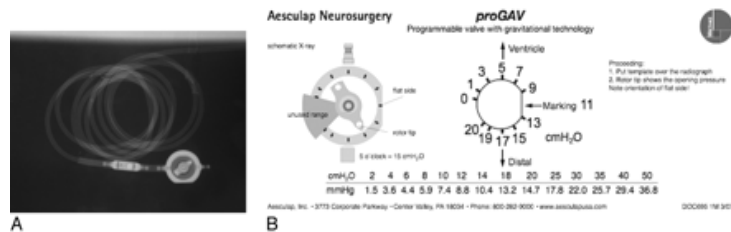


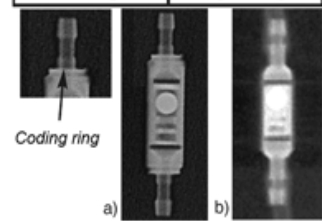
# Radiologic Identification of VP-Shunt valves and adjustment

The verification of shunt adjustment (so-called opening pressure) and also the primary identification of the implanted valve type can be a Problem in daily practice: Shunt pass is not always at hand and documents from external hospitals can be missing. Usually, a simple lateral skull X-ray helps to identify the type of valve and it's adjustment. Most common shunt types used by European neurosurgeons are listed at this page. Furthermore, we have noted our own experiences with MRI safety for the valves. **However, we strongly recommend to consult the manufacturer before MRI scans to verify the safety of the implanted product, the MRI protocols to scan the patients and the risks and hazards that may be associated with exposure to the high-field MRI. We DO NEITHER give any recommendation NOR clearance for performing an MRI for any of the listed implants!**

## GAV- / proGAV- Valves – Christoph Miethke GmbH, Germany



Opening pressure for vertical posture	Coding of gravitational unit
10 cmH <sub>2</sub> O	small, no ring
15 cmH <sub>2</sub> O	large, no ring
20 cmH <sub>2</sub> O	large, 1 ring
25 cmH <sub>2</sub> O	large, 2 rings
30 cmH <sub>2</sub> O	large, 3 rings
35 cmH <sub>2</sub> O	large, 4 rings



a) large, 2 rings = 25 cmH<sub>2</sub>O,  
b) small = 10 cmH<sub>2</sub>O

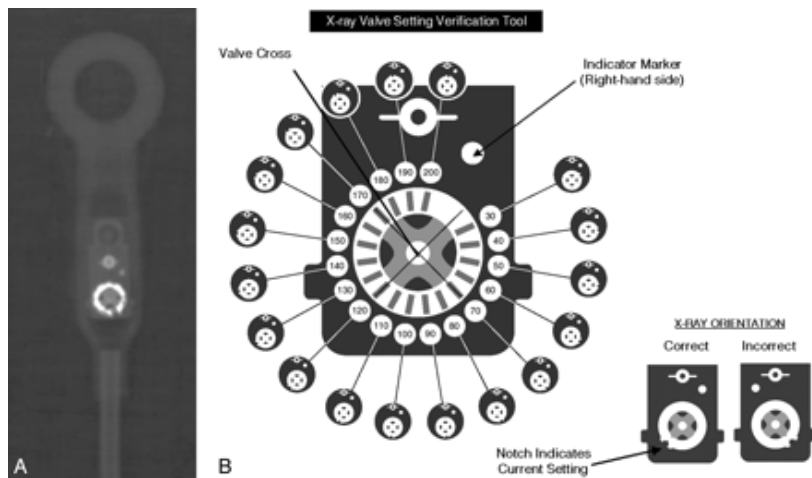
C

## paediGAV – Valves – Christoph Miethke GmbH, Germany

Öffnungsdruck horizontal / vertikal (cmH <sub>2</sub> O)	Kodierung paediGAV im Röntgenbild	Kodierung des alten paediGAV (mit distalem Katheter)
4/14		
4/19		
4/24		
9/19		
9/24		
9/29		

