

The Perrin Technique for Neuro-lymphatic Disorders

Prof. Raymond N Perrin DO PhD



**NEW YORK INSTITUTE
OF TECHNOLOGY**

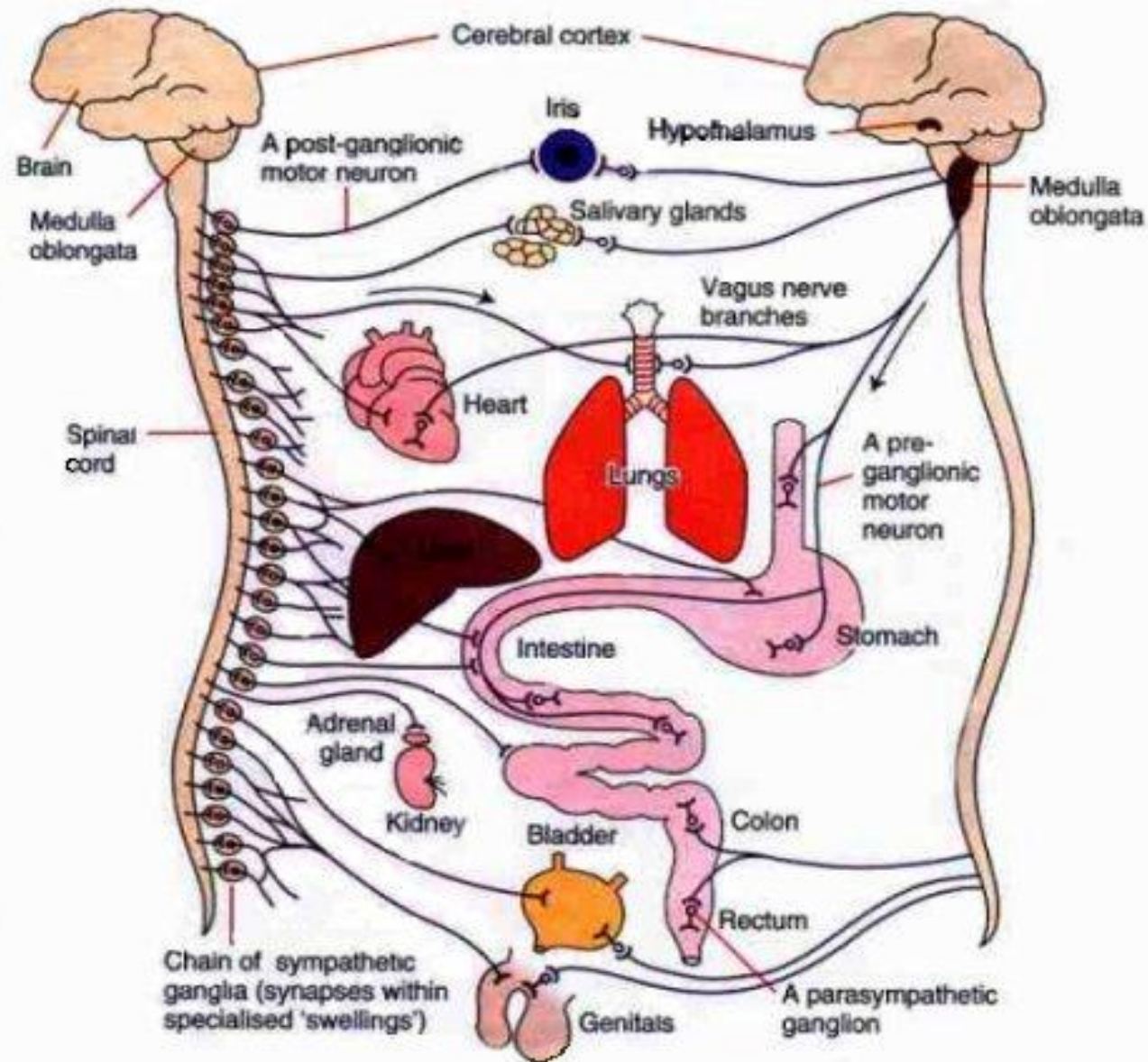
College of Osteopathic
Medicine



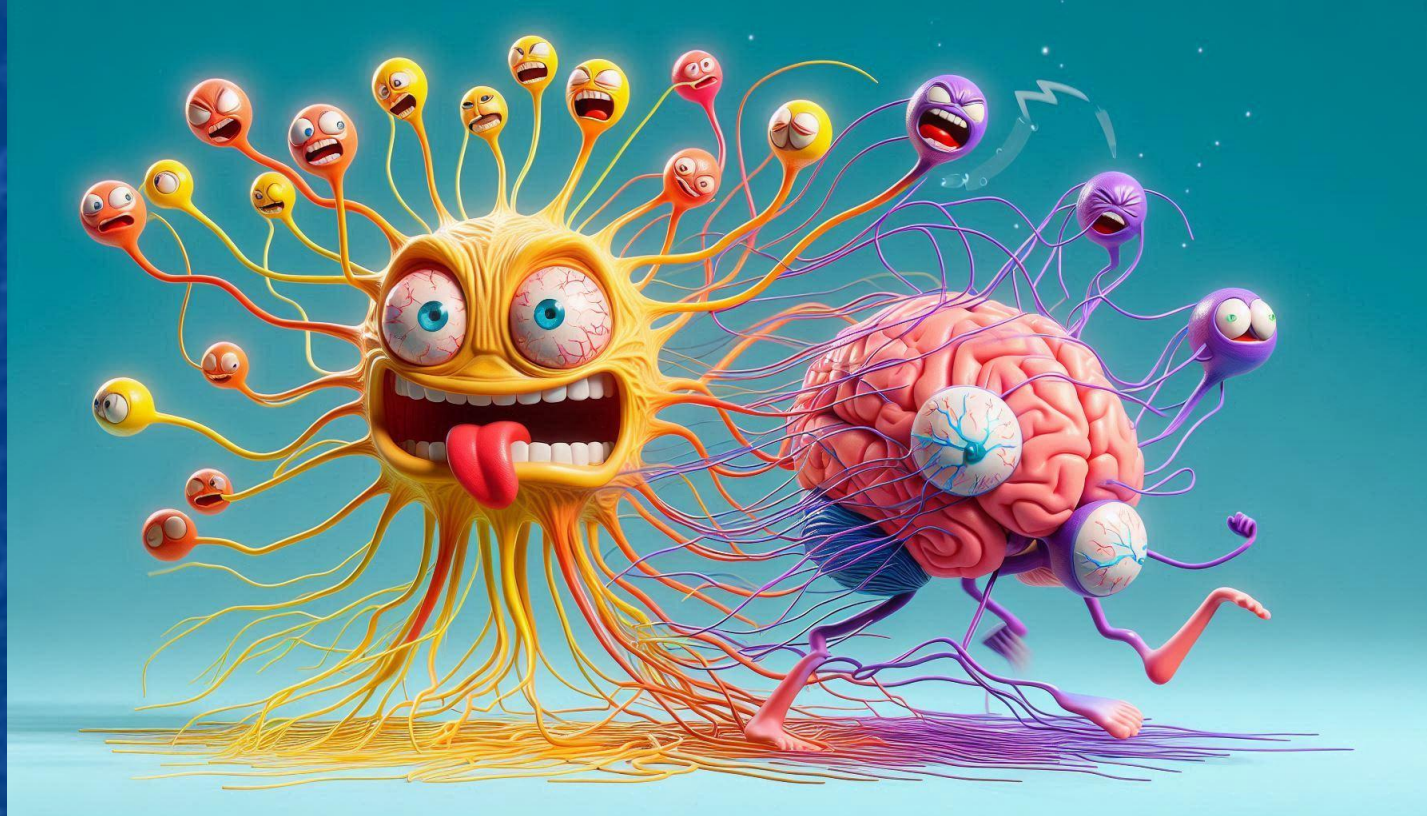


SYMPATHETIC DIVISION

PARASYMPATHETIC DIVISION



FACT 1



The Autonomic Nervous system via internal and external stressors has a major afferent influence on the brain.

THE SYMPATHETIC NERVOUS SYSTEM HAS A MAJOR
AFFERENT INFLUENCE RATHER THAN JUST EFFERENT

Jänig, W. (2022). *The Integrative Action of the Autonomic Nervous System:
Neurobiology of Homeostasis* (2nd ed.). Cambridge University Press.

AND

THE VAGUS NERVE HAS 80% AFFERENT FIBRES

Howland RH. Vagus Nerve Stimulation. *Curr Behav Neurosci Rep*.
2014 Jun;1(2):64-73. doi:10.1007/s40473-014-0010-5

SYMPATHETIC INFLUENCE

via:

- 1. Noradrenalin directly on peripheral afferent via alpha 1 adrenergic receptors.
- 2. Noradrenalin exciting alpha 2 adrenergic receptors mediating the release of prostaglandins exciting the primary afferent fibre.

3. Sympathetic and sensory fibres coupled electrically via synapses or the lesser known ephapses either in the terminal region or between fibres within Remak bundles (aggregation of C fibres) resulting in 'cross talk' (Gasser, 1955).

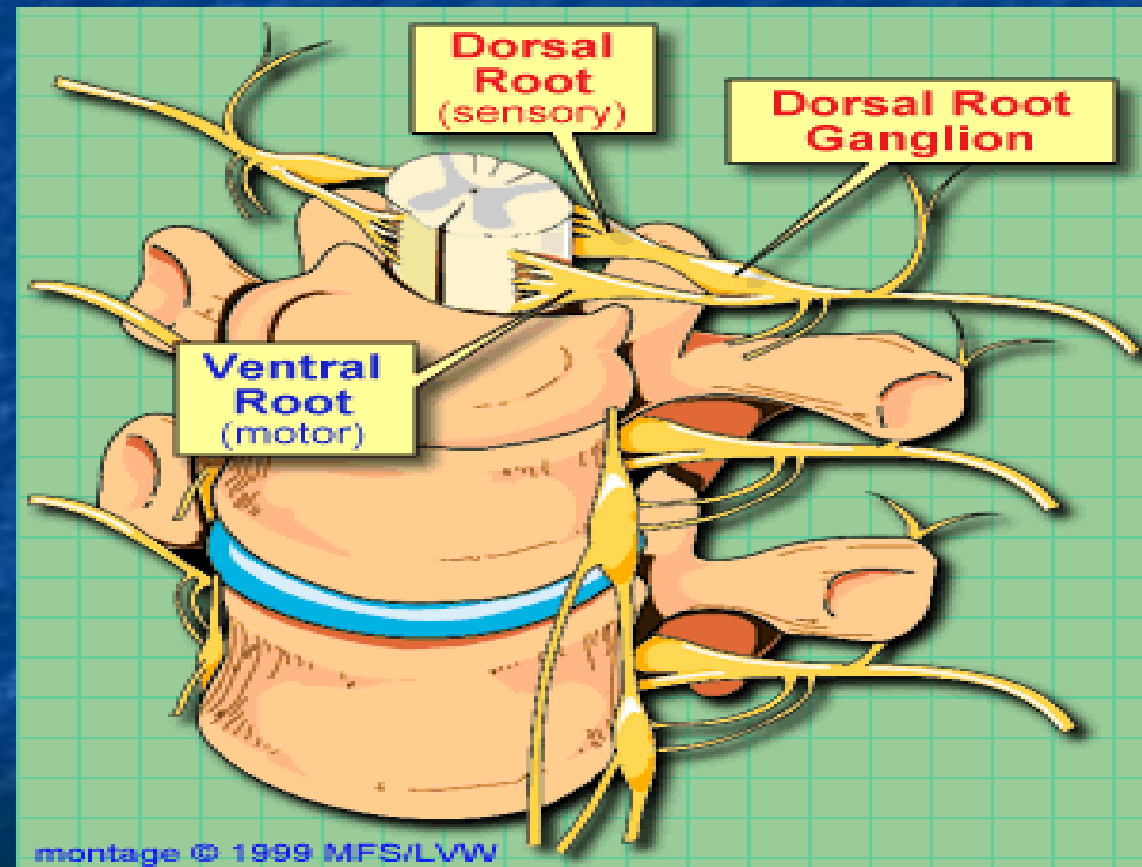
Ephapses



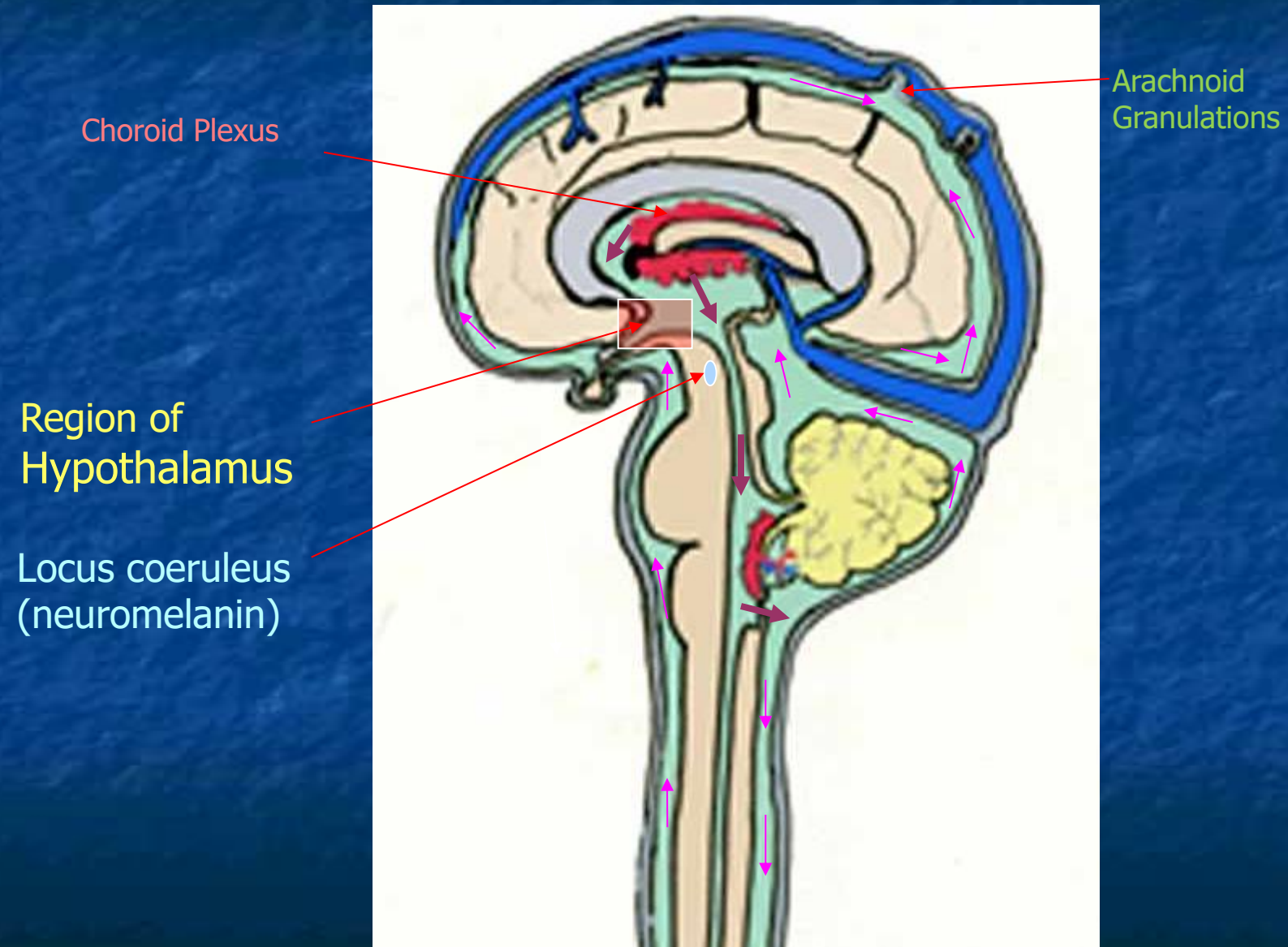
tingling /pain / burning/ numbness

4. Noradrenalin release may have local effects on blood flow, environment in skin enhancing activity.

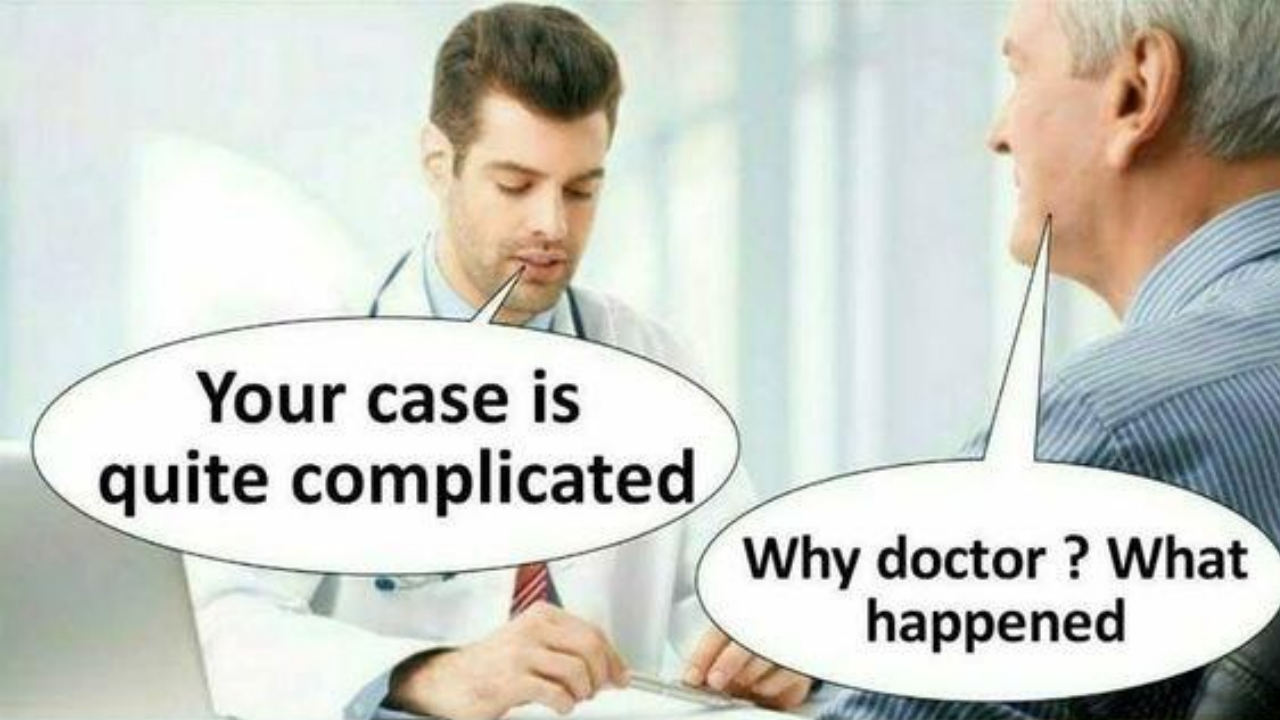
DORSAL ROOT GANGLION



The Hypothalamus

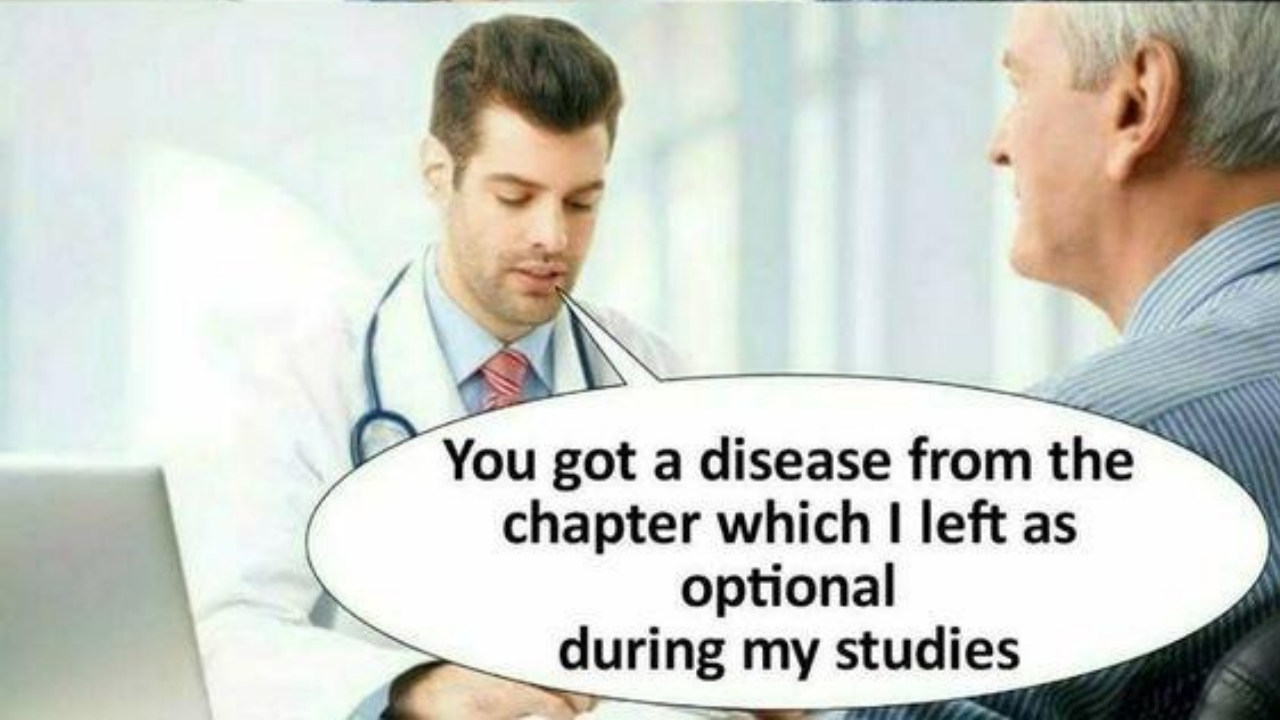


FACT 2



Your case is quite complicated

Why doctor ? What happened

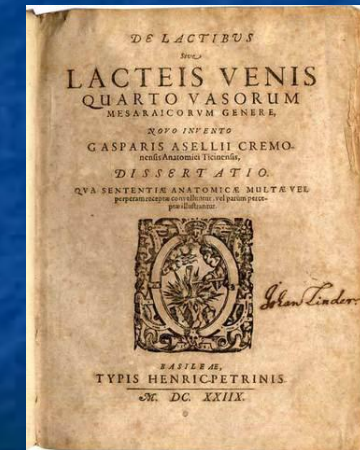
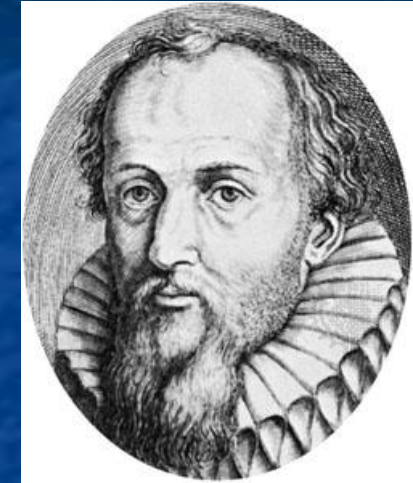


You got a disease from the chapter which I left as optional during my studies

The Lymphatic system is very rarely taught in depth in medical colleges around the world.

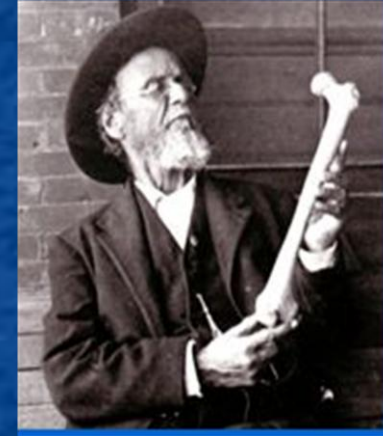
The Lymphatics

The first historical discovery of the lymphatic system was documented in 1622 which refers to the findings of 'milky veins'. In 1627 *De lactibus sive lacteis venis* by the Italian physician and anatomist **Gasparo (Gaspere) Aselli** (1581 – 1626) was posthumously published in Milan.



“Possibly less is known of the lymphatics than any other division of the life-sustaining machinery of man.”

Dr Andrew Taylor Still (1828-1917)



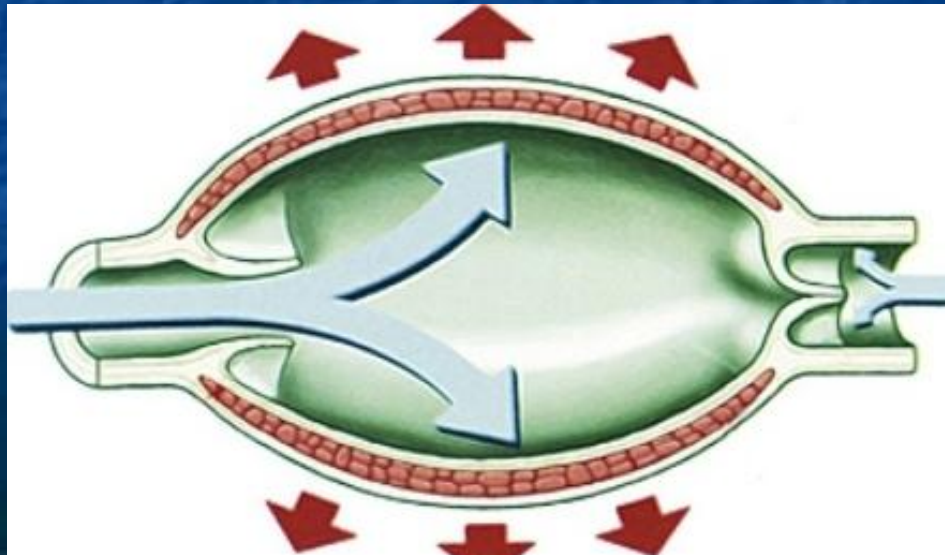
“illness is mainly due to stagnation of body fluids and that if you can stimulate blood flow and other fluid motion including cerebro-spinal fluid and lymphatic drainage then the body will recover”

“The lymphatics are
closely and universally
connected with the spinal
cord and all other nerves,
and all drink from the
waters of the brain”

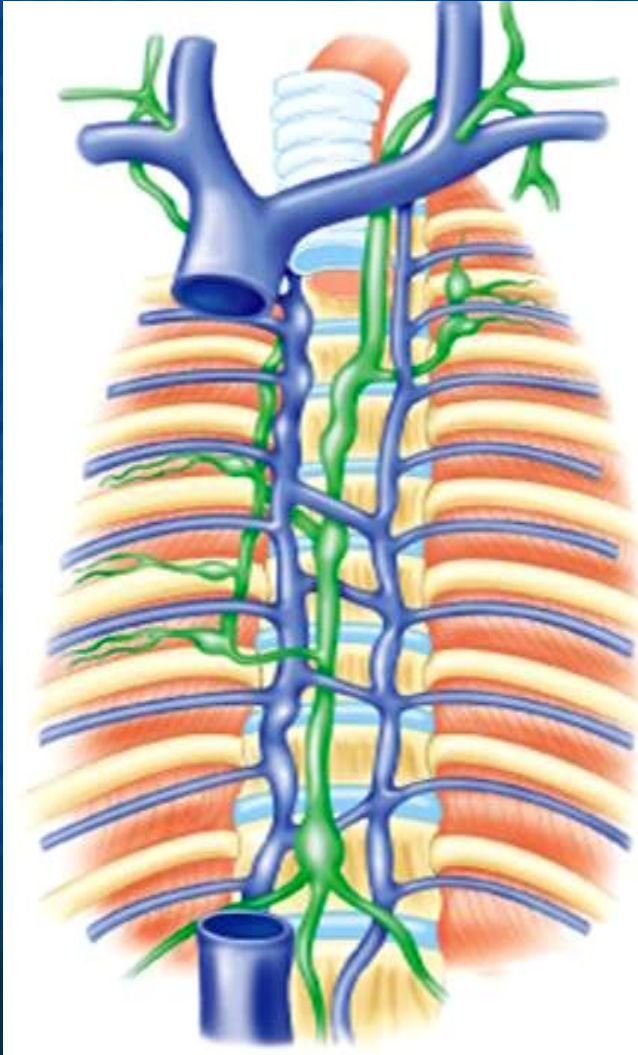
A T STILL

Fact 3

The sympathetic nervous system controls smooth muscle walls of the lymphatic collecting vessels from the minute lymphangion (shown below) to the main ducts. With the smooth muscle walls of the thoracic duct pumping at a rate of 4 BPM



The Thoracic Duct



@ 450- 800
in adult
human body

Lymph Nodes

Cervical @
300

Axillary @
20-30

Mesenteric
@ 100-150

Inguinal @
4-20

Popliteal @
2-9



From Anatomie des Lymphatiques de
l'Homme by Henri Rouvière in 1932.

