

# Research Paper: Vestibular Physiotherapy Patients May Require Medical Assessment: Results of Vertigo Audit in Hutt Hospital

Shyh Poh Teo<sup>1,2\*</sup>

1. Department of Internal Medicine, Geriatrics and Palliative Unit, RIPAS Hospital, Brunei Darussalam.  
2. Raja Isteri Pengiran Anak Saleha Hospital, Bandar Seri Begawan, Brunei Darussalam.



**Citation:** Poh Teo, S. Vestibular Physiotherapy Patients May Require Medical Assessment: Results of Vertigo Audit in Hutt Hospital Journal of Modern Rehabilitation. 2020; 14(2):89-96. <http://dx.doi.org/10.18502/jmr.v14i2.7706>

**doi** <http://dx.doi.org/10.18502/jmr.v14i2.7706>



## Article info:

**Received:** 13 Oct 2019

**Accepted:** 21 Jan 2020

**Available Online:** 01 Apr 2020

## Keywords:

Vestibular physiotherapy,  
Vertigo, Dizziness, Benign  
paroxysmal positional vertigo

## ABSTRACT

**Introduction:** To identify the type of referrals received by vestibular physiotherapists for vertigo and assess whether medical review for these patients would be appropriate.

**Materials and Methods:** We performed a retrospective review of referral forms, vestibular assessment forms, and vertigo clinic letters of patients referred for vertigo or vestibular physiotherapy input between July 1, 2013, to December 31, 2013.

**Results:** We studied 29 patients with a median age of 63 years. A diagnosis was provided in 65.5% of the referrals. Of 14 patients with possible benign paroxysmal positional vertigo (BPPV), Dix-Hallpike had been performed only for 4 patients. Almost half were seen for the medical review in the Vertigo Clinic due to the concerns of possible alternative non-vestibular diagnosis, medication issues, or syncope. Alternative diagnoses identified medically included orthostatic hypotension, stroke, vestibular migraine, medication-induced bradycardia, and phobic postural vertigo. Medication changes in vertigo clinic included treatment for heart failure, migraine, and medication optimization.

**Conclusion:** Medical review is appropriate for some patients referred for vestibular physiotherapy. A medical opinion should be sought by vestibular physiotherapists if there is uncertainty or concerns that the referred patients did not have straightforward vestibular problems, or there were possible alternative diagnoses, concerns with medications, or syncope.

## 1. Introduction

Patients presenting with dizziness offer a diagnostic challenge to clinicians. Among patients who present to primary health care with dizziness, almost

half do not have a documented diagnosis [1]. Patients with dizziness also have a high referral rate (up to 40%) to specialty services [2].

There are several subtypes that dizziness can be categorized into, such as vertigo, lightheadedness, presyncope, or dysequilibrium [3]. Of these, vertigo is the

\* Corresponding Author:

Shyh Poh Teo, MBChB, FRACP.

Address: Department of Internal Medicine, Geriatrics and Palliative Unit, RIPAS Hospital, Brunei Darussalam.

Tel: +673 2242424

E-mail: [shyhpoh.teo@moh.gov.bn](mailto:shyhpoh.teo@moh.gov.bn)

most common form of dizziness presenting to primary care [4]. Evaluation of vertigo relies on taking a detailed clinical history and clinical examination. Investigations alone are unhelpful and should be interpreted in the context of clinical findings. It is also important to have an interdisciplinary approach, as collaboration between physicians and vestibular physiotherapists may help manage vertigo patients [5].

Hutt Valley District Health Board provides health care and supportive services for over 140000 people living in Hutt Valley, New Zealand. Hutt Hospital is a small regional hospital with 270 beds. The rehabilitation service offers inpatient, outpatient, community assessment, and treatment by multidisciplinary teams. Patients with vertigo are referred to the rehabilitation service and examined by vestibular physiotherapists.

Several concerns were raised by the vestibular physiotherapists leading to the introduction of a Medical Vertigo Clinic. If there was uncertainty regarding diagnosis or a need for further investigations such as head imaging, there was no referral pathway from physiotherapists to Internal medicine, Ear, Nose, and Throat (ENT) or Neurology services. For complex patients with multiple comorbidities, the management of medical problems possibly contribute to dizziness and medication adjustments are outside the scope of a physiotherapist.