According to our experience all valves are secure for imaging in 3T-MRTs. Programmable valve types (proGAV) can be checked with the verification tool. Thus, there is usually no need for skull X-rays. Unintended readjustment of the valve by magnetic fields of MRI scanners has not observed by us, but has been reported. Opening pressure values are given in cm H2O (not mm H20)! **Please, also pay attention to manufacture's safety and warning guidelines! [www.miethke.com](http://www.miethke.com)**

**Codman Hakim Valves**



Codman Hakim Valves may be exposed to MRI magnetic fields up to 3T. Hakim valves are also available as fixed pressure valves (low-, medium- und high-pressure-valves). The latter do not require radiologic verification after MRI. Only programmable Hakim valves have to be checked by radiologic verification or by the use of a so-called VPV-programming tool. Pressure adjustments are in mmH20 units! **Please, also pay attention to manufacture's safety and warning guidelines! [www.depuy.de/codman/hydrozephalus](http://www.depuy.de/codman/hydrozephalus)**

**Codman SiphonGuard**

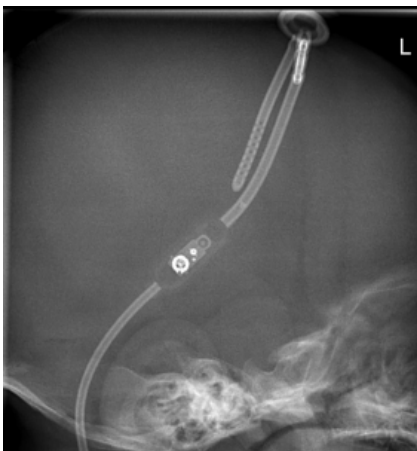


Codman SiphonGuard an add-on valve for the therapy of overdrainage (slit-ventricle syndrome). It is intended to prevent uncontrolled loss of CSF from the brain via the shunt system. It is MR-compatible and a valve without adjustment option. Thus, a check-up of the valve setting after MRI is not necessary. **Please, also pay attention to manufacture's safety and warning guidelines! [www.depuy.de/codman/hydrozephalus](http://www.depuy.de/codman/hydrozephalus)**

### Codman (Cordis) Hakim non-programmable (fixed-pressure) and programmable micro valves

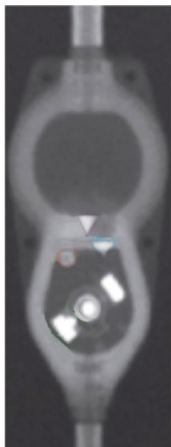


fixed-pressure Hakim microvalve



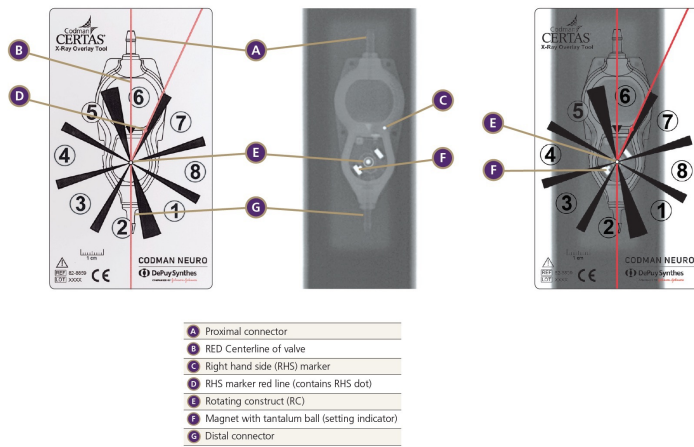
The fixed pressure valves do not require radiologic verification after MRI. Only programmable Hakim valves have to be checked by radiologic verification or by the use of a so-called VPV-programming tool. Pressure adjustments are in mmH20 units! **Please, also pay attention to manufacture's safety and warning guidelines!** [www.depuy.de/codman/hydrozephalus](http://www.depuy.de/codman/hydrozephalus)

