



A Case of Vascular MCI

Charles DeCarli, MD

**Victor and Genevieve Orsi Chair in
Alzheimer's Research
Director Alzheimer's Disease Center
University of California at Davis**



IDeA Lab
Imaging of Dementia and Aging



Initial Evaluation

- **78 y.o. Rt. Handed Male**

- ◆ **Memory decline starting ~2003.**

- ◆ **2005- Mild problems with language; including comprehension**

- ◆ **2000- CVA- dragging L foot; stroke dxd.**

Residual L hemiparesis and L arm dysaesthesias

- **Concerns regarding driving- since 2003- not staying in his lane, drifting towards incoming traffic. Not getting lost.**

- **Chronic problems with irritability and anger. Hx of depression, personality problems.**

Initial Evaluation (cont'd)

- Late 2004-
 - ◆ hands 'shaking', difficulty with yard work and painting
 - ◆ Hx falls and minor incontinence for a couple of yrs. Cane for 5 yrs, occasional walker
- Recent difficulties with organization and taking medications
 - ◆ Can handle money and operate home appliances
- MMSE= 26 (06/2005) → 25 (4/2006); started on Aricept (5 mg), 'MCI vs. mild dementia?', increased to 10 mg (8/2006).

Initial Evaluation

- PMH: CVA 2000, mild hypertension increased cholesterol
- Meds: amitriptyline (25 mg), Gabapentin (800 TiD), HCTZ, Simvastatin
- SH: retired mechanic, 12 yrs. Educ., Smoked 100 pkys then quit in 2002, no current ETOH
- FH: Mother had LO-AD

Physical Exam (IE)

- PE: Cor- frequent PVCs. Ext- decreased pulses in the LEs.
- Neuro Exam:
 - ◆ MMSE = 29/30 (-1 season) BIMC = 32/33
 - ◆ CNS: decreased sensation lower L face, decreased hearing bilaterally
 - ◆ Motor: slightly spastic L arm; decrease in strength L arm and leg; L intention tremor; decreased RAMs on L more than R.
 - ◆ DTRS: 3+ L KJ; 2+ R side except absent AJs bilaterally; L plantar responses equivocal.
 - ◆ No Frontal Release Signs.

Consensus Diagnosis

- **Multi-domain amnestic MCI; vascular etiology likely, AD somewhat likely**

1 year later....

- **No decline in cognitive function**
 - ◆ **Wears pad for some urinary incontinence, No bowel incont.**
 - ◆ **Wife continues to dispense meds**
 - ◆ **Mood 'good', but occasionally 'crabby', sleeps 12 hrs/night**
 - ◆ **Uses a cane 'to support knees'**
 - ◆ **No longer drives, but has license**
 - ◆ **No difficulty with basic ADL's**
 - ◆ **Goes to church, bowls weekly (scores ~ 135), watches TV, plays dominoes**

1 year later...

- Neuro Exam:

- ◆ MMSE= 26 (-1 year, day, date, place)
- ◆ STM: 2/5 on name and address → 4/5 with cue
 - 1.5/3 nonsense shapes after delay, intact recognition
- ◆ Motor: slight L arm spasticity, strength 5- R side; L WE, BC, TC 4+; deltoid 4; FE, FF 4-; L leg 4+ except dorsiflexors and plantar flexors 5-; RAMs moderately reduced on L, mildly reduced on R; No limb ataxia, Couldn't do HTS on L.
- ◆ DTRs: 2 upper extremities and sym., 2+ KJs, trace AJs. L toe equivocal.
- ◆ Gait: need to push off to arise. Neg. Romberg & Pull test.

