

# *YOUR BRAIN*

*BY SARAH A.*

10,000 years ago in the neolithic age, people practiced an early form of brain surgery known as trepanning. People would drill holes in other's skulls, we don't know why but it is believed that they would do this for relieving headaches. Early people also thought the heart NOT the brain was the center of knowledge! Did you know the greeks thought the brain was made of phlegm, the chinese thought it was made of bone marrow and the romans thought it was made of mucus? That's so cool! Speaking of cool greek philosopher Aristotle thought that the brain was incharge of cooling down your blood, so if the brain was damaged then the person would act strange and all the heart would do was think!!!

Inside your brain there are two main types of cells, glial cells and Neurons. Let's talk about the glial cells first! There are four main types of glial cells, Astrocyte which are the hardest working cells of our bodies they provide structural support, Microglia which are specialised immune cells that are only found in the brain, finally we have the schwann cells and oligoden do pretty much the same thing! They both wrap themselves around the axons in a process called myelination which creates the myelin sheath. The insulation of the myelin sheath helps prevent the electricity from "leaking".

Now about those neurons! Neurons communicate via chemicals called neurotransmitters, which are released by the axon terminals and are passed to the receptor of a neighboring cell. Each receptor can only react to one type of neurotransmitter because each axon is connected to

so many neurons by its axon terminals. It's important to be picky about which neuron gets which message otherwise things can get confusing very quickly! Because neurons are for transmitting messages they are extremely different from glial cells.

Your brain is pretty much a celebrity I mean LITERALLY! It has two tough defences that you could think of as bodyguards! First off, your skull! The skull is about 6.5-7.1 millimeters thick, that's not even including the muscles, hair and skin on top! The skull provides structure and support for your brain. The bones on the skull are the first line of defense; they are eight separate bones that grow together as you age. The skull can protect you from day to day minor impacts such as trips, slips and minor falls; however, your skull can't win a fight with concrete or a car. Wear a helmet to help your skull and brain!

After the skull it's the blood brain barrier's turn! The blood brain barrier is pretty much what it sounds like! It's literally a barrier that stops "garbage" and unwanted chemicals in your blood from entering your brain. BUT there are things like food, oxygen and other useful things that our brain needs that are allowed to pass the blood brain barrier!

Now that we have entered the brain through its defences let's talk about the different parts of your brain! First off we have the cerebellum! The cerebellum is important for movement. It tells the muscles of the body how to balance and move. The cerebellum is the reason why you don't have to constantly think about walking and talking as well as other things you have learned and do without having to think too much about it. Thanks cerebellum!!

