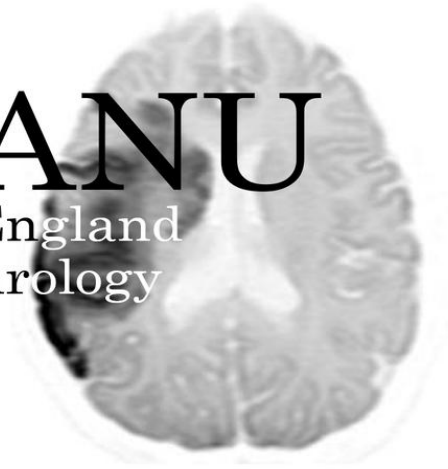


NEANU

North of England
Acute Neurology
Update



Off Legs... Can imaging help..?

Matt Jones
Chris Kobylecki

Disclosures



C Kobylecki

- Employment: Northern Care Alliance NHS Trust
- Grants: Parkinson's UK, Multiple System Atrophy Trust
- Lecture fees: Britannia Pharmaceuticals, Bial, Ipsen, Neurology Academy
- Trustee of Multiple System Atrophy Trust
- ABN movement disorder advisory group deputy chair

M Jones

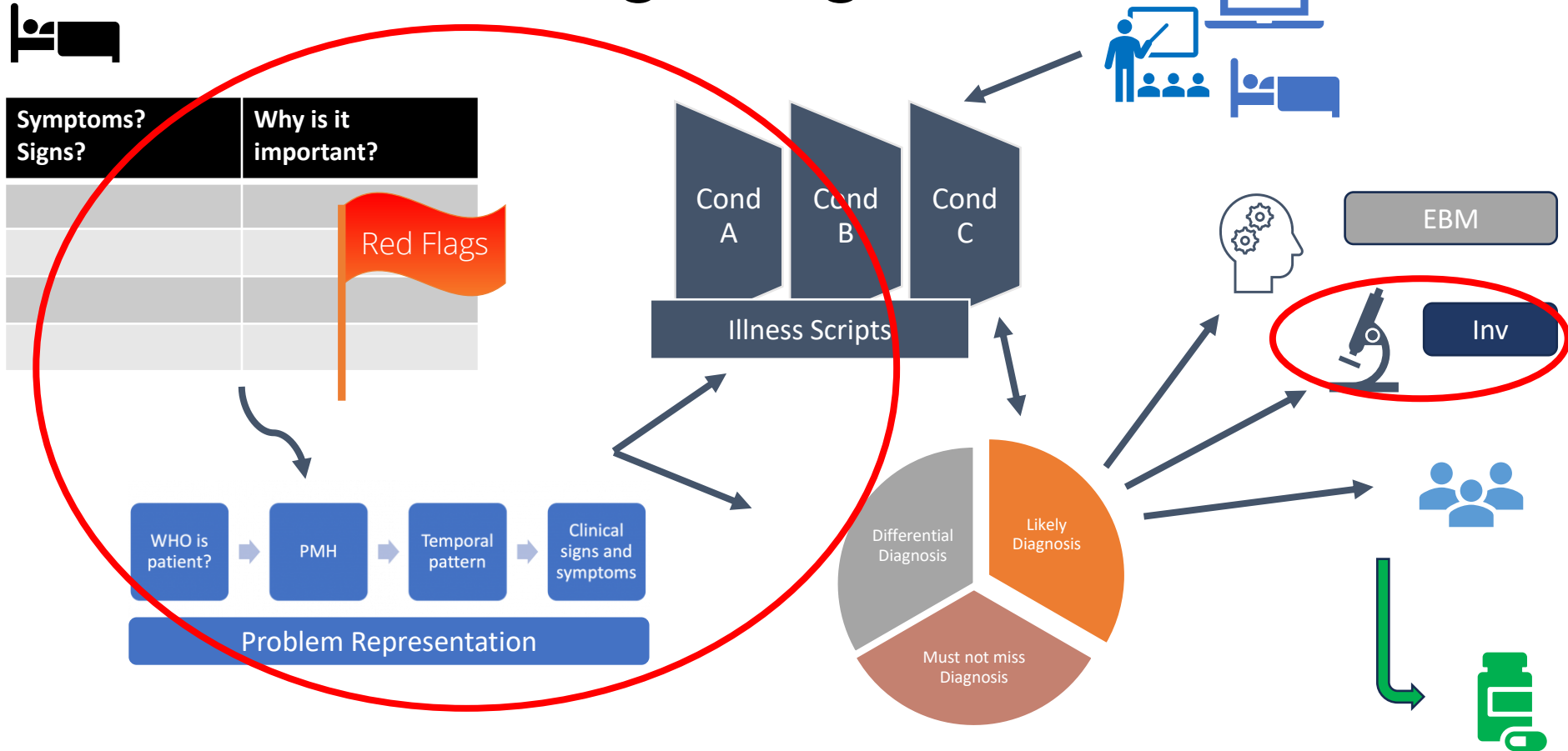
- Employment: Northern Care Alliance NHS Trust
- Lecture fees: Eisai, Lilly
- Expert Advisor – BMJ best practice
- ABN exec committee member



Objectives

- Understand the role of imaging
 - What scan for which patient?
- Case examples
 - When imaging helps
 - And perhaps when it doesn't...

