

## **Intermittency Of Vp Shunt Flow In An Asymptomatic Subject During Day-to-day Activities**

Author(s):

Joseph R. Madsen, MD

Peter Casey, MD

Tomer Anor, PhD

Gani Abazi, MD (Boston, MA)

### **Introduction**

Experience with the ShuntCheck® thermal flow detector with single readings in asymptomatic shunted outpatients has produced the unexpected finding that approximately 50% of tests read “no flow confirmed.” We addressed the question of flow intermittency in a single asymptomatic subject, having never required shunt revision in 19 years.

### **Methods**

Twenty-one thermal cerebrospinal fluid (CSF) flow studies were performed immediately after various bodily postures and various activities (including exercise, overnight sleep, and Trendelenburg position) over a five day span. A supine test was performed first, followed by a sitting test if no flow was detected in the supine test. The ShuntCheck sensors were left in place over the course of each day to minimize effects of device placement.

### **Results**

Tests yielded 56% “no flow confirmed”, while 44% read “flow confirmed.” No single activity consistently produced either “flow detected” or “flow not detected” results, but tests taken after waking up and three minutes of movement yielded the most consistent shunt flow. A supine test after sitting up at a 45° angle seemed to give the lowest reading.

### **Conclusions**

This is the first study where multiple, controlled assessments of CSF flow in a shunt were tested during activities simulating normal life of a subject with a VP shunt. Intermittency of flow likely accounts for the finding of frequent “flow not confirmed” readings in asymptomatic outpatients. Additional maneuvers may distinguish pathological shunt obstruction without flow from this intermittent finding of an undetectable flow state.

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