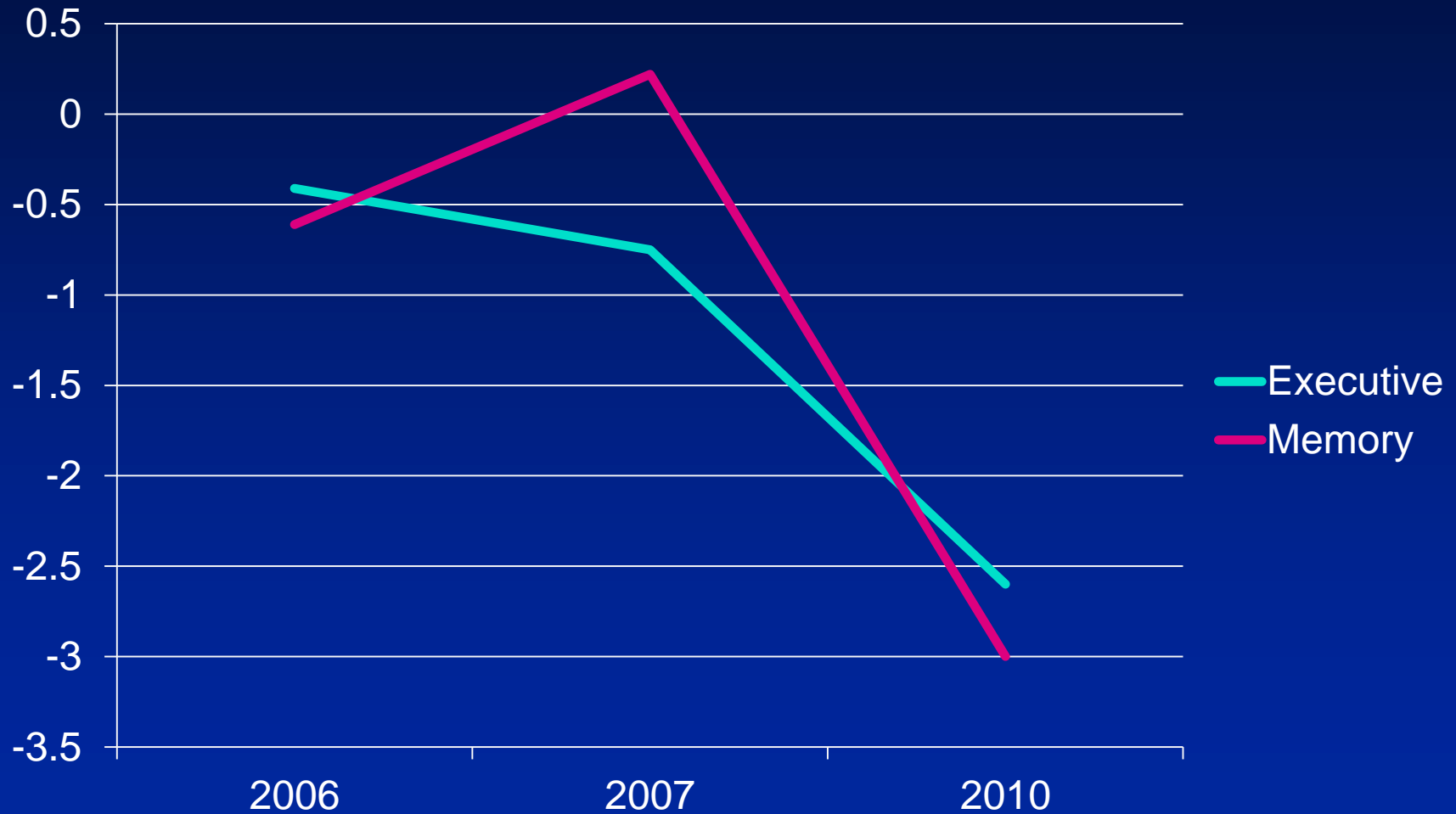
Additional F/U visits

- 2 years later...
 - ◆ MMSE 24/30 & BDS 23/33
- 5 years later...
 - ◆ MMSE 16/30 & BDS 13/33
 - ◆ CDR = 2

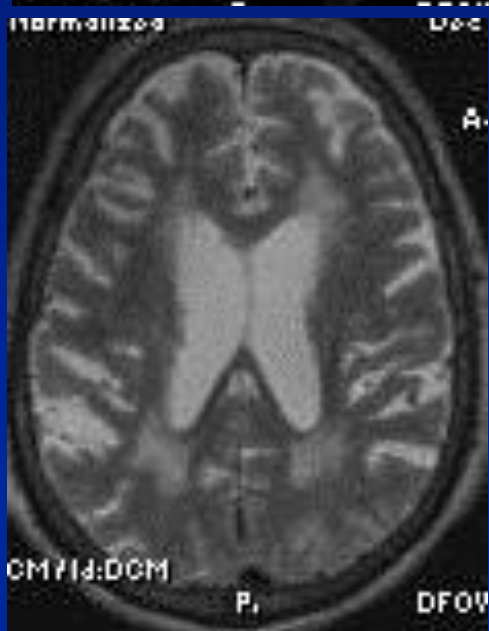
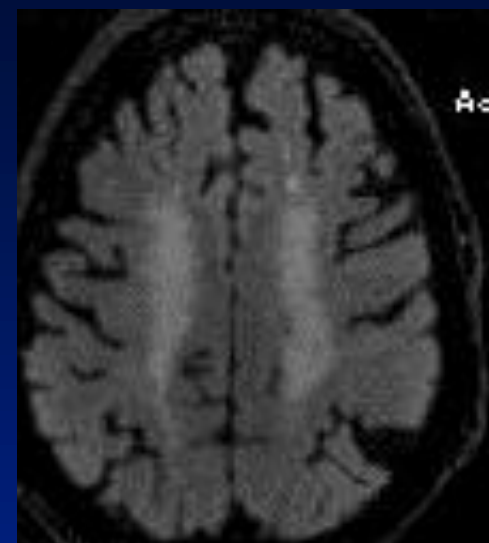
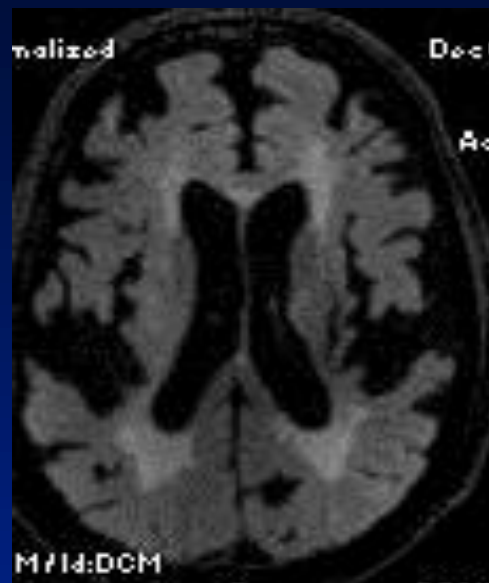
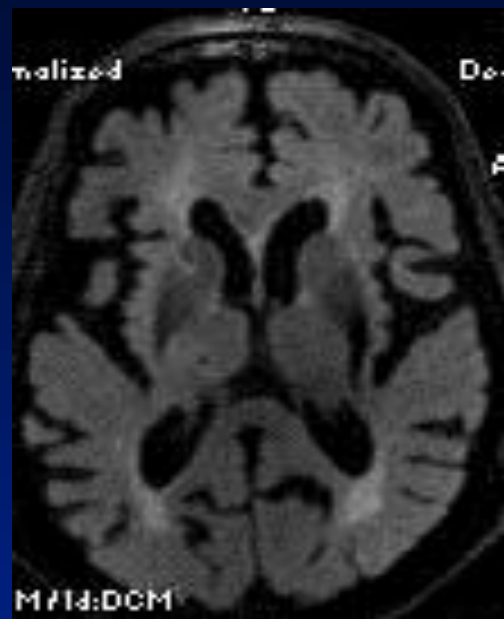
End-of-life History

- Died 05/22/1010
 - ◆ Due to Pulmonary embolism.
 - ◆ No Hx of additional strokes.

