

# IT'S NOT ALL IN THE HEAD: ECD AND THE BRAIN 2023 PATIENT FAMILY GATHERING

OLIVER TOBIN, MD  
MAYO CLINIC



BIOMED VALLEY™  
DISCOVERIES



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# CNS HISTIOCYTOSIS

**W. Oliver Tobin, M.B., B.Ch., B.A.O., Ph.D.**  
Associate Professor of Neurology,  
Mayo Clinic College of Medicine

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## **DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIP(S) WITH INDUSTRY**

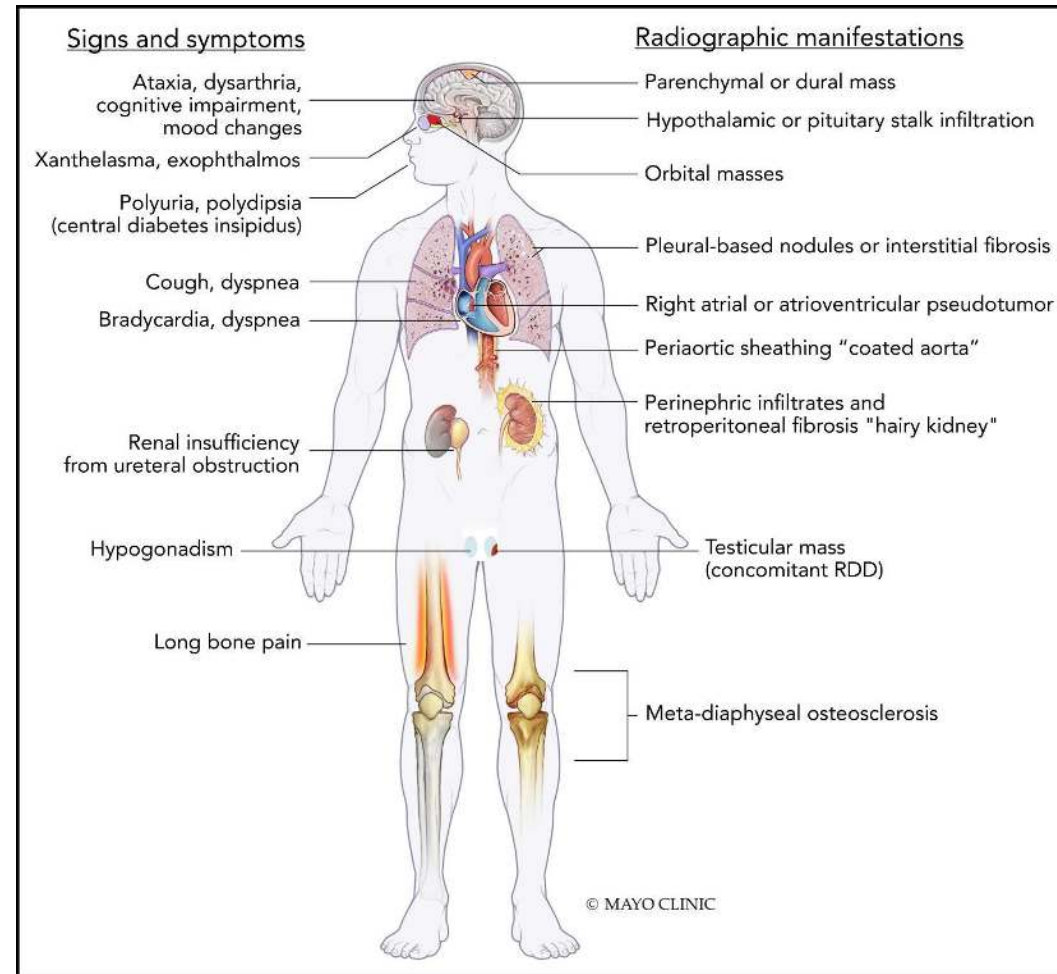
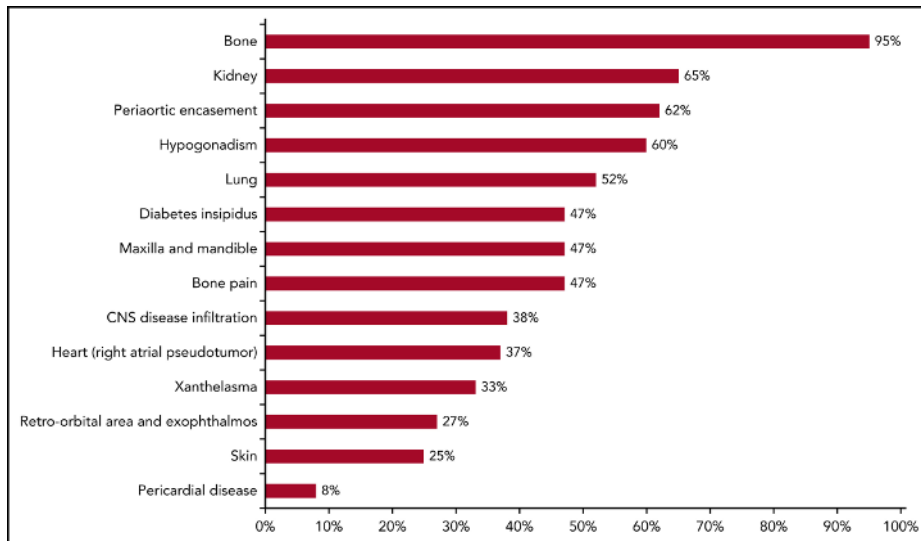
- Research fellow funded by the CMSAN
- Research funding from Mallinckrodt Inc
- R01 “Diagnosis of Indeterminate Brain Lesions Using MRI-Based Machine Learning and Polygenic Risk Models”

## **REFERENCES TO OFF-LABEL USAGE(S) OF PHARMACEUTICALS OR INSTRUMENTS**

- None

# ERDHEIM-CHESTER DISEASE

- Approx. 1500 cases worldwide
- Mean age 55
- Male: Female 3:1



**HOW COMMON  
IS  
NEUROLOGIC  
INVOLVEMENT**

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Erdheim–Chester disease approx. 50%