Putting it together...



The Basics



Different from all other medical specialties, save perhaps psychiatry, the neurologist is heavily dependent on listening to and interpreting what the patient tells us... If you don't know what is happening by the time you get to the feet you are in real trouble

Jerome M Posner, 2013⁴

Why do we image?

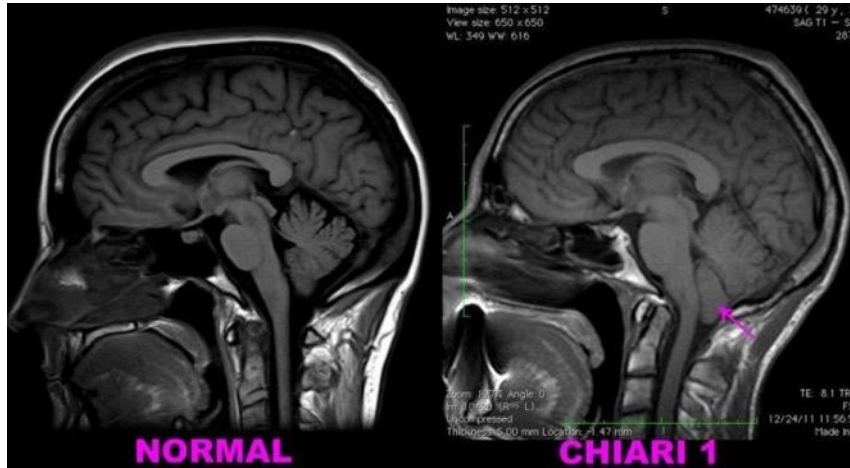


- To confirm a clinical diagnosis
- To rule out something serious
- To aid prognosis or treatment
- Are there any downsides to imaging?

VOMIT and BARF

Victim Of Modern Imaging Technology

Brainless Application of Radiologic Findings



Decisions, decisions...

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CT



MRI



Structural Imaging



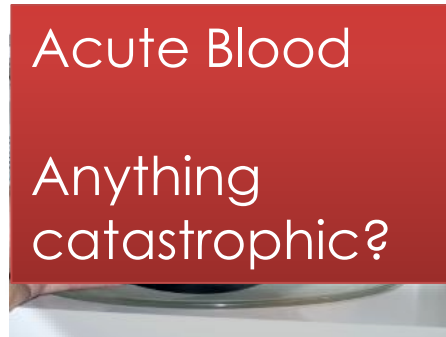
CT

- Quick
- Cheap
- Convenient
- Involves radiation

- Poor quality?

Acute Blood

Anything
catastrophic?



MRI

- Slow
- Expensive
- Bit more effort...
- No radiation

- High quality?

