



# Chronic Small Vessel Disease (SVD) imaging features and SVD score

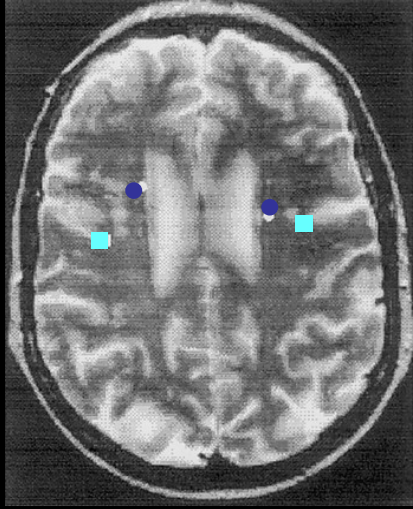
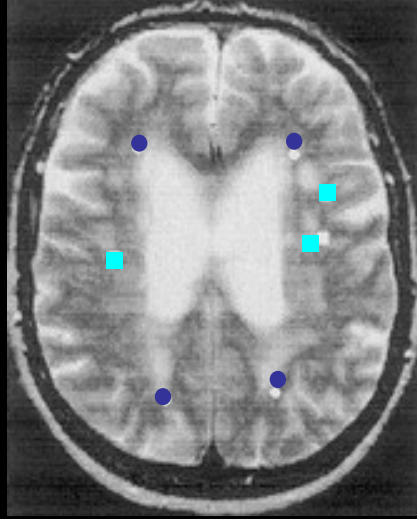
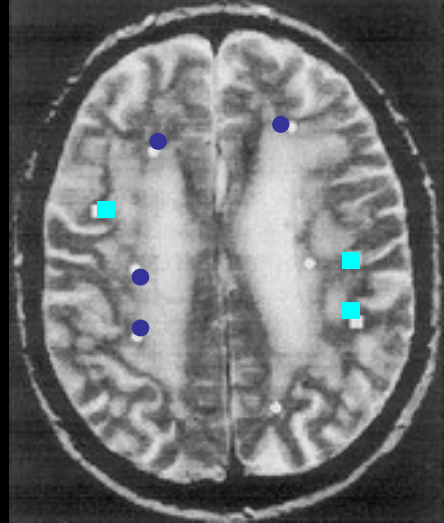


Part B - MRI



# Grading White Matter Hyperintensities (WMH) – Fazekas Score

Original description used T2 images like these.

Better to use FLAIR images.

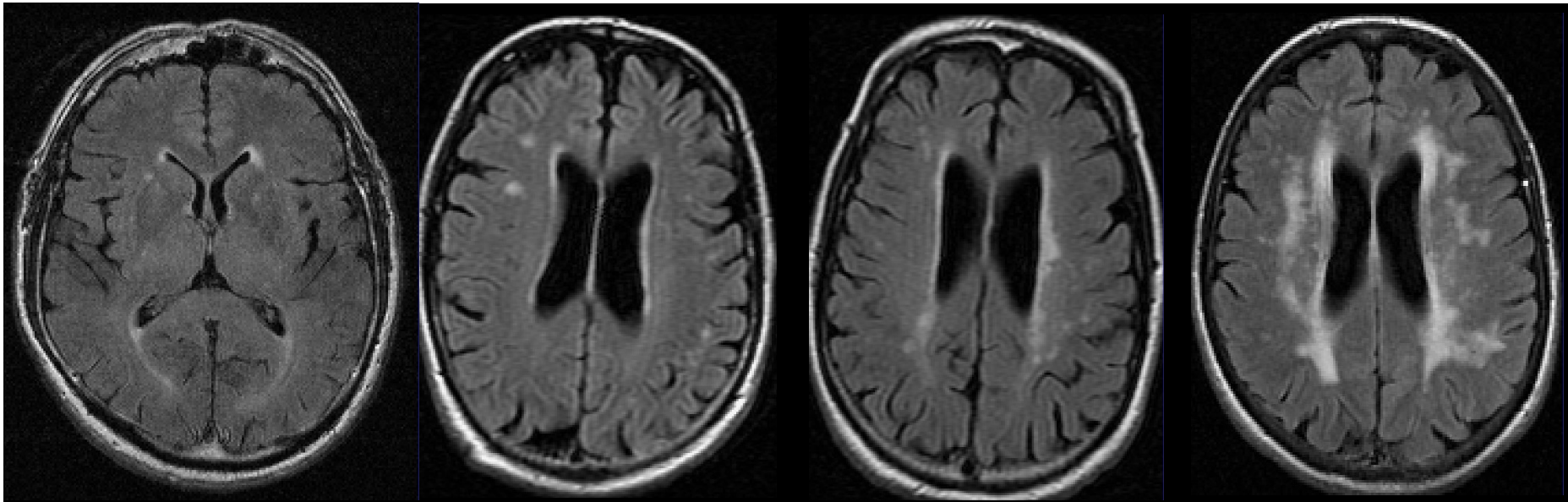
	Grade 1	Grade 2	Grade 3
			
 deep	punctate focal lesion	some confluence	large confluent areas
 Peri-ventricular	pencil-thin lining	smooth halo	irregular with extension

