

Intelligence and executive functions in children and adolescents with PKU

INTELLIGENCE

There have been several studies that have looked at the intelligence of children with treated PKU.

IQ scores are typically in the normal range, although they are often slightly lower than those of unaffected siblings or parents.

An example of the kind of results found is a study by Williamson who compared the IQ scores of children with treated PKU and their brothers and sisters, at the same age.

Results from the study are shown below.

Age	Children with PKU	Brothers and sisters
4	IQ 93	IQ 99
6	IQ 98	IQ 103

(IQ scores between 90 and 110 are in the Average Range)

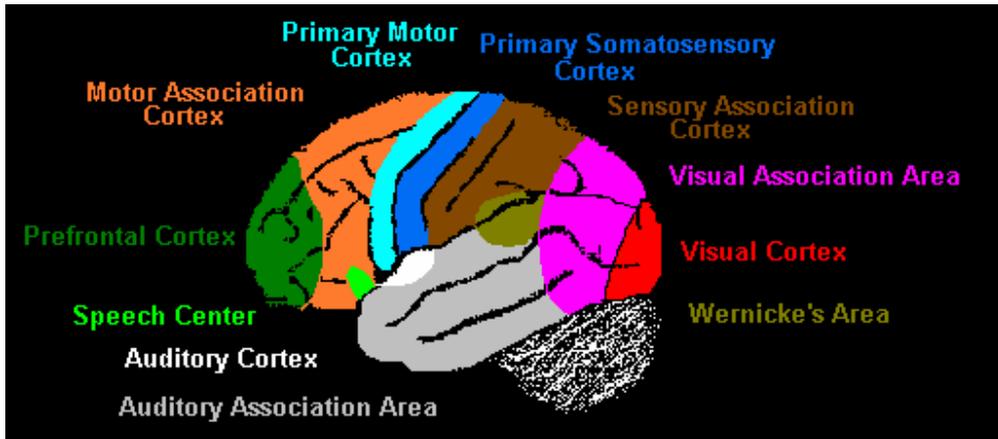
EXECUTIVE FUNCTIONS

It is thought that even with early treatment, PKU may cause subtle difficulties that are not picked up by traditional IQ tests. It is suggested that children with early treated PKU have greater difficulties on tests of executive functioning, even when still on diet.

Executive functions is a term used to refer to the ability to go about problem solving to reach a future goal. It can be thought of as the kind of abilities an executive of a company would have to have to do their job well, that is;

- To plan
- To be organised
- To think of options
- To not be impulsive
- To be flexible in their thinking and actions.
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These abilities are thought to depend on the prefrontal cortex. This is shown below.



It is suggested that PKU effects the neurotransmitters in the brain and the prefrontal cortex is the most sensitive part of the brain to problems with neurotransmitters because it has so many connections with other parts of the brain. Research on the development of executive functions in children with PKU is in its early years but does suggest that children with PKU are more likely to have difficulties with executive functions than other children. The research also shows that abilities dependent on other areas of the brain, such as memory, is normal in children with PKU.