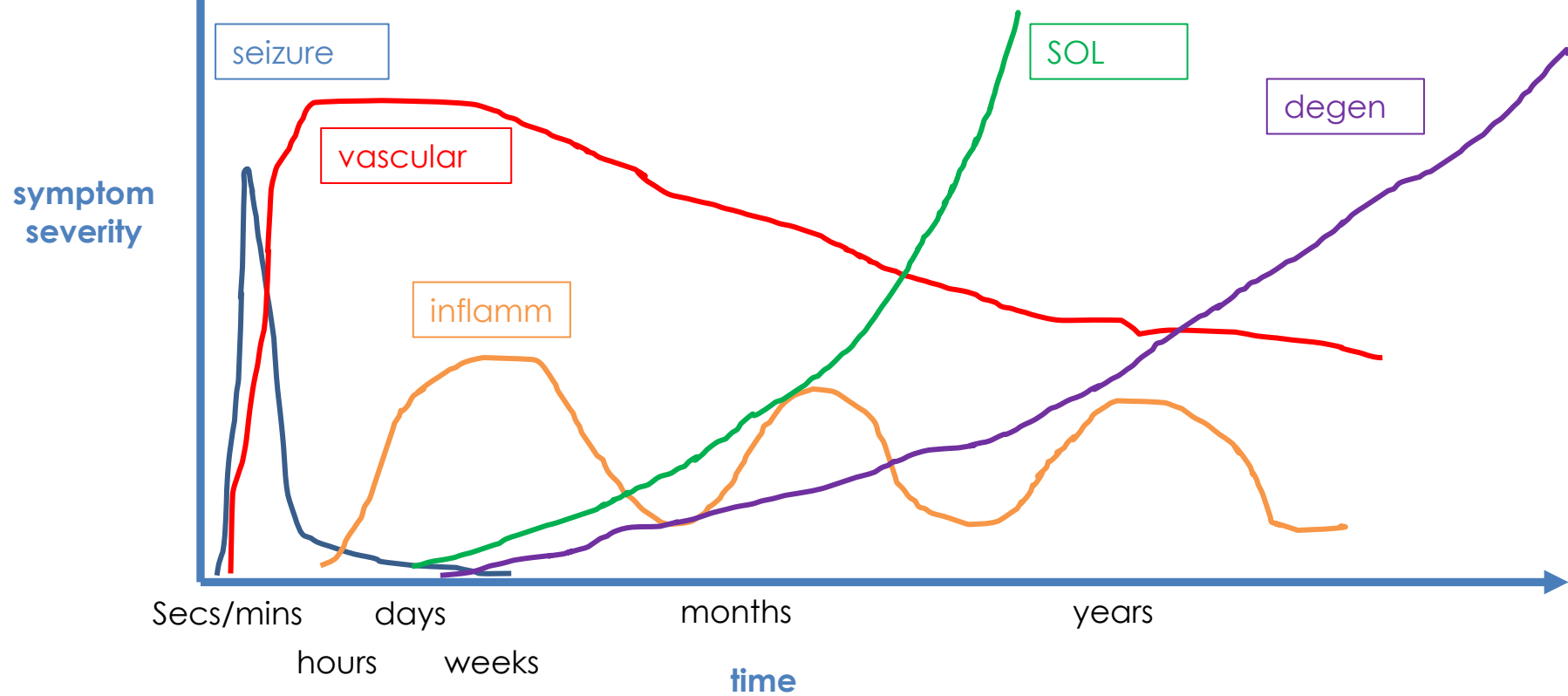
Everything else

A few
contraindications





**TIME COURSE CAN HELP YOU
CHOOSE YOUR IMAGING**

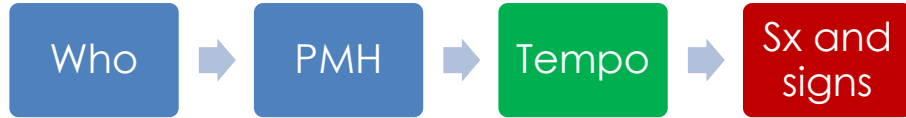


Case Vignettes



Problem representation

Imaging



- Will it help?
- What shall we image?
- Which modality?

Case 1



A 28 yr old female presents with 3 days of difficulty walking. She feels that both legs are weaker than usual and she is unsteady on her feet; if she closes her eyes she loses her balance. There is a 'fizzy' feeling of altered sensation in her legs and lower abdomen. She has been needing to urinate frequently and has to rush to the toilet. She has no issue with her arms. There have been no problems with vision, speech or swallowing.



She has had no previous spells of neurological symptoms. There are no background or long-term medical conditions. She smokes 10cpd, drinks alcohol in moderation at weekends, and does not use drugs. There is no family history of note. She works in advertising.



On examination pupils, fields and fundi were normal. The remaining cranial nerves were intact. UL examination shows normal tone, power, reflexes, coordination and sensation. In the LL there is mildly increased tone at the knees. Power is grade 4- at the hips and 4+ at the knees. Knee and ankle jerks are brisk, plantars are upgoing. Vibration sensation is reduced to the hips and there is some patchy pin-prick sensation loss distally. She walks on a broad base. Romberg sign is positive.



Problem Representation

- A usually well 28yr old female...
- Presents acutely with...
- A sensory ataxic, spastic paraparesis



Imaging?



Will Imaging help?

- Yes
- Why?
- Bit worried about transverse myelitis...

What to image?



But what if...