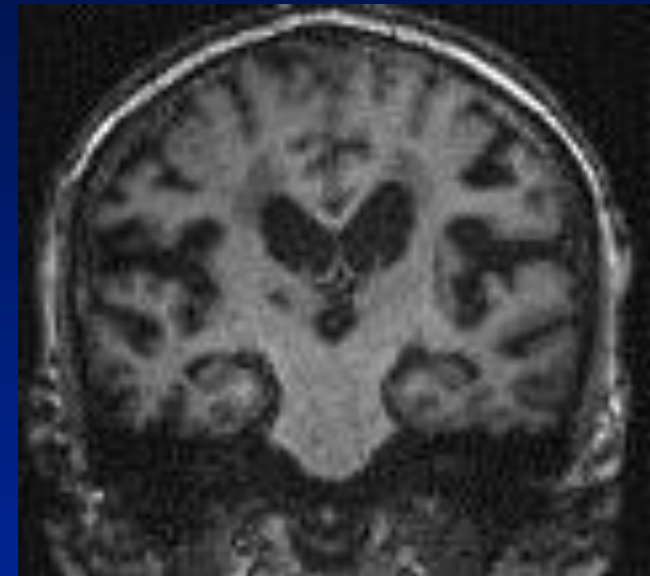
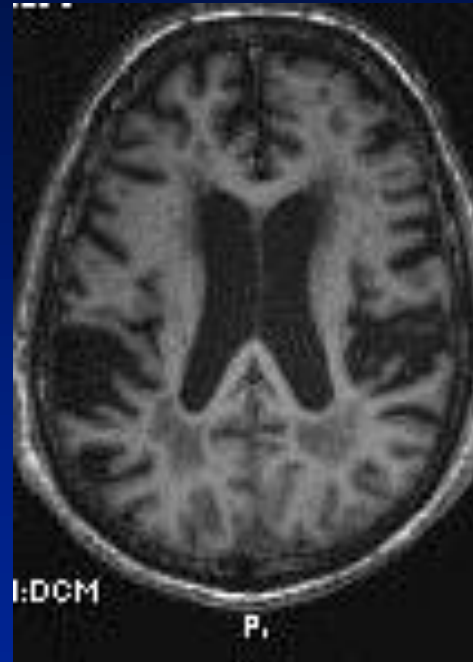
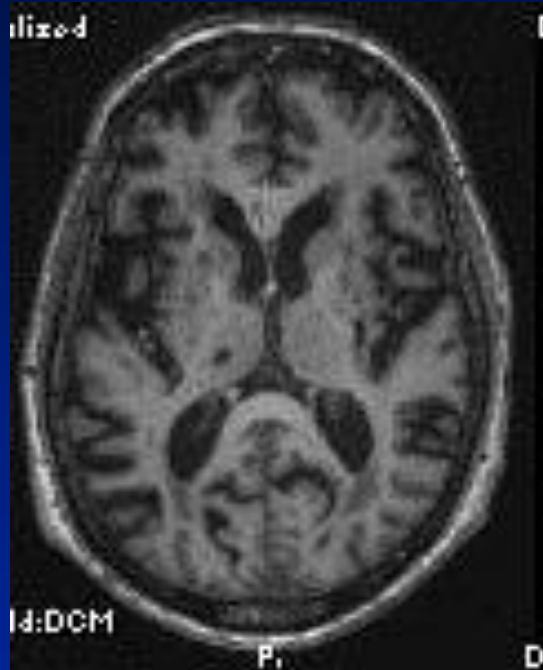
Longitudinal Cognitive Performance