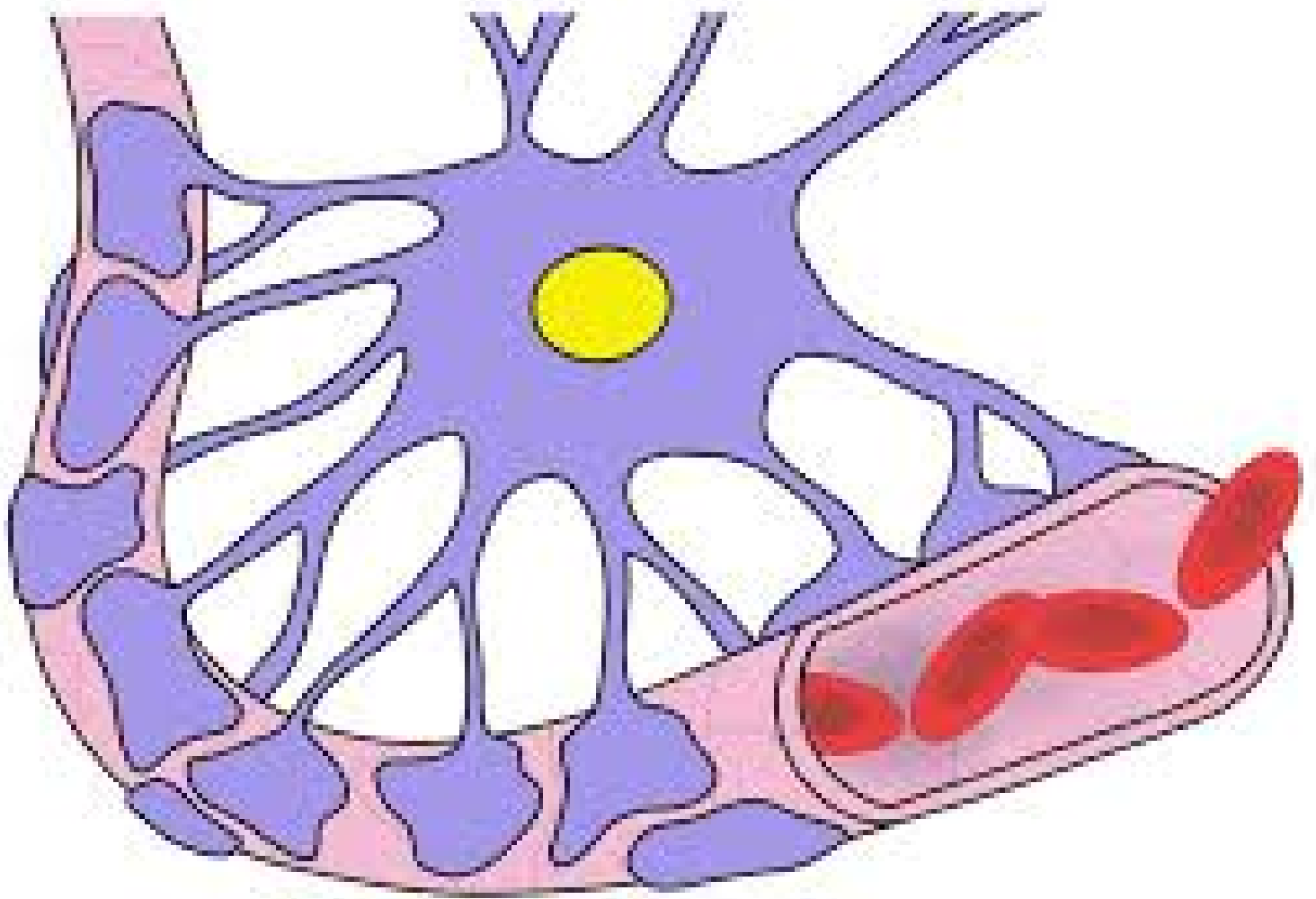
Next part of the brain! The cerebrum is the biggest part of your brain in total it makes up about 70 percent of your brain! This is where thought and talking happens! The cerebellum works with your cerebrum to make some specific movements possible Thanks to the cerebrum!!

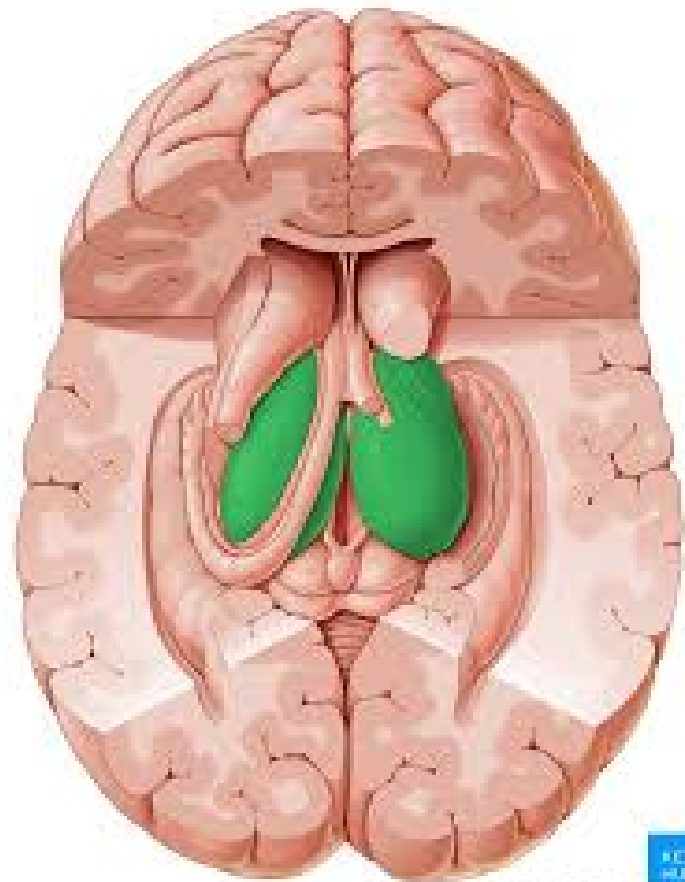
Let's talk about the amygdala! You've probably heard of the "Fight flight or freeze" response but how does it work? Great question! The amygdala is like the driver of this response. The amygdala will analyze the situation, processes whether or not the situation is life threatening or normal and finally your amygdala will chose whether you should fight, run away or if you're absolutely terrified your brain will actually fully focus on the danger and nothing else causing you to "freeze"!