Problem Representation

- A usually well 78yr old female...
- Presents acutely with...
- A sensory ataxic, spastic paraparesis

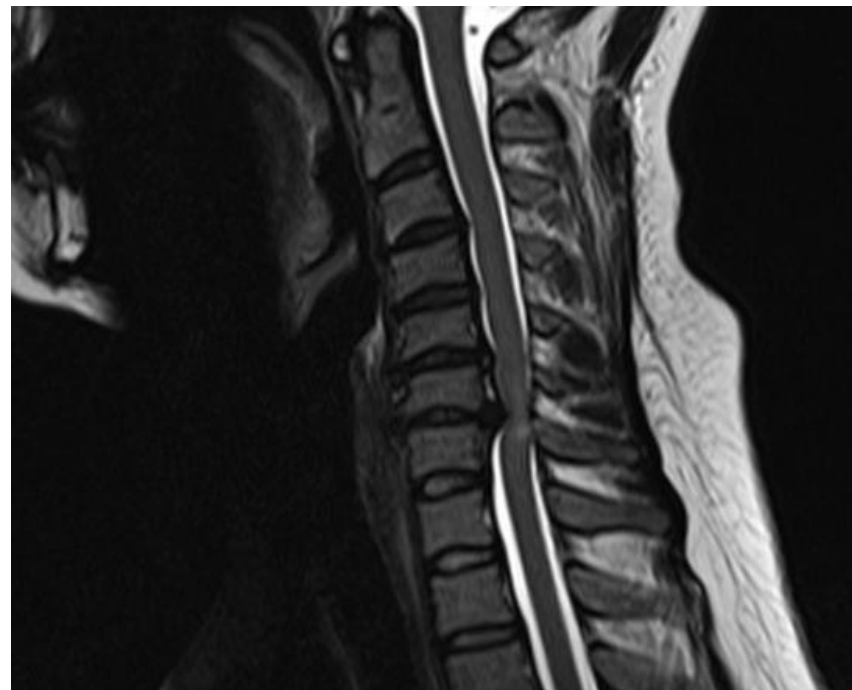


Imaging?

Will Imaging help?

- Yes
- Why?
- Bit worried about acute compression

What to image?



Case 2



A 28 yr old female presents with 1 day of difficulty walking. She awoke noticing both legs are weaker than usual and she is unsteady on her feet; if she closes her eyes she loses her balance. Her arms feel heavy. There is a 'fizzy' feeling of altered sensation in her arms and legs. She has been needing to urinate frequently and has to rush to the toilet. There have been no problems with vision, speech or swallowing.



On examination pupils, fields and fundi were normal. The remaining cranial nerves were intact. UL examination shows flaccid tone, grade 4+ weakness, reduced reflexes, mildly impaired coordination and patchy pin prick loss distally. In the LL there is normal tone. Power is grade 4- at the hips, knees and ankles. Knee and ankle jerks are present symmetrically, plantars are mute. Vibration sensation is reduced to above the hips and there is some patchy pin-prick sensation loss distally. She can barely walk unaided, is on a broad base and Romberg sign is positive.



Problem Representation

- A usually well 28yr old female...
- Presents hyperacutely with...
- A sensory ataxic, flaccid tetraparesis



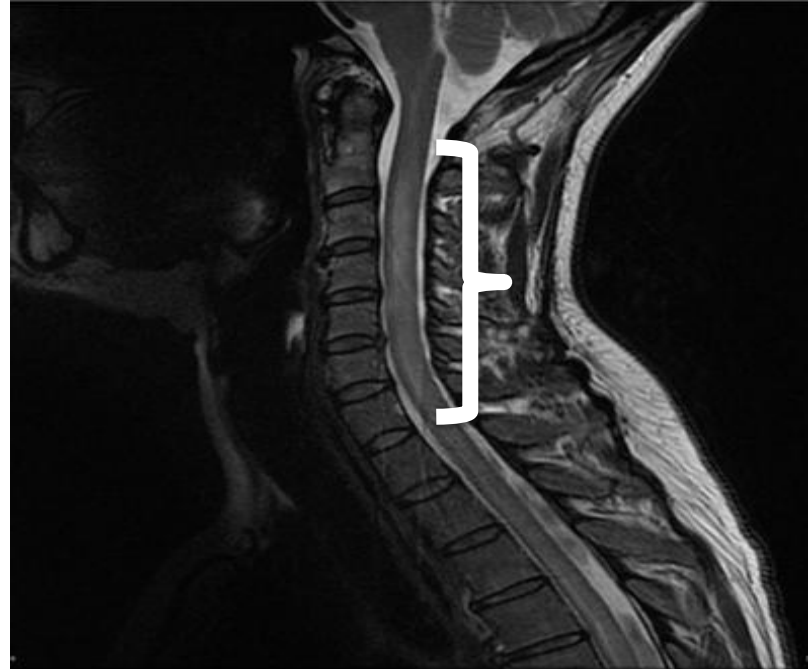
Imaging?



Will Imaging help?

- Yes
- Why?
- Bit worried about very acute demyelination

What to image?