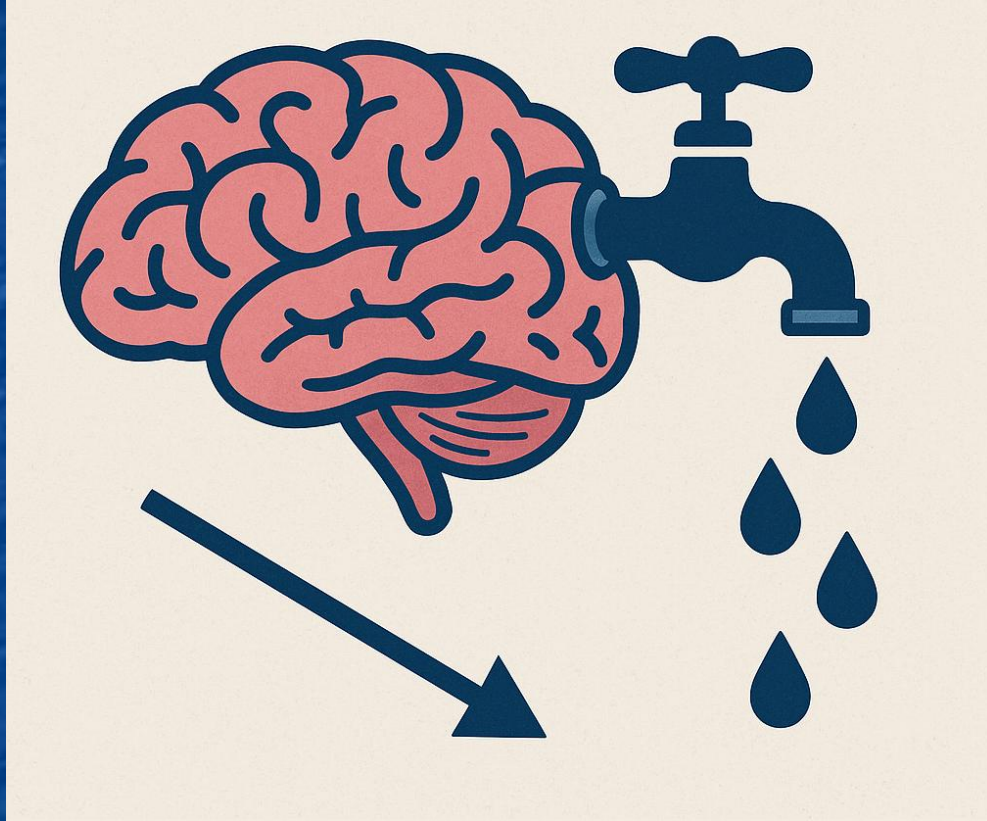
The hypothalamus is under more pressure in menstruating women due to cyclical hormonal changes and also during periods of major hormonal flux such as puberty, pregnancy and menopause.

This factor is one of the main reasons why patients assigned female at birth suffer more from long COVID, ME/CFS and fibromyalgia syndrome and may be a major aetiological factor in primary lymphedema and lipedema.

- There is even a recognised condition known as Generalised Lymphedema Associated with Neurologic Signs (GLANS) syndrome. This syndrome is almost certainly due to the lymphatics of the central nervous system being compromised.

WHAT IS REALLY GOING ON IN THE BRAIN?





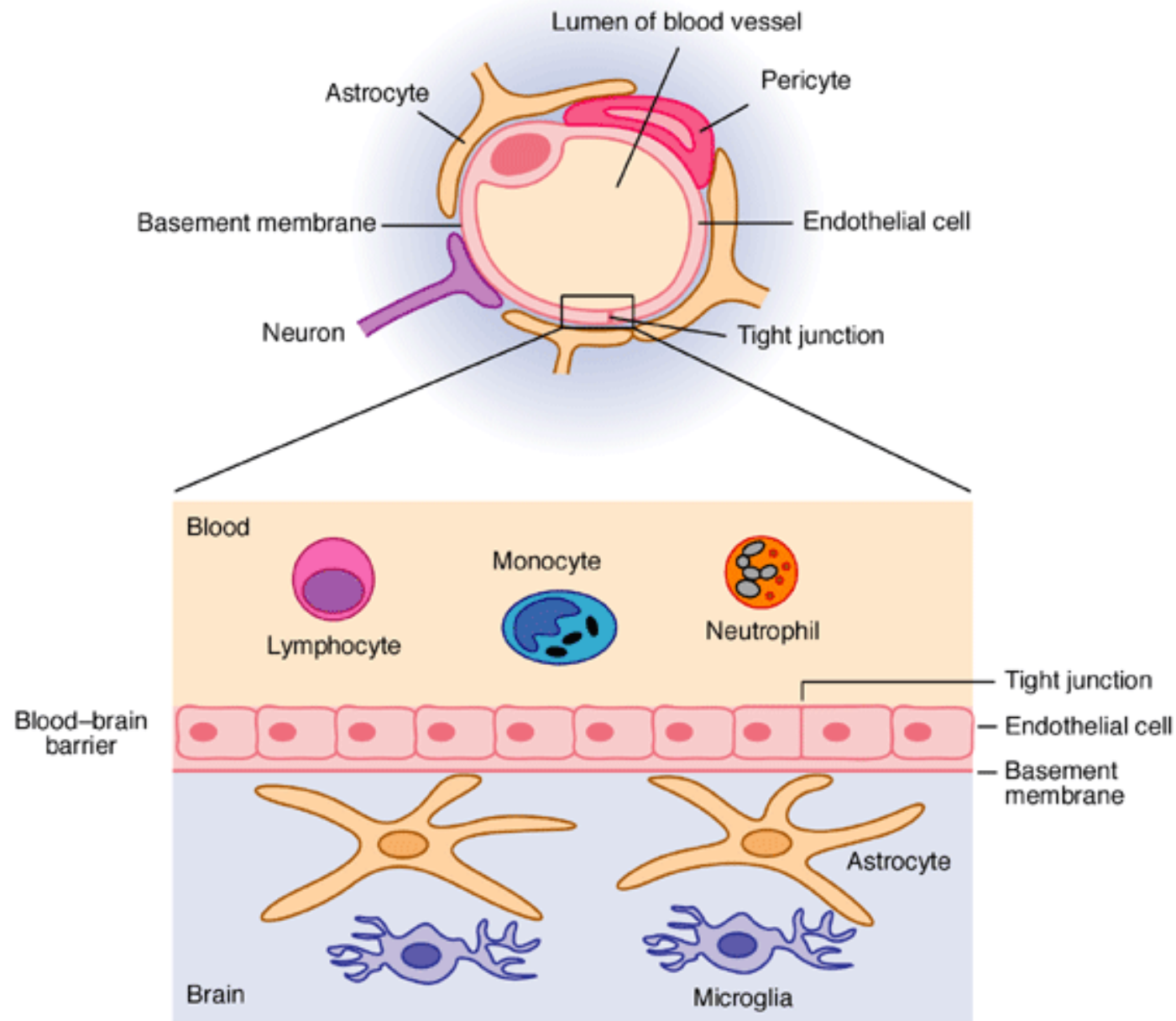
FACT 4

FACT 4

There is a substantial
lymphatic drainage
system of the brain

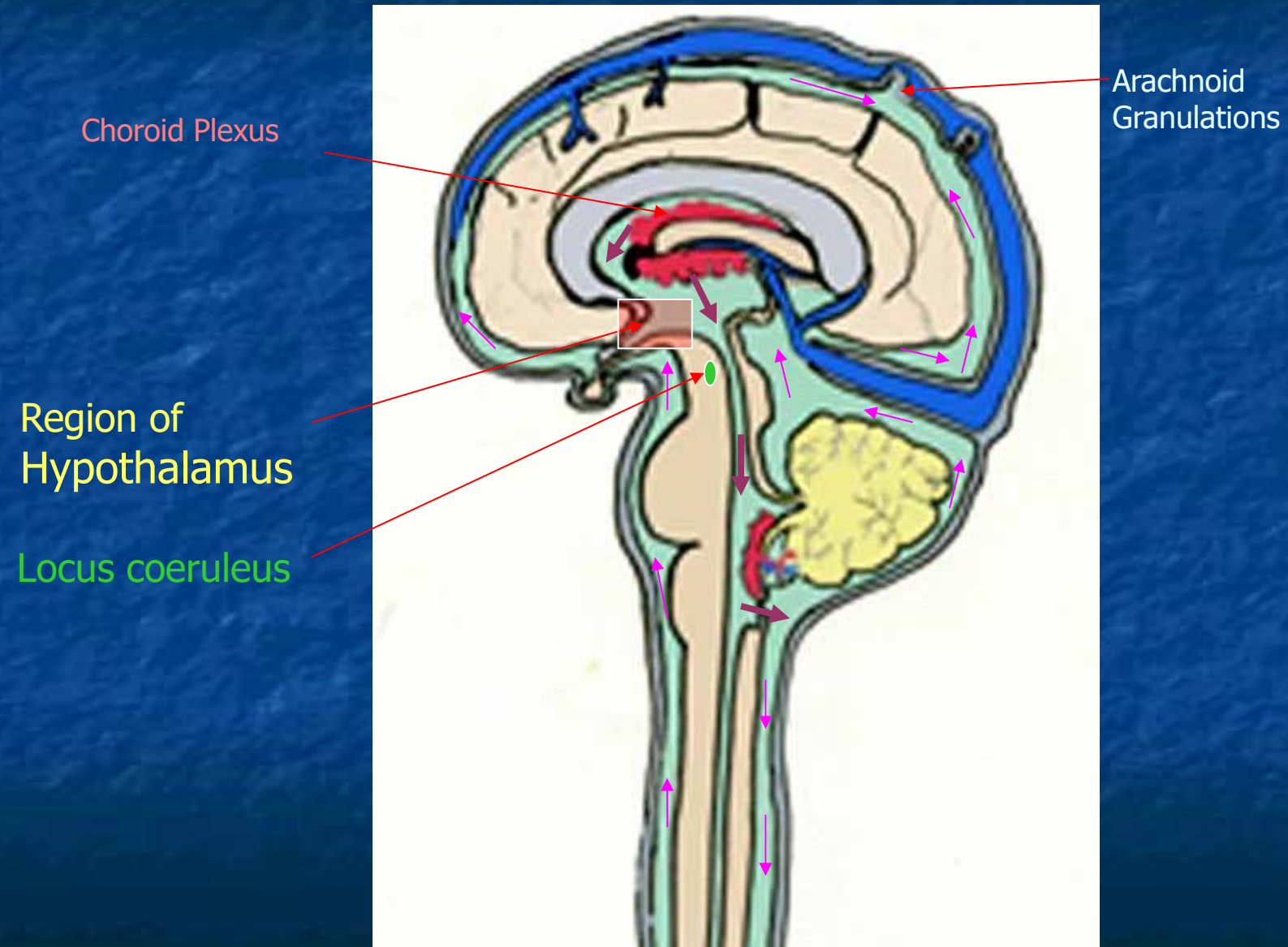
The Blood Brain Barrier

The blood–brain barrier (BBB) is composed of a monolayer of specialized endothelial cells linked by a complex arrangement of tight junctions (TJ).



The blood-brain barrier (BBB)

The Hypothalamus



HORMONES

The human insulin protein is composed of 51 amino acids and has a molecular weight of 5808 Da.

5808 Daltons is whapping!

Molecular weight of water = $M(\text{H}_2\text{O}) \approx$
18 Daltons





Circumventricular Organs

Pineal Gland

Pituitary Gland

Area Postrema

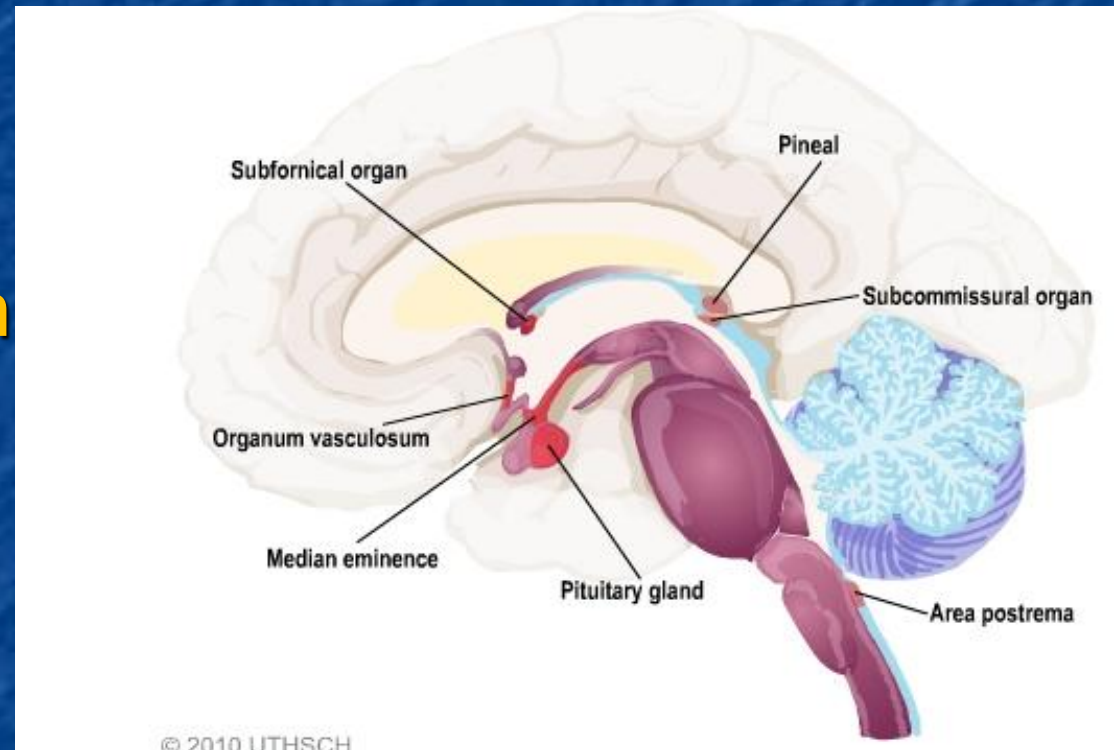
Subcommissural Organ

Subfornical Organ

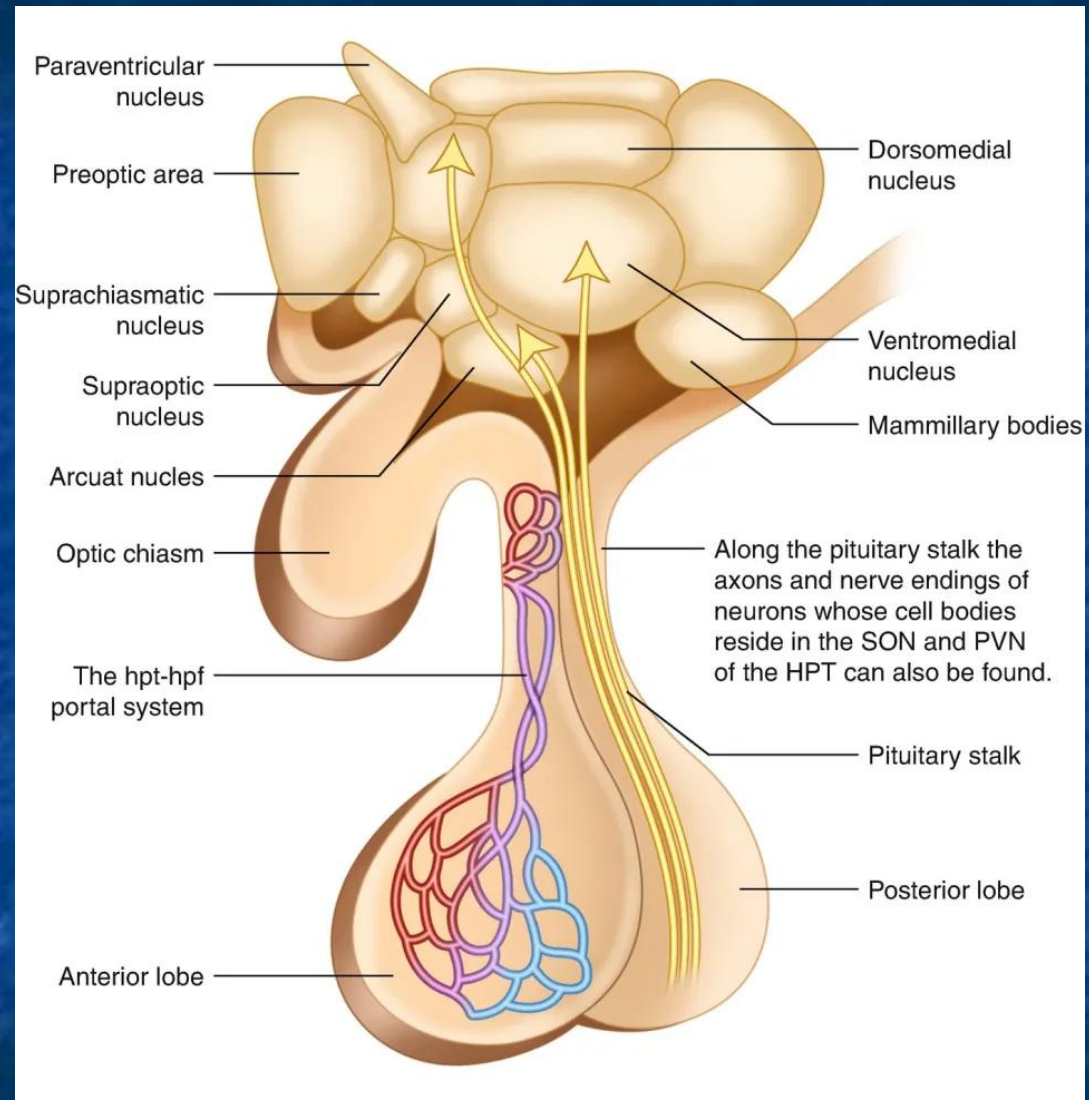
Median Eminence &

Organ Vasculosum

(both in the Hypothalamus)



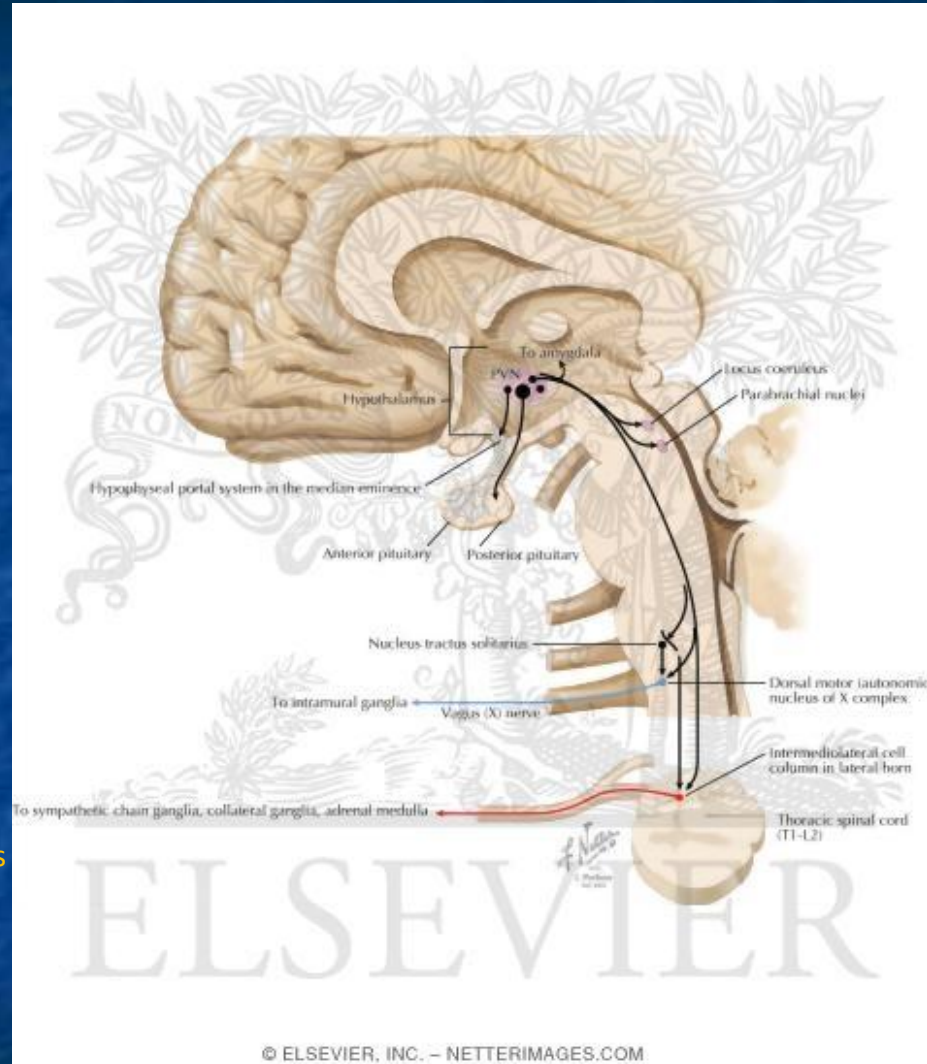
Hofer H O. , 1958

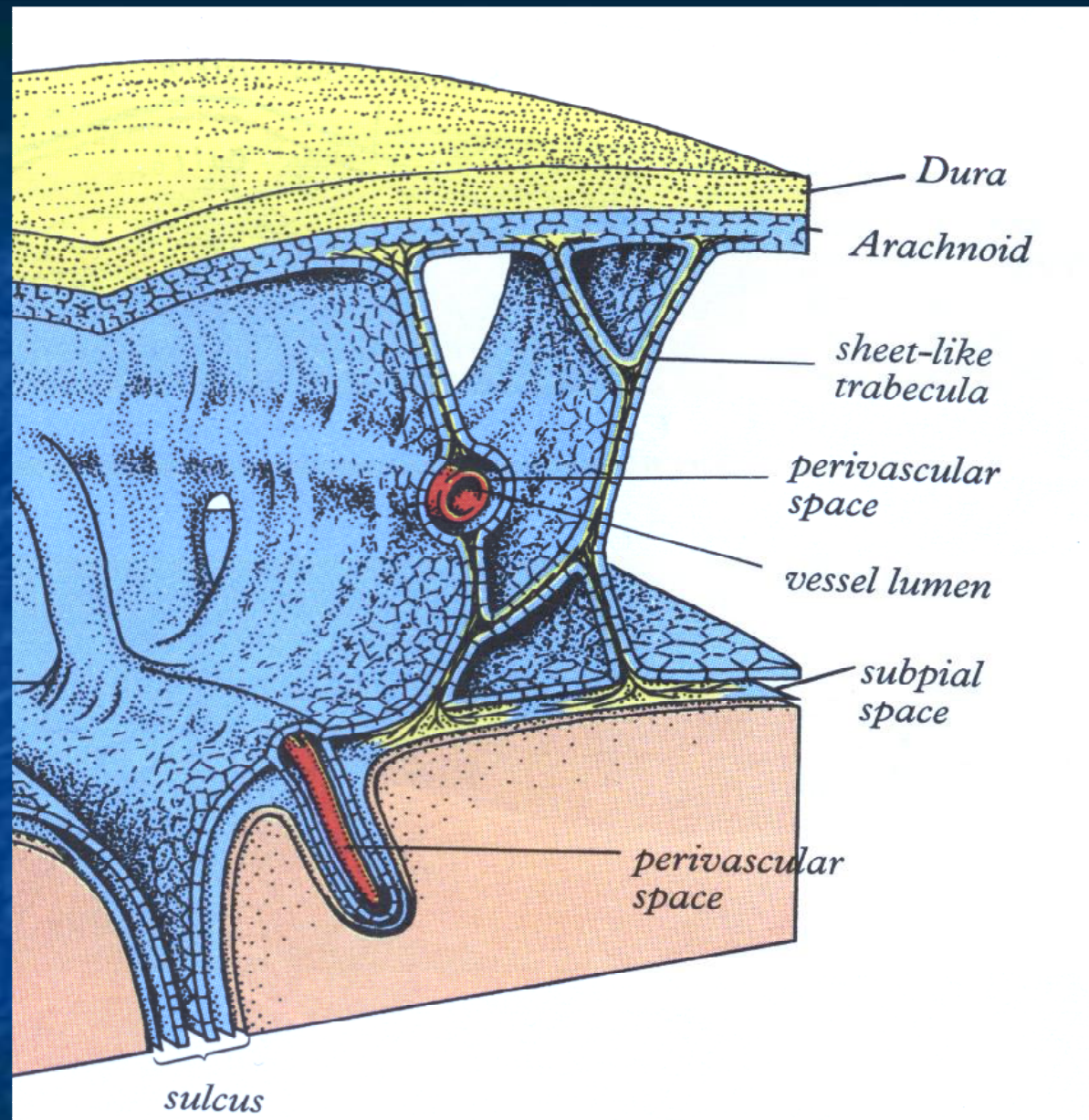


INFLUENCE OF THE PVN

1. The median eminence
2. Posterior pituitary
3. Nucleus tractus solitarius
4. Vagus nerve to intramural ganglia
5. Spinal sympathetic chain ganglia
6. Amygdala
7. Locus Coeruleus
8. Parabrachial nucleus

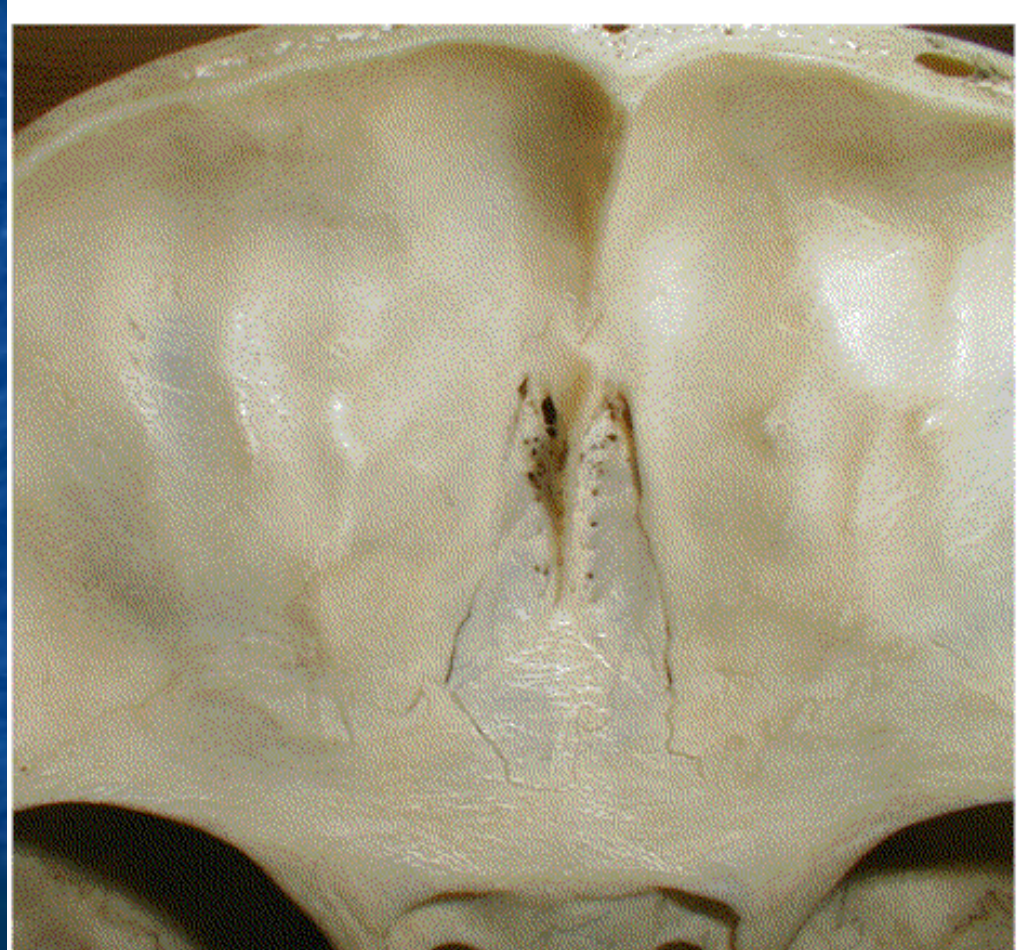
The hypophyseal portal system is a system of blood vessels in the microcirculation at the base of the brain, connecting the hypothalamus with the anterior pituitary. Its main function is to quickly transport and exchange hormones between the hypothalamus arcuate nucleus and anterior pituitary gland.





