The adolescent brain

An information sheet by Dr John Coleman

About this information sheet

The Association for Young People's Health works to understand and meet the particular health and wellbeing needs of 10-25 year olds. Our information sheets provide a summary of a key area of adolescent health in an easy to read format. There are suggestions for further reading and you can find more data and resources on our website and youth health data hub.

Dr John Coleman is a psychologist and former chair of AYPH.

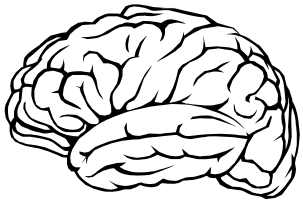
Introduction

Over the last 20 years or so there has been a remarkable increase in our knowledge of the teenage brain. Much of this information has direct relevance to the health field. Understanding the brain helps us make sense of much of young people's behaviour, especially in those who are seen in clinics, hospitals and in health settings in the community. The information we have gained about the major changes that take place during this stage of life has relevance to emotion regulation, to communication, to compliance and to the way young people respond to information about their health.

The brain

The brain is a mystery, but it is also a thing of wonder. It is the most complex entity in nature. It is a mystery as there is still so much we do not know about it. Some writers call it the "inner cosmos" as it has a capacity so vast, and because it is still mostly unexplored. The brain contains billions of cells, known as neurons. All these billions of neurons are connected to other neurons in bewildering patterns and networks.

There are dozens and dozens of different sites across the human brain. Three sites in particular play an important part in the way the brain functions. These are the amygdala, the site of emotion management, the prefrontal cortex, associated with thinking, reasoning and problem solving, and the hippocampus, a site that manages short-term memory.



Adolescence

It is important to understand that there are significant changes that take place in the brain during adolescence. This period can be a confusing and contradictory time of life. On one hand the brain is maturing, allowing the teenager to develop new skills and capabilities. On the other hand, the brain is also undergoing a major re-organisation, leading to times of confusion and uncertainty. This contradiction means that things are often topsy-turvy. The young person can be happy and sad, independent and in need of support all at the same time.

Two significant changes should be mentioned here. The first relates to pruning. At the end of childhood there is an increase in the number of neurons in the brain. Over the next period this number is pruned back, allowing better functioning in the future. The brain undergoes restructuring, which can lead to a period of adjustment. The second point to mention has to do with hormone variation. During this stage there are more hormones such as dopamine in the brain, but there is also a greater variation in the level of hormones. This is what lies behind the fluctuation of emotion during these years.

The adolescent brain and health

Why is this relevant to adolescent health? First and foremost, emotions at this time are more difficult to regulate, and this may lead to higher levels of anxiety or depression. Secondly, information processing may still be maturing, and thus it may be harder to think about consequences. An example might be the difficulty teenagers sometimes have over compliance with medicines and routines.

Young people often say that communication with adults is hard for them, as they are still learning how to use language to communicate their needs. Finally, since dopamine levels are higher in the teenage brain, rewards become especially powerful. When professionals are thinking of motivation, it pays to remember that young people are likely to be more responsive to reward than to any other incentive.

One final word for health professionals. The more you understand the adolescent brain, the easier it will be to work with this age group.

Further reading

Blakemore, Sarah-Jayne (2019) Inventing ourselves: the secret life of the teenage brain. Penguin Books.

Coleman, John (2024) The psychology of the teenage brain. Routledge.

For more information about AYPH and other resources: ayph.org.uk, info@ayph.org.uk