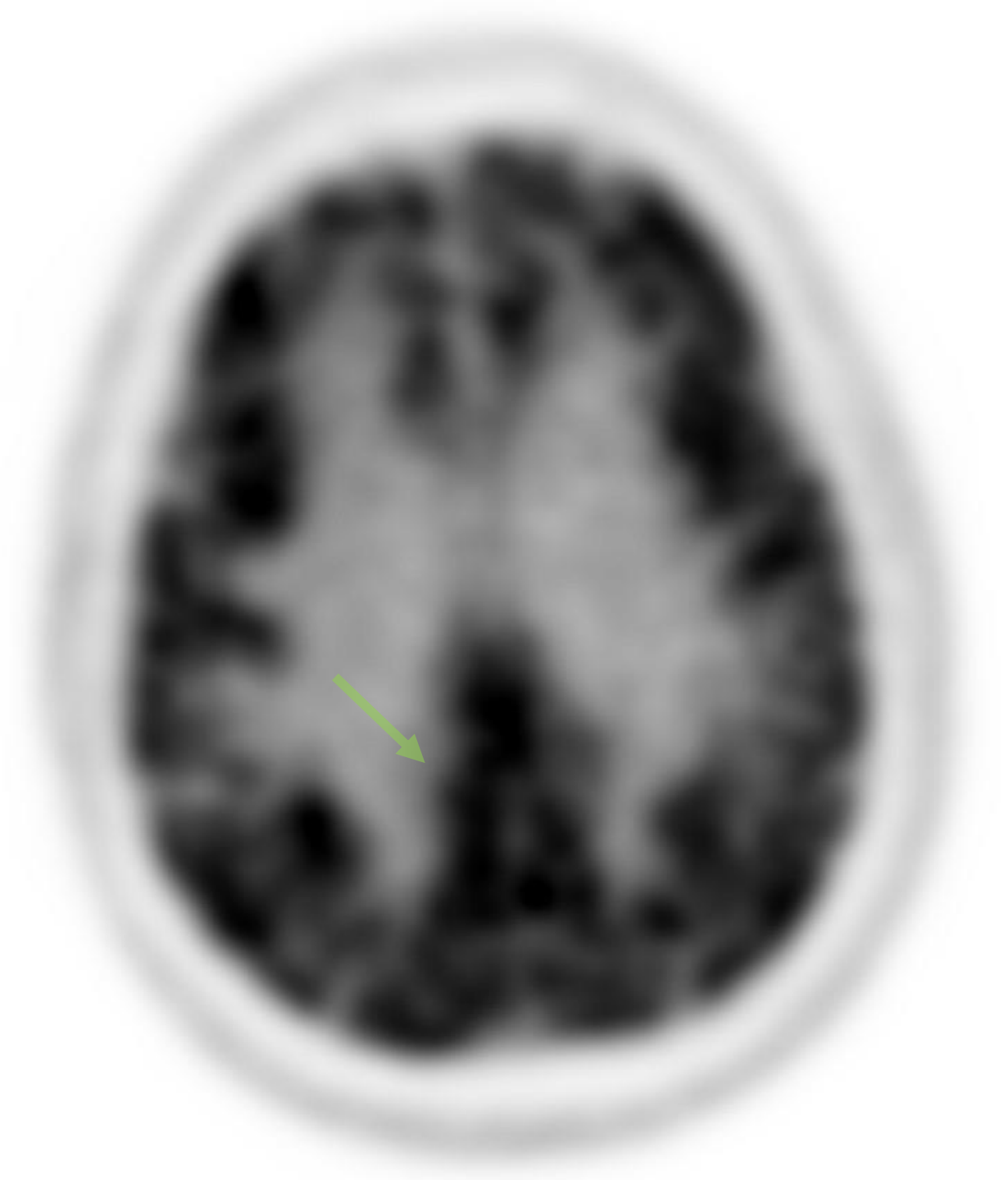
Normal scan

Parietal lobe activity = frontal lobe activity



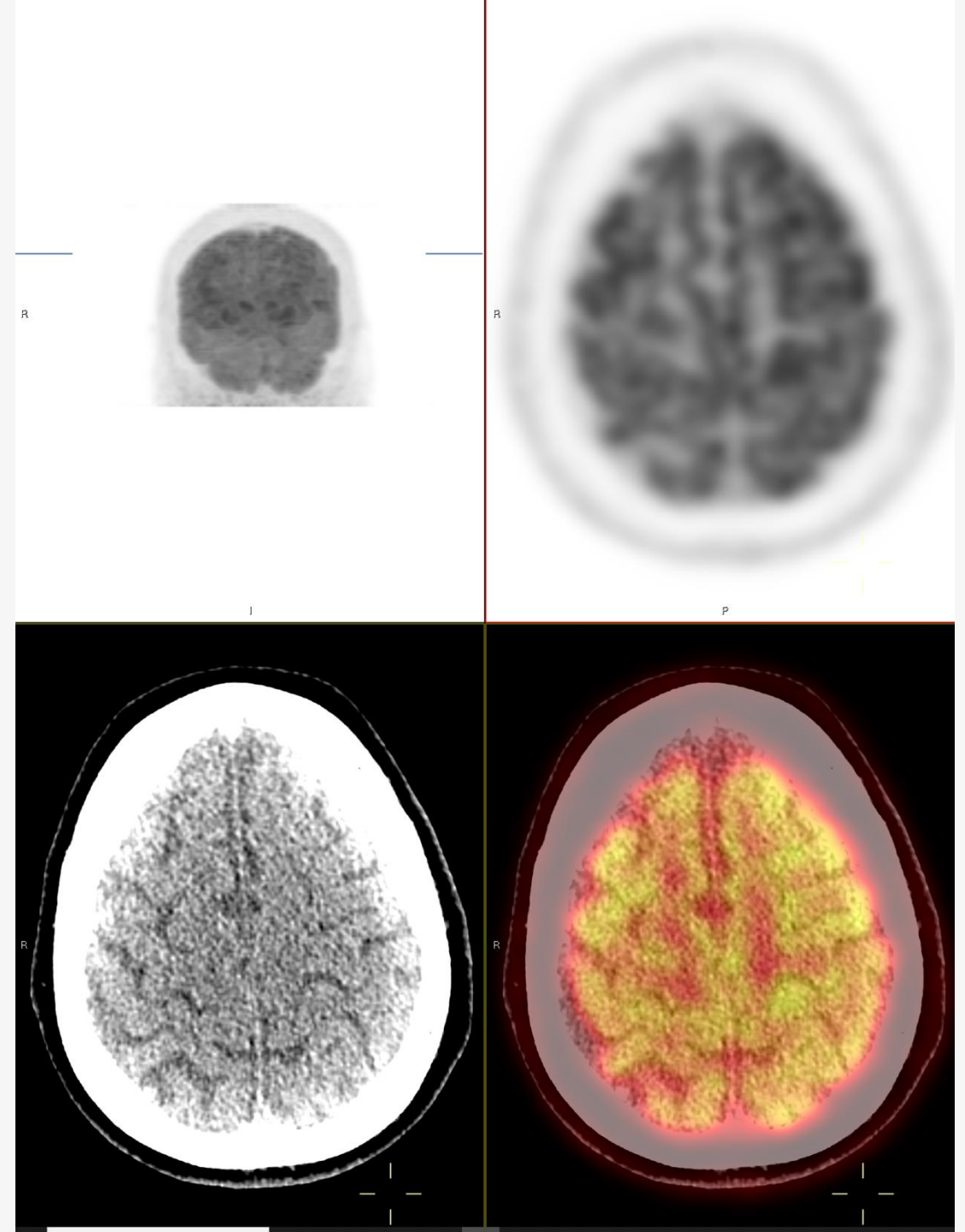
Normal scan

Check precuneus and posterior  
cingulate gyrus



Normal scan

Check sensorimotor strip and  
correlate with CT



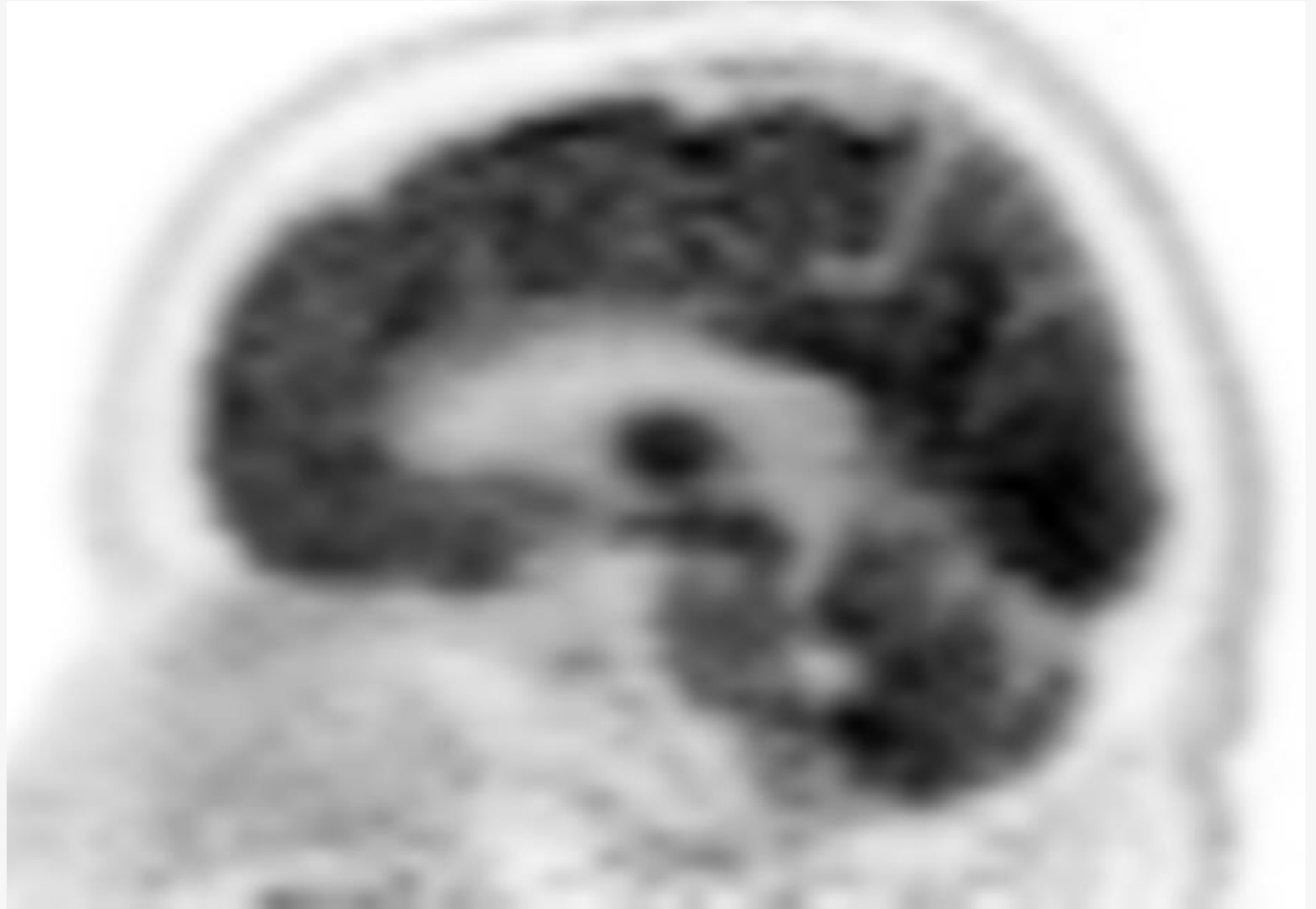
## Normal scan

Posterior cingulate gyrus = basal  
ganglia activity

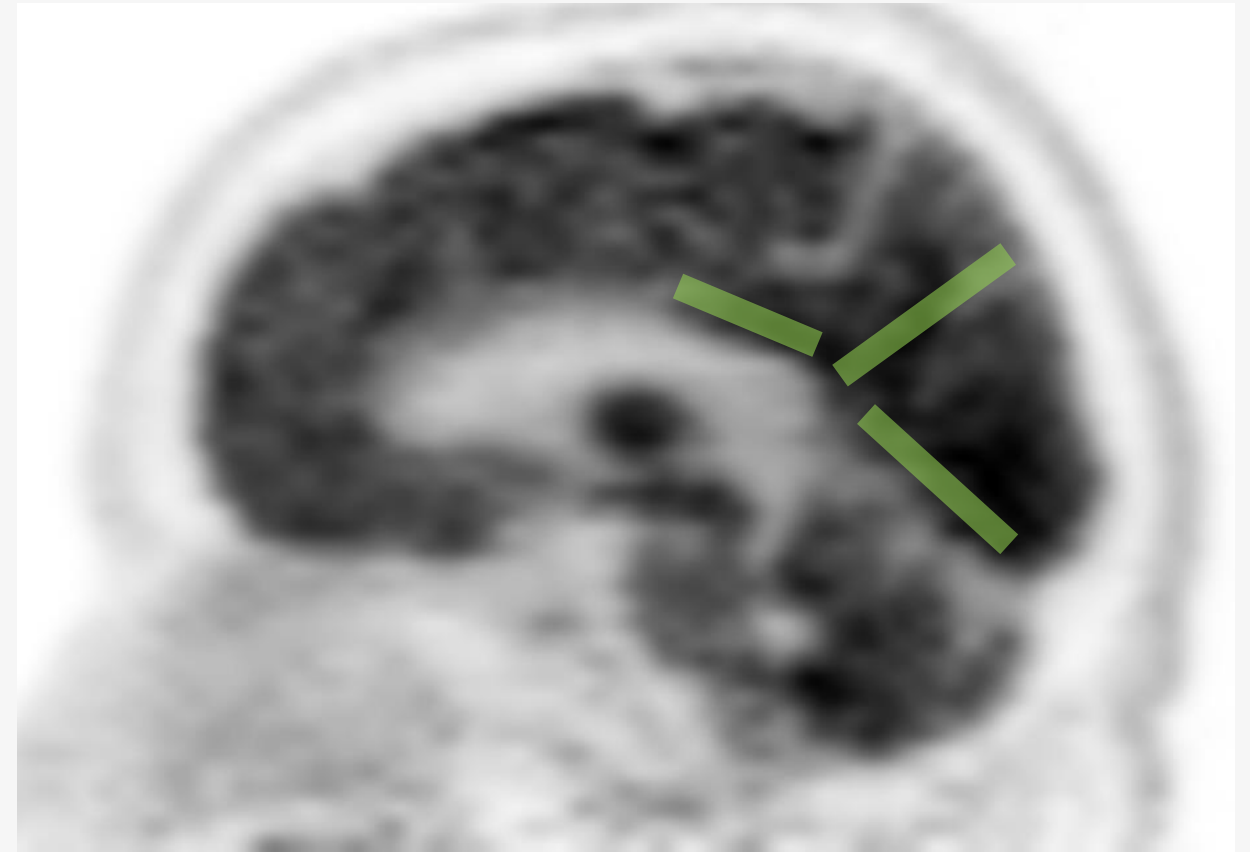
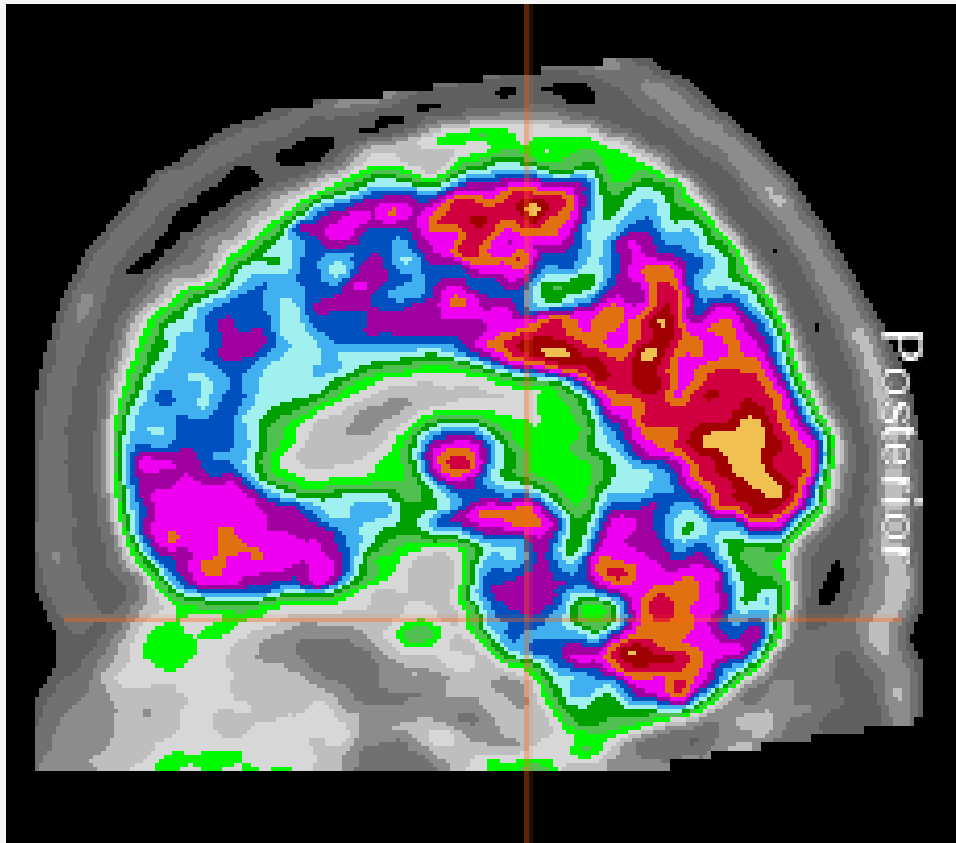
Primary visual cortex