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Langerhans cell histiocytosis approx. 30%

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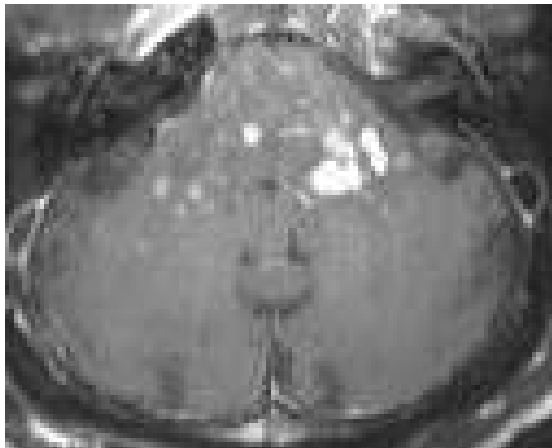
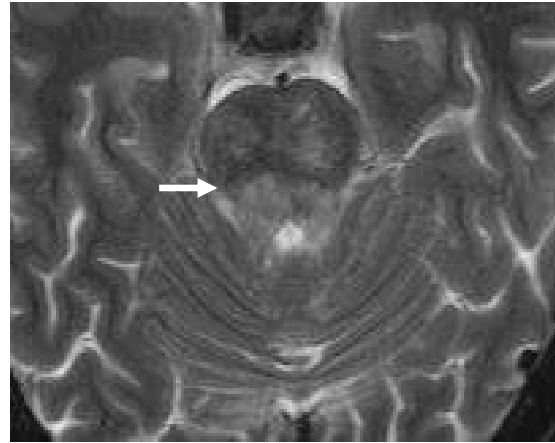
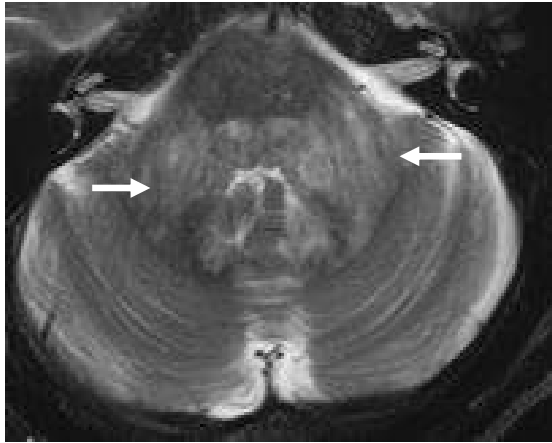
Rosai-Dorfman disease approx. 10%

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Associated with an increase in death rate  
BUT very high response rate to medications

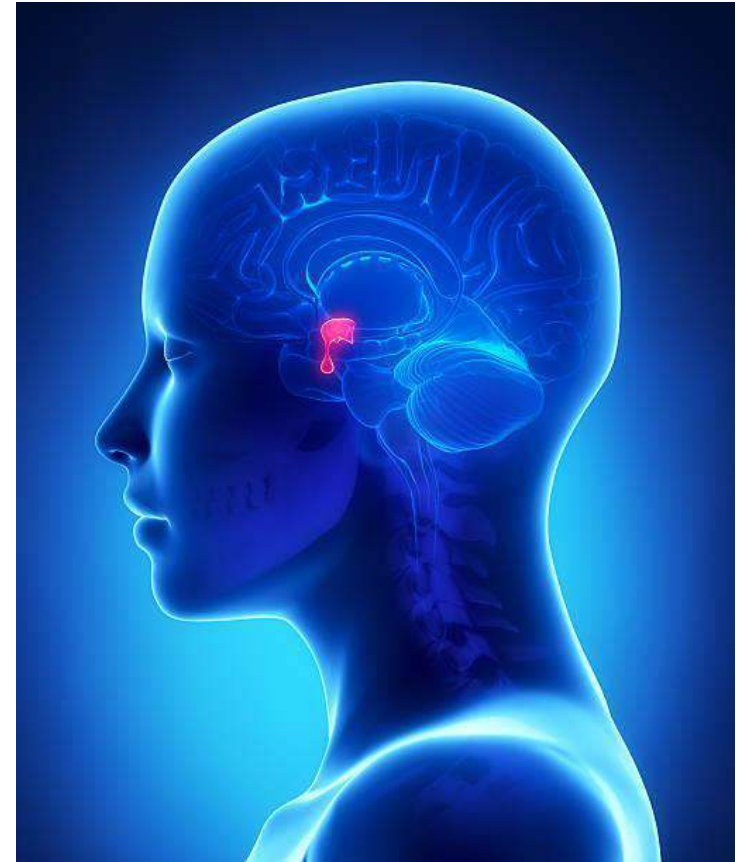
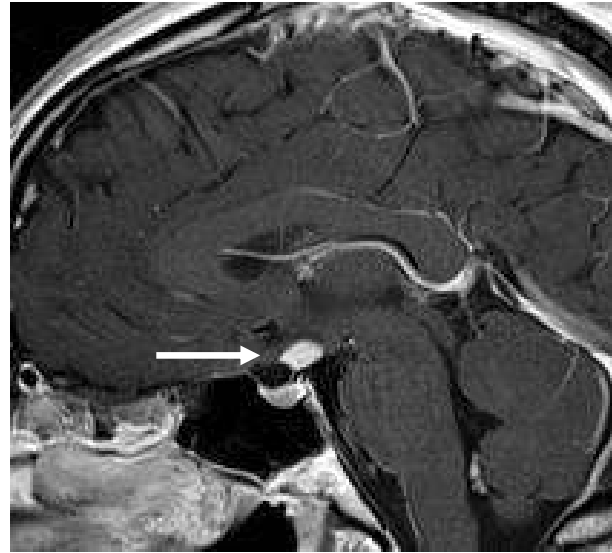
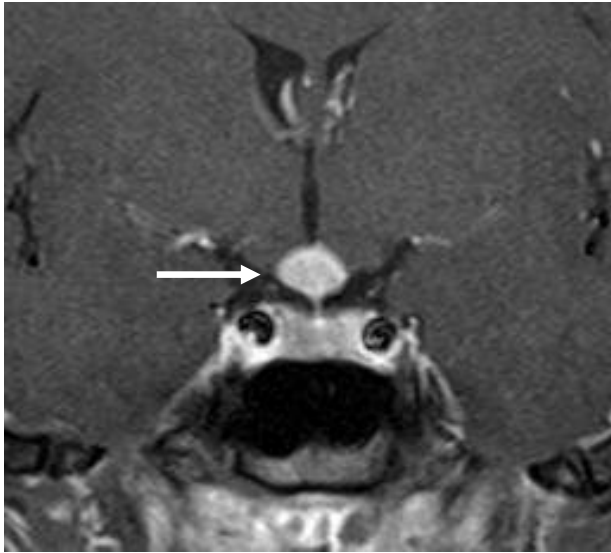
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# WHAT DOES NEUROLOGIC INVOLVEMENT MEAN?



