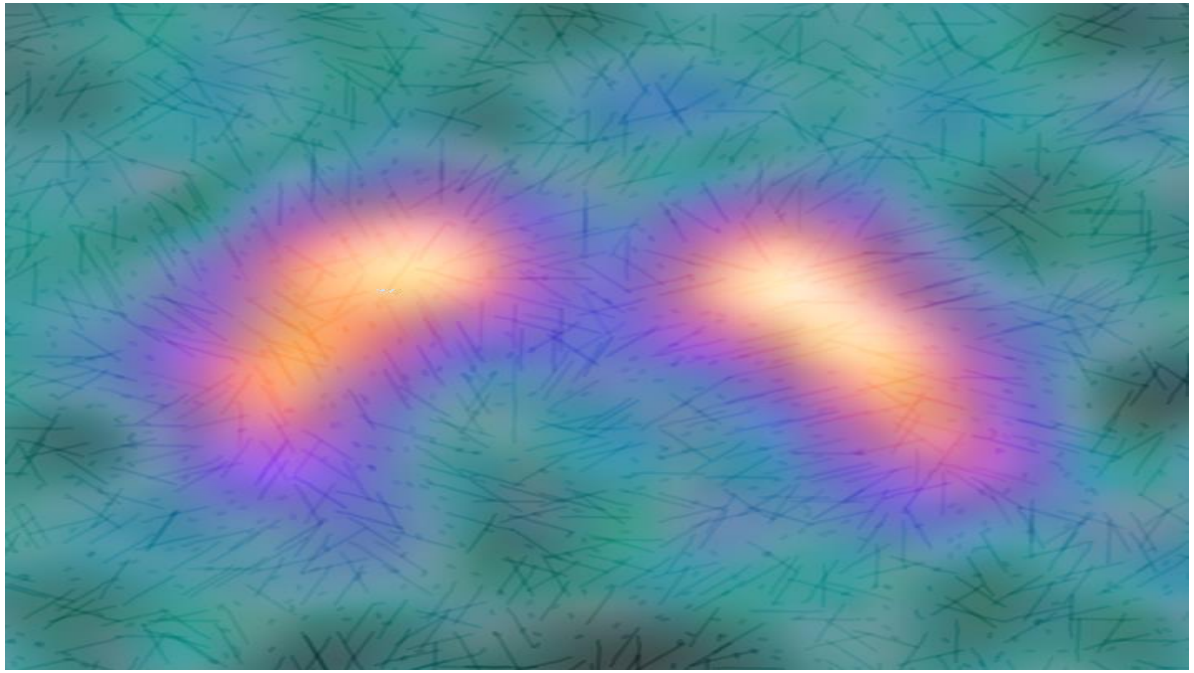
F/U study of patients with
“Balanced Loss”
of striatal dopaminergic transporters on DaTSCAN™



Mohamed El-Sayed, Joseph O’Brien, Alp Notghi

NHS
Sandwell and West Birmingham Hospitals
NHS Trust

Sandwell and West Birmingham Hospitals NHS
NHS Trust

- SWBH
- District General Hospitals

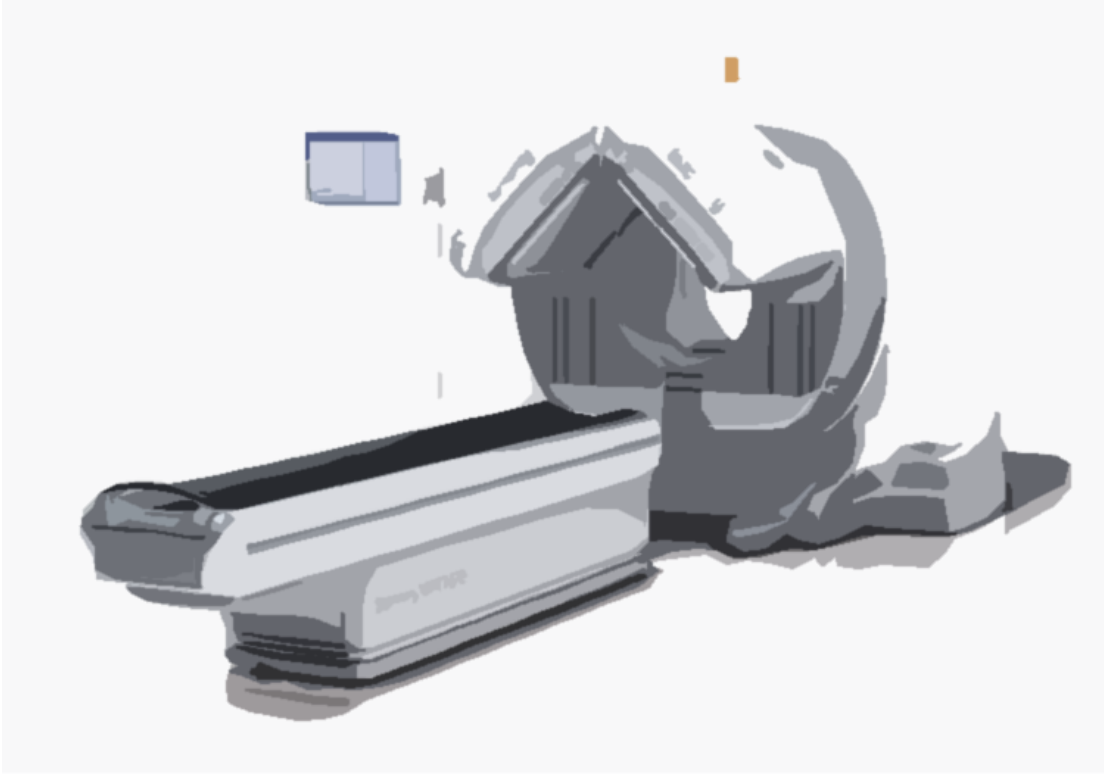
Declaration of interest:

I have no conflicts of interest to report

Outline

- What is DaTSCAN™?
- Aim
- Methods
- Results
- Conclusion

What is DaTSCAN™ ?

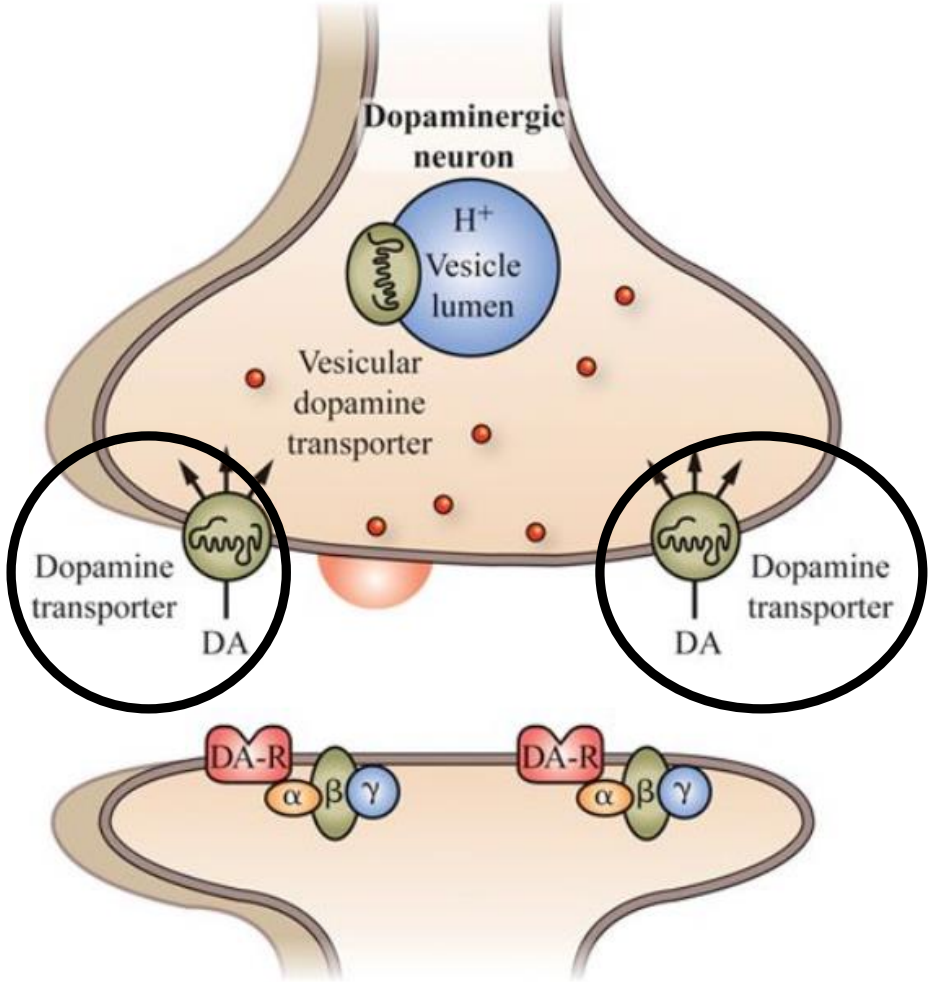


- SPECT of brain

- Ioflupane (I^{123})