Parietooccipital sulcus

Precuneus > activity anterior to it

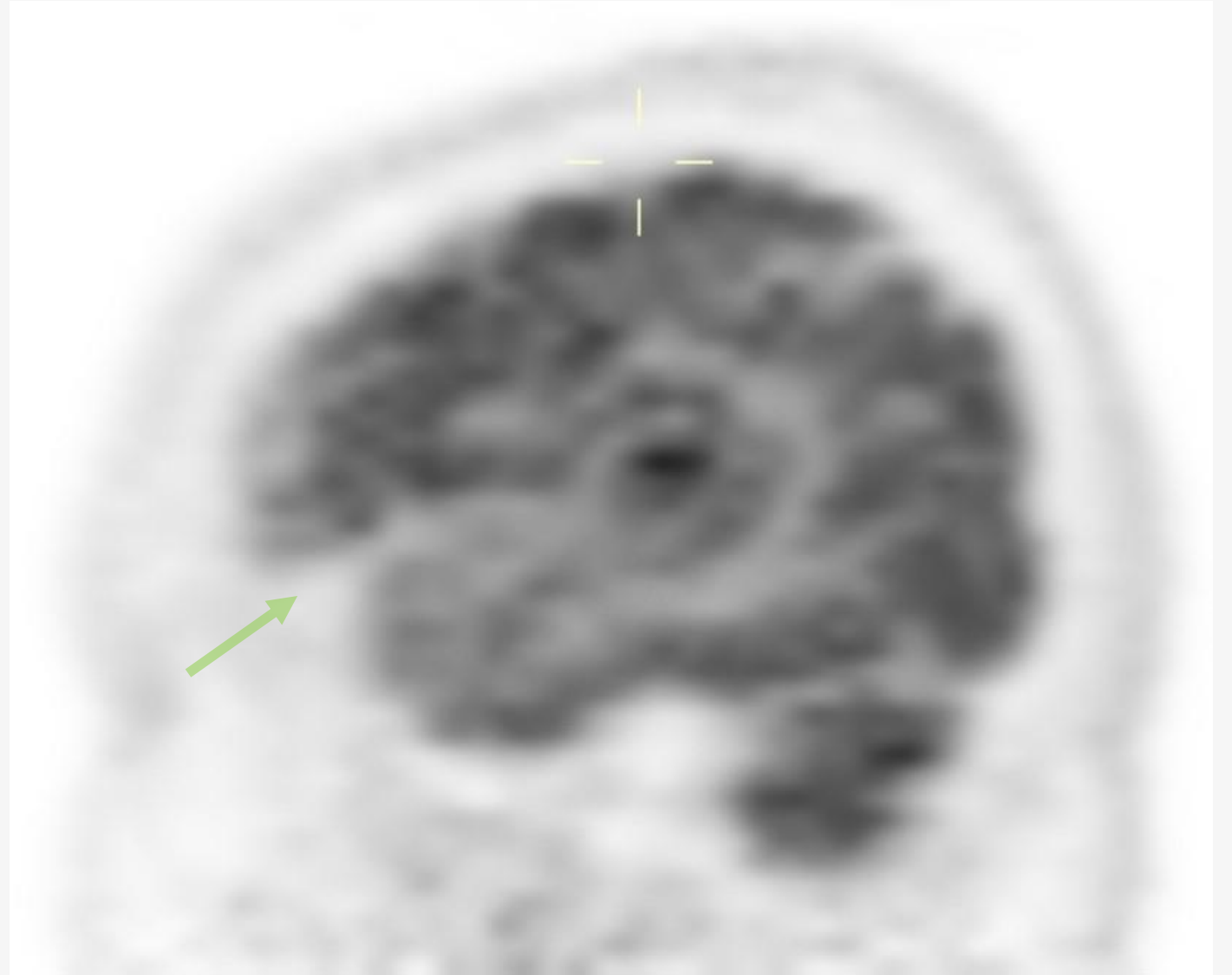


Normal scan



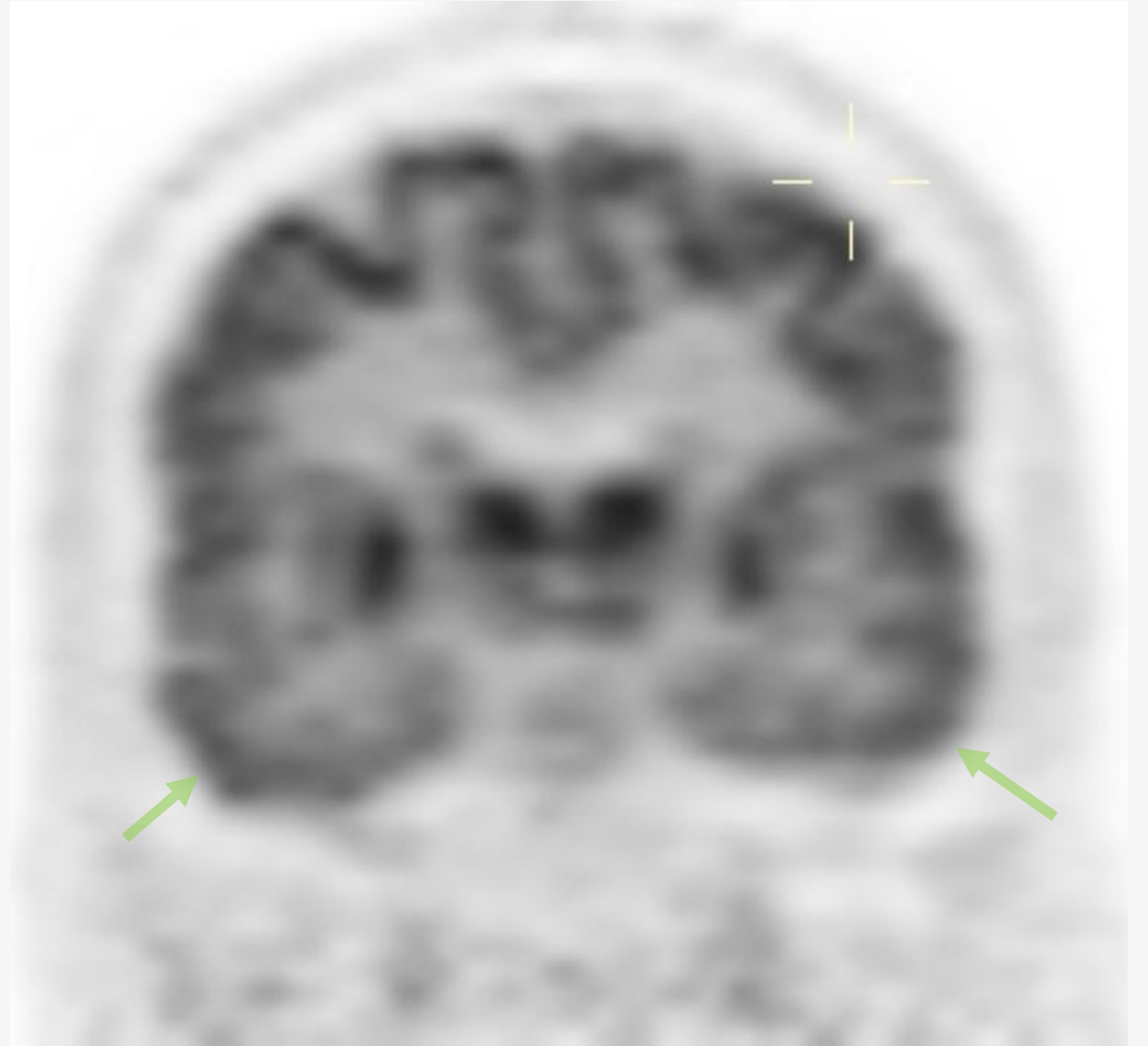
Normal scan

Check frontal vs temporal activity



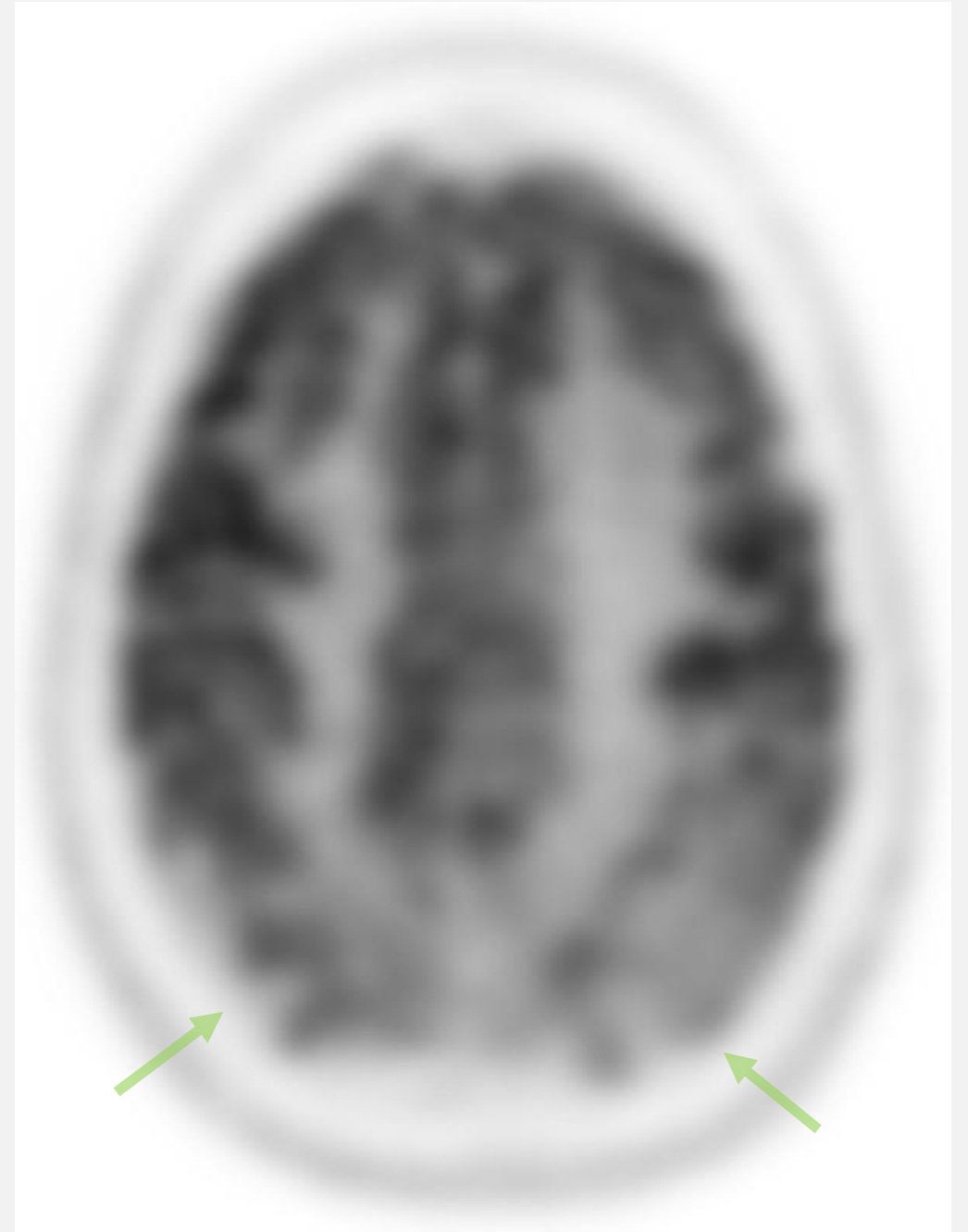
Normal scan

Look for Epsilon/Inverse Epsilon

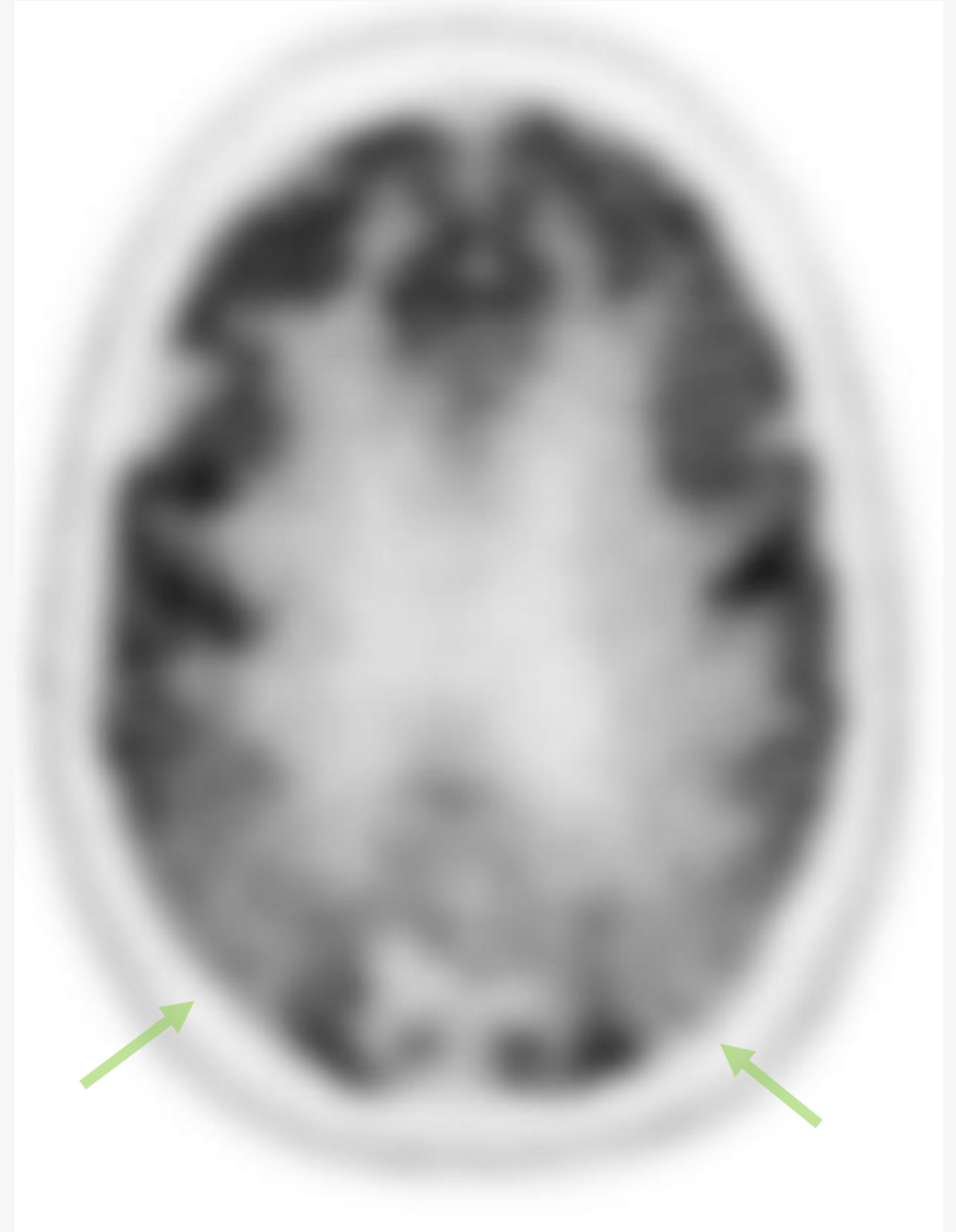




68 year old with cognitive problems  
and memory loss

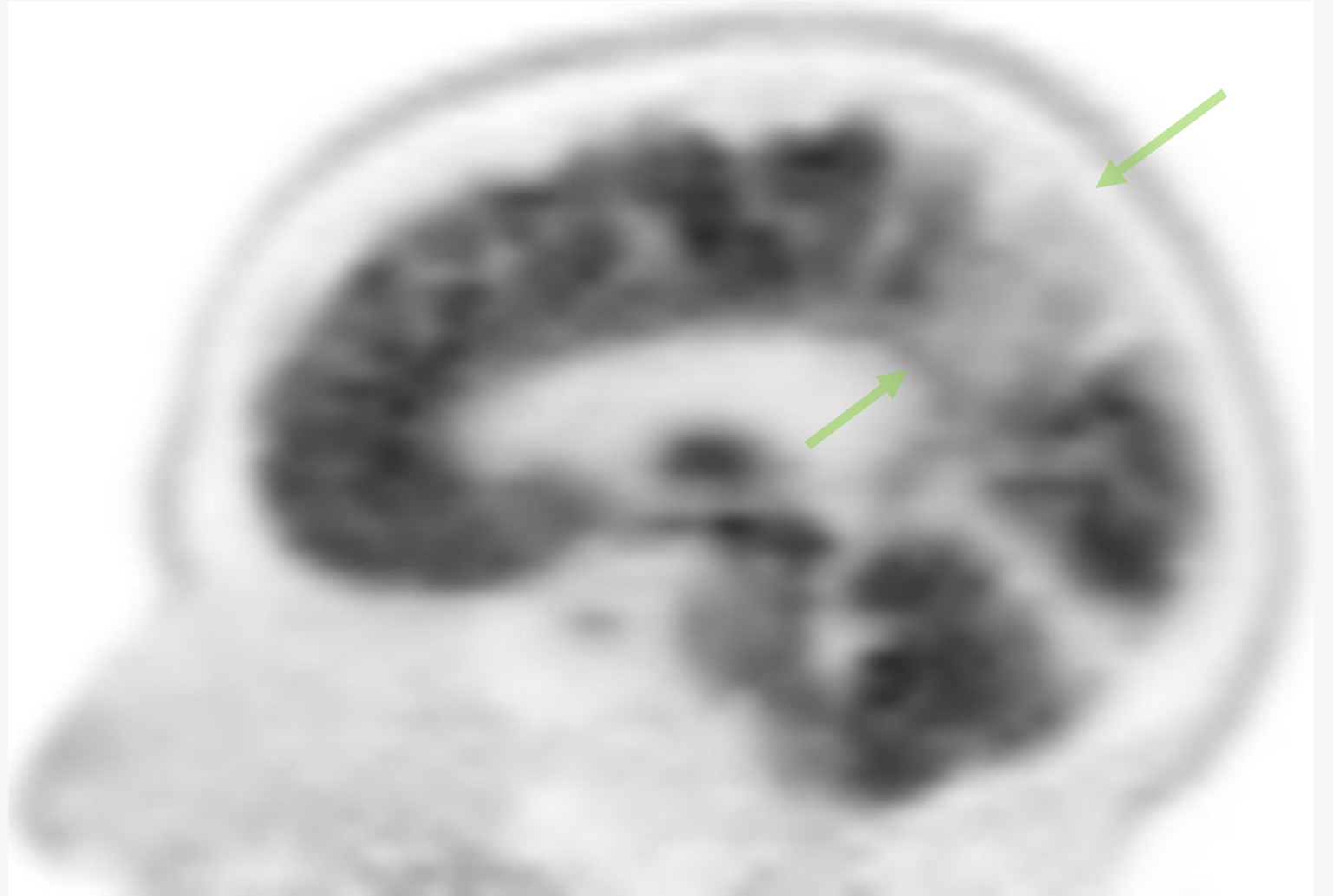


68 year old with cognitive problems  
and memory loss

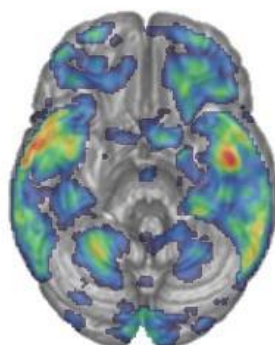


## Common syndromes - AD

68 year old with cognitive problems and memory loss

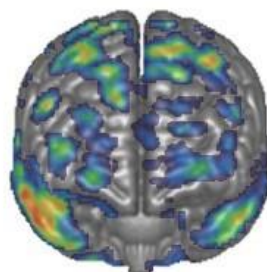


Transverse Inferior



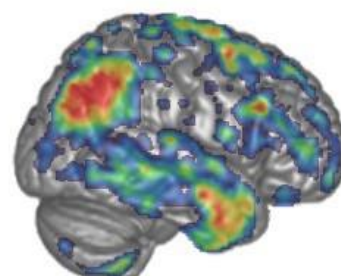
Left

Coronal Anterior



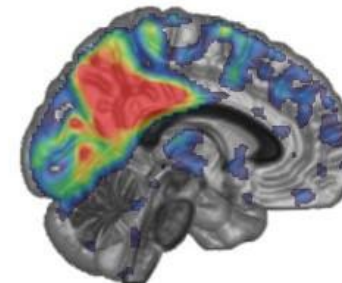
Left

Sagittal Right



Anterior

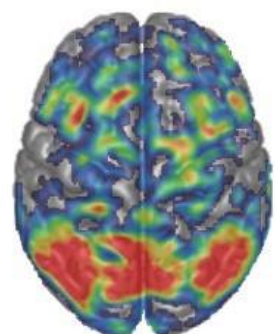
Internal Right



Anterior

Posterior

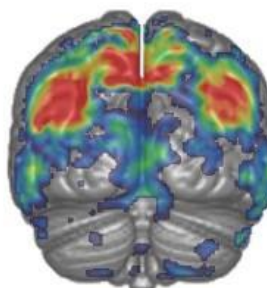
Transverse Superior



Right

Inferior

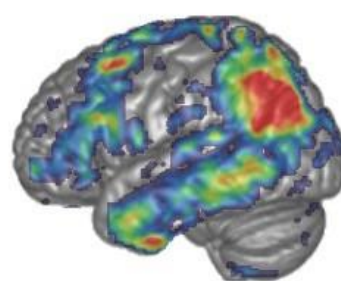
Coronal Posterior



Right

Inferior

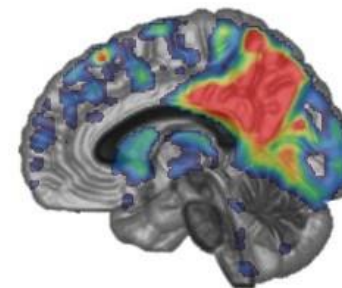
Sagittal Left



Posterior

Inferior

Internal Left



Posterior

Posterior

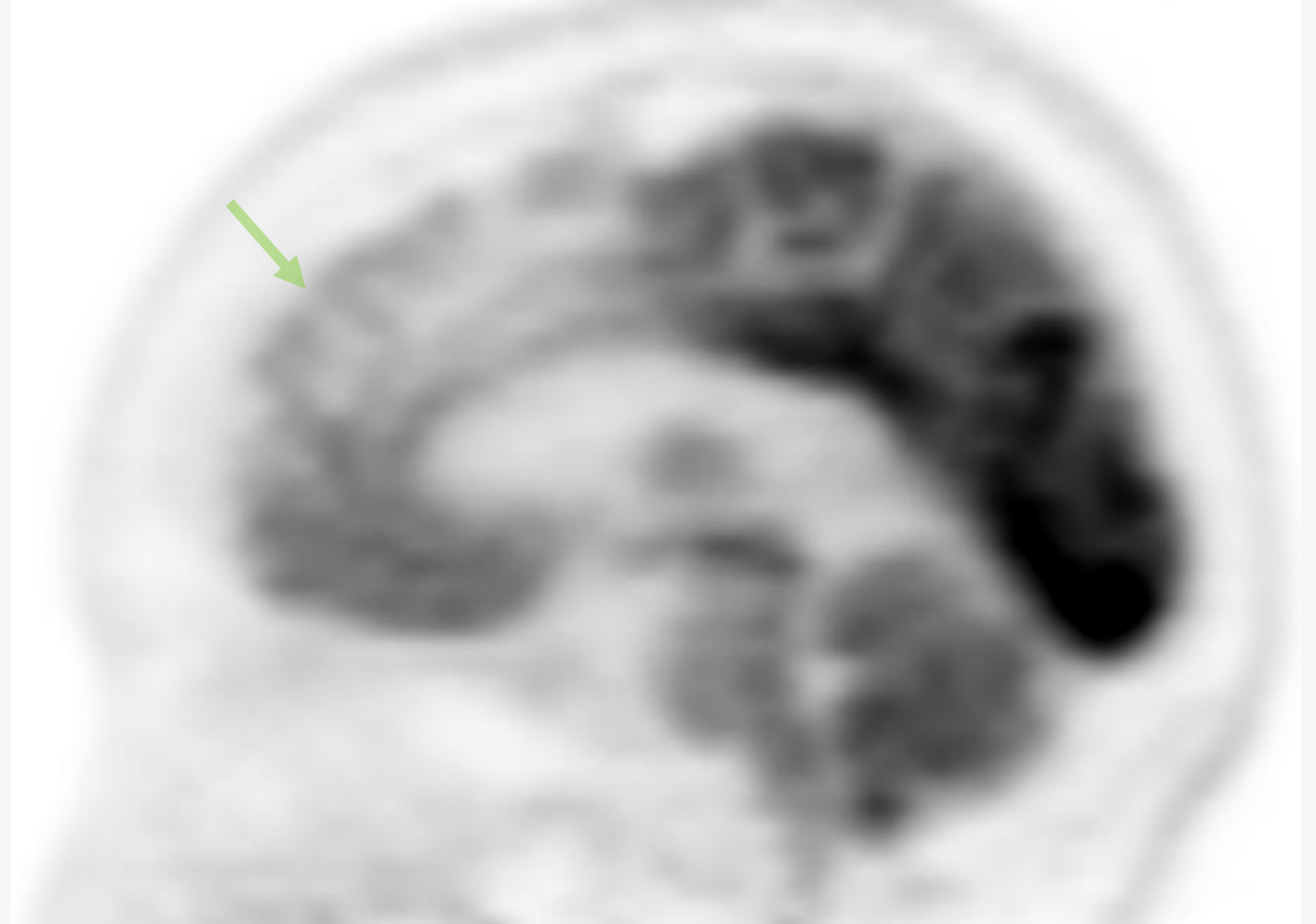
Inferior

Inferior

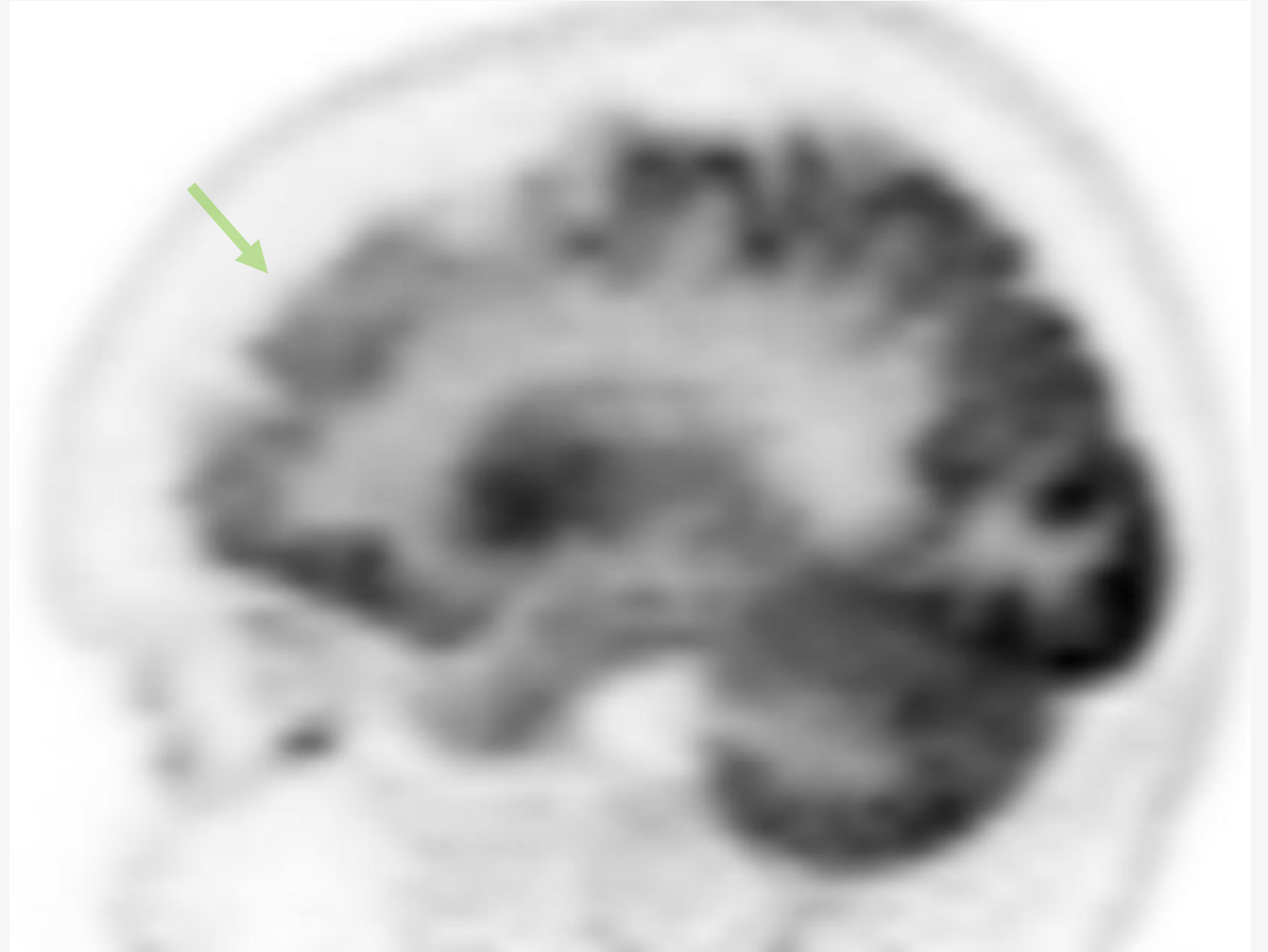
Inferior



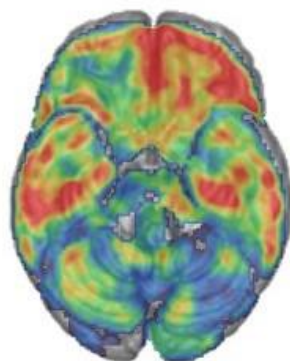
63 year old with suspected rapid  
onset dementia and low ACE III  
score (37/100)



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score (37/100)