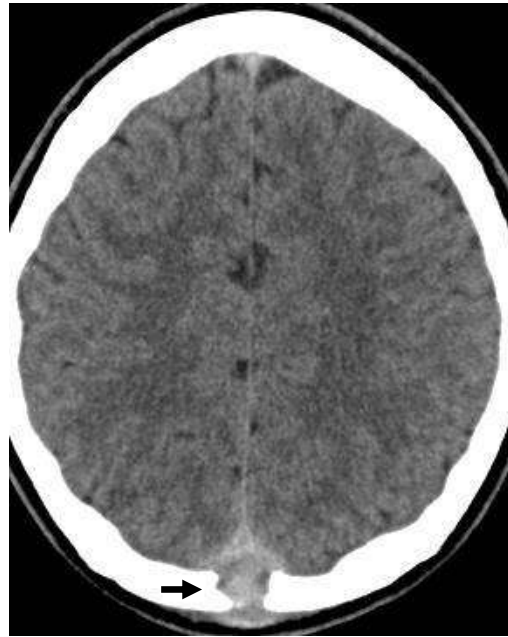
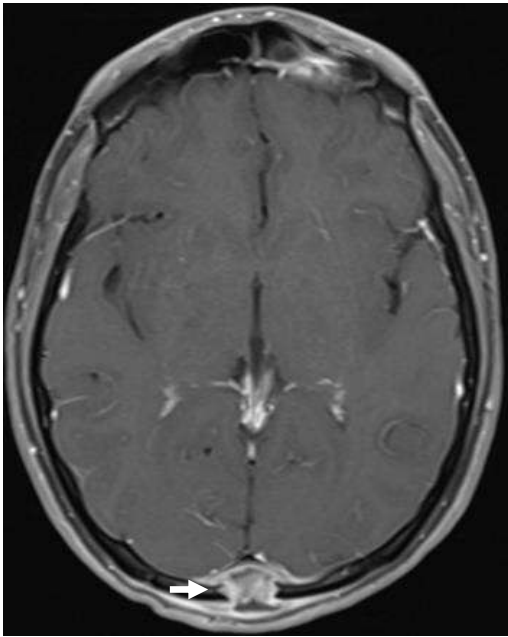
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# PITUITARY



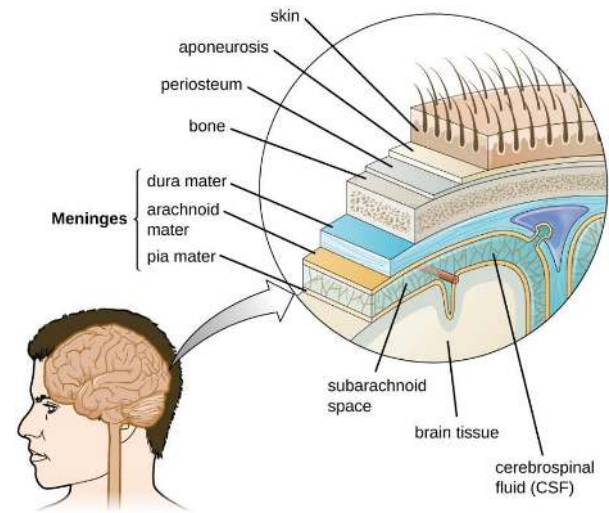
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# SKULL





# DURAL INVOLVEMENT

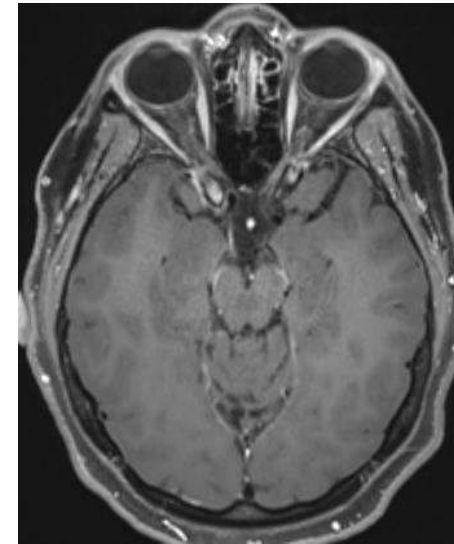
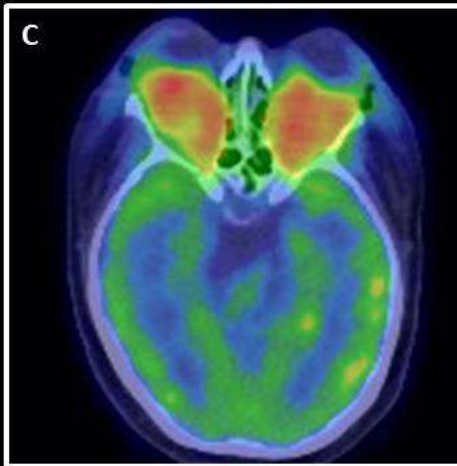
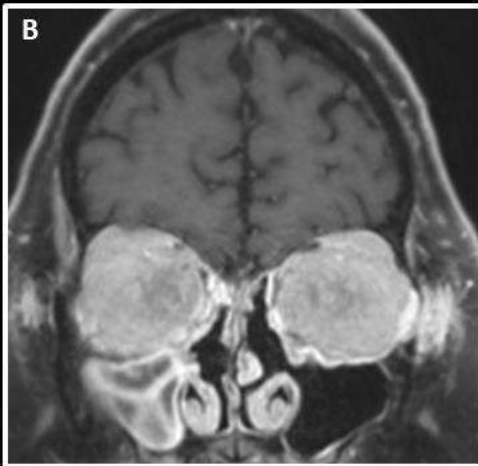