Hypothalamus' turn to step into the spotlight! The hypothalamus helps us with our small activities such as drinking, eating and more! But the hypothalamus also help's control and regulate our body temperature which is also small but every part of your brain does both small and sometimes big stuff! More things the hypothalamus can do and is involved in is that your hypothalamus modulates the endocrine system by accessing it's connection with the one and only purity gland!

Now please give it up for the one and only diencephalon!!! Your diencephalon helps regulate body functions such as sleep in which your diencephalon works with your thalamus to produce the sleeping cycle! The sleeping cycle is what it sounds like, the cycle of sleep! It starts with as you might now recall tossing and turning in bed this cycle is stage one of non-REM sleep then in stage two of non-REM sleep you become less aware of your surroundings and begin to actually fall asleep in stage three of non-REM sleep is when you go into deep sleep and this stage is the one that makes it the most difficult to wake up now

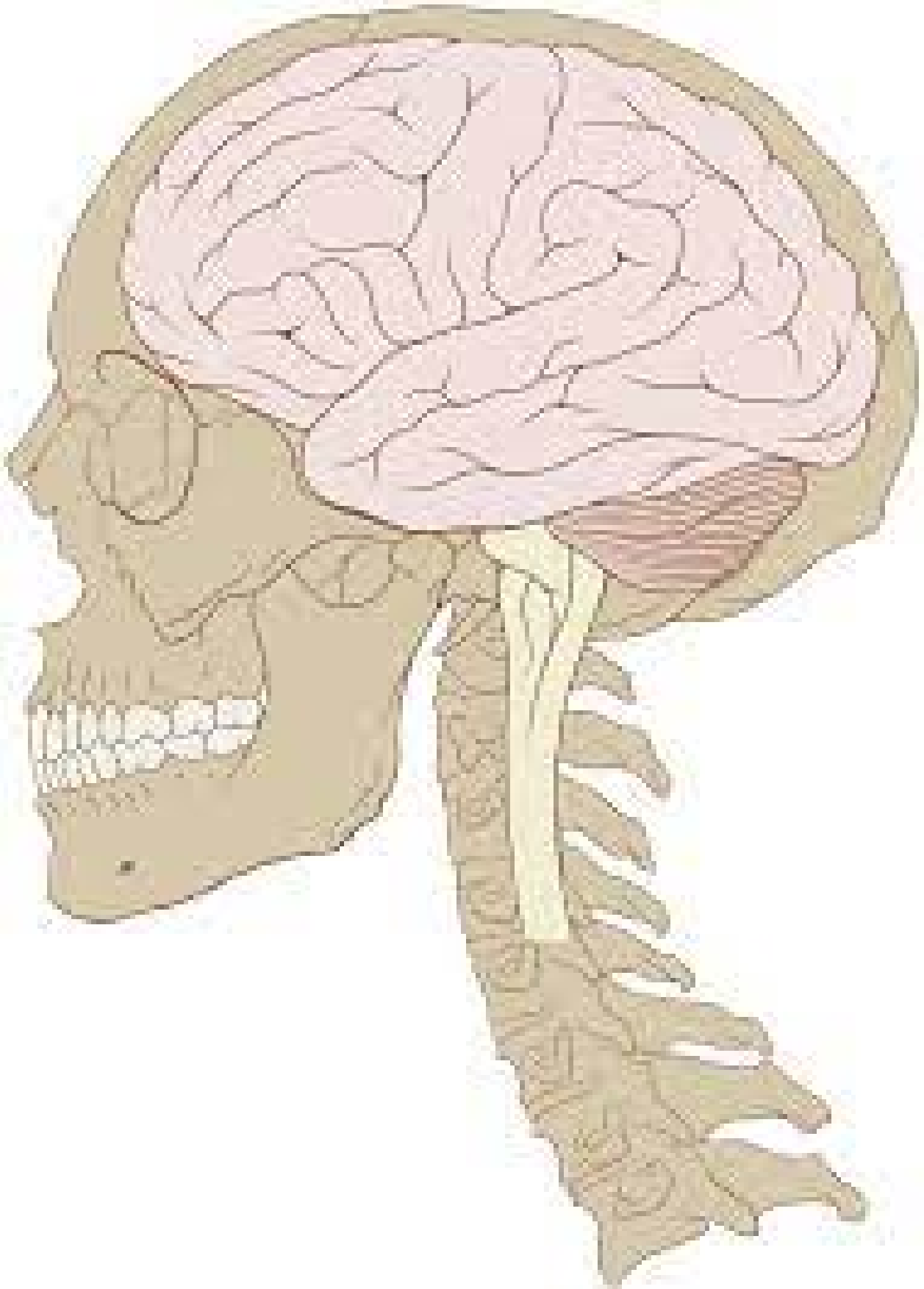
we have our fifth and final stage of the sleep cycle REM sleep REM stands for Rapid Eye Movement so in this stage yup you guessed it you make rapid eye movement! The REM stage finally occurs about 60-80 minutes into your sleep cycle! Pretty cool! Think about how hard your brain works even when you're sleeping or not thinking about it! Here are a few pictures of the brain to help visualise how it works!