Commercial name is: DaTSCAN™

or DaTscan™



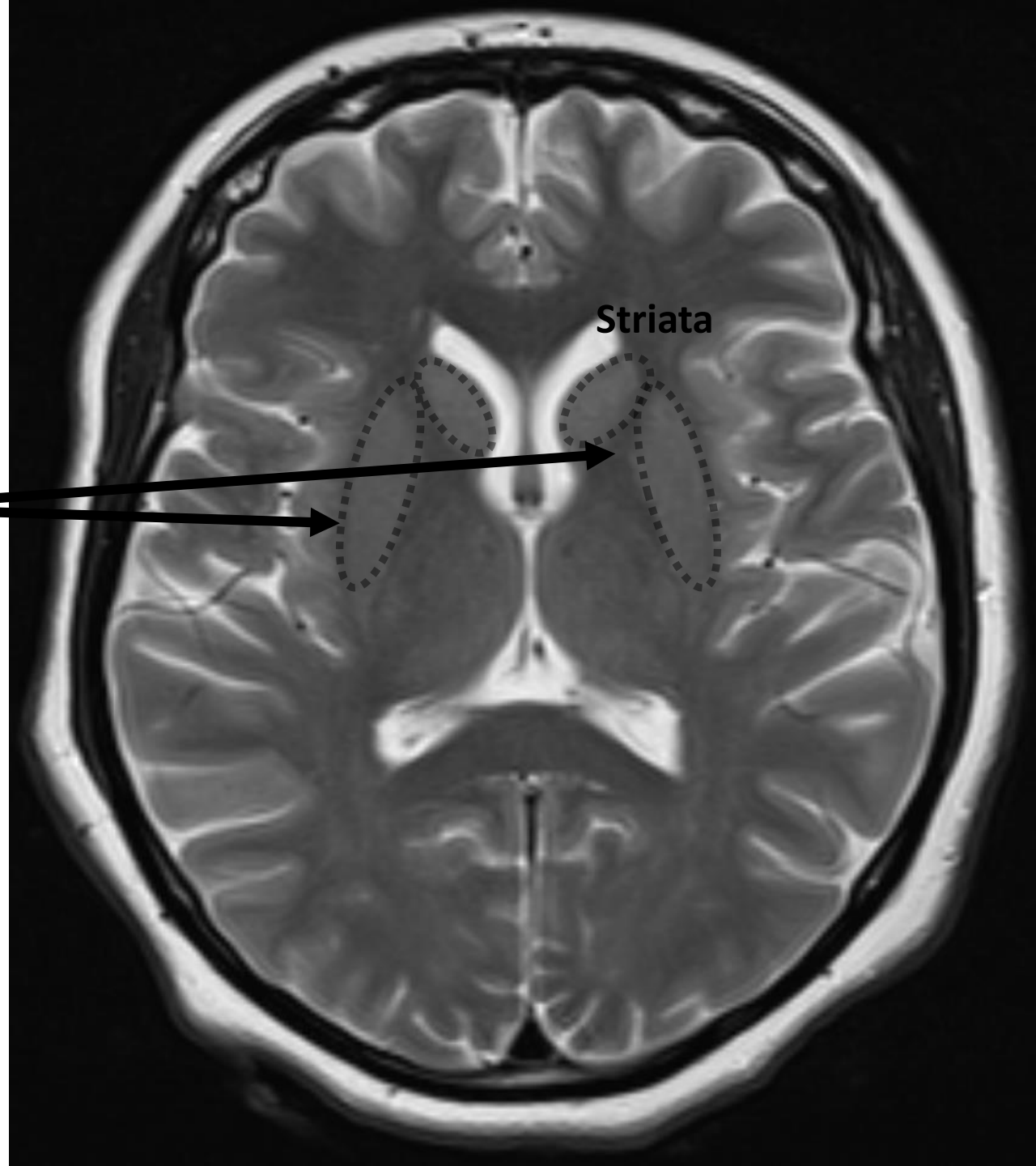
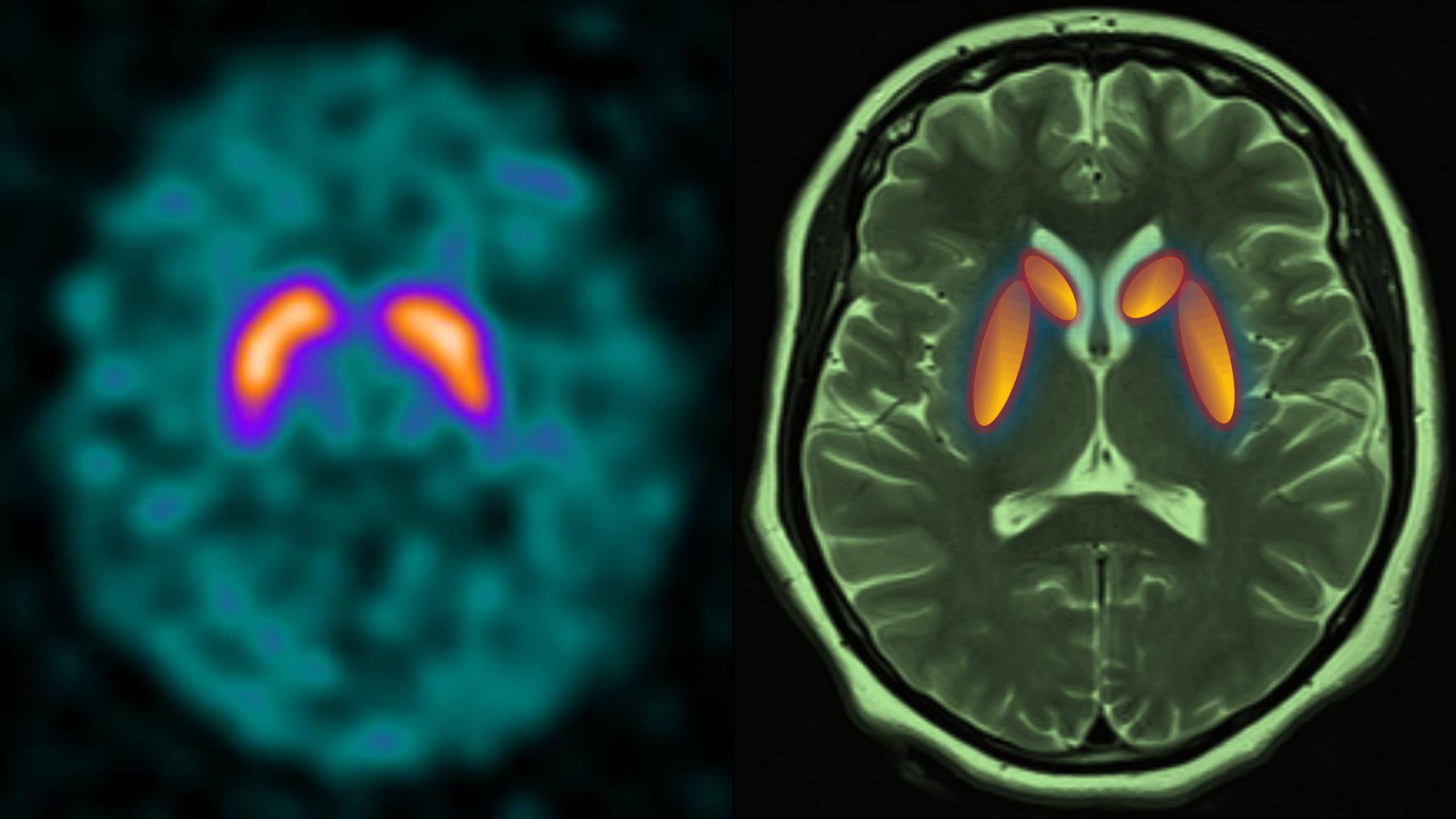
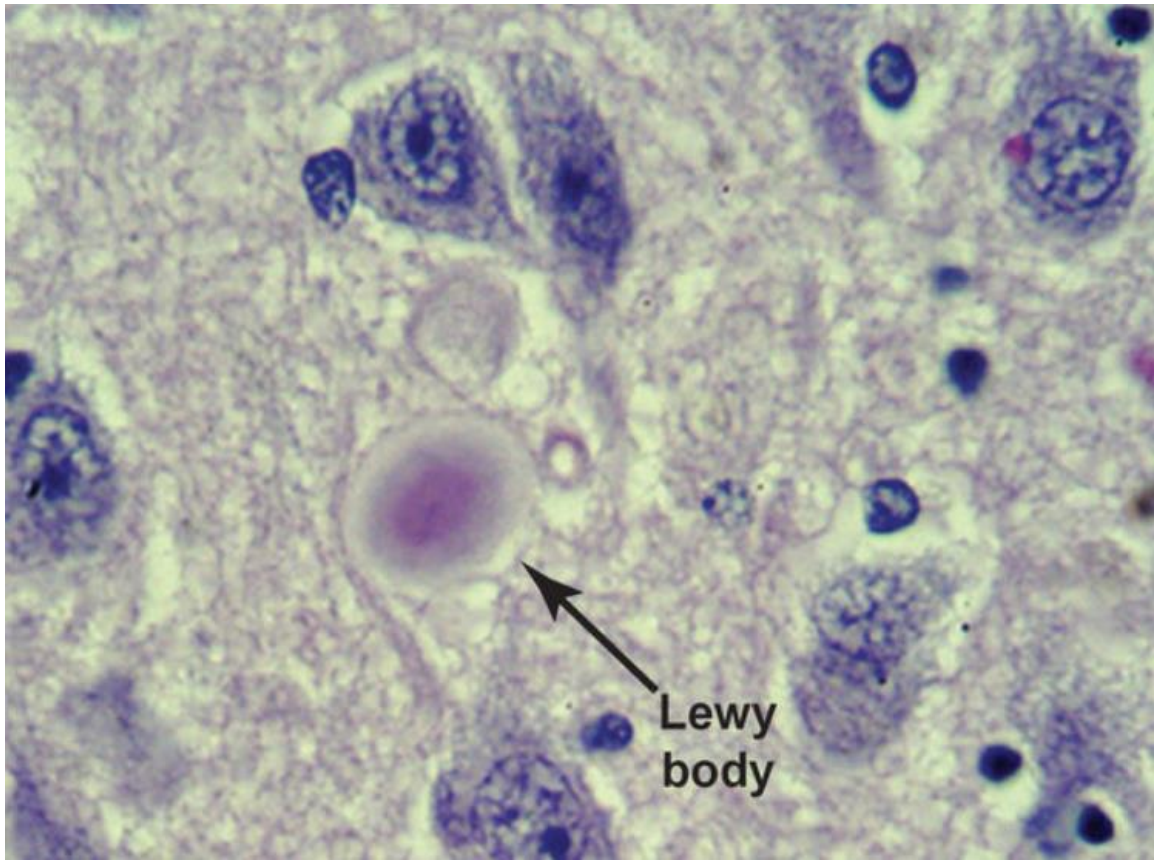


