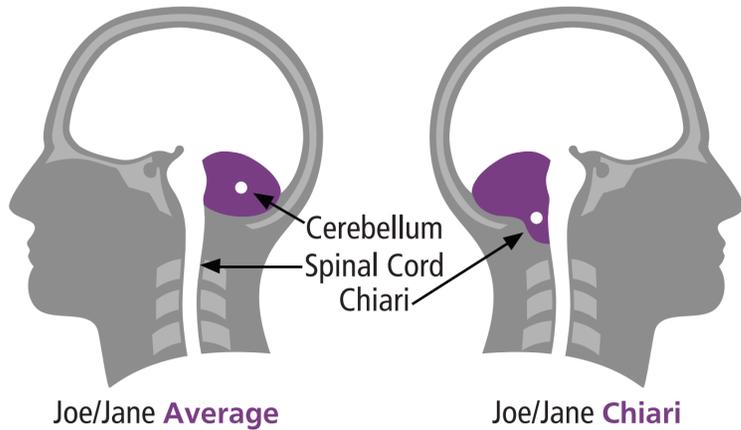


## Treatment Options



## Treat Symptoms Individually

**Symptoms not severe enough for surgery**  
**Patient does not want surgery**  
**Other medical conditions to address first**

Patients tend to find their own way of managing symptoms, whether adopting lifestyle changes, restricting activities, changing careers, trying alternative medicine or conversing with other Chiari patients on what works for them.

## Surgery

### Surgical Steps

#### Craniectomy-

A piece of the skull is removed

#### Laminectomy-

Part of one or more vertebrae are removed

#### Duraplasty-

The covering of the brain is opened and a patch is sewn in to make it bigger

#### Tissue removal-

Cerebellar tonsils are sometimes cauterized (controversial)

#### Plate insertion-

Mesh is inserted where skull was removed



Images courtesy of Dr. Ghassen Bejjani

## Wait & See

**Because there is no definitive test for symptomatic Chiari, and because people can have herniation of the cerebellar tonsils without symptoms, many people are advised to wait and see**

### Symptoms, if present, may not be due to Chiari

For example, experiencing frontal or more general headaches as opposed to headaches in the back of the head. Headaches are very common and can be caused by many different things

### Incidental Diagnosis

For example, a child has an MRI after head trauma during a sporting event and is found to have herniation of the cerebellar tonsils, but does not have symptoms associated with Chiari

### Doctor's Judgement

An experienced neurosurgeon does not think the symptoms will respond to surgery

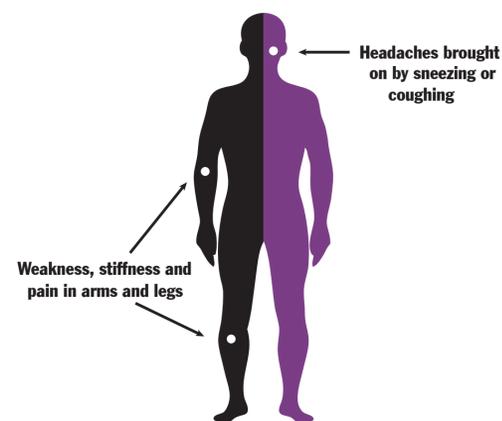
### Procedure

Monitor the condition with regular MRIs

### Regular Check-ups

Be on the look out for Chiari type symptoms

Medical Center  
NAME Patient A AGE 32  
ADDRESS 456 Lanes DATE 6/6/18  
**Rx**  
Medicine for pain  
Restricted Activities  
Follow-up MRI in 6 mos.  
  
Dr. Physician MD  
SIGNATURE  
LABEL  
REFILL 0 1 2 3 4 5 PRN NR



Medical Center  
NAME Patient B AGE 24  
ADDRESS 123 Ave. DATE 6/6/18  
**Rx**  
No Heavy Lifting  
Medicine for headache  
Call if symptoms worsen  
  
Dr. Physician MD  
SIGNATURE  
LABEL  
REFILL 0 1 2 3 4 5 PRN NR

## Surgical Variations/Controversies

**How much bone is removed**

**Whether the dura is opened at all**

**What type of material is used for a dural graft (patch)**

**Whether any brain tissue is removed**

**Whether a mesh is put in to take the place of the removed piece of skull**

American Association of Neurological Surgeons reported in 1997 that approx. 2,000 surgeries were performed each year by only 40% of neurosurgeons.

In 2007 11,000 surgeries were being performed each year by approx. 75% of neurosurgeons, a significant increase.

Dural patches have been used in many types of surgeries for more than 100 years, and doctors have tried many kinds of materials. In the 1800's both rubber and gold foil were used! In the 20th century, gelatin and silicone products were used as dural substitutes. More recently, patches have come from cadaver tissue, cow tissue, and completely synthetic materials.

Early data from the Chiari 1000 project indicates that pediatric patients respond better to decompression surgery than adults. Specifically, 59% of pediatric patients experienced either a significant improvement or a complete resolution of symptoms, compared to 42% of adult patients.