

UŽU – MDM

MOŽGANI

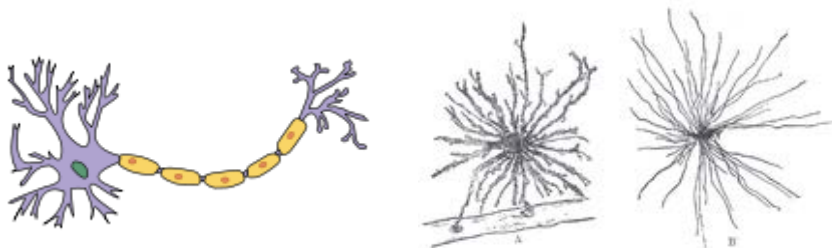
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Možgani se nikoli ne nehajo razvijati

Možgani so del centralnega živčnega sistema. Nahajajo se v lobanji. Zgrajeni so iz okoli 100 milijard živčnih celic ali nevronov in tehtajo približno 1200–1400 gramov. Sestavljajo jih veliki in mali možgani ter možgansko deblo. Na makroskopskem prerezu možganov ob njihovem robu vidimo siv predel, imenovan tudi sivina in v katerem so v glavnem zbrana telesa živčnih celic. V notranjosti možganov prevladuje bel predel ali belina. Tu se pretežno nahajajo podaljški živčnih celic. Ker so možgani zelo nagubani, je njihova površina povečana. To dejstvo omogoča, da so iz večjega števila živčnih celic. Kljub temu, da predstavljajo le 2 % človekove teže, porabijo kar 20 % vsega kisika. So najzapletenejši organ v človeškem telesu, saj uravnavajo oziroma nadzirajo delovanje vseh drugih organov.

Histološka zgradba možganov

Funkcionalna in strukturna enota živčevja je **nevron**. Sestavljen je iz **telesa**, v katerem se nahajajo **jedro in drugi celični organeli, in izrastkov (dendriti, akson)**. Dendriti so navadno krajši od aksona in številni ter služijo sprejemanju impulzov. Akson je večinoma en sam, po njem se akcijski potenciali prevedejo do naslednjih celic. Nevroni sprejemajo dražljaje, jih predelujejo in prevajajo vzbujenje. Telesa nevronov predstavljajo sivo možganovino, aksoni pa belo. Poleg nevronov najdemo v živčevju tudi nevroglijo (živčno oporno tkivo). Nevroglijske celice skrbijo za mehansko oporo, omogočajo prevajanje impulzov, delujejo kot izolator, sodelujejo pri prehrani, obrambi in obnovi nevronov. Med nevroglijske celice v centralnem živčevju spadajo astrociti, oligodendrociti in endotelijske celice.



Nevron

Astrocit

Astrociti so največje in najštevilnejše nevroglijske celice v centralnem živčevju. Pomembni so pri delovanju krvno-možganske pregrade, odstranjujejo nevrotoksine iz sinaps, sodelujejo pa tudi pri prehrani in obrambi (npr. odstranjevanje debrisa po poškodbi). Astrociti se po poškodbi razmnožijo in tvorijo glialno brazgotino, imenovano glioz. Z odstranjevanjem kalija iz zunajcelične tekočine omogočajo repolarizacijo membrane in normalno delovanje nevrona.

Oligodendrociti tvorijo mielin. Nahajajo se v beli in sivi možganovini. Njihova naloga je predstavljanje antigenov, sodelujejo pa tudi pri odstranjevanju debrisa po poškodbi.



Ependimske celice obdajajo notranjost možganskih ventriklov. Med njimi so tesni stiki, ki preprečujejo prestop makromolekul iz krvi v likvor.

Veliki možgani

So najobširnejši del centralnega živčevja. Ležijo v sprednji in srednji lobanjski kotanji, njihov zadnji del pa nad malimi možgani. Velike možgane sestavljata dve možganski polobli ali hemisferi, ki sta med seboj ločeni z vzdolžno špranjo. V globini te špranje pa vidimo strukturo, ki povezuje obe hemisferi in ji pravimo corpus callosum. Velike možgane lahko razdelimo na dva dela: telencefalon in diencefalon.