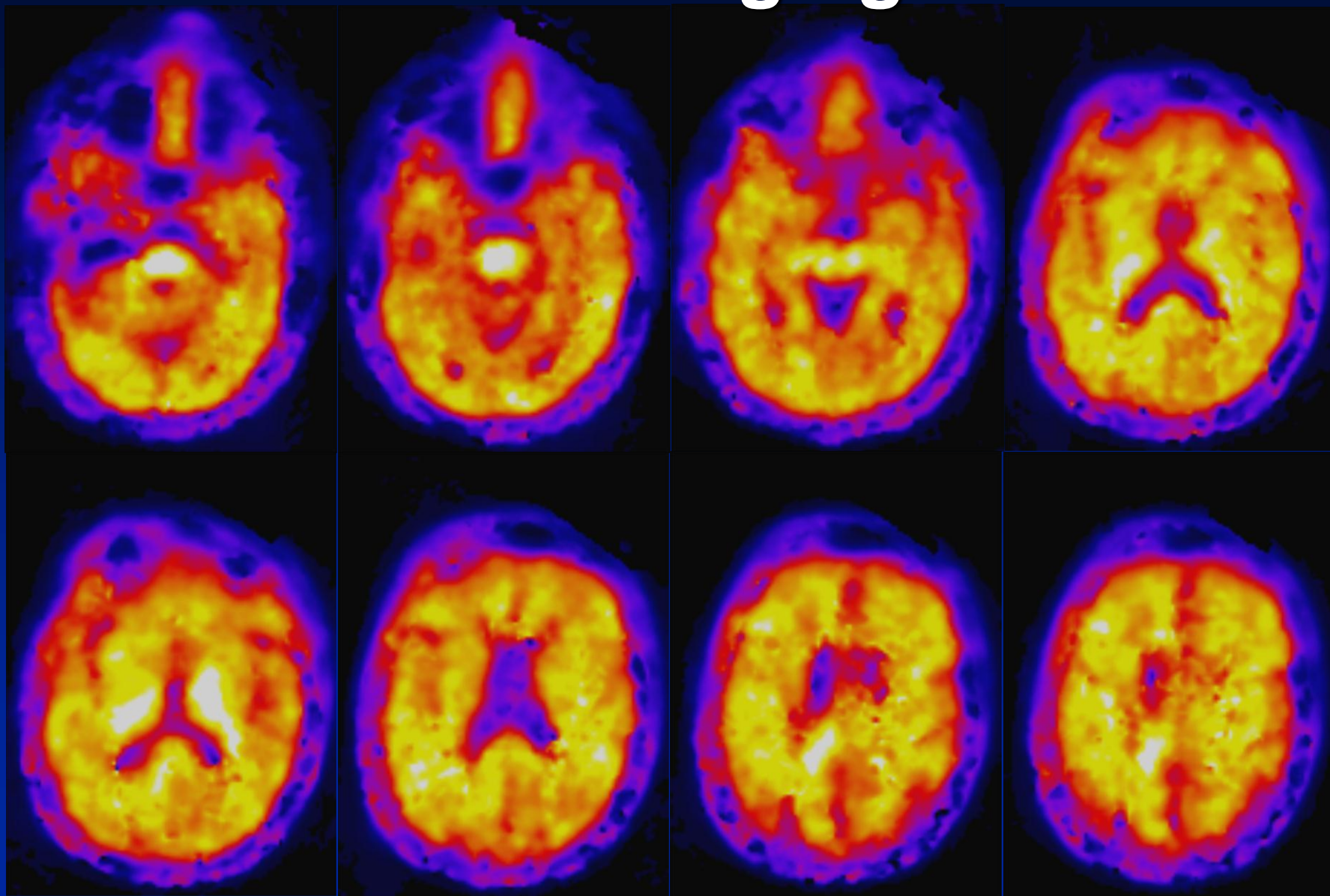
MRI Results



MRI Results

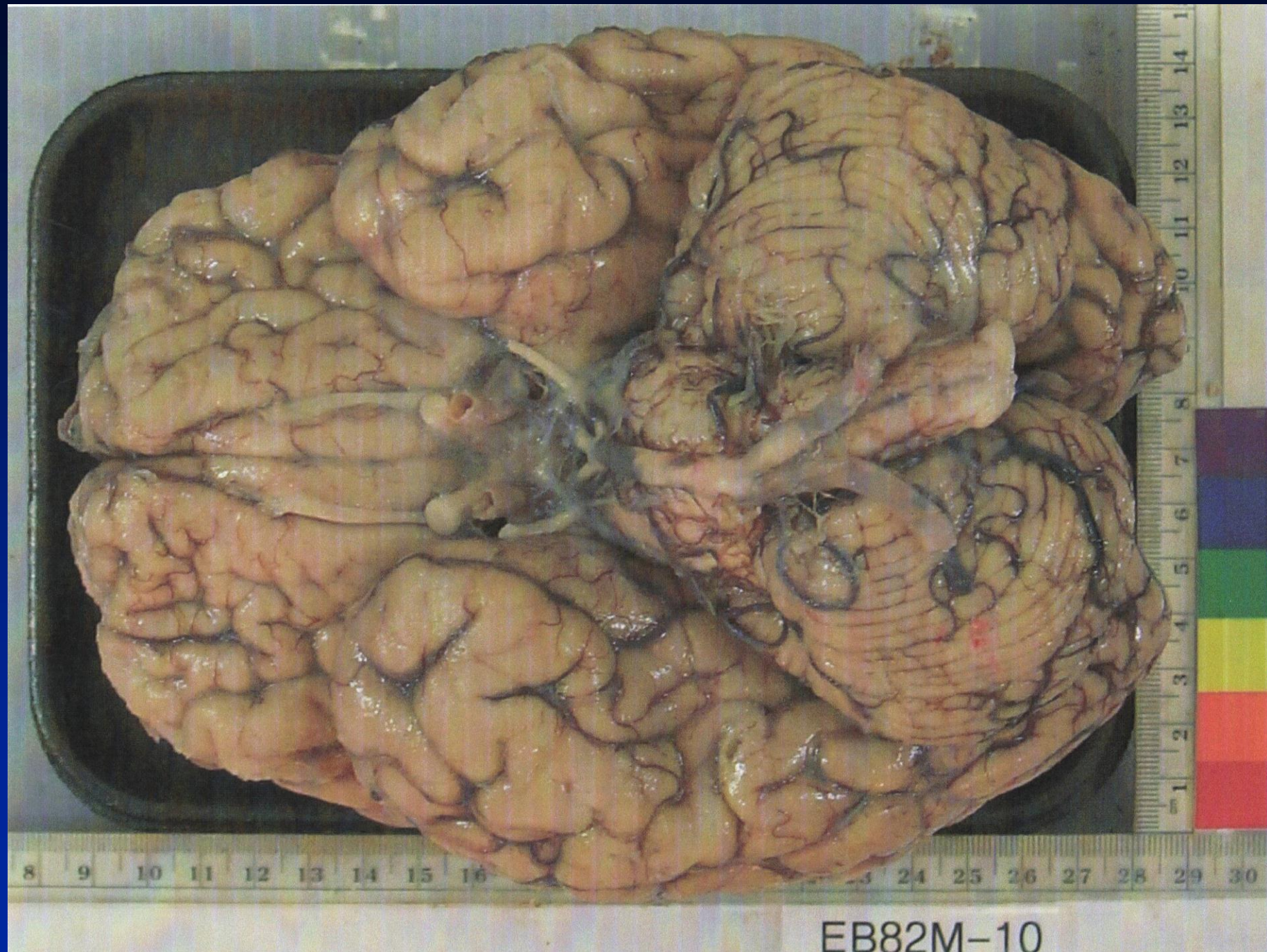


PiB Imaging

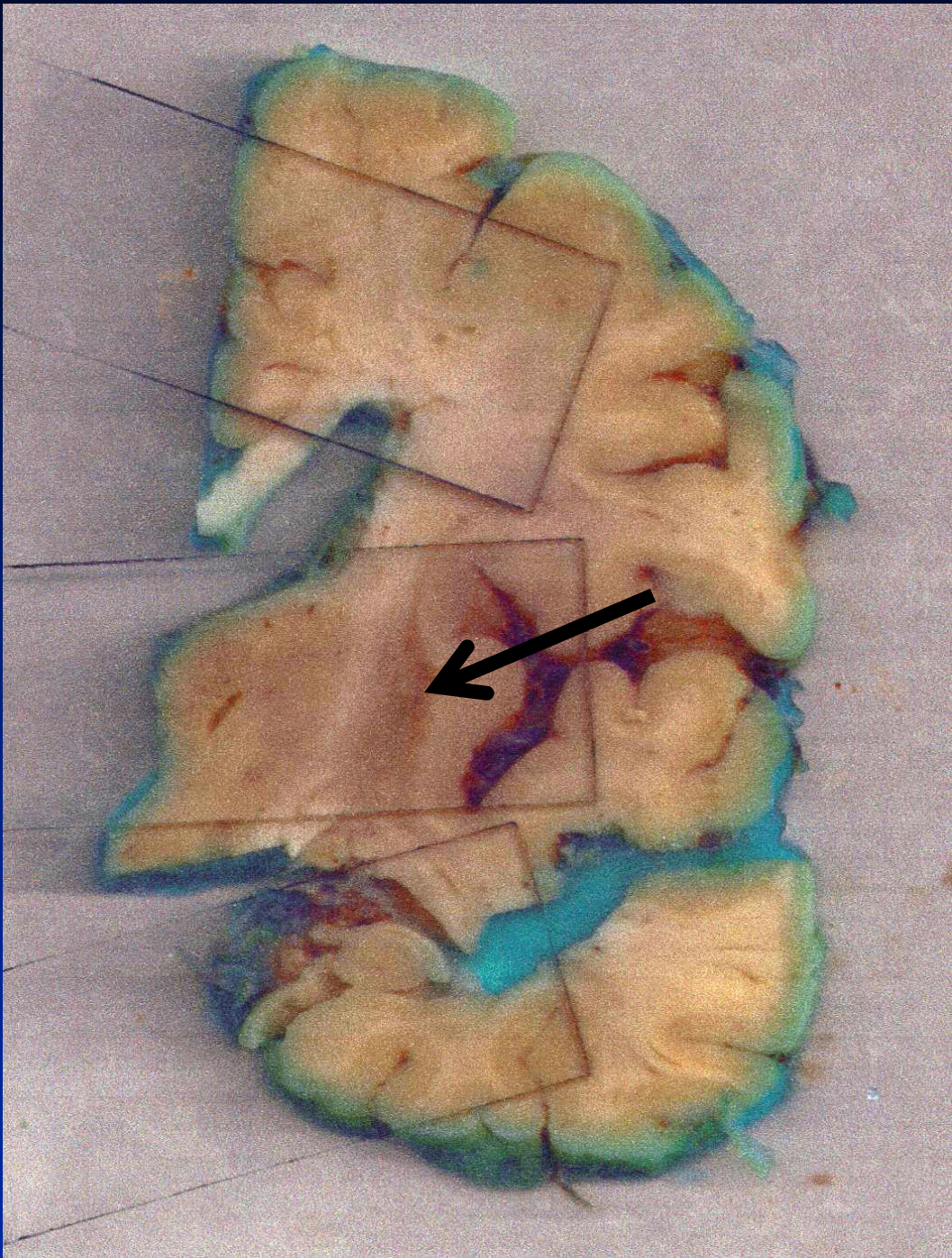


