

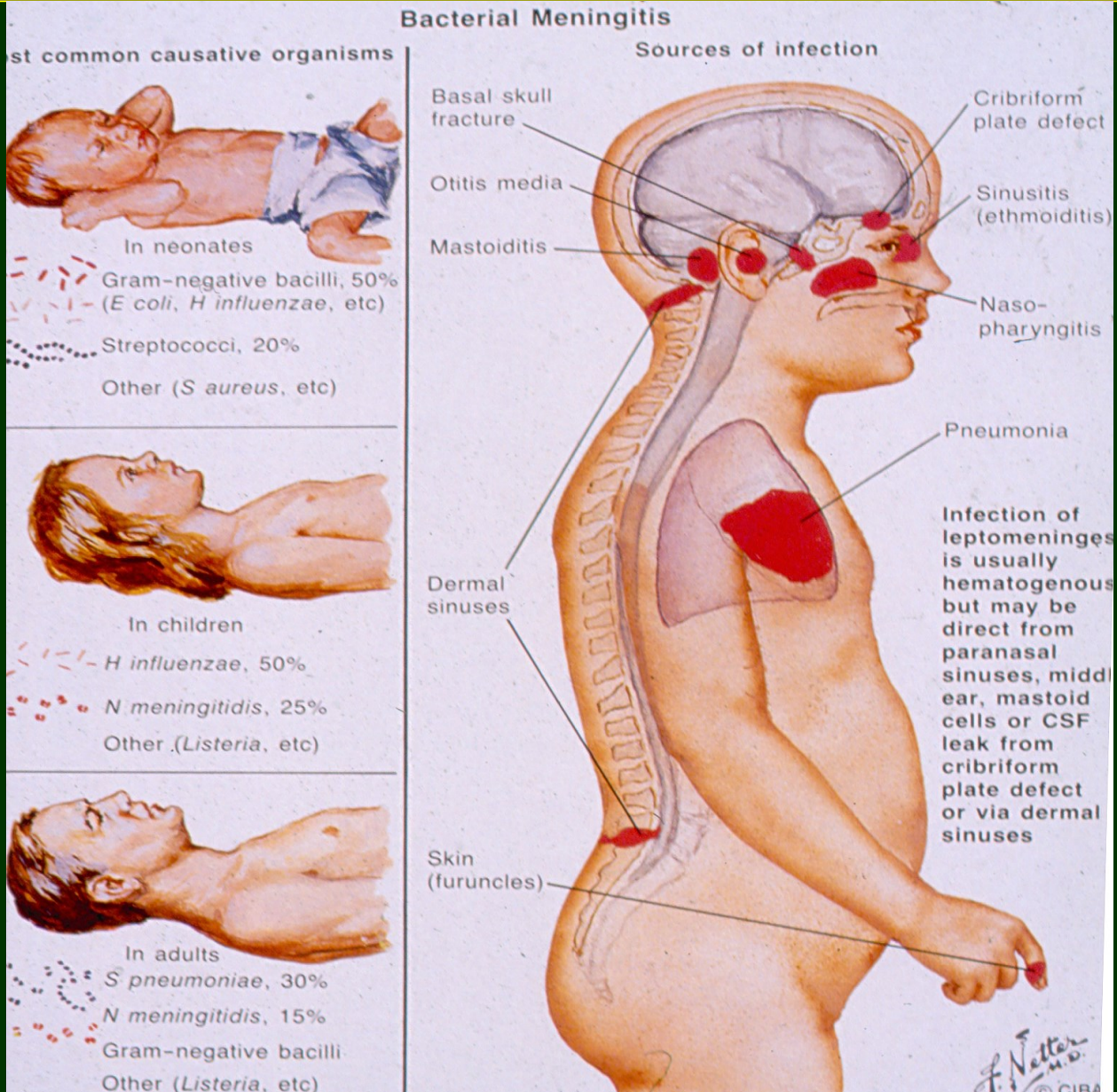
ΛΟΙΜΩΞΕΙΣ Κ.Ν.Σ.

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Ιατρικής Σχολής Ε.Κ.Π.Α.
(Πανεπιστημιακό Γενικό Νοσοκομείο «Αττικόν»)

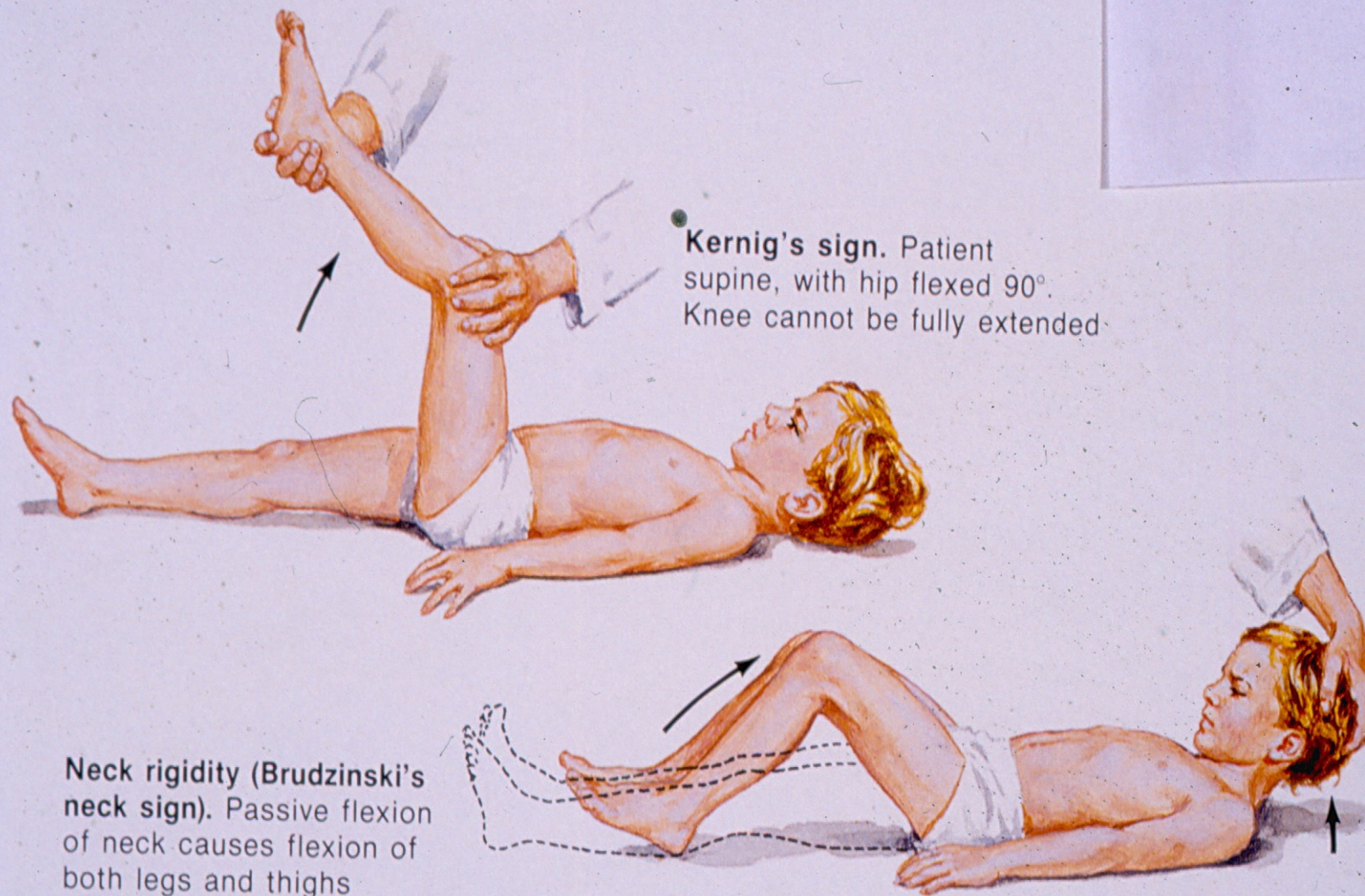
ΟΡΟΛΟΓΙΑ

- πολιο - / λευκο- + εγκεφαλίτις / μυελίτις
- παχυ- / (λεπτο-) + μηνιγγίτις

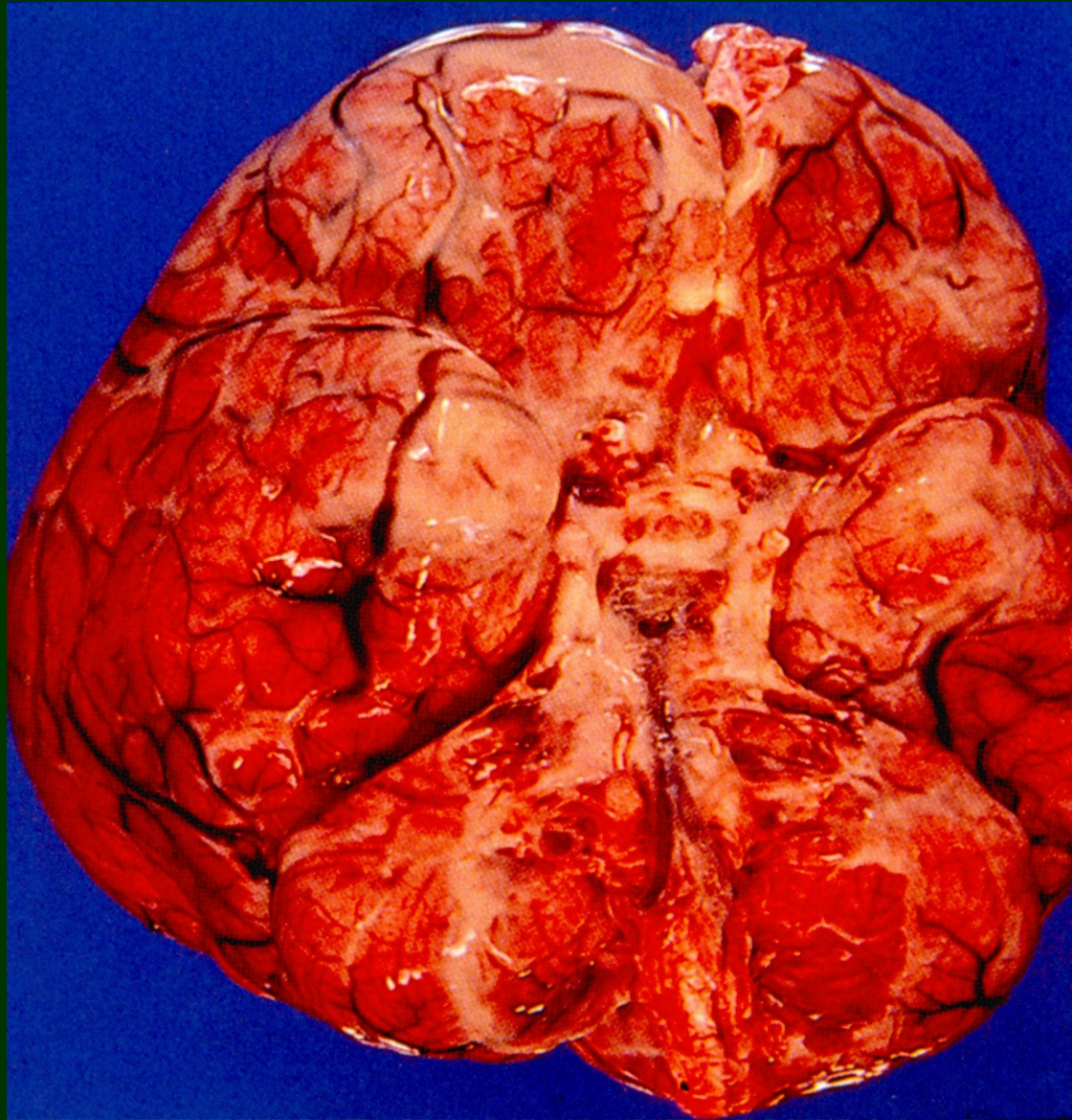
ΒΑΚΤΗΡΙΑΚΗ ΜΗΝΙΓΓΙΤΙΣ: ΑΙΤΙΟΛΟΓΙΑ, ΠΑΘΟΓΕΝΕΙΑ



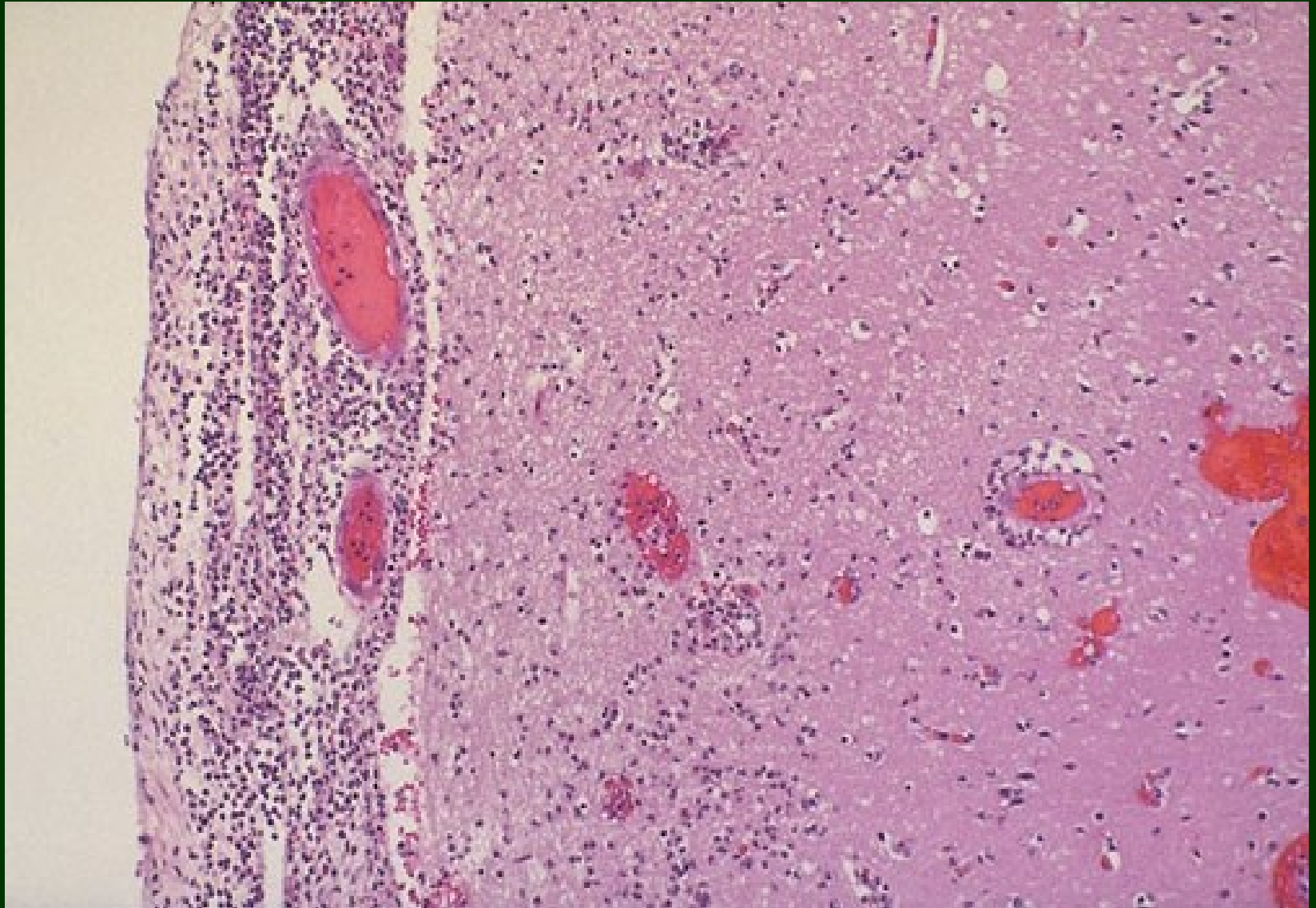
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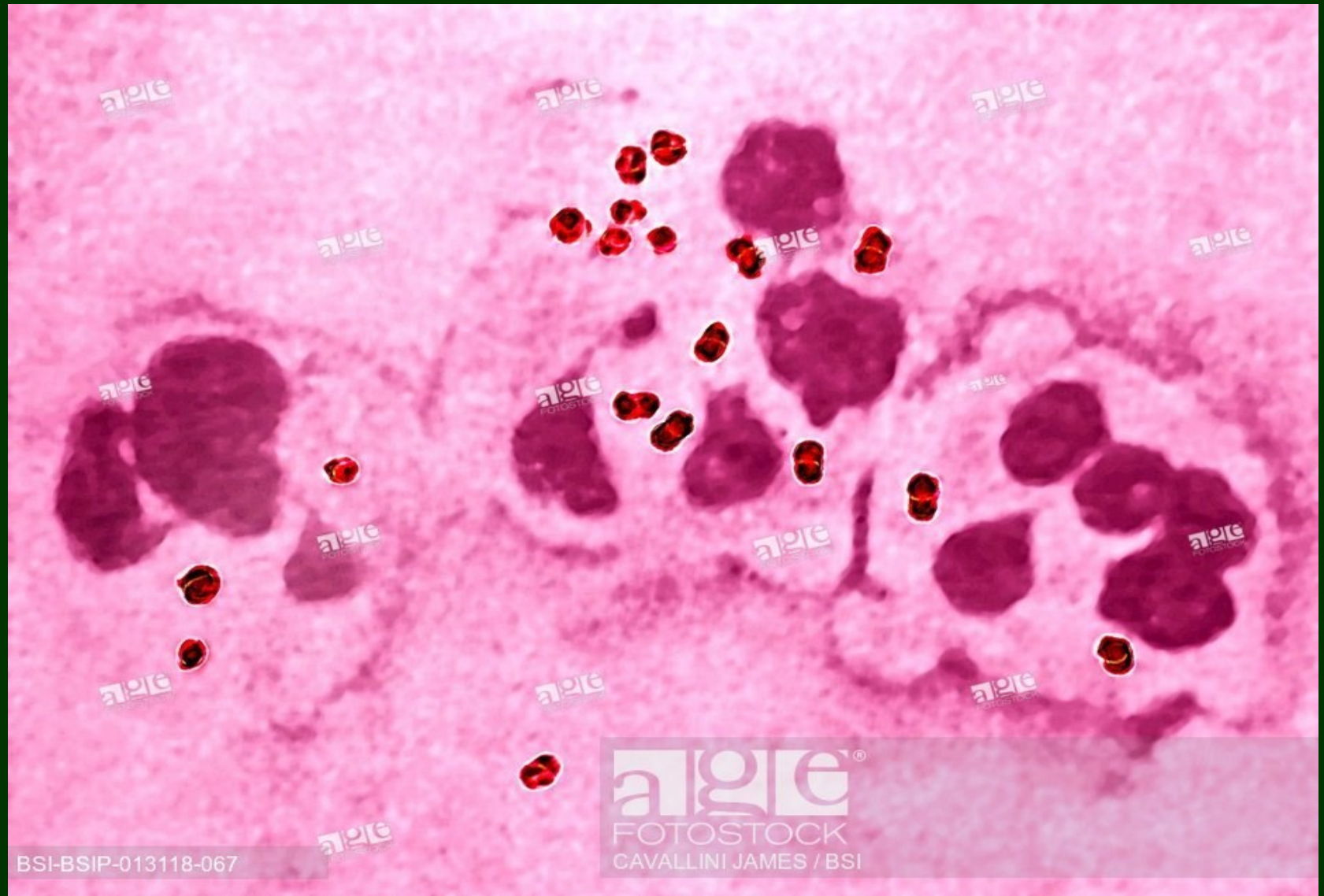
ΒΑΚΤΗΡΙΑΚΗ ΜΗΝΙΓΓΙΤΙΣ



ΒΑΚΤΗΡΙΑΚΗ ΜΗΝΙΓΓΙΤΙΣ



ΜΗΝΙΓΓΙΤΙΑΟΚΟΚΚΟΣ (NEISSERIA MENINGITIDIS)



Neisseria meningitidis (Meningococcus)

- Gram-negative diplococcus, capsulating with serotypes: A, B, C, W135, Y and X (very rare)
- Colonizes the nasopharynx of approximately 10% of the human population (carrier state)
- Spreads by respiratory or throat secretions (spit, kissing), and spread is promoted by changes in housing and close quarters (soldiers, college students)
- Can invade healthy individuals to establish bacteremia and meningitis; cases are typically sporadic (95%)
- Outbreaks (5%) occur in close communities over a short period of time and are caused by the same isolate.
- Colonization involves pili and Opc/Opa proteins, invasion requires capsule and factor H binding protein (fHBP), molecules that are antigenically variable
- Meningitis is a severe disease with high case fatality (up to 15%) and long term disabilities (retardation, loss of limb) in survivors (15-30%)