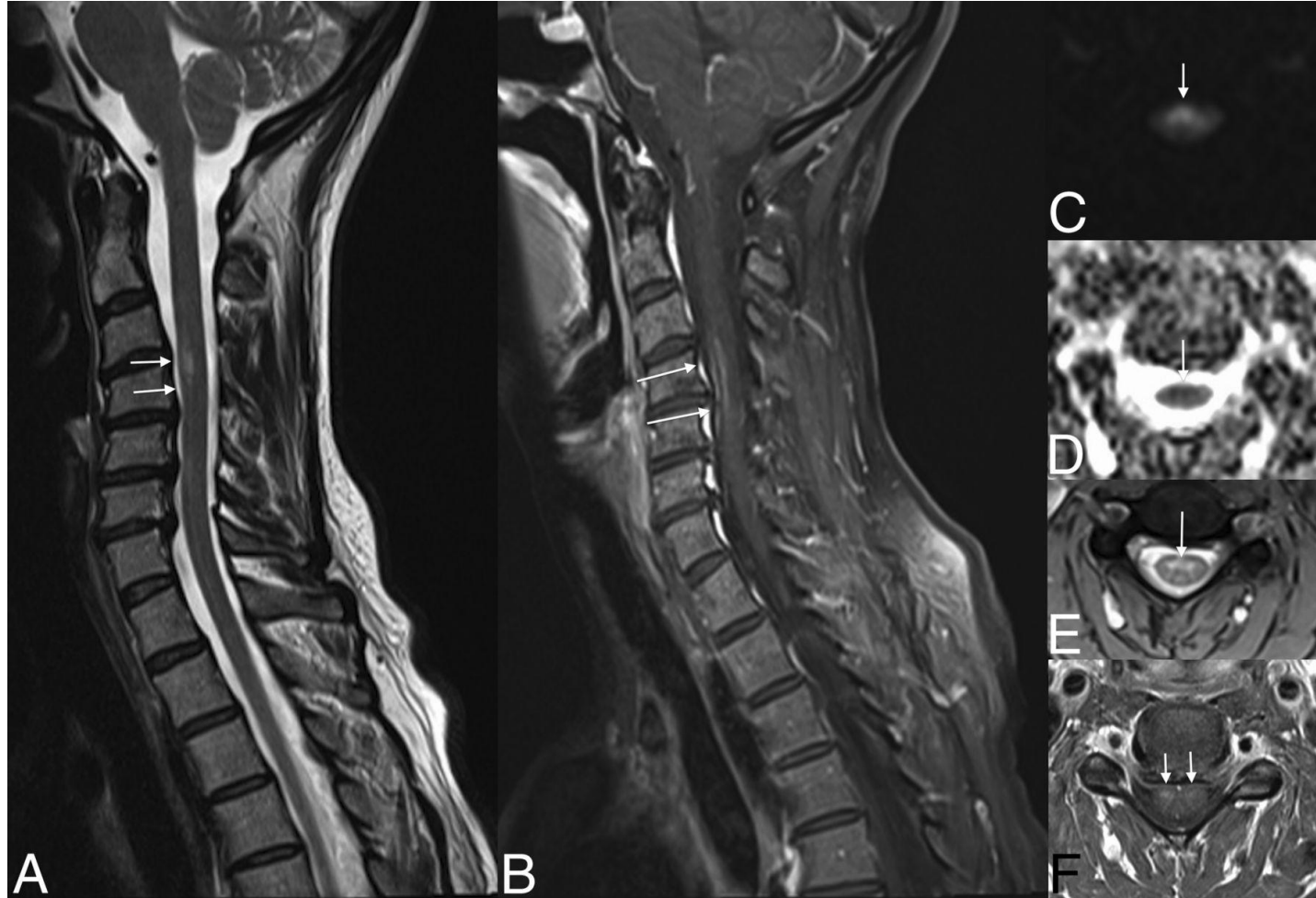
But what if...

That scan was normal...?

