



## Normal Pressure Hydrocephalus: Making the Right Diagnosis

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### Introduction

Making the diagnosis of Normal Pressure Hydrocephalus (NPH) presents a challenge for neurologists and neurosurgeons due to the high prevalence of the symptoms of the NPH triad in the elderly. Alternative pathologies, alone or in combination, can also cause the symptom triad; therefore, physicians are faced with broad differential diagnosis that is challenging to assess.

### Methods

Each patient underwent a structured history and physical examination, including in-depth review of their medications. Patients underwent cognitive and gait testing. Extensive blood and urine testing was performed, along with imaging of the brain and C-spine. If NPH was still felt to be the cause of the patient’s symptoms, a high volume LP was performed with gait and cognitive testing before and after and CSF analysis. Patients who have undergone CSF diversion are serially assessed for changes in gait, cognition and urinary habits.

### Results

111 patients were referred to our NPH clinic for evaluation between 2009 and 2012 and followed for variable periods of time. Patients were grouped as follows: probable NPH (n=22; 19.82%); alternative diagnosis (n=47; 42.34%); NPH and additional contributory diagnosis (n=6; 5.40%); patients with contraindications to workup or treatment of NPH e.g., anticoagulation that could not safely be suspended (n=16; 14.41%); treatment suspended per patient’s or family’s wishes (n=26; 23.42%) and evaluation currently under progress (n=8; 7.20%). The most common alternative diagnoses for those who have improved without shunting were adverse effects from anticholinergic medication, vertigo, and spinal degenerative disease. 25 patients (24.27%) underwent surgery; 60% reported improvement, 16% showed decline, 8% improved then worsened and 8% reported no change.

### Conclusions

Patients referred for evaluation of possible NPH should undergo comprehensive evaluation using a multidisciplinary approach to ensure correct diagnosis and suitable treatment. Identifying alternative diagnoses can lead to good outcomes without shunting when appropriately treated.

### Learning Objectives

By the conclusion of this session, participants should be able to: 1)perform comprehensive evaluation of patients with possible NPH; 2)differentiate NPH from pathologies with similar clinical picture; 3)formulate an appropriate management plan for patients with NPH.

### References

Wilson RK, Williams MA. The role of the neurologist in the longitudinal management of normal pressure hydrocephalus. Neurologist. 2010 Jul;16(4):238-48.