

# Assessment of response to cerebrospinal fluid tap test for normal pressure hydrocephalus: how we do it

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## DESCRIPTION

A 65-year-old woman was referred to our medicine for the older person day hospital with a 2-year history of frequent falls and progressive memory decline. On examination, she was cautious in her gait, slightly leaning to her left side and very unsteady on turning. MRI of her brain revealed prominence of third and lateral ventricles and increased surrounding signal intensity suggestive of normal pressure hydrocephalus (NPH) (figure 1). She consented to a video-recorded cerebrospinal fluid (CSF) tap test (TT) with removal of 50 mL of CSF. Pre and post (2-hour and 2-day) assessments are shown in table 1.

Post CSF TT, she had a 33.3% improvement in the Timed Up and Go Test (TUGT), a less likely tendency to fall and a smoother turn (videos 1 and 2). She subsequently underwent a CSF ventriculo-peritoneal shunt procedure with remarkable improvement in her mobility.

NPH is a syndrome which consists of a triad of gait disturbance, cognitive dysfunction and urinary symptoms. Owing to its potentially treatable nature, the selection of patients who may benefit from CSF shunt surgery is important.<sup>1</sup> The most widely used prognostic test to assess candidacy for shunt placement is the CSF TT.<sup>2</sup> This procedure is proven to have a high positive predictive value

**Table 1** Result of assessment of response to CSF TT

	Before CSF TT	2 hours after CSF TT	2 days after CSF TT
MMSE	18/30	19/30	20/30
ACE-R	58/100	68/100	70/100
TUGT	18 s	12 s	8 s
Number of steps taken for TUGT	16	12	10
Clinical observation	Cautious ataxic gait Near fall on turn	Steady confident gait Smooth turn	Smooth gait Perfect on the turn

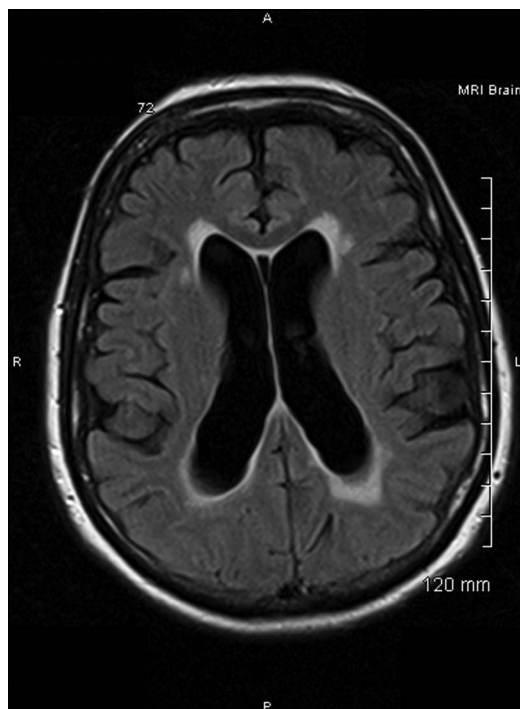
ACE-R, Addenbrooke's Cognitive Examination—Revised; CSF, cerebrospinal fluid; MMSE, Mini Mental State Examination; TT, tap test; TUGT, Timed Up and Go Test.



**Video 1** Pre cerebrospinal fluid tap test Timed Up and Go Test.



**Video 2** Post cerebrospinal fluid tap test Timed Up and Go Test.



**Figure 1** MRI of the brain showing prominence of ventricles.



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when correlated with successful shunt surgery.<sup>3</sup> The goal of a standard CSF TT should be to detect change in symptoms as efficiently as possible and should be extended for up to 2 days when the suspicion is high.

## Learning points

- ▶ The cerebrospinal fluid (CSF) TT has diagnostic and prognostic value in investigating suspected cases of normal pressure hydrocephalus.
- ▶ It is relatively easy to perform in an outpatient or a day-hospital setting.
- ▶ Standardised, reproducible measurement of gait speed and cognition should be measured pre and post CSF TT (ideally at 2 hours and at 2 days) and the patient should be video recorded if possible.

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## REFERENCES

- 1 Kang K, Hwang SK, Lee HW. Shunt-responsive idiopathic normal pressure hydrocephalus patient with delayed improvement after tap test. *J Korean Neurosurg Soc* 2013;54:437–40.
- 2 Ravdin LD, Katzen HL, Jackson AE, *et al.* Features of gait most responsive to tap test in normal pressure hydrocephalus. *Clin Neurol Neurosurg* 2008;110:455–61.
- 3 Wikkelsø C, Andersson H, Blomstrand C, *et al.* The clinical effect of lumbar puncture in normal pressure hydrocephalus. *J Neurol Neurosurg Psychiatry* 1982;45:64–9.

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