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# CAUDA EQUINA

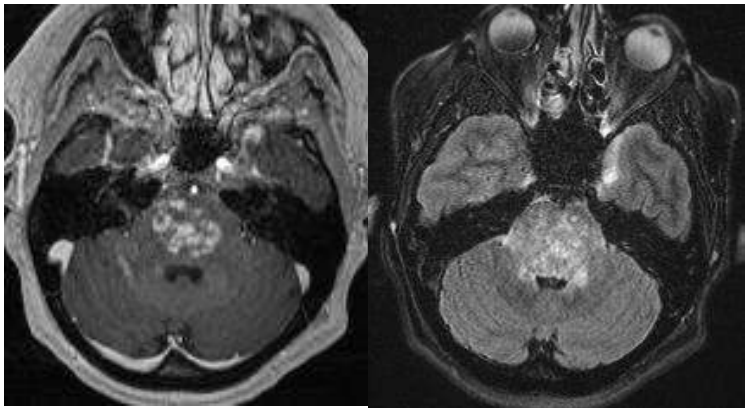
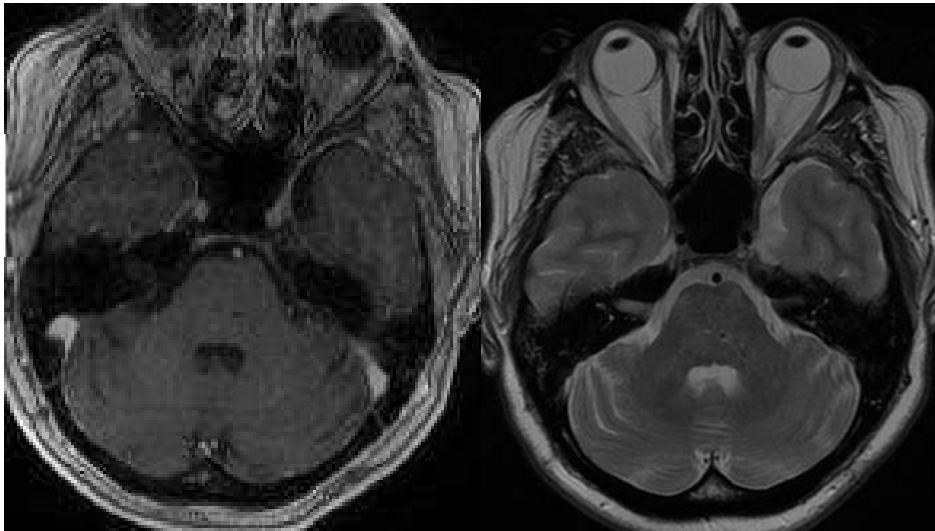
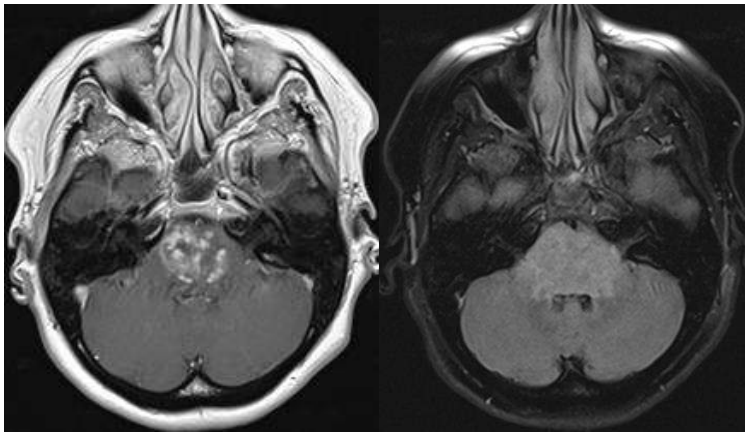