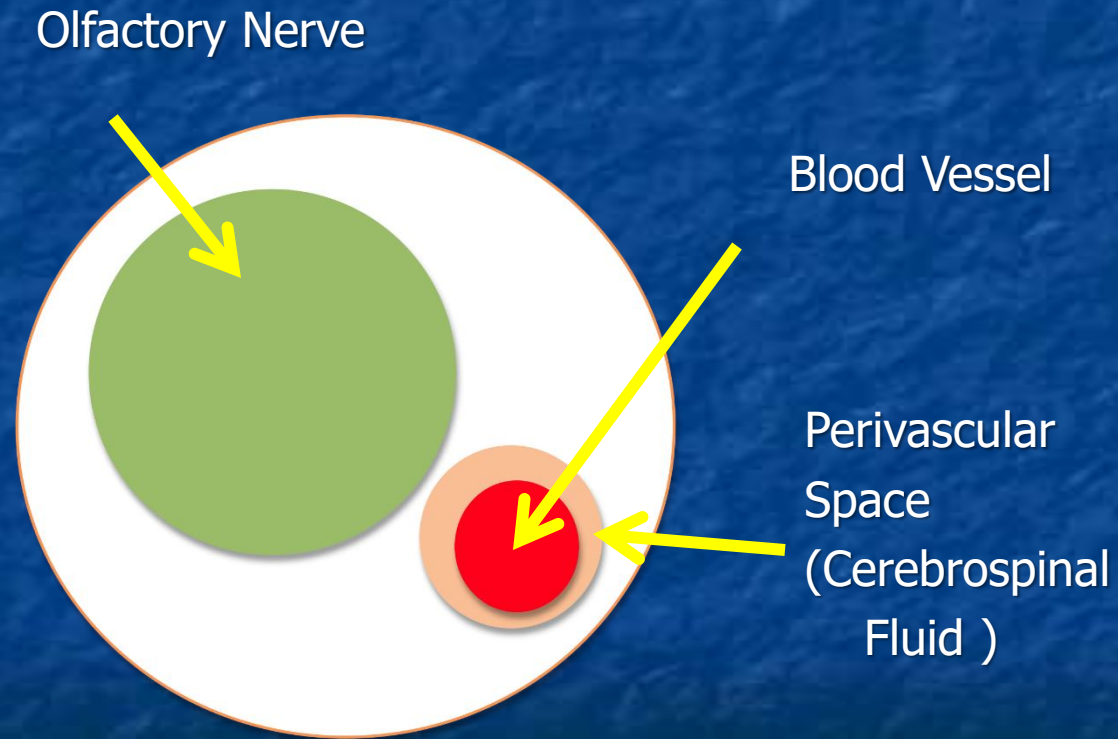
Section of the meninges illustrating perivascular spaces
(Illustration from Gray's Anatomy 38th Edition p.1213, Zhang *et al.*, 1990)

The Cribriform Plate



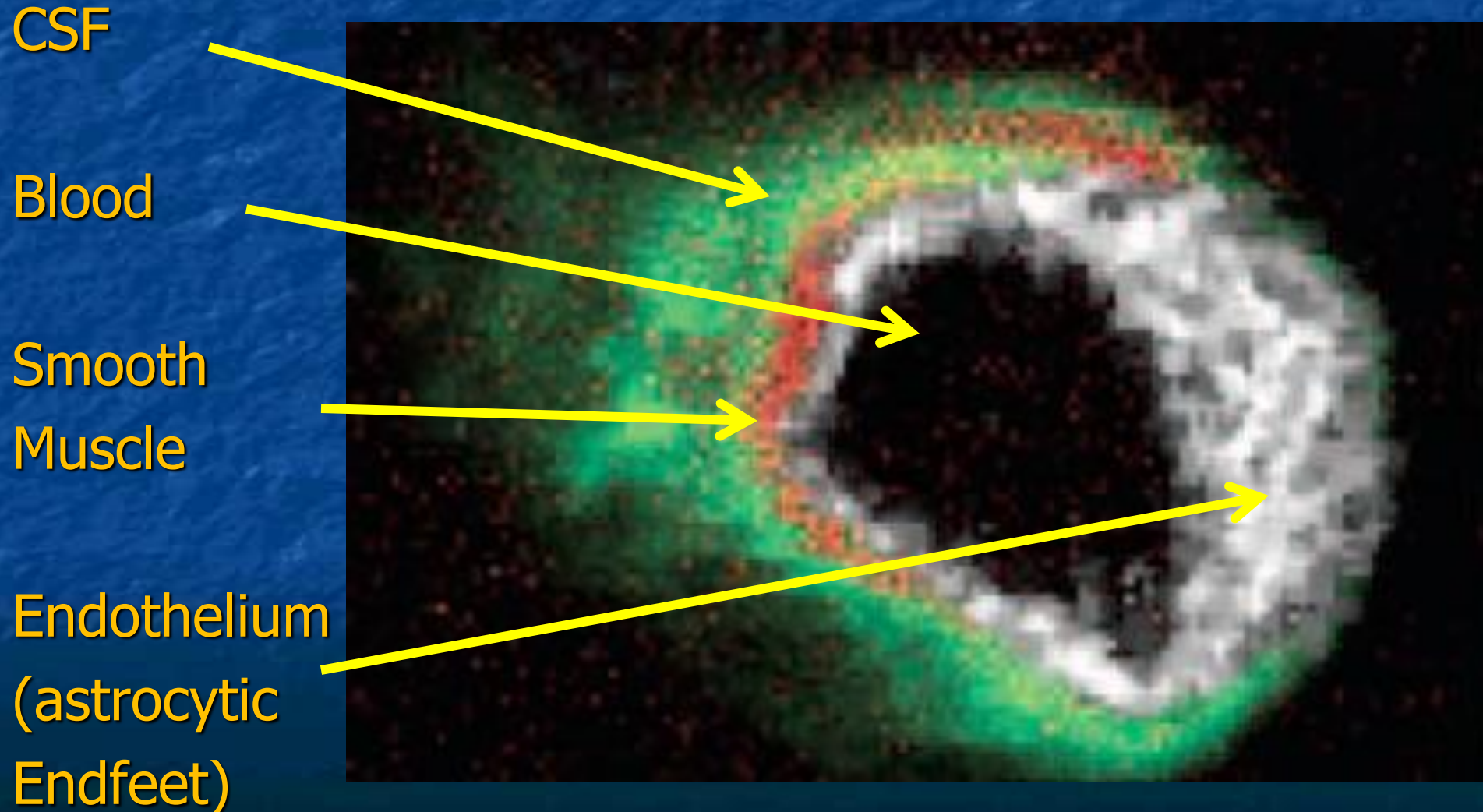
© Raymond N Perrin 2004

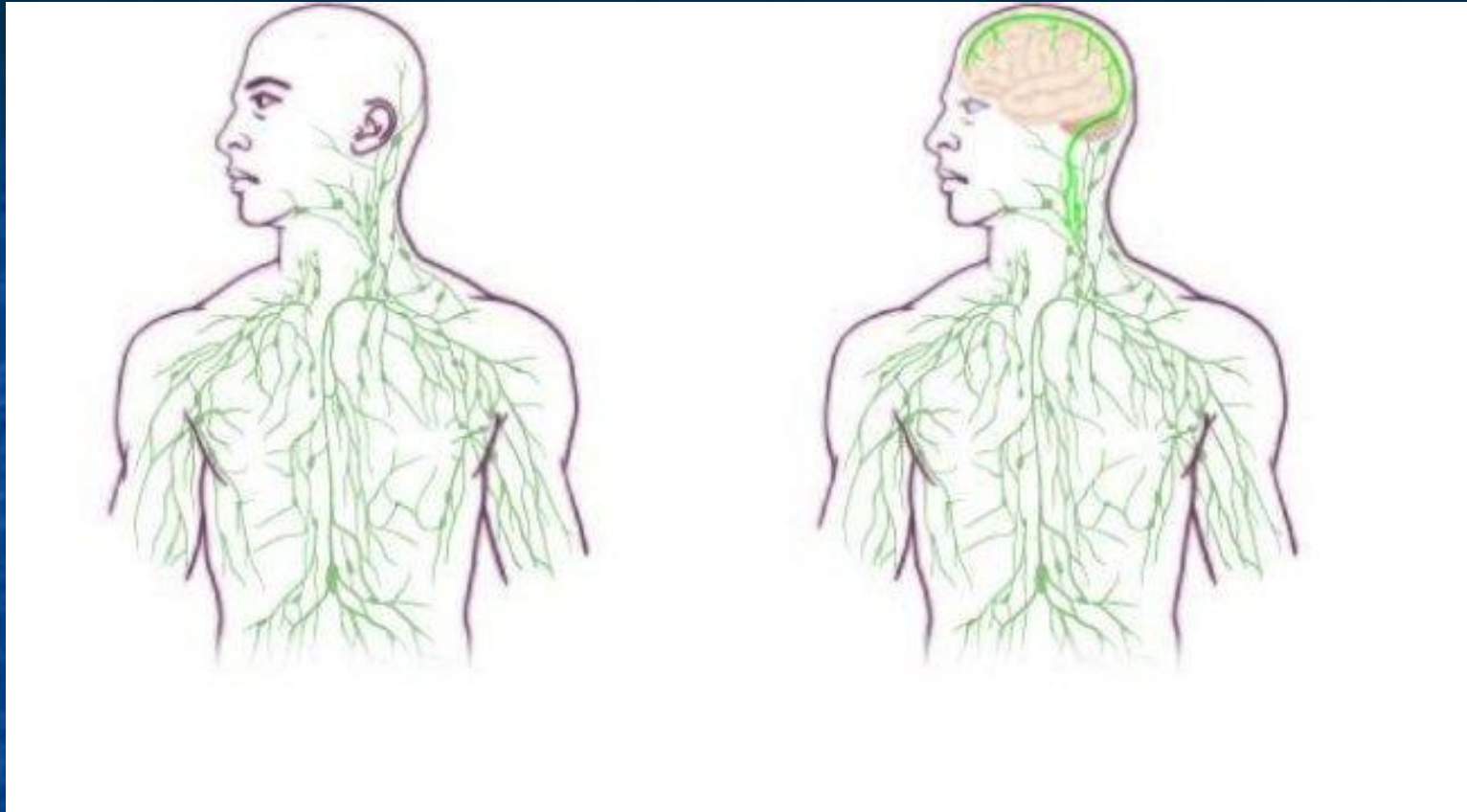
PERFORATION THROUGH THE CRIBRIFORM PLATE



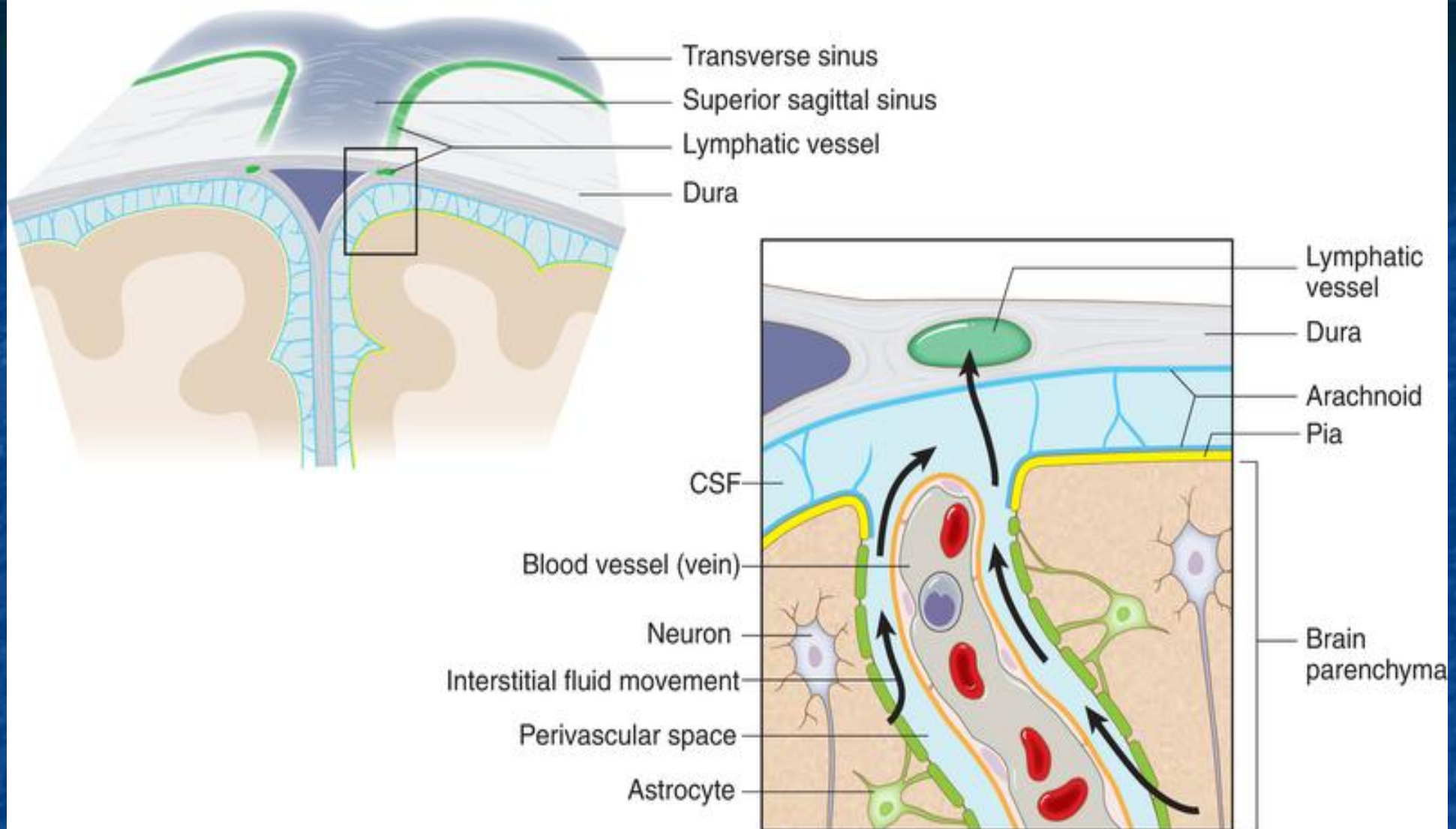
CSF tracer (Green) moves along the paravascular space around an arteriole in the brain.

Iliff J et al. August 2012

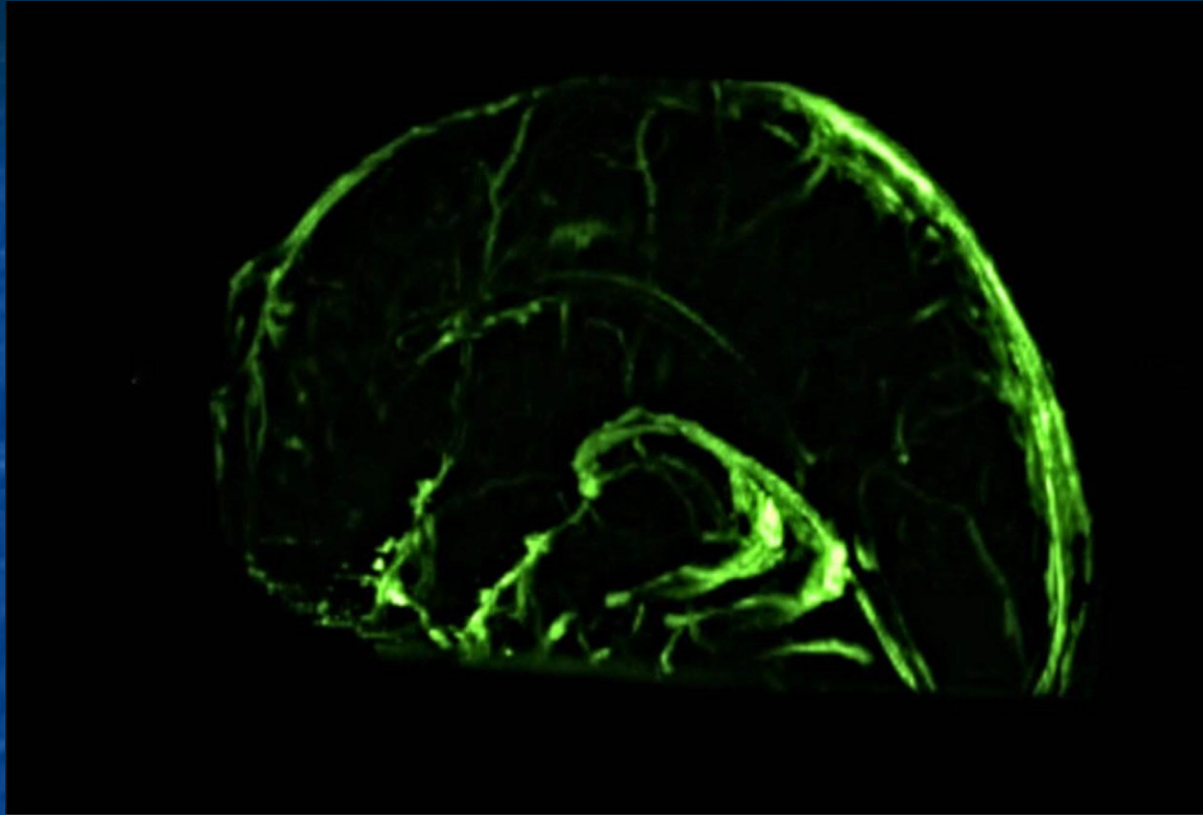




- In The Kipnis Lab, Virginia: True lymphatic vessels discovered in the dura.



Antoine Louveau et al. **Structural and functional features of central nervous system lymphatic vessels.** *Nature*, 2015;
DOI: [10.1038/nature14432](https://doi.org/10.1038/nature14432)



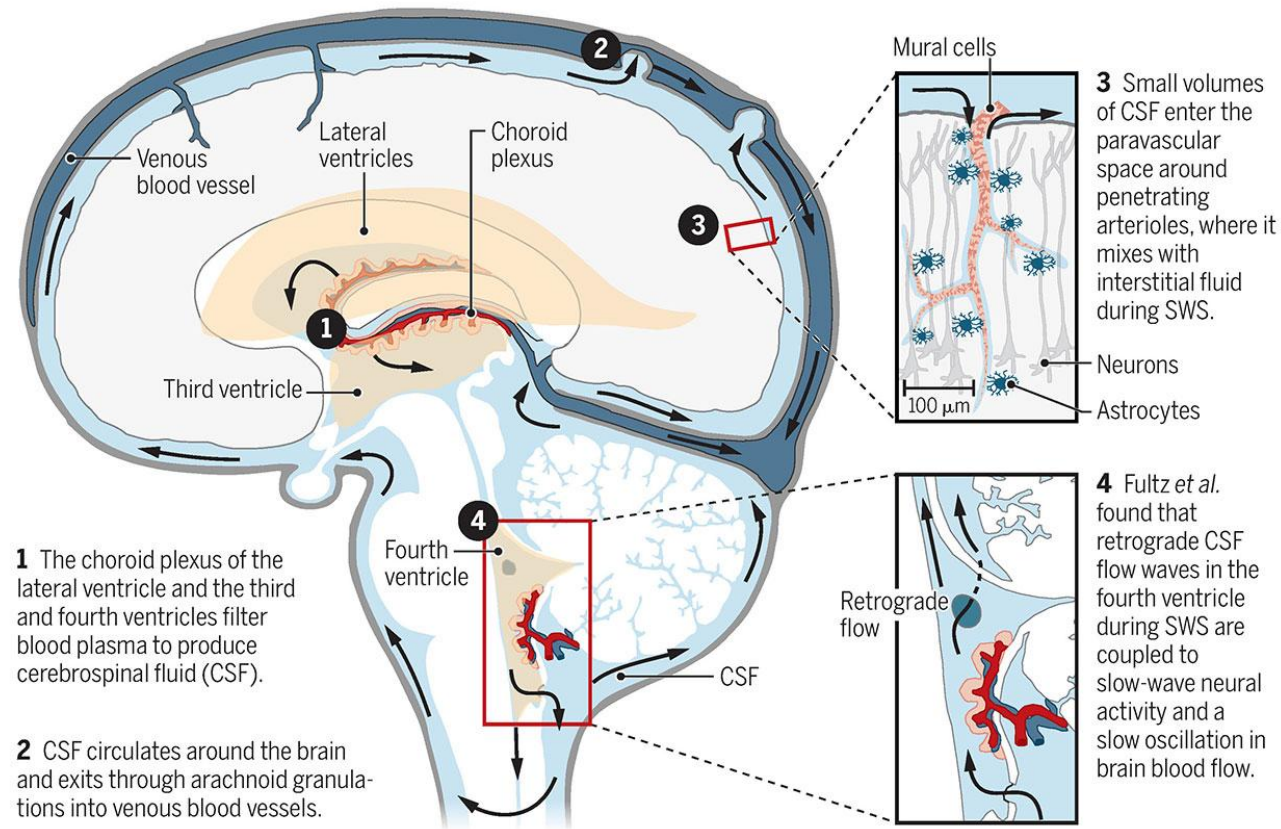
3D-rendering of dural lymphatics (green) in a 47 year old woman.

Absinta, Ha et al. Human and nonhuman primate meninges harbor lymphatic vessels that can be visualized noninvasively by MRI, October 3, 2017 eLife: [10.7554/eLife.29738](https://doi.org/10.7554/eLife.29738).

Prof Laura Lewis, Nina Fultz and colleagues at MIT

Brain fluid flow switches direction in deep sleep

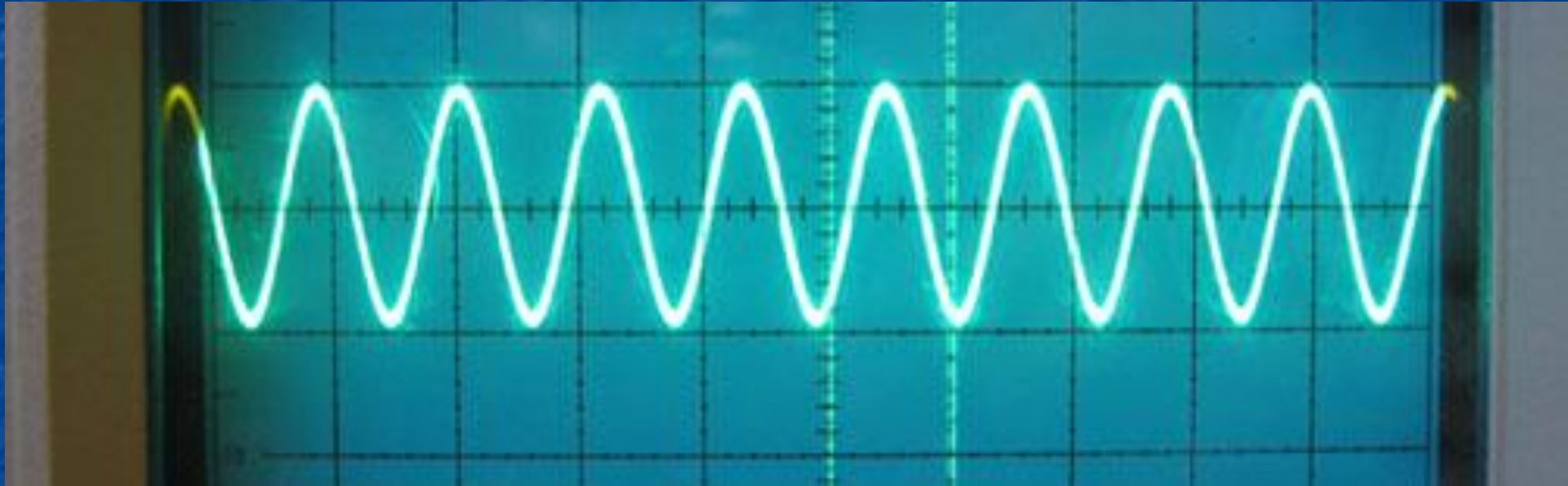
Fultz *et al.* show that retrograde brain fluid waves follow the fluctuations in neural activity and brain blood volume in slow-wave sleep (SWS).