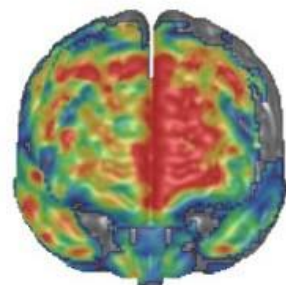


Transverse Inferior



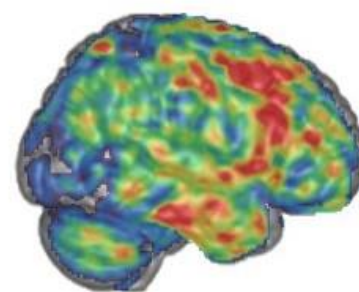
Left

Coronal Anterior



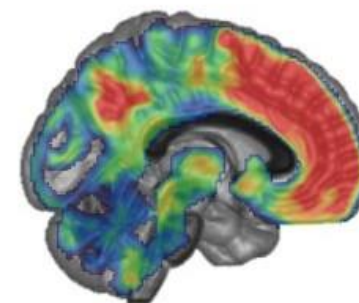
Left

Sagittal Right



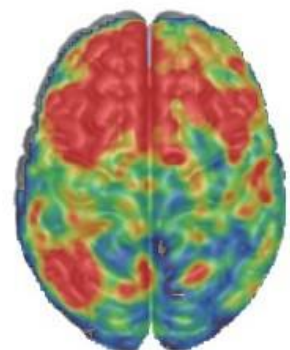
Anterior

Internal Right



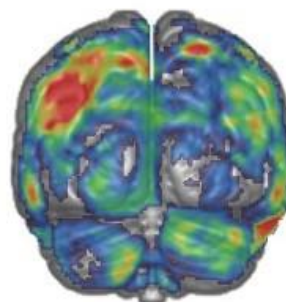
Anterior

Posterior  
Transverse Superior



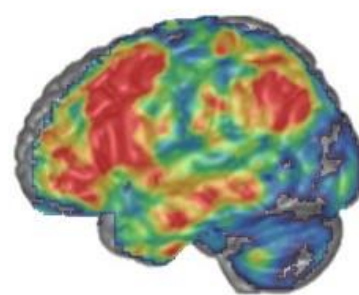
Right

Inferior  
Coronal Posterior



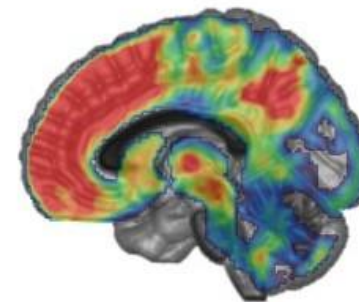
Right

Inferior  
Sagittal Left



Posterior

Inferior  
Internal Left

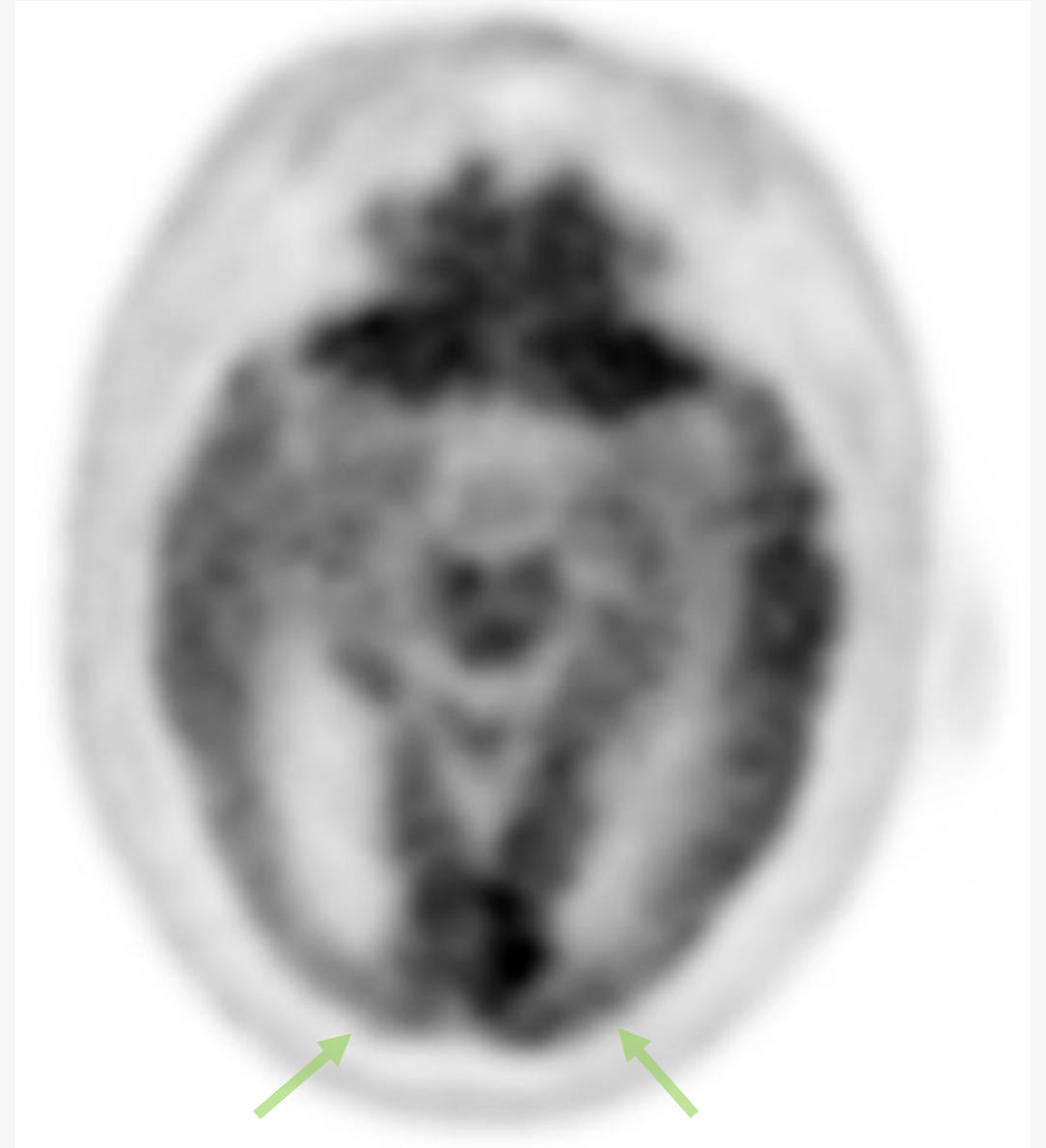


Posterior



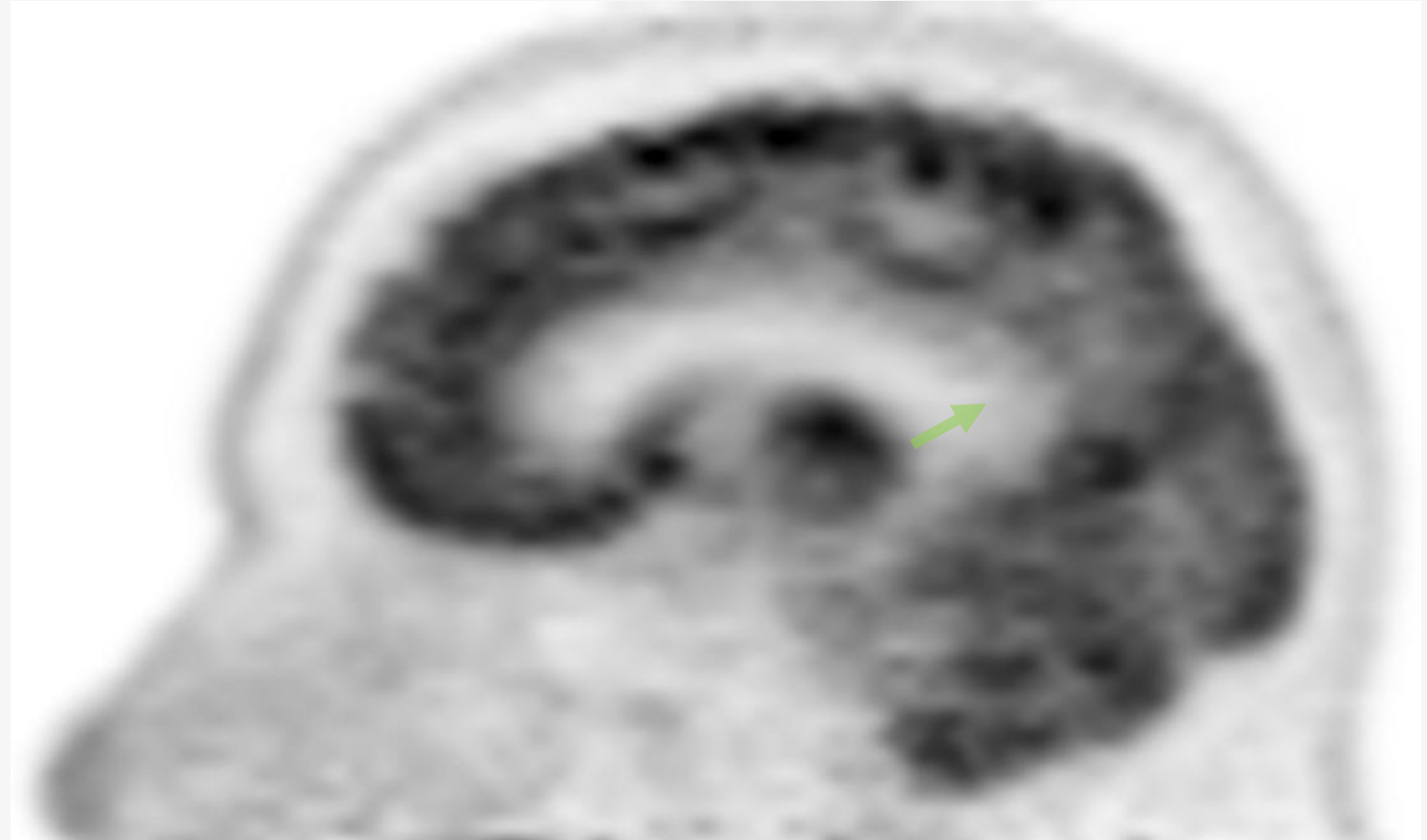


63 year old policeman with 1 year mild cognitive decline and difficulty interpreting visual information. Optician found bilateral peripheral vision deficit only.

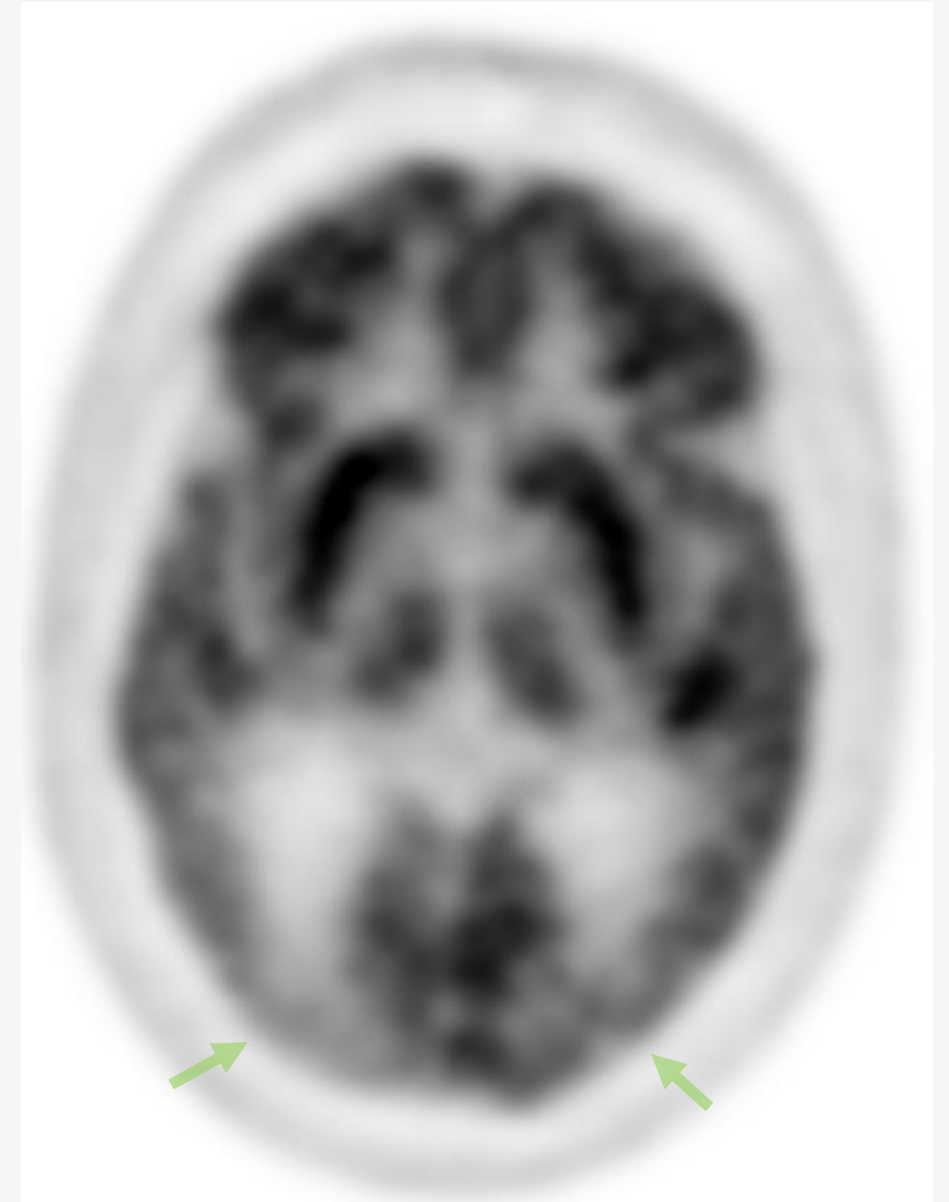




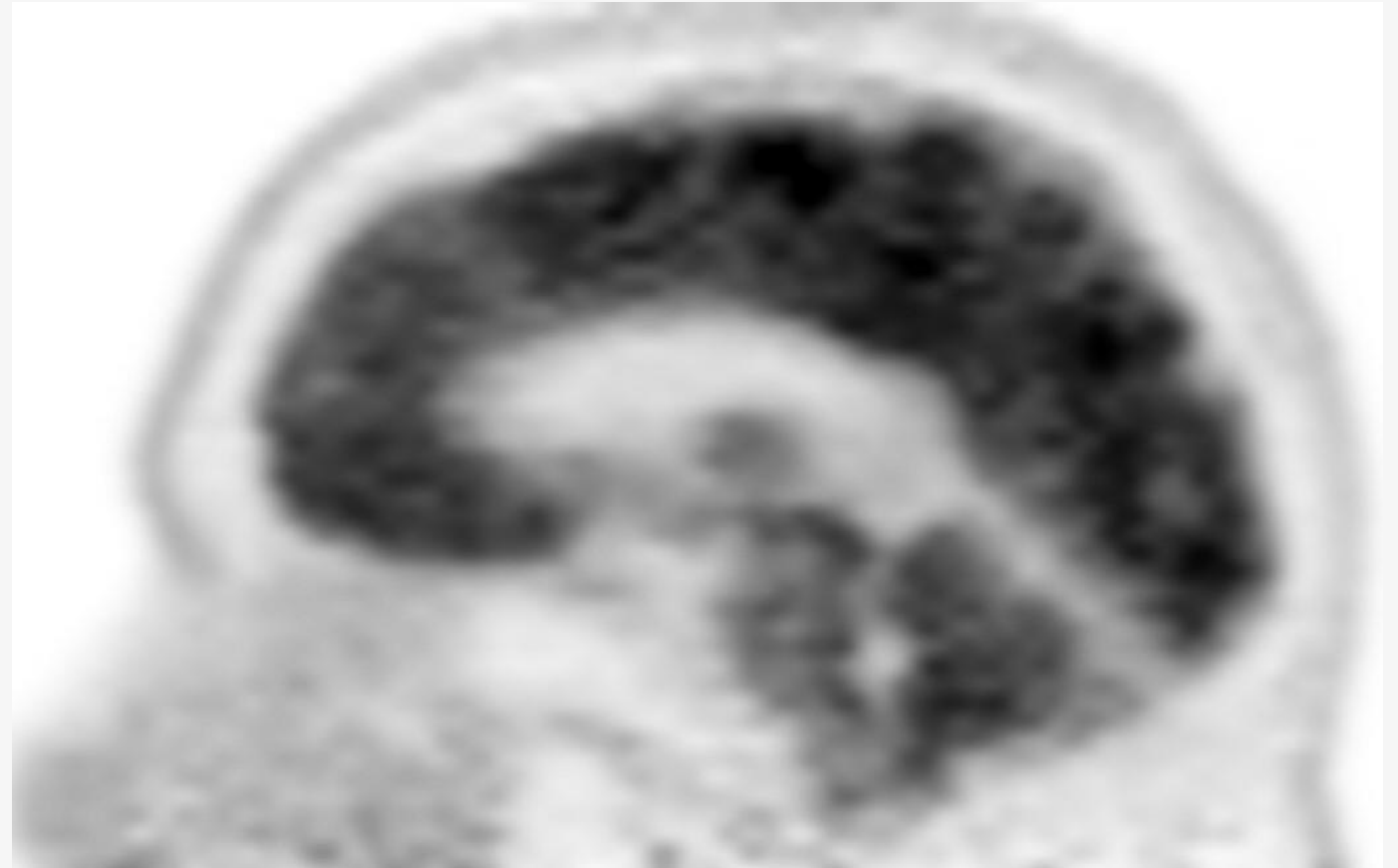
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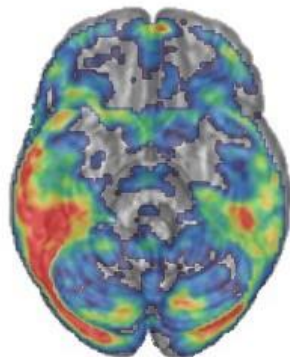
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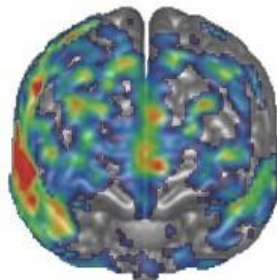