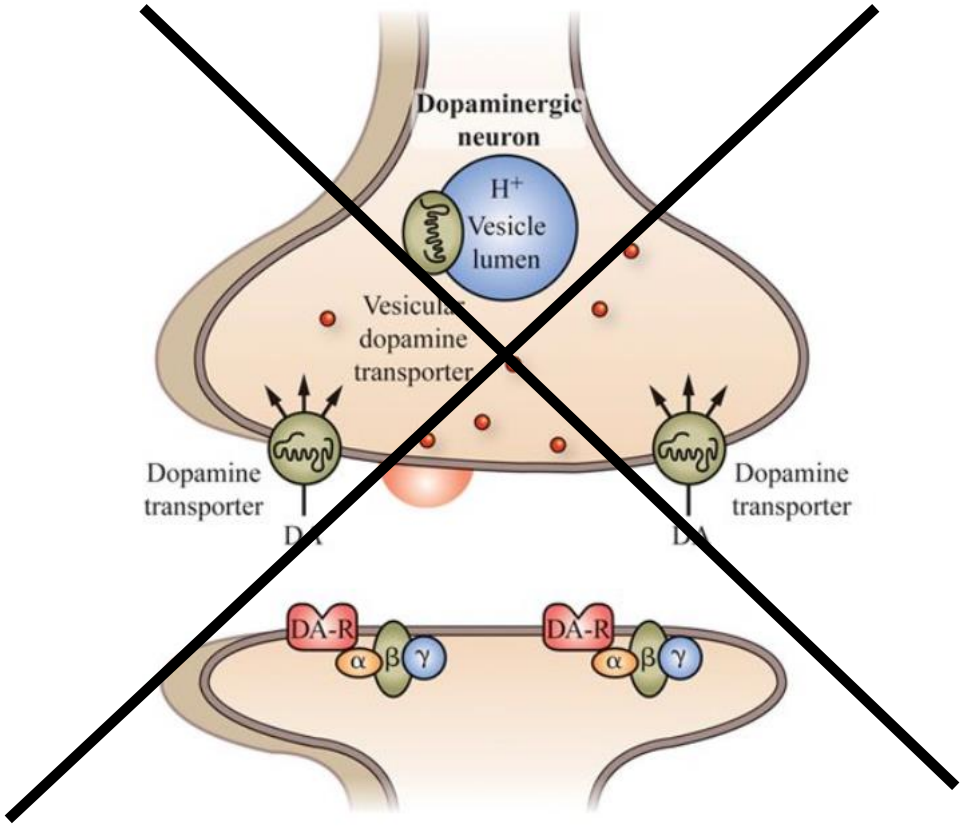
Image the functioning dopamine transporters (DaT) at the presynaptic nerve terminals of the striata

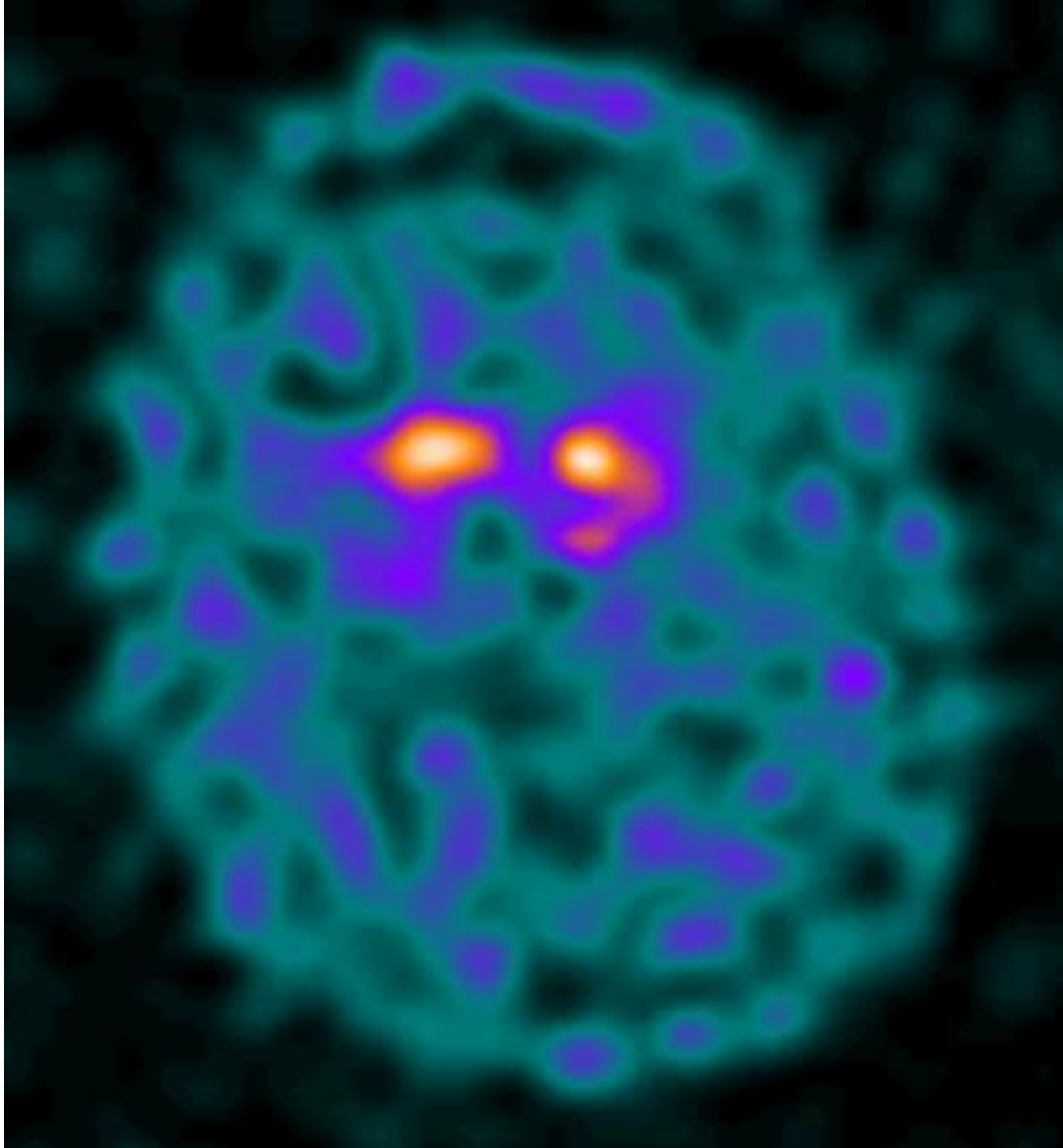


Dr. Frederic Henry Lewy
1885-1950

1912, he discovered microscopic neuronal inclusion bodies in the brain of a deceased Parkinson's patient