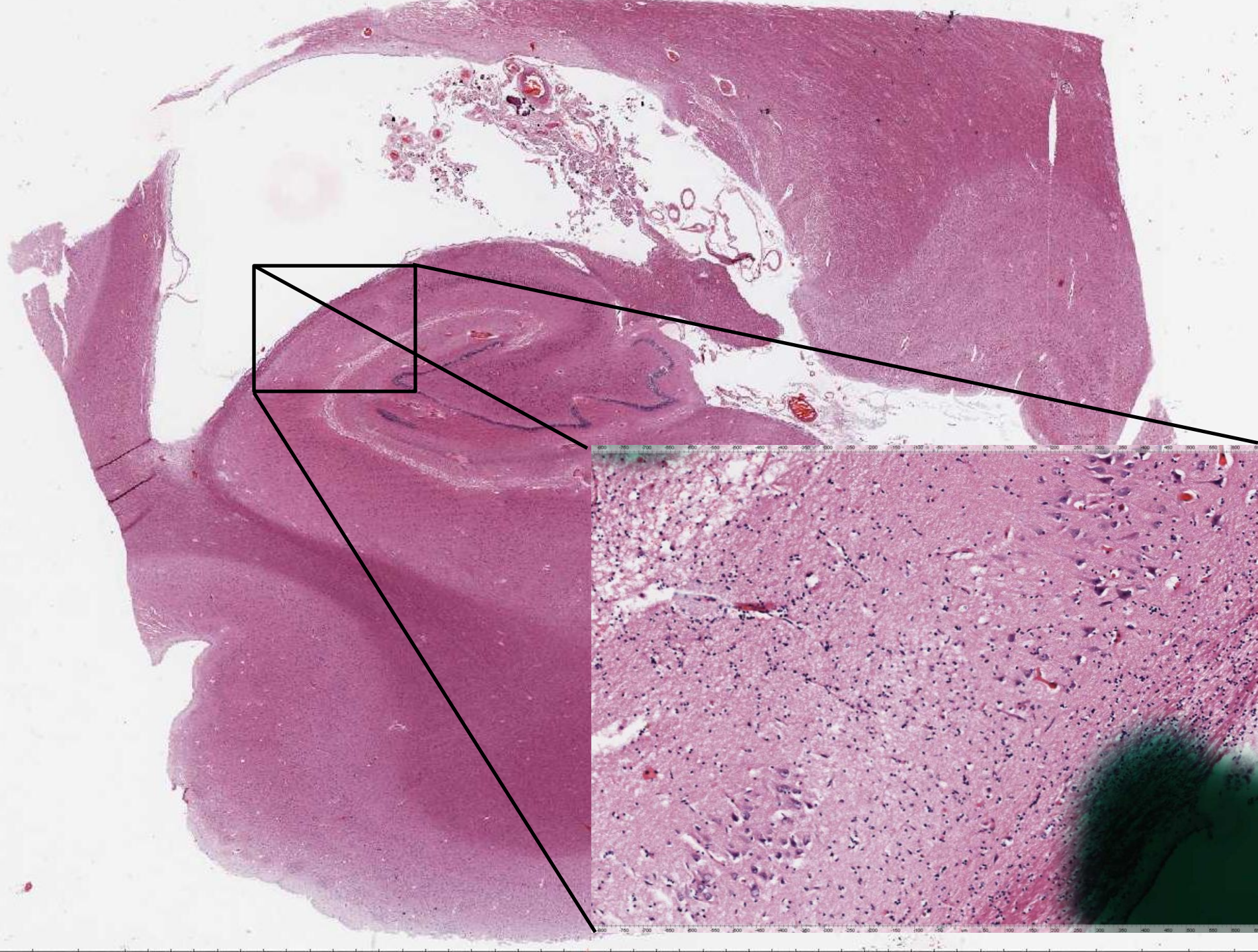
GROSS BRAIN EXAM

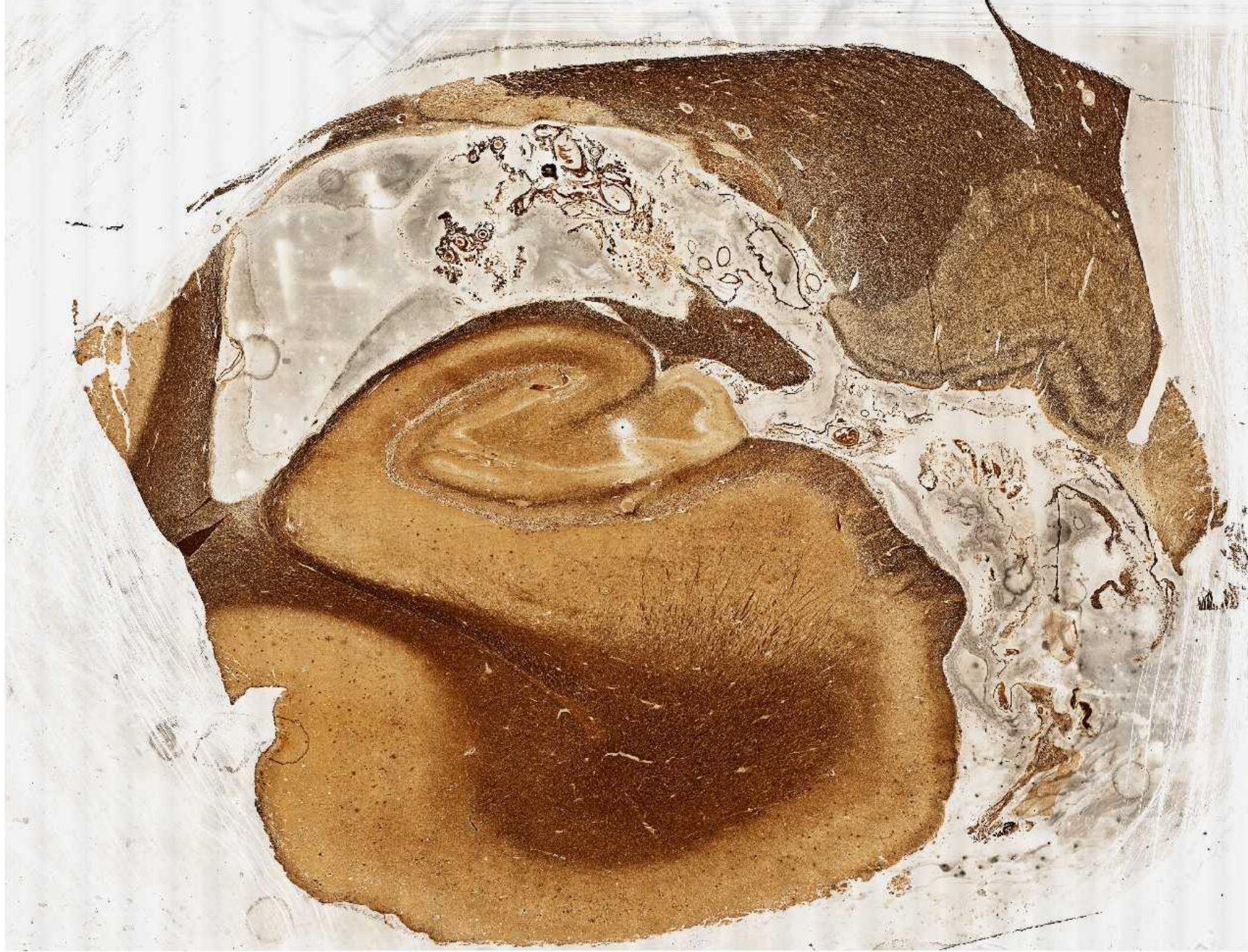
- Brain weight (fixed): 1333 grams.
- Moderate to severe atherosclerosis of the circle of Willis.
- Bilateral and multifocal cystic, non-cavitary, and lacunar infarcts in subcortical white matter and basal ganglia.
- Old lacunar infarct – basis pontis.