After the introduction of the Vertigo Clinic, the referral process was as follows: referrals were screened by the community team leader, also a physiotherapist before triaged for review. If there was uncertainty about the necessity of medical input, referrals were also reviewed by a geriatrician with the interest in vertigo. Those deemed appropriate for medical input were seen first medically in the Vertigo Clinic and then were referred to vestibular physiotherapy, specialty services, or further investiga-

tions such as imaging if required. A review of vertigo patients referred to the rehabilitation team was performed to identify the type of referrals received for vertigo and to assess whether medical review for these patients would be appropriate.

## 2. Materials and Methods

Patients referred for outpatient, community allied health input, or rehabilitation are collected daily. Patients referred for vertigo or vestibular physiotherapy input between July 1, 2013, and December 31, 2013, were identified from these lists. Vestibular physiotherapy assessments were documented on a standard proforma. Patients reviewed in the Vertigo Clinic had letters dictated to general practitioners and copied to the community team leader. Referral forms, vestibular assessment forms, and clinic letters were reviewed for the following details.

Demographic information, including age, gender and living arrangement, referral source, time taken for review and whether a diagnosis for patient symptoms was documented were identified. For patients seen in the Vertigo Clinic, referral letters were reviewed retrospectively to identify what triggered consideration of medical input. The nature of symptoms, whether patients sustained falls and medication changes relevant to presenting symptoms were reviewed. Clinical assessment findings by vestibular physiotherapists or the Vertigo Clinic, and investigations patients received were identified. The diagnoses provided in the referrals, vestibular assessment forms, and clinic letters were compared. Outcomes such as medication and whether the patient required vestibular physiotherapy after the Vertigo Clinic were identified.

## 3. Results

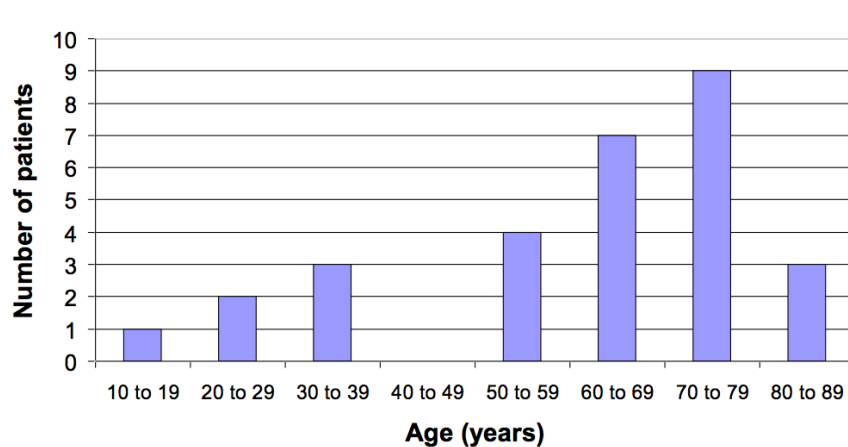


Figure 1. Age distribution of the patients

There were 29 patients in total. Their median age was 63 years, ranging 18-89 years. Figure 1 shows the age distribution of patients. Fourteen patients were men and 15 were women. Their living situation was as follows: 10 lived alone, 11 lived with a spouse, 7 with other family members, and 1 with a friend.

### Referral information

Nineteen patients (65.5%) were referred by general practitioners, 5 (17.2%) from general medicine, 2 (6.9%) from geriatric medicine, and 1 (3.4%) from each of the following departments: ENT, Emergency Department, and Hematology. The median time taken since referral to review was 19 days (Range 1 to 47 days). A diagnosis was provided by the referring of 19 patients (65.5%). Diagnoses given were as follows:

Benign paroxysmal positional vertigo	14 patients
Labyrinthitis	2 patients
Acoustic neuroma	1 patient
Vestibular neuritis	1 patient
Stroke	1 patient

Of 14 patients suspected to have BPPV, only four (28.6%) had a diagnostic maneuver performed by the referrer.

For patients without a diagnosis, the referrer provided the following explanations of patient symptoms:

- Vertigo (2 patients)
- Vestibular problems (2 patients)
- Vestibular physiotherapy previously helped
- Vertigo, head MRI negative
- Peripheral vestibular cause but the risk of posterior circulation stroke
- Vertigo, possible central lesion but normal cerebellar findings
- Proprioceptive issues versus inner ear
- Dizzy, possible vertigo

### Vertigo Clinic review

Fourteen patients (48.3%) were examined in the Vertigo Clinic. The main reasons for the exam were possible alternative diagnoses, concerns with medications, and syncope. There were 8 patients with possible alternative diagnoses suggested by details in the referral form. The details from referrals for these patients are listed below:

- Possible stroke (2 patients) may need to assess with head CT first but normal neurological examination’;
- Vertigo and severe headache;
- Young woman with previous breast lesion, possible BPPV but long duration of episodes;
- Wife identified a low pulse during dizziness (subsequently declined physiotherapy when contacted as patient and wife felt likely cardiac in origin);
- Parkinson's disease - postural drop identified in the referral letter;
- Vertigo but normal findings when seen by ENT and neurology - no diagnosis offered;

Two patients were seen due to concerns regarding medications and polypharmacy. One patient had multiple comorbidities and no diagnosis was provided for dizziness. This patient also had previous gentamicin toxicity and treatment with prochlorperazine caused tardive dyskinesia. The other patient had symptomatic treatment with prochlorperazine, metoclopramide, and quetiapine.

Three patients (10.3%) had syncope with vertigo. One had a fall and syncope, with a comment on the referral form regarding a possible neck injury. One had bradycardia and postural hypotension identified when they presented with dizziness and syncope. This patient did not tolerate the Dix-Hallpike maneuver when attempted so he was referred for physiotherapy to have this performed. The final syncopal patient had previous anemia from menorrhagia.

### Assessment by vestibular physiotherapy or the Vertigo Clinic

Clinical assessment was completed for 28 patients; one patient declined to attend the clinic as his symptoms resolved. The complaints of the patients are presented in Table 1. Twenty-six patients (89.7%) had episodic symptoms. Two had chronic continuous symptoms and one had an acute course of vertigo. Four patients (13.8%)

**Table 1.** Presenting complaint

Presenting Complaint	No. (%)
Vertigo	10 (34.5)
Dizziness	5 (17.2)
Lightheadedness	2 (6.9)
Unsteady / Dysequilibrium	2 (6.9)
More than one subtype	10 (34.5)

JMR

had falls; 18 (62.1%) did not. For 7 patients (24.1%), it was not documented whether they sustained any falls.

### Medications

Fourteen (48.3%) patients were on blood pressure medications. Five patients (17.2%) had confirmed orthostatic hypotension, while 14 (48.3%) did not. In ten patients (34.5%), postural blood pressure was not performed. Fifteen (51.7%) were started medications by the referrer. Eleven patients were started on prochlorperazine, of which two developed intolerance with symptomatic tachycardia and tardive dyskinesia. Three were commenced on cyclizine and another three on betahistine. One patient was commenced antidepressants and another diazepam. Four patients were started on two medications for their symptoms.

A patient not on medications for dizziness had a history of multiple myeloma. The clinical records from the Vertigo Clinic stated that his prescription was filled but not

consumed as the information booklet stated it should be avoided by patients with bone marrow problems.

### Clinical Evaluation

Seventeen patients had positive findings on dynamic eye maneuvers or head impulse test, of whom 10 (58.5%) had a positive Dix-Hallpike or Semont maneuver. Although four patients did not have cerebellar testing documented, the remaining 24 patients had normal cerebellar findings. Other investigations done for these patients (cumulative including by referring doctor) are presented in Table 2. Table 3 presents the patients' final diagnoses after reviewing by vestibular physiotherapists or the Vertigo Clinic.

Eleven patients had more than one diagnosis. Two patients were not given a diagnosis; one did not attend the clinic and the other patient had no symptoms on review. While the history was suggestive of BPPV, this could not be confirmed as the clinical examination was normal.

**Table 2.** Investigations for vertigo

Investigations	No. (%)
Done	4 (13.8)
Audiometry	
Consider if persistent symptoms	1 (3.4)
Offered in the clinic but the patient declined	1 (3.4)
Imaging	
Head CT	4 (13.8)
Head MRI	10 (34.5)
Blood tests	3 (10.3)
Caloric testing	2 (6.9)
Caloric testing and evoked myogenic potentials	2 (6.9)

Not all patients had additional investigations performed besides bedside testing.

Audiometry only involves assessment of hearing acuity at different frequencies.

Inclusion of eleven patients with two diagnoses, two patients without a diagnosis.

JMR

**Table 3.** Diagnosis after reviewing by vestibular physiotherapists or the Vertigo Clinic

Diagnosis	No. (%)
Benign paroxysmal positional vertigo	10 (34.5)
Unilateral vestibular hypofunction	9 (31.0)
Postural hypotension	5 (17.2)
Bilateral vestibular hypofunction	4 (13.8)
Labyrinthitis	3 (10.3)
Stroke	2 (6.9)
Vestibular neuritis	2 (6.9)
Vestibular migraine	1 (3.4)
Phobic postural vertigo	1 (3.4)
Bradycardia (medication-induced)	1 (3.4)

JMR

The diagnosis of the referrer and rehabilitation team matched in 12 patients (41.4%). Sixteen (55.2%) had a different diagnosis after reviewing by vestibular physiotherapists or the Vertigo Clinic.