Fazekas *et al.* AJNR 1987;8:421–426

# Grading WMH – Fazekas Score

PV/  
Deep:          1/1                          1/1                          2/1                          3/3

<b>SVD Score</b>	0	0	0	1
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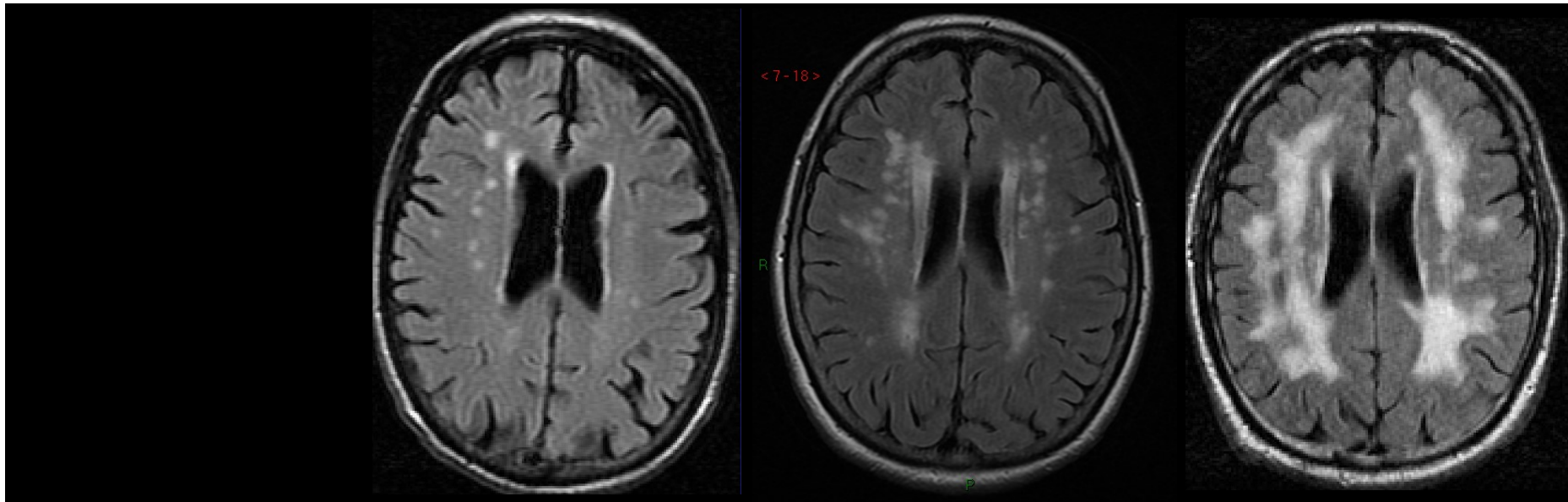
FLAIR images

## Periventricular Fazekas score

- 0 absent
- 1 caps or pencil-thin lining around ventricles
- 2 smooth halo around ventricles
- 3 irregular, extending into the deep white matter