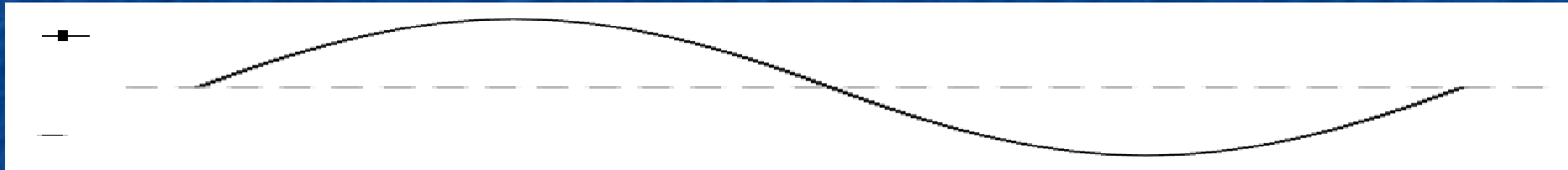
Nina E. Fultz et al. *Science* 2019;366:628-631

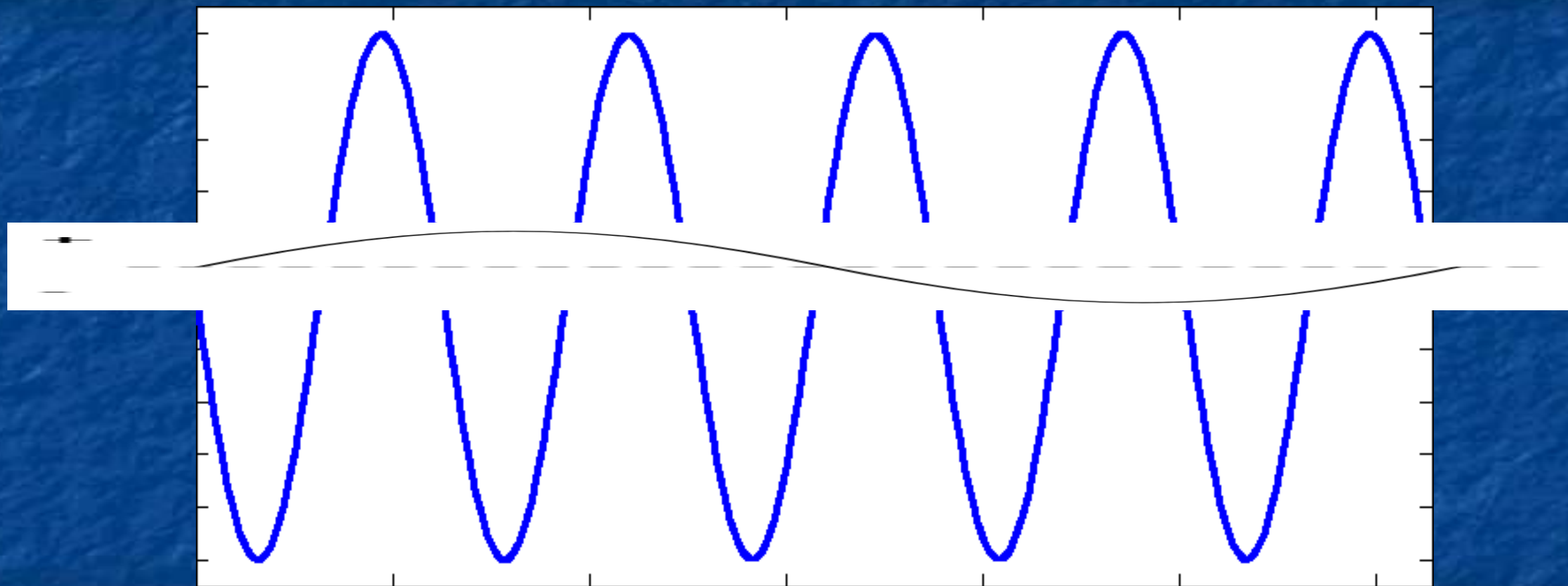


HR =intercranial CSF pulse
50-100bpm

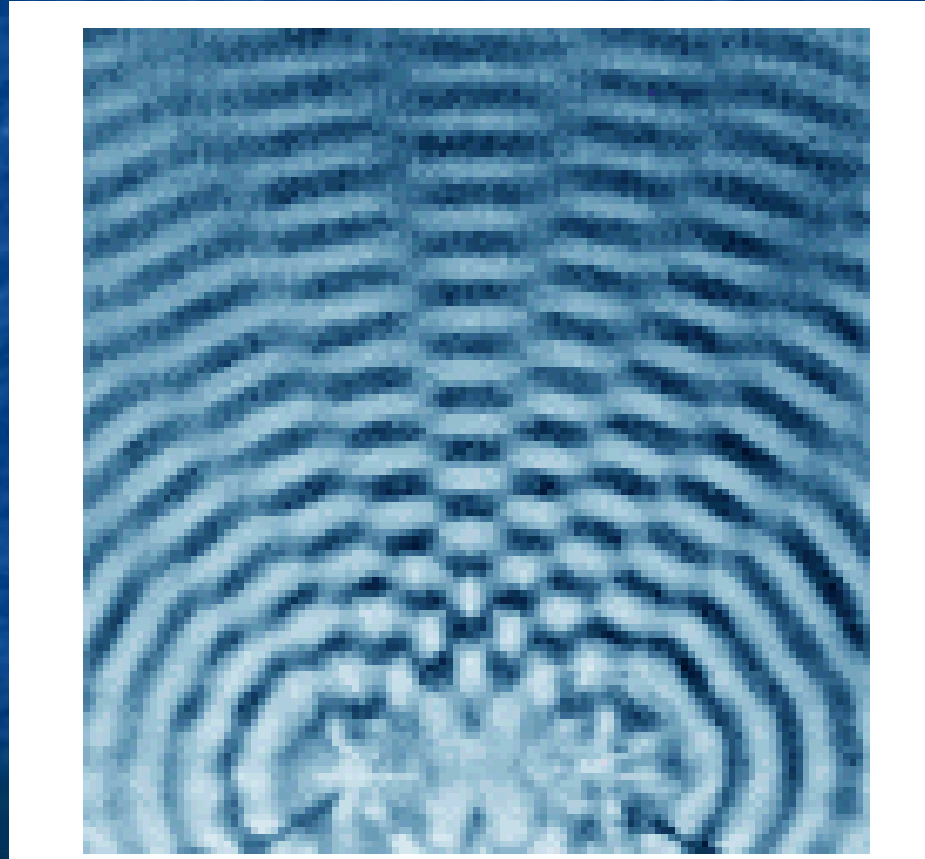


Thoracic duct Pump = 4bpm



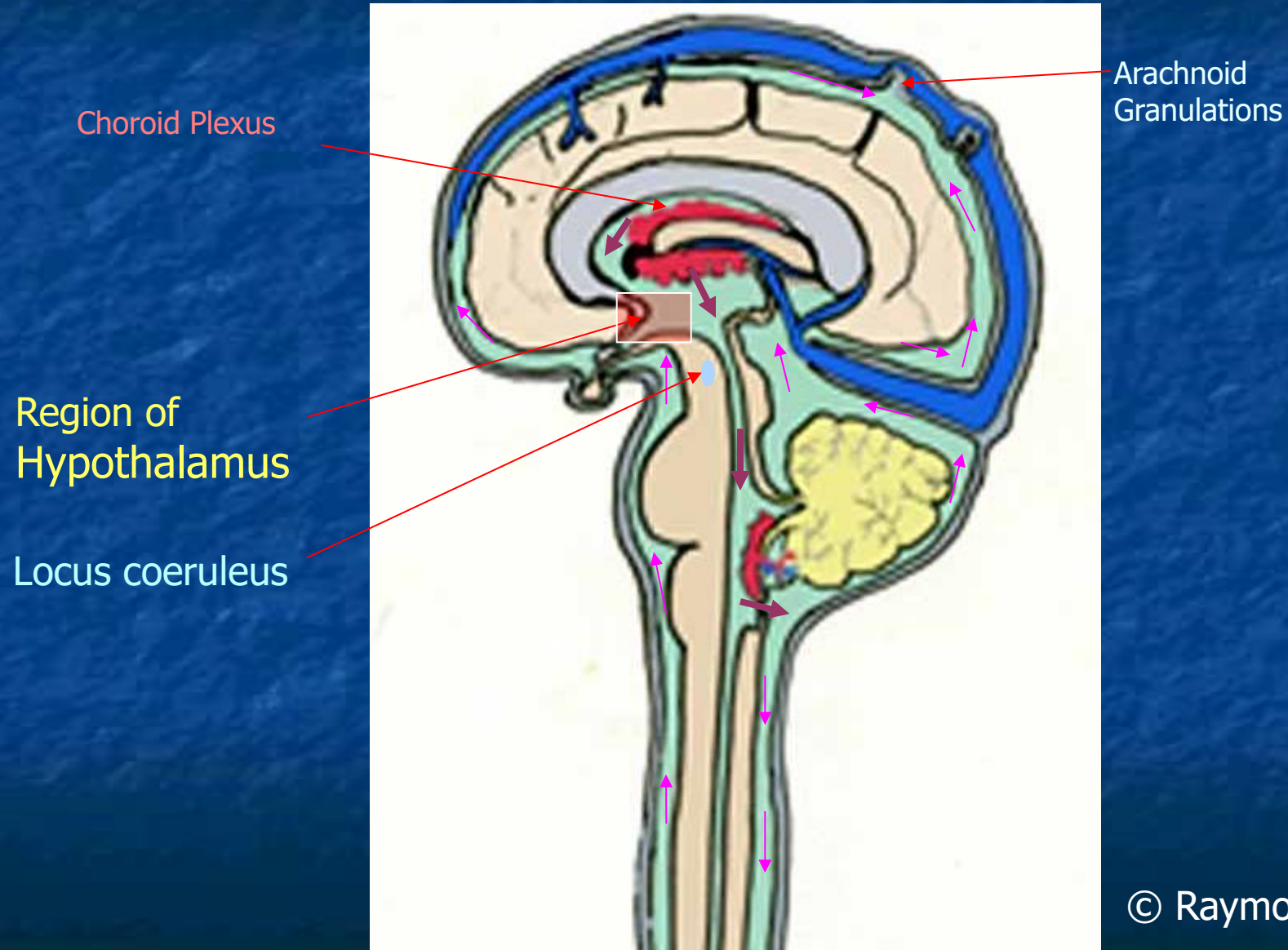


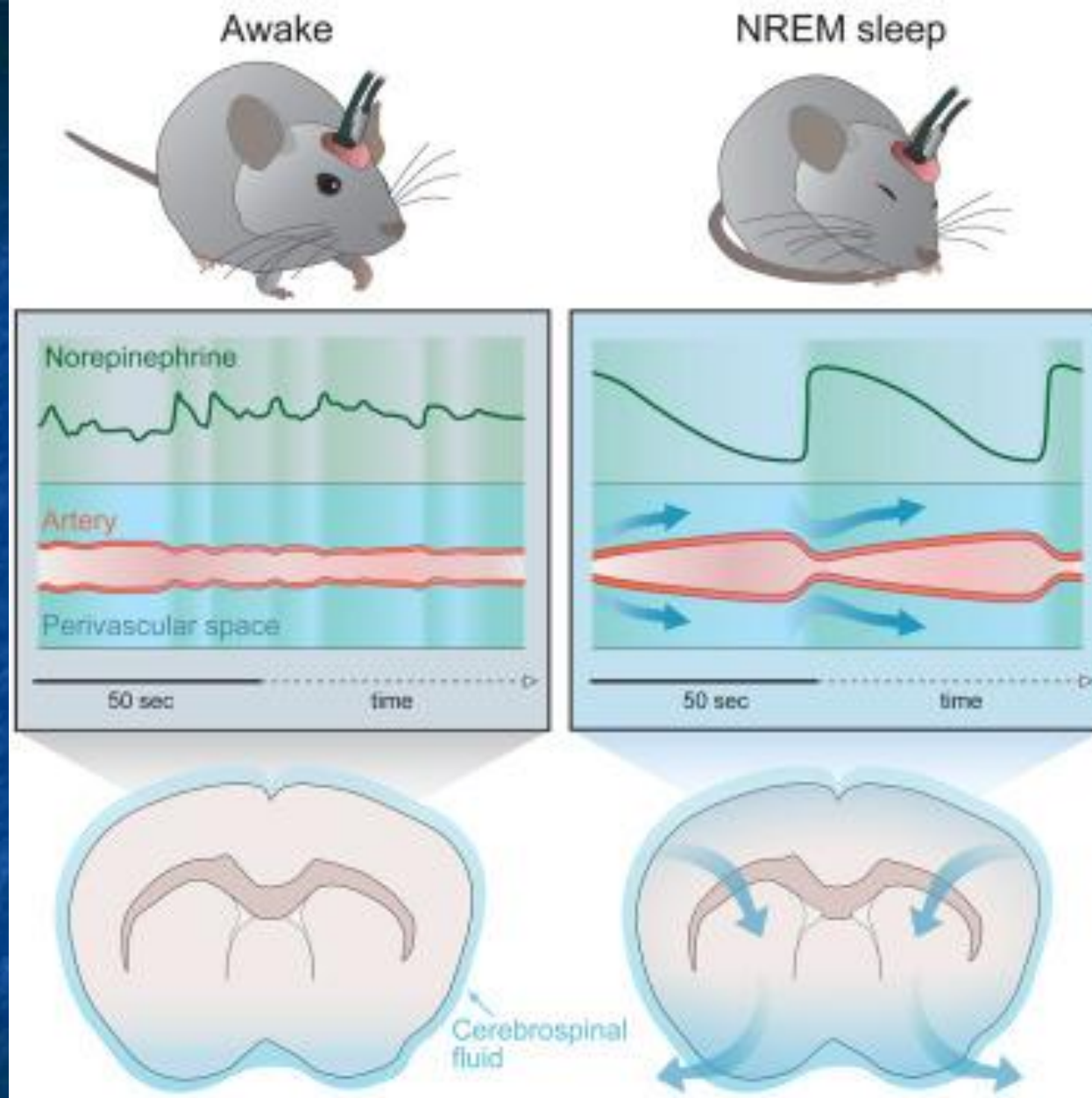
The Interference Wave = The Cranial Rhythmic Impulse 7-12 BPM



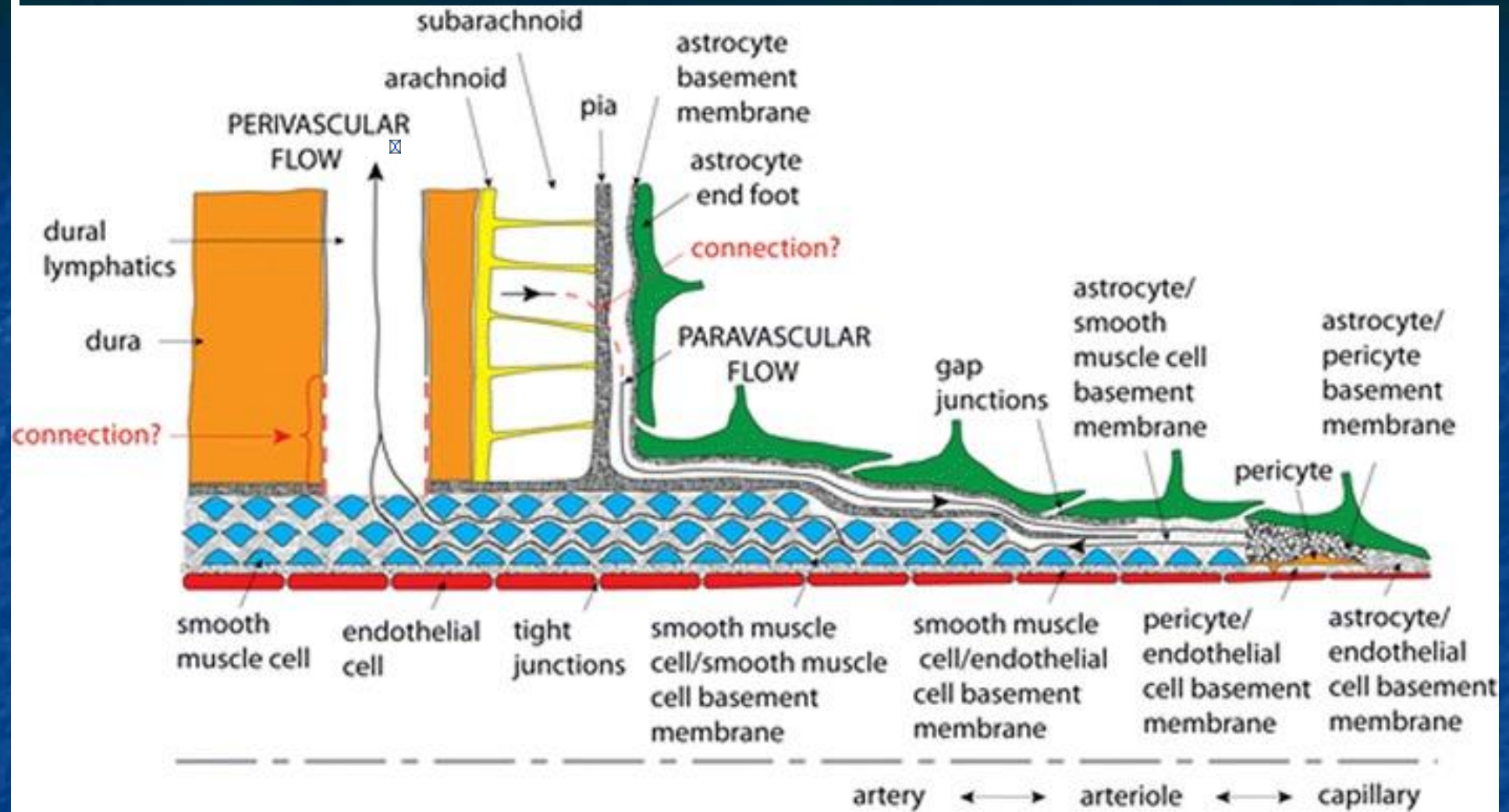


The Hypothalamus-Locus Coeruleus Axis drives the lymphatic drainage of the brain.



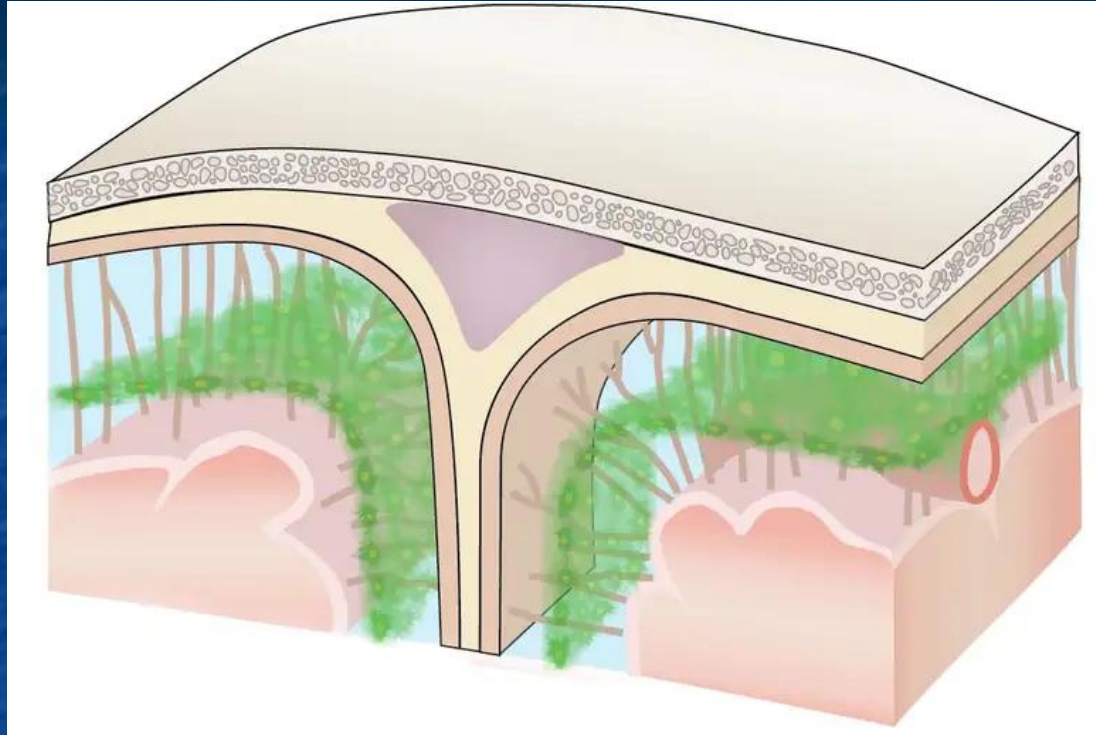


Hauglund NL et al., 2025



Faghih MM & Sharp MK. 2018

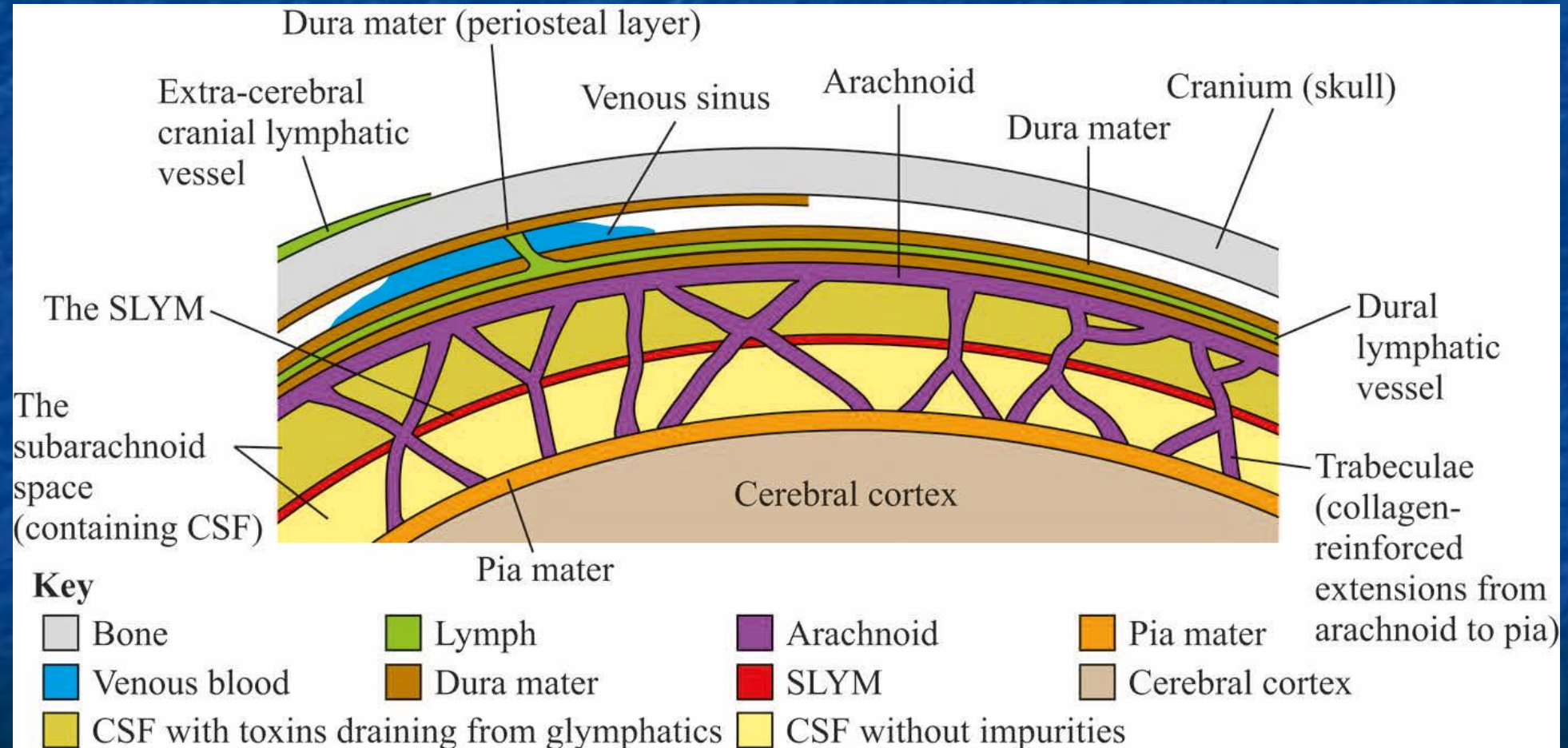
The SLYM

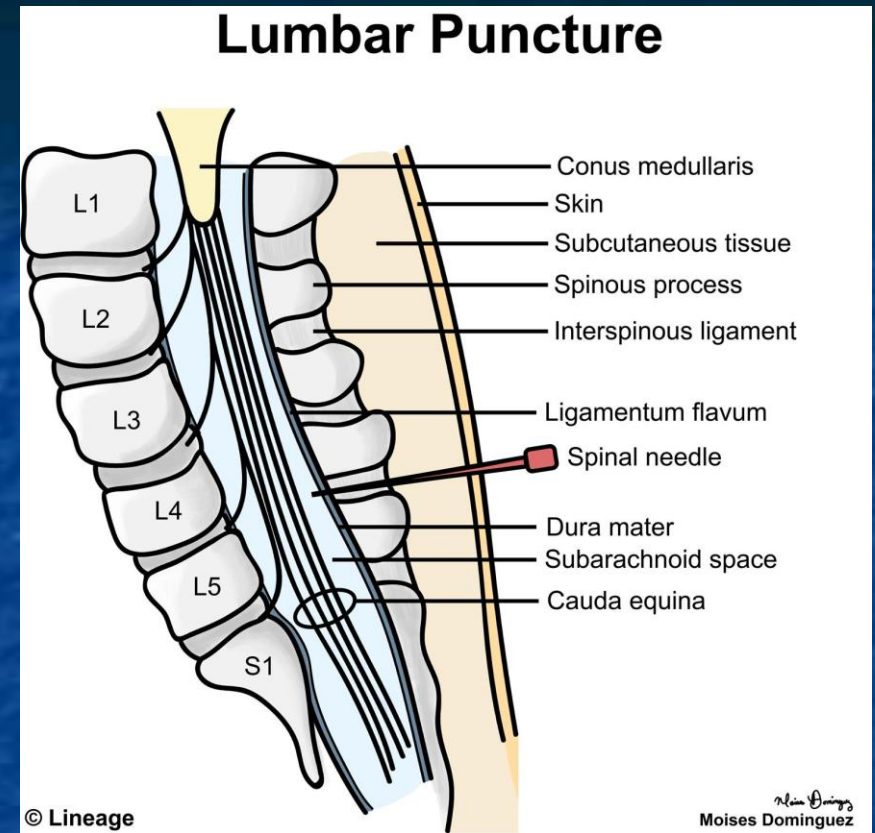
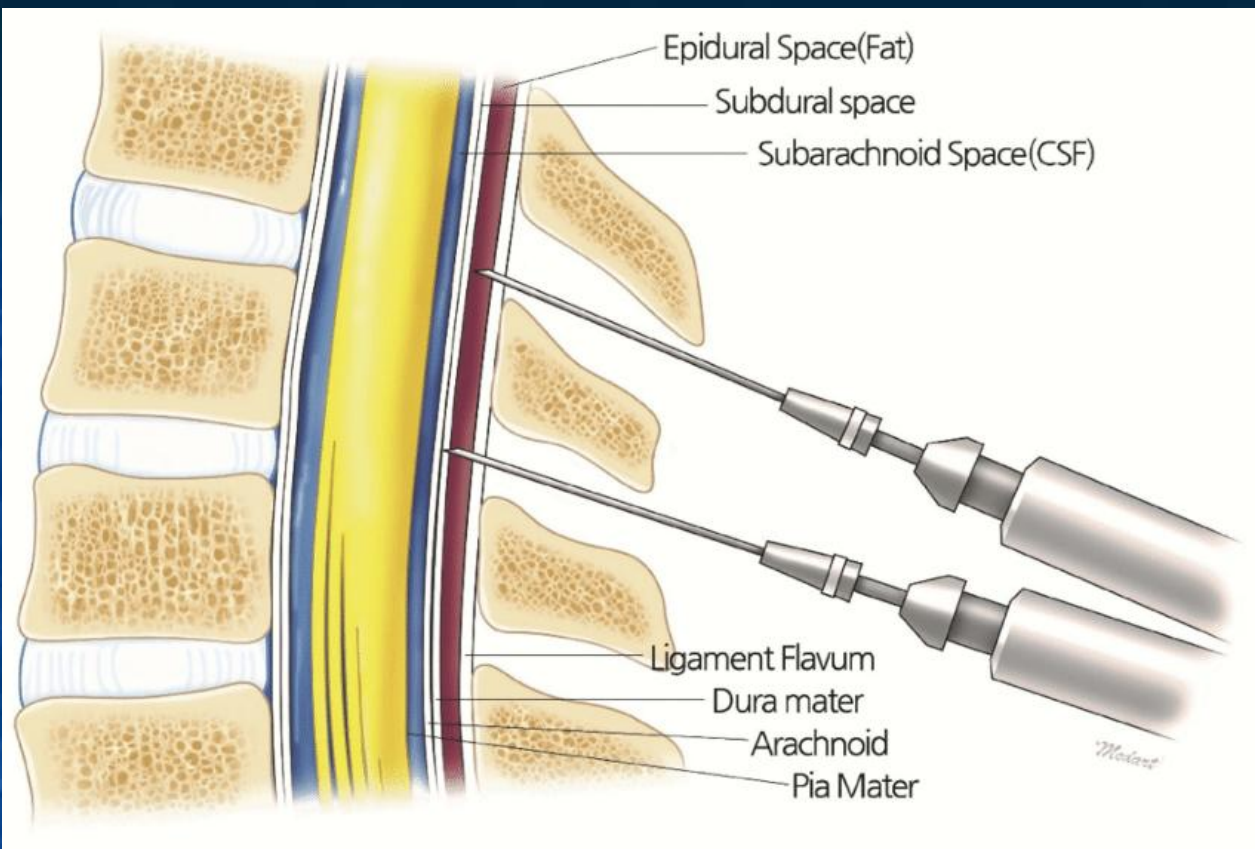


Cross section of the skull (top) and outer layer of the brain, showing the subarachnoid lymphatic-like membrane in green
A cross-section of the skull (top) and the outer layer of the brain, showing the subarachnoid lymphatic-like membrane in green

University of Copenhagen

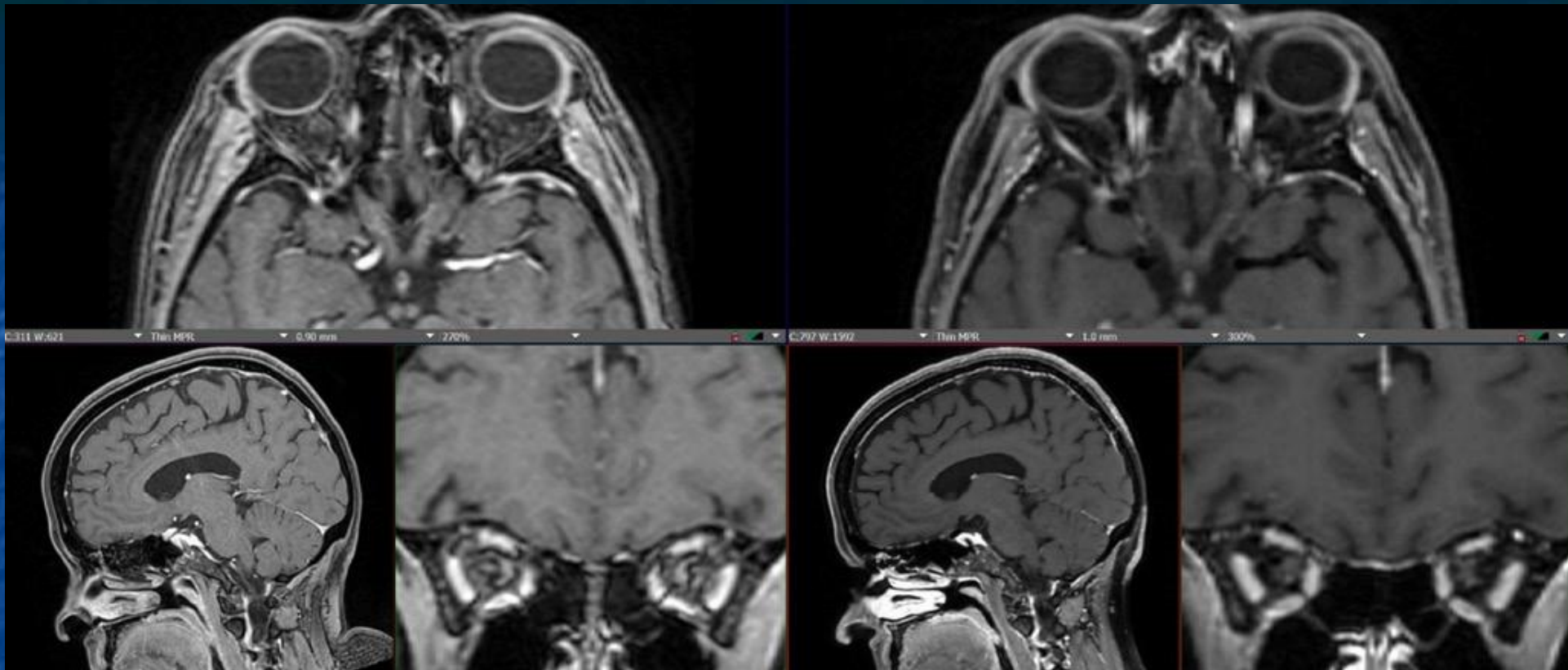
The SLYM





The spinal subarachnoid space is continuous with the intracranial subarachnoid space. It communicates with the intracranial subarachnoid space via the foramen magnum and ends at the level of S2

Radiological Evidence of impaired Neurolymphatic drainage ?