Transverse Inferior



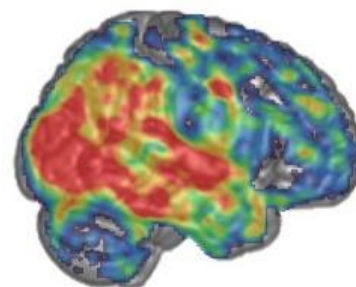
Left

Coronal Anterior



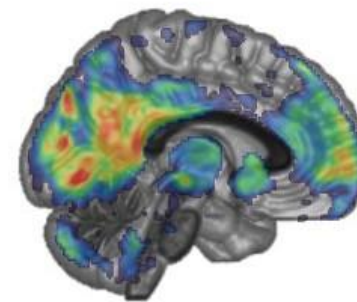
Left

Sagittal Right



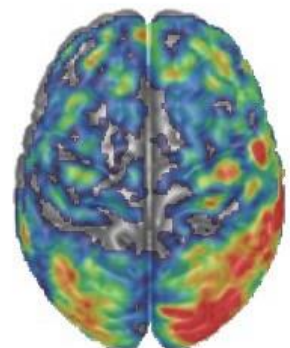
Anterior

Internal Right



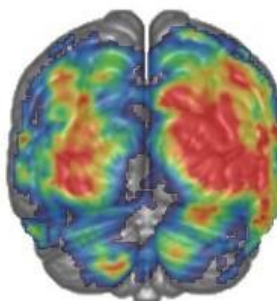
Anterior

Posterior  
Transverse Superior



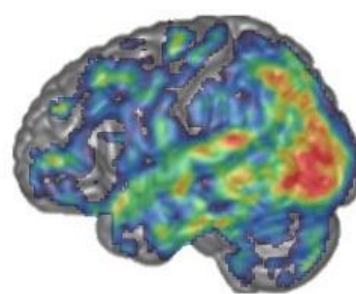
Right

Inferior  
Coronal Posterior



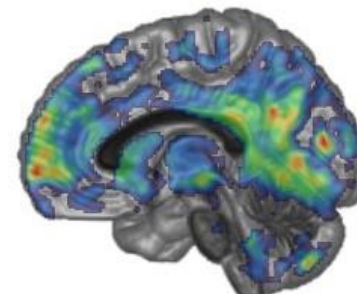
Right

Inferior  
Sagittal Left



Posterior

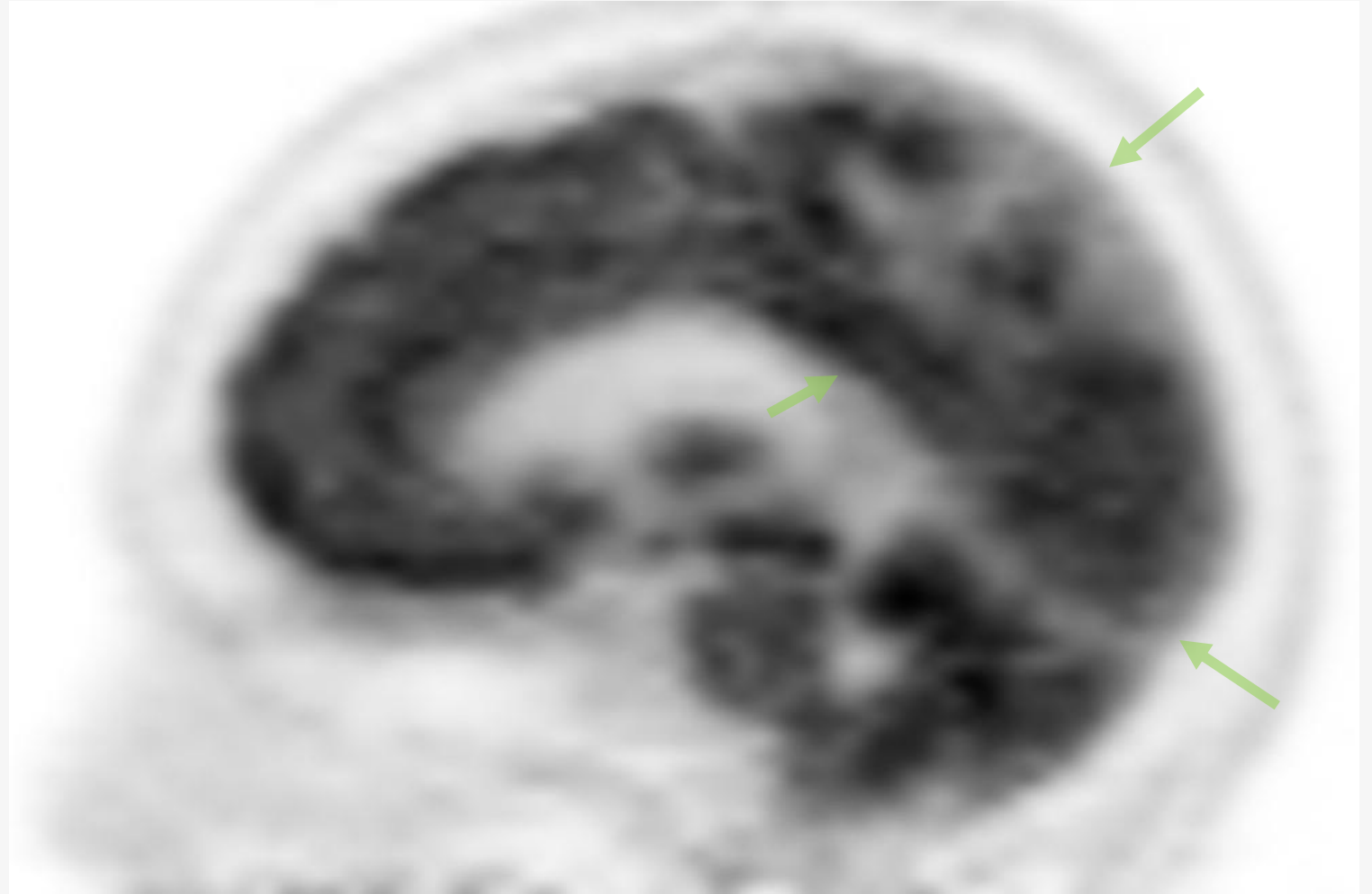
Inferior  
Internal Left



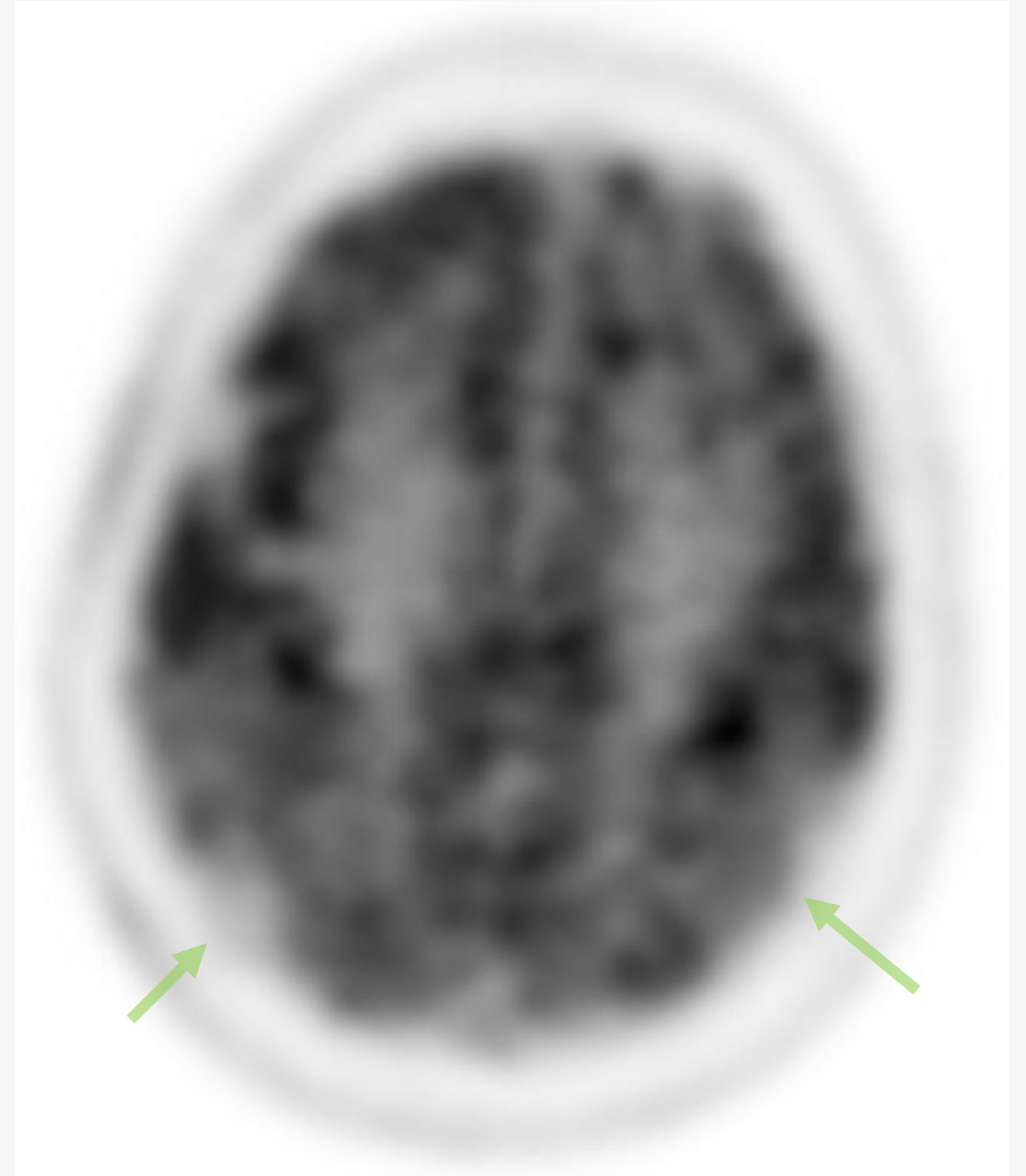
Posterior



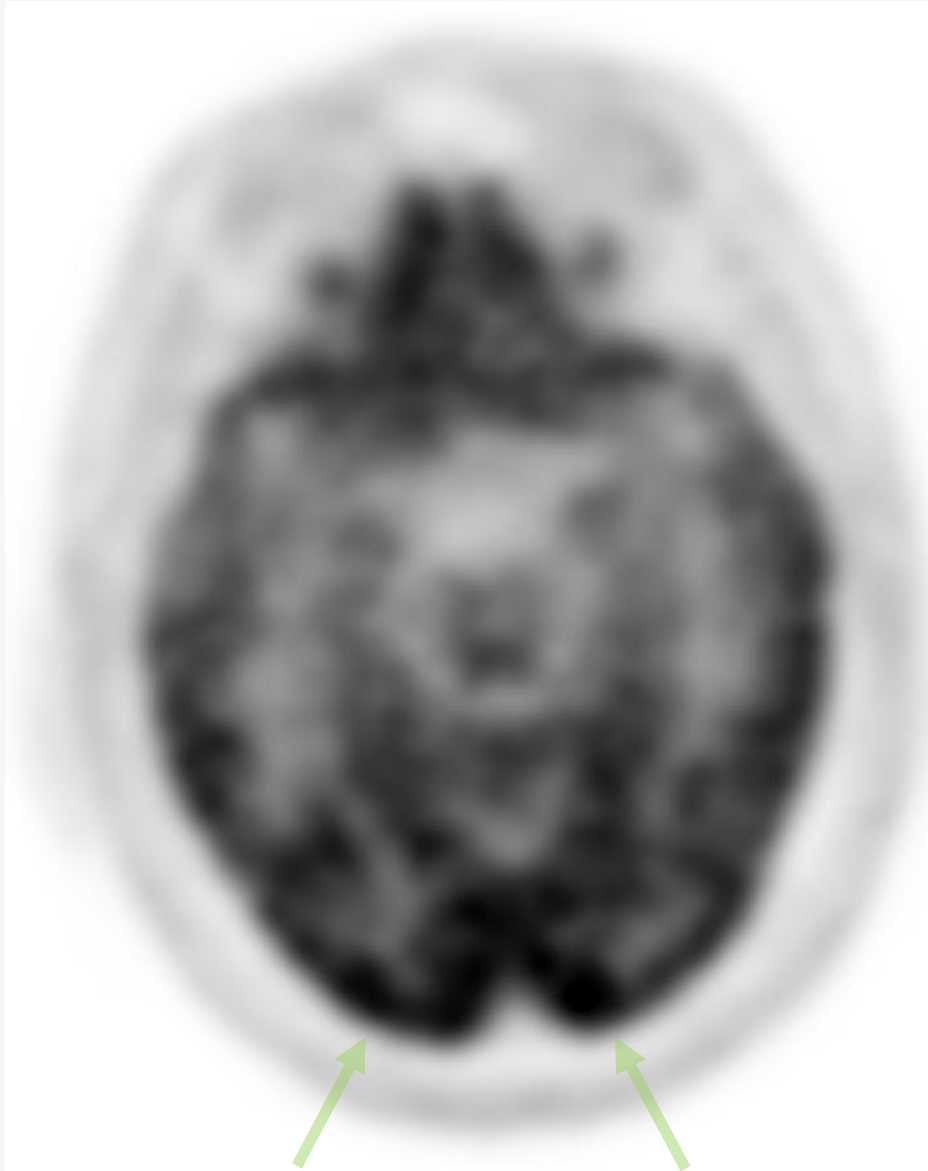
62 year old with progressive decline, confusion, agitation and movement disorder including parkinsonian tremor



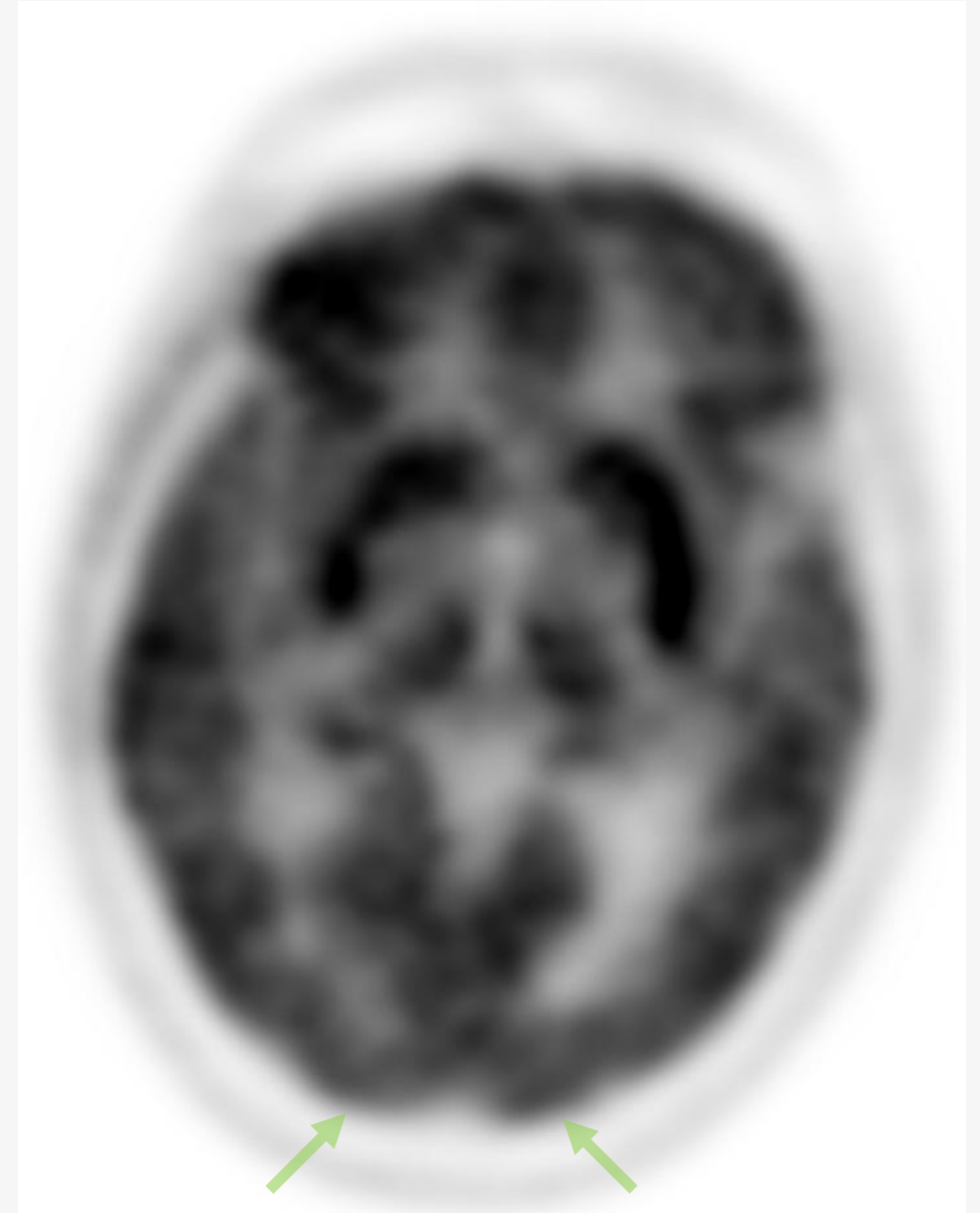
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confusion, agitation and movement disorder  
including parkinsonian tremor



## Common syndromes - DLB

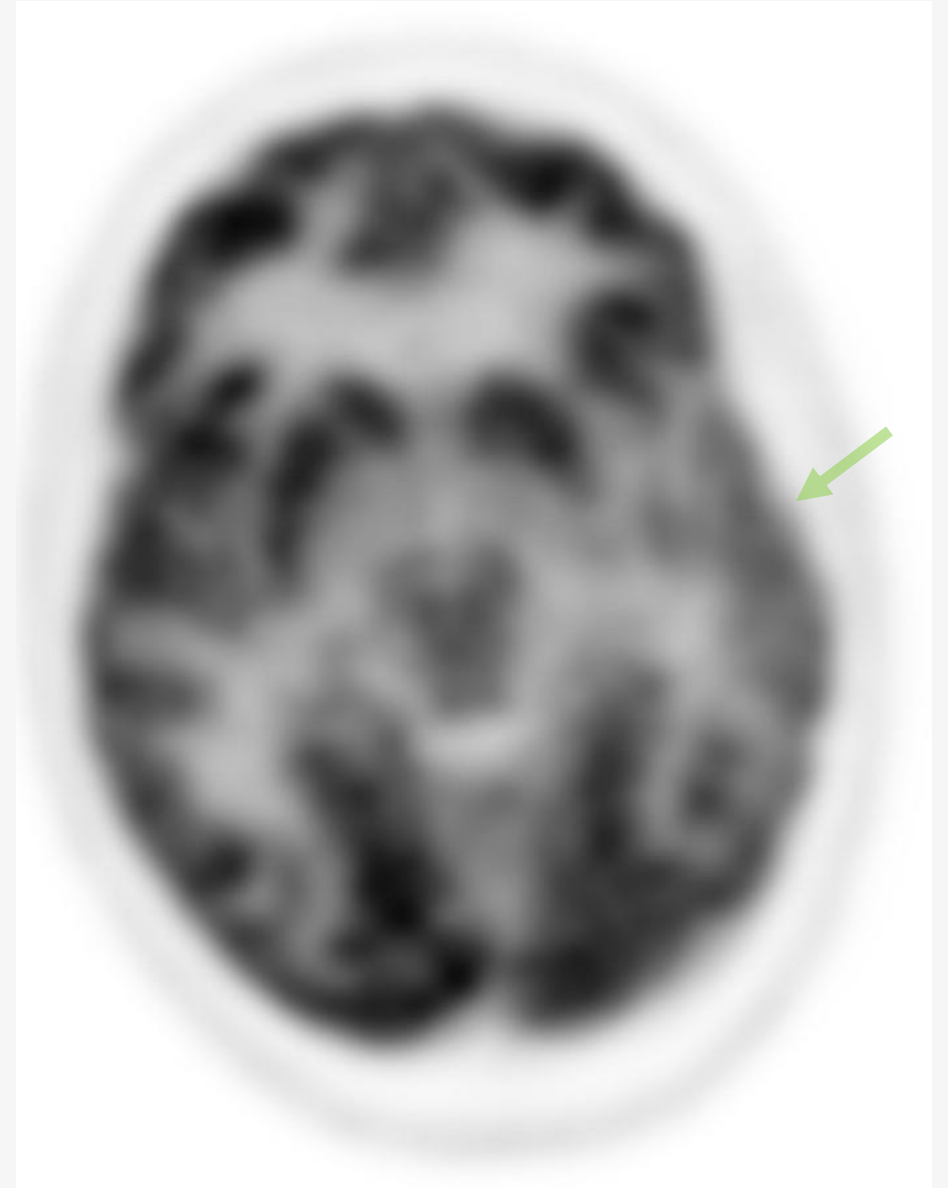


Normal



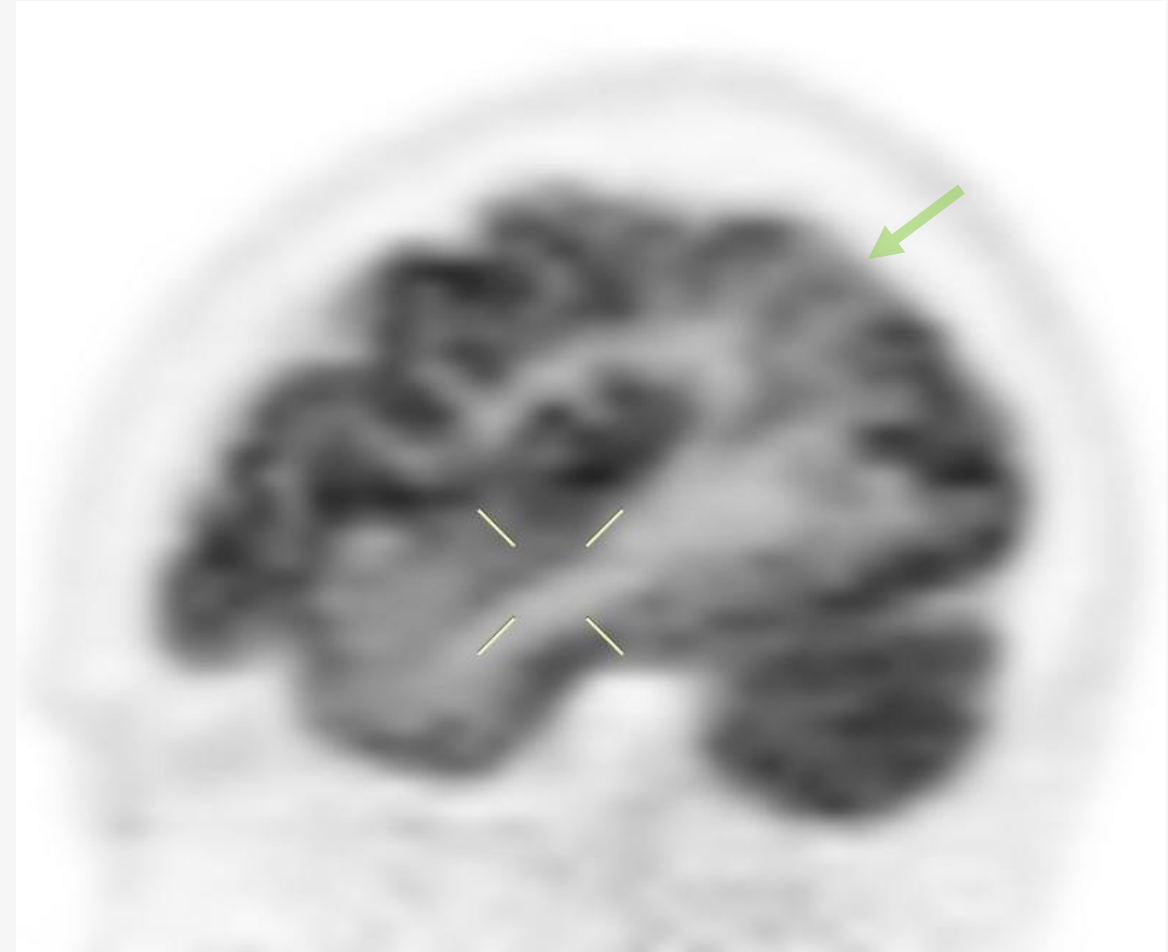
DLB

61 year old presenting with poor language and word finding difficulties. Struggling with activities such as making tea. Decline in ACE score from 93 in 2020 to 87 in 2022

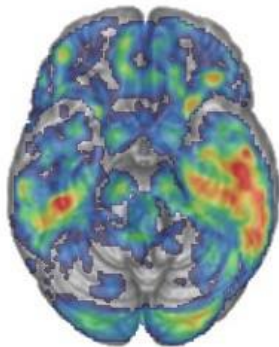




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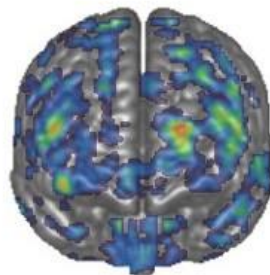