# Grading WMH – Fazekas Score

PV/ Deep:	1/1	2/2	2/3
<b>SVD Score</b>	0	1	1



## Deep WMH Fazekas score

FLAIR images

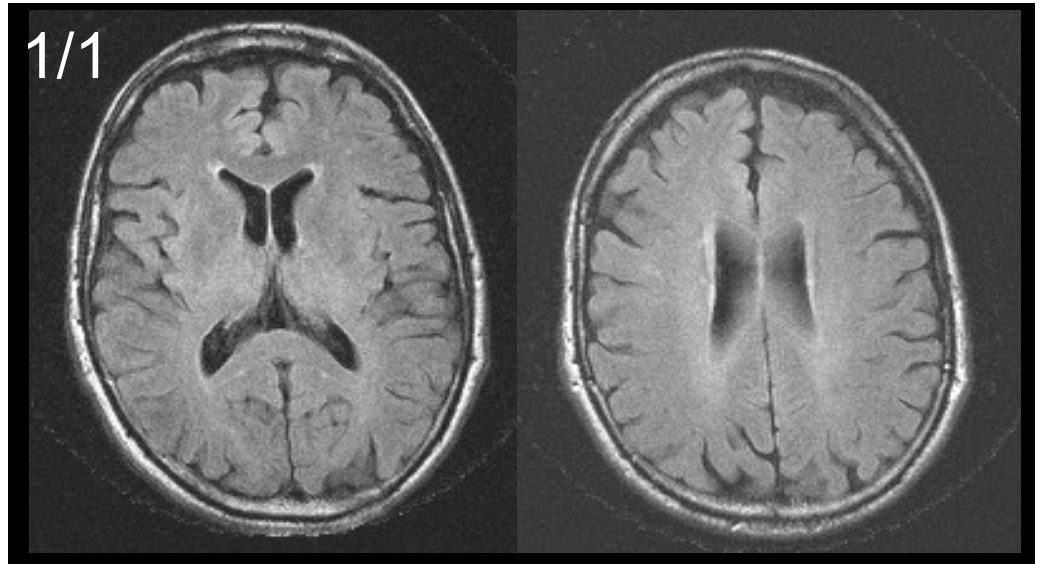
- 0 absent
- 1 punctate focal lesions (discrete lesions; single lesion  $\leq$  9mm; grouped lesions are  $\leq$  20mm diam), and no more than 20 lesions
- 2 beginning of confluence of lesions (single lesion 10-20 mm; grouped lesions  $>$ 20 mm diam; no more than connecting bridges between individual lesions) or more than 20 individual lesions
- 3 large confluent areas (single lesions, or confluent areas of hyperintensity of  $\geq$  20 mm diam)