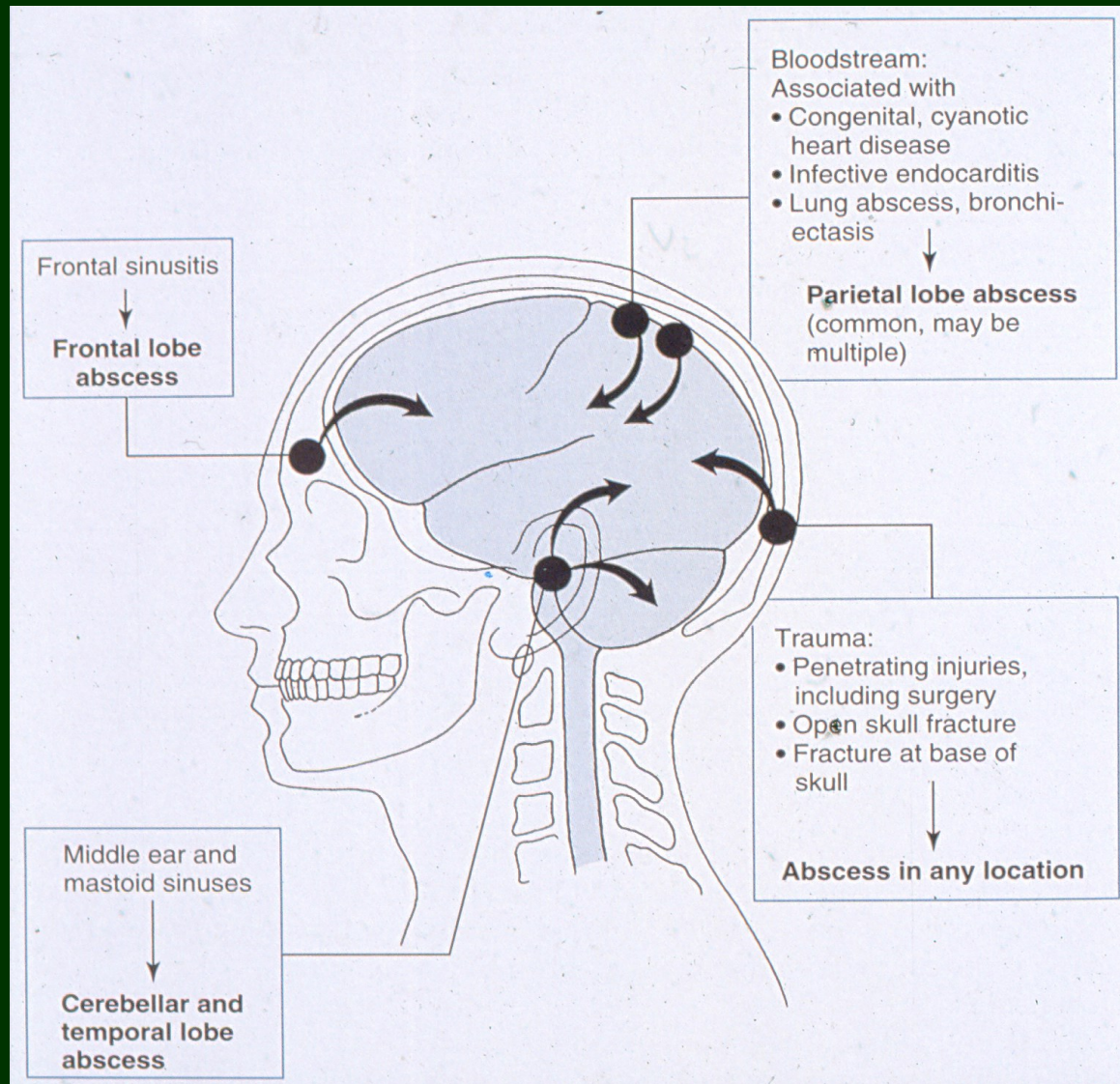
ΜΗΝΙΓΓΙΤΙΔΟΚΟΚΚΑΙΜΙΑ



ΣΥΝΔΡΟΜΟ WATERHOUSE-FRIDERICHSEN

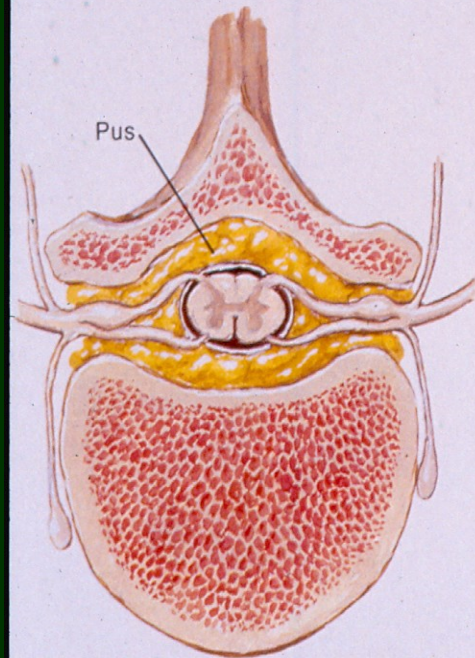


ΕΓΚΕΦΑΛΙΚΟ ΑΠΟΣΤΗΜΑ



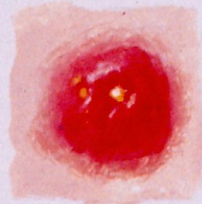
ΕΠΙΣΚΛΗΡΙΔΙΟ ΑΠΟΣΤΗΜΑ

C. Epidural abscess



Sources of infection

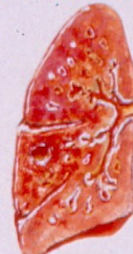
Hematogenous



Skin:
furuncle,
carbuncle



Urinary tract:
renal, perirenal or
prostatic abscess;
pyelonephritis



Lung:
pneumonia,
abscess,
bronchiectasis

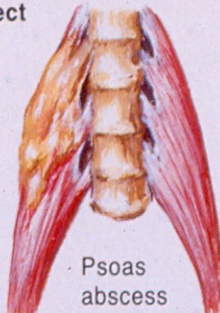


Dental:
abscess

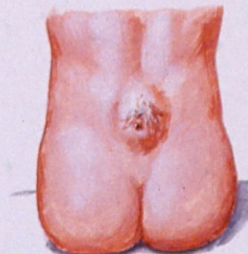


Throat:
pharyngitis,
tonsillitis,
abscess

Direct



Psoas
abscess



Dermal sinus



Decubitus ulcer,
direct or hematogenous



Pain on percussion
of spine.
Local warmth
may be noted

ΑΠΟΣΤΗΜΑ ΕΓΚΕΦΑΛΟΥ



Figure 2: Abscesses in the right basal ganglia and thalamus (arrow) and the left parietal (arrowheads) regions.

ΚΑΤΑΡΓΗΣΗ ΑΙΜΑΤΕΓΚΕΦΑΛΙΚΟΥ ΦΡΑΓΜΟΥ

The BBB can be broken down by:

Hypertension (high blood pressure): high blood pressure opens the BBB

Development: the BBB is not fully formed at birth.

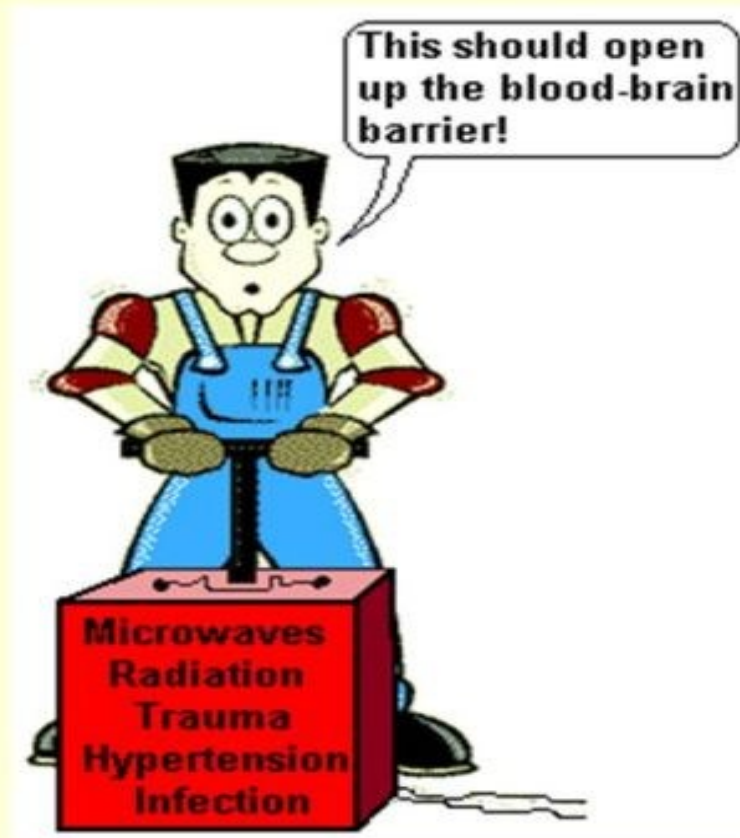
Hyperosmolality: a high concentration of a substance in the blood can open the BBB.

Microwaves: exposure to microwaves can open the BBB.

Radiation: exposure to radiation can open the BBB.

Infection: exposure to infectious agents can open the BBB.

Trauma, Ischemia, Inflammation, Pressure: injury to the brain can open the BBB.



ΦΥΜΑΤΙΩΣΗ ΚΝΣ: ΠΑΘΟΦΥΣΙΟΛΟΓΙΑ

- πάντοτε δευτερογενής
- αιματογενής διασπορά μυκοβακτηριδίου στο ΚΝΣ
- αρχικά σχηματισμός μικρών εστιών (του Rich): μήνιγγες, υποχωριοειδείς και υποεπενδυματικές θέσεις του εγκεφάλου, νωτιαίος μυελός
- επανενεργοποίηση λόγω ενδογενούς (ανοσοανεπάρκειες) ή επίκτητης (υποσιτισμός, χημειοθεραπευτικά/ανοσοκατασταλτικά, μεταμόσχευση, λοιμώξεις [ιλαρά, AIDS],...) δυσπραγίας κυτταρικής ανοσίας
- δυνητικός ρόλος του TNF α

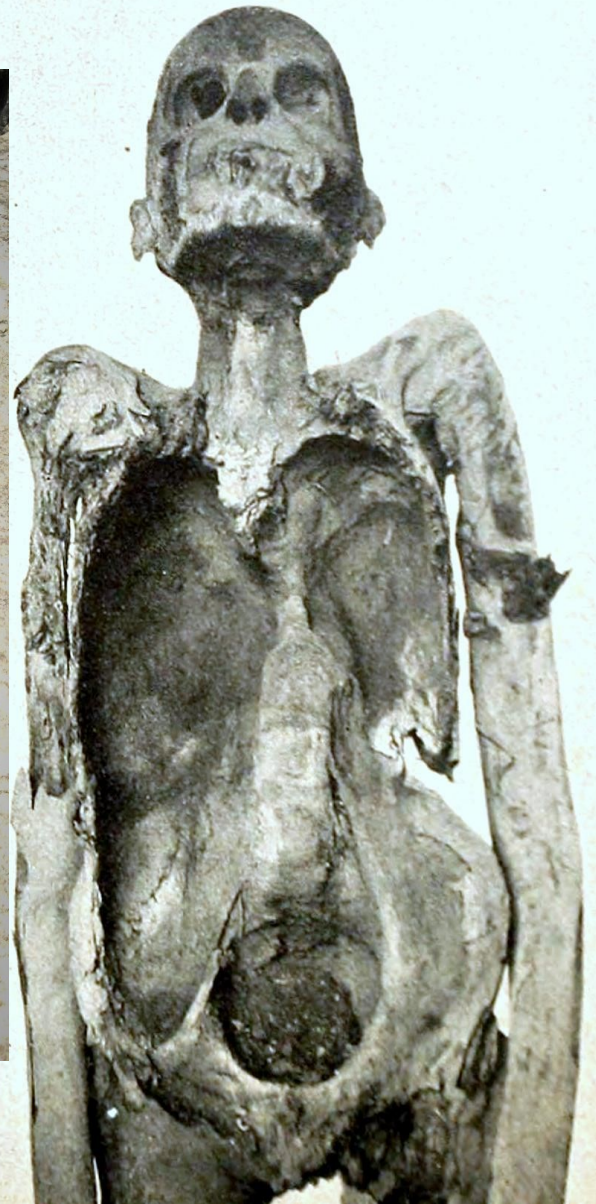
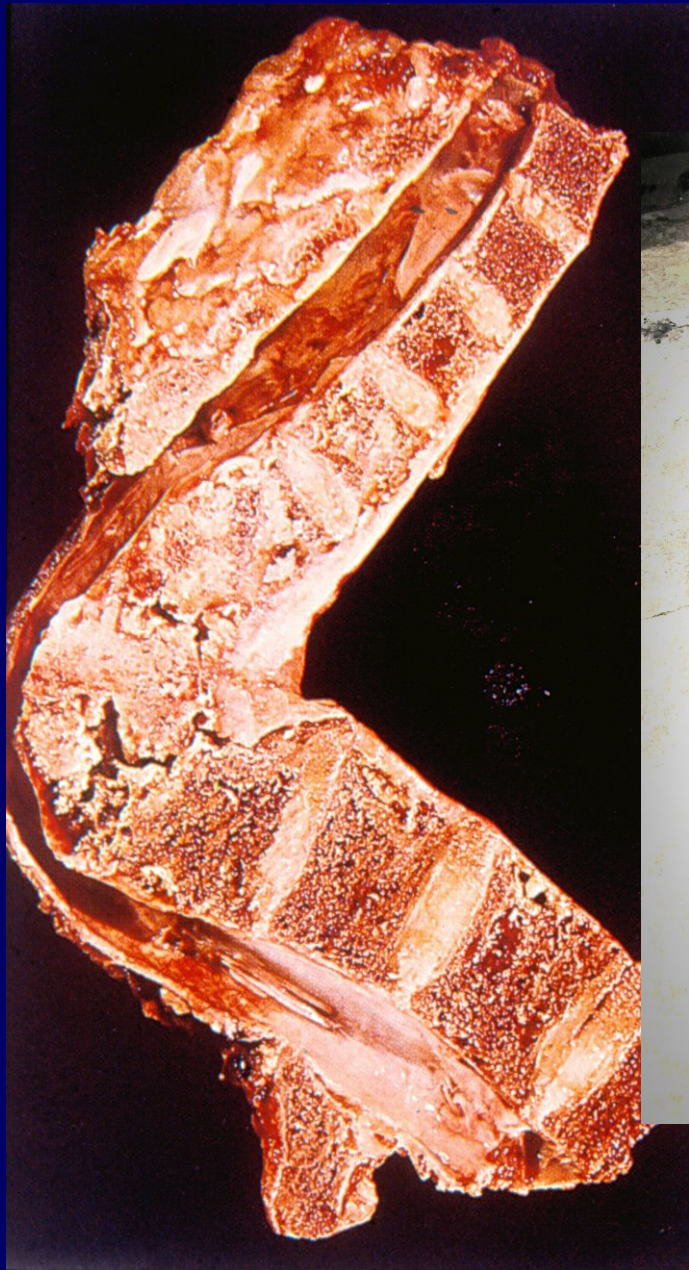
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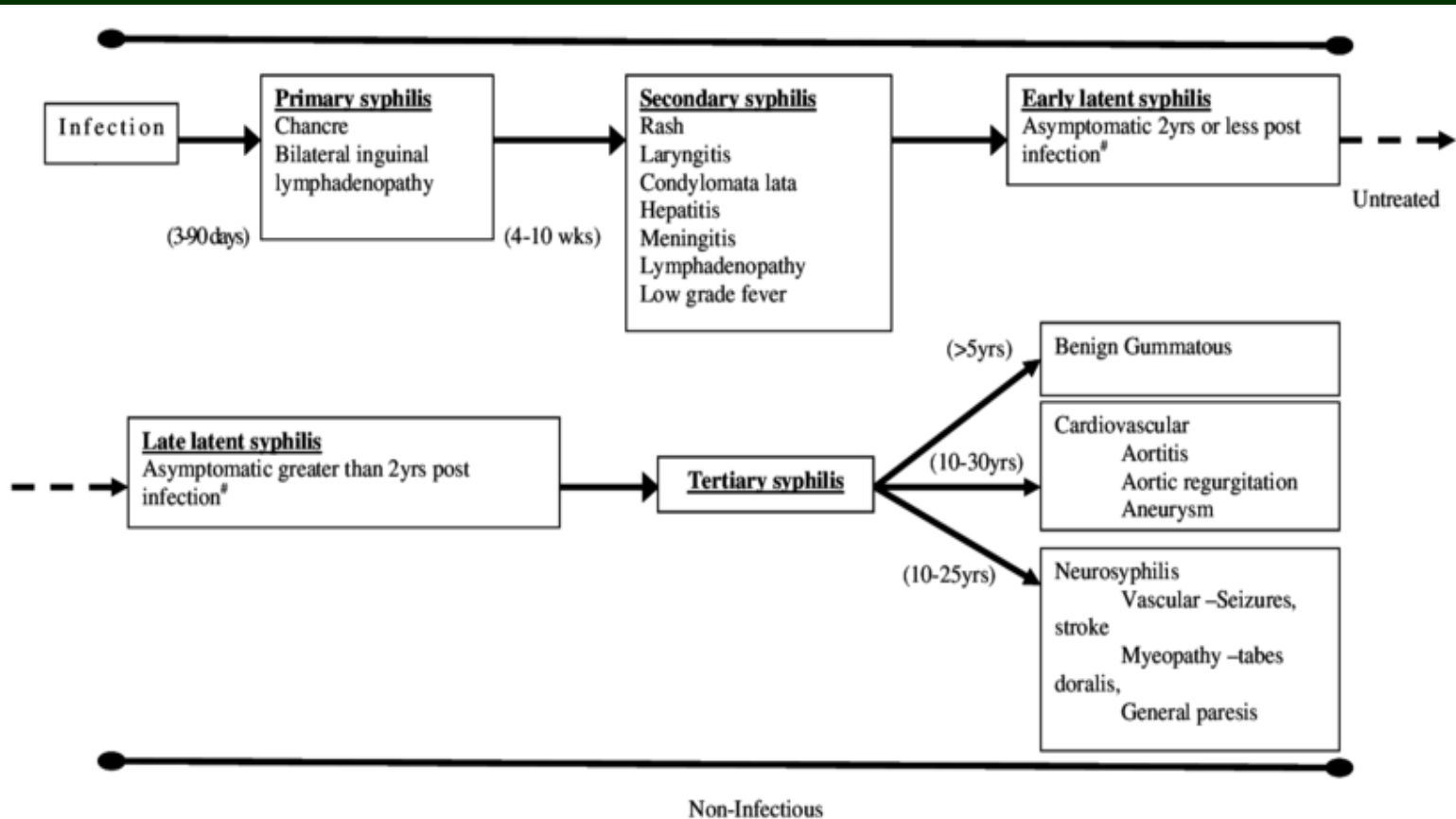
ΦΥΜΑΤΩΜΑ ΕΓΚΕΦΑΛΟΥ



ΦΥΜΑΤΙΩΔΗΣ ΣΠΟΝΔΥΛΙΤΙΣ ΑΜΕΣΣ (ΝΟΣΟΣ ΡΟΤΤ)



ΣΤΑΔΙΑ ΣΥΦΙΛΗΣ

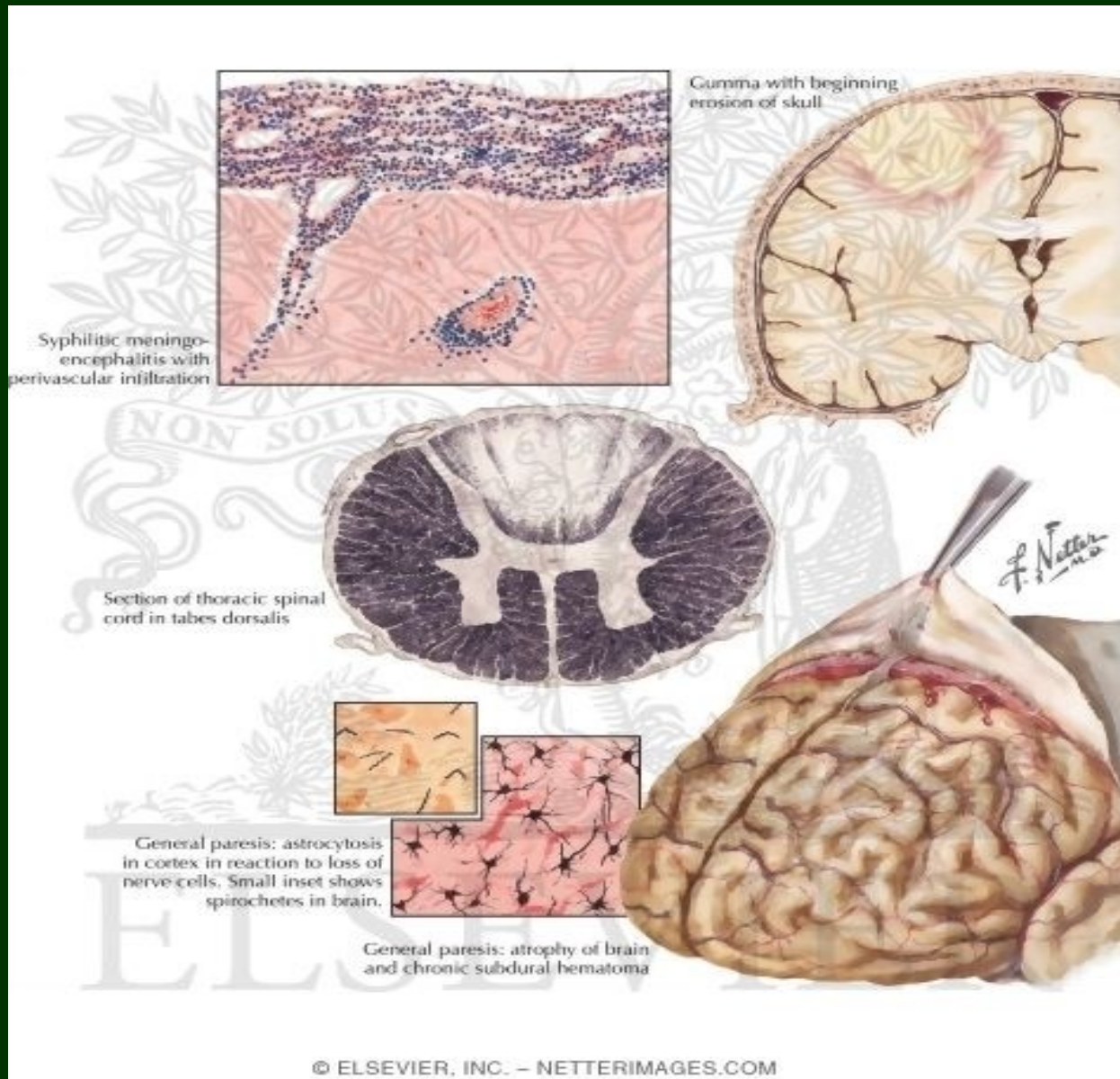


1yr or greater in US and European guidelines [10, 11]

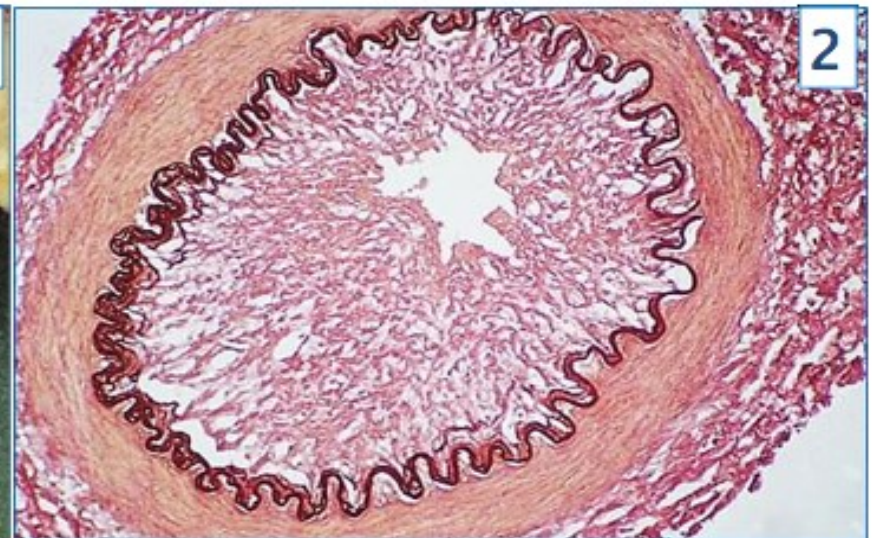
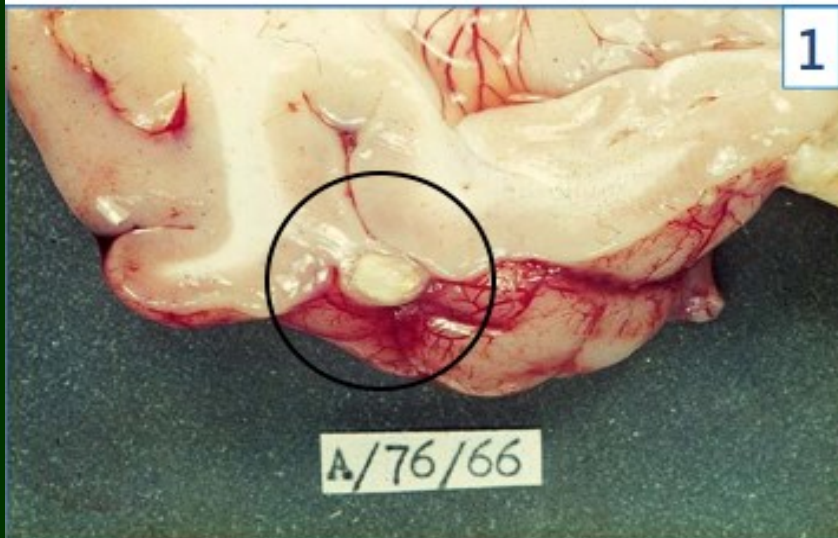
ΣΥΦΙΛΗ ΚΝΣ: ΠΑΘΟΦΥΣΙΟΛΟΓΙΑ