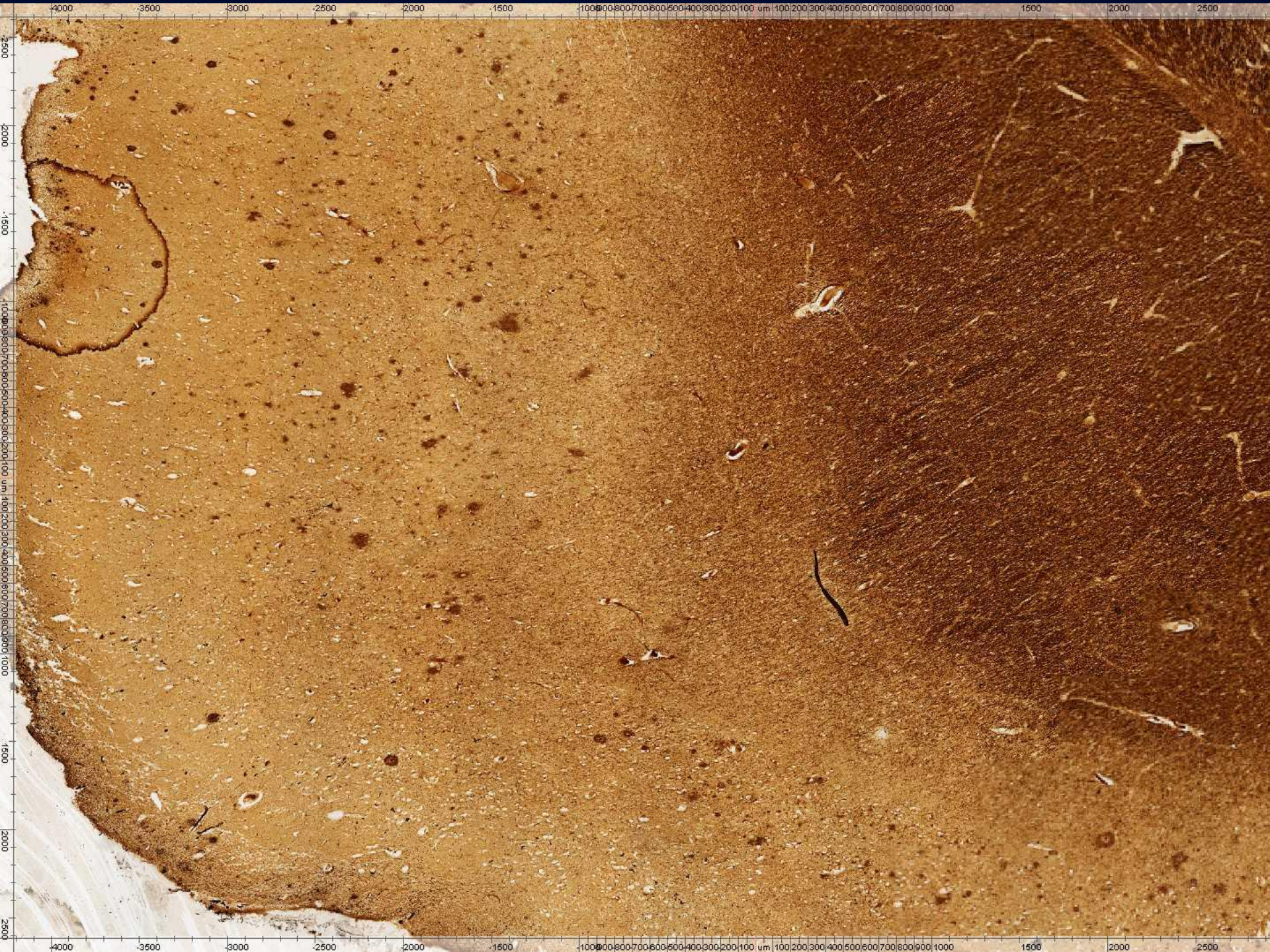


EB82M-10

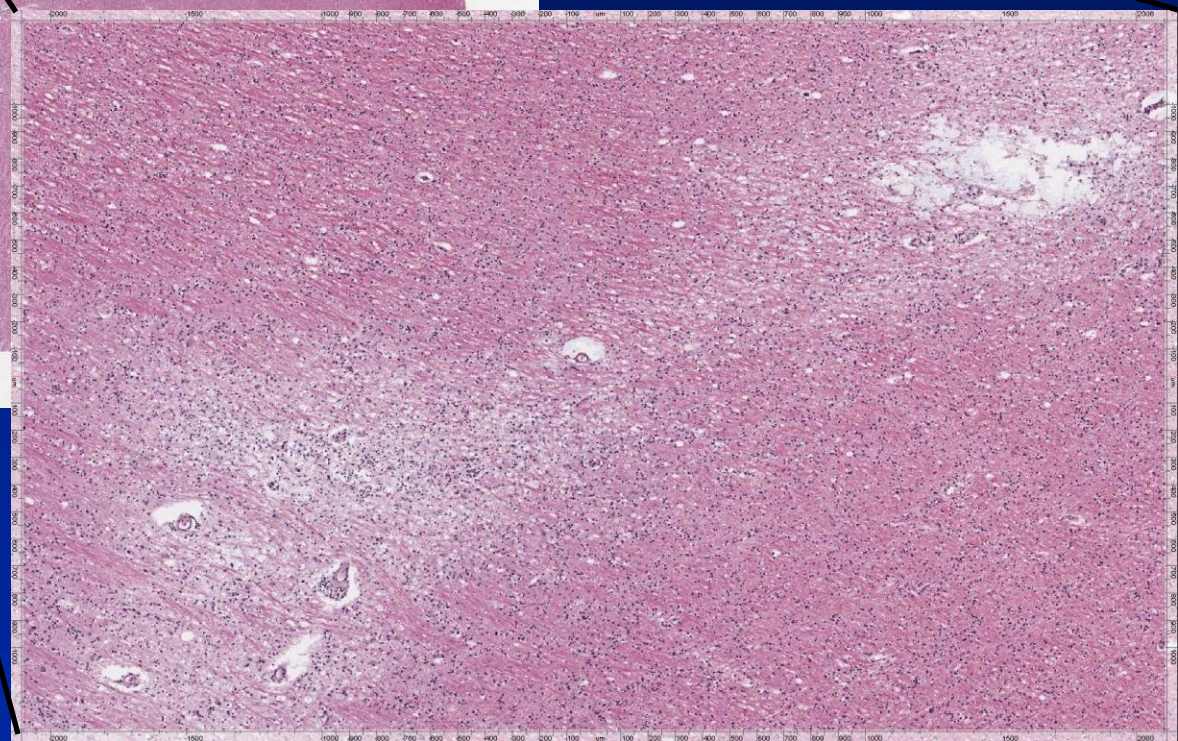
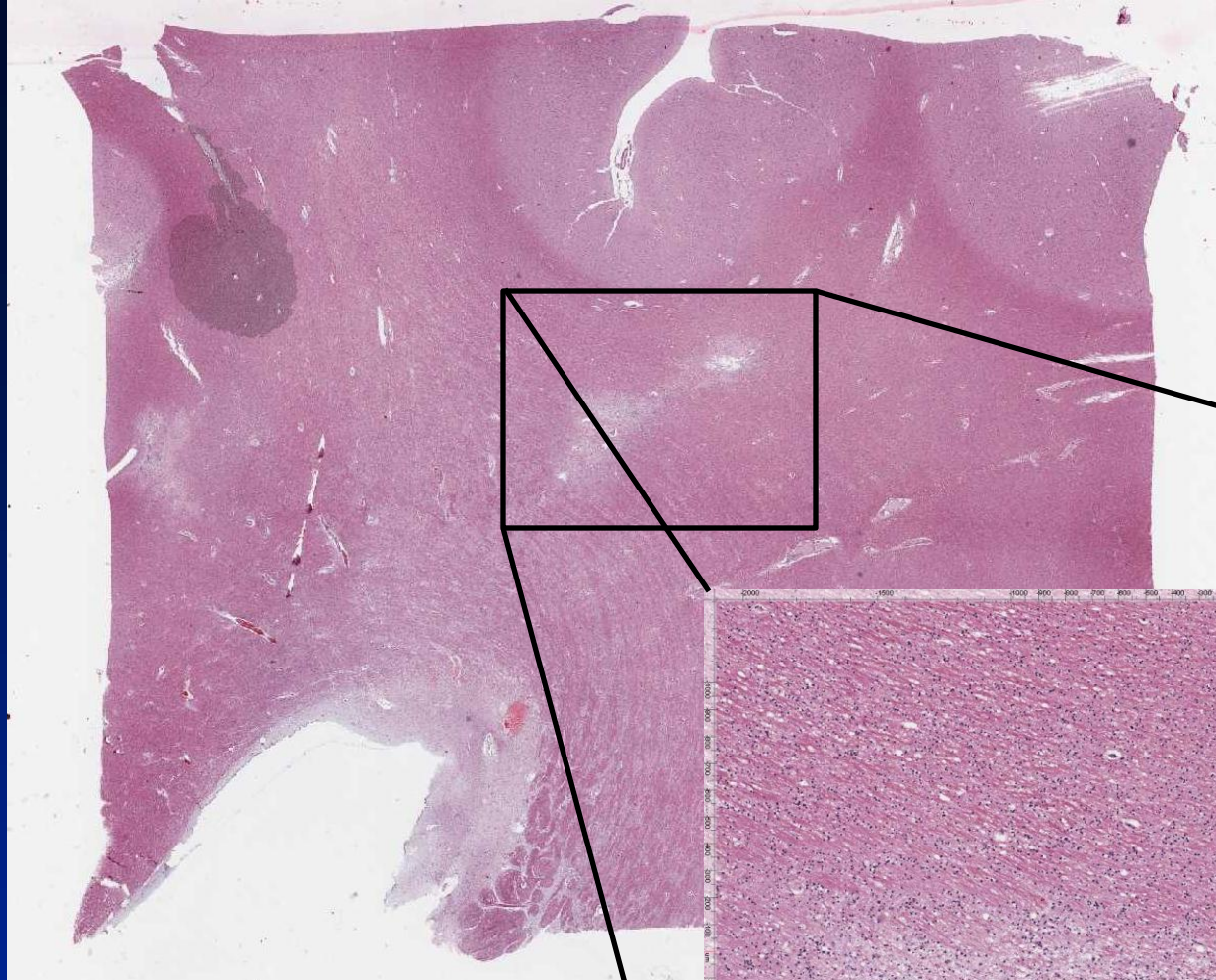