# WMH - 2 Examples

FLAIR images

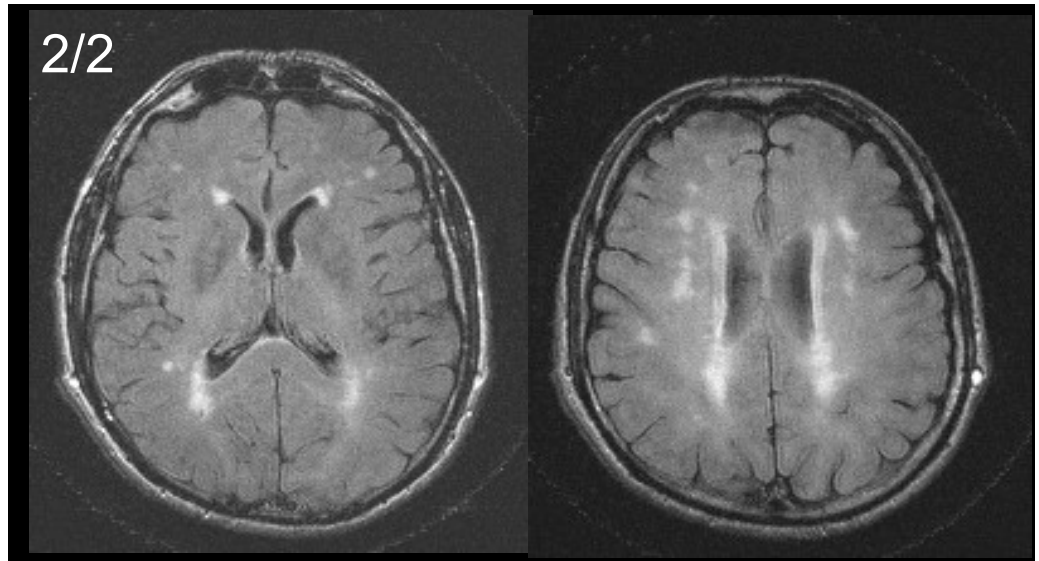
WMH score PV/Deep

SVD score pts  
for WMH = 0



WMH score PV/deep

SVD score pts  
for WMH = 1

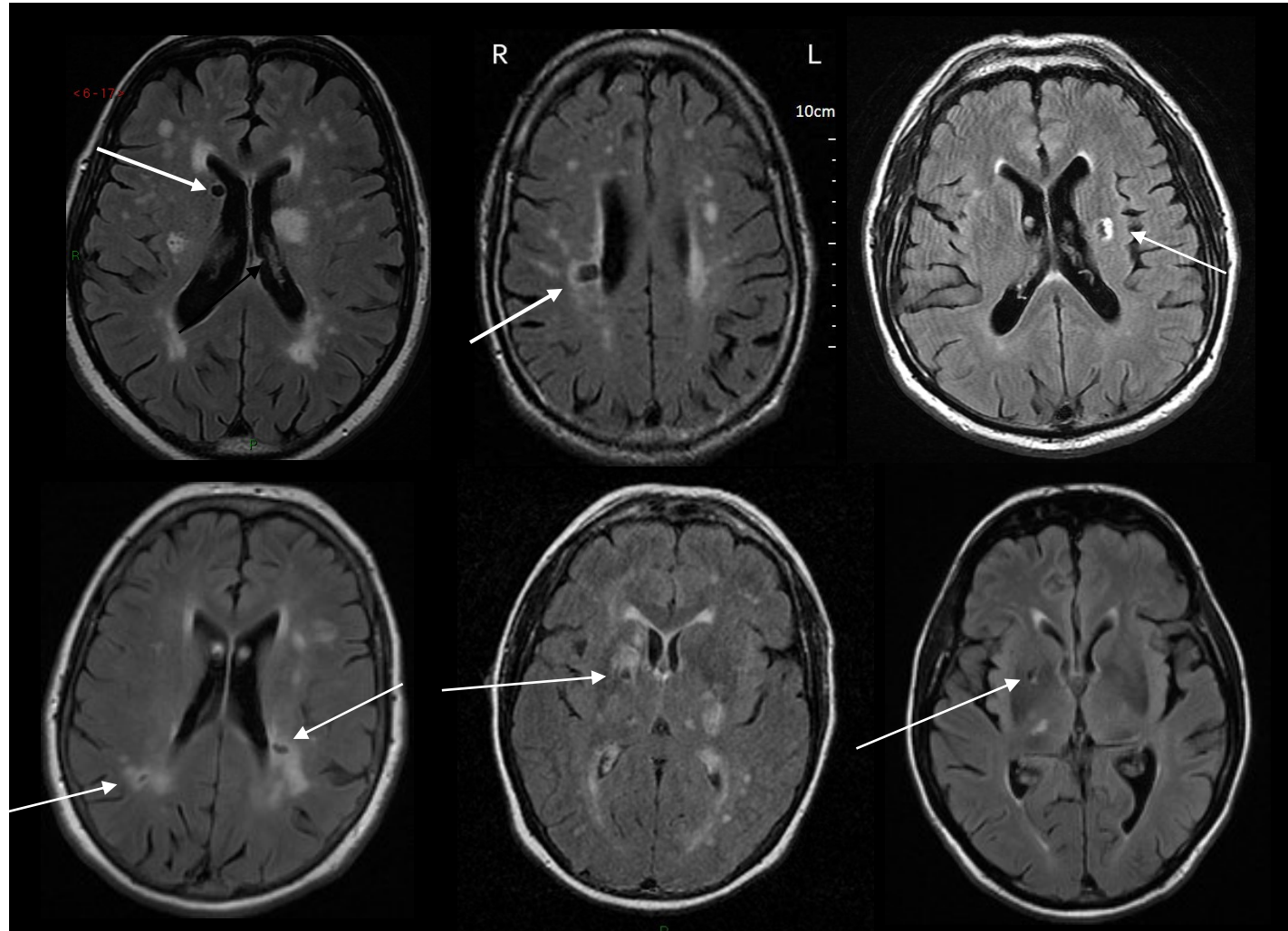


# Lacunae = CSF containing holes

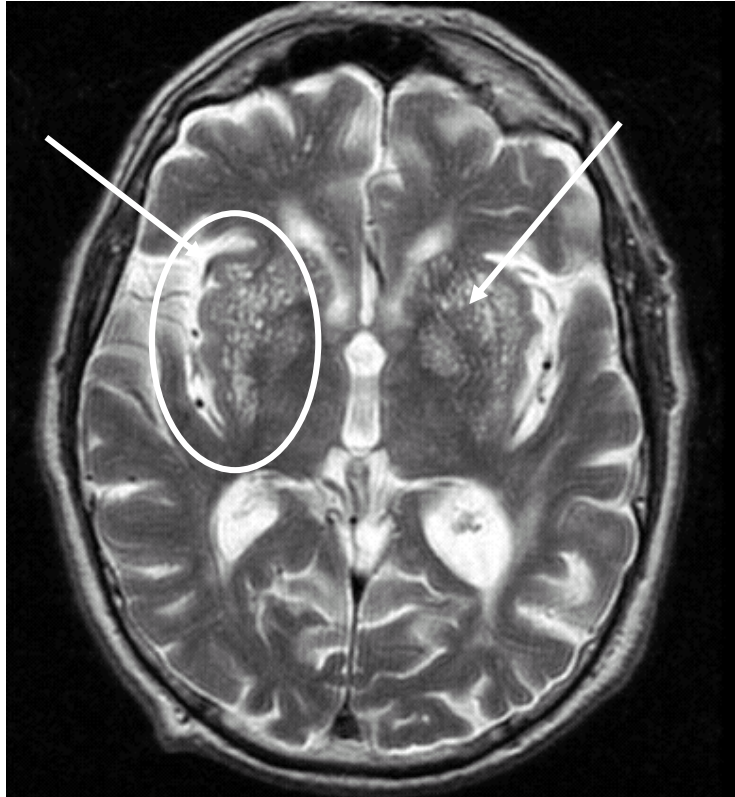
Best seen on T2 or T1 but can be seen on FLAIR and T2\*