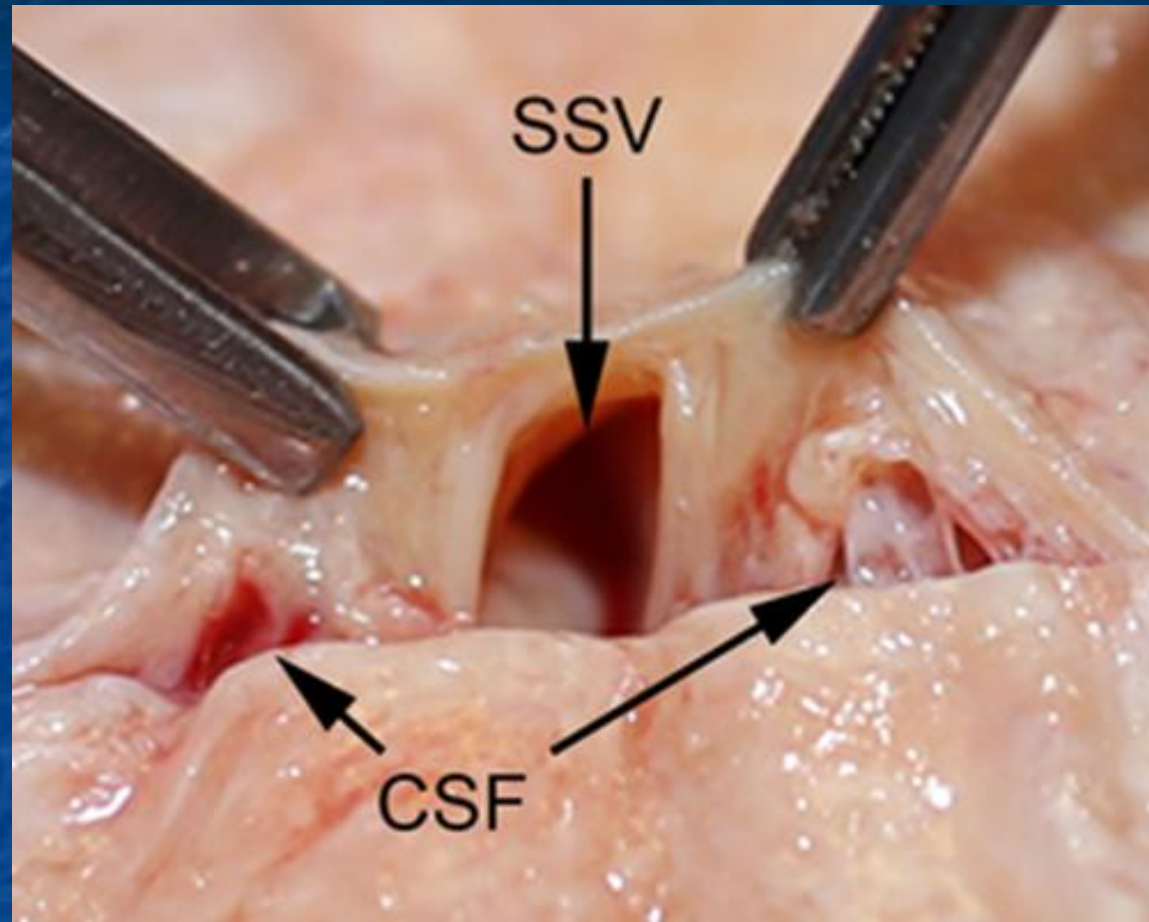
Prominent perivascular spaces in the right greater than left basal ganglia were visualised on MRI.

Post-COVID-19 syndrome: persistent neuroimaging changes and symptoms 9 months after initial infection

Grach SL, Ganesh R, Messina SA, et al. BMJ Case Rep 2022;**15**:e248448.
doi:10.1136/bcr-2021-248448

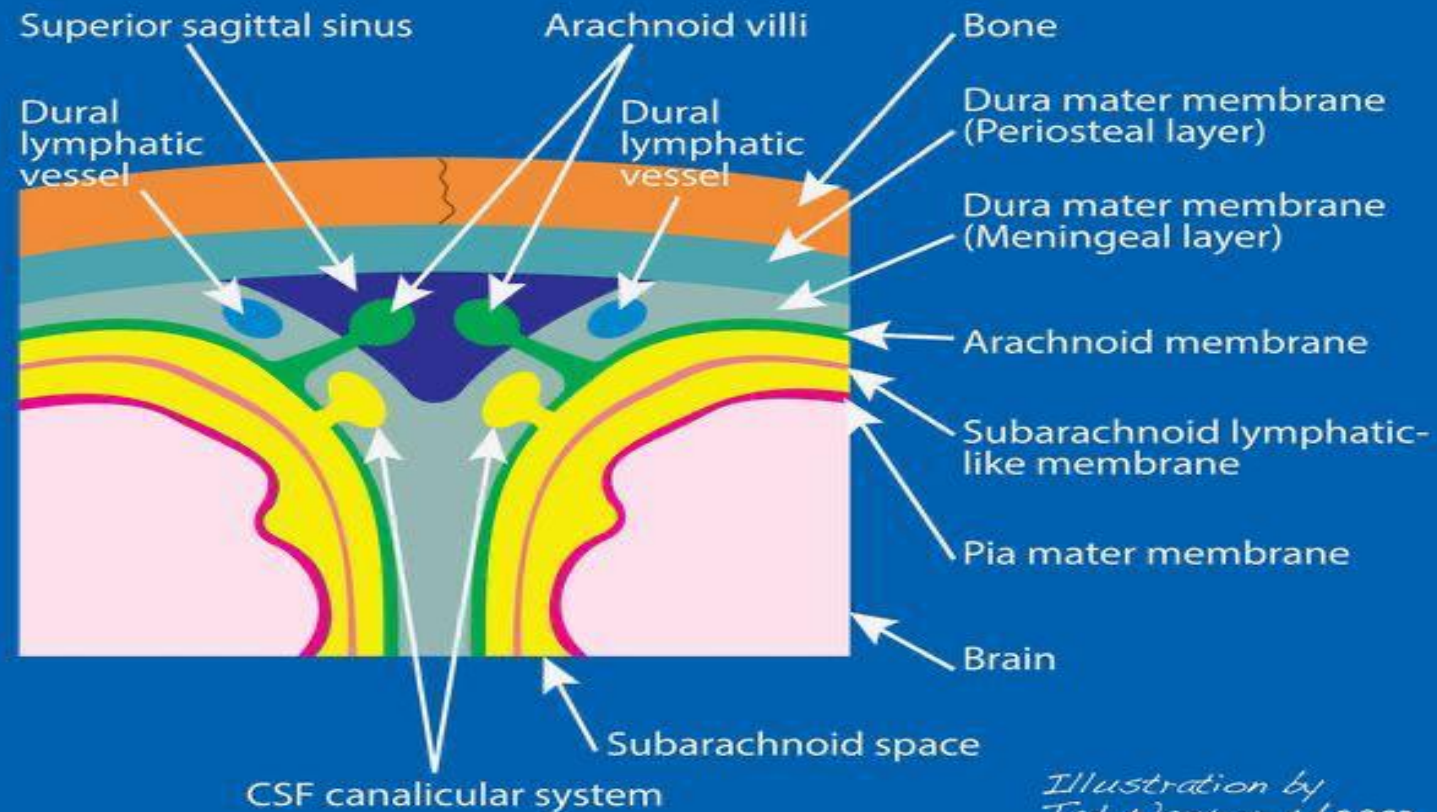
Identification of a novel path for cerebrospinal fluid (CSF) drainage of the human brain

Pessa JE (2023). PLoS ONE 18(5).
<https://doi.org/10.1371/journal.pone.0285269>

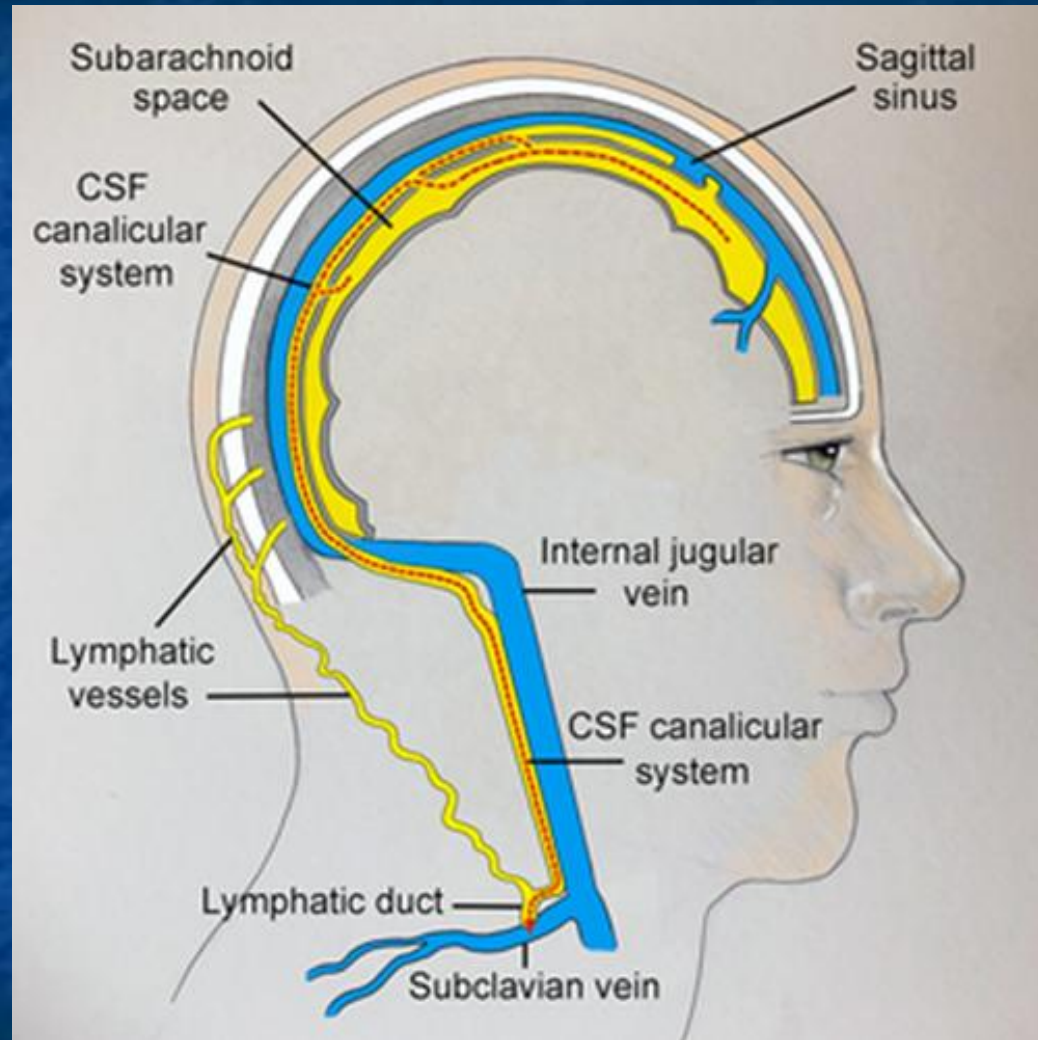


SSV= SAGITAL SINUS VEIN CSF = CEREBROSPINAL FLUID

Cross Section of the Superior Sagittal Sinus, Arachnoid Villi, Dural Lymphatic Vessels & CSF Canalicular System



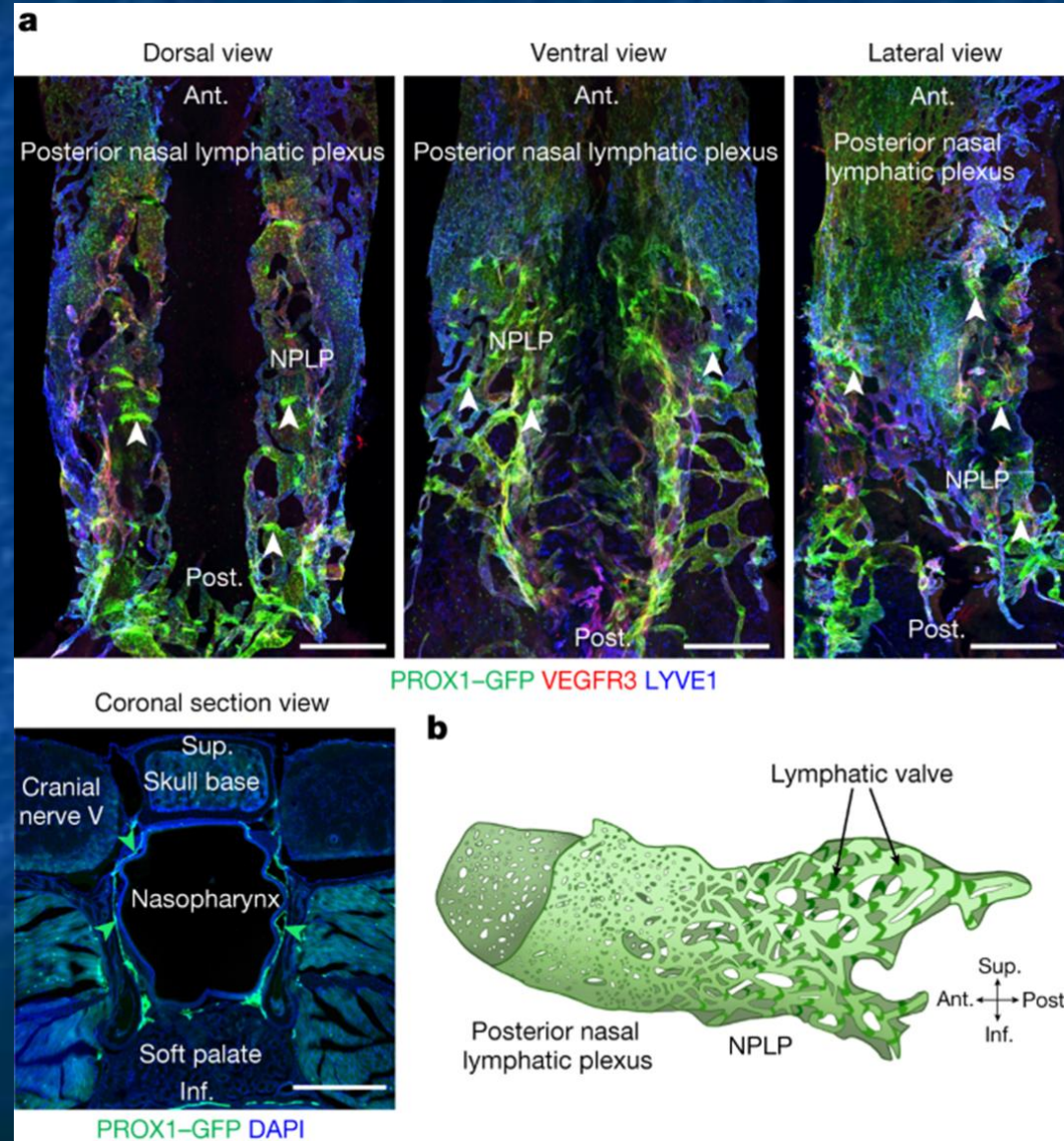
*Illustration by
Tad Wanveer 6/2023*

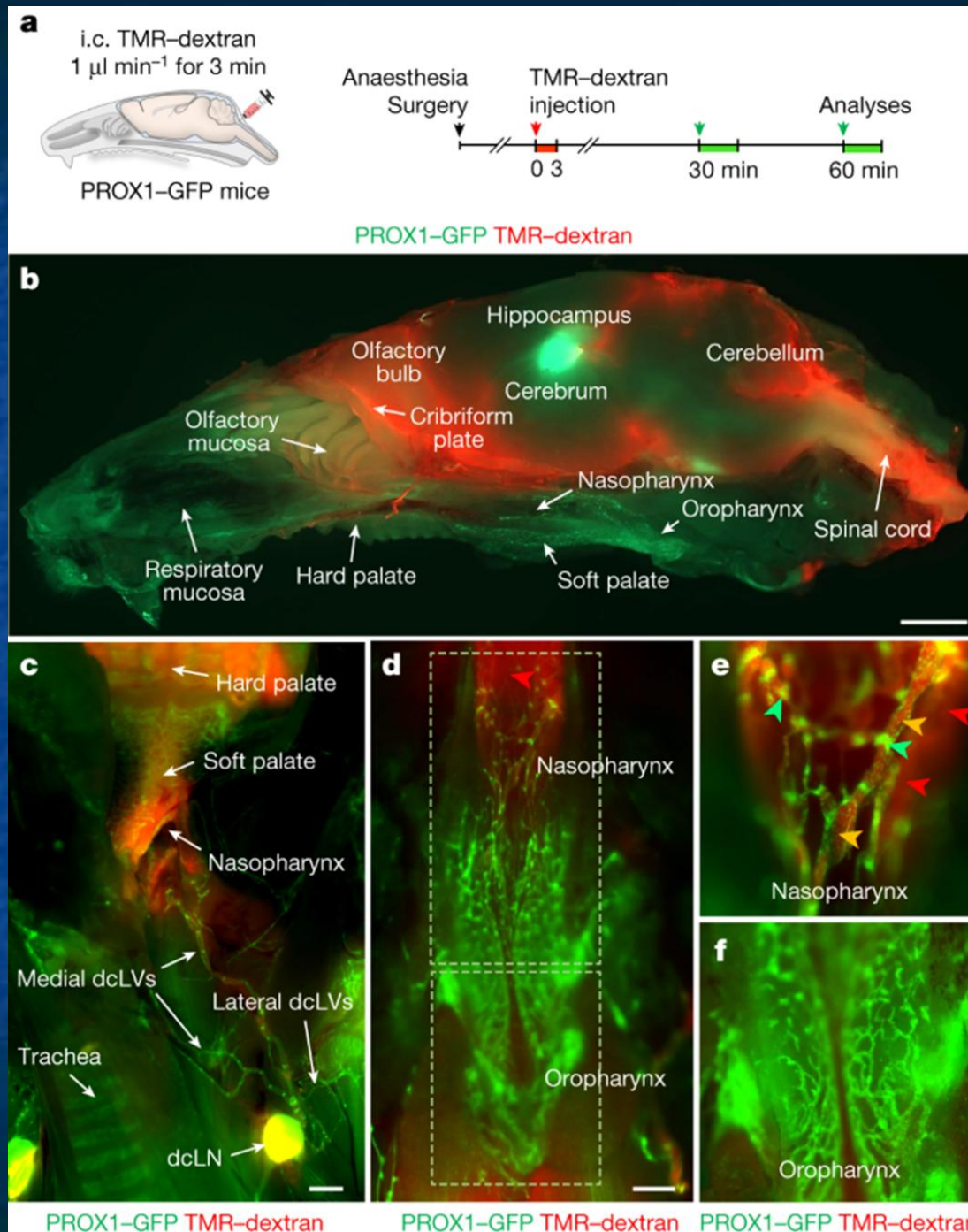


Researchers in South Korea discovered a crucial network of lymphatic vessels at the back of the nose, which significantly contributes to draining cerebrospinal fluid (CSF) from the brain. This study reveals a previously unknown CSF outflow route, offering insights into neurodegenerative conditions.

Yoon JH. et al. 2024 Jan;625(7996):768-777. doi: 10.1038/s41586-023-06899-4. Epub 2024 Jan 10.
Nasopharyngeal lymphatic plexus is a hub for cerebrospinal fluid drainage

Three-dimensional morphological features of the nasopharyngeal and posterior nasal lymphatic plexuses



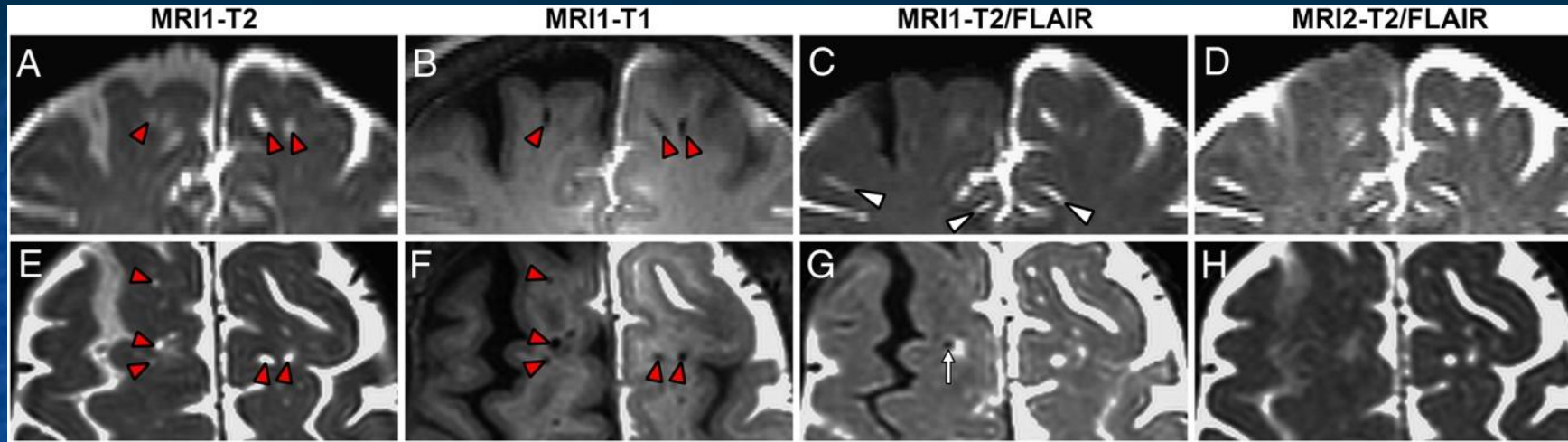


Preferential and selective distribution of TMR-dextran in the head and neck after intracisternal infusion

- Cervical lymphatics are thought to be responsible for around 50% of CSF outflow to cervical lymph nodes. The remainder of CSF outflow drains from the spinal cord to mediastinal, iliac and sacral lymph nodes, or through perivascular spaces, although lymphatics can contribute to the latter.

- The researchers used fluorescent tracers in mice and monkeys to uncover a new drainage pathway connecting facial lymphatics to deep lymph nodes, which remains intact even in older individuals. A handheld device that lightly strokes the skin restored youthful CSF flow in aged animals, opening up exciting potential for wearable treatments that prevent or slow neurological decline.
- Jin, H., Yoon, JH., Hong, S.P. *et al.* Increased CSF drainage by non-invasive manipulation of cervical lymphatics. *Nature* **643**, 755–767 (2025). <https://doi.org/10.1038/s41586-025-09052-5>

THE HUMAN NEURO- LYMPHATIC SYSTEM



Visualization of perivascular spaces by intrathecal contrast-enhanced brain MRI. Intrathecal contrast-enhanced brain MRI in coronal (A–D) and axial planes (E–H). T2 (A and E), T1 (B and F), and T2/FLAIR (C and G) sequences from timepoint 1, and T2/FLAIR from timepoint 2 (D and H) are shown.

Some MV-PVSs decrease in signal intensity while others increase between timepoints 1 and 2.

Red arrowheads: MV-PVS on T1 and T2 sequences.

White arrow: Postcontrast, nonenhancing MV-PVS.

White arrowheads: Enhancing MV-PVSs (D and H).