- είσοδος *Treponema pallidum* στο ΚΝΣ, ανοσιακές αντιδράσεις, αγγειίτις
- μπορεί να είναι (κλινικώς) **ασυμπτωματική** (ΕΝΥ!)
- μηνιγγοαγγειακή σύφιλη (ενδαρτηρίτις Heubner)
- κομμιώματα ΚΝΣ ή οστών
- προϊούσα γενική παράλυση (general paresis of the insane [GPI]): μικροέμφρακτα / ατροφία φλοιού, απώλεια νευρώνων, αστρογλοΐωση και μικρογλοΐωση
- νωτιαία φθίση (tabes dorsalis): απομυελίνωση δεματίων Goll και Burdach

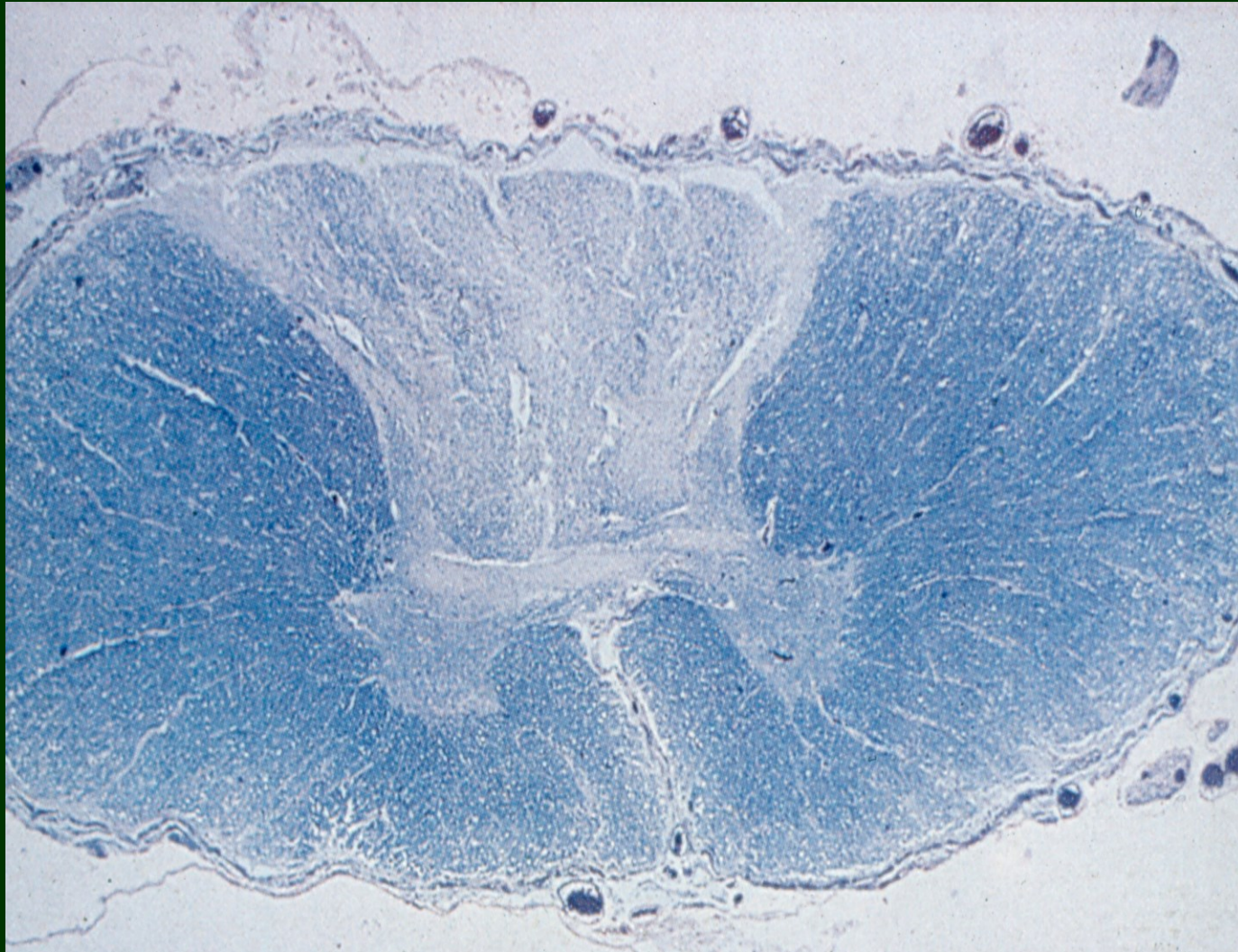
ΜΟΡΦΕΣ ΣΥΦΙΛΗΣ ΚΝΣ



ΣΥΦΙΑΙΔΙΚΟ ΚΟΜΜΙΩΜΑ ΕΓΚΕΦΑΛΟΥ



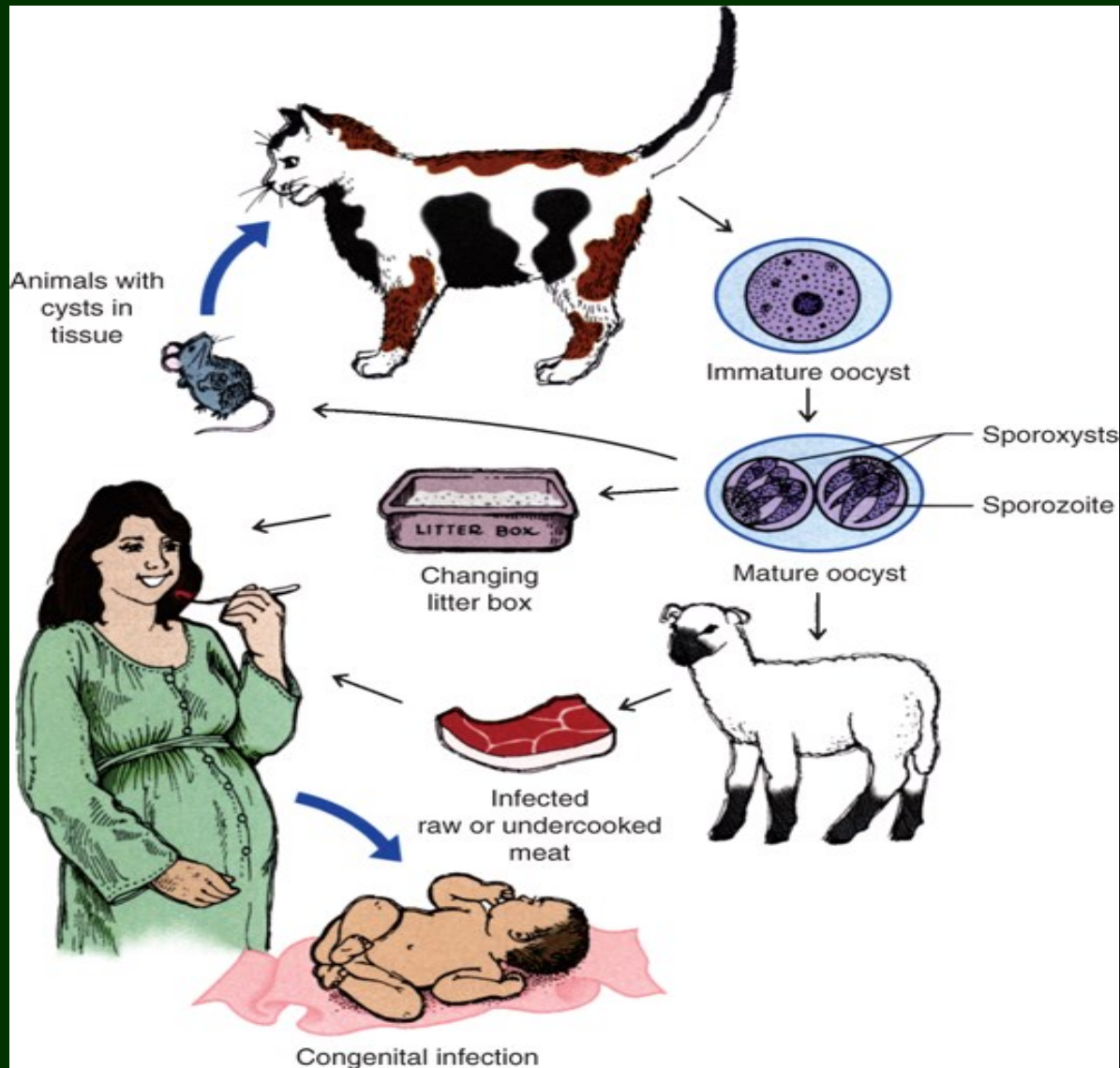
ΝΩΤΙΑΔΑ ΦΘΙΣΗ



ΑΡΘΡΟΠΑΘΕΙΑ CHARCOT ΣΕ ΝΩΤΙΑΔΑ ΦΘΙΣΗ



ΤΟΞΟΠΛΑΣΜΩΣΗ: ΠΑΘΟΓΕΝΕΙΑ



ΤΟΞΟΠΛΑΣΜΩΣΗ ΕΓΚΕΦΑΛΟΥ

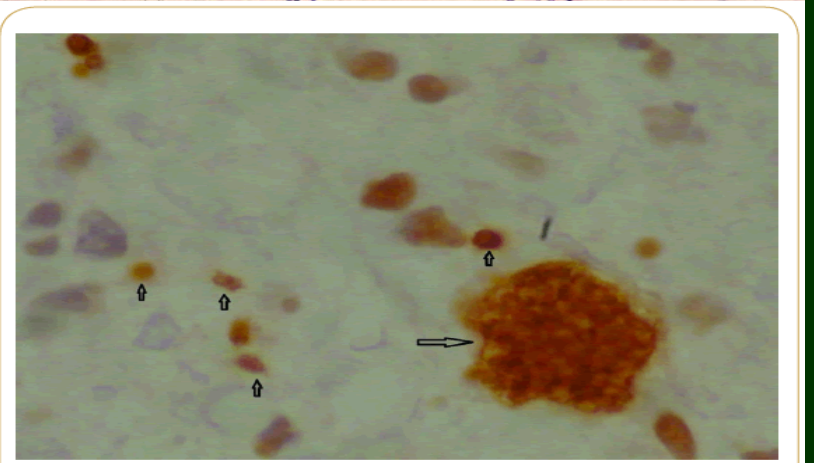
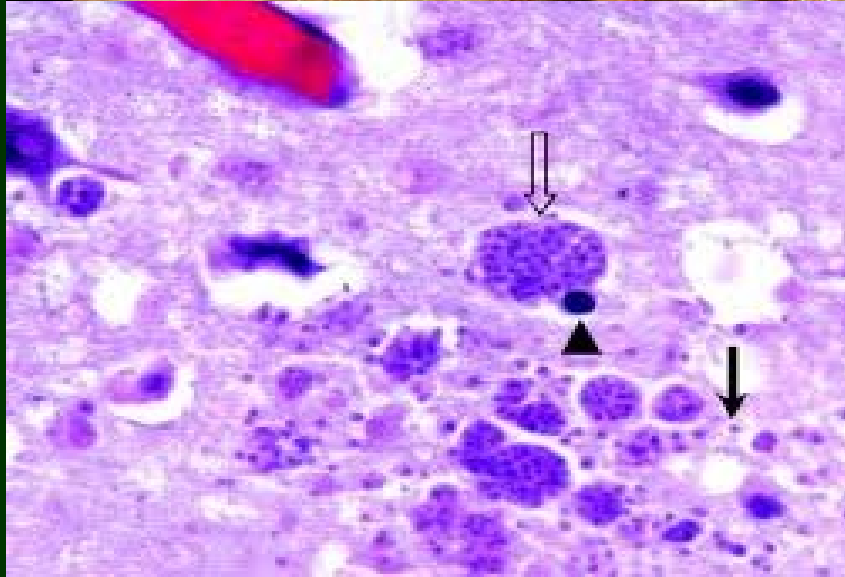
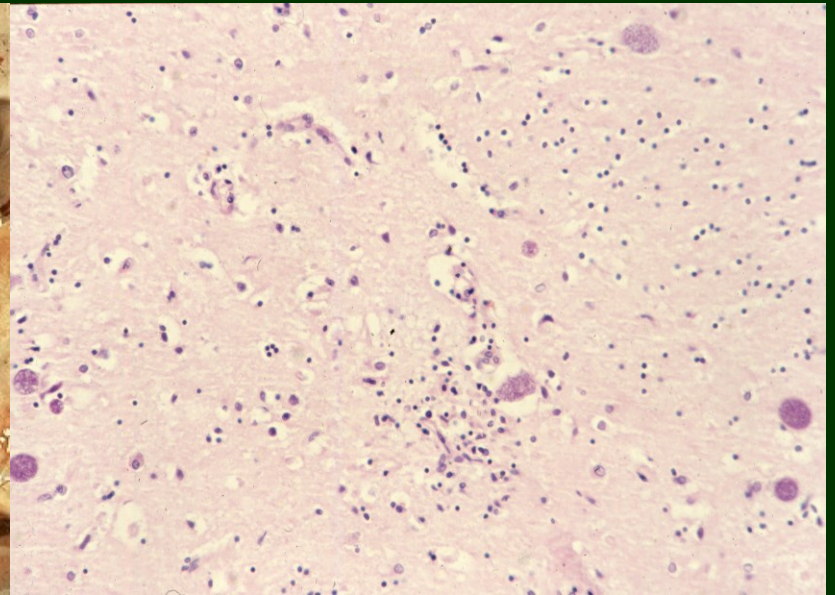
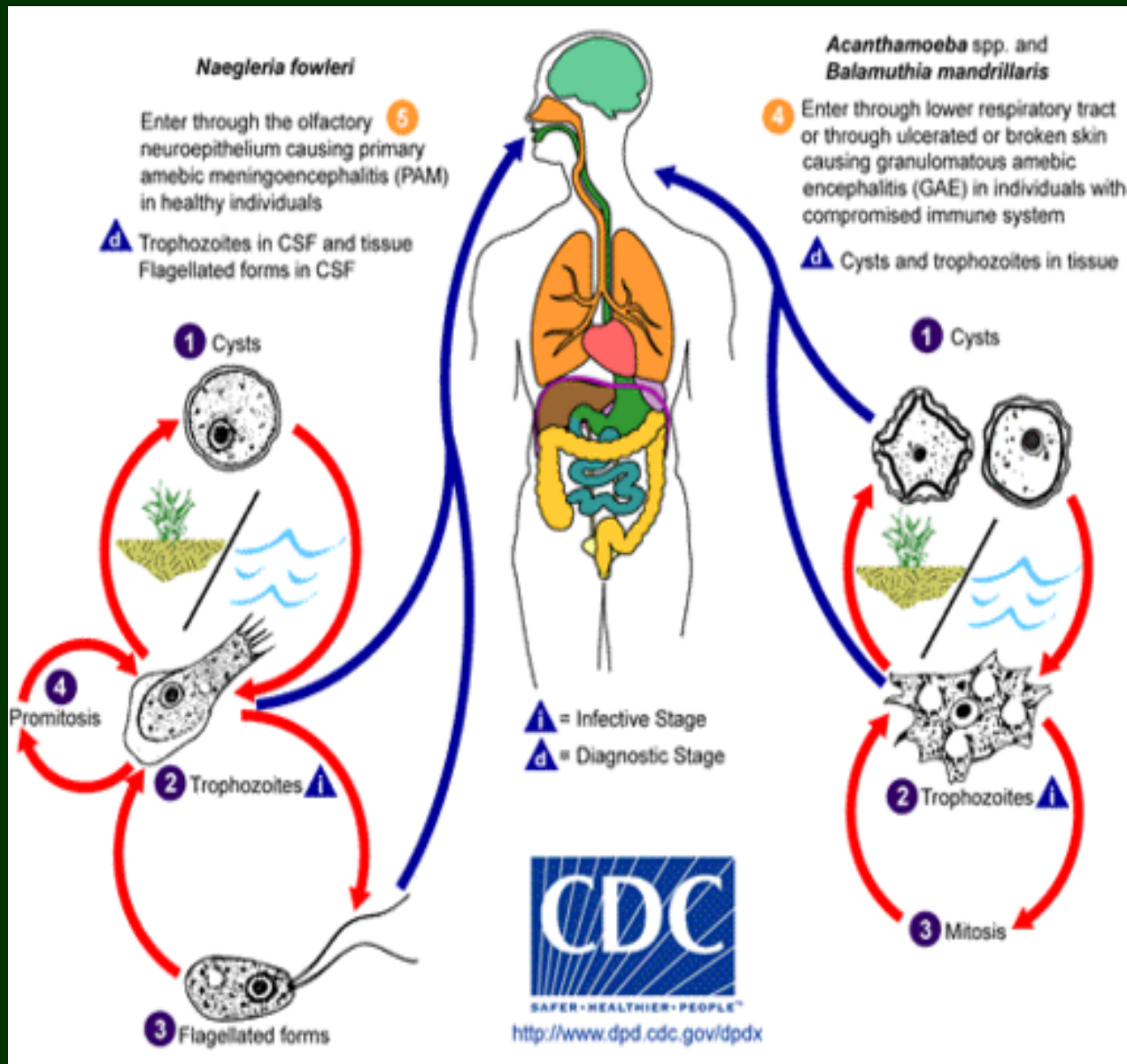


Figure 6 Toxoplasma immunostaining showing many bradyzoites in the cyst (Large Black Arrow) with small tachyzoites in the tissue around it (Small Black Arrows) (400X).

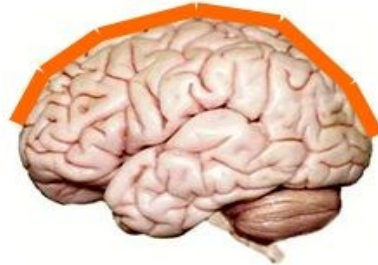
ΑΜΟΙΒΑΔΙΚΗ (ΜΗΝΙΓΓΟ)ΕΓΚΕΦΑΛΙΤΙΣ



ΑΜΟΙΒΑΔΙΚΗ (ΜΗΝΙΓΓΟ)ΕΓΚΕΦΑΛΙΤΙΣ

Naegleria meningoencephalitis

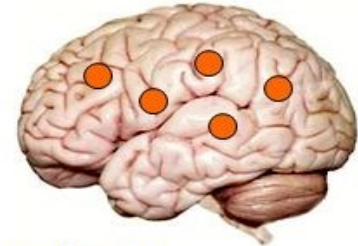
Children &
young adults



- Diffuse meningoencephalitis.
- Runs rapidly fatal course (death within 3-6 days)
- History of swimming in natural water or swimming pools.
- Infection occurs through:
The nasal route →
cribriform plate →
olfactory nerve → brain.

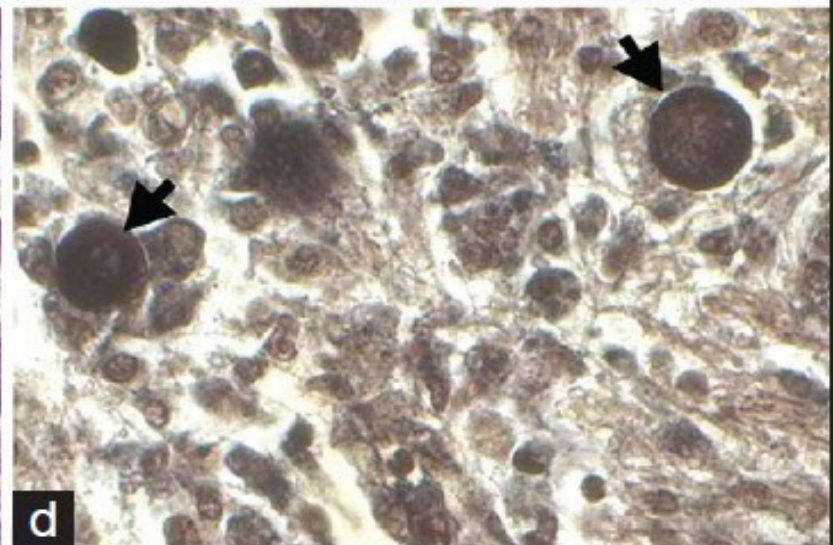
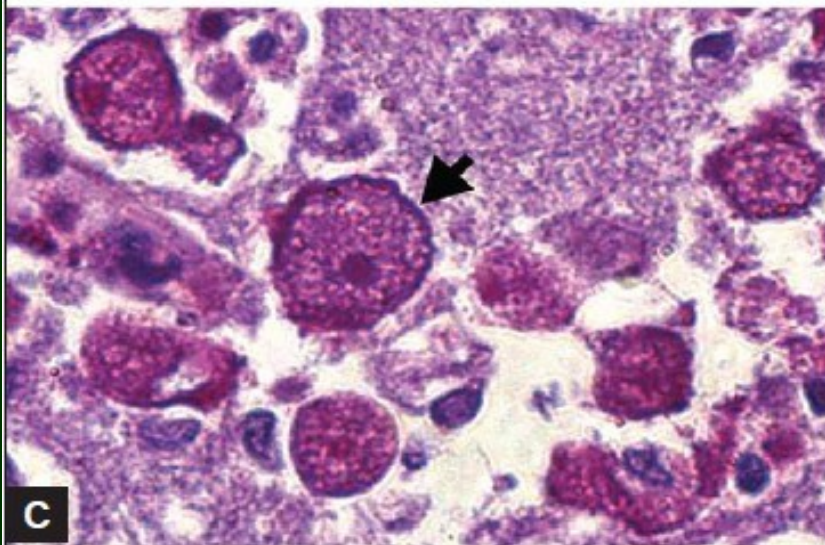
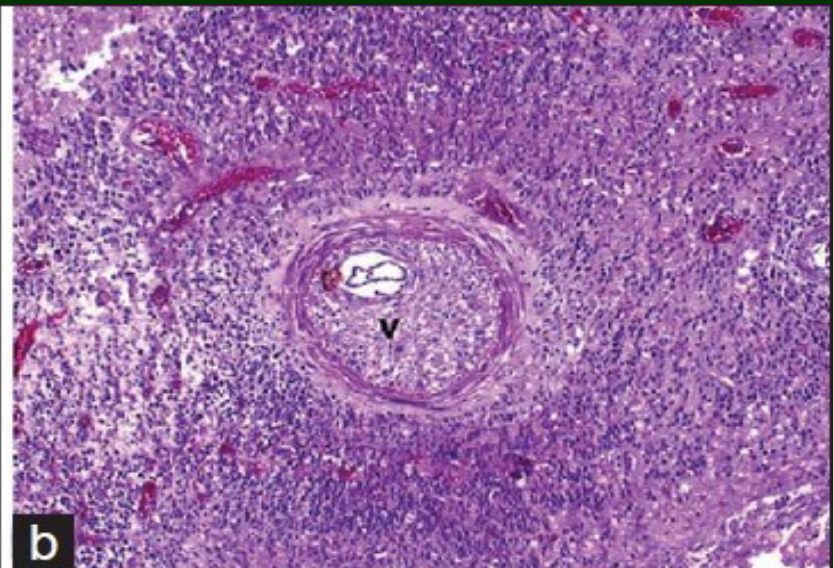
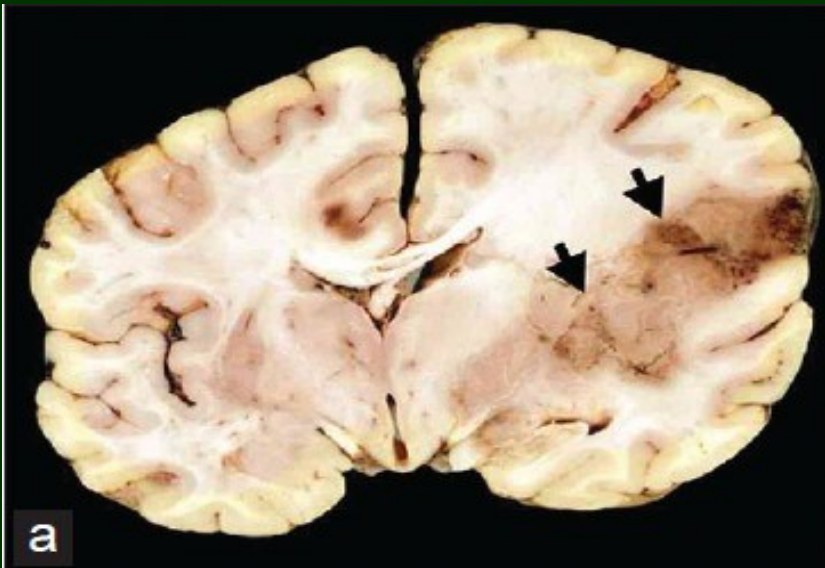
Acanthamoeba encephalitis

