

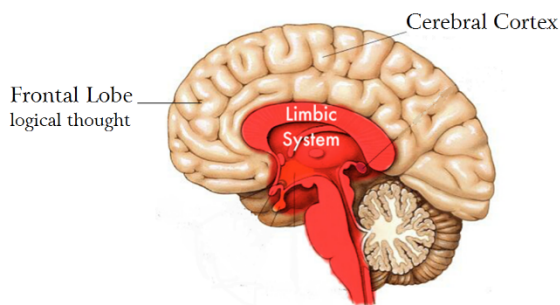
The Development of the Adolescent Brain

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By the time you are six or seven years old your brain has reached approximately 90-95% of its adult size, however there is still much development that needs to occur before it can function as an actual adult brain. Neurons need to be restructured and rewired, new brain cells need to form in certain regions and the folds and creases of the brain need to continue developing and becoming more complex. This remodelling process happens throughout your adolescent years and into your mid-twenties.

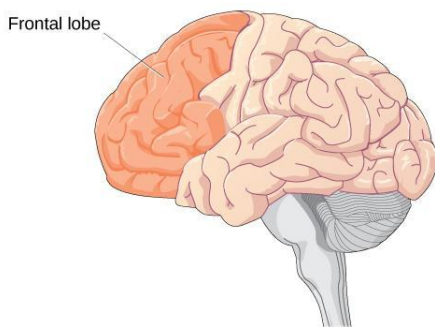
The Limbic System – Early adolescence



The limbic system plays a role in determining rewards and punishments along with the processing of emotions and social information. By the time adolescence is reached the amygdala (a subregion of this system) is well developed and is associated with emotions, impulses, aggression and instinctive behaviour. For a time (while the prefrontal cortex

undergoes further development) this area of the brain is the main governing body of various actions and plays a role in adolescent risk taking and emotional outbursts, especially during times of high stress.

The Frontal Lobe – Myelination & Synaptic Pruning (Late adolescence)



During late adolescence significant changes occur in the frontal lobe region of the brain, especially the **prefrontal cortex**, which is involved in the ability to plan and think about the consequences of actions, solve problems and control impulses, along with other higher brain functions. Two processes known as **myelination** (an increase in the amount of myelin surrounding a neuron) and **synaptic pruning** (the elimination of the number of neurons in the brain leaving only the most

efficient ones) occur which allows the neurons in this region to become stronger and more efficient in electrical transmission and processing information.

The Limbic System – Functions	The Prefrontal Cortex – Functions
Risk taking and impulsivity	Decision making
Reward seeking	Planning and strategizing
Emotional expression	Coordination of thoughts and emotions
Motivation and boredom	Self-control
Hunger and sleep cycle	

Promoting Healthy Brain Development

- Getting a healthy amount of sleep: The sleeping patterns of adolescents differ from those of adults. Adolescents are often drowsy upon waking, tired throughout the day, and wakeful at night. This is **not a sign of laziness** but rather the levels of **melatonin** (a sleep hormone) varying during adolescence, with natural levels rising late into the night and then falling late in the mornings.
- Take **healthy** risks: Exploring new and varying experiences can help you develop an independent identity, explore adult behaviour and eventually grow and develop, moving towards independence. New experiences and sensations also help the brain during the pruning process in making stronger refined connections, however it can also hinder it if these experiences are negative, such as smoking, drinking, drug use etc. Always strive to explore the world in a healthy positive manner.
- Build a **support network** of friends and family: Adolescence can be a time of high stress (peer pressure, new schools, major life events), and throughout the years your developing brain is more vulnerable to stress factors. Staying connected with those around you can help with coping with stress and promote healthy brain development.

Adolescence is a tough time and many challenges will have to be overcome, however there are resources available that can help.

Always ask for help during hard times.