

# Idiopathic normal pressure hydrocephalus treatment complications

The rate of [complications](#) or [readmission](#) within 30 d of [ventricular shunting](#) for [NPH](#) is 25.15%. Preoperative comorbidities of [myocardial infarction](#) within 1 yr, [cerebrovascular disease](#), and moderate/severe [renal disease](#) are independent risk factors for poor outcomes <sup>1) 2)</sup>.

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Outcomes did not differ significantly among different CSF diversion techniques, and overall improvement was reported in more than 75% of patients. The use of [programmable valves](#) decreased the incidence of revision surgery and of subdural collections after surgery, potentially justifying the higher initial cost associated with these valves <sup>3)</sup>.

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The goal is to avoid serious complications, such as [subdural effusion](#) or [subdural hematoma](#). [Adjustable pressure valves](#) offer the advantage of being able to lower the pressure setting incrementally until symptoms improve and to raise the pressure setting if low-pressure symptoms or complications emerge. The introduction of adjustable valves has dramatically lowered the need for [shunt revisions](#), and most [complications](#) can be handled by changing the shunt setting. Severe complications, such as subdural hematoma with mass effect, [shunt infection](#), and [shunt obstruction](#), typically require neurosurgical intervention. Adjustable shunts can be used to safely manage patients with [Idiopathic normal pressure hydrocephalus](#) who need chronic anticoagulation <sup>4)</sup>.

[Subdural collections](#), [shunt malfunction](#), and postoperative [seizures](#) constituted the most frequent complications <sup>5)</sup>.

see [Shunt overdrainage in idiopathic normal pressure hydrocephalus](#).

The objectives of Larsson et al., from the Umeå University, in [Sweden](#) were to establish the frequencies of [epilepsy](#), [headache](#), and [abdominal pain](#) and determine their impact on patient [quality of life \(QOL\)](#), in long-term follow-up after [shunt surgery](#) for INPH.

One hundred seventy-six shunt-treated patients with [Idiopathic normal pressure hydrocephalus](#) (INPH) (mean age 74 years) and 368 age- and sex-matched controls from the population were included. The mean follow-up time after surgery was 21 months (range 6-45 months). Each participant answered a [questionnaire](#) regarding present frequency and severity of [headache](#) and [abdominal pain](#). Confirmed diagnoses of epilepsy and all prescriptions for [antiepileptic drugs](#) (AEDs) before and after shunt surgery for INPH were gathered from national registries. Equivalent presurgical and postsurgical time periods were constructed for the controls based on the date of surgery (the division date for controls is referred to as virtual surgery). All registry data covered a mean period of 6 years (range 3-8 years) before surgery/virtual surgery and 4 years (range 2-6 years) after surgery/virtual surgery. Provoked epileptic seizures were excluded. Patient [QOL](#) was assessed with the [EuroQoL](#) 5-dimension 5-level instrument.

Epilepsy was more common in shunt-treated patients with INPH than in controls (4.5% vs 1.1%, respectively;  $p = 0.023$ ), as was treatment with AEDs (14.8% vs 7.3%, respectively;  $p = 0.010$ ). No difference was found between the populations before surgery/virtual surgery (epilepsy, 2.3% [INPH]

vs 1.1% [control],  $p = 0.280$ ; AED treatment, 8.5% [INPH] vs 5.4% [control],  $p = 0.235$ ). New-onset epilepsy and new AED treatment after surgery/virtual surgery were more common in INPH (epilepsy, 2.3% [INPH] vs 0.0% [control],  $p = 0.011$ ; AED, 8.5% [INPH] vs 3.3% [control],  $p = 0.015$ ). At follow-up, more patients with INPH than controls experienced headache several times per month or more often (36.1% vs 11.6%, respectively;  $p < 0.001$ ). Patients with INPH and unilateral headache had more right-sided headaches than controls ( $p = 0.038$ ). Postural headache was experienced by 16% ( $n = 27$  of 169) of the patients with INPH. Twenty percent ( $n = 35$ ) of the patients with INPH had persistent abdominal pain. Headache was not correlated to lower QOL. The study was underpowered to draw conclusions regarding QOL in patients with INPH who had epilepsy and abdominal pain, but the finding of no net difference in mean QOL indicates that no correlation between them existed.

Epilepsy, headache, and abdominal pain are common in long-term follow-up in patients after shunt surgery for INPH and are more common among patients with INPH than in the general population. All adverse events, including mild and moderate ones, should be considered during postoperative follow-ups and in the development of new methods for shunt placement <sup>6)</sup>.

## Transient or minimal improvement of symptoms

Di Rienzo et al. [retrospectively](#) collected [data](#) on a 10-year series of VP-shunted patients with [Idiopathic normal pressure hydrocephalus](#) showing transient or minimal improvement of symptoms within 3 weeks from surgery. A full workup (including noninvasive diagnostic, [cognitive](#), and invasive tests) was performed. After ruling out mechanical [ventriculoperitoneal shunt malfunction](#), they performed a [tap test](#) followed by a [Katzman test](#) 2 weeks later. The confirmed persistence of disturbance of [cerebrospinal fluid dynamics](#) was treated by [shunt revision](#) and, if found working, by its replacement into the atrial cavity.

Twenty patients were diagnosed with shunt insufficiency. At surgery, the distal end of the shunt was easily extruded and found working in all cases. It was then repositioned into the right atrium (the first 8 patients of the series also underwent failed contralateral abdominal replacement). Early postoperative clinical improvement was always confirmed. In 1 case, [shunt overdrainage](#) was corrected by valve upregulation.

Inadequate distal end placement of a shunt might be one of the reasons needing investigation in patients with INPH failing improvement after surgery. In such situations, the conversion to a [ventriculoatrial shunt](#) proved to be a low-cost and successful treatment option <sup>7)</sup>.

## References

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