Transverse Inferior



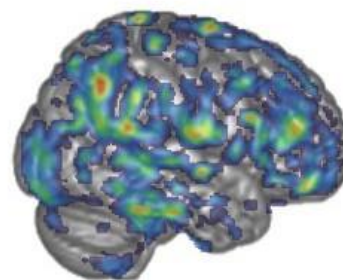
Left

Coronal Anterior



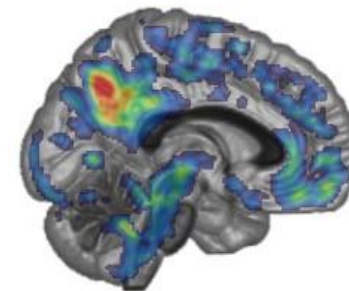
Left

Sagittal Right



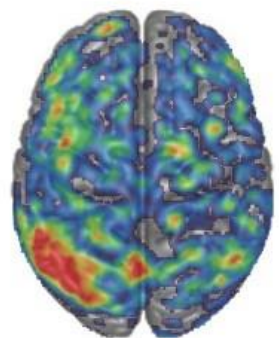
Anterior

Internal Right



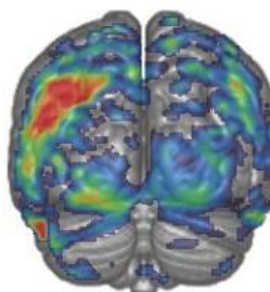
Anterior

Posterior  
Transverse Superior



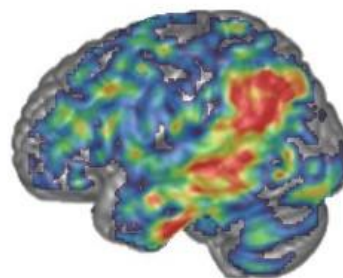
Right

Inferior  
Coronal Posterior



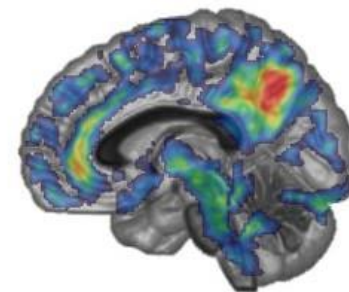
Right

Inferior  
Sagittal Left



Posterior

Inferior  
Internal Left



Posterior

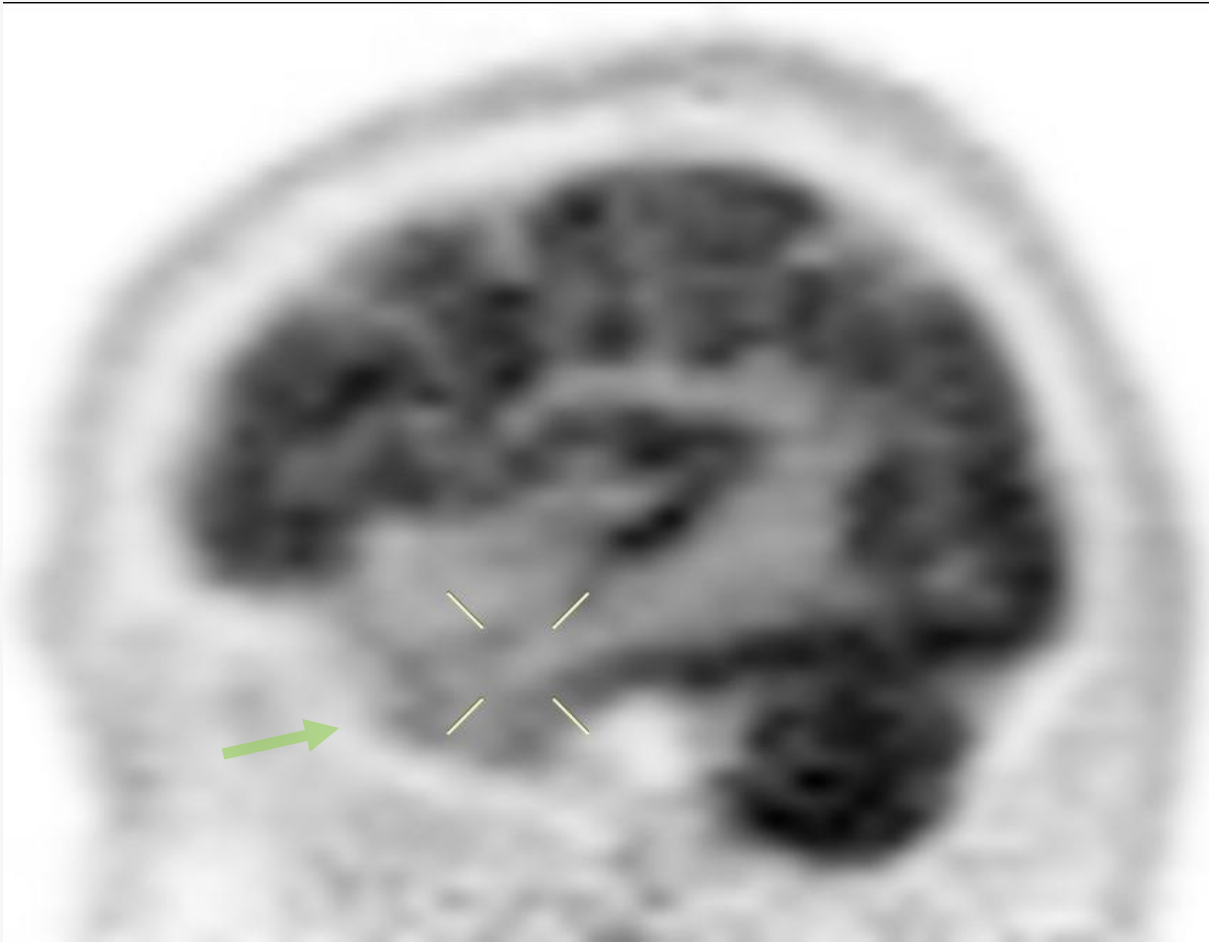
Posterior

Inferior

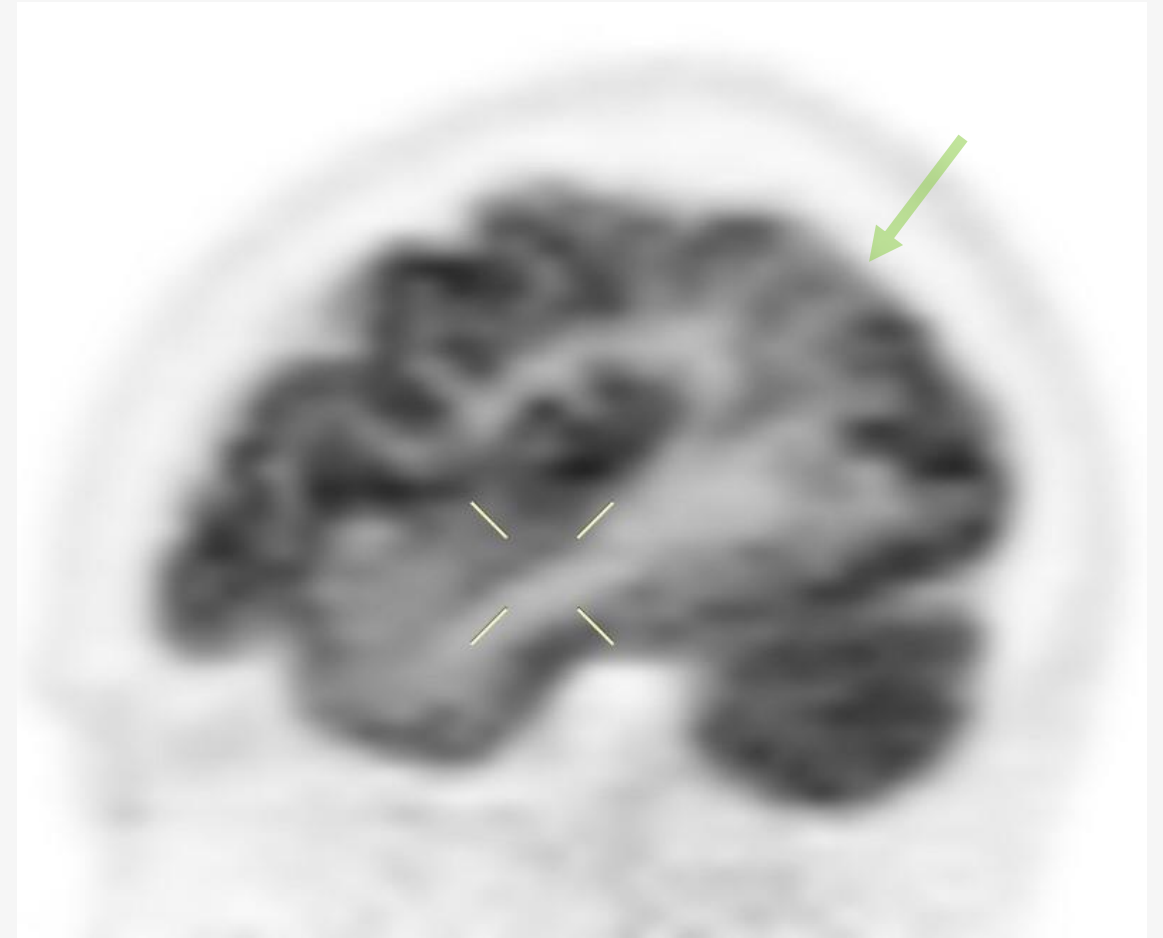
Inferior

Inferior



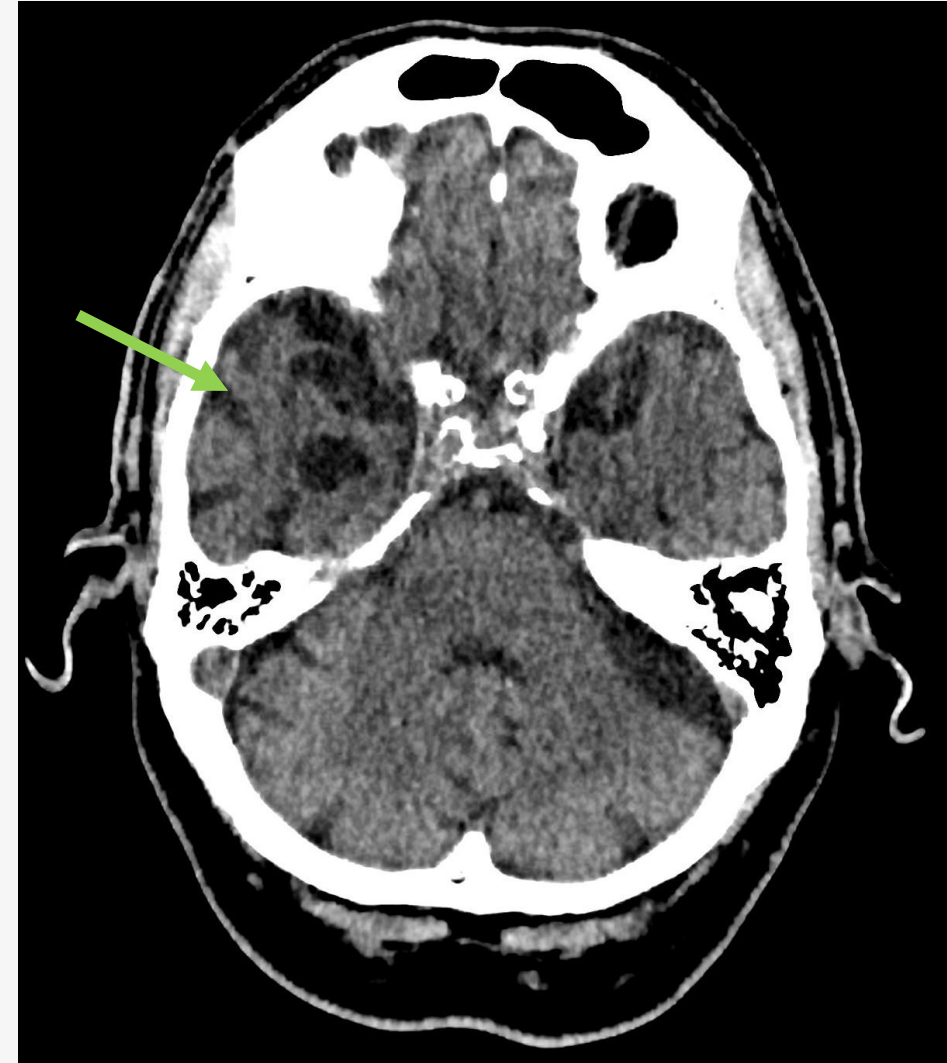
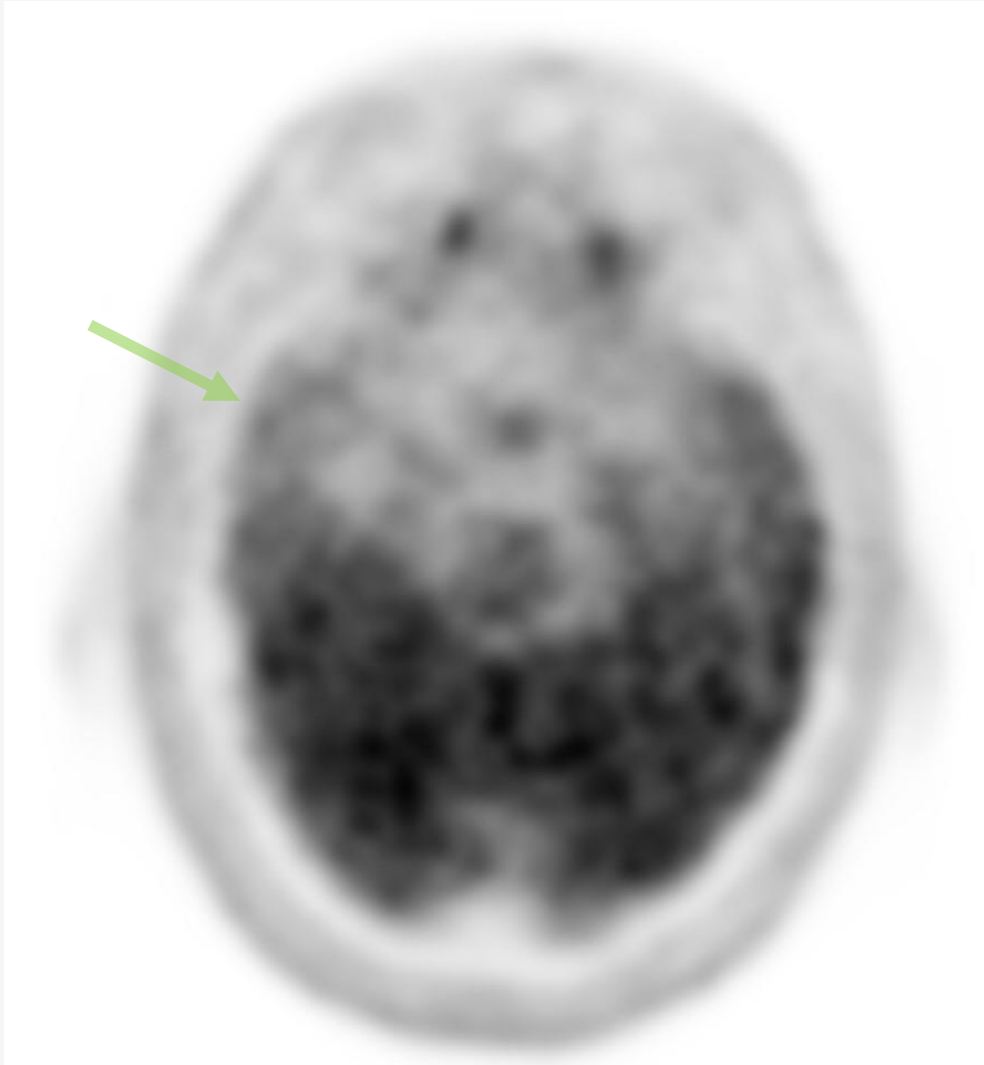