Debilitated
Chronically ill
low immunity

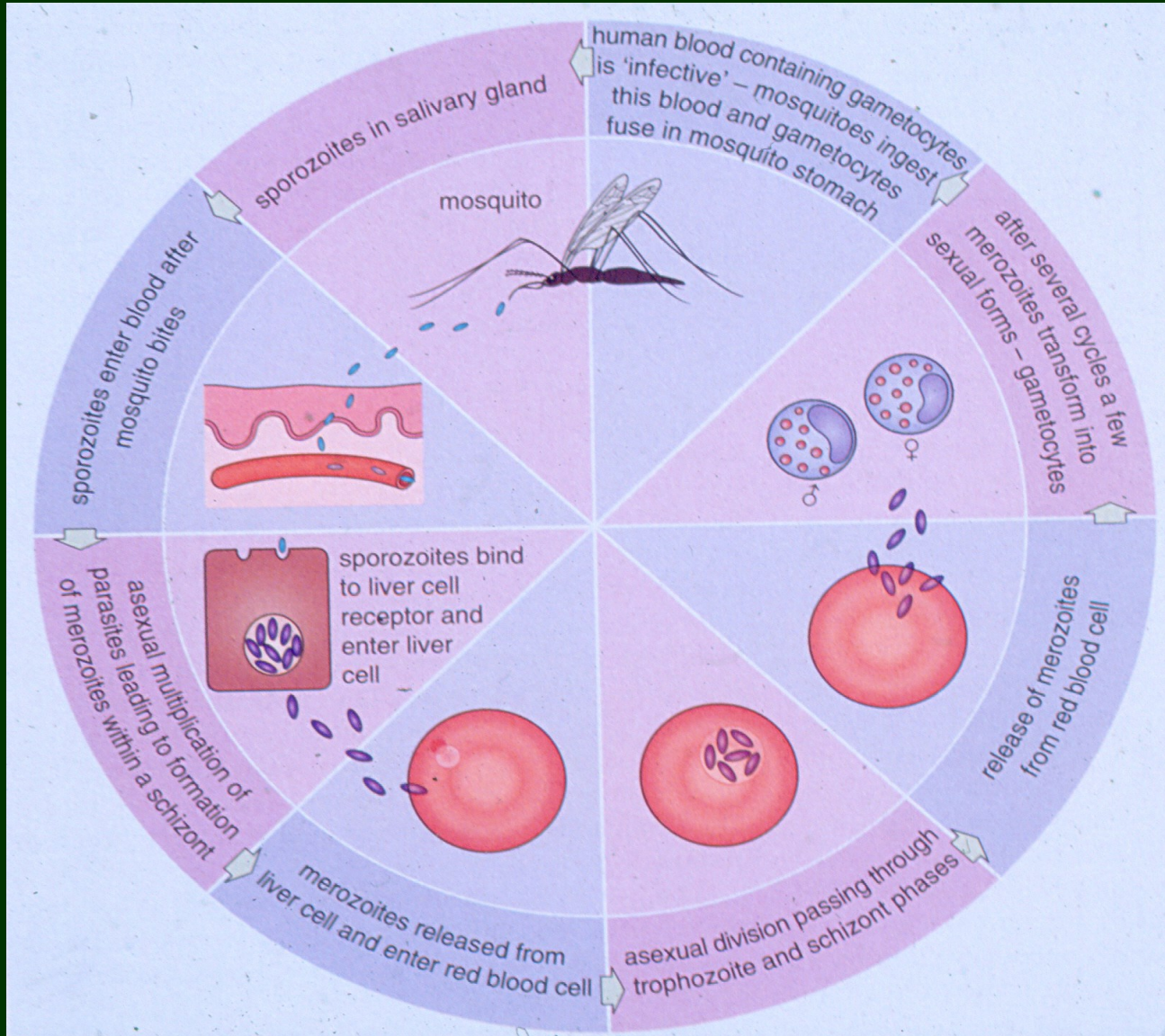


- Focal, granulomatous, space-occupying lesion.
- Runs sub-acute or chronic course (lasts for weeks, months or years)
- Not strongly associated with swimming.
- Infection occurs in:
Lower respiratory tract,
ulcerated skin or mucosa
blood stream → CNS

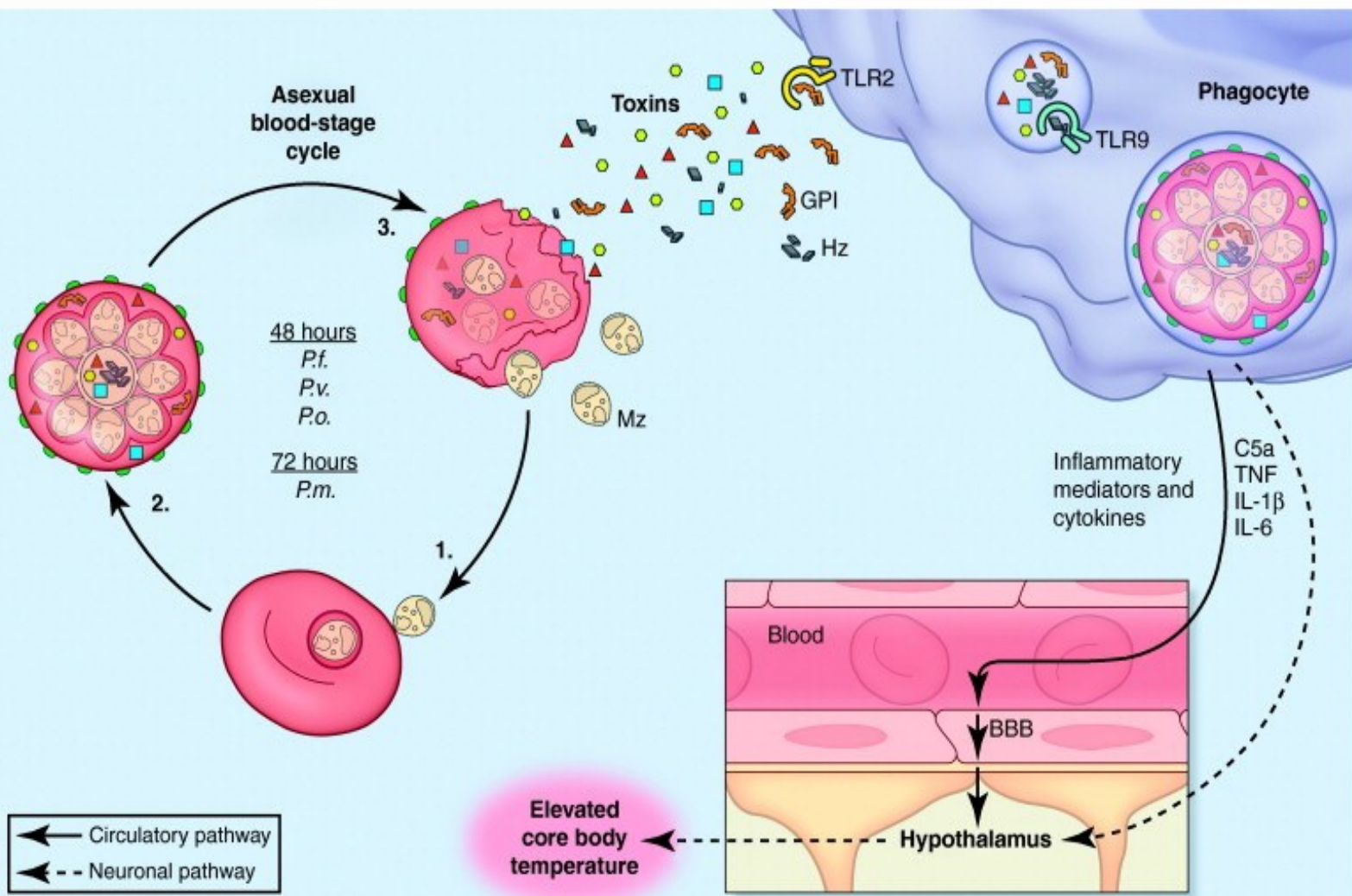
ΑΚΑΝΘΑΜΟΙΒΑΛΩΣΗ ΕΓΚΕΦΑΛΟΥ



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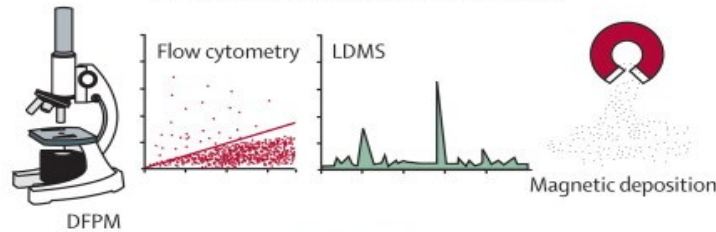


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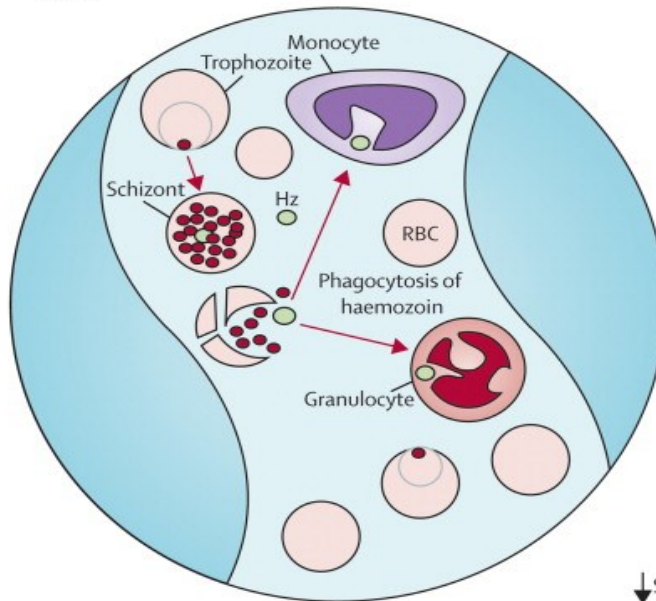
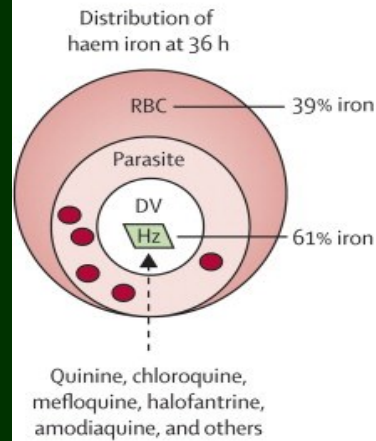


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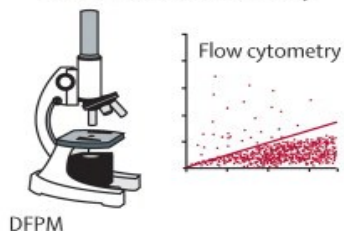
Haemozoin detection to diagnose malaria



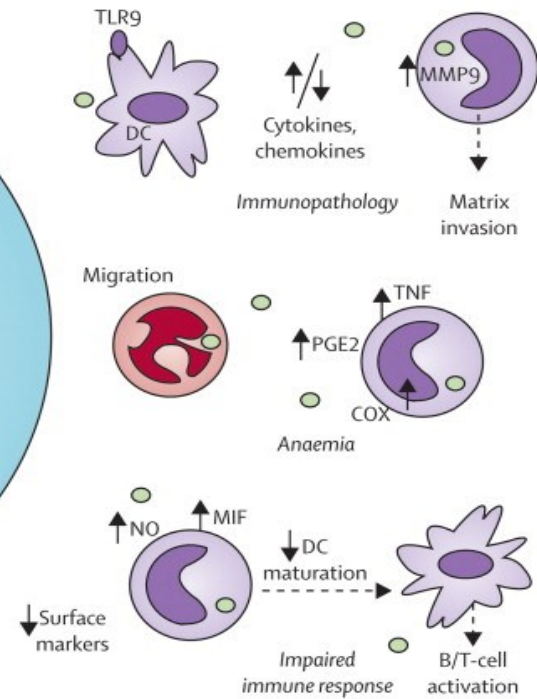
Haemozoin biocrystalisation as drug target



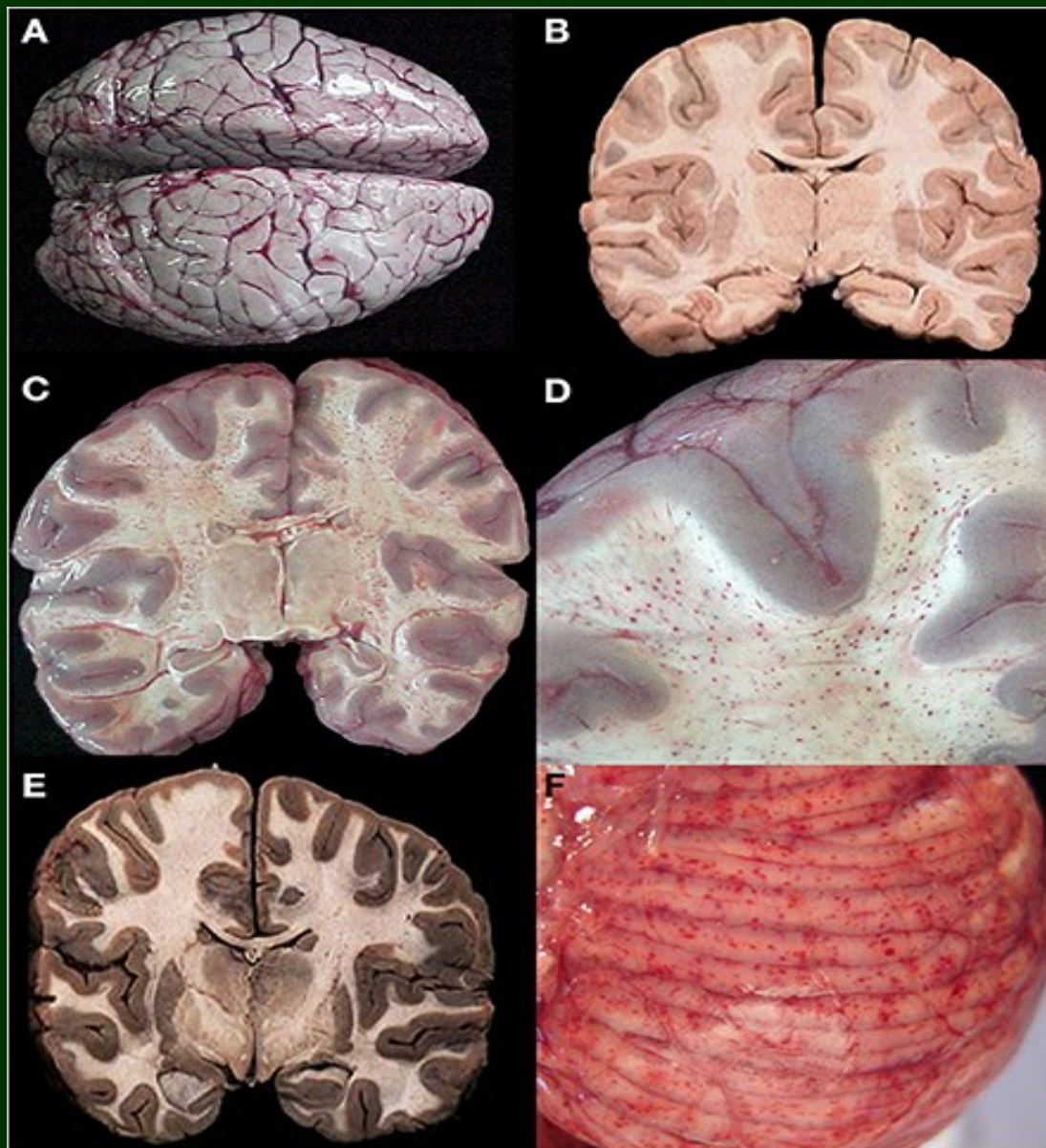
Haemozoin-containing monocytes/granulocytes as marker of disease severity