One or more  
lacunae = 1 SVD  
score point

All these cases get  
on SVD score point  
for lacunae



# Perivascular Spaces (PVS)



Basal Ganglia:  
Look for the slice showing  
the lentiform and caudate  
nucleus, ie not too low

MR only – T2-weighted images are best.

- Small, sharply delineated structures of cerebrospinal fluid (CSF) intensity,
- measuring <3mm diam,
- following the course of perforating vessels into the brain
- round ‘dots’ in cross-section or thin lines in longitudinal section

SVD score only uses basal ganglia PVS;  
Get 1 SVD score point for moderate or severe PVS (PVS score 3 or 4);  
Moderate or severe PVS are when you can see >20 little white ‘dots’ in one basal ganglia slice. See next slide.

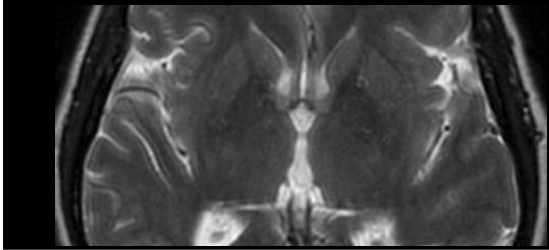
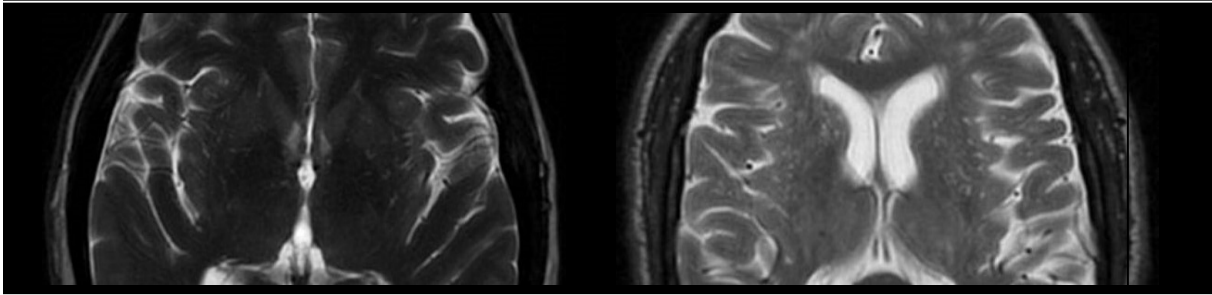
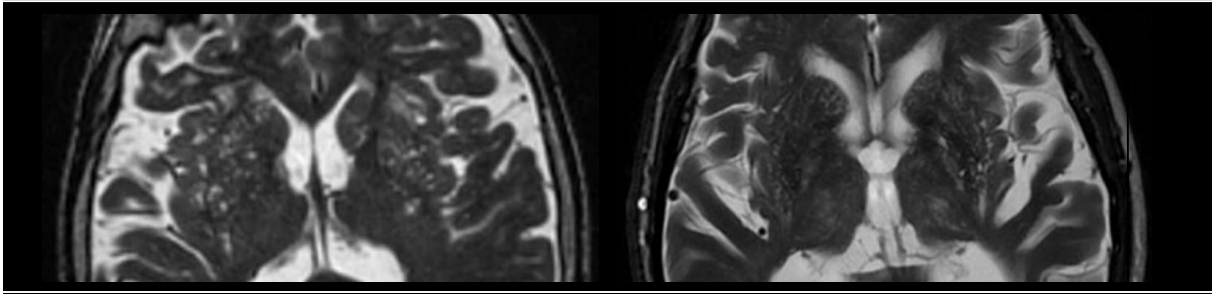
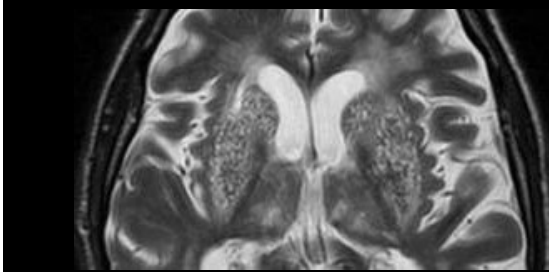
# PVS Score