Mali možgani

Ležijo v zadnji lobanjski kotanji. Delimo jih na srednji, vzdolžni del, ki se imenuje črv (vermis), in dve polobli (leva in desna). Zgornja ploskev je ravna, spodnja pa zaobljena, tako da se prilega svoji kotanji. Tudi mali možgani so sestavljeni iz sivine in beline. Belino tvori nitje, ki povezuje skorjo malih možganov in njihovih jeder z možganskim deblom. Funkcionalno delimo male možgane na 3 dele: arhiocerebelum, paleocerebelum in neocerebelum. Arhiocerebelum je, kakor tudi ime pove, najstarejši del. Pomemben je za ohranjanje ravnotežja. Paleocerebelum dobiva informacije iz mišic zgornjih in spodnjih udov. Uravnava držo in mišični tonus. Neocerebelum dobiva informacije iz velikih možganov. Ta del malih možganov uravnava in izboljšuje natančne, hotene gibe. **Glavne naloge malih možganov so torej ohranjanje ravnotežja, uravnavanje drže in koordinacija gibov.**

Možgansko deblo

V deblu se nahajajo tudi pomembni centri za vitalne funkcije organizma. Mednje spadajo center za pretok krvi, center za dihanje, center za požiranje, center za bruhanje. Ti centri z različnimi mehanizmi kontrolirajo kardiovaskularni, respiratorni sistem in prebavni sistem, prav tako tudi našo pozornost in zavest.

Likvor

Cerebrospinalni likvor je bistra, brezbarvna tekočina. Vsebuje več kot 90 % vode, elektrolite, malo beljakovin in redke limfocite. Nahaja se v možganskih prekatih (ventriklih), centralnem kanalu in v subarahnoidalnem prostoru. Obliva možgane, tako da ti lebdiijo v njem in so po zaslugi vzgona lažji. Zaradi likvorja se sile, ki nastanejo pri pretresih in udarcih, težje prenašajo na možgane. Nadomešča tudi limfo, saj slednje v centralnem živčevju ni.

Možganski živci

Možganskih živcev (*nervi craniales*) je dvanajst parov. Prvi in drugi par izvirata iz velikih možganov, preostalih deset pa iz možganskega debla. Možganski živci so motorični (služijo premikanju mišic), senzorični (služijo zaznavanju dražljajev) ali pa mešani (so motorični in senzorični). Nekateri živci vsebujejo tudi vegetativno nitje. Jedra možganskih živcev, z izjemo prvega in drugega, ležijo vzdolž možganskega debla. Glede na lego jeder so vzdolžno razporejena tudi njihova izstopišča. Možgane prehranjujejo štiri glavne arterije.

The brain is one of the largest and most complex organs in the human body.

It is made up of more than 100 billion nerves that communicate in trillions of connections called synapses.

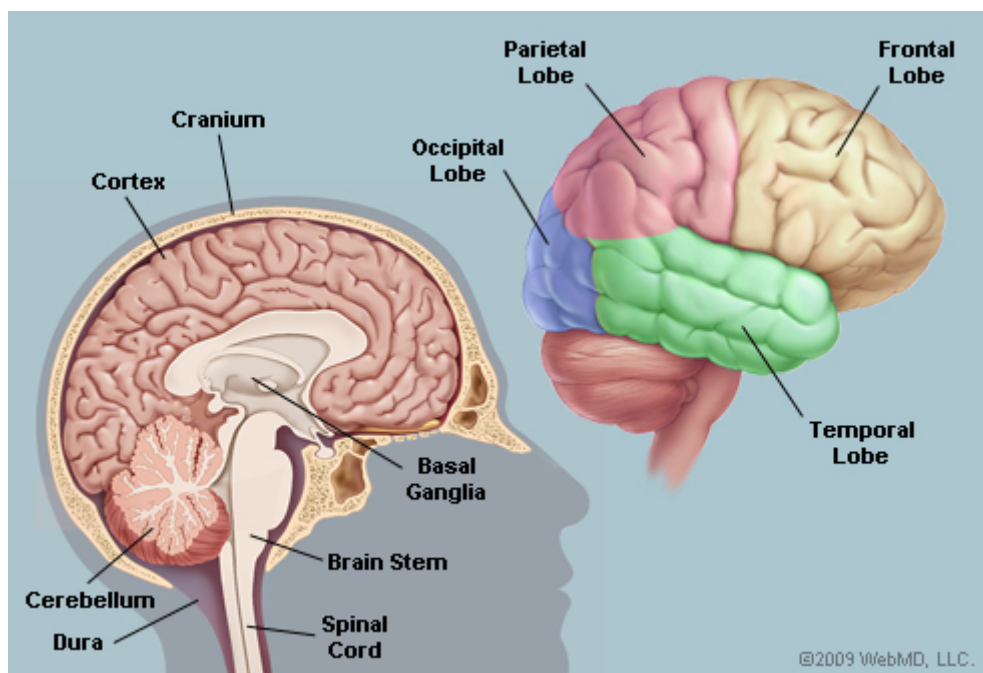
The brain is made up of many specialized areas that work together:

- The cortex is the outermost layer of brain cells. Thinking and voluntary movements begin in the cortex.
- The brain stem is between the spinal cord and the rest of the brain. Basic functions like breathing and sleep are controlled here.
- The basal ganglia are a cluster of structures in the center of the brain. The basal ganglia coordinate messages between multiple other brain areas.
- The cerebellum is at the base and the back of the brain. The cerebellum is responsible for coordination and balance.

The brain is also divided into several lobes:

- The frontal lobes are responsible for problem solving and judgment and motor function.
- The parietal lobes manage sensation, handwriting, and body position.
- The temporal lobes are involved with memory and hearing.
- The occipital lobes contain the brain's visual processing system.

The brain is surrounded by a layer of tissue called the meninges. The skull (cranium) helps protect the brain from injury.





Stroke is brain damage caused by a blocked blood vessel or bleeding in the brain. The signs of a stroke may include weakness, numbness, blurred vision, confusion, and slurred speech. Getting to a hospital quickly is vital for a good outcome with a stroke.

Symptoms of Parkinson's disease include muscle rigidity, tremors, and changes in speech and gait. Parkinson's causes are unknown but genetics, aging, and toxins are being researched. After a Parkinson's diagnosis, Parkinson's disease treatments are given to help relieve symptoms. There is no cure for Parkinson's and herbal remedies are unproven. Studies on using stem cells to treat Parkinson's disease are under way. The prognosis depends on the patient's age and symptoms.

Alzheimer's disease is the most common type of dementia. Symptoms of Alzheimer's, including early-onset Alzheimer's, include problems with memory, judgment, and thinking, which makes it hard to work or take part in day-to-day life. As the stages of Alzheimer's progress, memory loss and other signs of Alzheimer's become more apparent. Many people find help with Alzheimer's drugs, but there is no cure for this form of dementia.

A **tumor** is a mass of tissue that's formed by an accumulation of abnormal cells. Normally, the cells in your body age, die, and are replaced by new cells. With cancer and other tumors, something disrupts this cycle. Tumor cells grow, even though the body does not need them, and like normal old cells, they don't die. As this process goes on, the tumor continues to grow as more and more cells are added to the mass.

Primary brain tumors emerge from the various cells that make up the brain and central nervous system and are named for the kind of cell in which they first form. The most common types of adult brain tumors are gliomas and astrocytic tumors. These tumors form from astrocytes and other types of glial cells, which are cells that help keep nerves healthy.

The second most common type of adult brain tumors are meningeal tumors. These form in the meninges, the thin layer of tissue that covers the brain and spinal cord.

What's the Difference Between Benign and Malignant Brain Tumors?

Benign brain tumors are noncancerous. Malignant primary brain tumors are cancers that originate in the brain, typically grow faster than benign tumors, and aggressively invade surrounding tissue. Although brain cancer rarely spreads to other organs, it will spread to other parts of the brain and central nervous system.

Benign brain tumors usually have clearly defined borders and usually are not deeply rooted in brain tissue. This makes them easier to surgically remove, assuming they are in an area of the brain that can be safely operated on. But even after they've been removed, they can still come back, although benign tumors are less likely to recur than malignant ones.

Although benign tumors in other parts of the body can cause problems, they are not generally considered to be a major health problem or to be life-threatening. But even a benign brain tumor can be a serious health problem. Brain tumors damage the cells around them by causing inflammation and putting increased pressure on the tissue under and around it as well as inside the skull.