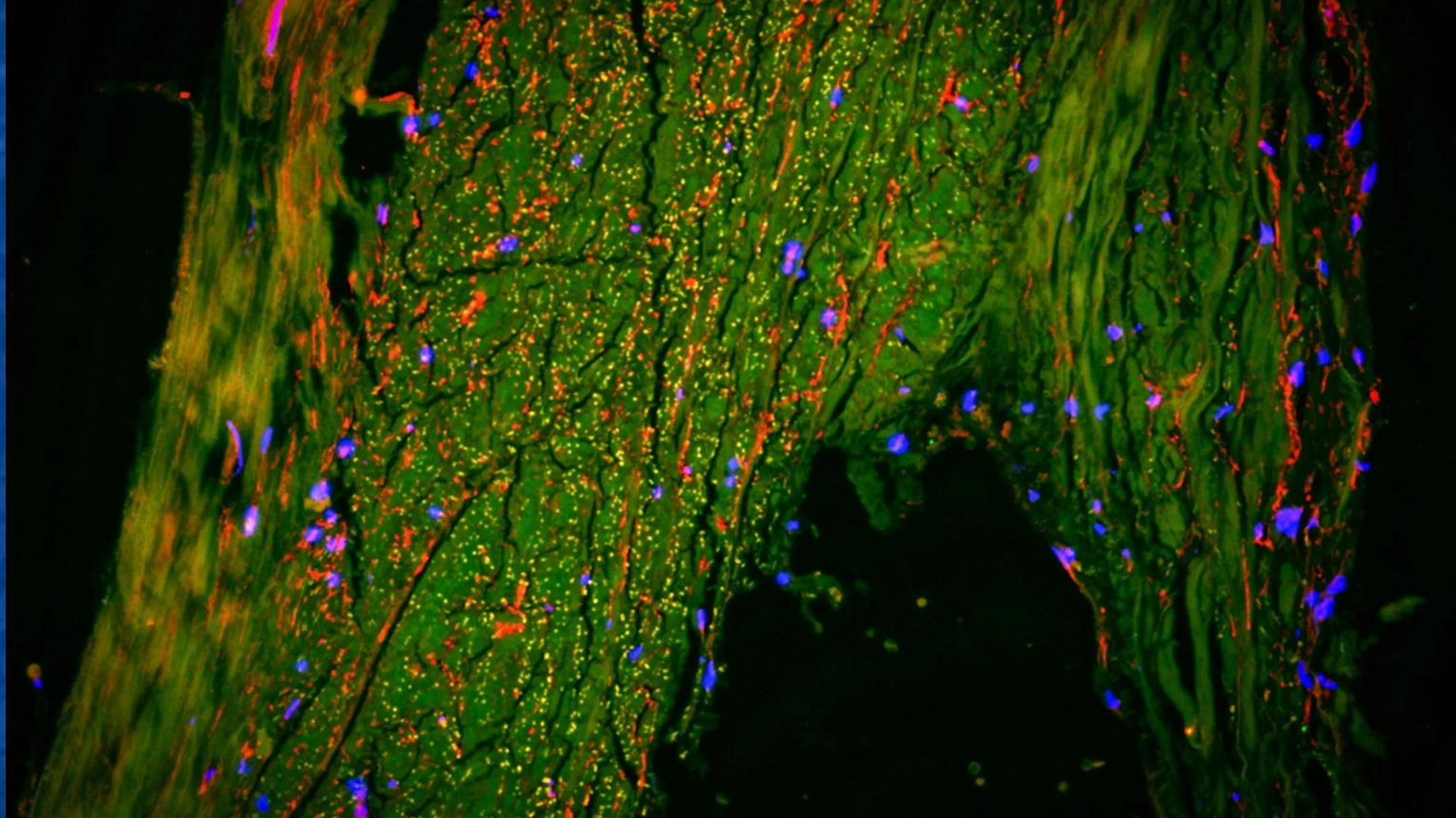
Fig. 2. Yamamoto, E. A., et al. (October 2024)

Albayram M, Richmond SB, Yagmurlu K, et al; 2025. Meningeal lymphatic architecture and drainage dynamics surrounding the human middle meningeal artery. iScience, 28 (11): 113693 DOI: 10.1016/j.isci.2025.113693

A hidden waste-removal pathway in the brain has finally been caught in action.

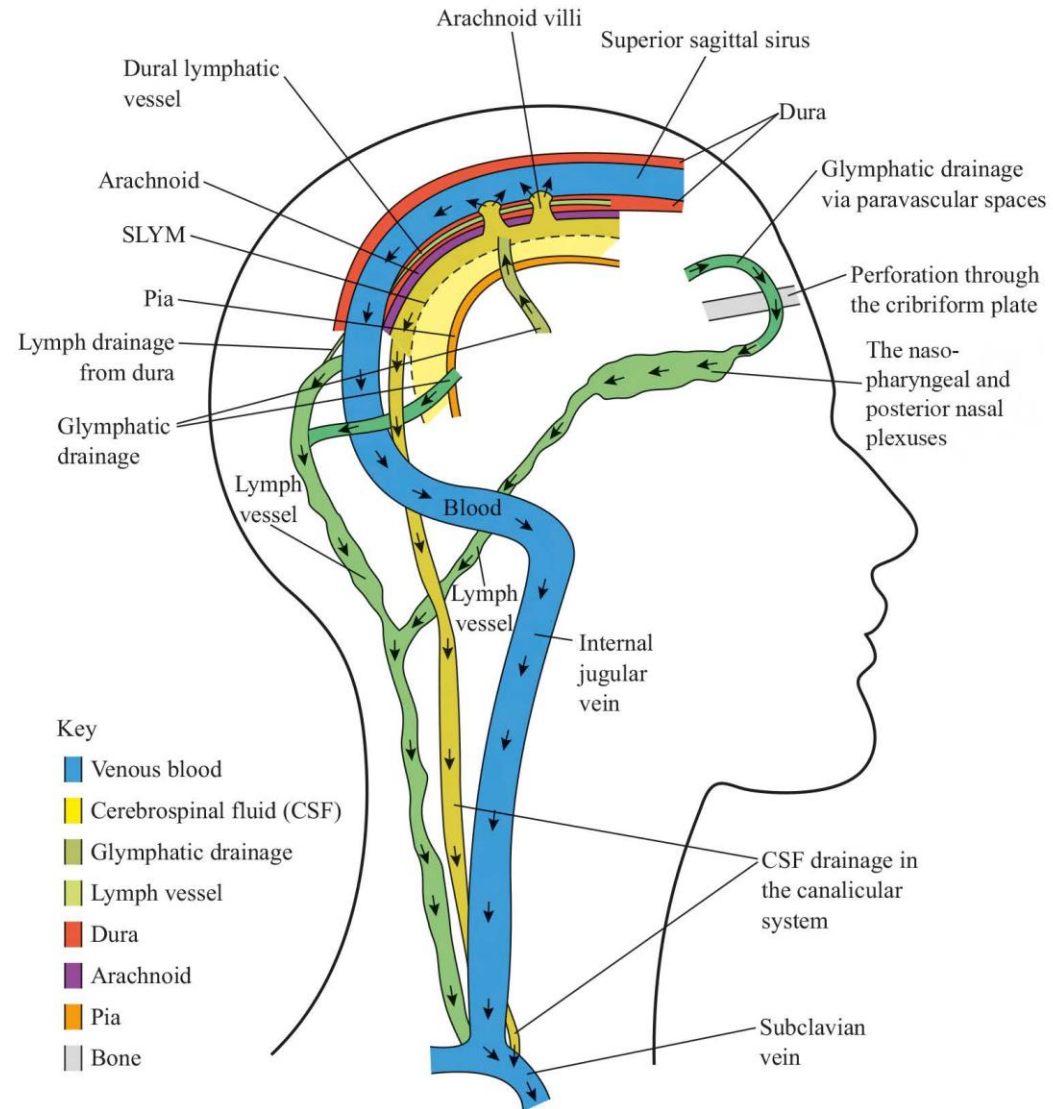
Using cutting-edge MRI scans, researchers discovered that fluid flows along the middle meningeal artery in a slow, lymphatic-like pattern—very different from blood.

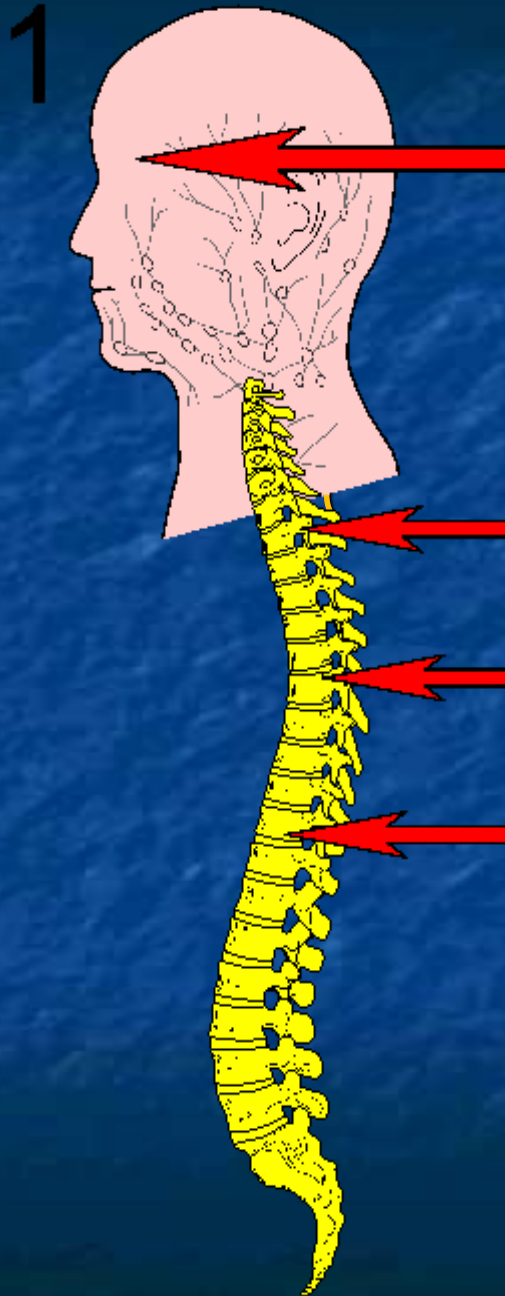
Microscope image showing
lymphatic vessels (red) in the dura.



Albayram M et al , Medical University of South Carolina, 2025.

The drainage of Toxins from the brain...The Full Picture





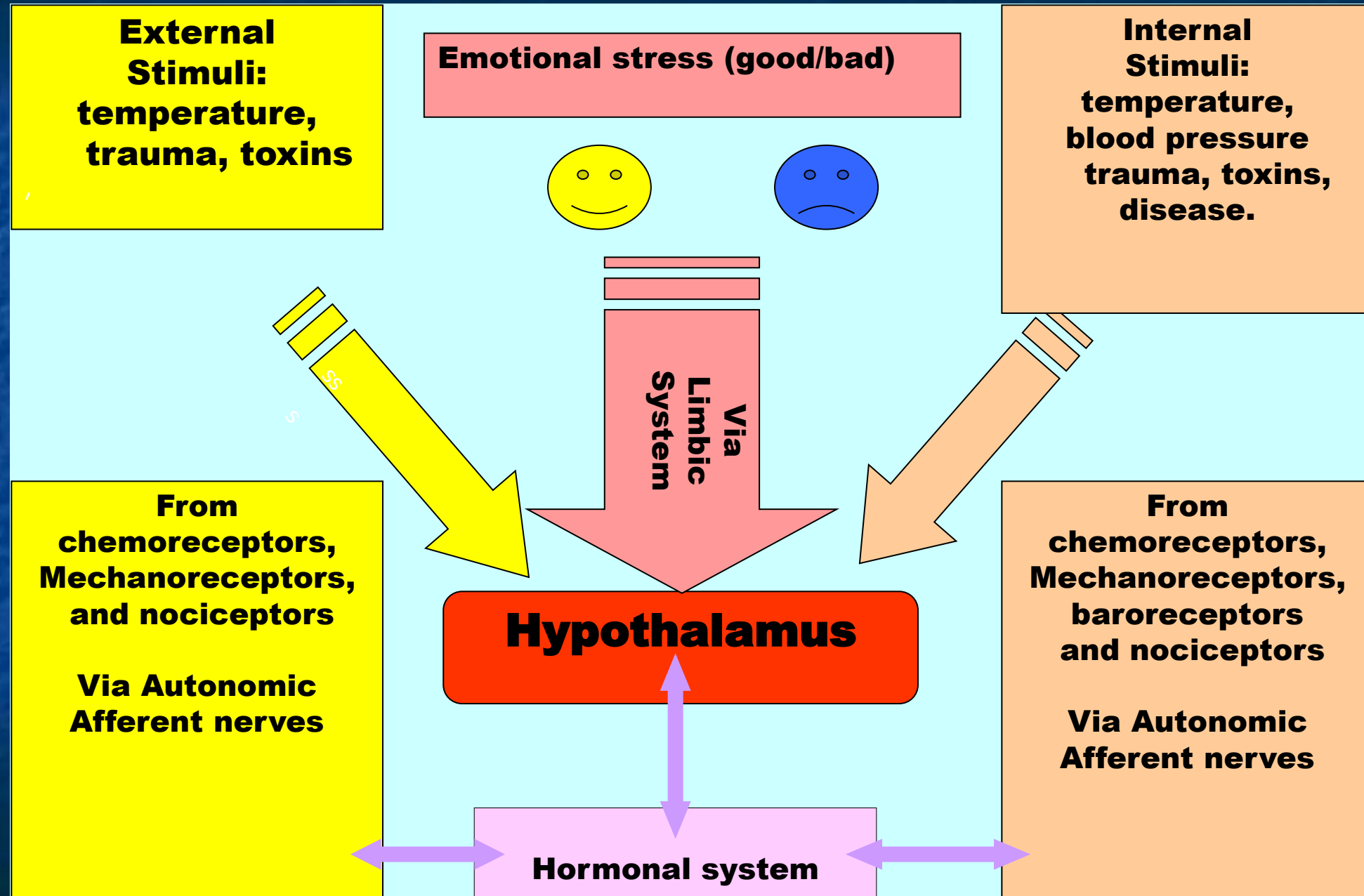
Trauma/ Congenital
Physical damage/abnormality
affecting perivascular spaces.
olfactory; optic; trigeminal; auditory

Spinal Canal and alongside
Spinal Nerve Roots

Build Up of Stress:

- Emotional Trauma
- Physical Trauma/Pain
- Immunological Trauma
(Infections or Sensitivities/ Allergies)
- Environmental Trauma (Pollution)
- Other Pathologies

STAGES LEADING UP TO ME/CFS

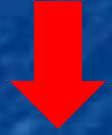


STAGES LEADING UP TO ME/CFS

SYMPATHETIC OVERLOAD



SYMPATHETIC DYSFUNCTION



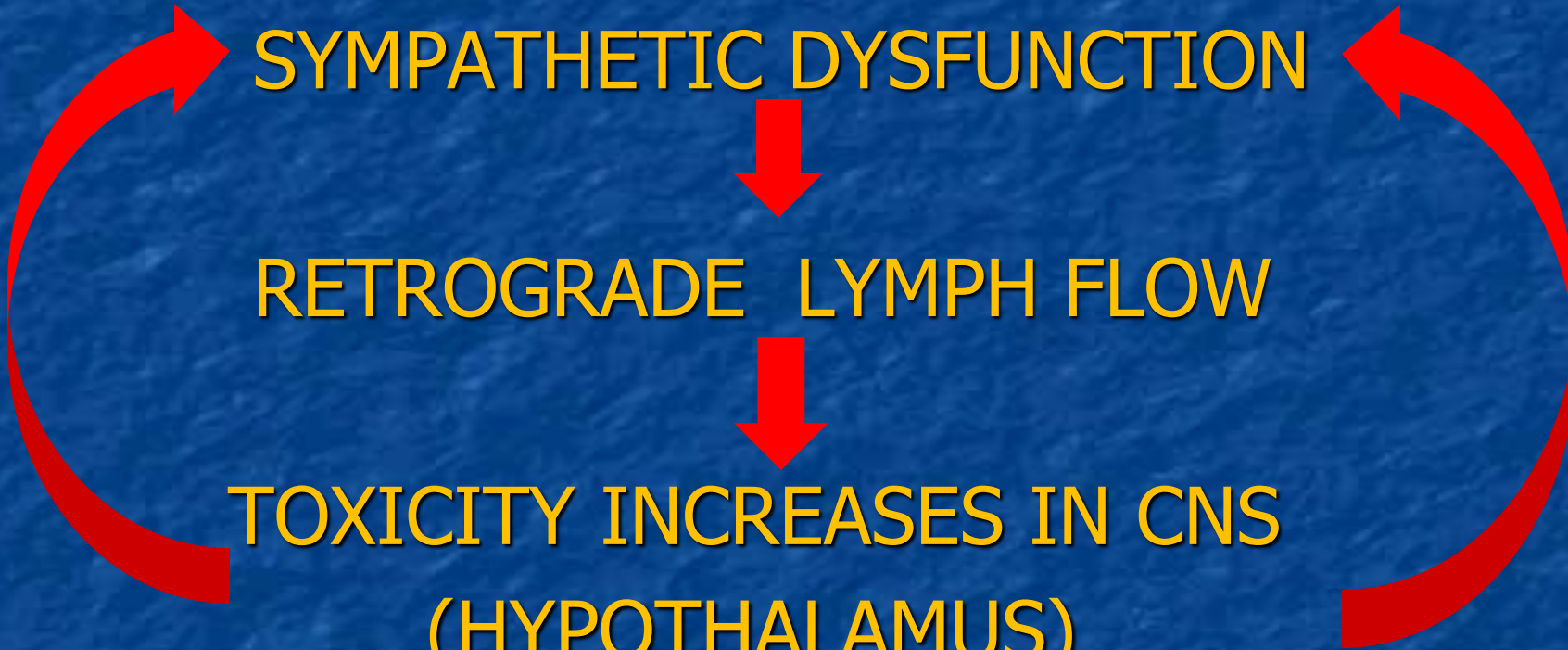
RETROGRADE LYMPH FLOW



TOXICITY INCREASES IN CNS
(HYPOTHALAMUS)



ME/CFS



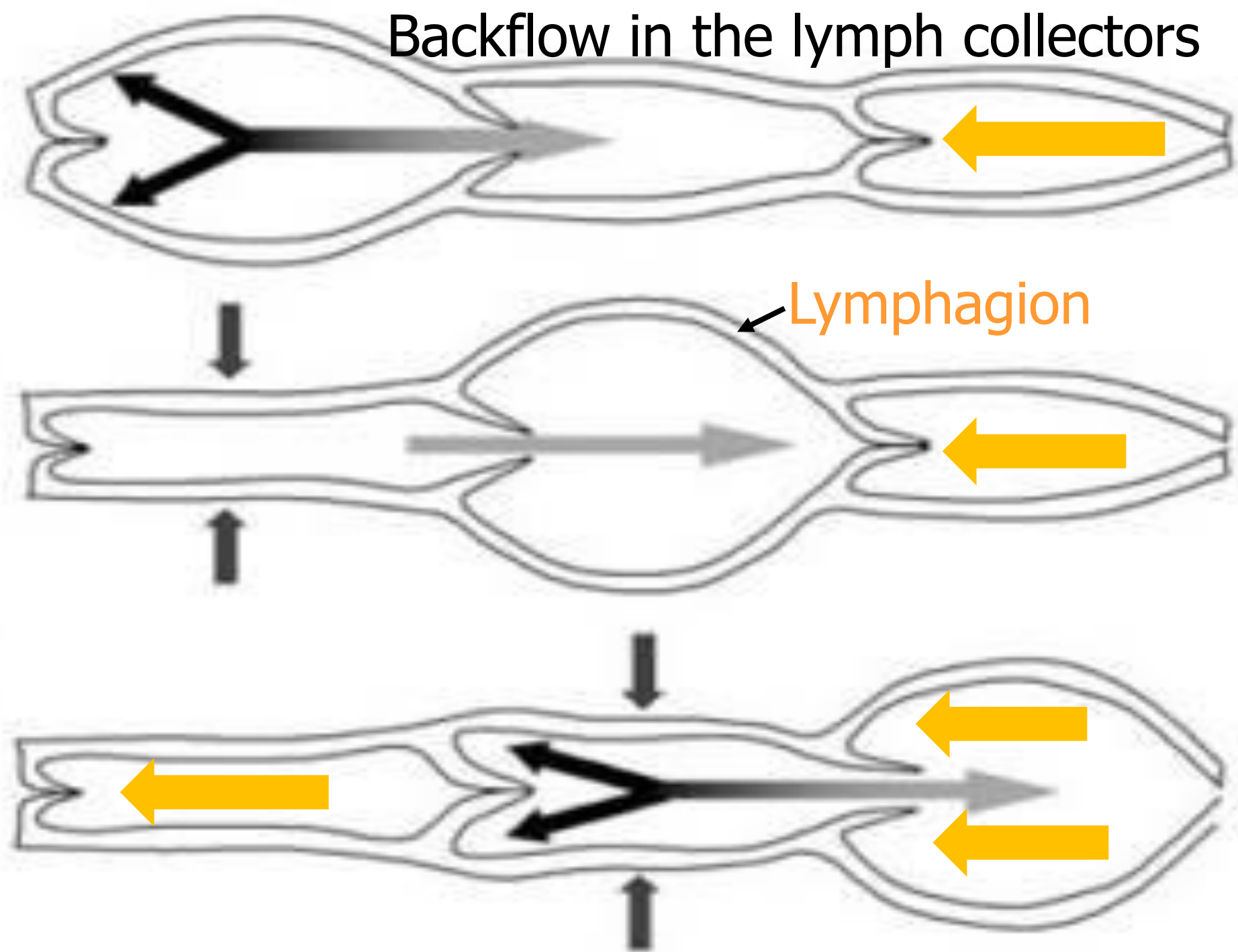


- Professor John Kinmonth
- Guys and St Thomas Medical School

Kinmonth JB. 1982. *The Lymphatics*, 2nd Edition.
Edward Arnold, London. p. 80.

Browse NL. 1968. Response of lymphatics to
sympathetic nerve stimulation. *J. Physiol.*
(London) **19**: 25.