PVS Rating	Description	SVDpoints
0	No PVS	0
1	1-10 PVS	
2	11-20 PVS	
3	21-40 PVS	1
4	>40 PVS	

- Use the worst affected side
- The score uses the basal ganglia on one side only – ie if there are 21-40 PVS dots in the right basal ganglia and it is the worst side, the PVS score is 3 and this would give 1 point on the SVD score.
- Where rating is difficult (e.g. due to movement, severe WMH, or uncertainty due to variations in PVS visibility), select the closest category
- The rating scale does not take account of PVS size

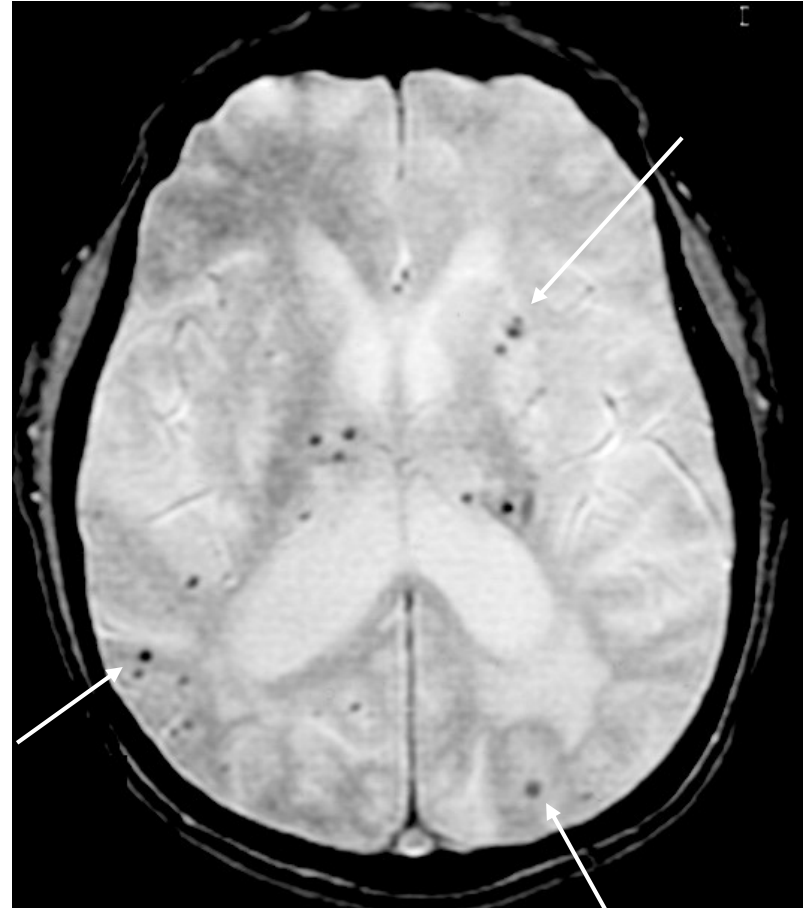


# PVS - 6 Examples

Example	# PVS	PVS score	SVD point