### Codman Certas Valve



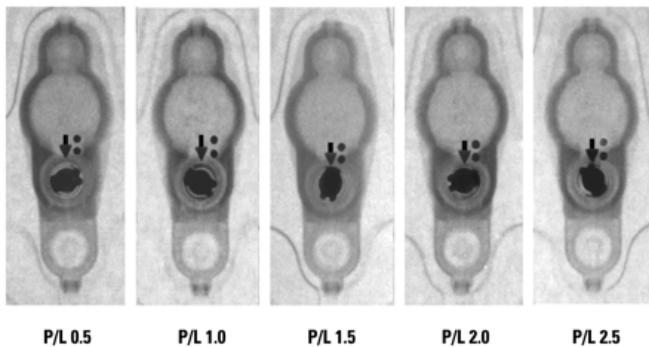
The Certas Valve is the first generation of programmable differential pressure Certas valves by Codman and has been discontinued due to problems during MRI scanning and accidental reprogramming. Please, check current information of the manufacturer, as radiological verification of shunt adjustment can be recommended. **Please, also pay attention to manufacture's safety and warning guidelines!** [www.depuy.de/codman/hydrozephalus](http://www.depuy.de/codman/hydrozephalus)

Codman Certas Valve Plus



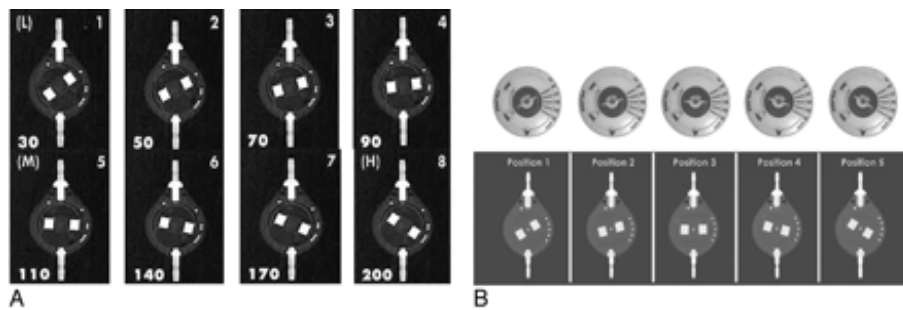
Das Certas Ventil is the latest generation of programmable differential pressure Certas valves by Codman and been declared MRI safe up to 3 Tesla. Please, check current information of the manufacturer, as radiological verification of shunt adjustment can be recommended. **Please, also pay attention to manufacture’s safety and warning guidelines!** [www.depuy.de/codman/hydrozephalus](http://www.depuy.de/codman/hydrozephalus)

Medtronic (PS Medical) Strata Valve



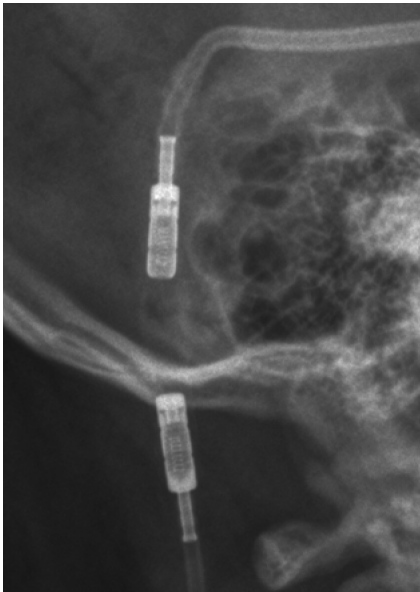
Strata valves and their flow-regulation adjustment can be identified in plain skull X-rays. MRI scanners up to 3 Tesla are quoted to be safe, but a post-MRI radiologic check of adjustment is recommended in literature. **Please, also pay attention to manufacture’s safety and warning guidelines!** [www.medtronic.com/for-healthcare-professionals/products-therapies/neurological/shunts/index.htm](http://www.medtronic.com/for-healthcare-professionals/products-therapies/neurological/shunts/index.htm)