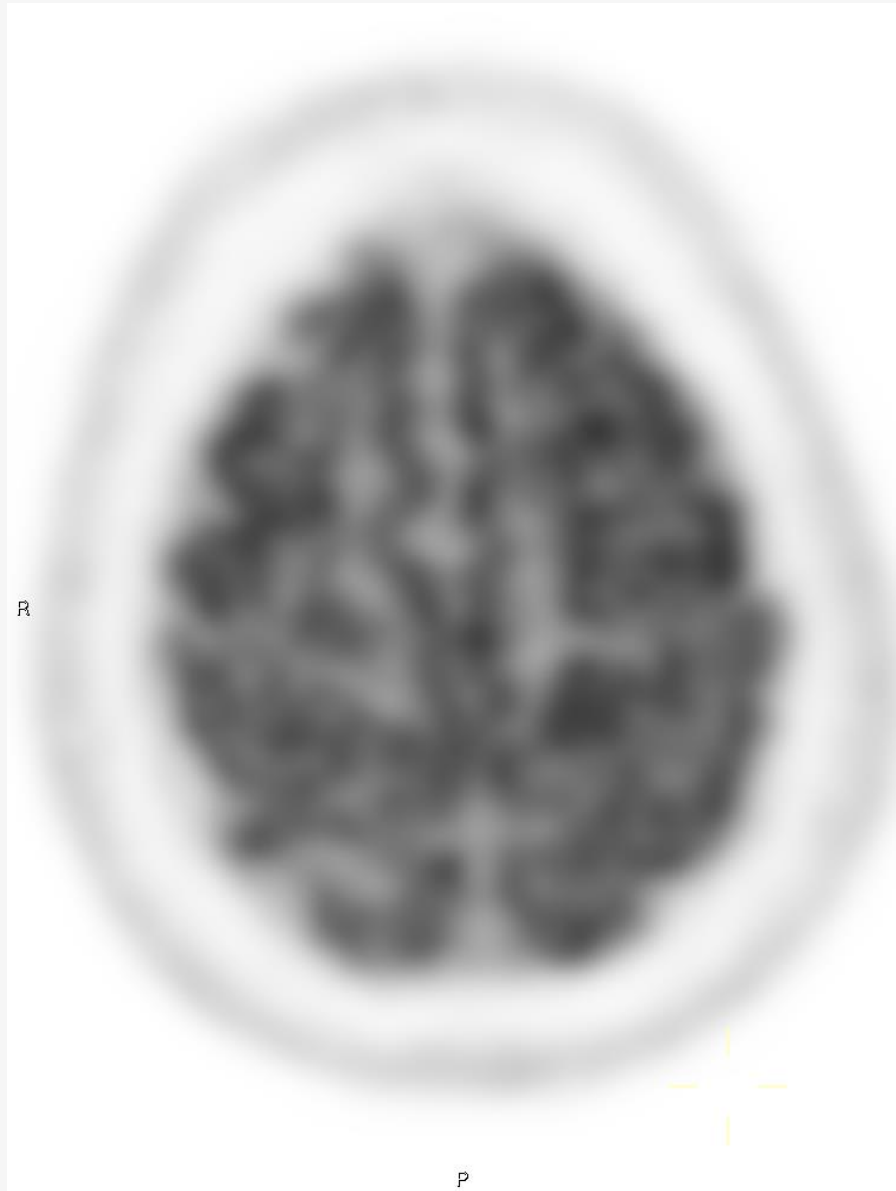
Semantic dementia



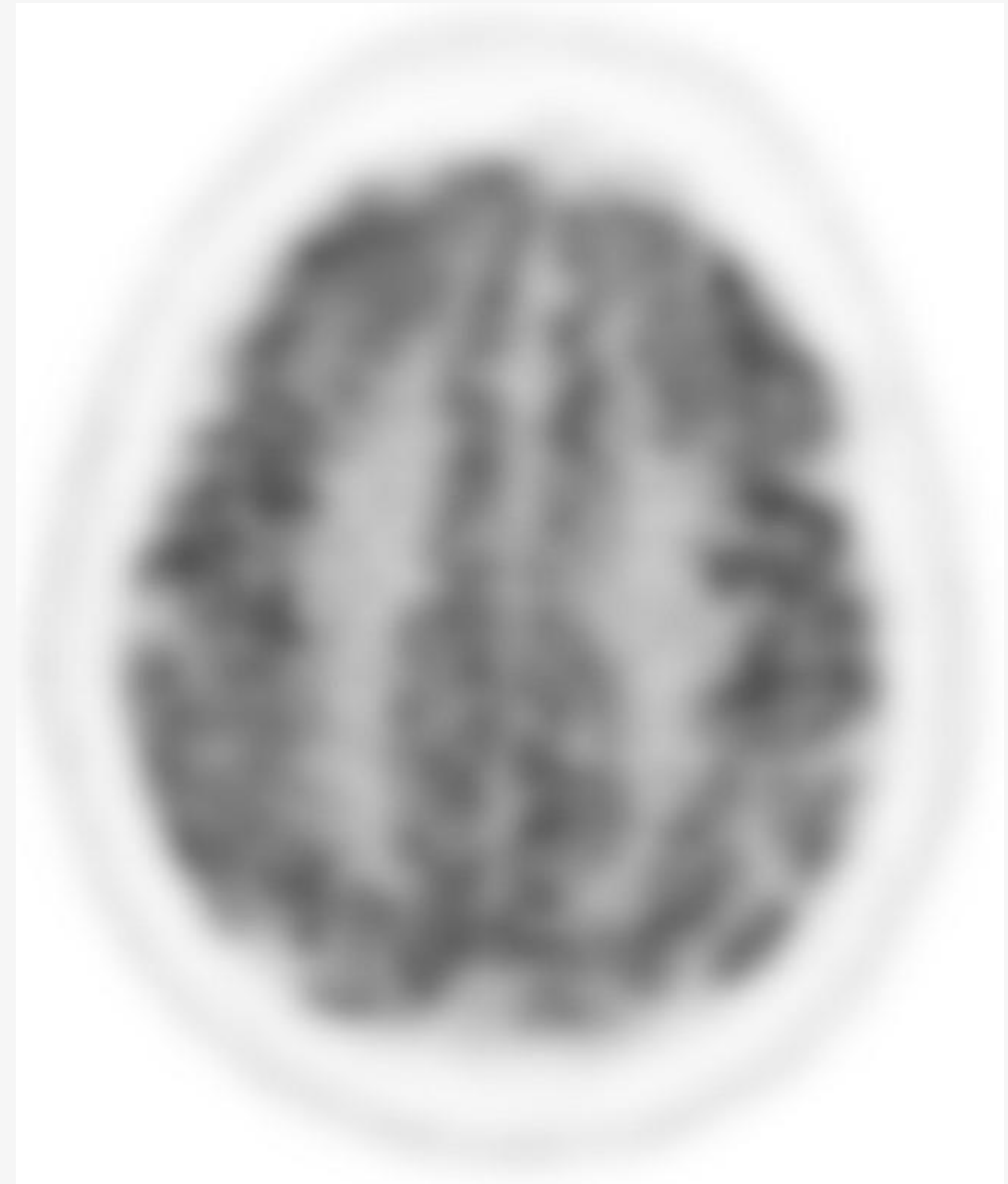
Logopenic aphasia

78 year old with 2 year history of cognitive decline, short term memory loss and word finding difficulties.