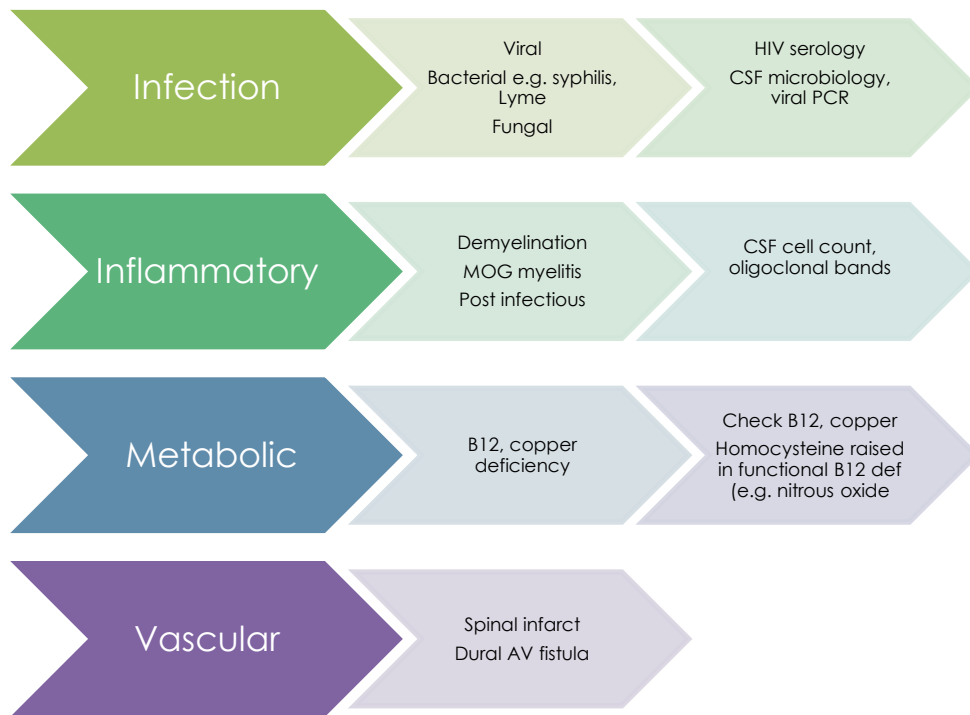
- Still worried about demyelination...
- ... the other sort...
- ?GBS

Other stuff to consider...

- Spinal cord infarct
- Venous infarct
 - Stenosis
 - Epidural abscess



Some scan negative myelopathies





Case 3

- A 28 yr old female presents with 7 days of difficulty walking. She feels very unsteady on her feet; if she closes her eyes she loses her balance. Her arms feel clumsy. There is a 'fizzy' feeling of altered sensation in her arms and legs. She has had mild urinary frequency. There have been no problems with vision, speech or swallowing.



On examination pupils, fields and fundi were normal. The remaining cranial nerves were intact. UL examination shows normal tone and power, reduced reflexes, mildly impaired coordination and patchy pin prick loss distally. In the LL there is normal tone and power. Knee jerks are brisk, ankle jerks are absent and plantars are upgoing. Vibration sensation is reduced to above the hips and there is some patchy pin-prick sensation loss distally. She can barely walk unaided, is on a broad base and Romberg sign is positive.



Problem Representation

- A usually well 28yr old female...
- Presents (quite) acutely with...
- A sensory ataxic syndrome with mixed UMN and LMN signs...



Imaging?



Will Imaging help?

- Perhaps
- Why?
- Bit worried SACD

What to image?



Case 4



An 18 year old male with a background of mild learning difficulties presents with 2-3 weeks of unsteadiness and clumsiness in hands. This is unchanged when eyes are closed and he is now unable to walk unaided. His speech is slurred. He had a flu vaccine 4 weeks ago. He describes joint pains and generalized muscle aches. There are no bladder or bowel problems, no sensory disturbance and no swallow problems.



On examination pupils, fields and fundi are normal. He has gaze-evoked nystagmus in all directions. His speech is dysarthric. Tone and power are normal in upper and lower limbs. He has brisk reflexes throughout and upgoing plantars. He has difficulty with finger-nose testing more on the left than right. He walks with a broad-based unsteady gait and requires assistance of 1. Romberg's sign is negative.



Problem Representation

- A usually well 18 year old male...
- Presents subacutely with...
- A cerebellar syndrome with nystagmus, dysarthria, limb and gait ataxia...



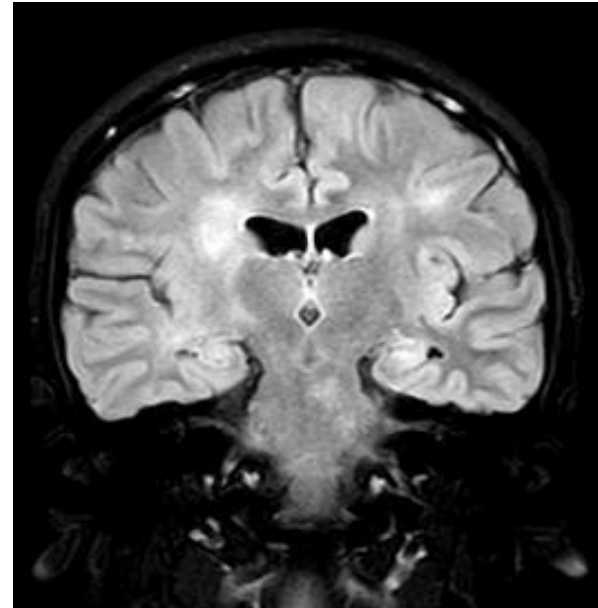
Imaging?

