

SEPTEMBER IS CHIARI AWARENESS MONTH

Limitations of **MRI**

Chiari is a medical condition that is historically defined by a measurement taken on an MRI (tonsillar position). Conquer Chiari has posted several times regarding the fact this measurement is not a great marker for symptomatic Chiari, meaning that some people with small herniations have severe symptoms and some people with large herniations have no symptoms. However, what is not talked about as much are the inherent limitations involved with the MRI process. An MRI is a complex machine that uses magnetic fields to manipulate and measure water content (hydrogen) in order to create a representation of what is inside the body. It builds the image set through a series of slices in different directions. However, as with any machine, it is not perfect and there are a number of areas where variability and lack of resolution occur. The strength of the magnet, the MRI manufacturer, the patient's head position, the patient's movement in the machine, and the exact settings on the machine all play a role. The end result is that the same person having an MRI twice, even in the same machine, will result in different pictures. The images for the same person having an MRI on different machines will almost always look different. In addition, sometimes the anatomical landmarks needed to measure tonsillar position are clear, but sometimes they aren't. This results in variability in the measuring process. In fact, unpublished research has shown that the same images measured by different, trained people, results in a significant variation in the tonsillar position length. The unfortunate outcome of all of this is that far too many people get stuck in the diagnostic process because an MRI might say they have 2mm of herniation. This is why Conquer Chiari recommends that anyone with an indication of tonsillar herniation (or crowding) and symptoms be evaluated by a neurosurgeon. This is also why the researchers at the CCRC are aggressively pursuing new, objective indicators of symptomatic Chiari and also developing automated software so that clinicians will have more consistent data available to help in evaluating patients.