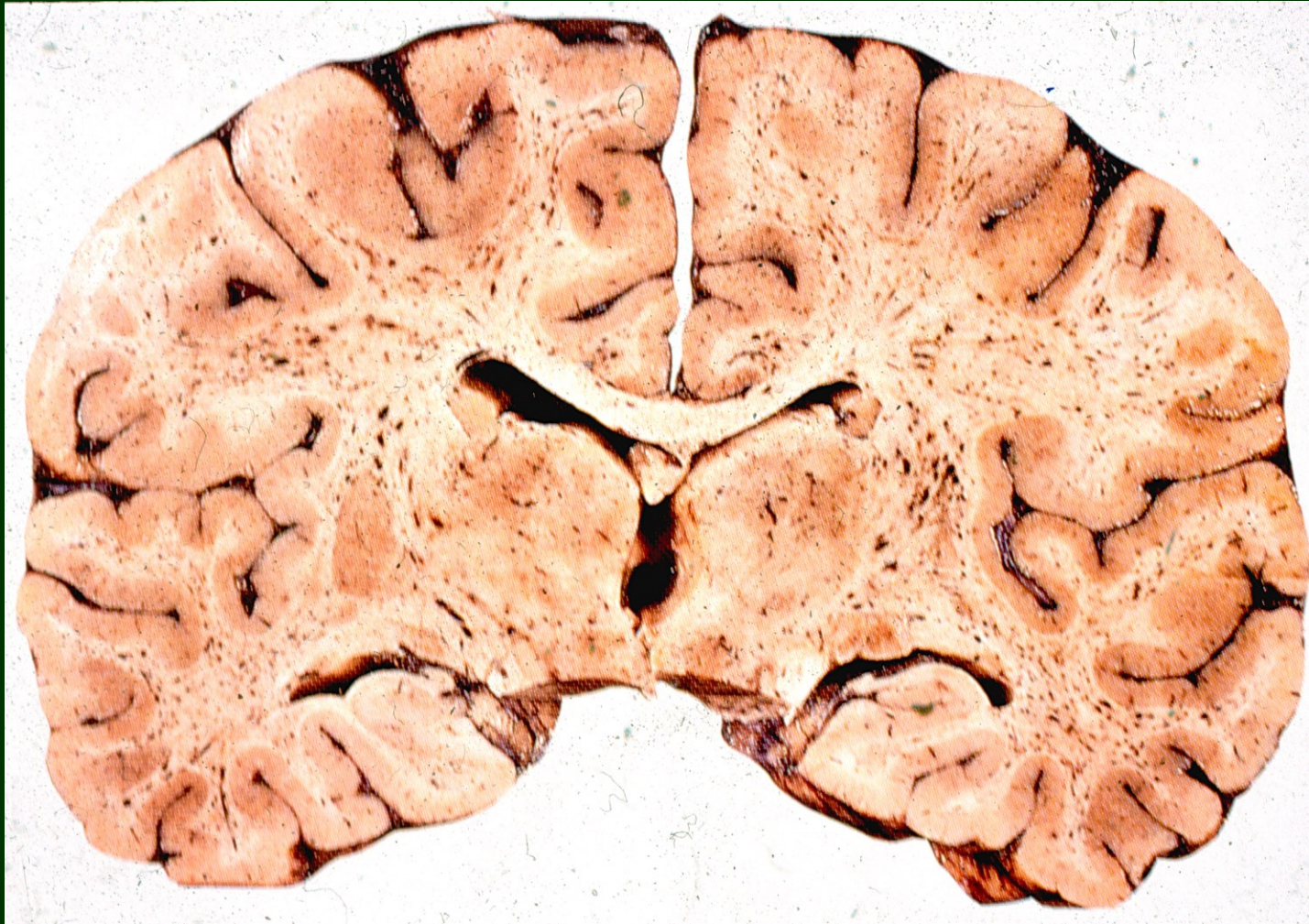
Haemozoin-induced immune modulation



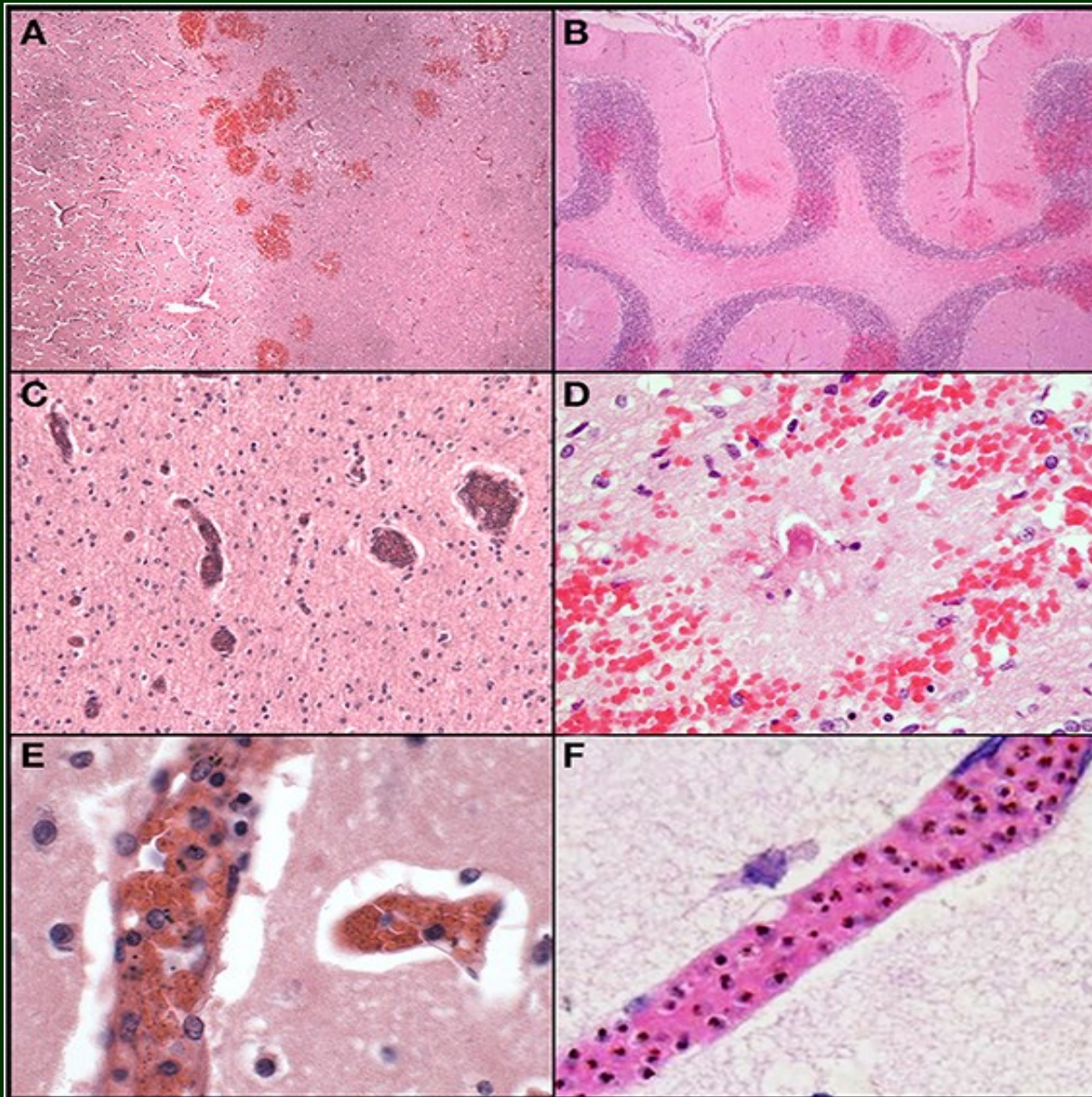
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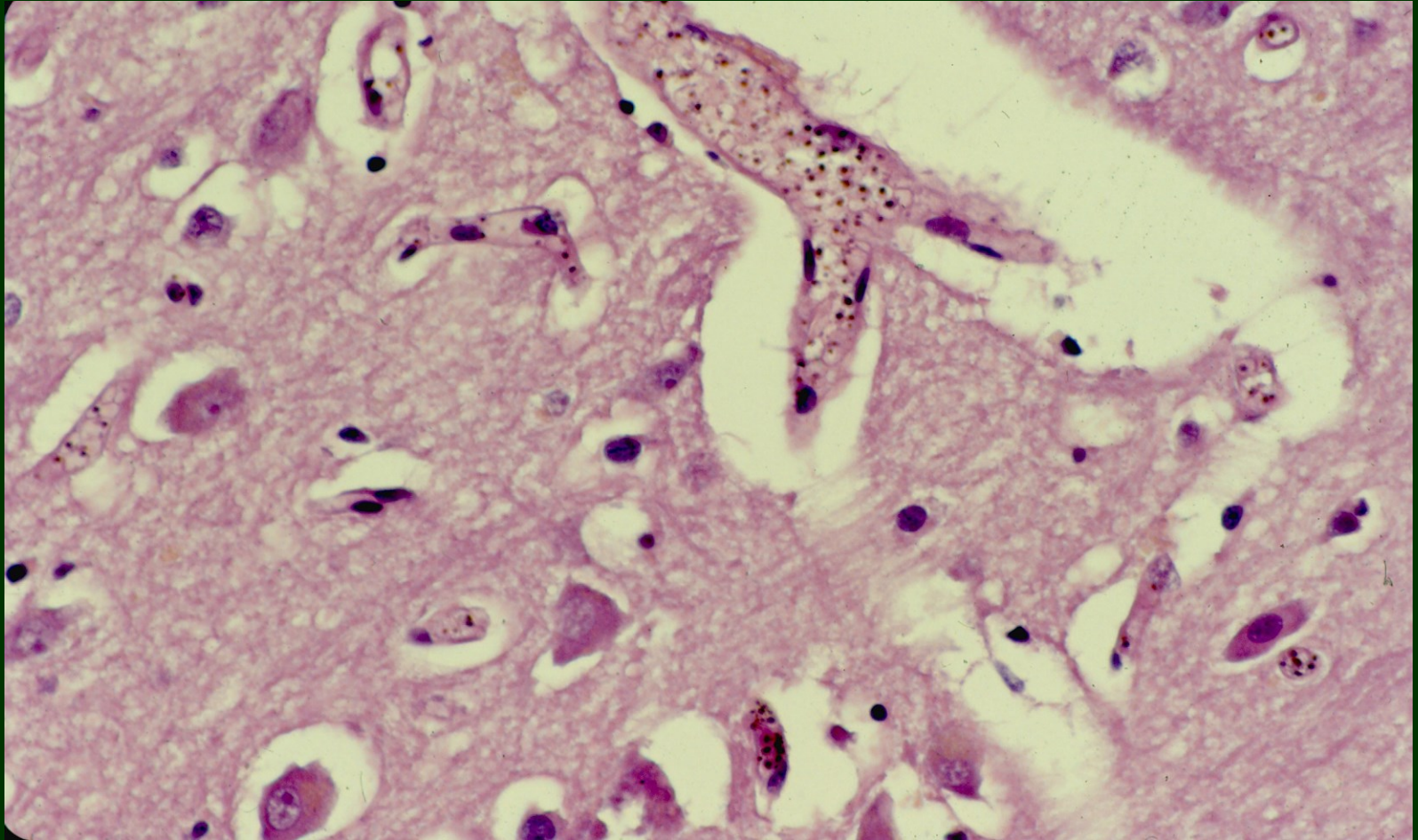
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ΕΛΟΝΟΣΙΑ ΕΓΚΕΦΑΛΟΥ



ΕΛΟΝΟΣΙΑ ΕΓΚΕΦΑΛΟΥ



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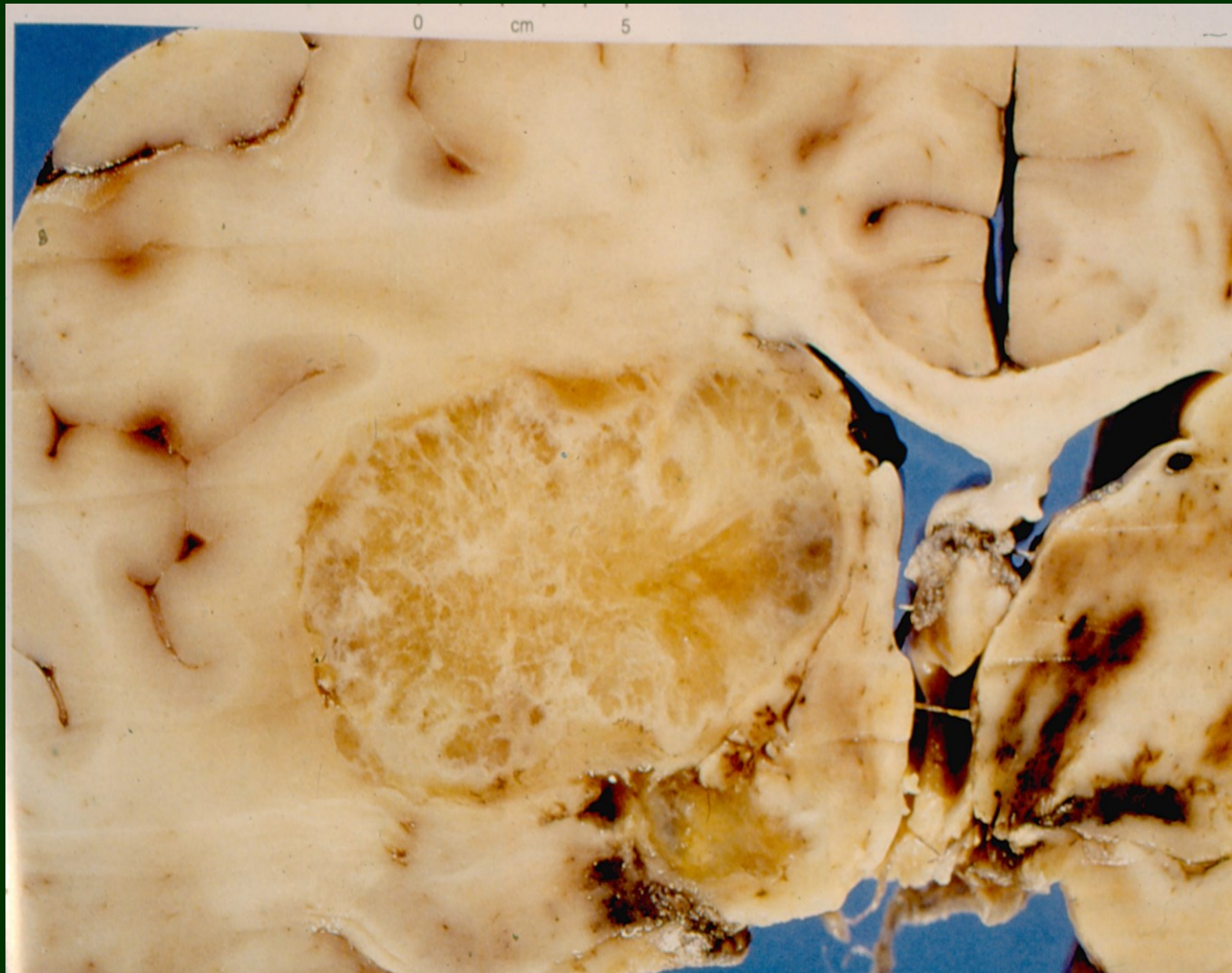


1-3-9. Numerous cysticerci in the brain. X0.5,
6.

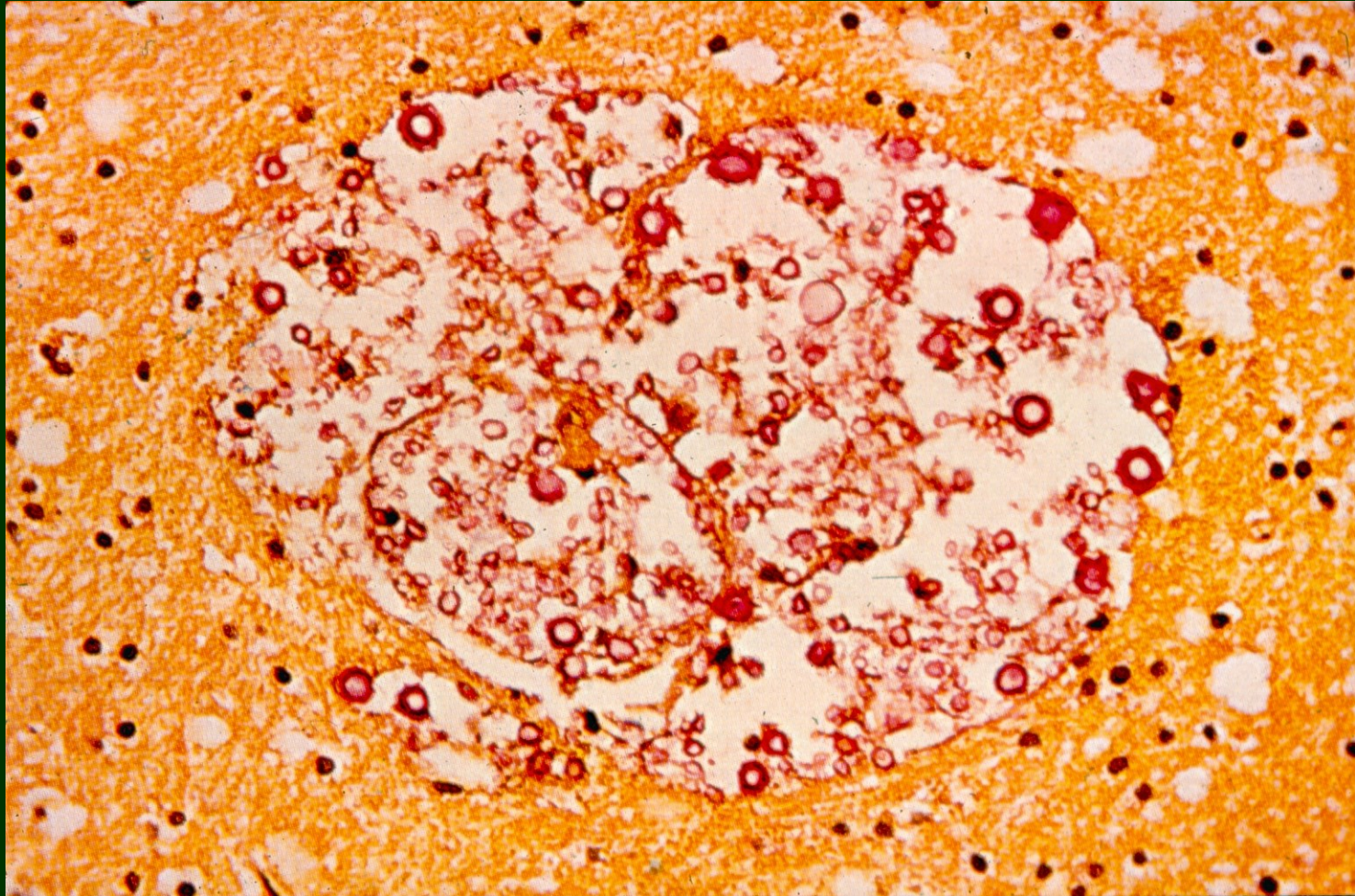
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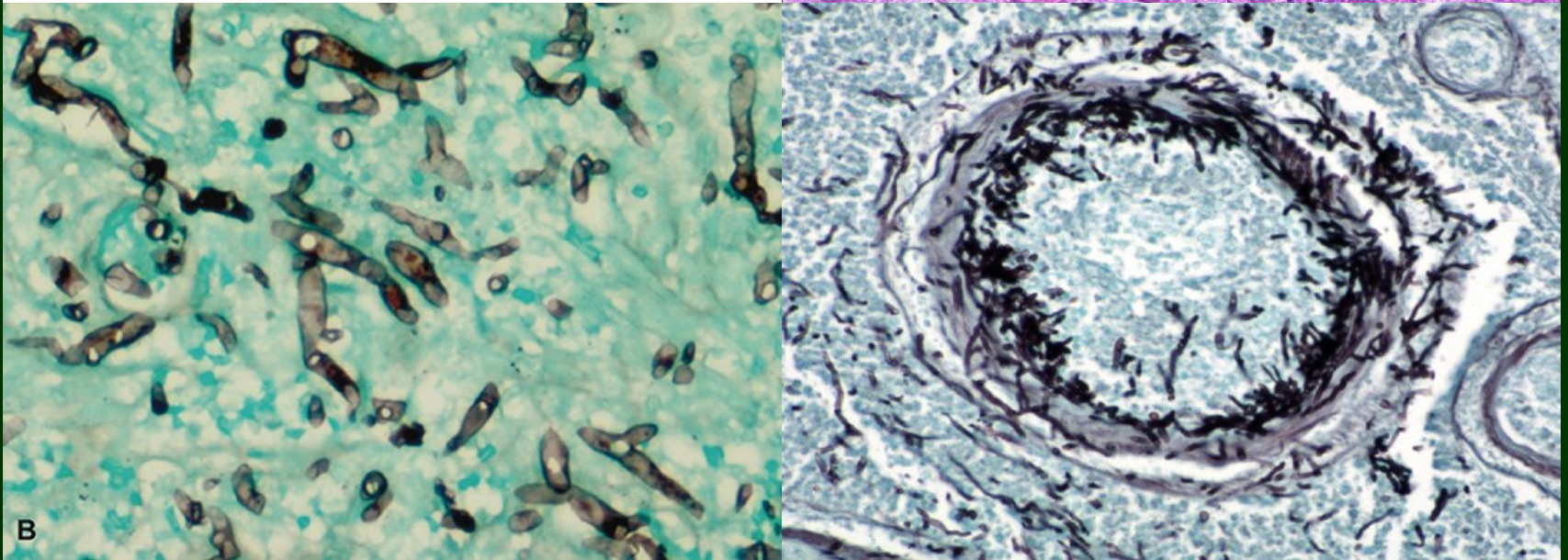
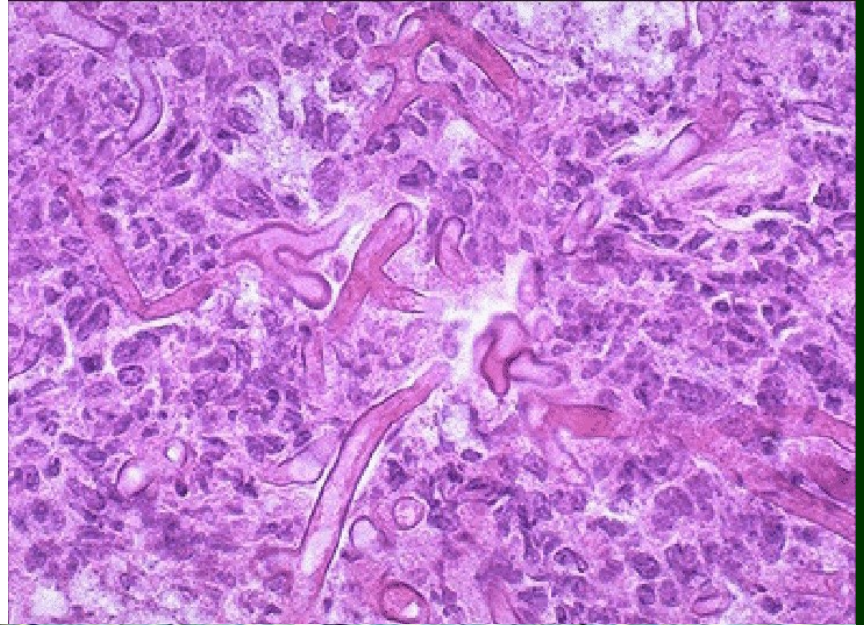
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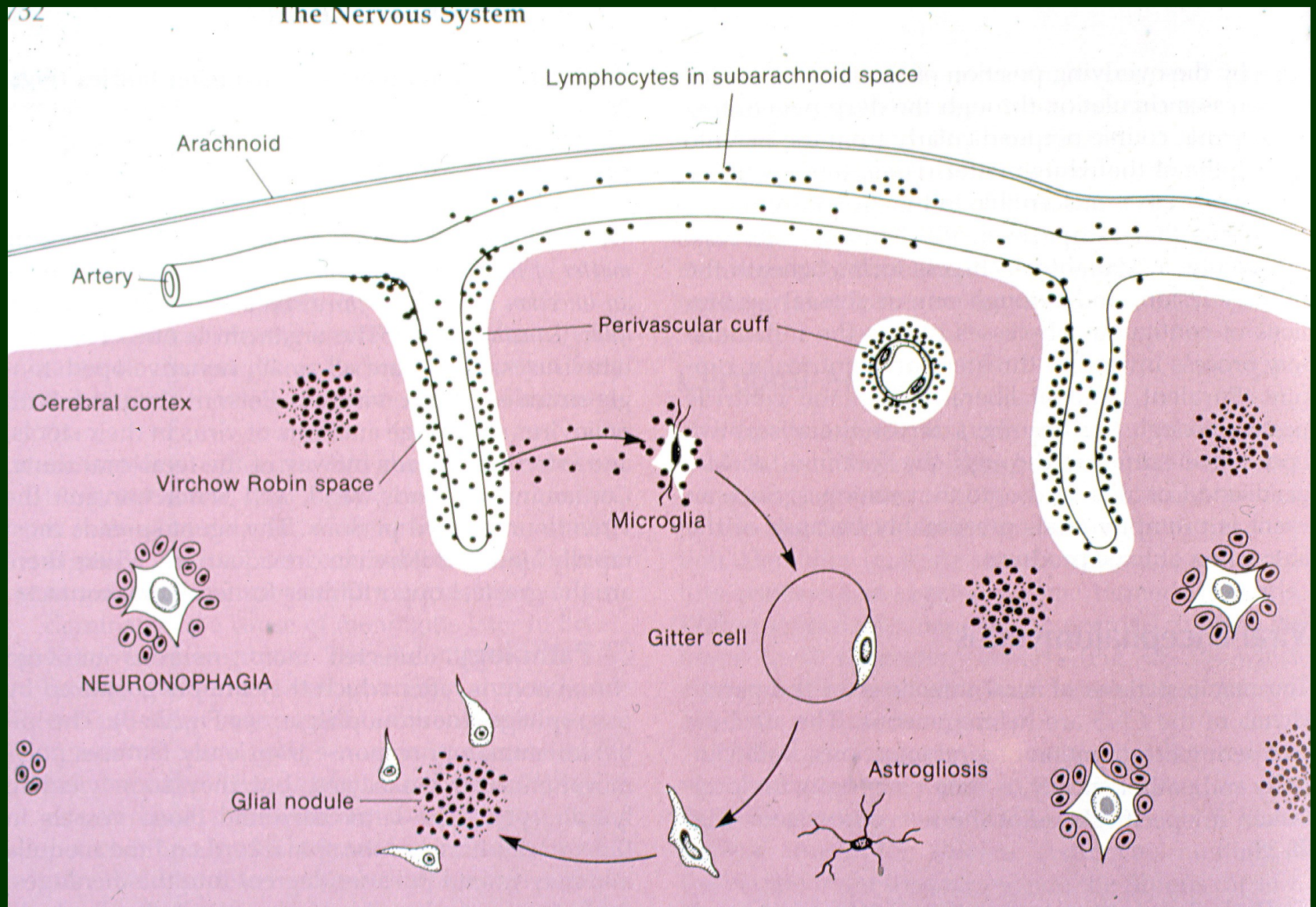
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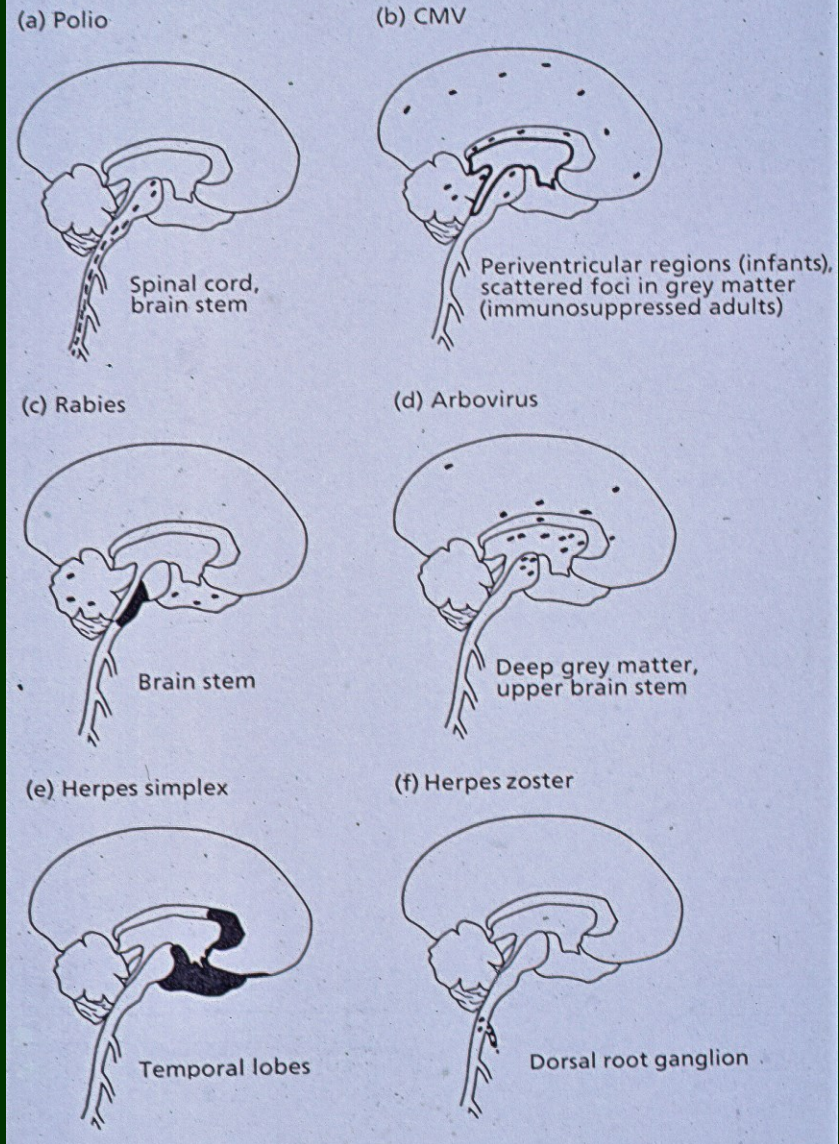
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ΙΟΓΕΝΕΙΣ ΛΟΙΜΩΞΕΙΣ ΕΓΚΕΦΑΛΟΥ