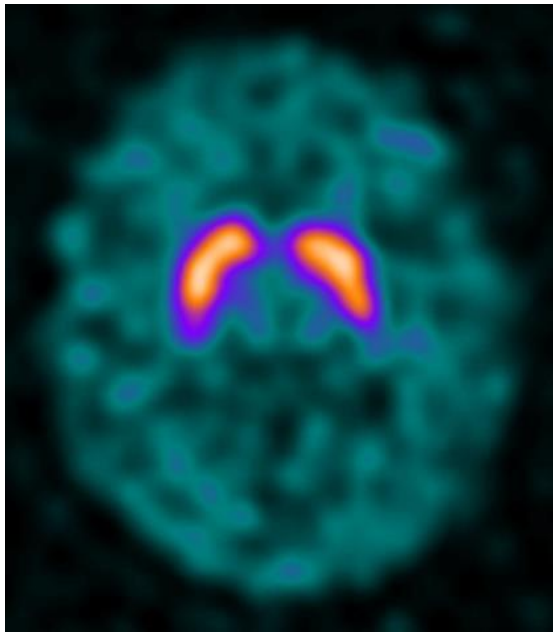

Dopaminergic neuron
H+
Vesicle lumen
Vesicular dopamine transporter
Dopamine transporter
Dopamine transporter
DA-R
α
β
γ
DA-R
α
β
γ



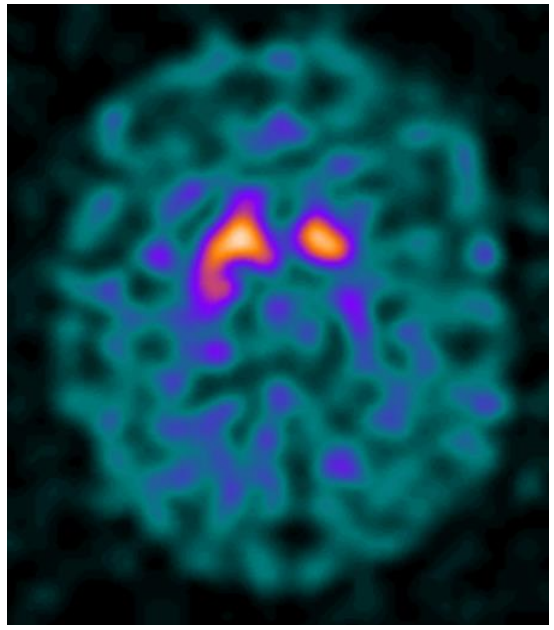
Common patterns of DaTSCAN™ results

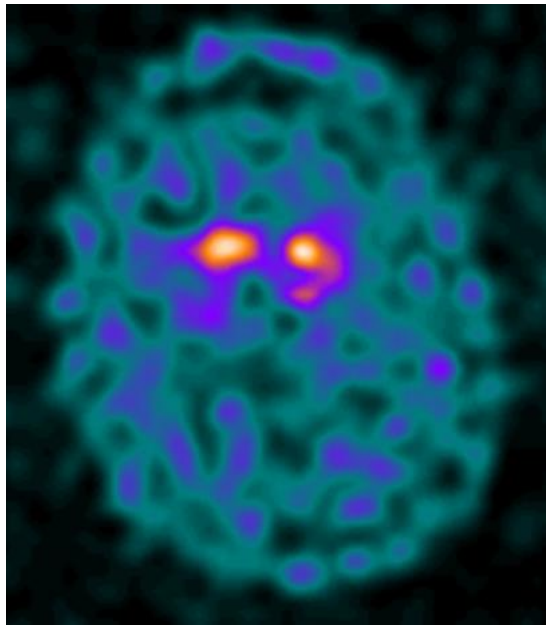
Visual assessment

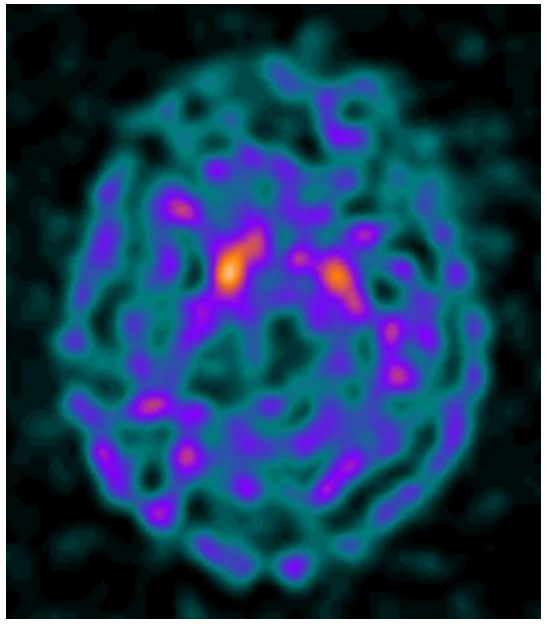
Normal



Abnormal



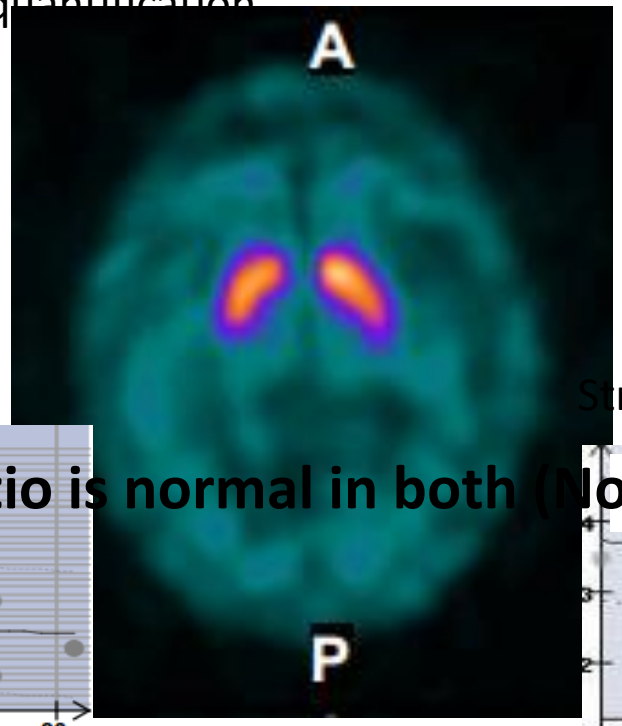


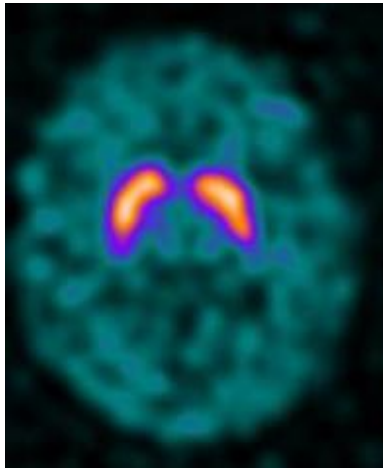


Less common pattern of DaTSCAN™ result

But, abnormal on quantification

Balanced loss



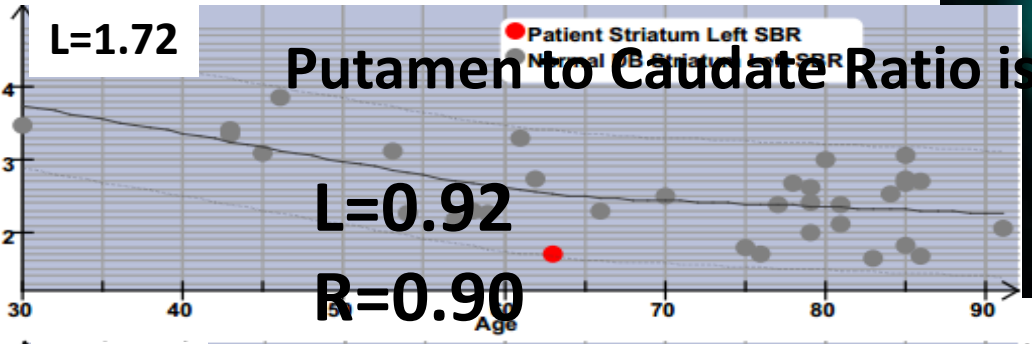


Normal on visual analysis

Normal Quantification

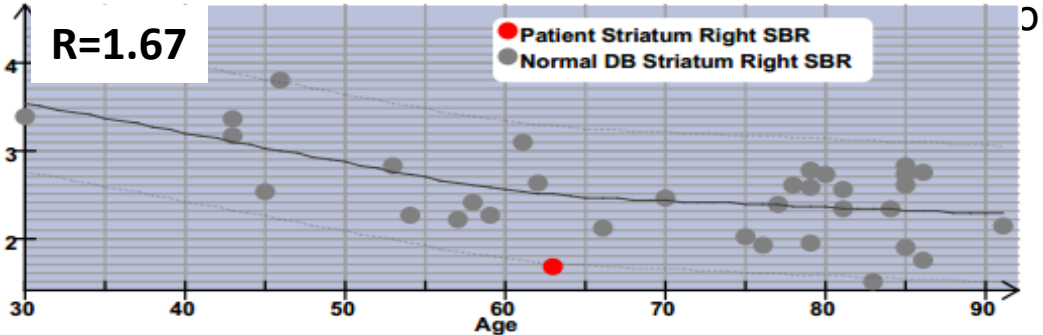
Normal study

Striatal to BG ratios (Normal>1.9)



