

# Bedside Diagnosis and Prognosis of Vestibular Neuritis

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## Abstract

To determine if the use of four bedside tests (head impulse, head heave, head shake, vibration) could be as effective as the caloric test (the gold standard) in the diagnosis and prediction of the time of recovery from vestibular neuritis.

## Introduction

The acute onset of severe vertigo in otherwise normal individuals is usually attributed to a vestibular 'neuritis'. Patients with vestibular neuritis usually also have disequilibrium, nausea and vomiting but not auditory symptoms. Symptoms usually resolve in weeks, but there may be a more protracted course with persistent disequilibrium. The etiology is thought to be viral, though labyrinthine ischemia may be a cause in rare instances. Caloric testing has been the traditional gold standard for detecting a peripheral vestibular deficit, but some recently developed bedside examination tests can also provide important information on the diagnosis and prognosis of vestibular neuritis.

## Methods and Materials

The cohort studied is a patient-based clinic population (68 patients) seen between January 2002 and January 2004 in the ENT Department of Siena Medical School. Patients were seen in the acute stage of the vestibular neuritis and after 1, 3, 6 and 12 months. Spontaneous, head shaking<sup>1</sup> and vibration induced nystagmus<sup>2</sup> (elicited with a battery powered device) were sought using Frenzel goggles. The head impulse<sup>3</sup> and head heave<sup>4</sup> tests were performed manually. Caloric irrigation was administered with hot, cold and ice water. Statistical analysis were performed through pairwise odds ratios, Kaplan-Meier methods and multiple regression models.

## All you need to perform these 4 tests



Figure 1. Frenzel goggles



Figure 2. Mastoid vibrators (Brookstone®)

## Results

More than half of all patients had positive signs for head impulse, head heave, head shake, and vibration tests at baseline. All had a caloric paresis or paralysis at baseline. Head impulse and head heave signs correlated highly (OR=24.9, p<0.0001), as did head shake and the vibration tests (OR=22.8, p<0.0001). Patients with a positive head impulse sign or vibration test were 70% less likely to recover than those with a negative sign. Head impulse (HR=0.08, p=0.002) and head shake (HR=0.23, p=0.01) tests were associated with the outcome of the caloric test.

		Paresis at baseline N=10	Paralysis at baseline N=55**	p-value*
Age	13-39	1 (10.0%)	12 (21.8%)	0.55
	40-54	4 (40.0%)	17 (30.9%)	
	55-69	4 (40.0%)	13 (23.6%)	
	70-84	1 (10.0%)	13 (23.6%)	
Gender	Men	7 (70.0%)	34 (61.8%)	0.73
	Women	3 (30.0%)	21 (38.2%)	
Head Heave sign at baseline	positive	3 (30.0%)	40 (72.7%)	0.02
Head Thrust sign at baseline	positive	4 (40.0%)	50 (90.9%)	<0.0001
Head Shake sign at baseline	positive	9 (90.0%)	53 (96.4%)	0.40
Vibration test at baseline	positive	6 (60.0%)	46 (85.2%)	0.08
	negative	4 (40.0%)	8 (14.8%)	
Treatment given	yes	8 (80.0%)	33 (63.5%)	0.47
	no	2 (20.0%)	19 (36.5%)	
	missing	0 (0.0%)	3 (100%)	

Table 1. Baseline Characteristics; Paresis was considered 30%-99% deficit, paralysis was 100% deficit, according to caloric irrigation

Table 2. Association of Bedside Tests with Caloric test

	Hazard Ratio	95% CI	p-value
Positive Head Thrust sign	0.08	[0.009, 0.68]	0.002
Positive Head Shake sign	0.23	[0.06, 0.82]	0.01
Positive Vibration test	0.36	[0.08, 1.54]	0.14