# EYE INVOLVEMENT



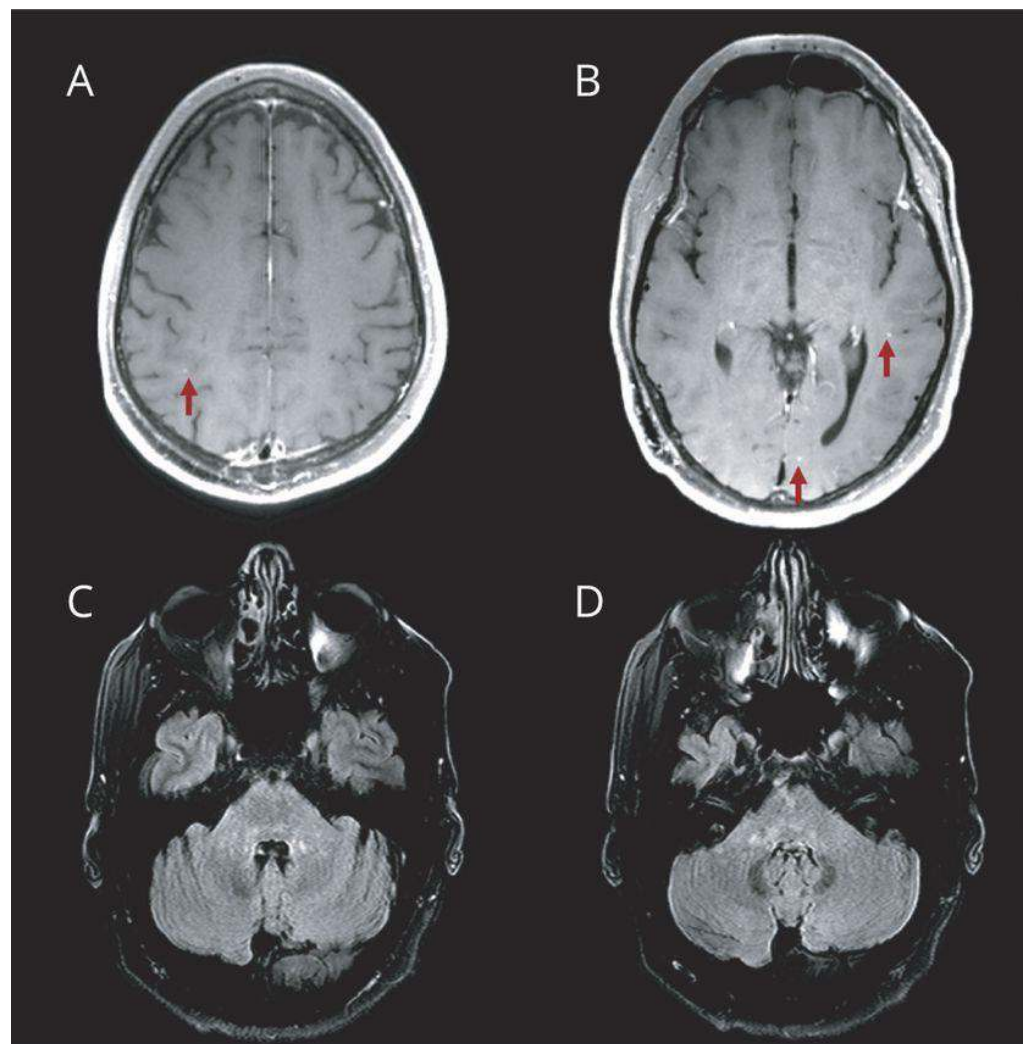
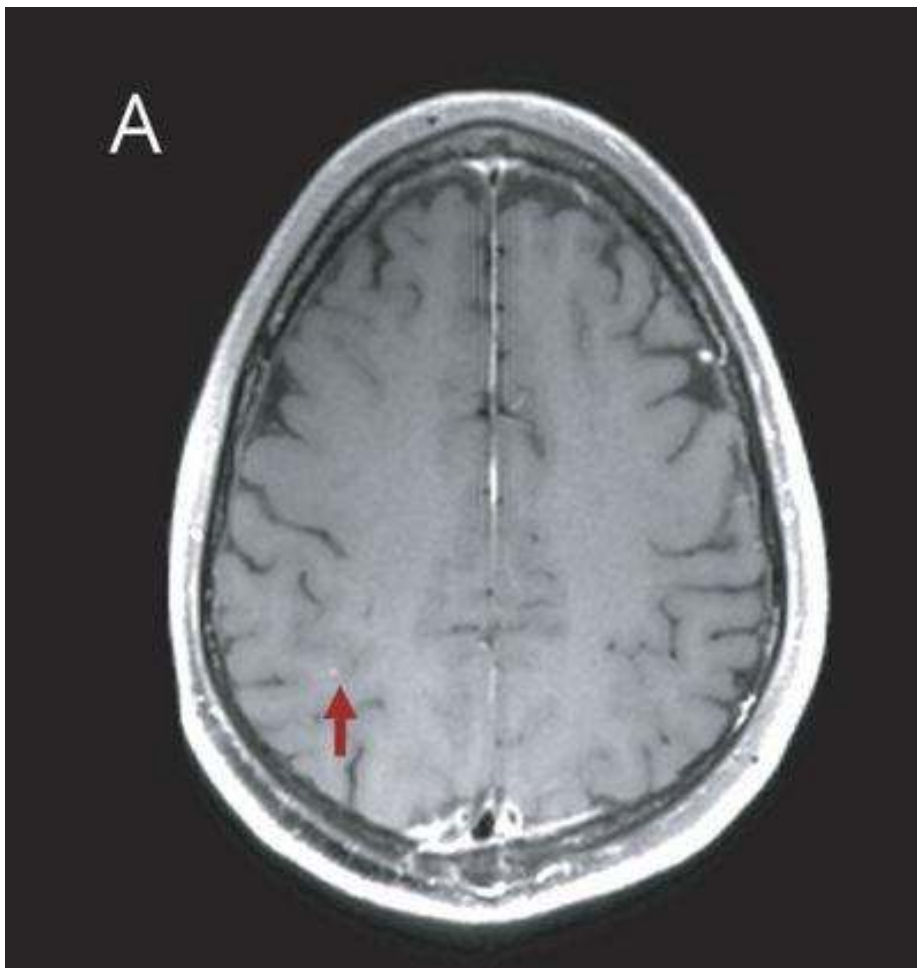
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# ACTIVE VS INACTIVE DISEASE