Will imaging help?

- Probably...
- Concerned about a cerebellar $\pm$ brainstem lesion

**Post-vaccine acute
demyelinating
encephalomyelitis (ADEM)**

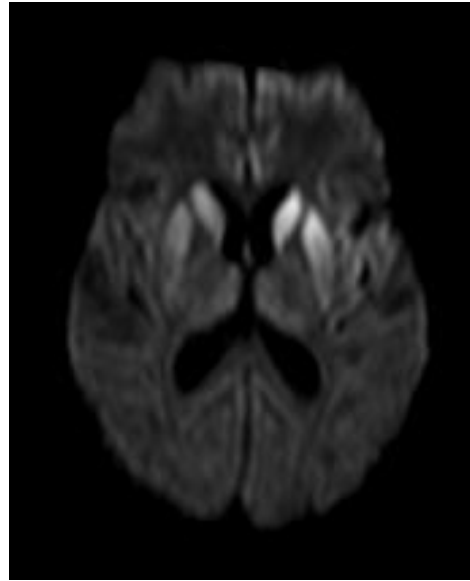
What to image?



But what if?

Cerebellar imaging was normal?

- Changes elsewhere can reflect disease process
- e.g. presentation with cerebellar ataxia in sporadic CJD



Case 5



- 75 year old male, no previous medical history
- Worsening mobility and falls over 12 months, worse in last week
- Unable to stand unaided
- Difficulty with focusing, dry eyes
- On examination restricted vertical eye movements, cognitively slowed
 - Mild slowing of finger taps, moderate axial rigidity
 - Reflexes globally brisk



Problem Representation

- A 75 year old male previously well...
- Presents acutely on a background of chronic decline with...
- Falls, impaired vertical gaze and parkinsonian features...



Imaging?

Will imaging help?

- Possibly...
- Why?
- Concerned about degenerative cause
e.g. PSP

What to image?



Case 6

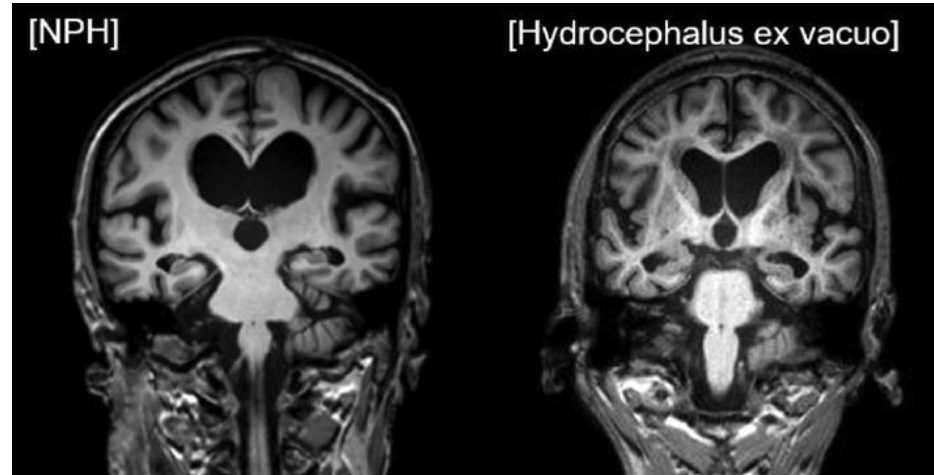
- 85 year old male
- Admitted with acute confusion and reduced mobility
- Usually independently mobile
- No neurological signs
- Features of delirium
- Suspected underlying UTI
- Already scanned in ED
- CT brain report:
 - “There is generalized atrophy and dilation of the ventricular system. Advise neurological opinion for suspected normal pressure hydrocephalus”

What now?