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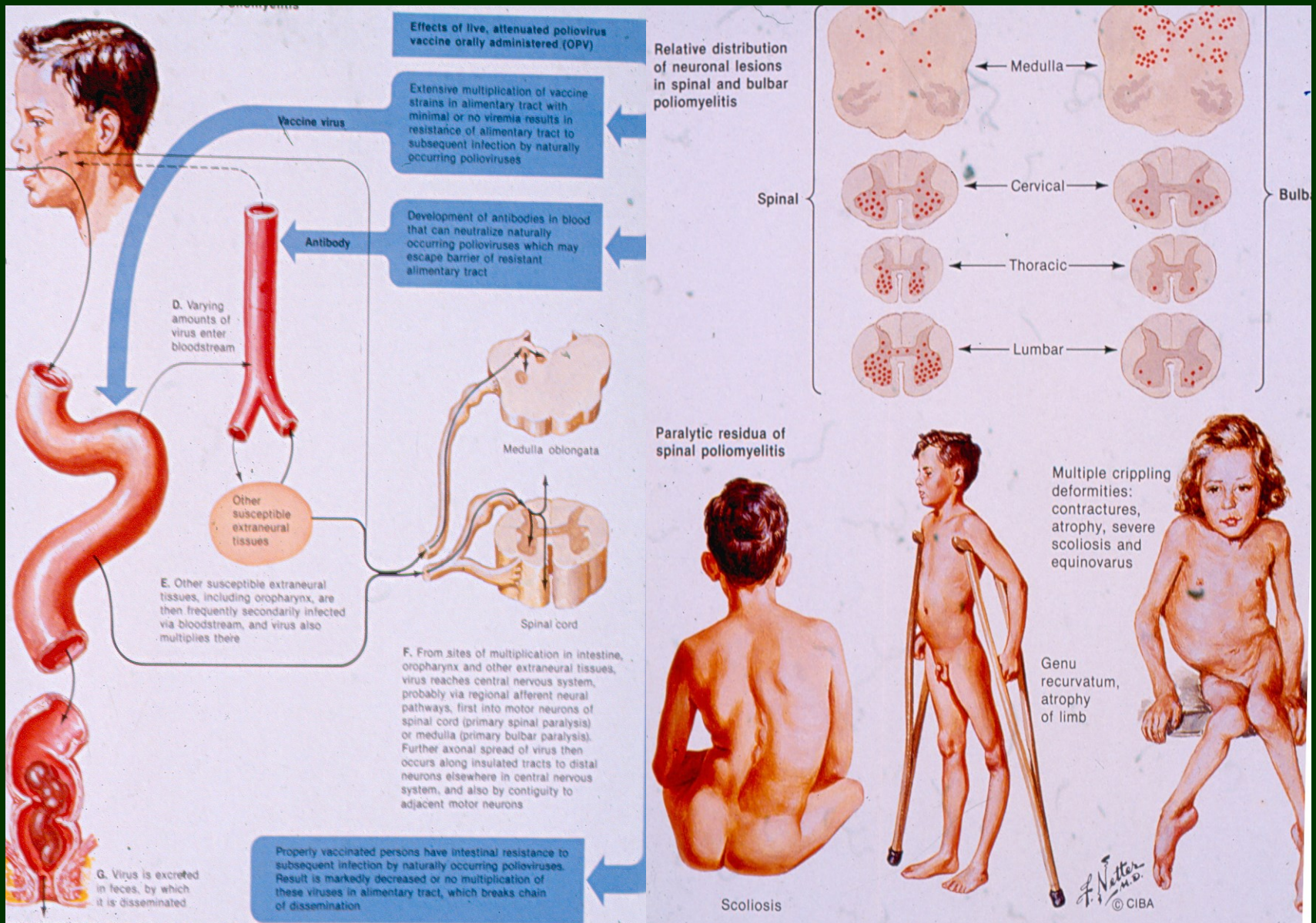
ΠΟΛΙΟΜΥΕΛΙΤΙΣ



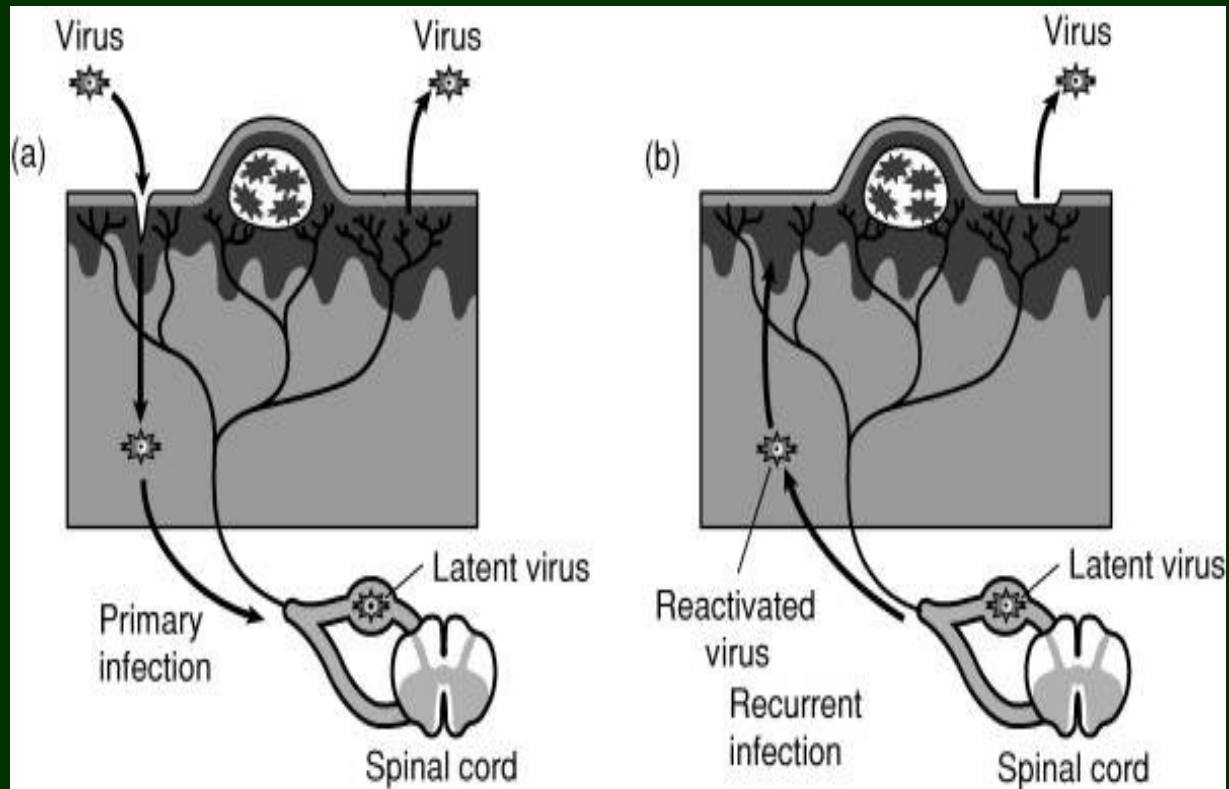
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ΠΟΛΙΟΜΥΕΛΙΤΙΣ

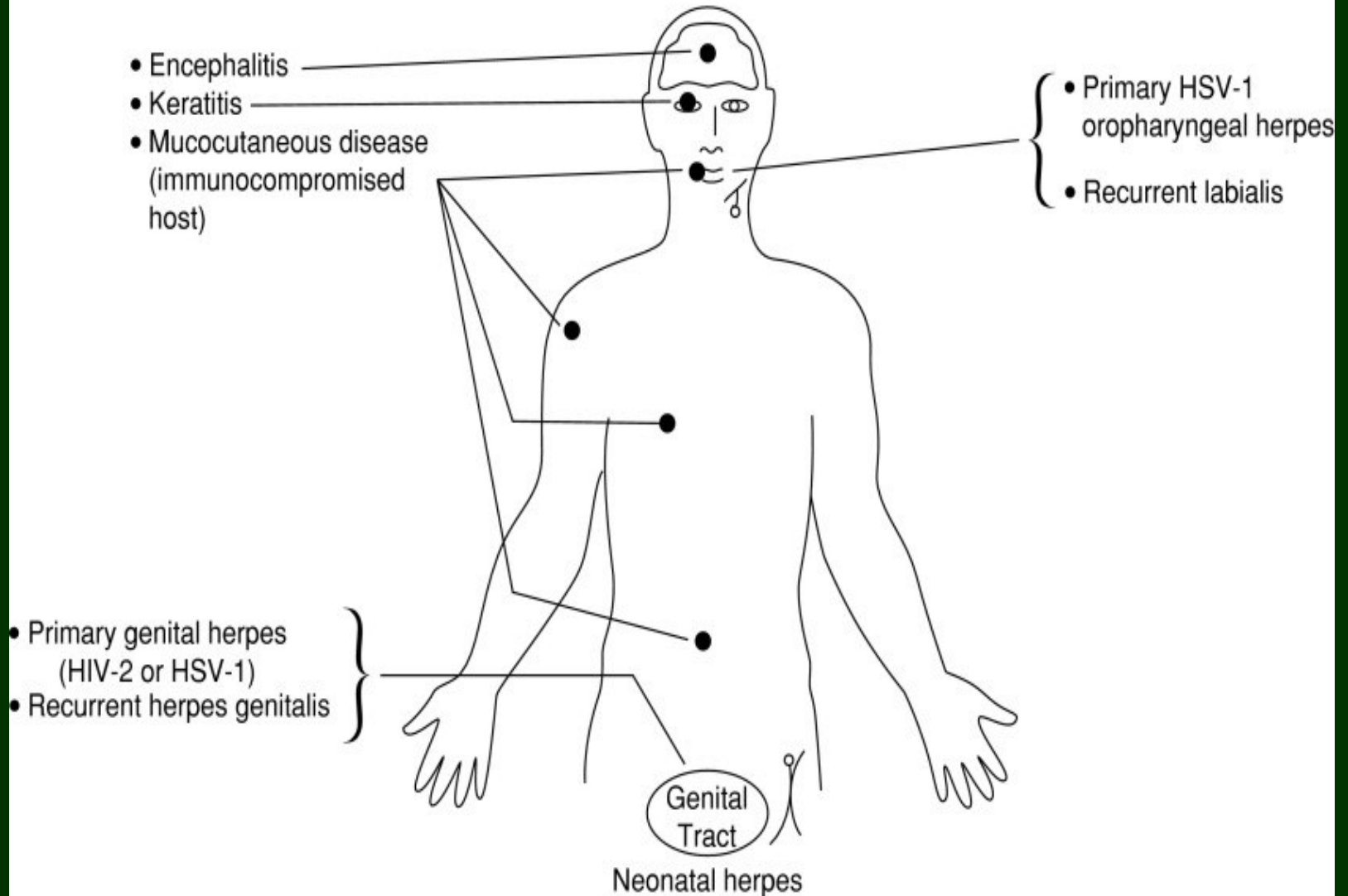


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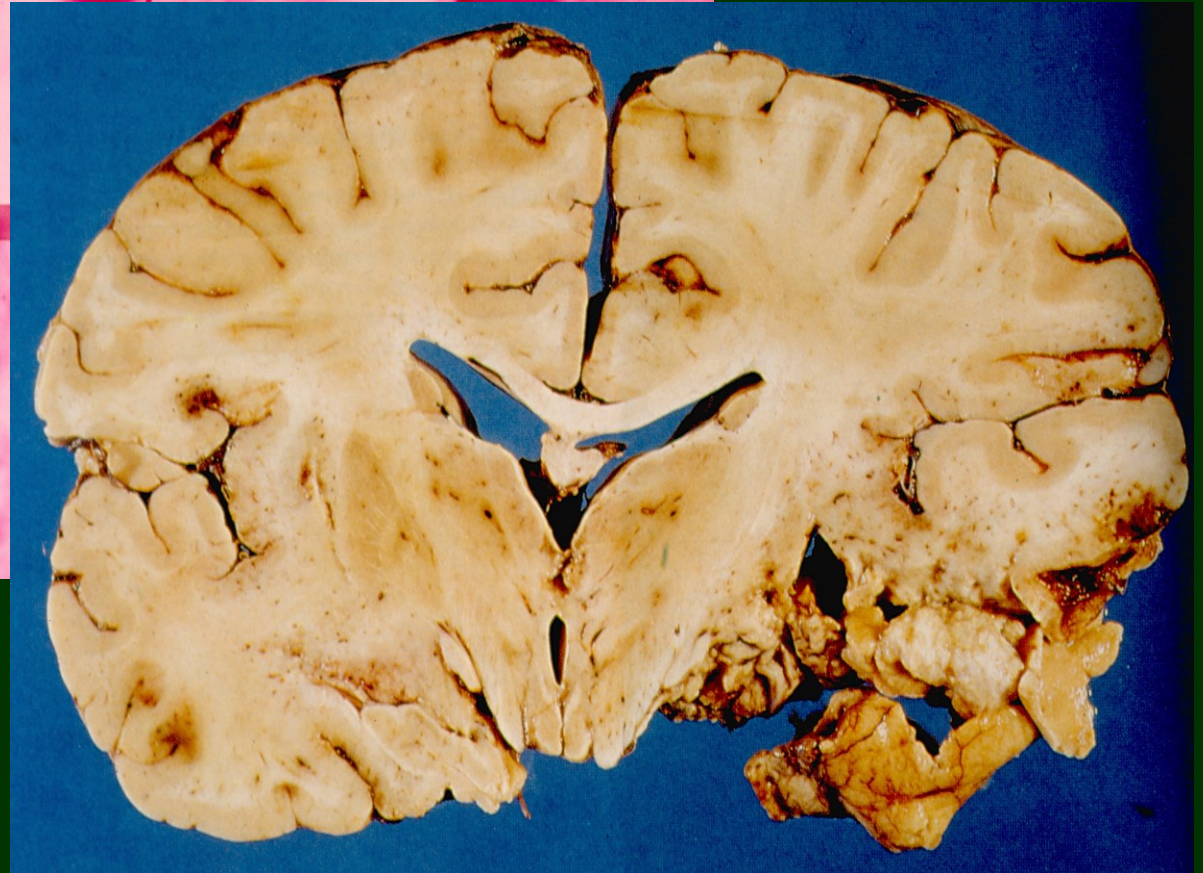
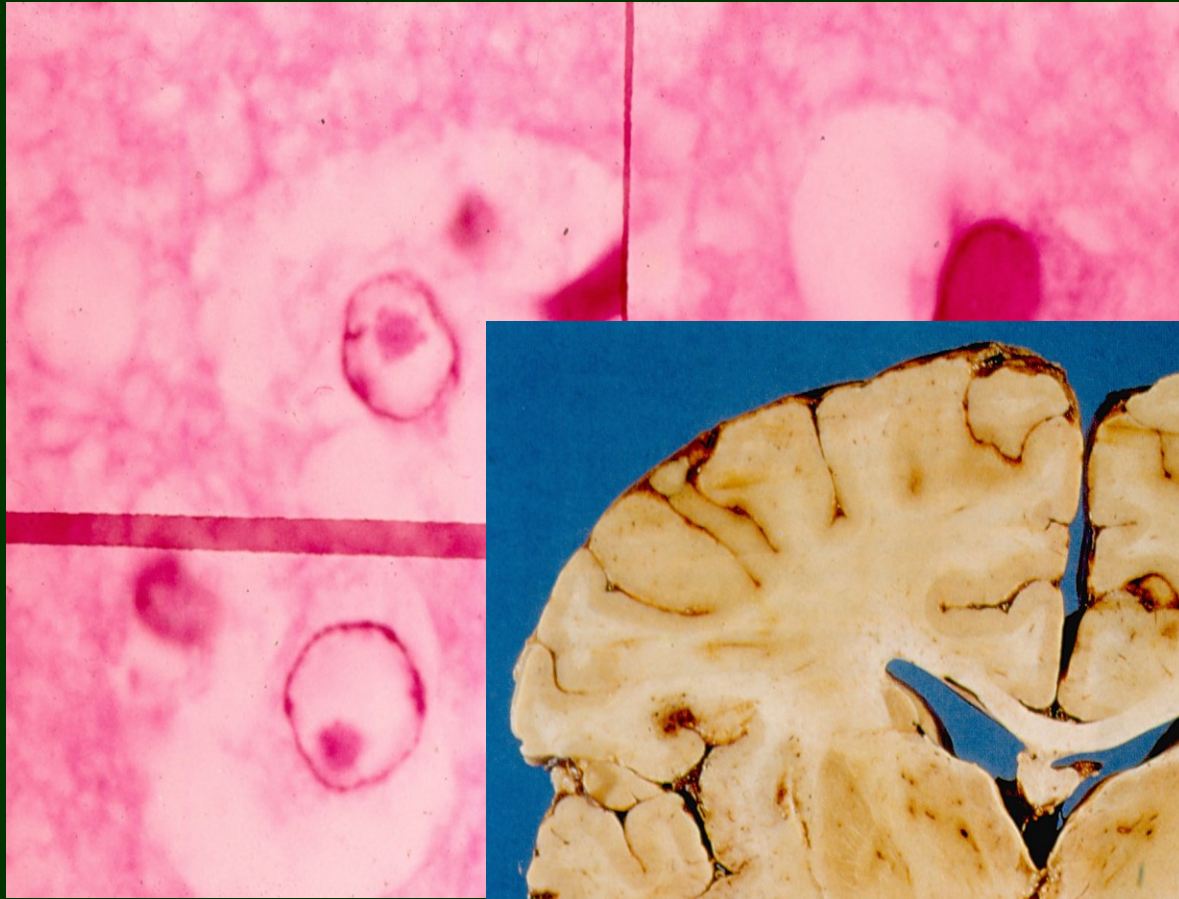


ΕΡΠΗΤΙΚΗ ΕΓΚΕΦΑΛΙΤΙΣ

Sites of HSV Infection and Disease



ΕΡΠΗΤΙΚΗ ΕΓΚΕΦΑΛΙΤΙΣ



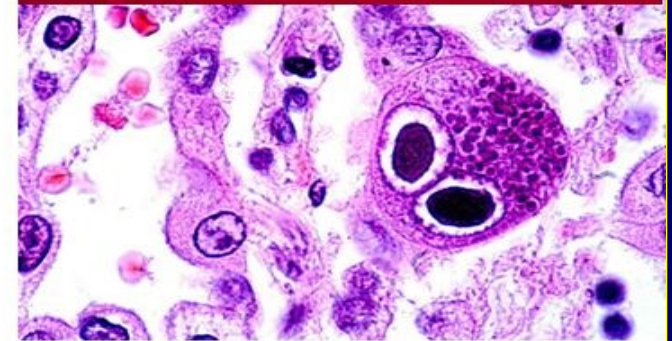
Cytomegalovirus

Fetuses / immunosuppressed

In utero: **periventricular necrosis and calcification, microcephaly**

Morphology :

In immunosuppressed patient -
subacute encephalitis, with **CMV inclusion-bearing cells**



ΠΡΟΪΟΥΣΑ ΠΟΛΥΕΣΤΙΑΚΗ ΛΕΥΚΟΕΓΚΕΦΑΛΟΠΑΘΕΙΑ (PML)