After  
steroids

# MRI IS NOT PERFECT...

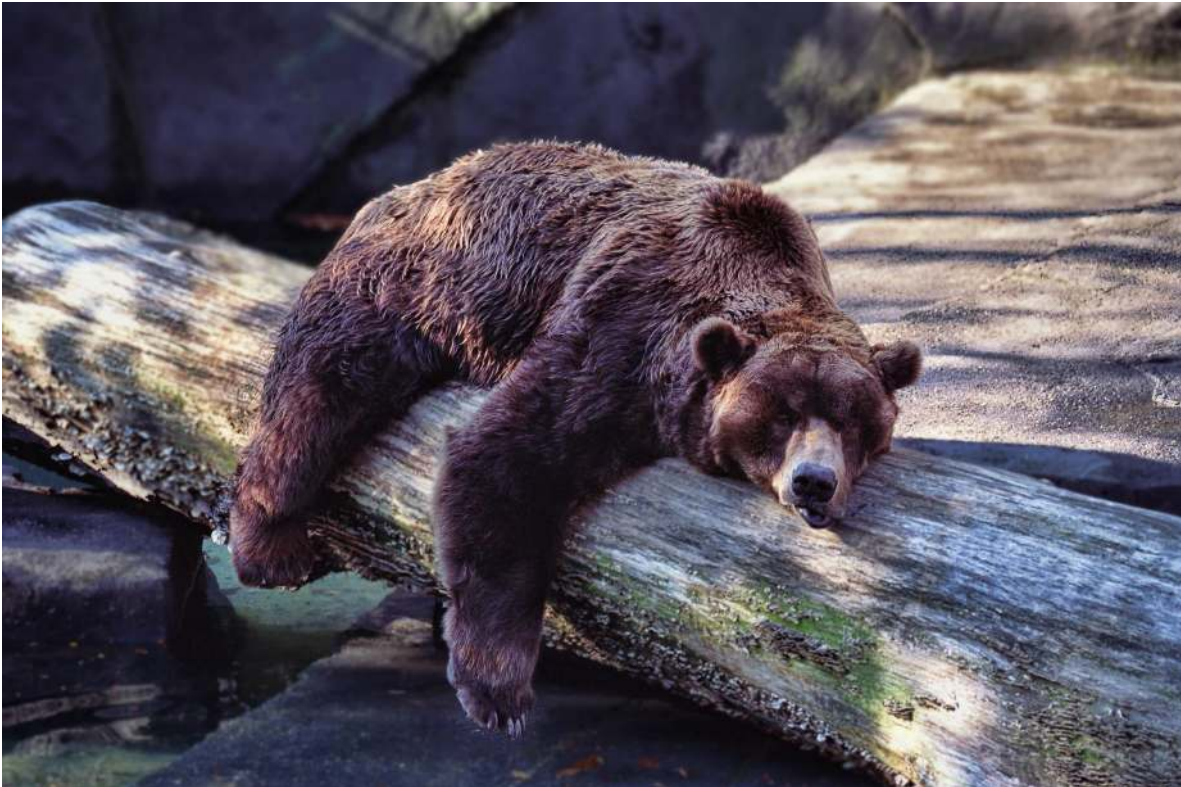




# **SYMPTOM MANAGEMENT**

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# FATIGUE



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# FATIGUE

## PRIMARY CAUSES

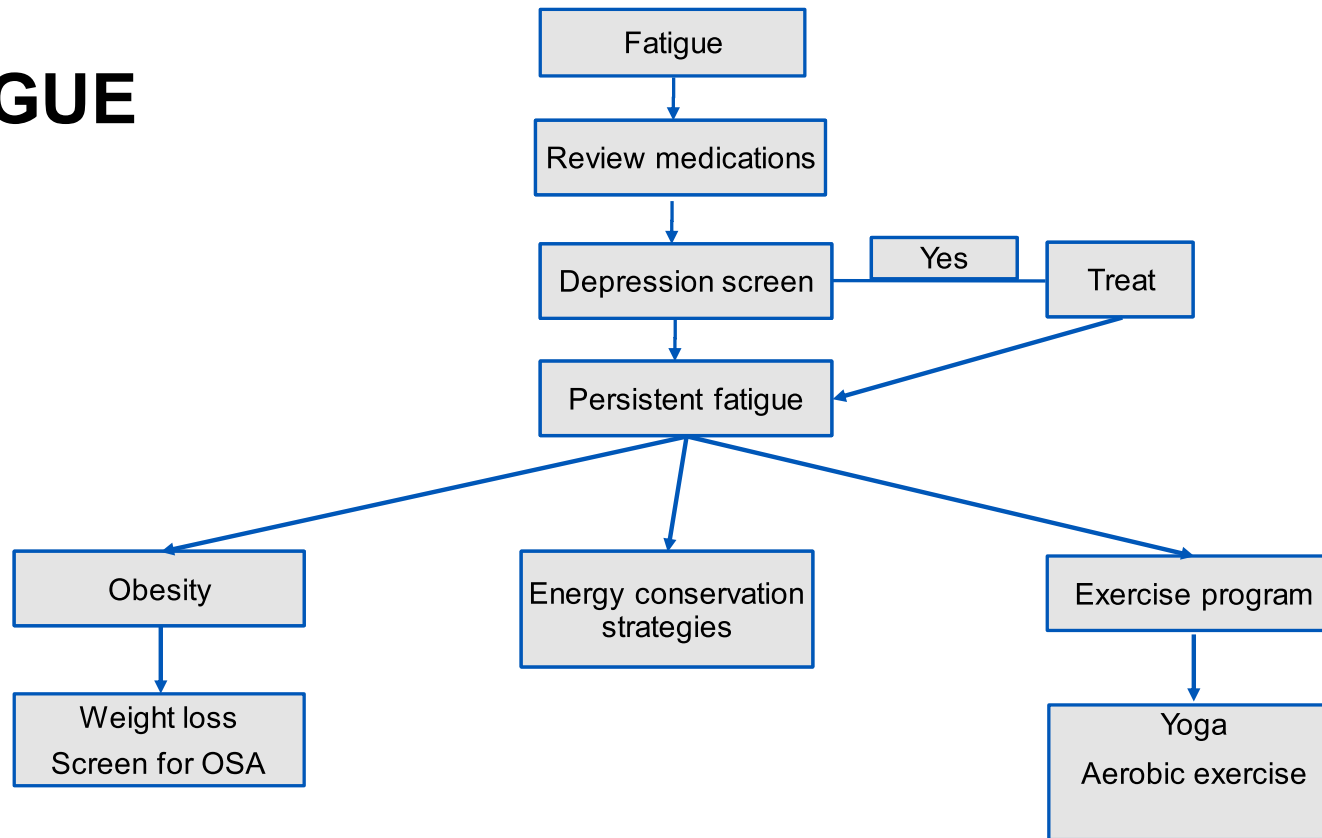
- Immune dysregulation (~↑IL6)
- Endocrine factors
- Neurotransmitter dysregulation
- Neuronal dysfunction