L=0.92

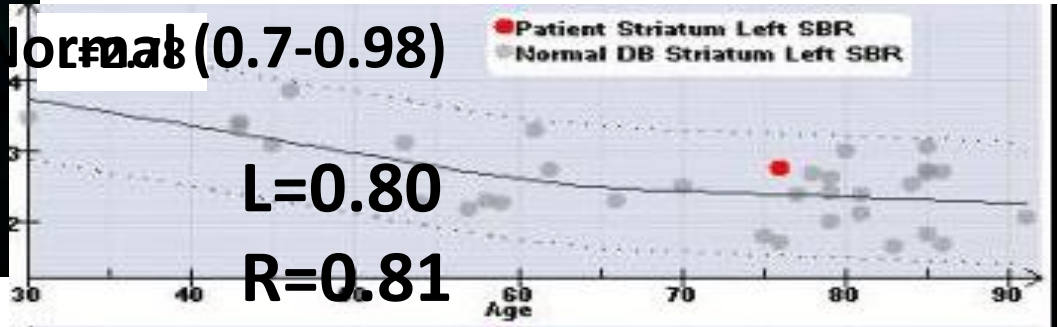
R=0.90



Putamen to Caudate Ratio is normal in both (Normal (0.7-0.98)

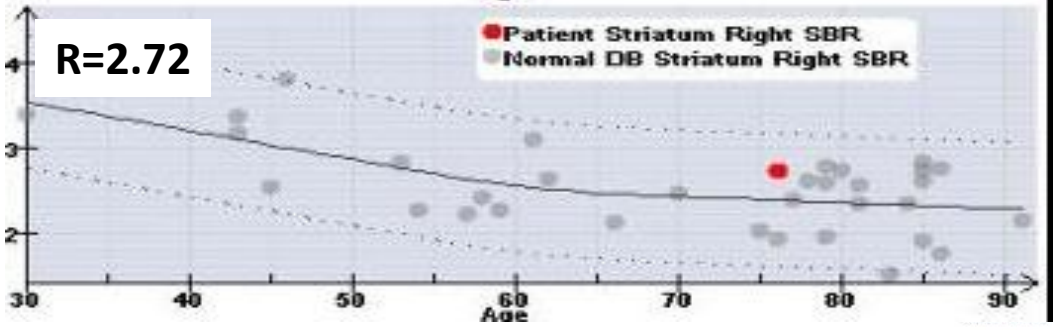
ormal on visual analysis

Striatal to BG ratios (Normal>1.9)



L=0.80

R=0.81

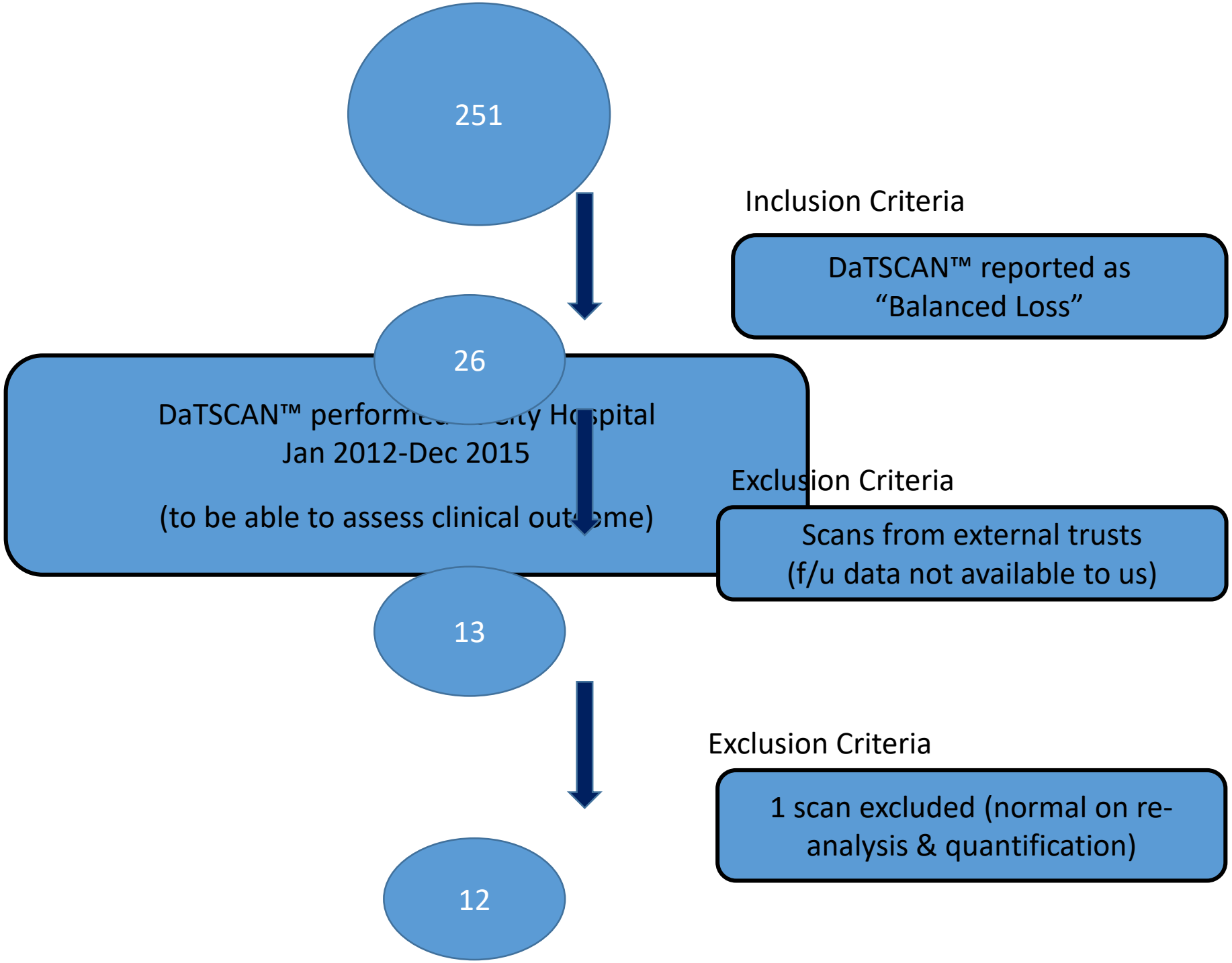


Aim

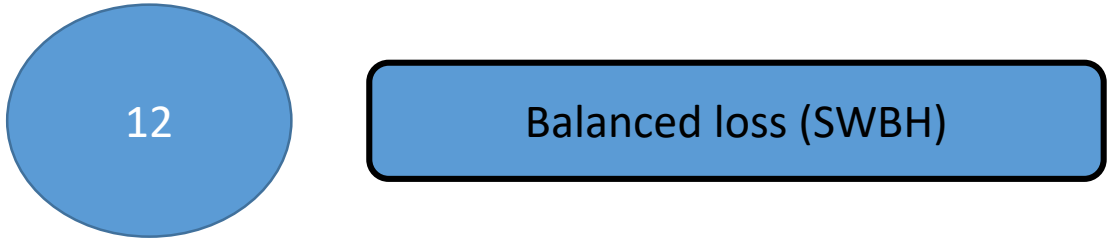
- To assess the clinical outcome of patients with DaTSCAN™ reported as “Balanced Loss” of dopaminergic nerve terminals in the striata.