Pathogenesis of JC Virus

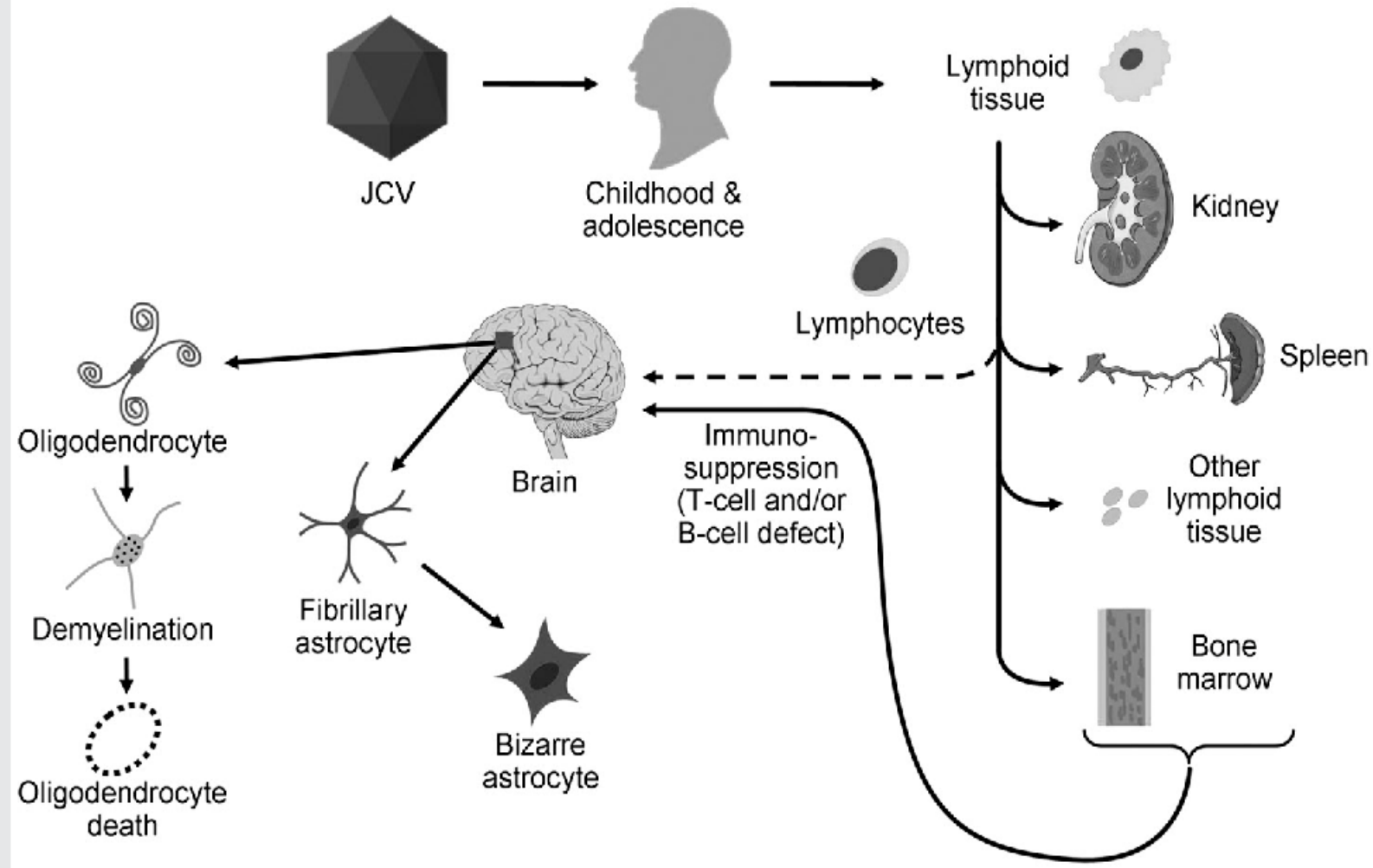
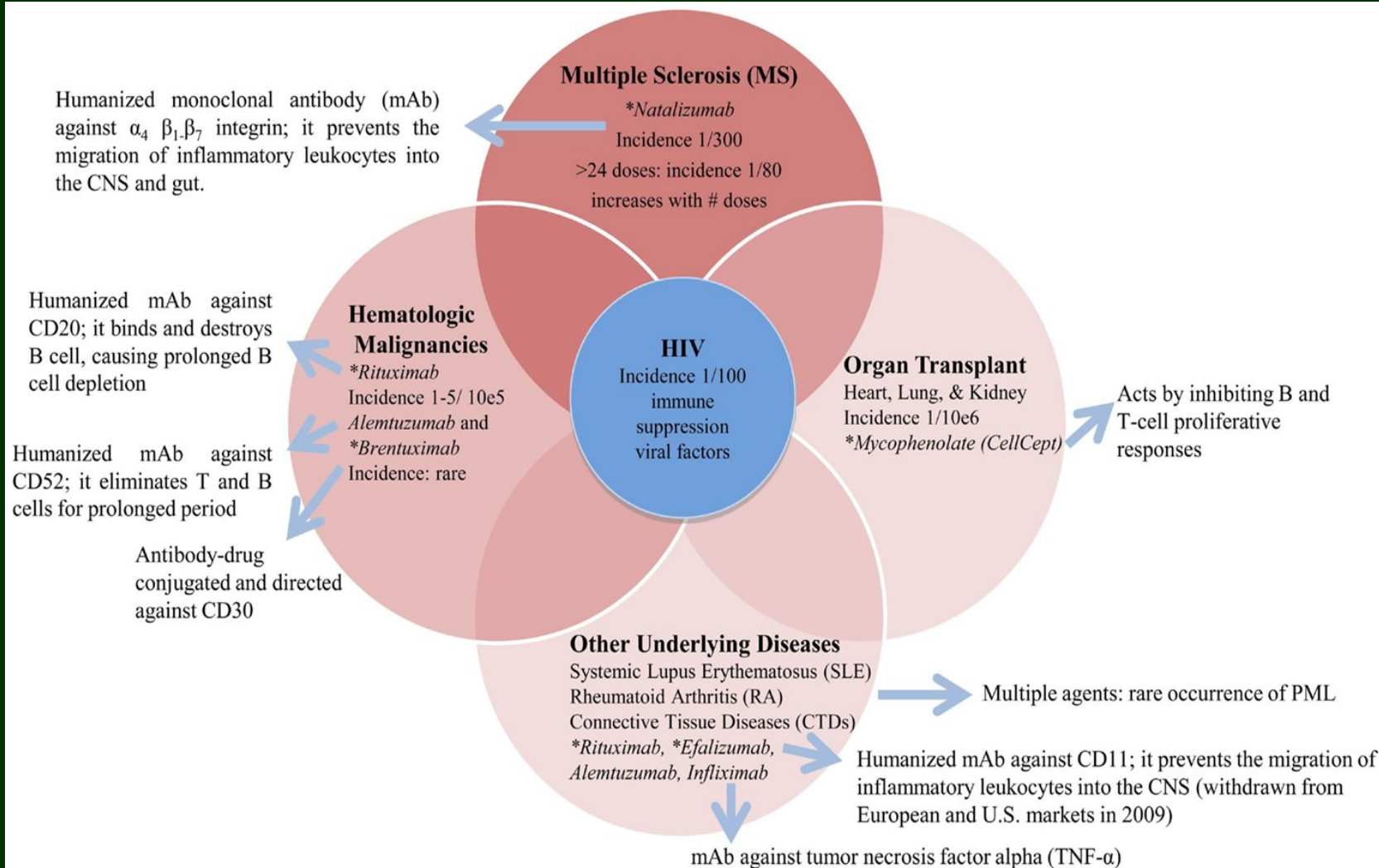
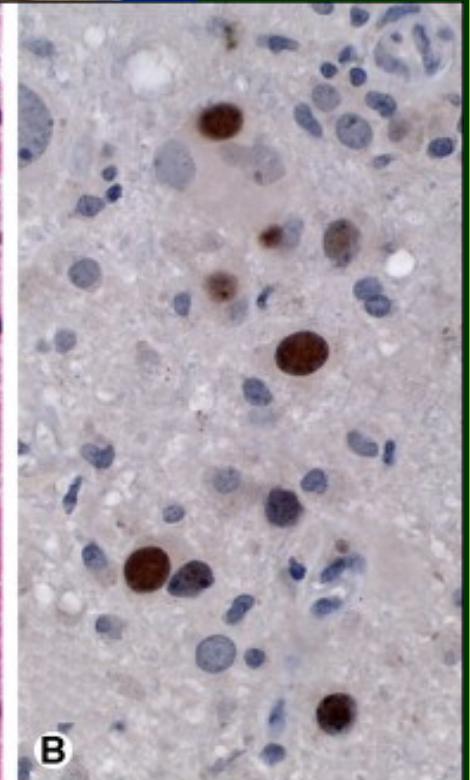
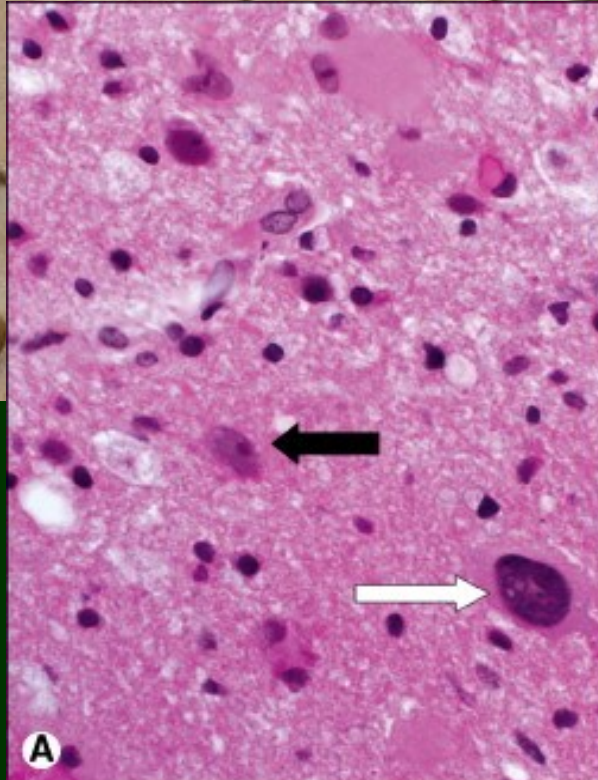
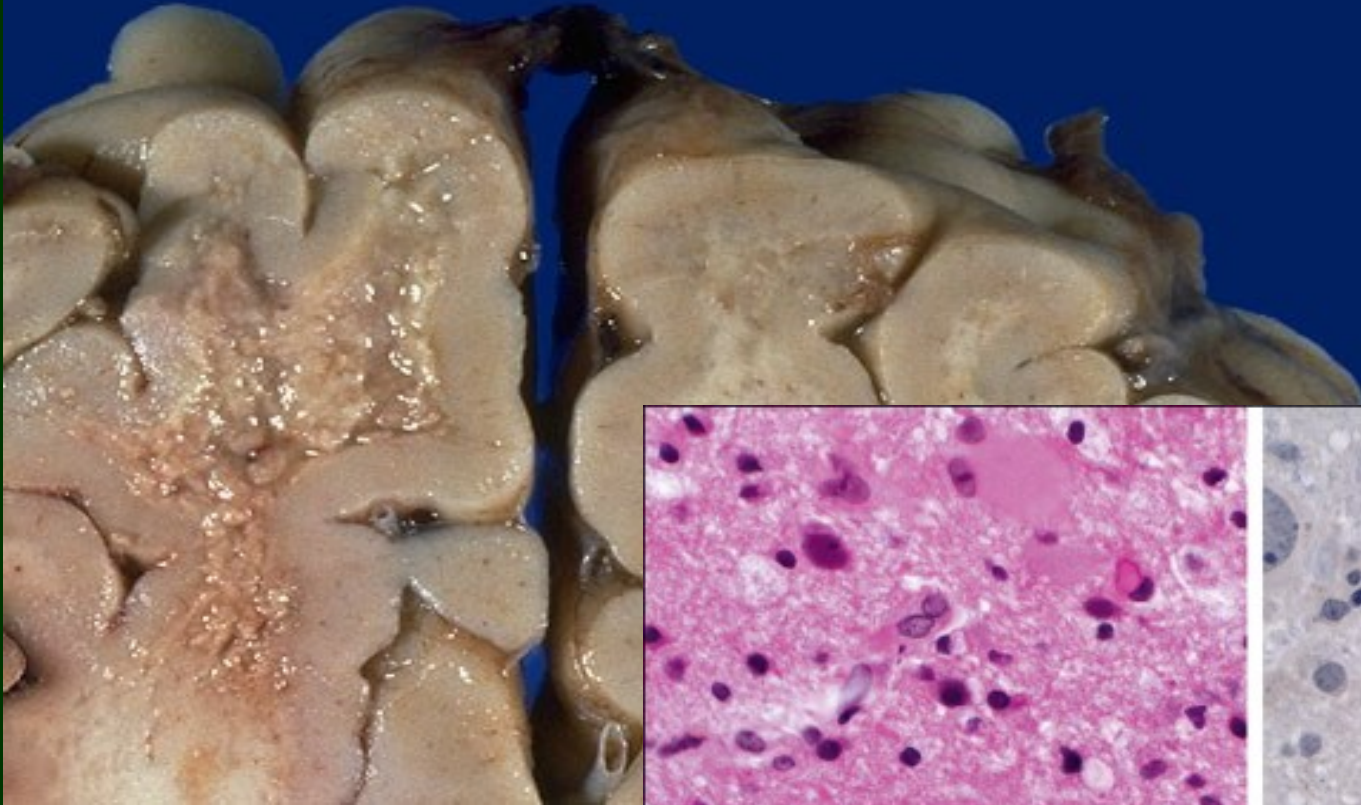


FIGURE 7.1 Pathogenesis of JC virus infection causing progressive multifocal

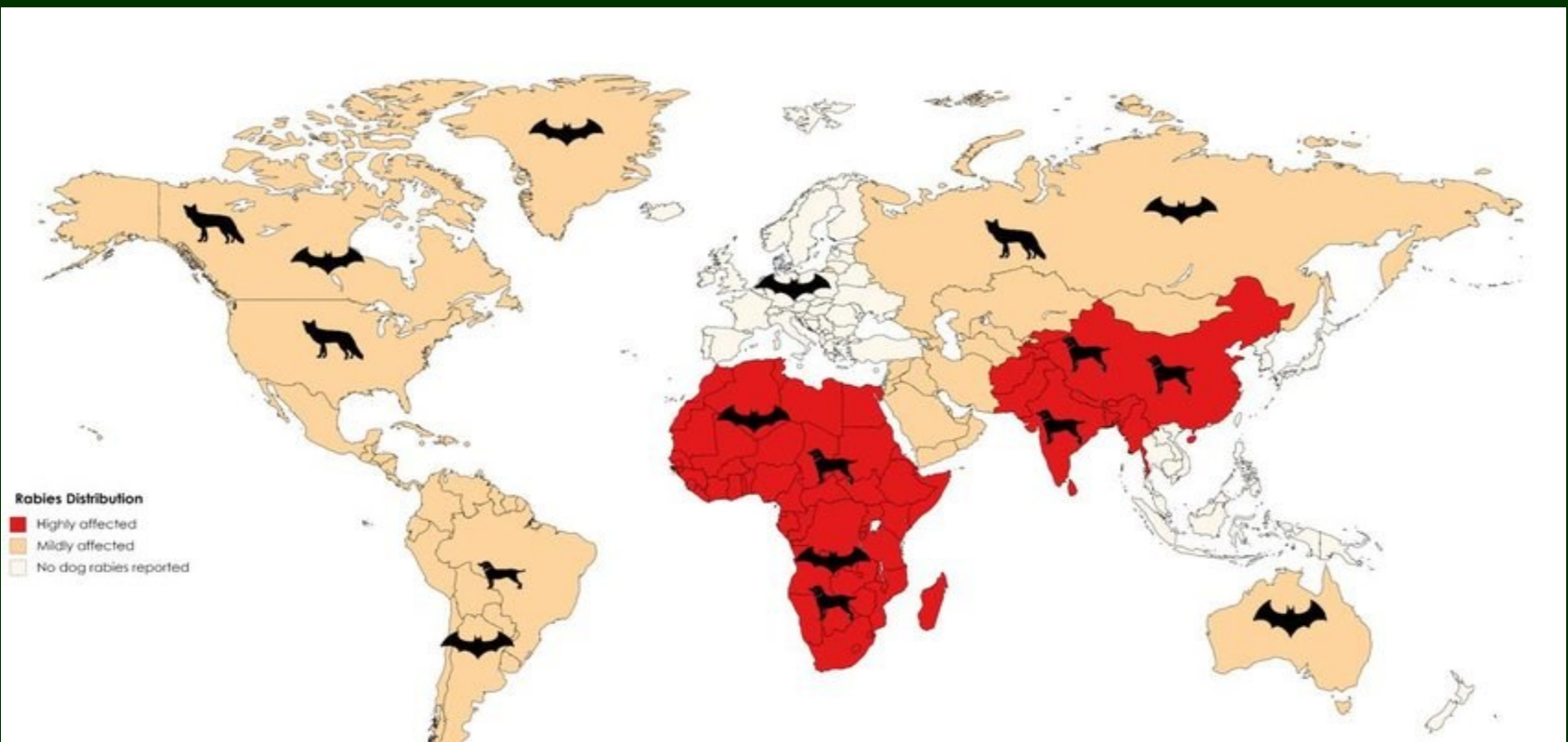
ΠΡΟΪΟΥΣΑ ΠΟΛΥΕΣΤΙΑΚΗ ΛΕΥΚΟΕΓΚΕΦΑΛΟΠΑΘΕΙΑ (PML)



ΠΡΟΪΟΥΣΑ ΠΟΛΥΕΣΤΙΑΚΗ ΛΕΥΚΟΕΓΚΕΦΑΛΟΠΑΘΕΙΑ (PML)



ΛΥΣΣΑ



Pathogenesis of Rabies virus



5) Replications take place in the motor neuron of spinal cord & ganglia travels to brain

6) Infection of brain neurons leading to fatal inflammation

4) Virus travels within axons in peripheral nerves through axonal transport

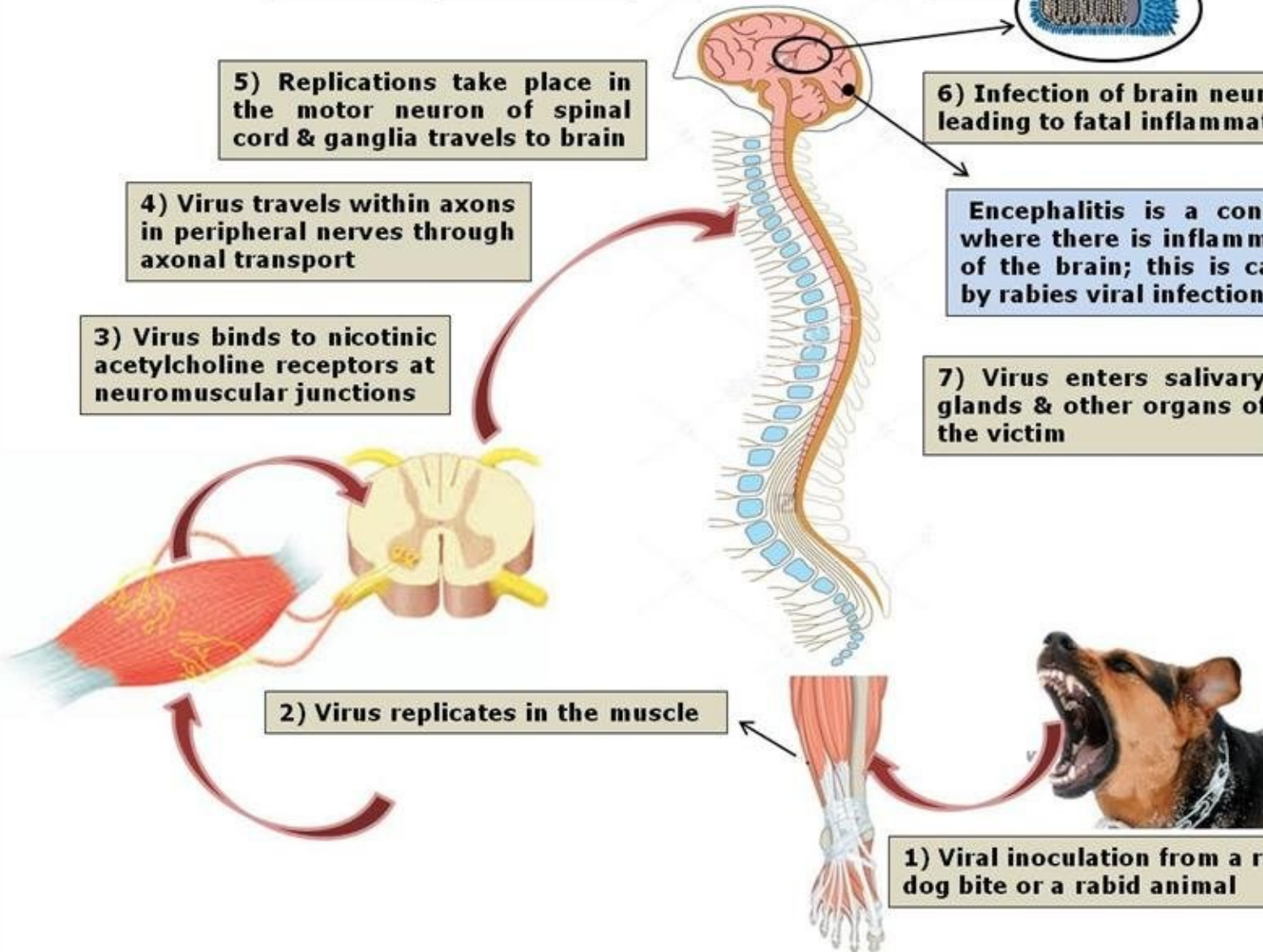
Encephalitis is a condition where there is inflammation of the brain; this is caused by rabies viral infection

3) Virus binds to nicotinic acetylcholine receptors at neuromuscular junctions

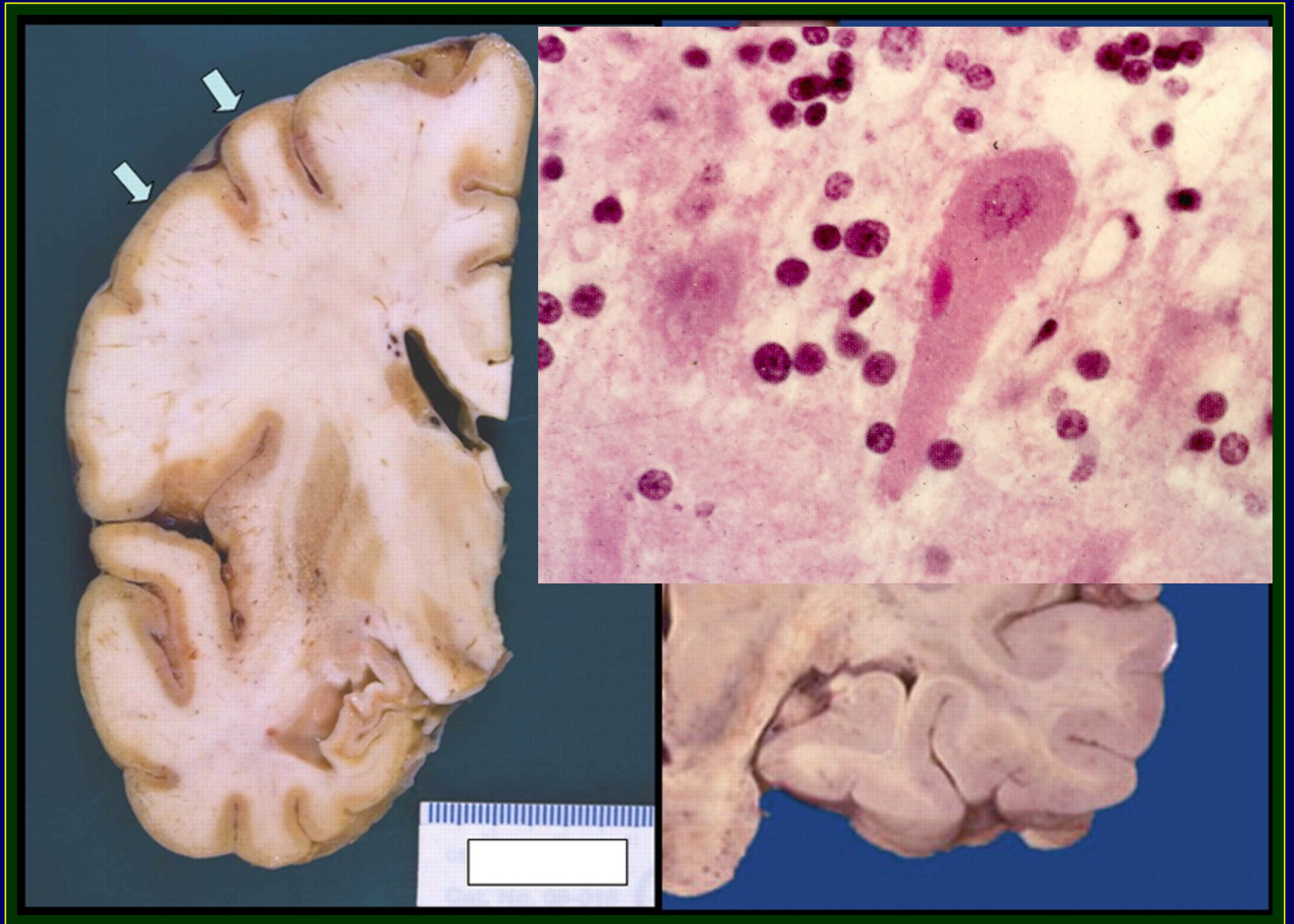
7) Virus enters salivary glands & other organs of the victim