## SECONDARY CAUSES

- Deconditioning
- Sleep dysfunction
- Pain
- Anxiety
- Medications



# FATIGUE



Adapted from: Khan et al, Front Neurol 2014

# SPASTICITY

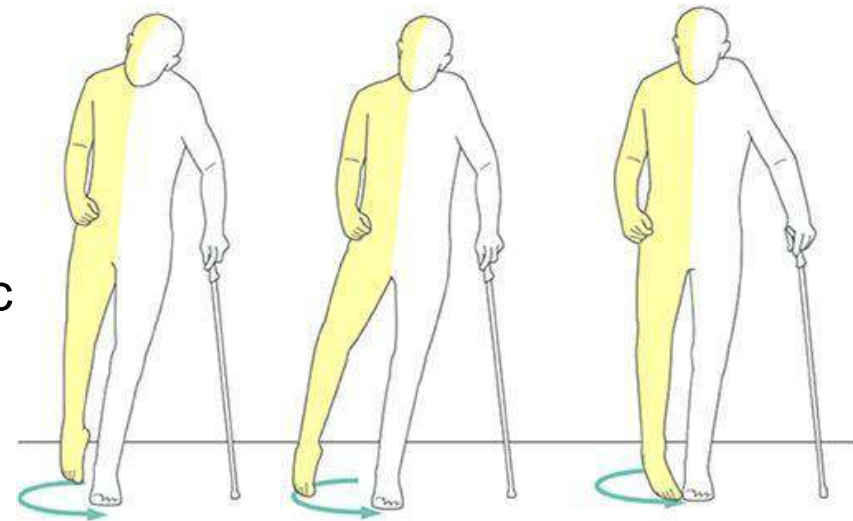
## Stretching – twice daily

### Second line:

- Baclofen
- Tizanidine

### Third line:

- Botulinium toxin (works best for focal spastic)
- Intrathecal baclofen



# WEAKNESS

Physiatrist evaluation

<https://www.aapmr.org/>



[https://physicians.aapmr.org/Physicians/Physicians/Find\\_a\\_PMR\\_Physician/Spasticity.aspx](https://physicians.aapmr.org/Physicians/Physicians/Find_a_PMR_Physician/Spasticity.aspx)

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**aapm&r**

FIND A PM&R PHYSICIAN | WHY VISIT A PM&R PHYSICIAN? | CONDITIONS & TREATMENTS

## Spasticity

Welcome to the Find a PM&R Physician Spasticity Database that allows you to locate a practicing spasticity provider in your area. You can search more [PM&R experts by specialty and practice area](#).

Please read our [disclaimer](#) statement prior to using this service.

Starting Zip Code

Radius (miles)



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## BLADDER SYMPTOMS



# BLADDER SYMPTOMS

## Bladder Irritants

- Caffeine
- Tobacco
- Alcohol
- Carbonated beverages (including sparkling water),
- Chili peppers
- Citrus fruits
- Vitamin C supplements

## Medical treatments

- Anticholinergic medications
- Botox toxin
- Catheterization



### Suprapontine lesion

- History: predominantly storage symptoms
- Ultrasound: insignificant PVR urine volume
- Urodynamics: detrusor overactivity



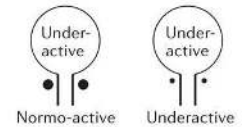
### Spinal (infrapontine-suprasacral) lesion

- History: both storage and voiding symptoms
- Ultrasound: PVR urine volume usually raised
- Urodynamics: detrusor overactivity, detrusor-sphincter dyssynergia

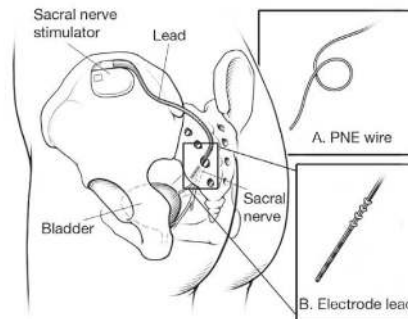


### Sacral/infrasacral lesion

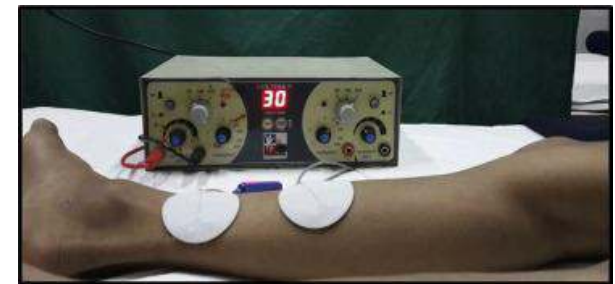
- History: predominantly voiding symptoms
- Ultrasound: PVR urine volume raised
- Urodynamics: hypocontractile or acontractile detrusor



Nature Reviews | Urology



**Figure 1. Full battery implant shown, also called a sacral nerve stimulator**  
**Box A:** PNE or percutaneous nerve stimulation uses a wire to do short-term test of nerve function.  
**Box B:** Electrode lead is used for the nerve testing and future therapy.



Patidar N et al J Pediatr Urol. 2015 Dec;11(6):351.e1-6

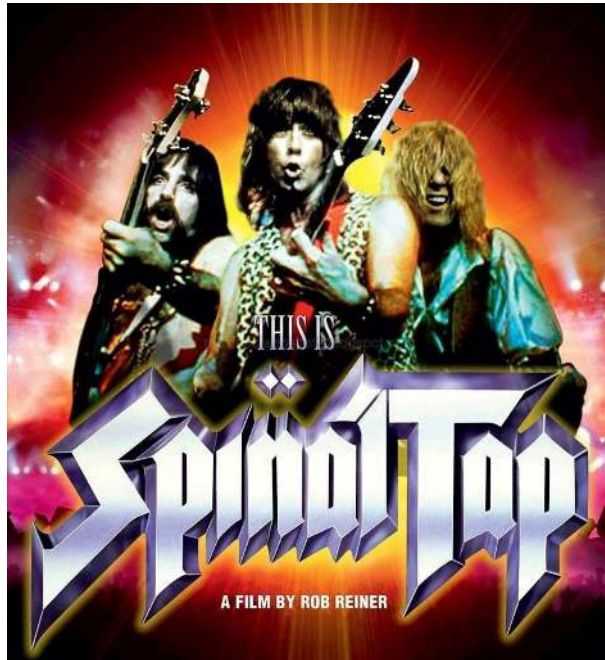
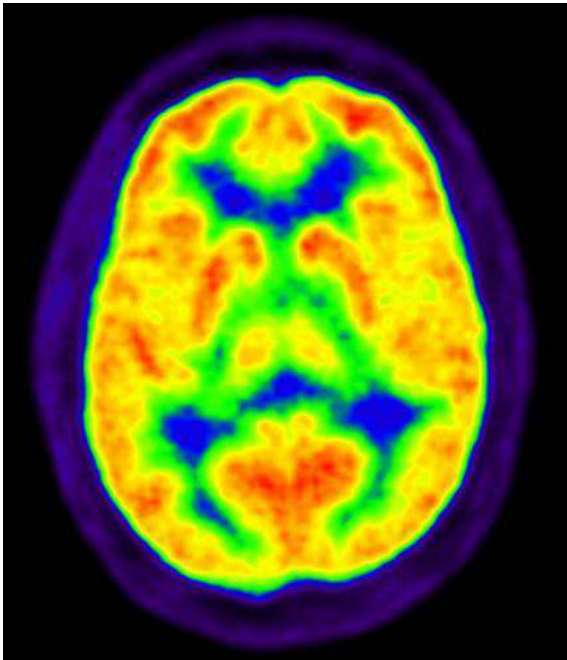