Methods

Methods


251
Inclusion Criteria
DaTSCAN™ reported as "Balanced Loss"
26
DaTSCAN™ performed [illegible] Hospital
Jan 2012-Dec 2015
(to be able to assess clinical outcome)
Exclusion Criteria
Scans from external trusts
(f/u data not available to us)
13
Exclusion Criteria
1 scan excluded (normal on re-analysis & quantification)
12

Methods



Methods

Re-analysis & Quantification

10x10 iterative reconstruction

DaTQUANT (GE Healthcare)

&

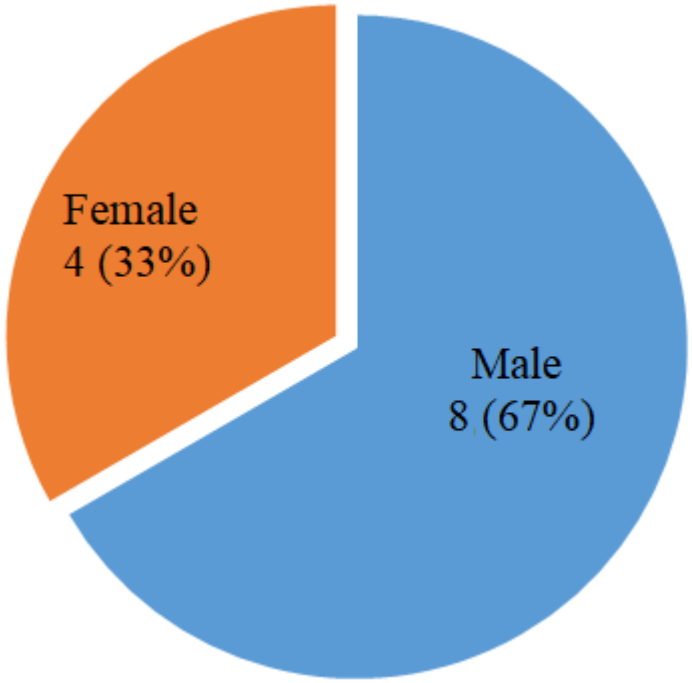
Follow up

Final diagnosis

Results

Results

Demographics:



Age: 57-90

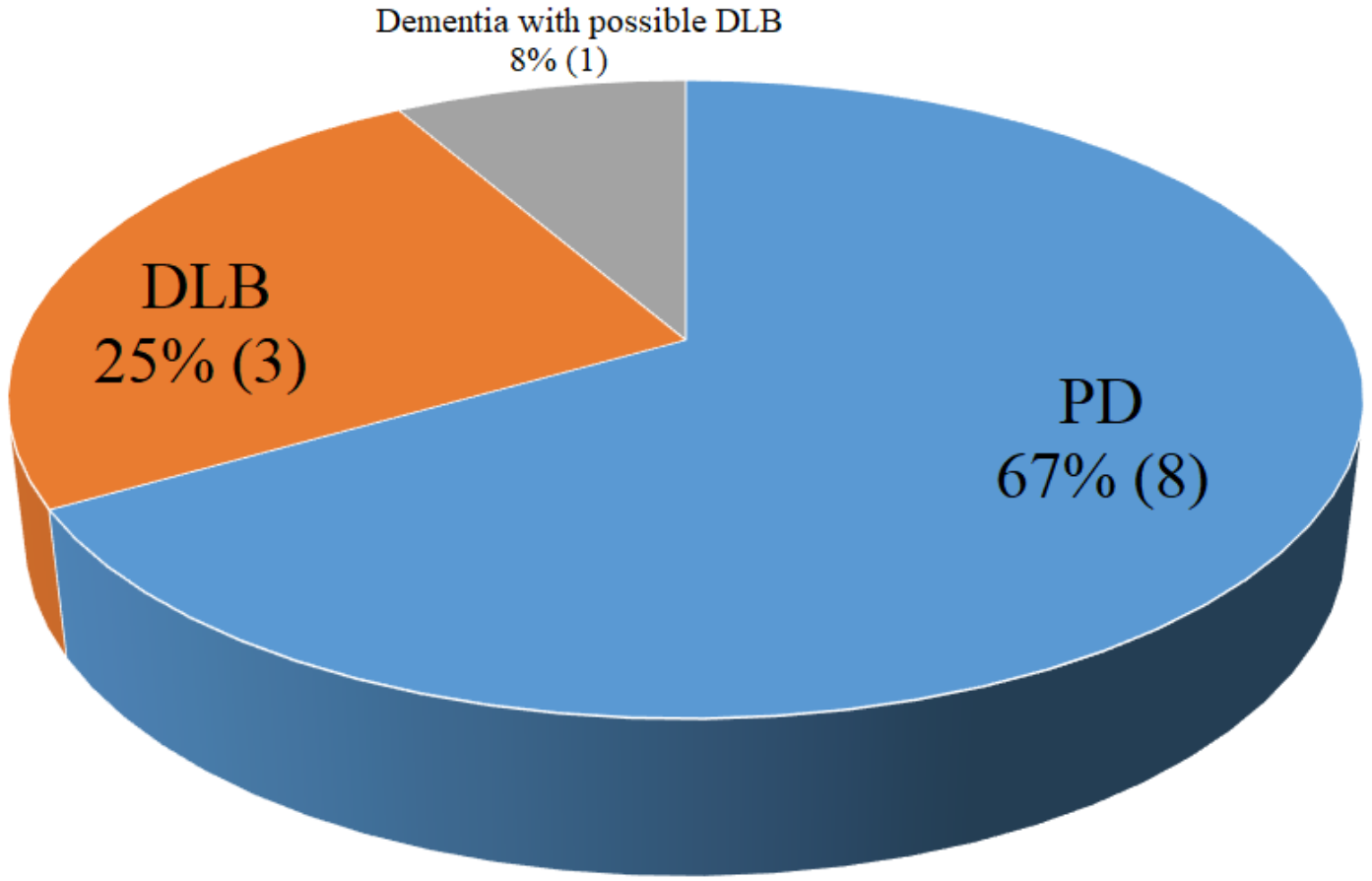
Results

- Re-analysis & Quantification

	Normal	Abnormal
Striatum/Background ratio (Normal >1.9)	0%	100% (12) L: Mean 1.49; R: Mean 1.50
Putamen/Caudate ratio (Normal 0.7-0.98)	83% (10)	17% (2) Despite their visual normal comma appearance