2) Virus replicates in the muscle

1) Viral inoculation from a rabid dog bite or a rabid animal



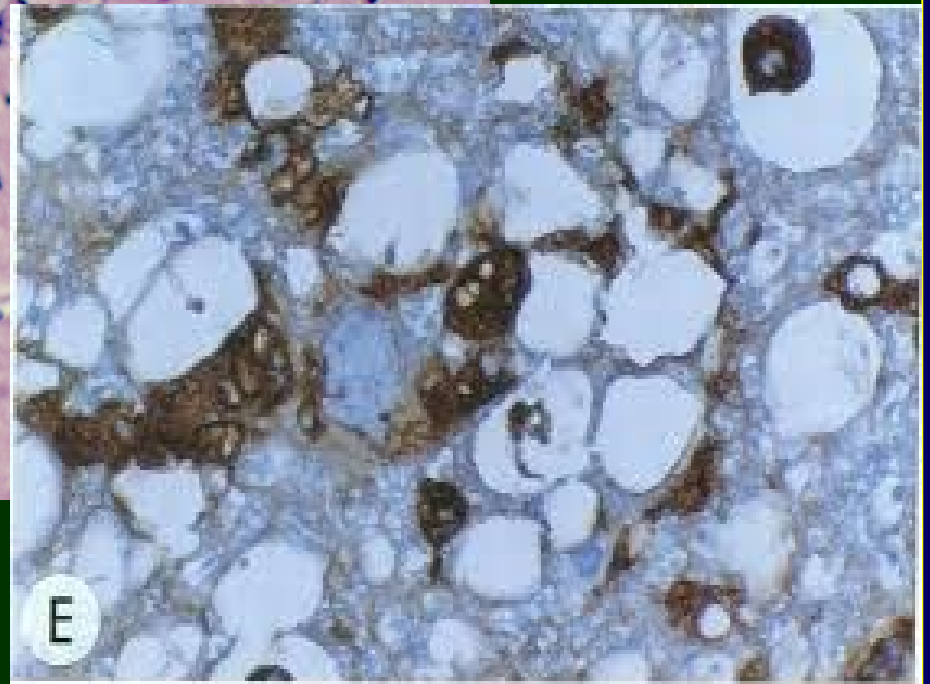
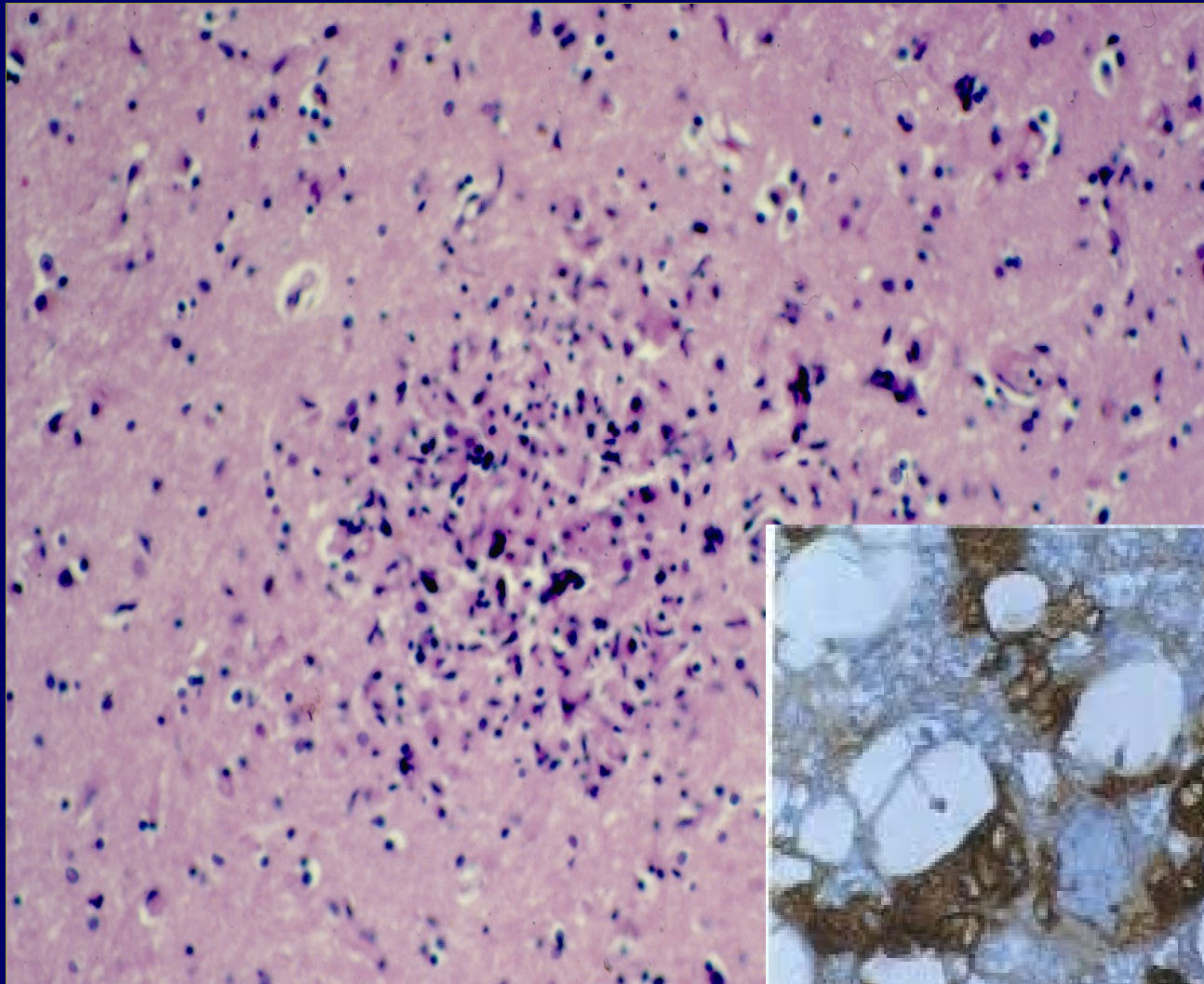
ΛΥΣΣΑ



ΕΚΔΗΛΩΣΕΙΣ Α.Ι.Δ.Σ. ΣΤΟ Κ.Ν.Σ.

- ευκαιριακές λοιμώξεις (άτυπα μυκοβακτηρίδια, τοξόπλασμα, μύκητες)
- νεοπλάσματα (σάρκωμα Kaposi [HHV-8], πρωτοπαθή μη-Hodgkin B λεμφώματα Κ.Ν.Σ. [EBV])
- αλλοιώσεις οφειλόμενες στον HIV (γλοιομεσεγχυματικά οζία και γιγαντοκύτταρα στον εγκέφαλο, κενотоπιώδης μυελοπάθεια)
- φαρμακευτικές αντιδράσεις

A.I.D.S.



ΛΟΙΜΩΣΗ ΑΠΟ SARS-CoV-2 (CoViD-19)

Pulmonary involvement

- ACE2 receptor on type II alveolar epithelial cells → lung tropism
- SARS-CoV-2: alveolar injury and interstitial inflammation
- Proinflammatory factors, cytokine storm and immune system activation
- Diffuse pulmonary intravascular coagulopathy
- Silent hypoxia and atypical ARDS

Renal involvement

- ACE2 in podocytes, mesangial cells, epithelium of the Bowman's Capsule, proximal cells brush border and collecting ducts
- Uncontrolled systemic inflammatory response → kidney injury
- Alterations in renal hemodynamics

Hematological manifestations

- Direct ACE2-dependent infection of lymphocytes, cytokine-induced lymphocyte apoptosis → lymphopenia
- Systemic inflammation → increased inflammatory indices
- Endothelial dysfunction and immune deregulation → blood hypercoagulability

Skin manifestations

- Direct virus infection
- Related to underlying vasculopathy
- Secondary to host immune response
- Treatment-related

Nervous system involvement

- Direct CNS invasion: hematogenously or via the retrograde neuronal route eg olfactory neurons
- Hyper-inflammatory status: cytokine-mediated brain damage
- Host immune response effects
- Cerebrovascular disease on the ground of hypercoagulation
- ACE-2 in host olfactory and gustatory pathways → anosmia, ageusia
- Direct PNS and skeletal muscle infection

Cardiovascular manifestations

- Heart: direct - ACE2 related → acute MI, myocarditis, decompensated HF, tachyarrhythmias.
- Heart: indirect → inflammatory reaction leading to decompensation of underlying disease
- Endotheliopathy
- Kawasaki-like syndrome

Gastrointestinal and liver involvement

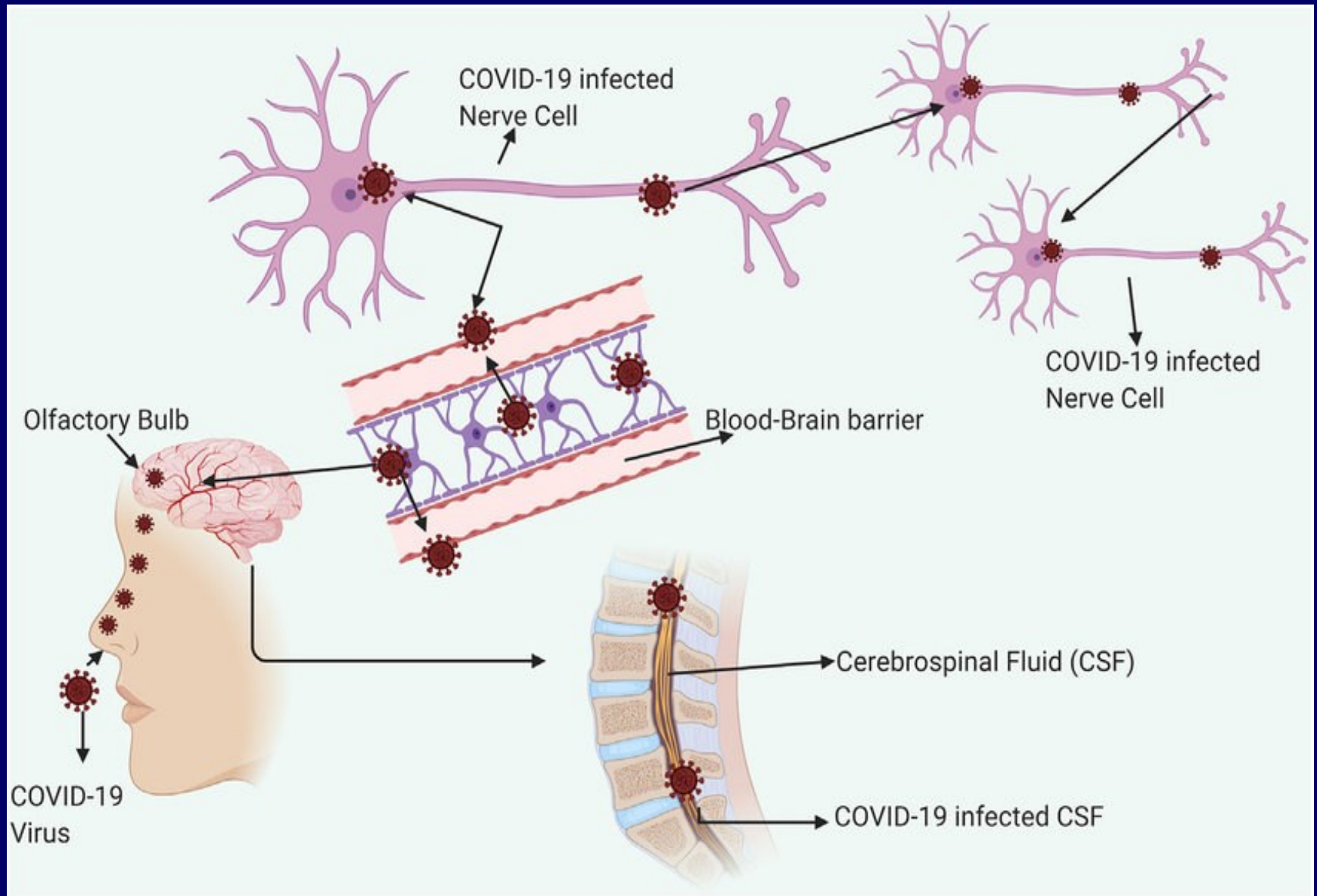
- ACE2 on enterocytes in the ileum and colon
- Direct infection and apoptosis of epithelial cells in the GI tract → diarrhea, vomiting, nausea
- Liver: direct infection and apoptosis of hepatocytes, hypoxia, sepsis, drug-induced toxicity

Endocrine manifestations

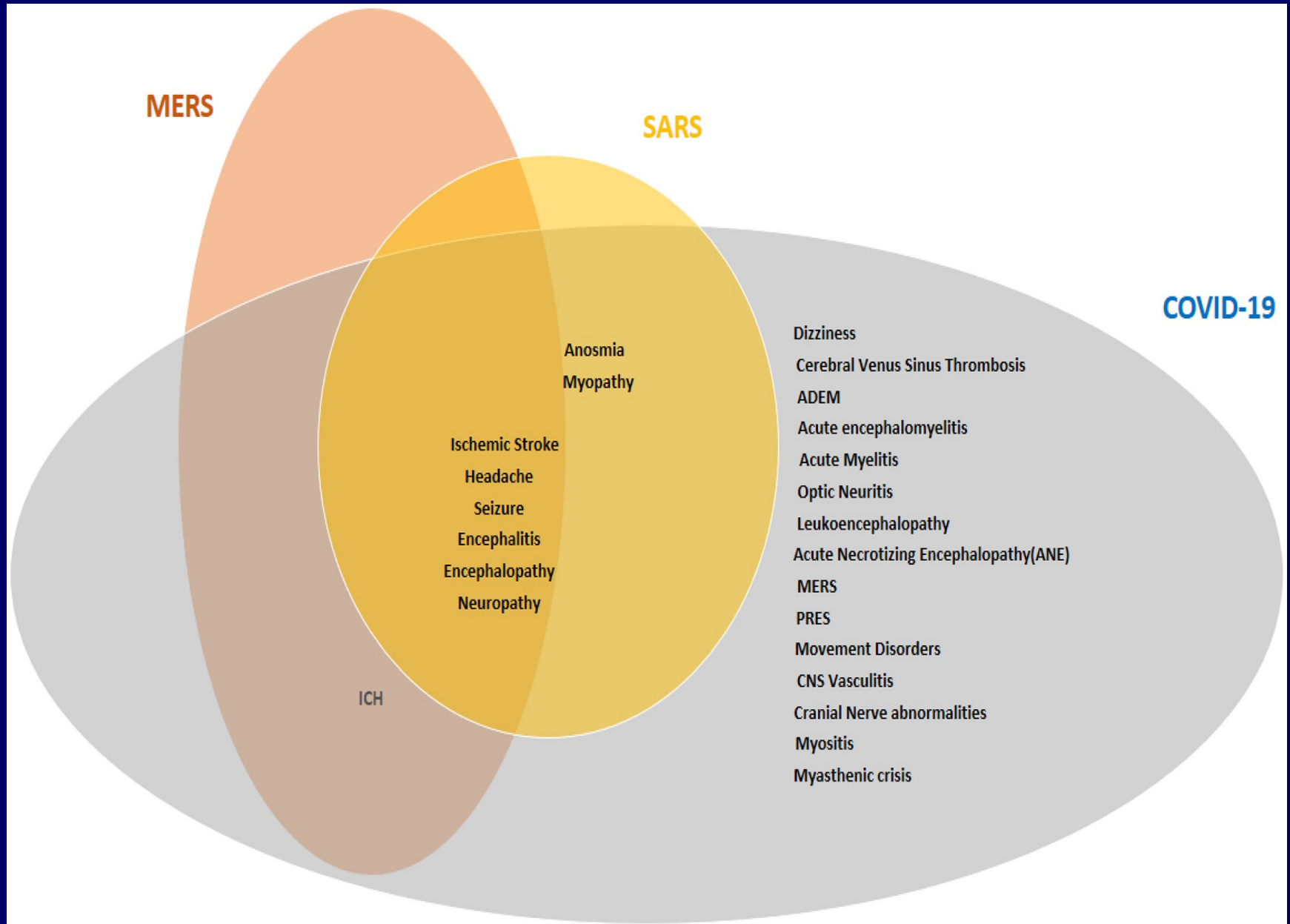
- Molecular mimics to the host ACTH → cortisol insufficiency
- Direct infection → degeneration and necrosis of the adrenal gland
- ACE2 expressed on hypothalamic and pituitary tissues → direct hypothalamic damage and hypophysitis



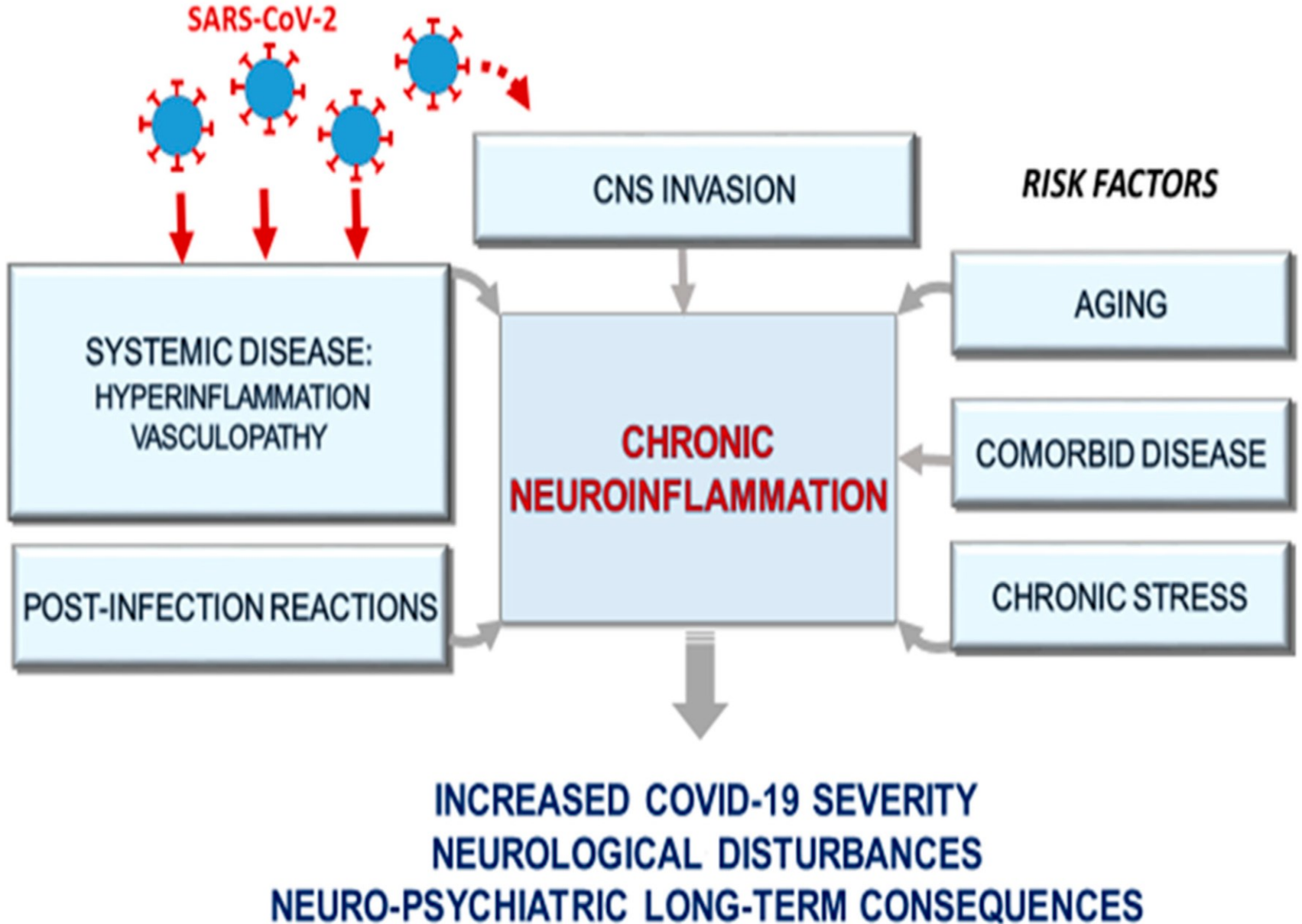
ΛΟΙΜΩΞΗ ΑΠΟ SARS-CoV-2 (CoViD-19)



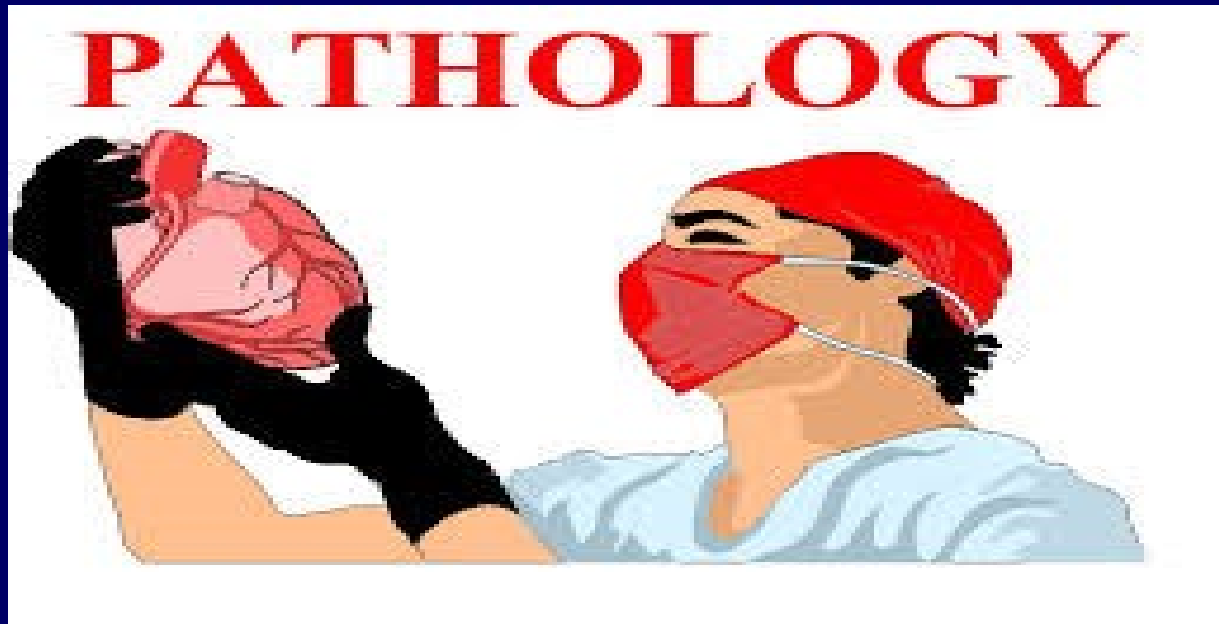
ΛΟΙΜΩΞΗ ΑΠΟ SARS-CoV-2 (CoViD-19)



ΛΟΙΜΩΣΗ ΑΠΟ SARS-CoV-2 (CoViD-19)



ΣΥΜΒΟΛΗ ΤΟΥ ΠΑΘΟΛΟΓΟΑΝΑΤΟΜΟΥ



«Κακοὶ μάρτυρες ἀνθρώποισιν ὀφθαλμοὶ καὶ ὠτα,
βαρβάρους νόας ἔχόντων»

Ἡράκλειτος, *Περὶ τοῦ παντός*, IV