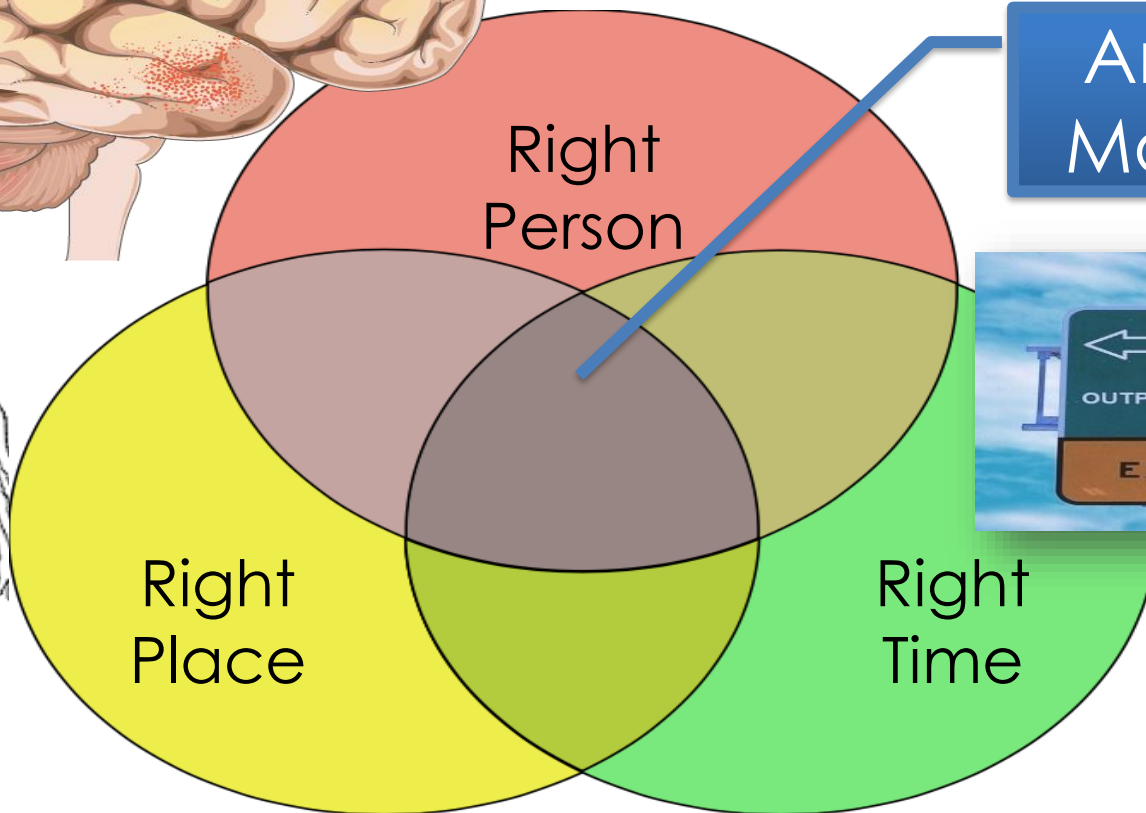
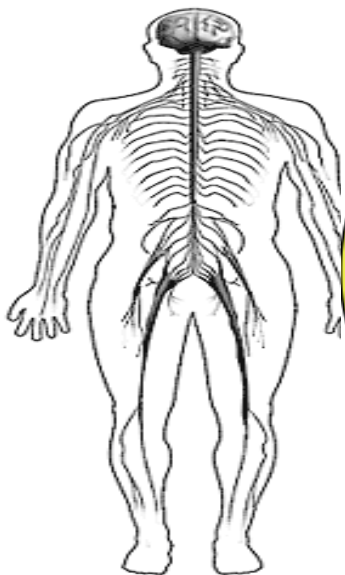
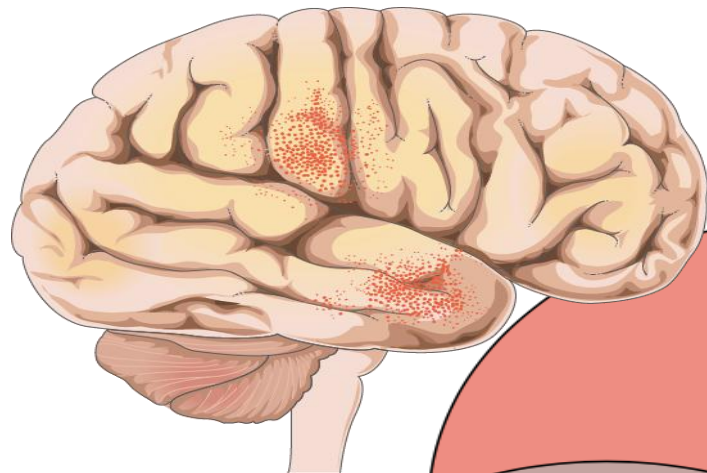
Further imaging needed?

- Does not fit with clinical syndrome of NPH
- Likely incidental finding
- No further acute imaging needed

NPH vs cerebral atrophy



Kim M et al. *Psychiatry Investig*
2021;18:628-635.



And Right
Modality...