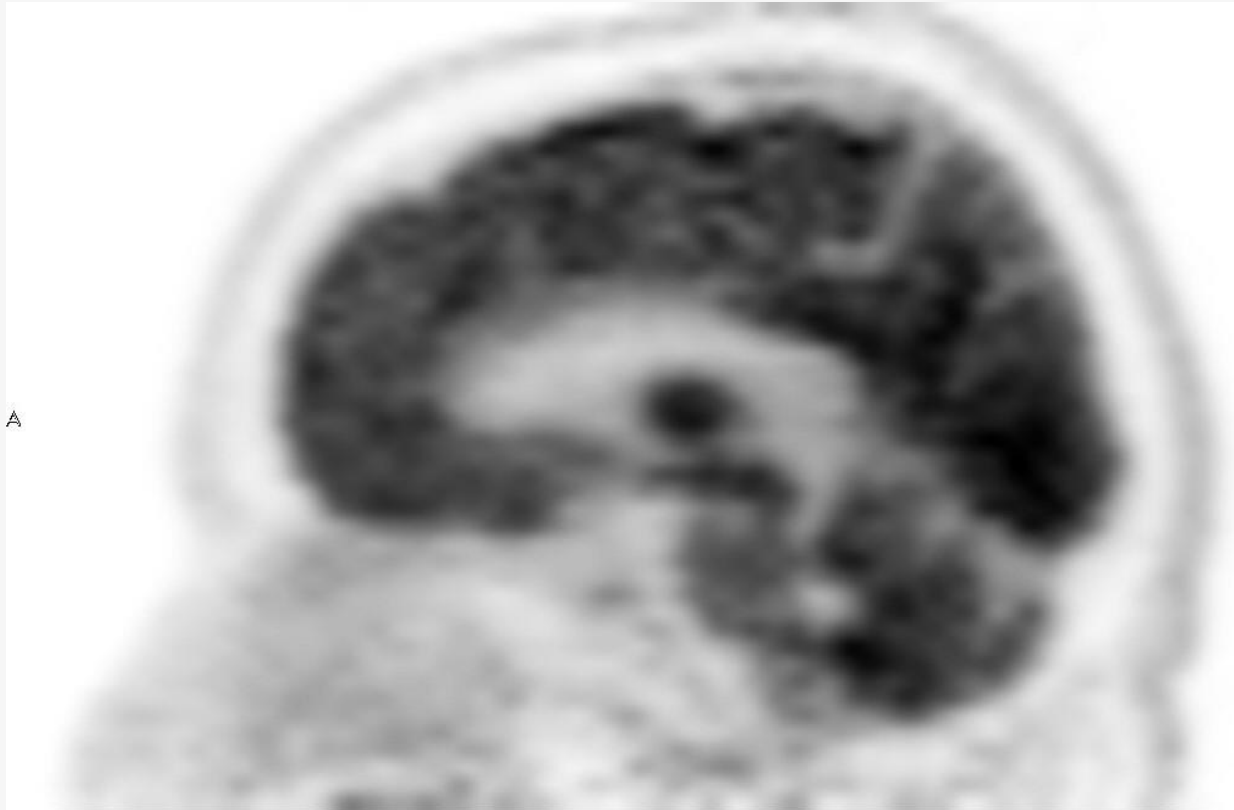




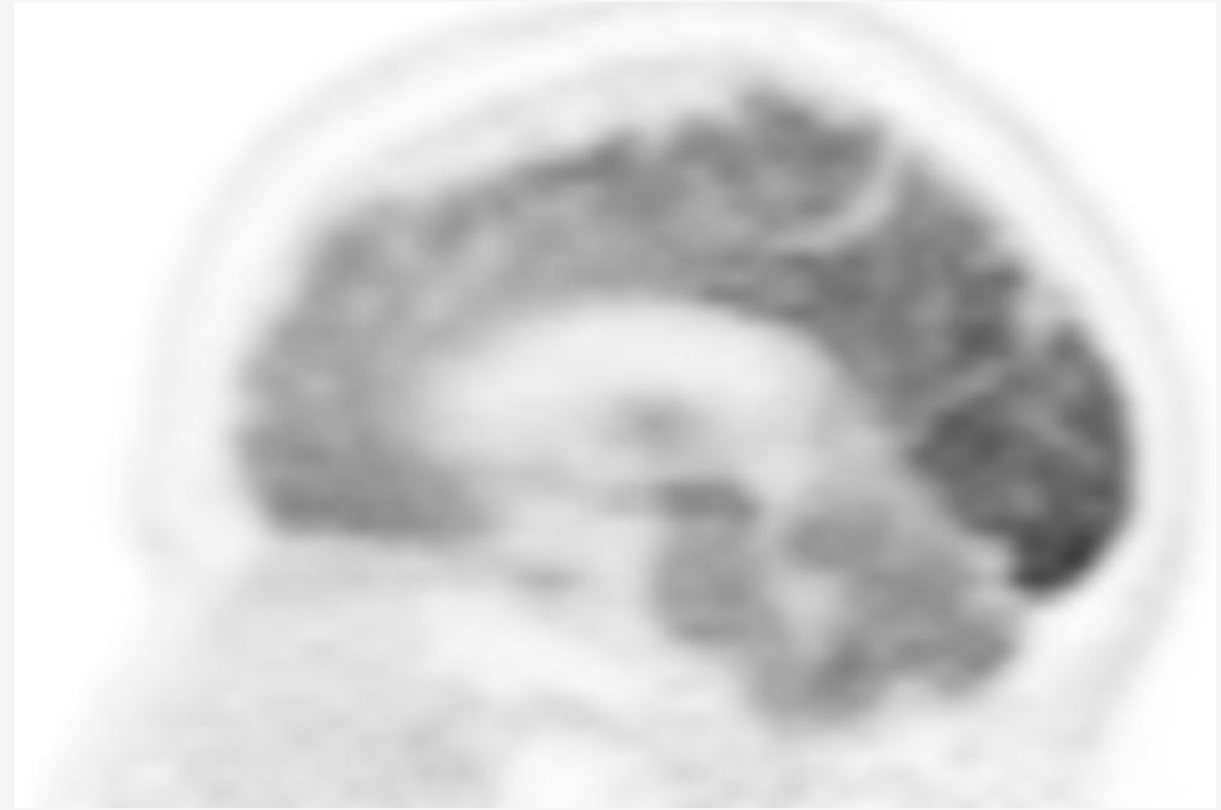
Normal



Diffuse low activity



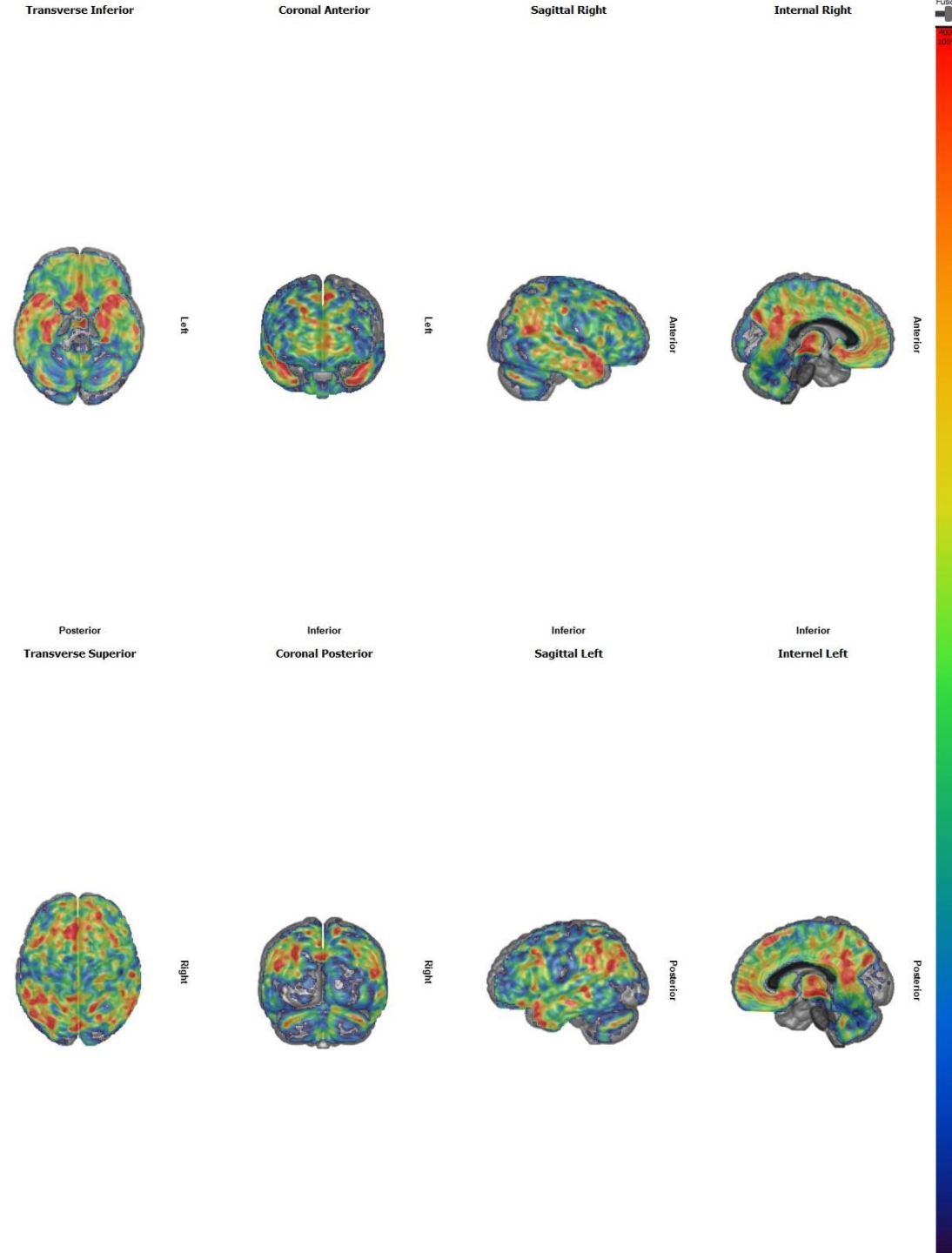
Normal

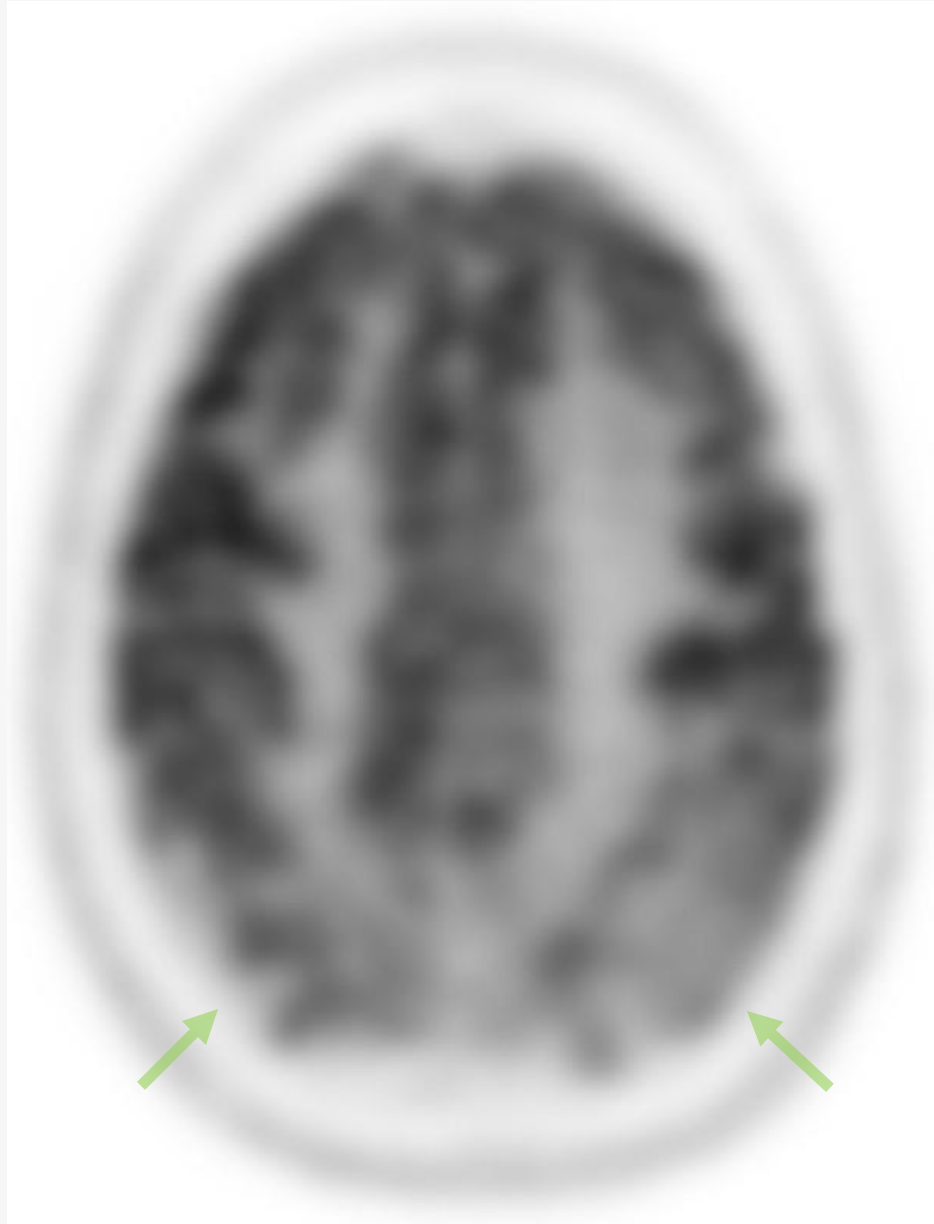


Diffuse low activity

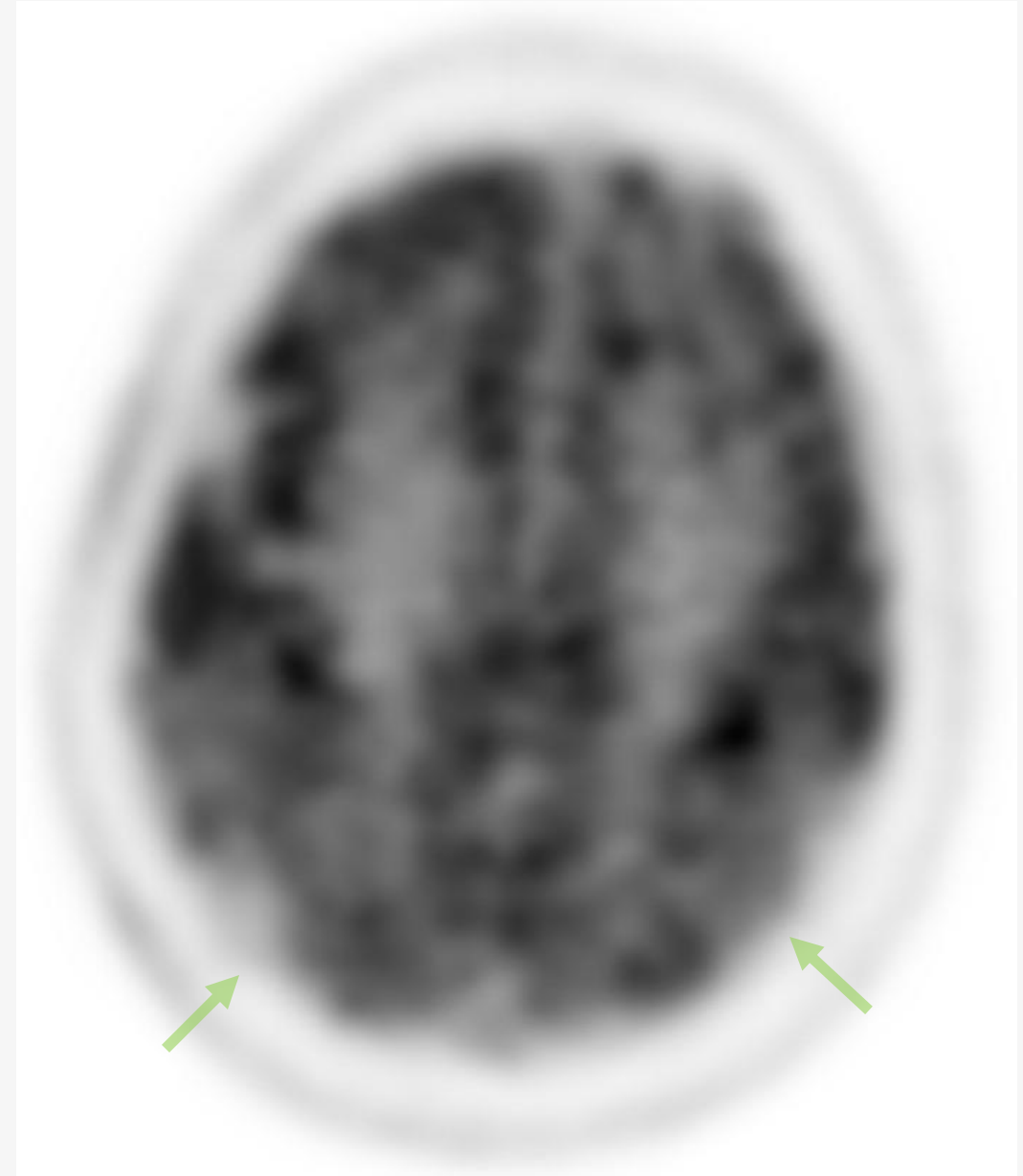


## Reporting tips





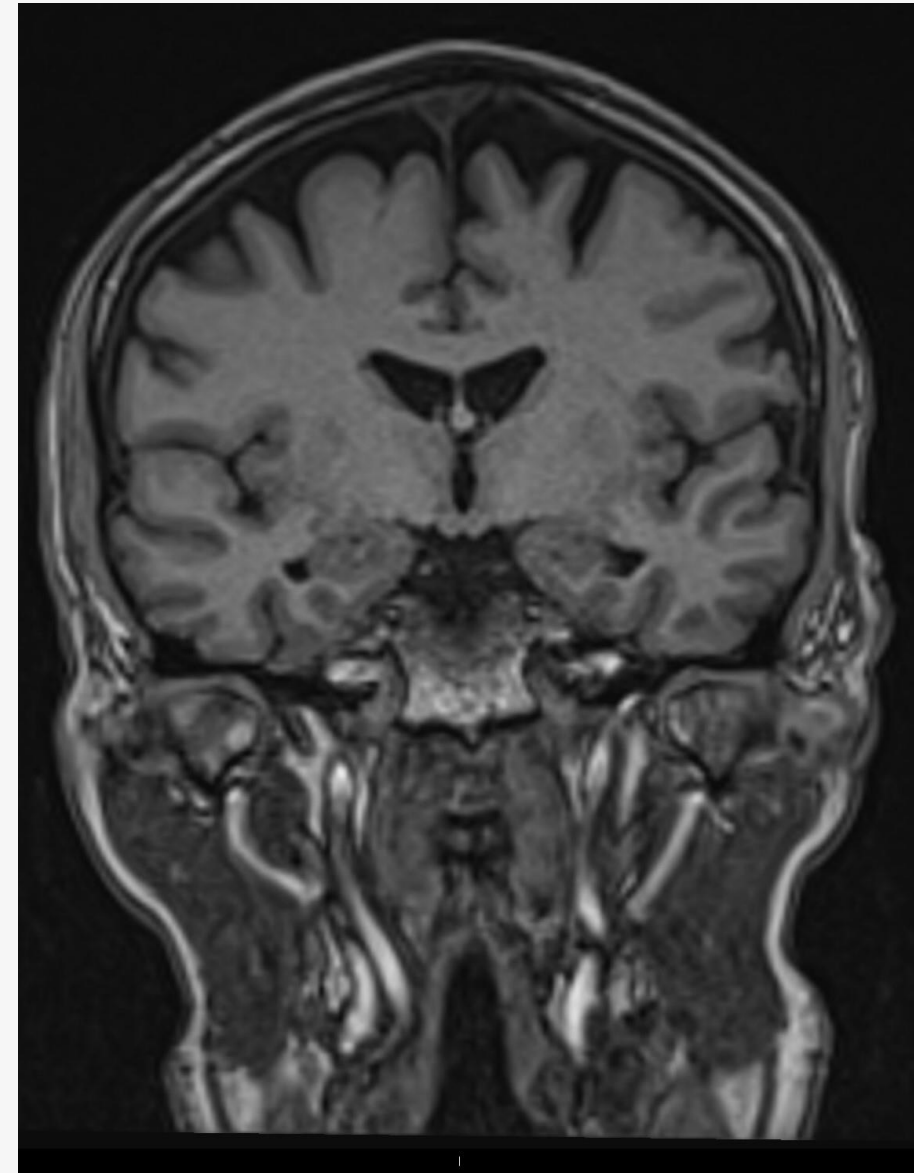
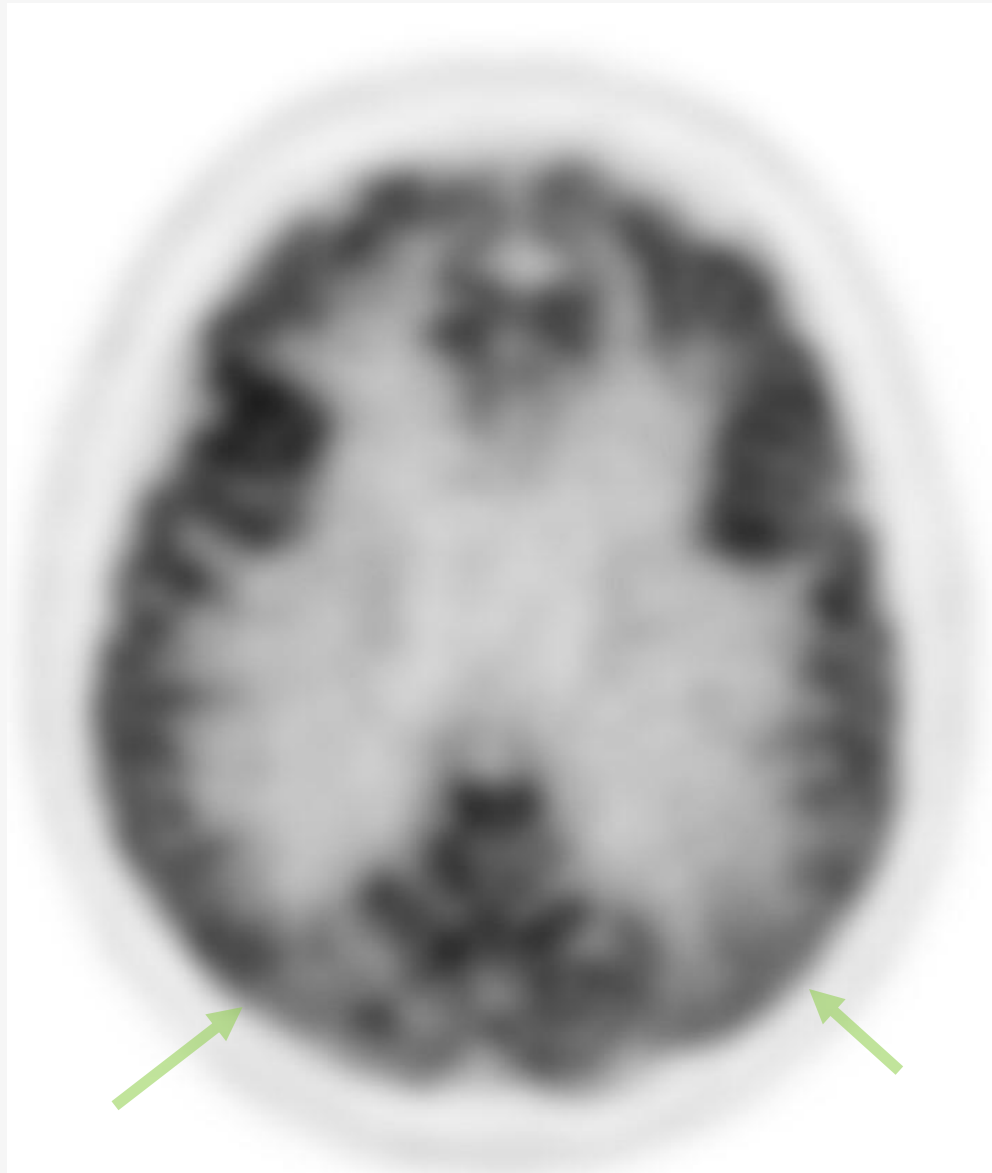
AD



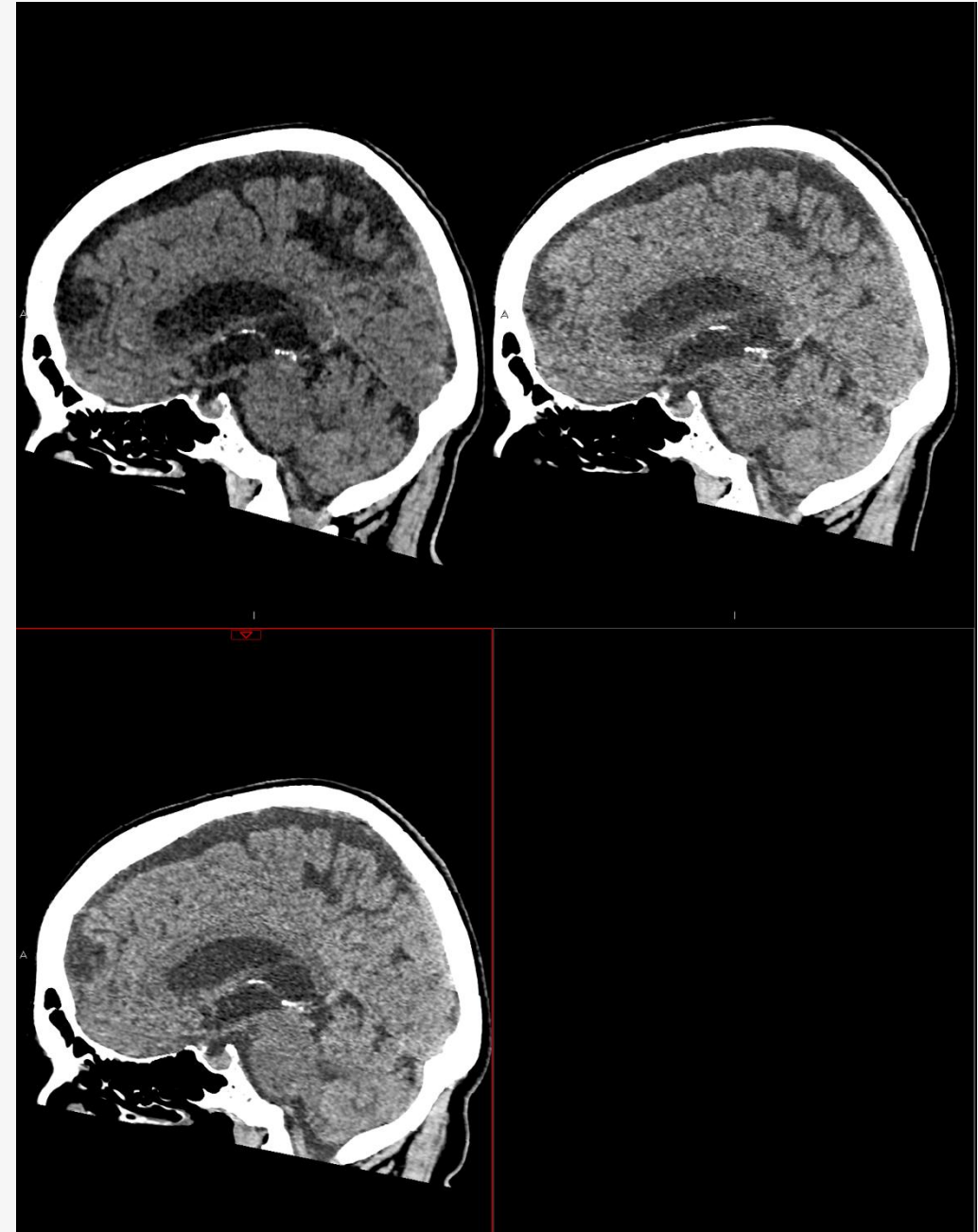
DLB

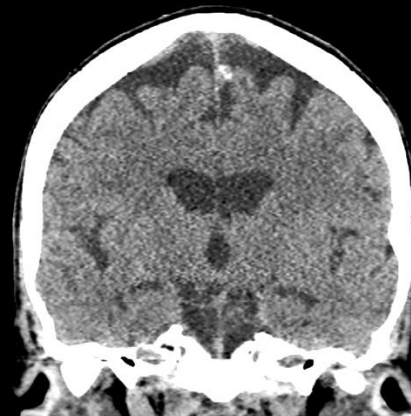
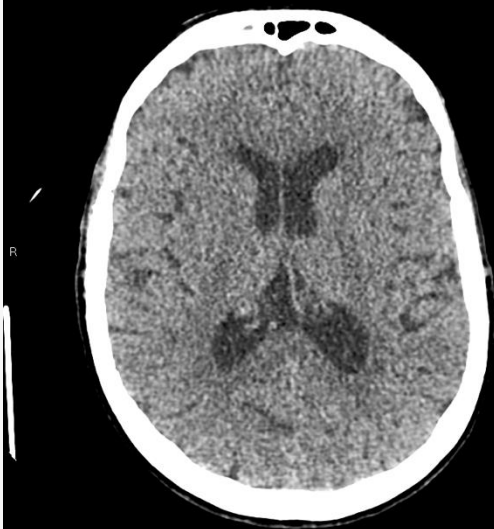
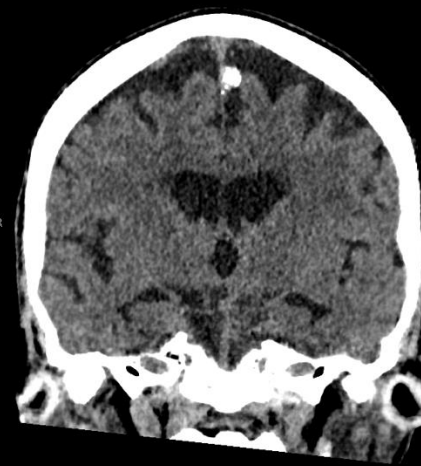


66 year old, cognitive decline, ACE was 78, now 75/100.



75 year old with history of depression with a recent break in treatment. 12 month history of cognitive decline but not progressive. ACE III 58.





- Use a standardised system with references to look at images
- Large variation in normal appearances
- Imaging appearances of common dementias are patterns based on affected areas rather than defined pathologies
- Use all information available when reporting scans including clinical history and previous imaging
- Correlation with anatomical imaging is very helpful
- Uncertain cases should be discussed at MDT

**My scan date is:**

-----

**On the day of your scan**

- Wear loose fitting clothes that are comfortable and warm. Avoid wearing clothes with metal on them such as zippers.
- Feeling anxious is normal and the staff in the centre are here to support you. Please speak to us and let us know how you like to be reassured.
- Drink some plain, still water. We have some in the unit if you need a drink of water when you arrive.
- **Do not eat for 6 hours before your scan. This includes not drinking tea or coffee or fruit juices.**
- Bring a relative or friend if you would like to.
- Our staff are very friendly and will look after you.