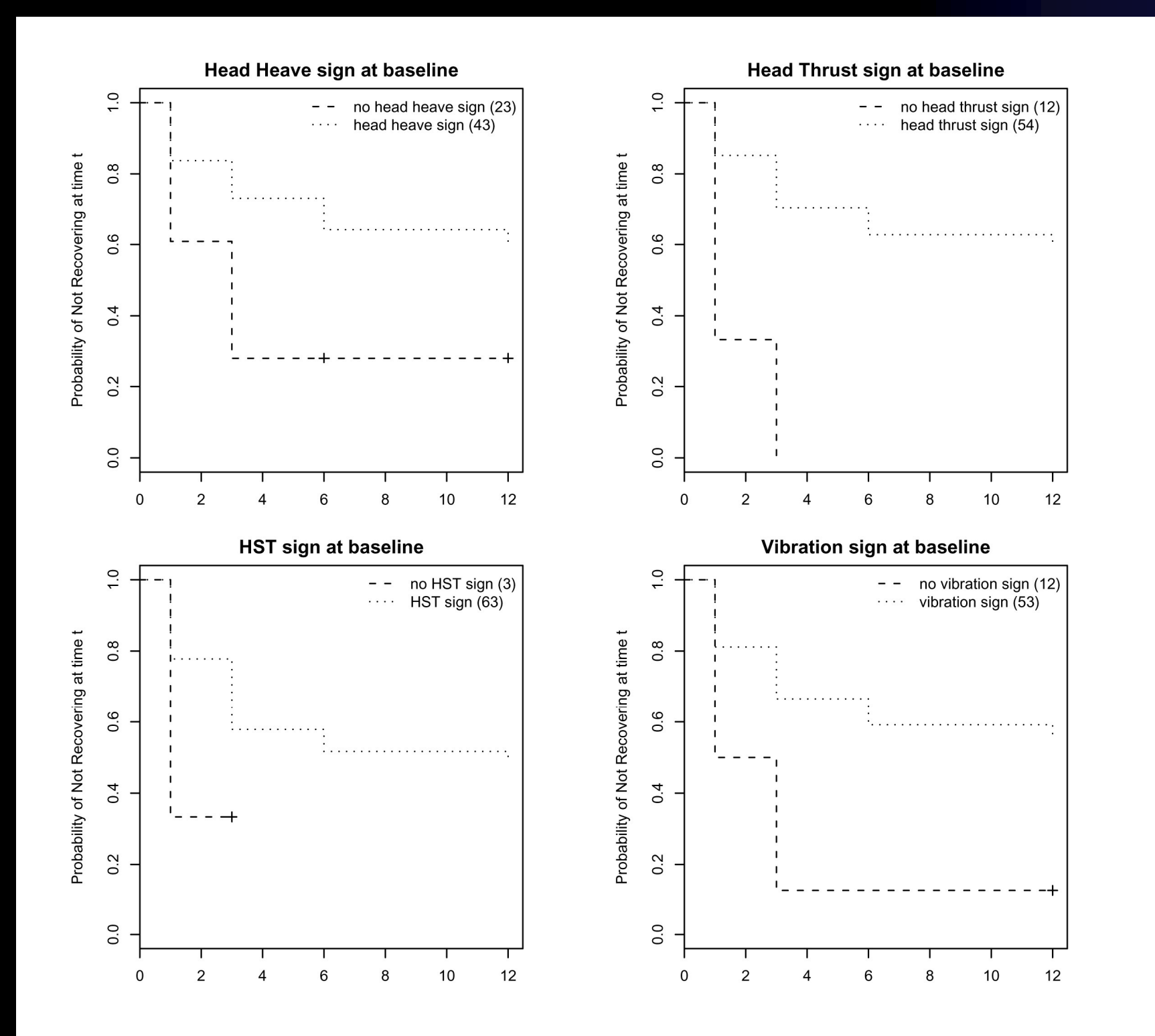


Figure 3. Survival curves for event of recovery

## Conclusions

We have shown that a careful bedside examination of patients with vestibular neuritis has both diagnostic value acutely, and prognostic value chronically.

Our results confirm that with a careful bedside clinical examination one can almost always diagnose a unilateral peripheral vestibular deficit. This is especially important in those patients evaluated in the Emergency Department because quantitative caloric testing is rarely immediately available.

As described in our previous study<sup>5</sup>, both the head impulse and head heave tests had good prognostic value if they were absent in the acute phase. Here we also found that a negative vibration test in the acute phase is also a strong predictor of a high chance of recovery.

A careful anamnesis for vascular risk factors and a general neurological examination are required to exclude the all too common presentation of a vertebral-basilar infarction as an acute peripheral vestibular deficit<sup>6</sup>.

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