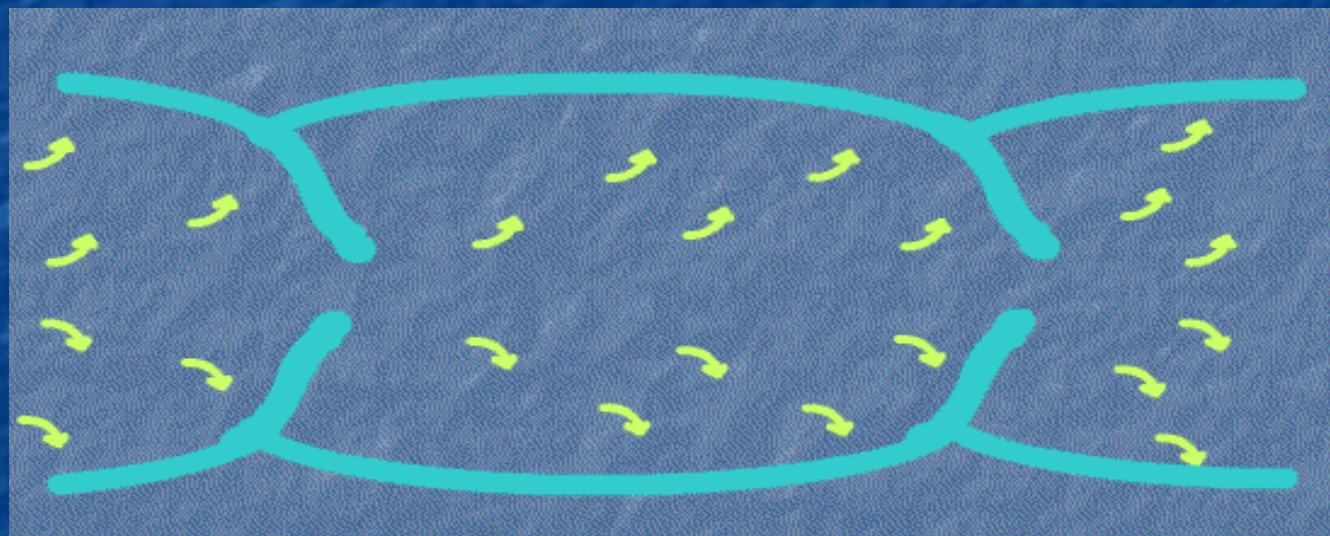
Lymphangion Cross Section



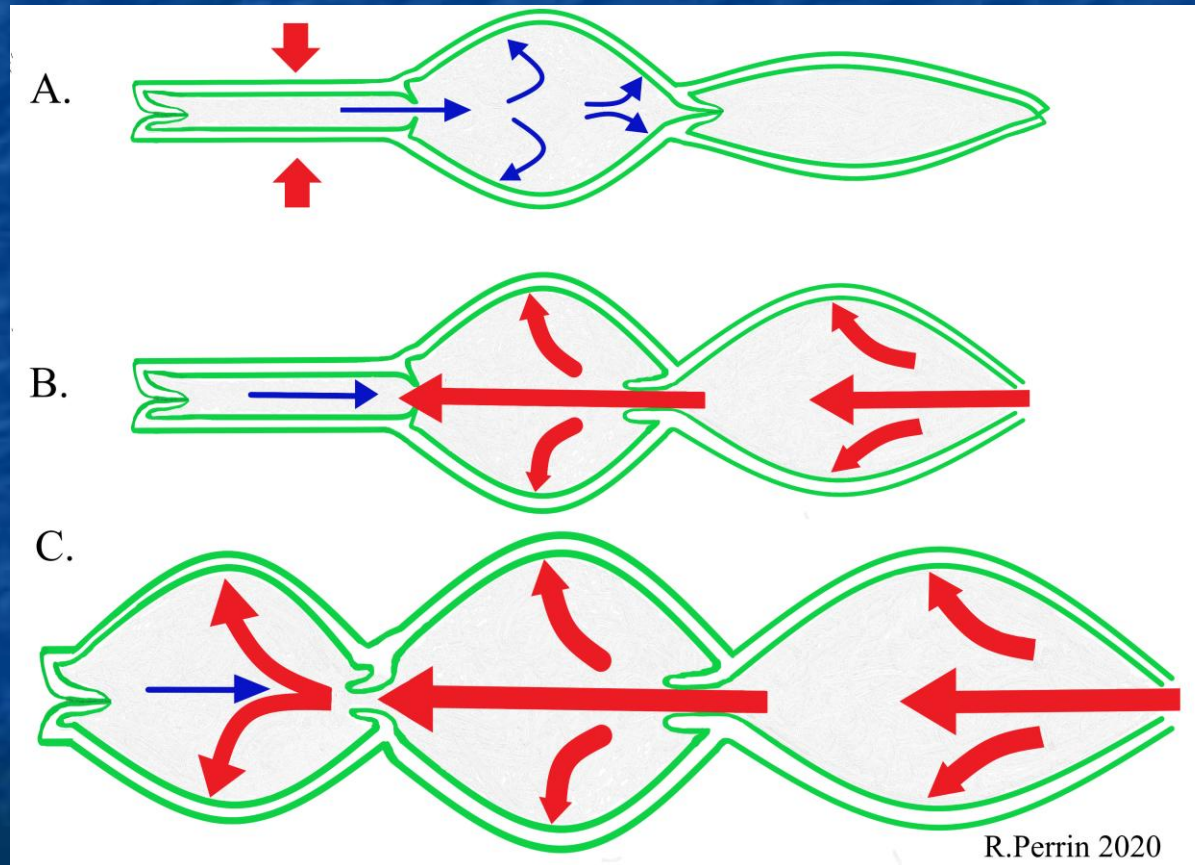
Backflow in the lymph collectors

Lymphagion

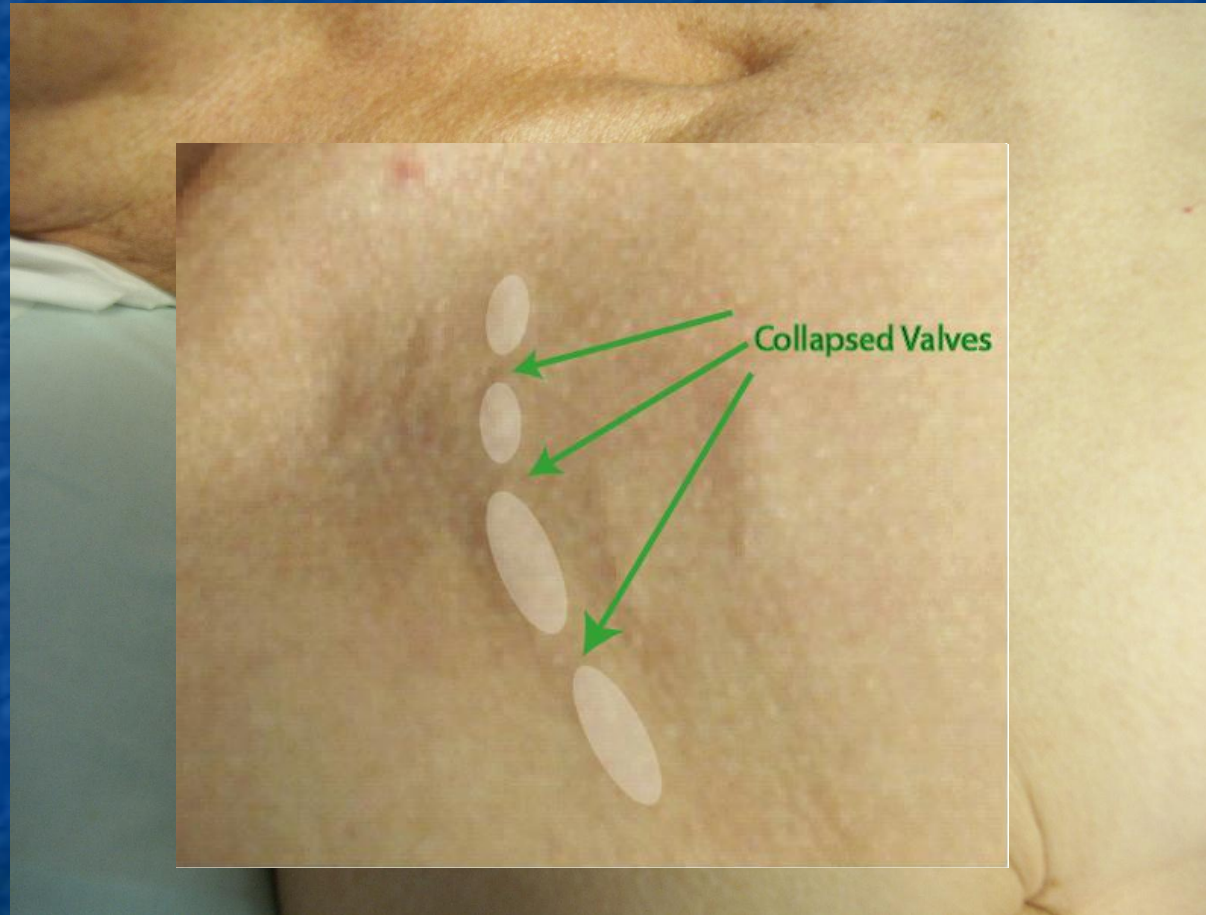
Varicose Mega-Lymphatics



The formation of Varicose Megalymphatics



Varicose Mega-Lymphatic Vessels



Varicose Lymphatic Vessels

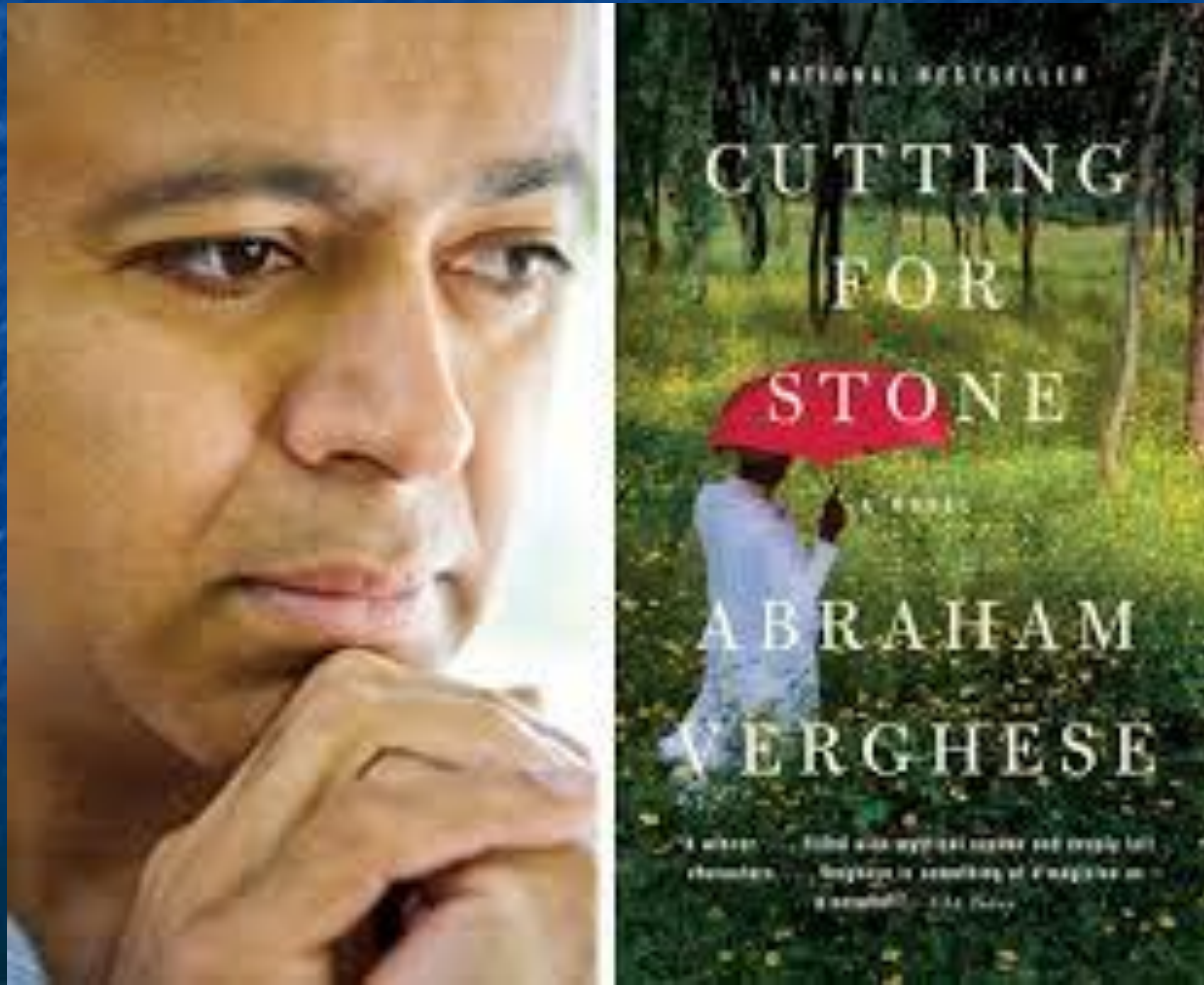




Varicose Megalymphatics seen throughout the left breast of a 73-year-old Long COVID Patient



Prof Abraham Verghese Stanford University



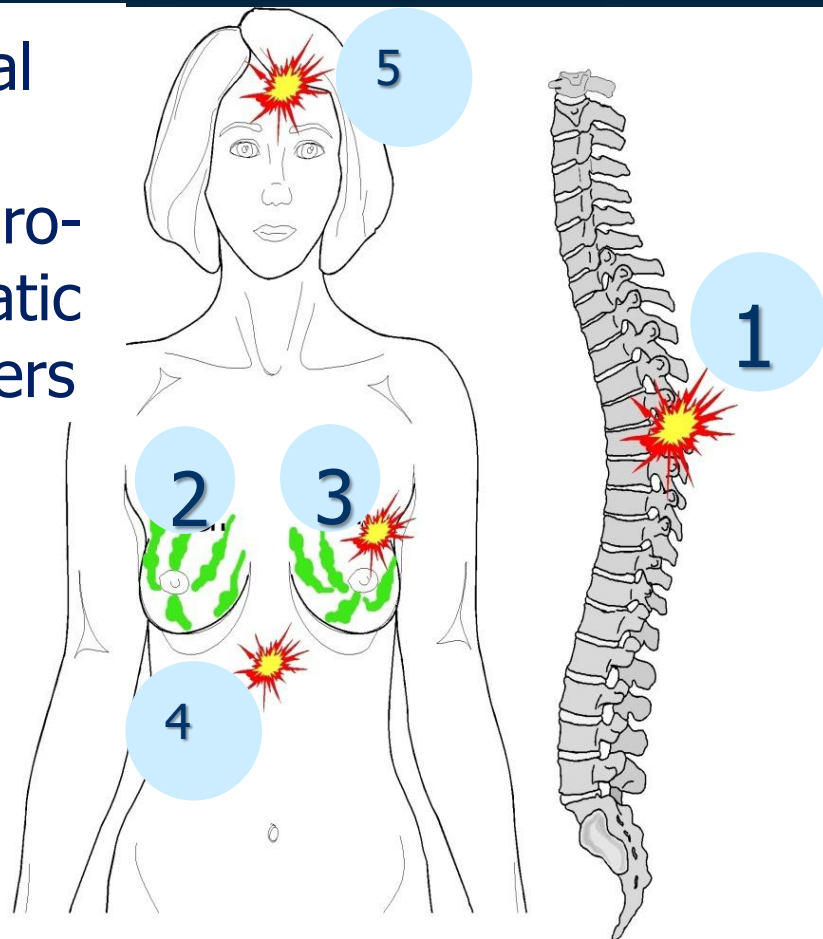
“The doctor’s round.....



.....has become Square”



Physical Signs In Neuro- lymphatic Disorders



1. Postural/Mechanical Disturbance in Mid/Upper Thoracic spine
2. Varicose Mega-lymphatics
3. Perrins Point
4. Coeliac Plexus Tenderness
5. Disturbance of cranial rhythm

BMJ Open Can physical assessment techniques aid diagnosis in people with chronic fatigue syndrome/myalgic encephalomyelitis? A diagnostic accuracy study

Lucy Hives,¹ Alice Bradley,² Jim Richards,³ Chris Sutton,⁴ James Selfe,⁵ Bhaskar Basu,⁶ Kerry Maguire,⁷ Gail Sumner,⁸ Tarek Gaber,⁹ Annice Mukherjee,¹⁰ Raymond N Perrin³

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ABSTRACT

Objective To assess five physical signs to see whether they can assist in the screening of patients with chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) and potentially lead to quicker treatment.

Methods This was a diagnostic accuracy study with inter-rater agreement assessment. Participants recruited from two National Health Service hospitals, local CFS/ME support groups and the community were examined by three practitioners on the same day in a randomised order. Two allied health professionals (AHPs) performed independent examinations of physical signs including: postural/mechanical disturbances of the thoracic spine, breast varicosities, tender Perrin's point, tender coeliac plexus and dampened cranial flow. A physician conducted a standard clinical neurological and rheumatological assessment while looking for patterns of illness behaviour. Each examination lasted approximately 20 min.

Results Ninety-four participants were assessed, 52 patients with CFS/ME and 42 non-CFS/ME controls, aged 18–60. Cohen's kappa revealed that agreement between the AHPs was substantial for presence of the tender coeliac plexus ($\kappa=0.65$, $p<0.001$) and moderate for postural/mechanical disturbance of the thoracic spine ($\kappa=0.57$, $p<0.001$) and Perrin's point ($\kappa=0.56$, $p<0.001$). A McNemar's test found no statistically significant bias in the diagnosis by the experienced AHP relative to actual diagnosis ($p=1.0$) and a marginally non-significant bias by the newly trained AHP ($p=0.052$). There was, however, a significant bias in the diagnosis made by the physician relative to actual diagnosis ($p<0.001$), indicating poor diagnostic utility of the clinical neurological and rheumatological assessment.

Conclusions Using the physical signs appears to improve the accuracy of identifying people with CFS/ME and shows agreement with current diagnostic techniques. However, the present study concludes that only two of these may be needed. Examining for physical signs is both quick and simple for the AHP and may be used as an efficient screening tool for CFS/ME. This is a small single-centre study, and therefore, further validation in other centres and larger populations is needed.

Strengths and limitations of this study

- This is the first study that explores agreement on the presence of physical signs in the screening of patients with chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) and demonstrates proof of concept of these signs.
- This study did not assess the performance of physical signs in diagnosing CFS/ME among people reporting with illness in clinical practice.
- The screening method did not involve patient/family history, patient symptoms or any discussion between practitioner and patient; including these would be likely to increase accuracy in clinical practice.
- There were more female participants than males, at a rate similar to other studies, which have found a higher prevalence of CFS/ME in females; however, there were similar percentages of males and females among the controls.
- This was a small study that included only two allied health professionals using the Perrin technique and did not include participants with severe CFS/ME; this limits the generalisation of the findings.

INTRODUCTION

Chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) is characterised by severe, debilitating fatigue that is exacerbated by exercise but does not improve with rest. This condition can lead to a substantial impairment, making every day activities difficult. There is currently no universally accepted method of diagnosing CFS/ME, so other conditions with a similar presentation of symptoms must first be ruled out. Therefore, the diagnosis of CFS/ME can often be a long process.

Up until recently, the most widely accepted criteria for CFS/ME was the revised US Centers for Disease Control and Prevention (CDC) definition,¹ which required at least a 6-month period of fatigue that significantly

We investigated the effectiveness of using specific physical signs as an aid to diagnosing ME/CFS.

In the blind controlled study the accuracy of the practitioners using these physical signs was 81% and 88%

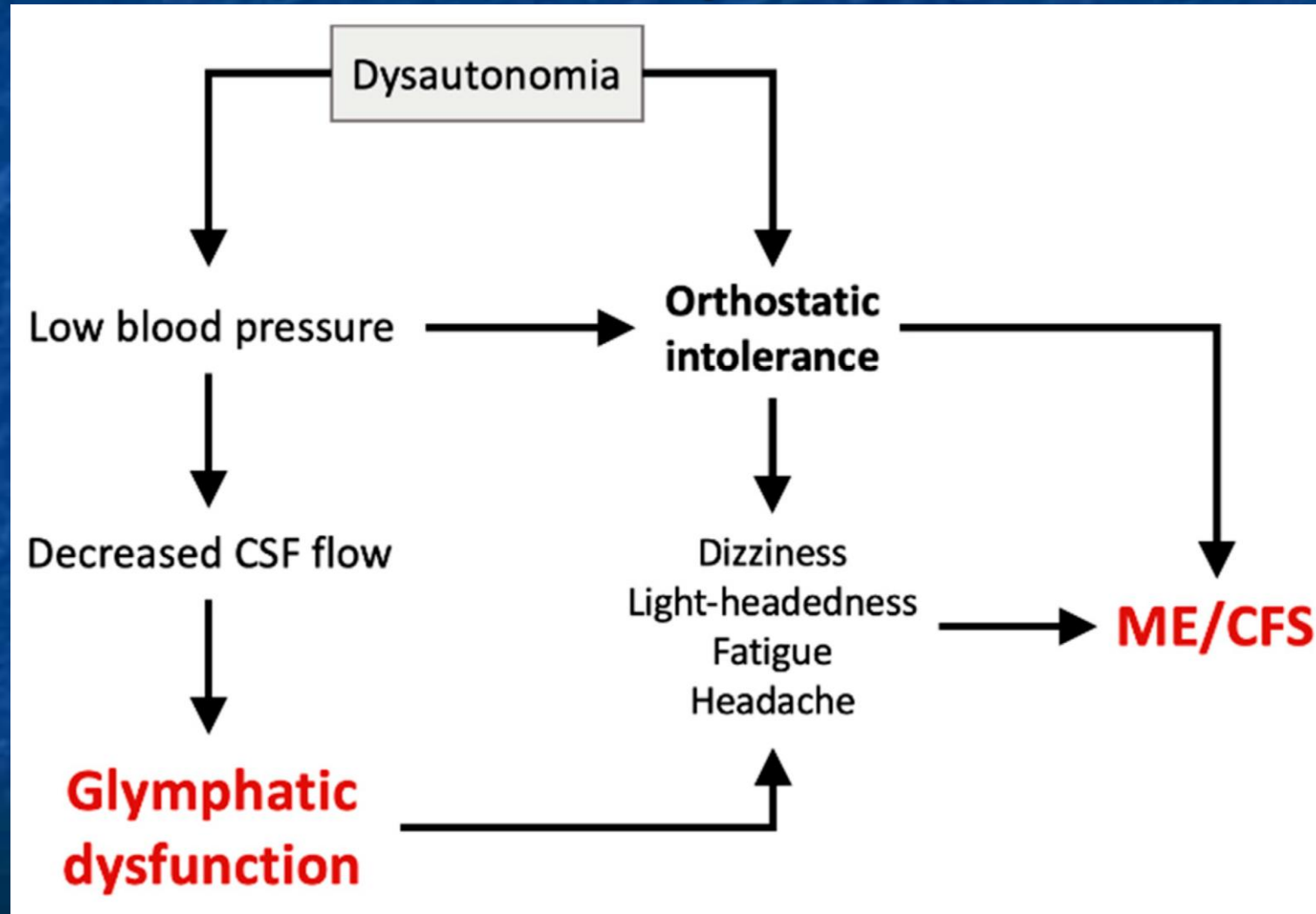
The physician only correctly diagnosed 44% of the ME/CFS patients.

Hives L, Bradley A, Richards J, et al. Can physical assessment techniques aid diagnosis in people with chronic fatigue syndrome/myalgic encephalomyelitis? A diagnostic accuracy study. *BMJ Open* 2017;**0**:e017521. doi:10.1136/ bmjopen-2017-017521

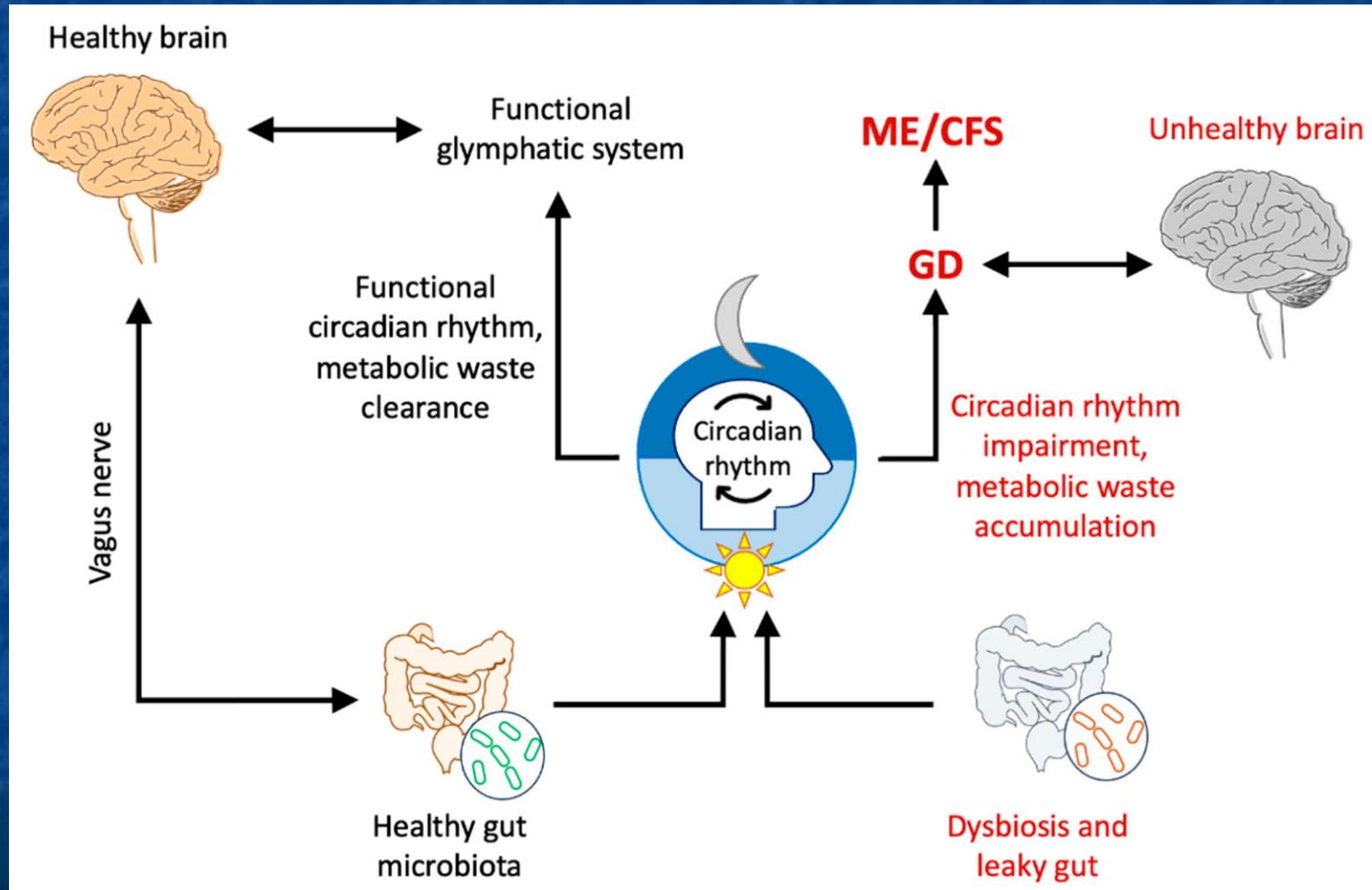
“wired and fired” or Shattered



Dysautonomia and Glymphatic Dysfunction in ME/CFS



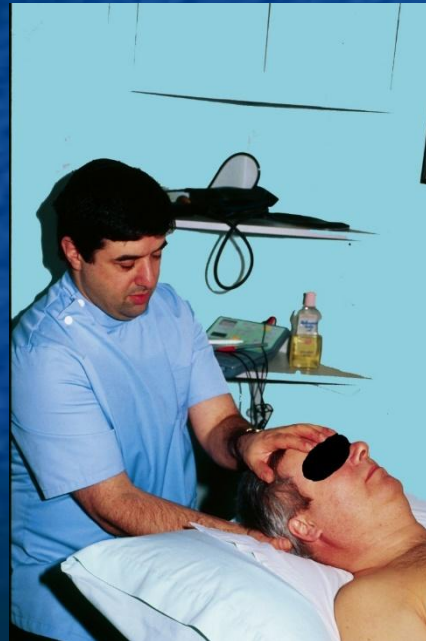
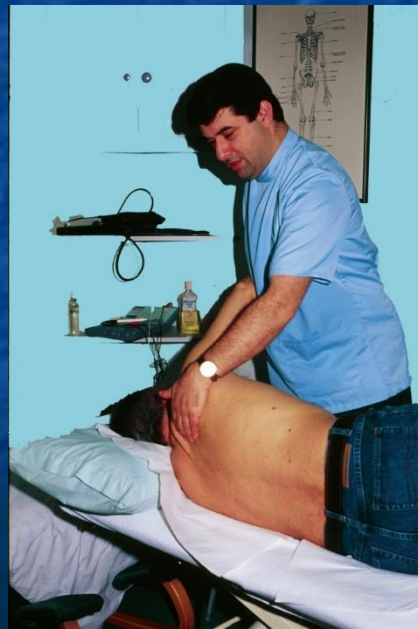
Gut Dysbiosis, Circadian Rhythm and Glymphatic dysfunction in ME/CFS



Nemat-Gorgani, M.; Jensen, M.A.; Davis, R.W. 2025

THE PERRIN TECHNIQUE

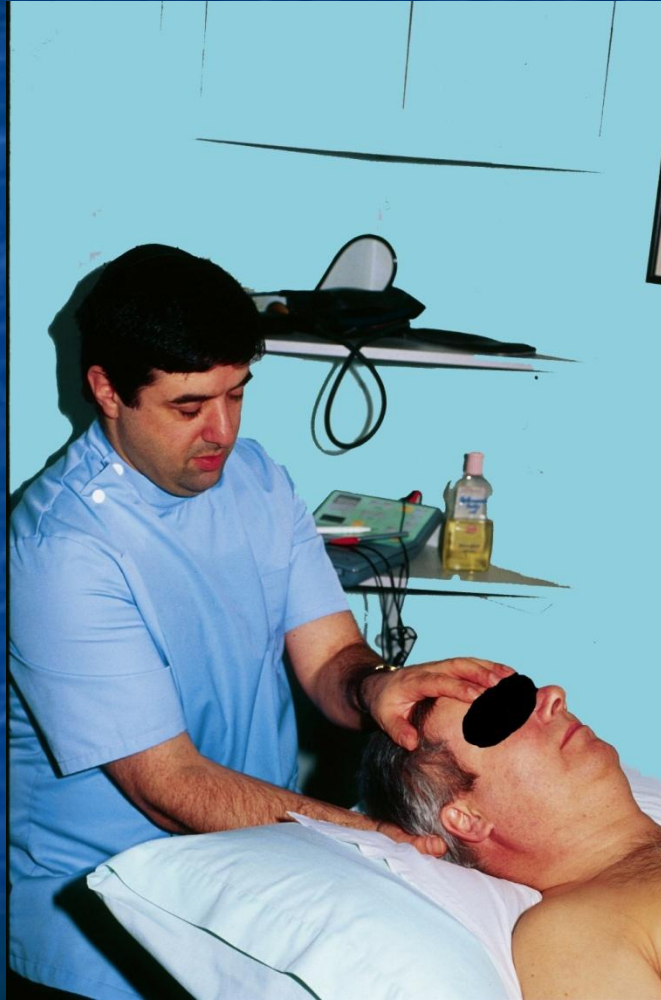
Developed in 1989



Lymphatic drainage, joint mobilisation and muscle stretching and relaxation.