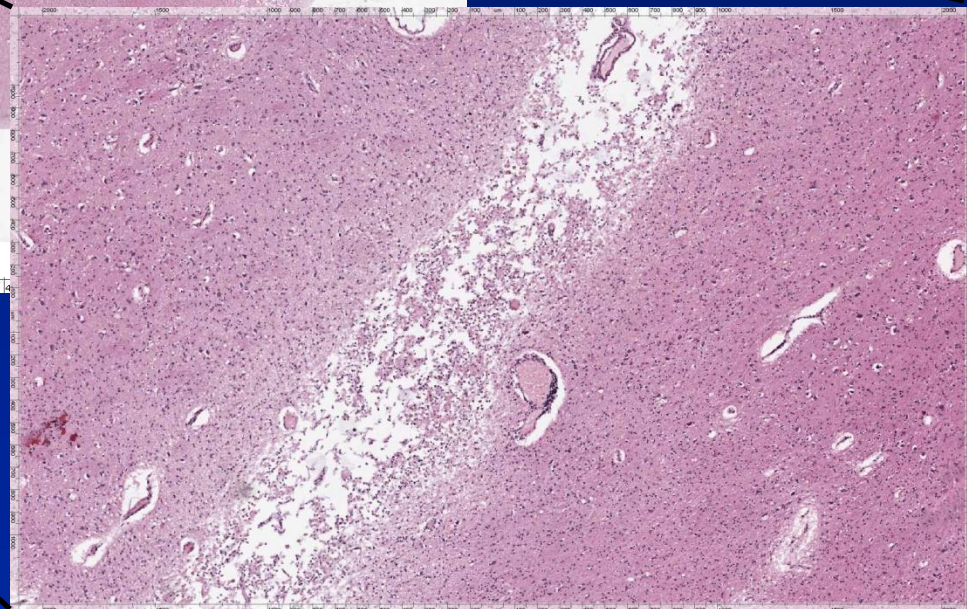
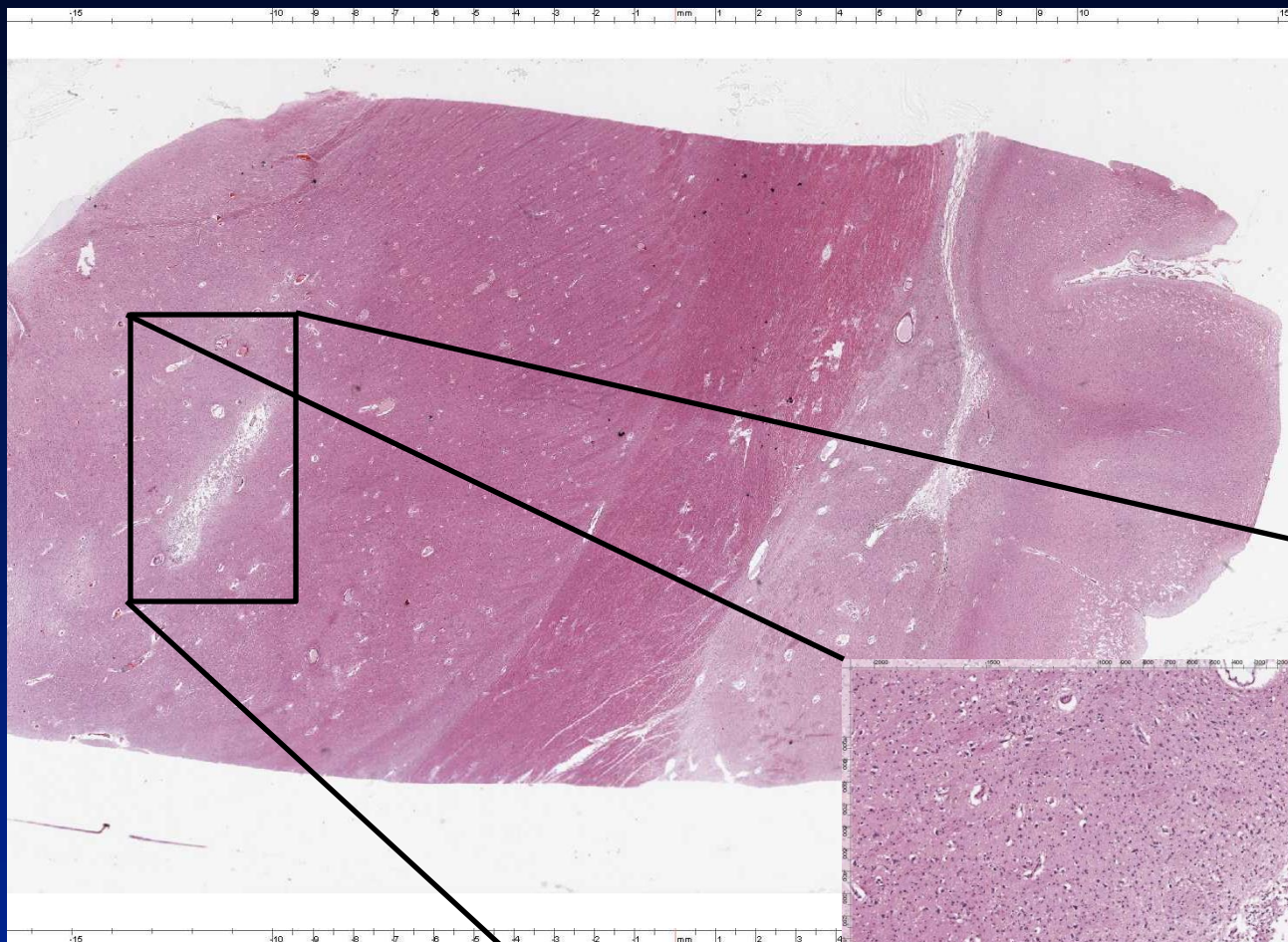












NEUROPATHOLOGIC DIAGNOSIS

- **Cerebrovascular disease:**
 - ◆ **Atherosclerosis, moderately severe in major branches of the circle of Willis, extending focally into many leptomeningeal arteries**
 - ◆ **Arteriolosclerosis/ lipohyalinosis, variably severe throughout the brain, in many parenchymal arteries**
 - ◆ **Vascular calcinosis, severe and extensive, in ganglionic arteries**

NEUROPATHOLOGIC DIAGNOSIS

- **Alzheimer's disease changes, Braak stage III:**
 - ◆ **Neurofibrillary tangles confined to the hippocampi/parahippocampal regions**
 - ◆ **Senile plaques, sparse to moderate, in cortex and hippocampi**
 - ◆ **No amyloid angiopathy**

Key Findings

- **History of stroke**
- **Focal findings on clinical examination consistent with history of stroke**
- **Imaging features of substantial CVD**
- **Lack of severe cognitive impairment at initial assessment despite functional impairment**