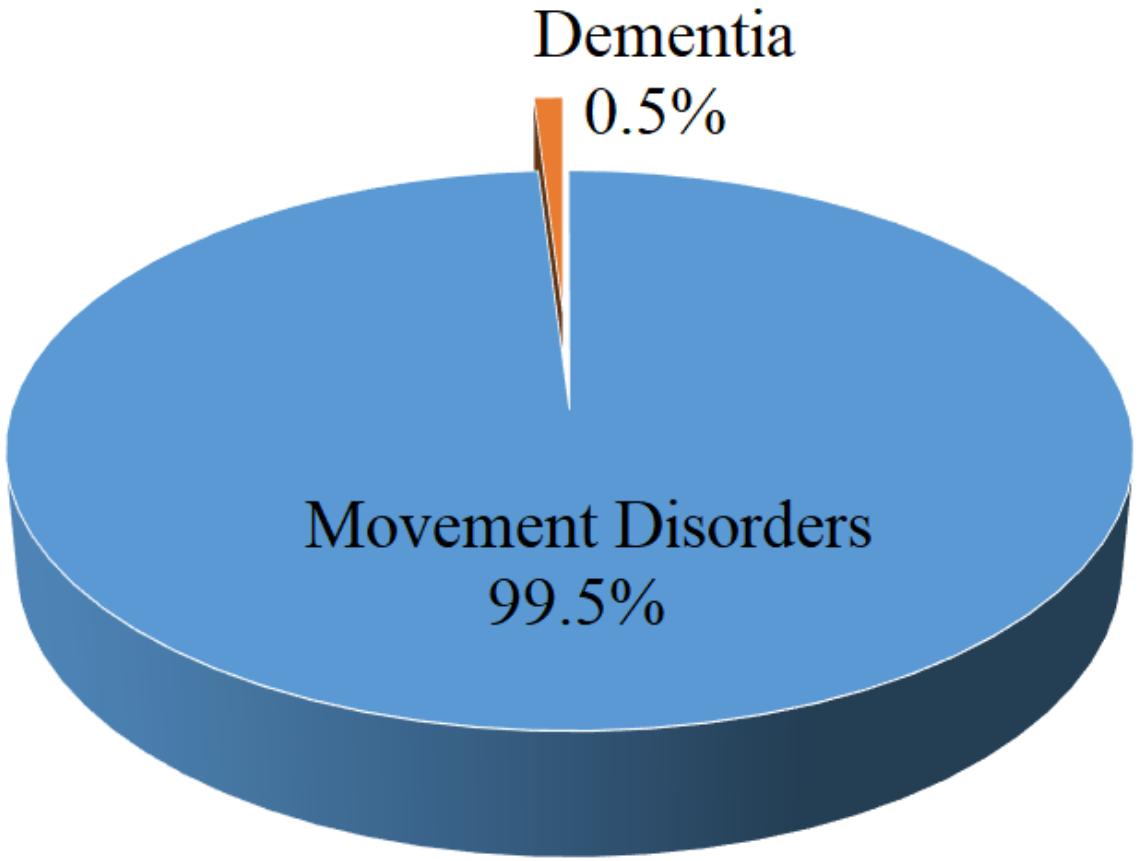
Results

Follow up: Minimum f/u was 2.5 years

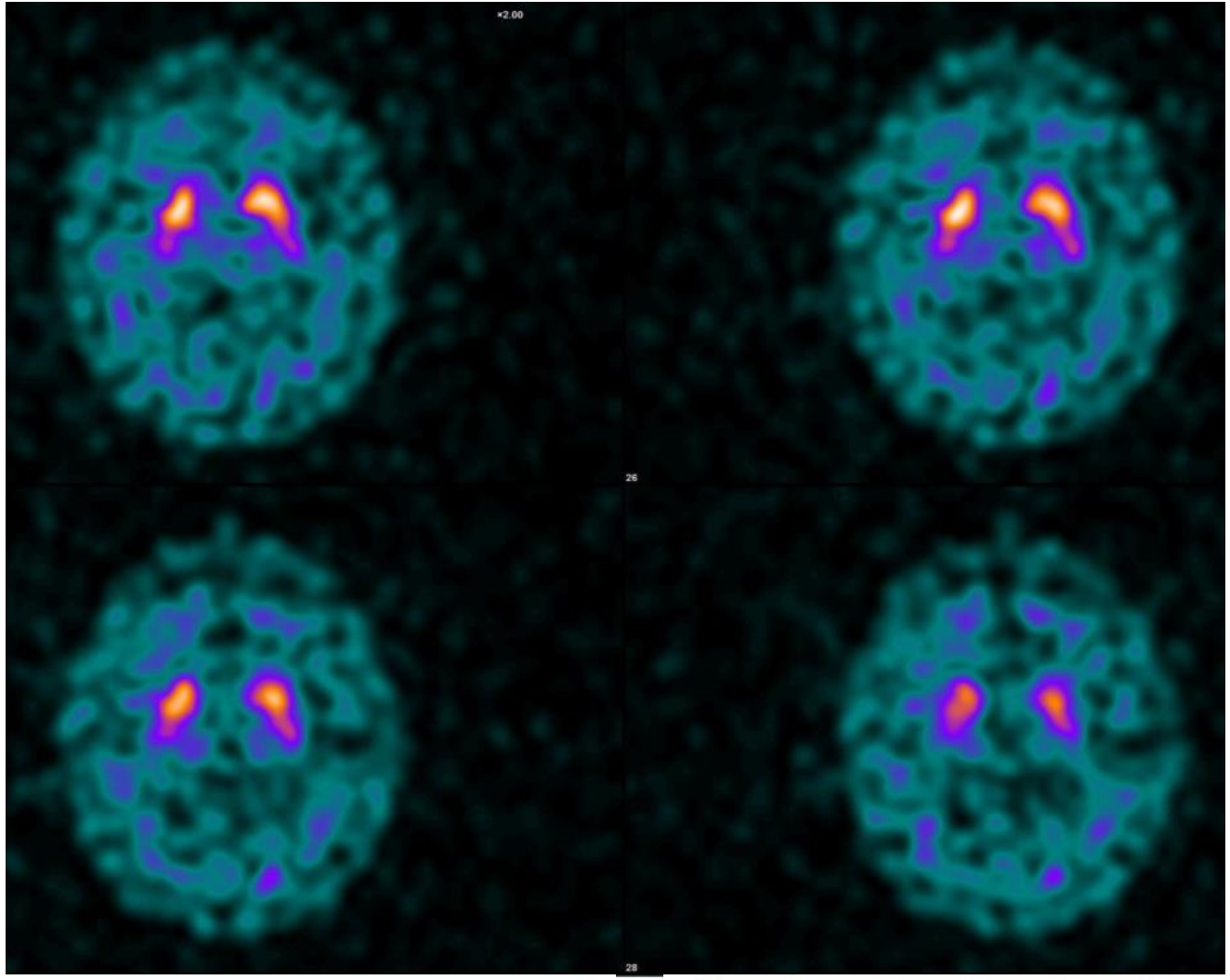


Results

Analysis of the referral pattern (251 patients)

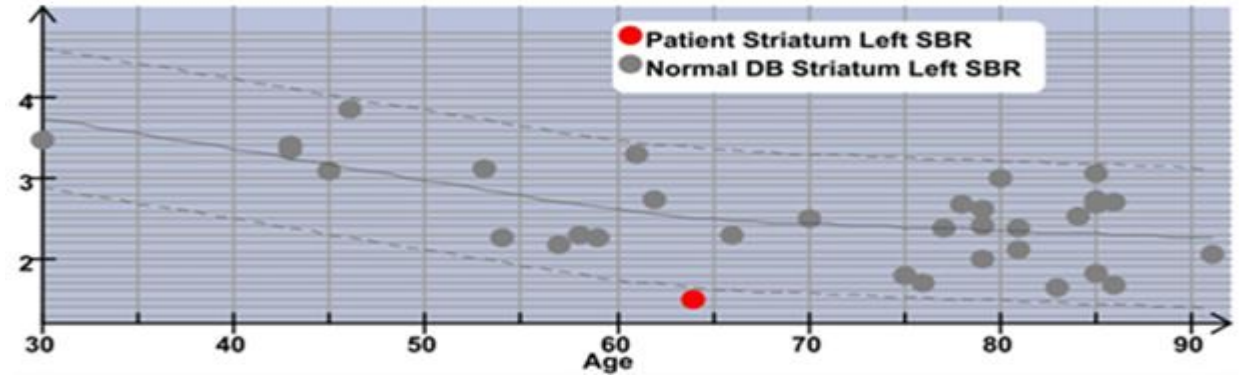


Example: Case 1

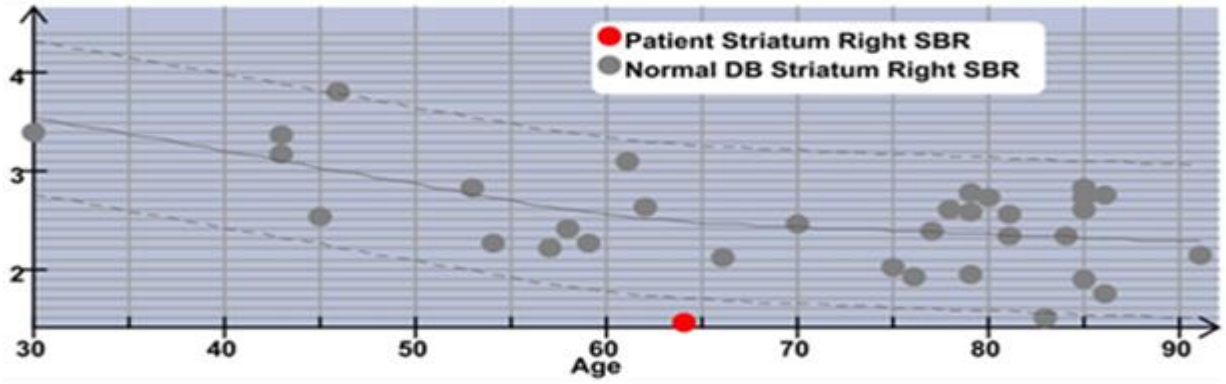


Normal values
Striatal/BG ratio >1.9
Putamen/Caudate ratio 0.7-0.98

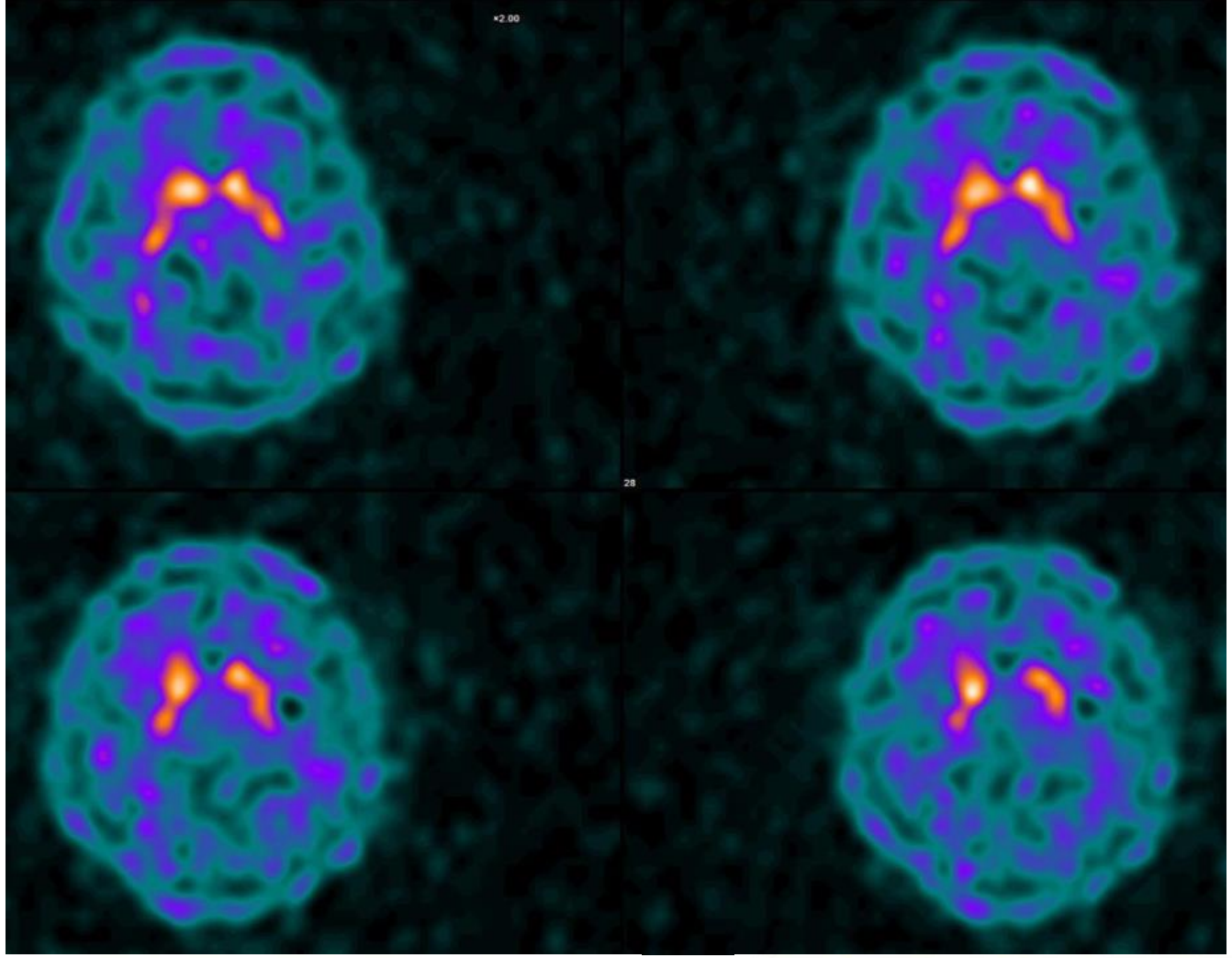
Left
Striatal/BG ratio 1.48
Putamen/Caudate ratio 0.83



