



Chiari Academy Video Transcription Impact of Chiari – Cognitive Impact

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In the previous modules we discussed the wide-ranging effects of living with

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chronic pain and the physical disabilities associated with Chiari. In this module we

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will focus on the cognitive impact of Chiari. To understand the cognitive impact of Chiari,

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first we must understand what we mean by cognition. Cognition can be defined as the

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mental process of acquiring knowledge and understanding through thought, experience,

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and sensation, or in other words how your brain takes in and uses information. Over the years,

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researchers have used different models to describe cognition and all its component parts,

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such as perception, attention, memory, reasoning, planning, decision making, and language.

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At the basic level our brains are constantly gathering information from our senses in terms

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of what we see, hear, feel, smell, and taste. Our senses are how we perceive the environment around

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us and the process of the brain acquiring this information is called perception.

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However, our environment can present an overwhelming amount of information at any

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one time, so our brains use what is called attention to decide what input to focus on.

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The process of attention can be divided into selective attention, meaning focusing

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on information that is relevant to the task at hand and filtering out irrelevant information;

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divided attention, meaning the ability to focus on more than one thing at the same time;

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and attention capacity which refers to how much information the brain can focus on at one time.

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Once the brain filters the information we receive through perception and attention, it stores the

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information in memory. Like attention, scientists describe memory as having three main components.

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Short-term memory which allows us to hold a few items of information for a brief period,

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long-term memory which allows us to store a vast amount of information for indefinite periods of

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time and working memory which allows us to draw information from both short and long-term memory

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to use in performing complex tasks. The continuous processing of information through perception,

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attention, and memory enable us to engage in higher order tasks, such as thinking,

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reasoning, problem solving, planning, language, artistic creativity, etc.

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Cognitive psychologists – scientists who study how the brain works – use several different

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methods to test both the basic processes of perception, memory, and attention, and higher

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order functioning. These include performance based tasks designed to isolate specific cognitive tasks

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such as selective attention, visual spatial reasoning, and even recognizing the emotional

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state of other people. Their toolkit also includes measuring the electrical activity of the brain

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using sensors placed on the scalp and different types of imaging. For example, functional MRI is

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used to show which areas of the brain are active during specific tasks and DTI is a type of MRI

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which can show damage to the brain's connections. Now that we've covered some of the basics we can

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turn to the impact Chiari can have on the brain's normal functioning.