Sophy SM8 and Polaris Valves – Sophysa



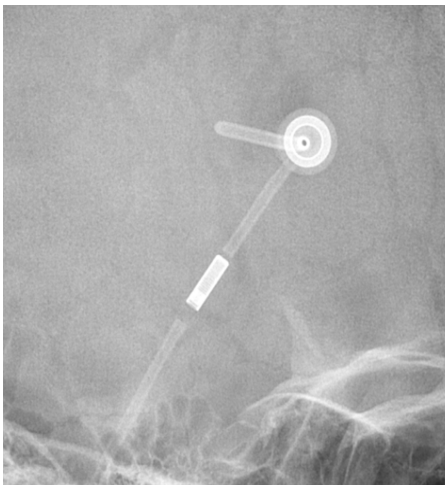
In literature, MRT scans with scanners up to 3 Tesla are possible, but rare accidental readjustments have occurred. A radiologic check after MRI is recommended to verify correct adjustment. Both valve types are programmable in pressure levels of mmH2O – Sophy-Valve using 8 and Polaris offering 5 possible opening pressure settings. **Please, also pay attention to manufacture’s safety and warning guidelines!** [www.sophysa.com](http://www.sophysa.com)

Spitz-Holter Ventil, Integra



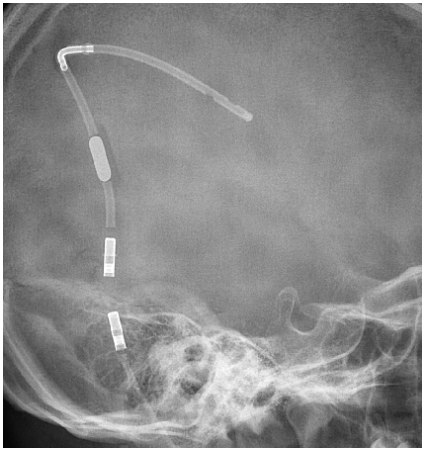
Spitz-Holter-Valves have been used routinely in Leipzig during 60s and 70s and are very long-lasting. We have no negative experience with MRI scans with up to 1.5T even in valves older than 25 years. There is possibility to identify the opening pressure type of the valve in X-ray (low, medium, high pressure types of valves). **Please, also pay attention to manufacture's safety and warning guidelines! [www.integralife.com](http://www.integralife.com)**

#### Integra Omni-Shunt System



The Omni-Shunt System is a non-programmable differential pressure valve. We have never noticed any malfunction in correlation to MRI scans up to 1.5 Tesla yet. There is possibility to identify the opening pressure type of the valve in X-ray (low, medium, high pressure types of valves). **Please, also pay attention to manufacture's safety and warning guidelines! [www.integralife.com](http://www.integralife.com)**

## Integra DP valve (Differential-pressure) System



The DP-valve (TM) System is a non-programmable differential pressure valve. We have never noticed any malfunction in correlation to MRI scans up to 1.5 Tesla yet. There is possibility to identify the opening pressure type of the valve in X-ray (low, medium, high pressure types of valves). **Please, also pay attention to manufacture's safety and warning guidelines! [www.integralife.com](http://www.integralife.com)**

**Source:**

Lollis SS, Mamourian AC, Vaccaro TJ, Duhaime AC. Programmable CSF shunt valves: radiographic identification and interpretation. AJNR Am J Neuroradiol. 2010 Aug;31(7):1343-6. doi: 10.3174/ajnr.A1997.

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## News

After presentations at the Congress of the European Society for Pediatric Neurosurgery (ESPN) in Rome and the German Neurosurgical Society (DGNC), many new cooperations are in preparation and new therapeutic concepts are about to be integrated.

We aim to be always in concordance with the current state-of-the-art concepts as well as to participate in developing guidelines for the future.

## Languages

 Deutsch  English

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