Cranial Treatment

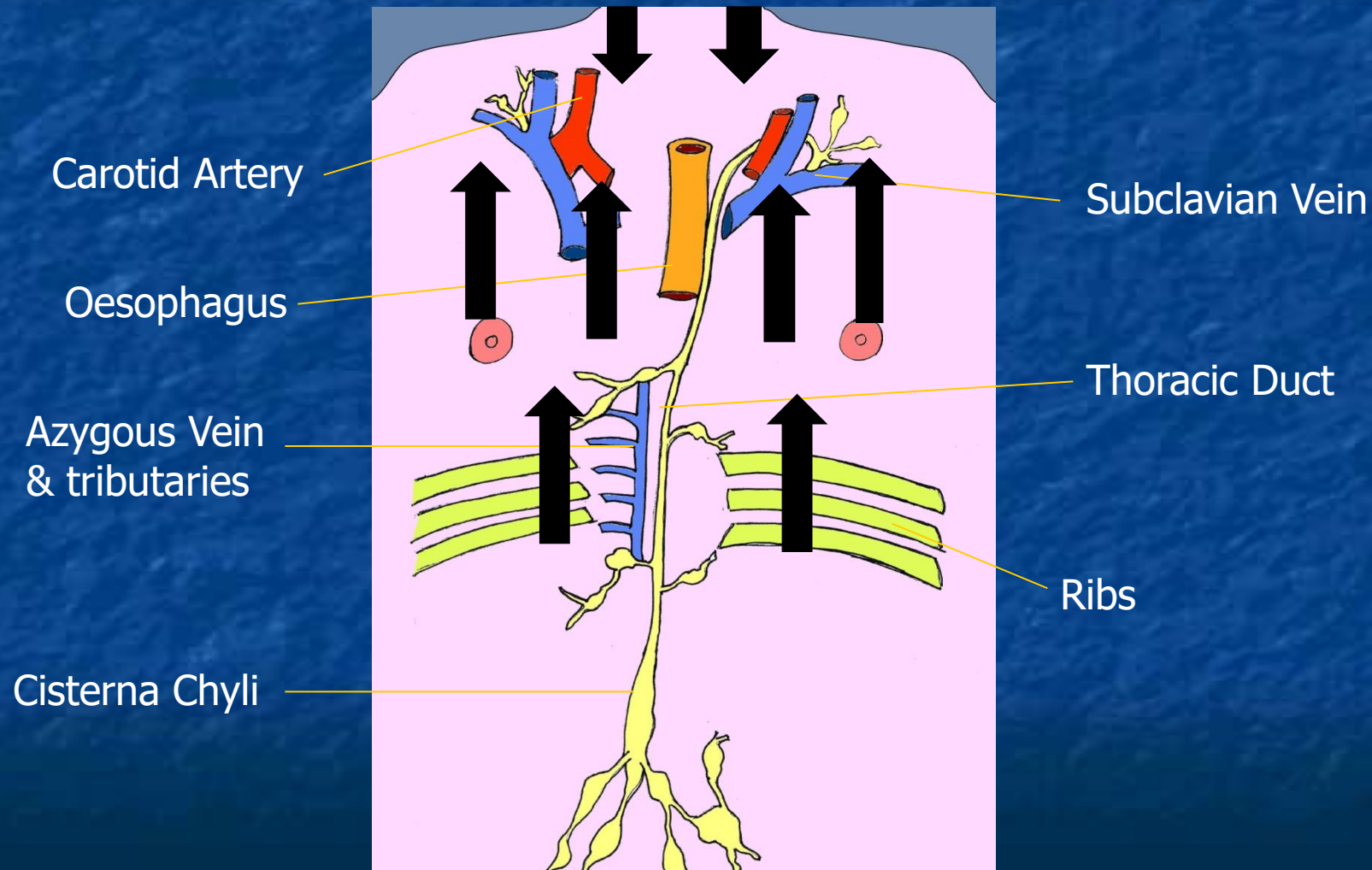


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The Concertina Effect



The Concertina Effect



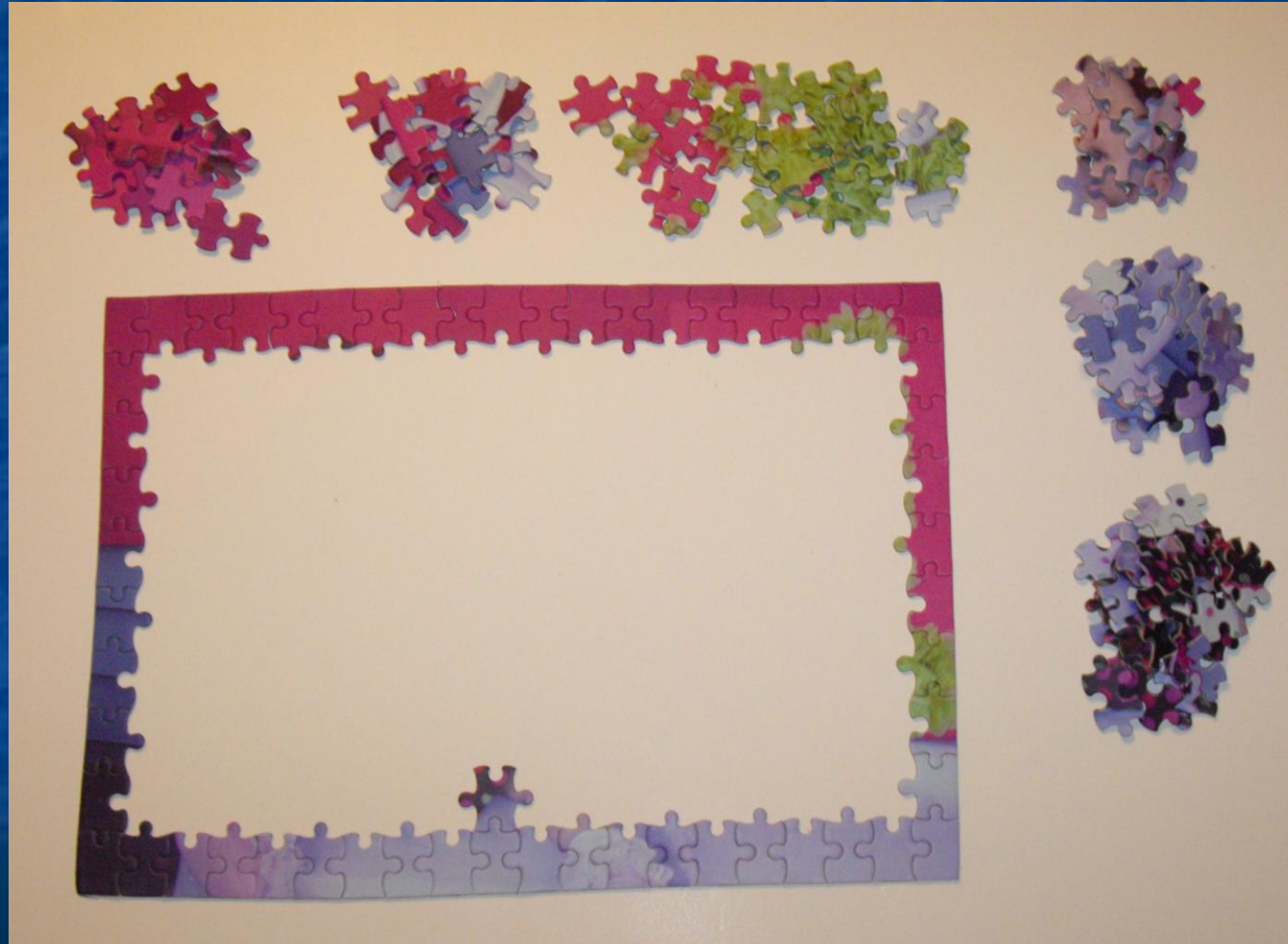
The Siphon Effect



PAIN = NO GAIN !

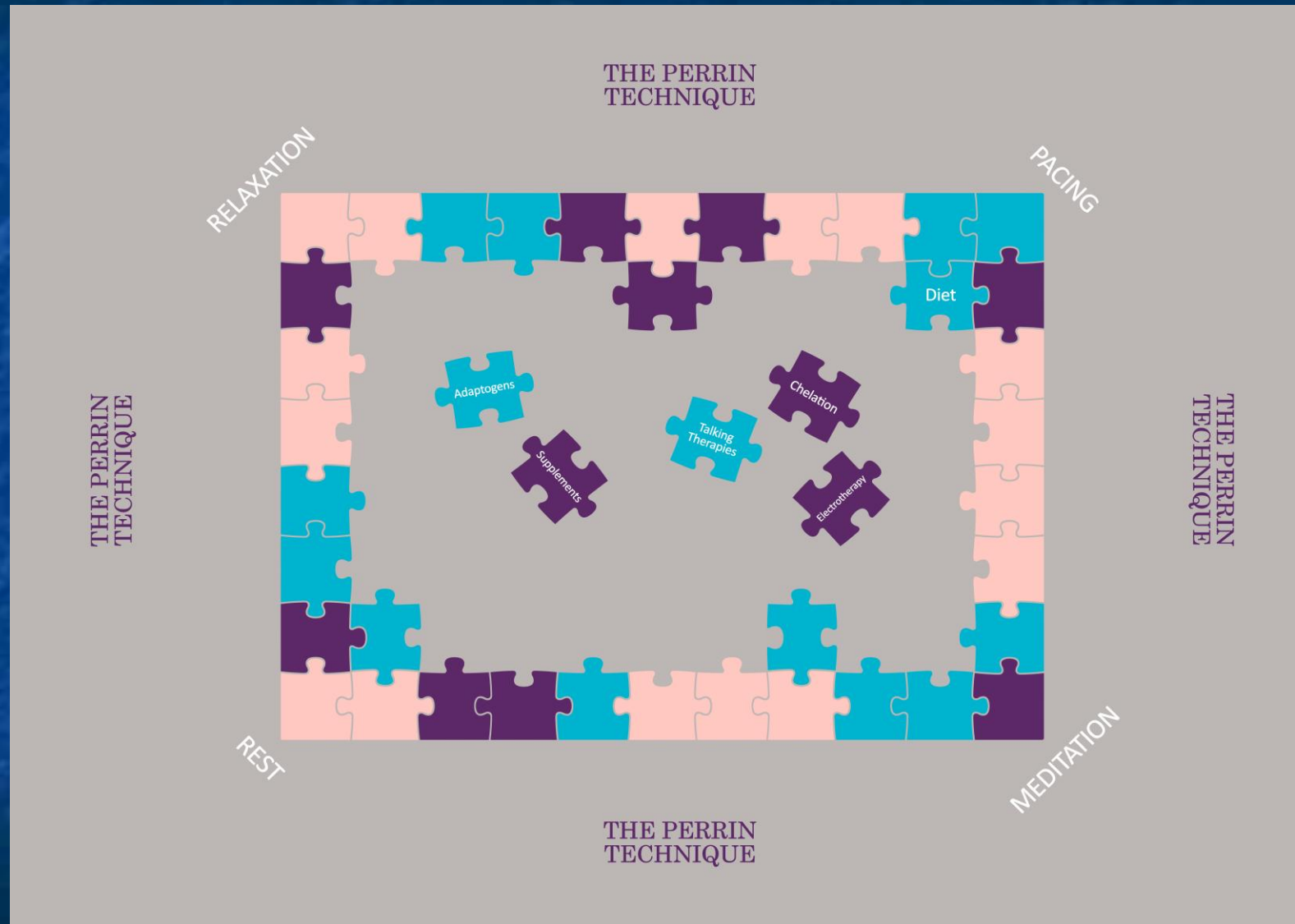


ME/CFS & FMS: THE JIGSAW PUZZLE ANALOGY

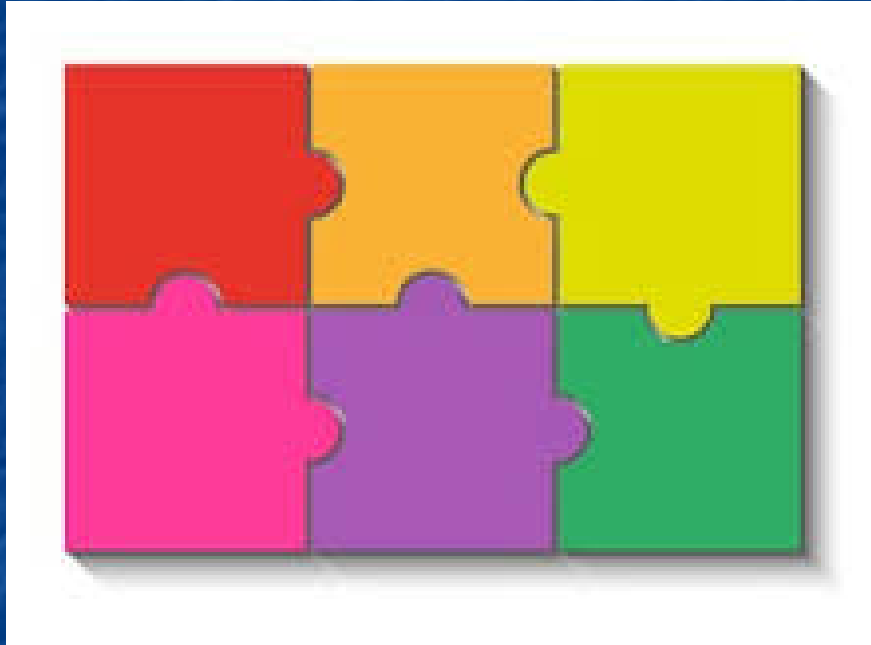


Perrin R. 2020

The Jigsaw Puzzle Analogy



ME/CFS THE JIGSAW PUZZLE ANALOGY



ME/CFS & FMS: THE JIGSAW PUZZLE ANALOGY

Sometimes it looks too difficult...



ME/CFS THE JIGSAW PUZZLE ANALOGY

So, start with the corners and edges first to bring about the best result.



Long-COVID

Perrin R et al. 2020. Into the looking glass: Post-viral syndrome post COVID-19

Med Hypotheses. 2020 Nov; 144: 110055.

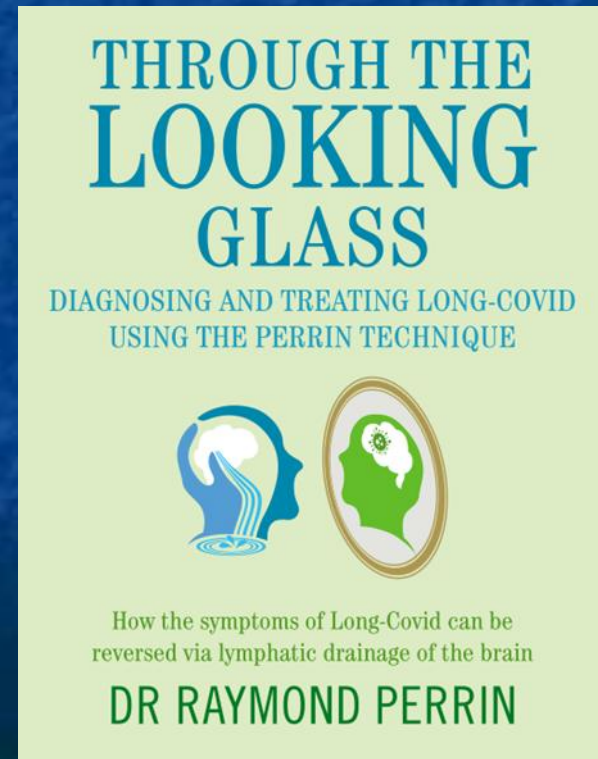
Published online 2020 Jun 27. doi: 10.1016/j.mehy.2020.110055

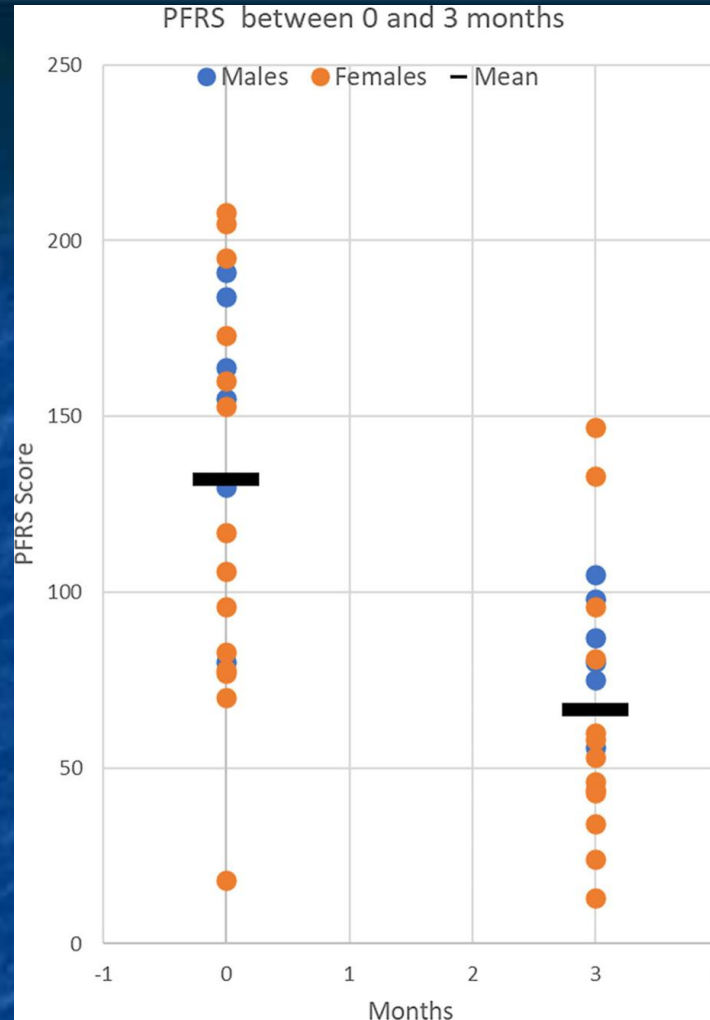
PMCID: PMC7320866

Through the looking glass:
Diagnosing and Treating
Long-COVID using
The Perrin technique .

Hammersmith Books, London.

Published November 7th 2024.





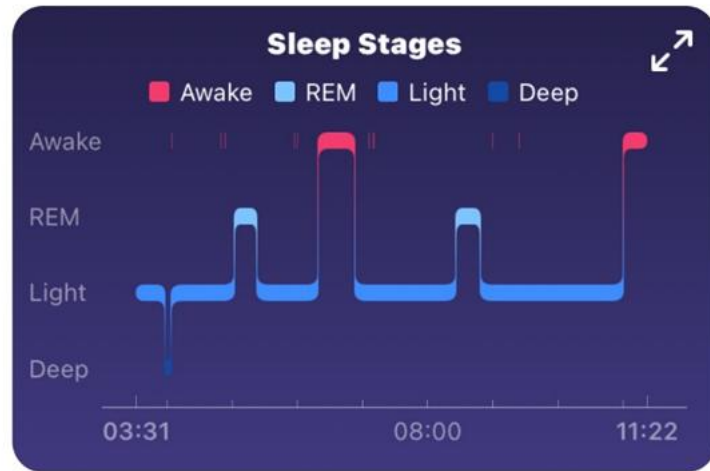
Heald AH, Perrin R, Walther A, et al. Reducing fatigue-related symptoms in Long COVID-19: a preliminary report of a lymphatic drainage intervention. *Cardiovasc Endocrinol Metab*. 2022 Jun; 11(2): e0261. Published online 2022 Apr 12. doi: 10.1097/XCE.0000000000000261

Single case study using a Fitbit

- Perrin, R., Riste, L., Hann, M., & Heald, A. H. (2024). Deep sleep improved by a manual therapy aimed at aiding glymphatic drainage in long COVID: a case study. *Fatigue: Biomedicine, Health & Behavior*, 1–7.
<https://doi.org/10.1080/21641846.2024.2370202>

Deep and REM

13 / 25

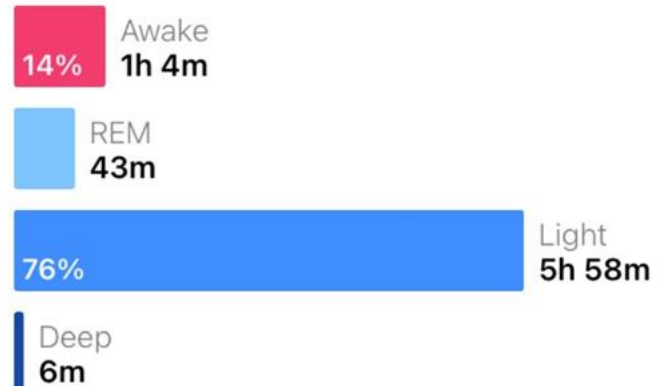


19 Jun

30 Day Avg

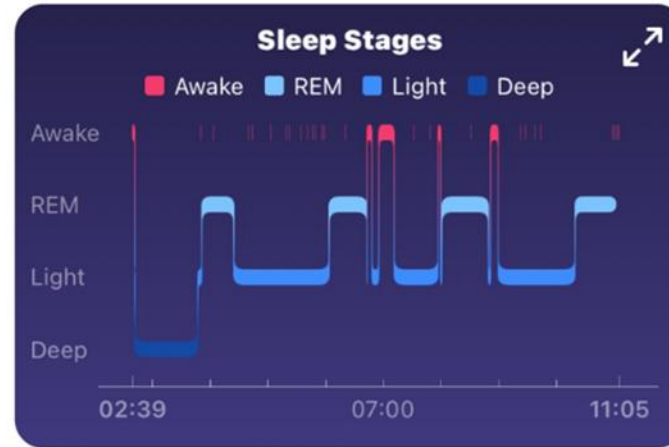
Benchmark

Time spent in each stage of sleep



Deep and REM

20 / 25

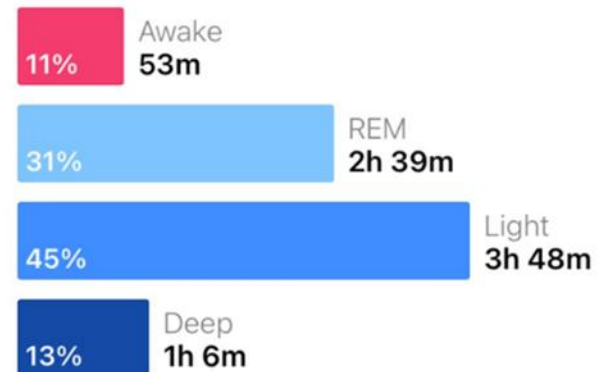


6 Nov

30 Day Avg

Benchmark

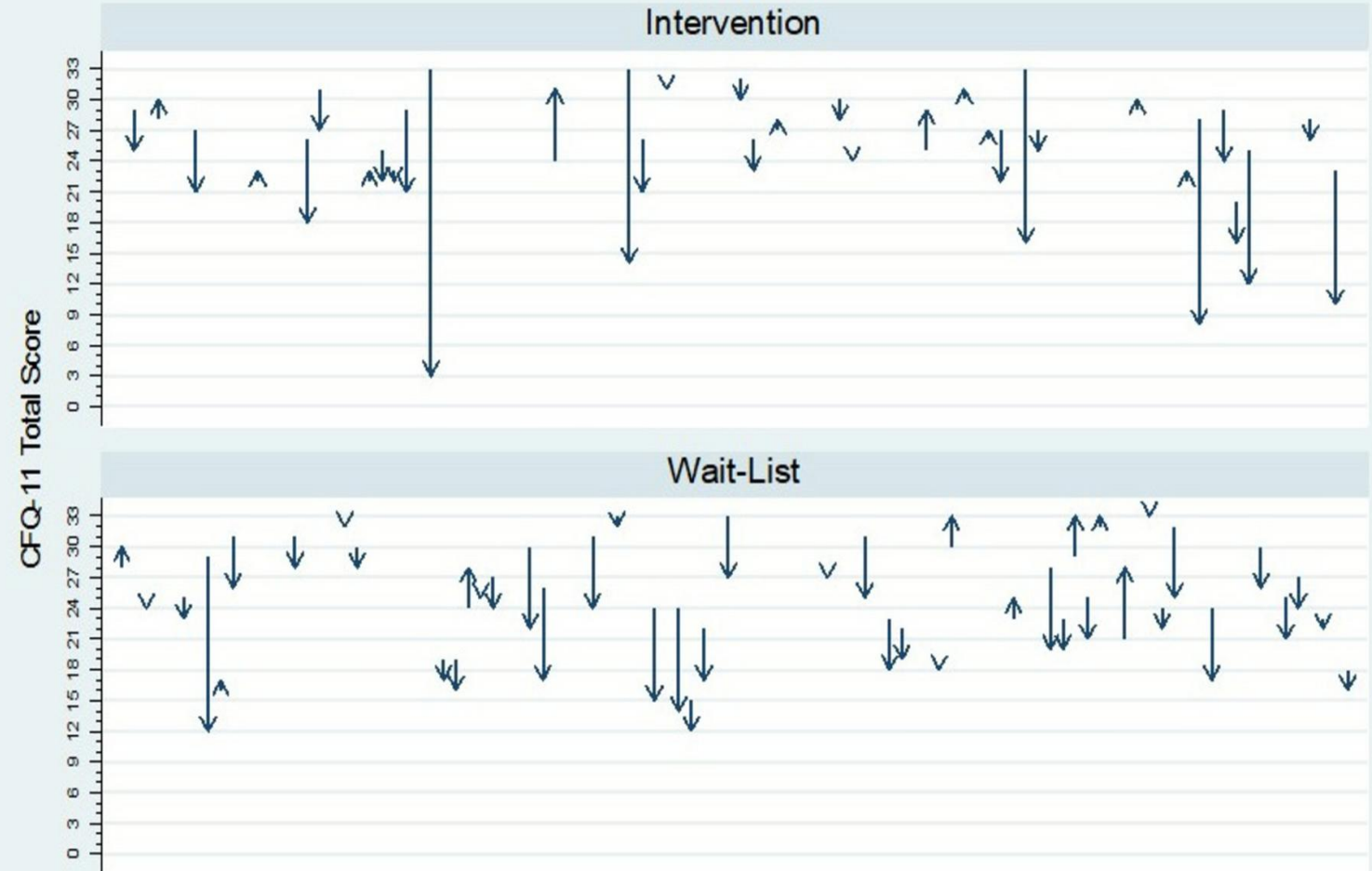
Time spent in each stage of sleep



Attrition rate only 21%



Riste, L., Perrin, R., Mulholland, T. *et al.*
 Testing the Feasibility of a Self-Help Intervention
 That Includes Lymphatic Drainage to Reduce
 Fatigue-Related Symptoms Among Patients with
 Long COVID in General Practice: Experiences from
 Our Randomized Controlled Trial (RCT).
Infect Dis Ther (2025)



Change in CFQ-11 Score from Baseline (direction of arrow indicates direction of change from baseline)

ME ASSOCIATION SURVEY 2010

Top 25 Treatments as expressed by
patient preference.

1. Pacing
2. Relaxation/meditation
3. The Perrin technique
22. CBT
24. Graded Exercise Therapy

Harvard/Open Medicine Foundation Treatment Survey for Long COVID and ME/CFS.

Manual Lymphatic drainage for ME/CFS
(AKA The Perrin technique) listed 10th
best out of 150 treatments used by
patients

Eckey M, Li P et al., Patient-reported treatment outcomes in ME/CFS and Long COVID. Proc Natl Acad Sci, USA. 2025 Jul 15;122(28):e2426874122

A.L.Komaroff, Growing recognition of post-acute infection syndromes, Proc Natl Acad Sci, USA. 122(29) e 2513877122

Jade

Housebound for 11 years, Wheelchair for 2 years
before treatment.....

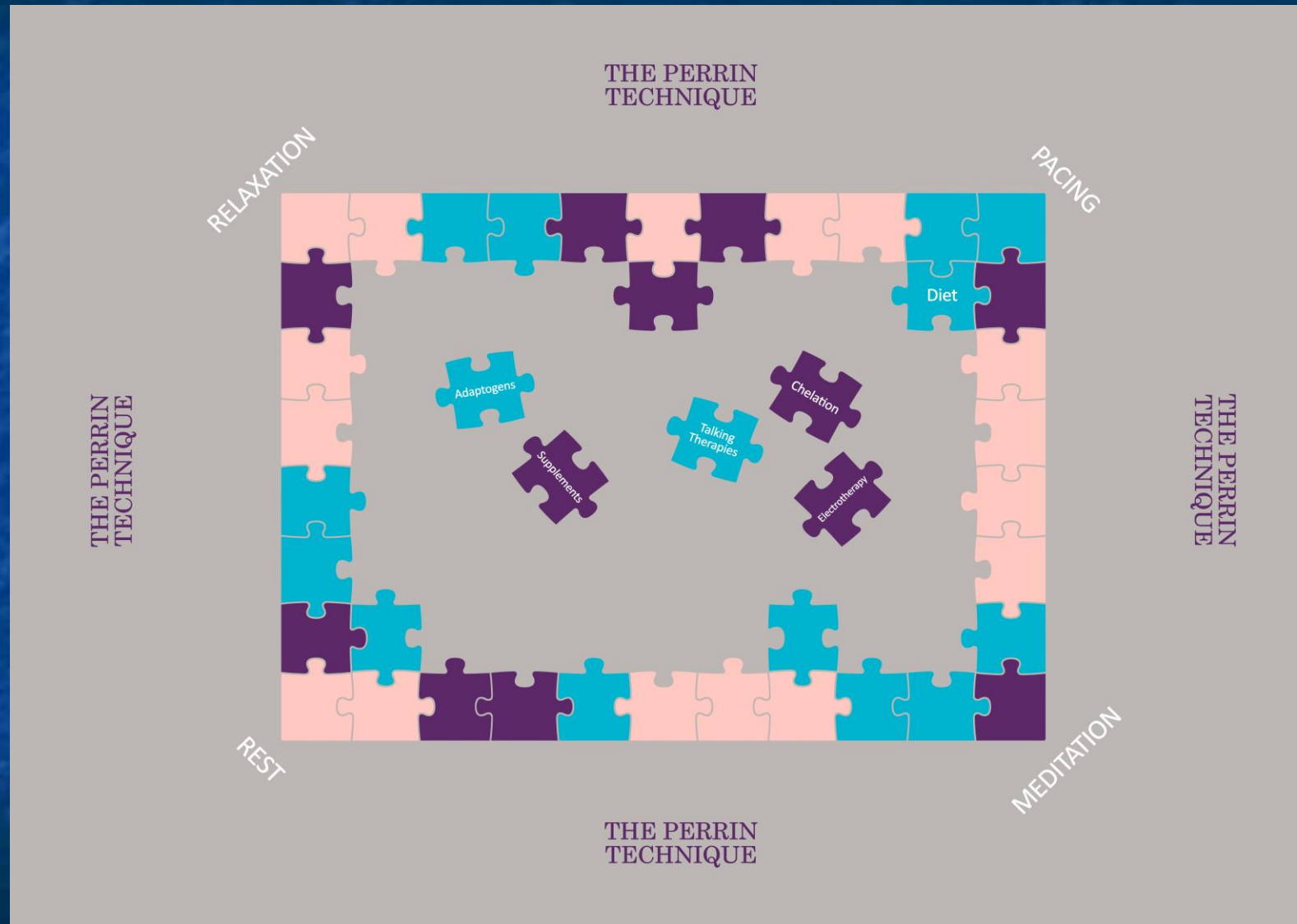


Jade18 months later





The Jigsaw Puzzle Analogy

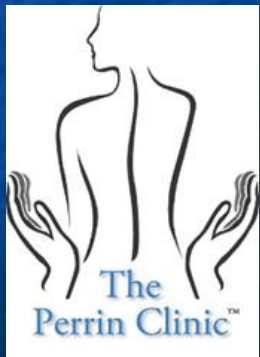


THE PERFECT JIGSAW PUZZLE PICTURE OF HEALTH

THANK YOU



VERY MUCH



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