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## HOW TO STUDY!

So you may think, like many people that the best way to study is to do it non stop all the time. BUT!!!! You're wrong. Believe it or not I have the best way to study and it gives you sleep and fun! The first step is to study in a space where all the things that may distract you (ex. Phone, Toy, computer etc") are far away from you! The second step is to take small portions of information at a time for example instead of saying everything at once try breaking it down to small parts so it's easier for your brain to comprehend. Third step is REPETITION! Repetition is important since the more you say it the more your brain will think "Oh hey this seems important I should probably remember this!" Then on the day of your quiz your brain will think "Right this is the important thing!!!" The fourth and final step is SLEEP! It's extremely important to get enough sleep before any big day. Especially a quiz because when you go to sleep it's like refreshing a page and starting a new one! When you sleep all the action or memories you make go into your short or long term memory! You want to make sure that you get a good amount of time to store the information that you learned!! Easy right!!!!!!

Now, Your memory is SUPER DUPER important! Here's how it works! Let's say your dad's making cookies but he used the last of the eggs on your breakfast and finished the sugar for those delicious pancakes you had for lunch! He asks you to go get him sugar and eggs. You go to the corner store BUT you see a man in a clown costume and get so scared! You forget everything and- wait now you remember your first encounter with a clown WHAT?!?! Wait wait wait HOLD UP!!!! When you see something that triggers a memory you will see that memory vividly replaying in your brain! Cool right!? Anyways. The cashier asks you what you wanted "OH NO" you think YOU FORGOT!!!! The cashier asks you who told you to come "dad" you say. The cashier asks why OH YAH

you say. Your brain thinks of the surroundings and people related to the memory then BOOM shopping list!

# REFERENCES

*For my pretty much all of the information I used my book called: Science comics, THE BRAIN THE ULTIMATE THINKING MACHINE 1st edition author, Tory Woollcott illustrator Alex Graudins.*

*For the pictures I went on google and searched, Brain for the picture of the brain, Thalamus for the picture of the Thalamus and I searched Brain Blood Barrier for the Brain Blood Barrier.*