Right
Striatal/BG ratio 1.45
Putamen/Caudate ratio 0.84

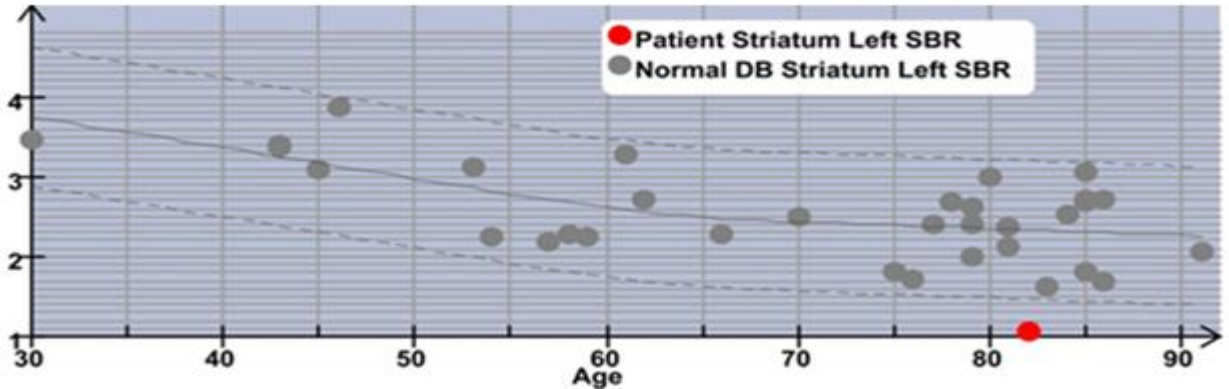


Example: Case 2

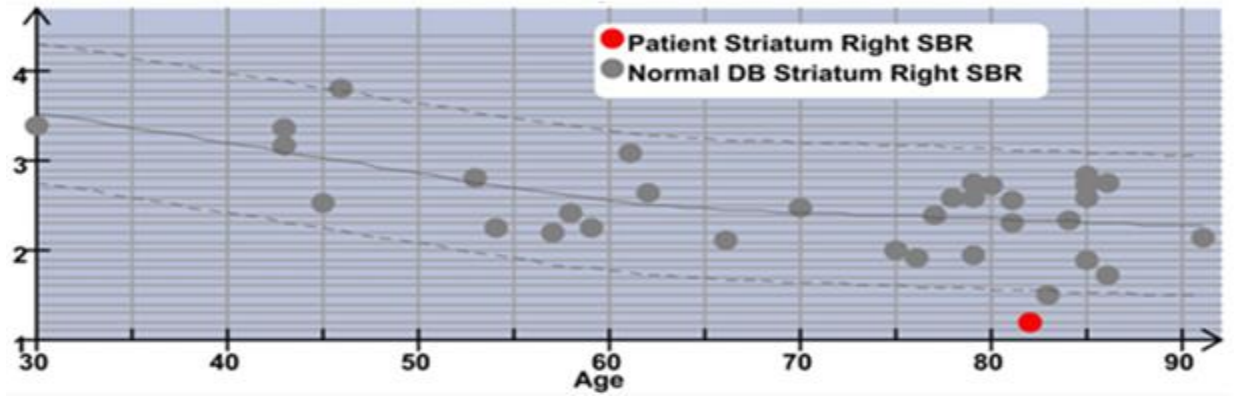


Normal values
Striatal/BG ratio >1.9
Putamen/Caudate ratio 0.7-0.98

Left
Striatal/BG ratio 1.06
Putamen/Caudate ratio 0.79



Right
Striatal/BG ratio 1.20
Putamen/Caudate ratio 0.68



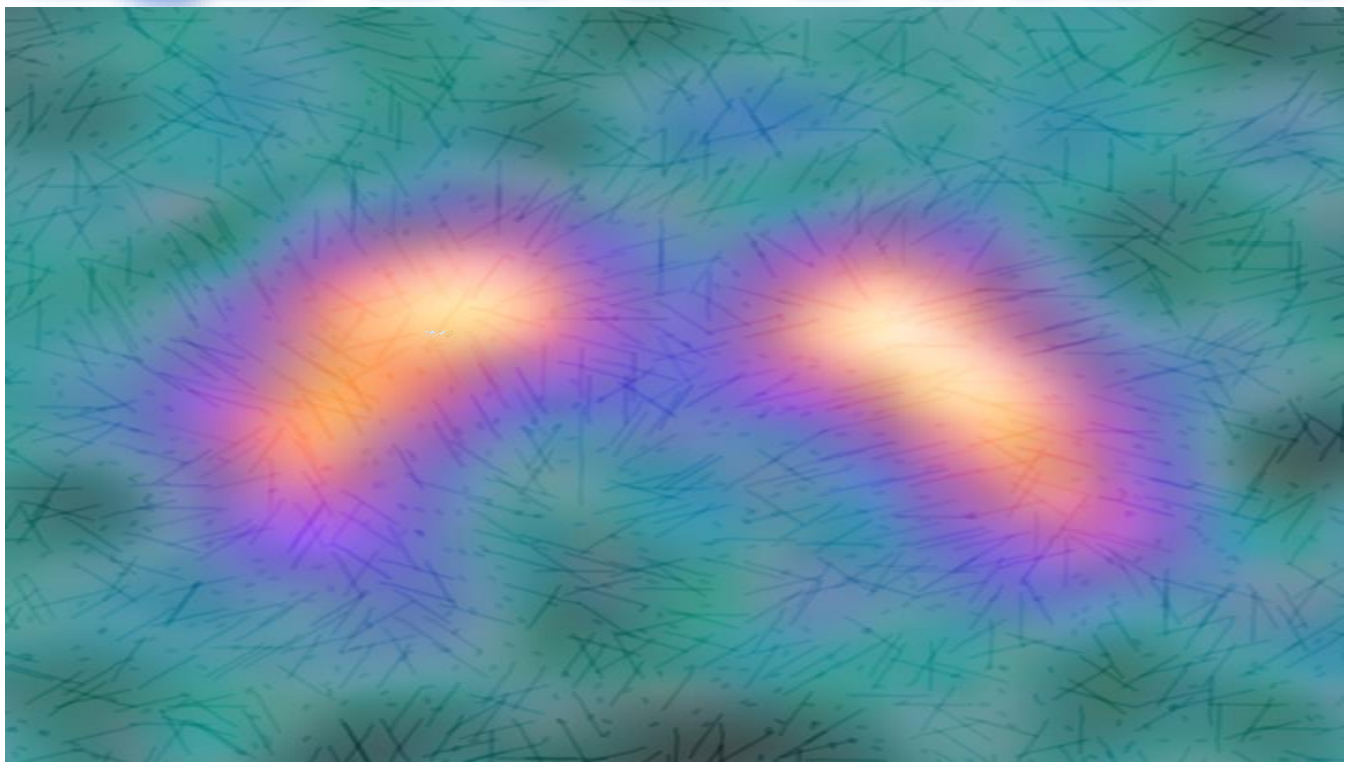
Conclusion:

- Balanced loss of dopaminergic transporters in striata is associated with final diagnoses of PD and DLB.
- It is known that balanced striatal loss is more often seen in DLB.
- The apparently high number of PD in this study could be because of our high PD patient referral pattern.

Conclusion:

- The use of Quantifiction in DaTSCAN™ reporting is extremely important in order not to miss balanced loss.

Questions ?



Thank You