	1-10	1	0
	11-20	2	0
	21-40	3	1
	>40	4	1

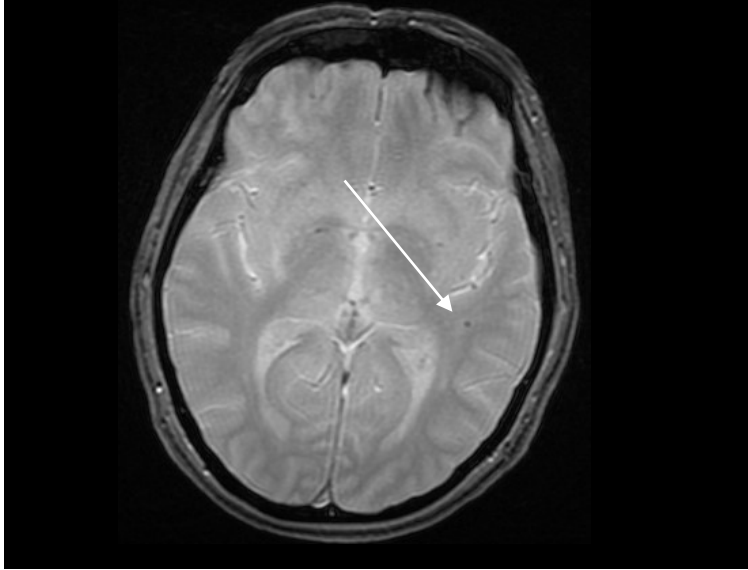
# Microhaemorrhages/Microbleeds

- MR only
- Small black dots on T2\* or SWI scans
- Single or multiple
- Size usually  $\leq 5\text{mm}$  diam, occasionally up to 10mm – caution not to confuse large with a haematoma
- Usually at the:
  - cortico-subcortical junction or
  - in deep white matter or
  - in deep grey matter
- - Careful not to confuse with small blood vessels, or calcification





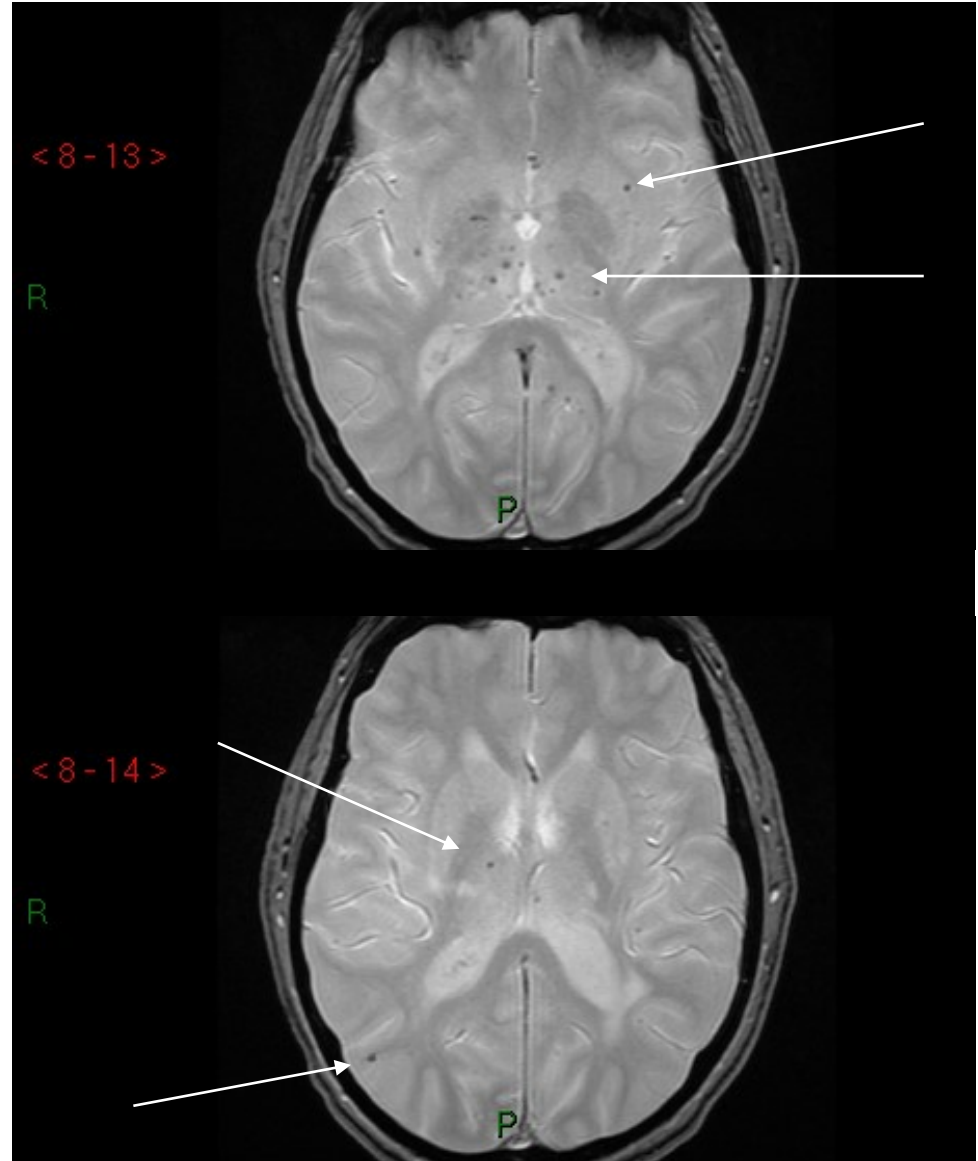
# Microhaemorrhages/Microbleeds – 2 examples