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## MEMORY PROBLEMS

- Brain fog
- Fatigue
- Lack of concentration

# TESTING



NAME : \_\_\_\_\_  
 Education : \_\_\_\_\_  
 Sex : \_\_\_\_\_ Date of birth : \_\_\_\_\_  
 DATE : \_\_\_\_\_

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

VISUOSPATIAL / EXECUTIVE		Copy cube	Draw CLOCK (Ten past eleven) (3 points)	POINTS																	
		[ ]	[ ]	/5																	
<b>NAMING</b>					/3																
<b>MEMORY</b>	Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">FACE</td> <td style="text-align: center;">VELVET</td> <td style="text-align: center;">CHURCH</td> <td style="text-align: center;">DAISY</td> <td style="text-align: center;">RED</td> </tr> <tr> <td style="text-align: center;">1st trial</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> </tr> <tr> <td style="text-align: center;">2nd trial</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> <td style="text-align: center;">[ ]</td> </tr> </table>		FACE	VELVET	CHURCH	DAISY	RED	1st trial	[ ]	[ ]	[ ]	[ ]	[ ]	2nd trial	[ ]	[ ]	[ ]	[ ]	[ ]	No points
	FACE	VELVET	CHURCH	DAISY	RED																
1st trial	[ ]	[ ]	[ ]	[ ]	[ ]																
2nd trial	[ ]	[ ]	[ ]	[ ]	[ ]																
<b>ATTENTION</b>		Read list of digits (1 digit/sec). Subject has to repeat them in the forward order [ ] 2 1 8 5 4 Subject has to repeat them in the backward order [ ] 7 4 2			/2																
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors		[ ] FBACMNAAJKLBAFAKDEAAAJAMOFAB			/1																
Serial 7 subtraction starting at 100		[ ] 93	[ ] 86	[ ] 79	[ ] 72	[ ] 65	/3														
<b>LANGUAGE</b>		Repeat : I only know that John is the one to help today. [ ] The cat always hid under the couch when dogs were in the room. [ ]			/2																
Fluency / Name maximum number of words in one minute that begin with the letter F		[ ] _____ (N ≥ 11 words)			/1																
<b>ABSTRACTION</b>		Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler			/2																
<b>DELAYED RECALL</b>	Has to recall words WITH NO CUE	FACE [ ]	VELVET [ ]	CHURCH [ ]	DAISY [ ]	RED [ ]	Points for UNCUE recall only	/5													
Optional		Category cue [ ]			Multiple choice cue [ ]																
<b>ORIENTATION</b>		[ ] Date	[ ] Month	[ ] Year	[ ] Day	[ ] Place	[ ] City	/6													
© Z.Nasreddine MD Version November 7, 2004		Normal ≥ 26 / 30			<b>TOTAL</b>			/30													
<a href="http://www.mocatest.org">www.mocatest.org</a>		Add 1 point if ≤ 12 yr edu																			

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# BRAIN PROTECTION







## **FUTURE DIRECTIONS AND UNANSWERED QUESTIONS**

- Does neurodegenerative disease occur in adult histiocytosis?
- Non-invasive diagnosis – liquid biopsy, cytokines
- What is the best way to monitor response to treatment?
- Treatments for histiocytic disorders without an identified mutation



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# THANK YOU

[Tobin.Oliver@mayo.edu](mailto:Tobin.Oliver@mayo.edu)



# QUESTIONS & DISCUSSION



# 2020\_MC\_WHITE

MSAN UPDATE 2021 – 3988066

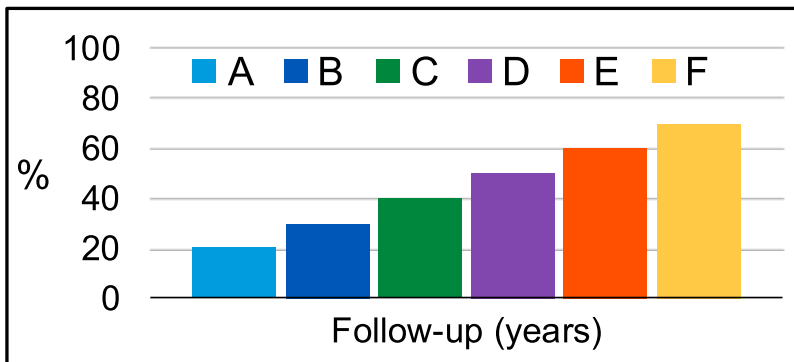
Color Theme

Highlight

Footnote/subdue

X-Y Axis

Gridlines



Row	No.	%
1	12.3	47
2	459.2	26
3	56.7	98

**This is the side title color**

- Type first bulleted point here
  - Type first subpoint here
  - This is the highlight color

**Notes**

- Table column headings: colored cells with 1 pt white top border and 6 pt white right borders between header cells (for “white” space between cells)

JS 12/10/2020