MR only

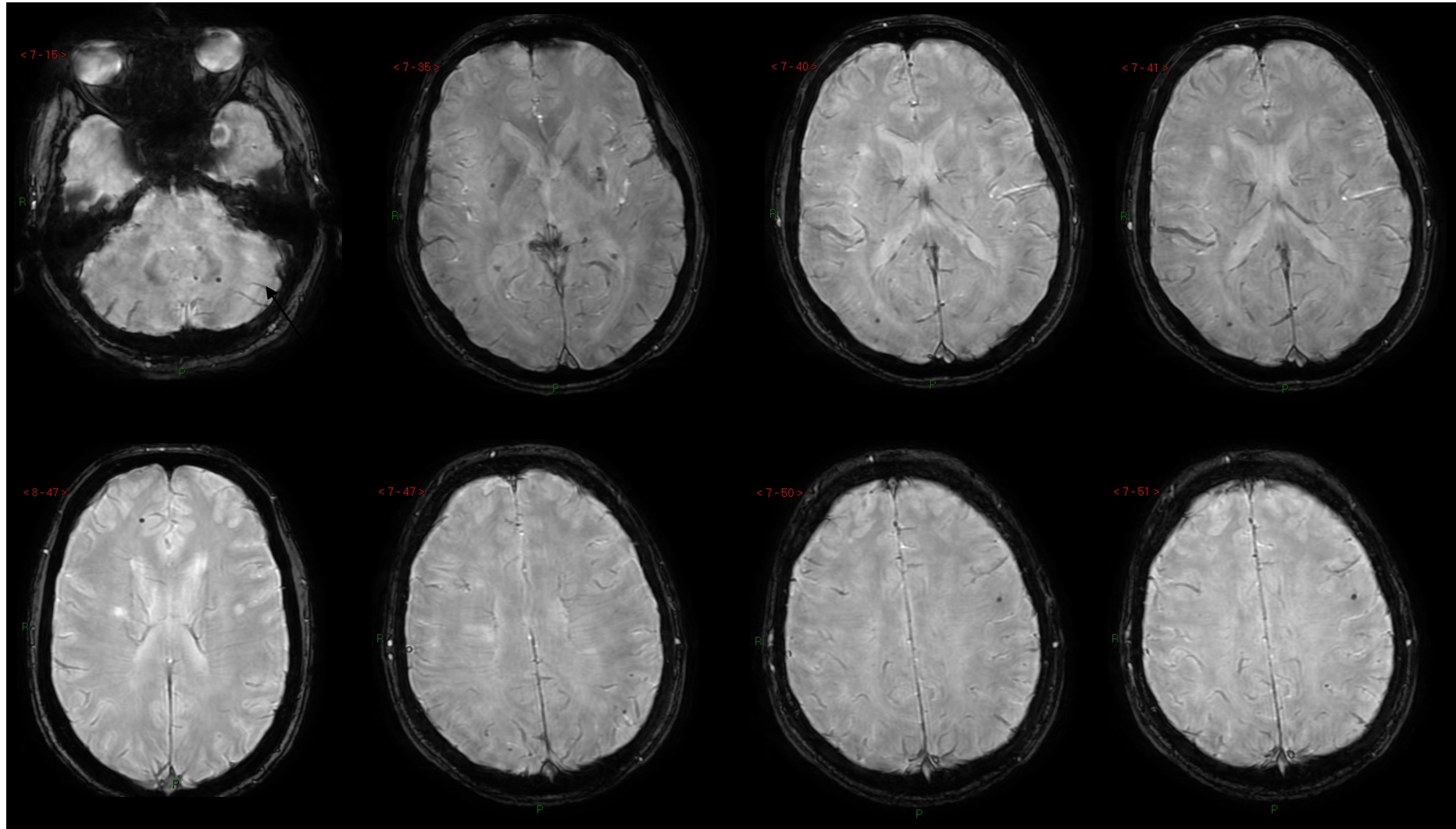
SVD score: 1 point for having  
1 or more microbleeds

This example, SVD score points  
for microbleeds = 1



# Microhaemorrhages/Microbleeds – 1 Example

SVD score points = 1 for microbleeds



Don't overlook the cerebellum and brainstem