### Medication changes

Overall, four patients (13.8%) ended up with new medications. Two had vestibular sedatives started by the general practitioner but not discontinued after review; both were seen by physiotherapists. Diuretics were started for one patient for symptomatic heart failure, with breathlessness restricting the Dix-Hallpike manoeuvre from being performed. One patient was started rizatriptan in the clinic for vestibular migraine. Seven patients (24.1%) had medications discontinued and four other patients had a reduction in polypharmacy.

Of 14 patients seen in the Vertigo Clinic, eight (57.1%) no longer required vestibular physiotherapy referrals while the remaining six (42.9%) patients still needed physiotherapy input. Two onward referrals were sent; one for a general practitioner to be followed up for blood pressure after medication changes, and the other to ENT.

### Outcomes

Thirteen patients (44.8%) had improvement of symptoms, while nine (31.0%) had complete resolution of symptoms. Four (13.8%) remained unchanged and three (10.3%) had unknown outcomes as discharged without follow-up.

## 4. Discussion

Assessment of a dizzy patient can be complex and challenging. However, there is a general approach that can be applied to evaluate these patients [6-8]. BPPV was a frequent diagnosis provided by referrers. In a consensus guideline, it is strongly recommended to perform a diagnostic maneuver, such as Dix-Hallpike to identify posterior semicircular canal BPPV for patients with vertigo [9]. The utility of this maneuver to rule in or out BPPV by referrers was low. Further education may be required to improve the confidence of general practitioners in assessing vertigo patients and performing these maneuvers.

The Vertigo Clinic enabled vestibular physiotherapists to seek a medical opinion, and if appropriate, further investigations or onward referrals to other specialties could be facilitated. The concern that alternative medical diagnosis contributed to patient symptoms was confirmed in a proportion of patients referred initially for vestibular physiotherapy only. Almost half of the referrals were deemed appropriate for medical review during screening for referrals. The indications were classified into three groups: possible alternative diagnosis, medication concerns, and syncope.

The other diagnoses identified in the Vertigo Clinic were postural hypotension, stroke, vestibular migraine, medication-induced bradycardia, and phobic postural vertigo. It would be inappropriate for these conditions to be managed by vestibular physiotherapists alone. A possible neck injury mentioned in a referral raised concerns, as this should be ruled out before vestibular assessments such as performing head impulse tests. Patients with syncope should be flagged for medical review, as it could herald a cardiac or neurological disorder.

Vertigo clinic patients should be routinely checked for postural blood pressures, which may not occur when assessed by physiotherapists. This should ideally be performed in primary care before referral for vestibular physiotherapy. If orthostatic hypotension was identified, a medical practitioner is required for adjusting medication doses. Besides, discontinuing vestibular sedatives was also possible in the Vertigo Clinic. The following issues were emphasized for the assessment of vertigo patients after the review: establish from history that the patient has vertigo, establish the time course of vertigo and examination must include Dix-Hallpike and the head impulse test [10].

After drafting a pathway for the assessment and management of vertigo, interpretation of clinical findings particularly dynamic eye movements has remained challenging for primary care physicians. Educational sessions should be held, focusing on pertinent history in vertigo patients, head impulse test, and BPPV maneuvers. Screening of referrals for vertigo is currently ongoing, as this review identified patients that were more appropriate to be examined medically first before vestibular physiotherapy.

Limitations include the small sample size and the retrospective nature of review dependent on accurate documentation. It was not possible to confirm diagnostic accuracy for any discrepancies, for example between the referrer and vestibular physiotherapy or the Vertigo Clinic. Finally, as our results were based in a smaller regional hospital, findings may not be generalized to other settings, particularly if there is the ease of access to medical or other specialty input such as neurology or Ear, Nose, and Throat for vertigo patients.

## 5. Conclusion

A medical review would be appropriate for some patients referred for vestibular physiotherapy. Referrals for vertigo may need to be screened medically or reviewed in the clinic. Otherwise, a medical opinion should be sought by vestibular physiotherapists if there was uncertainty or concerns that patients referred did not have obvious vestibular conditions.

The Key Points are as follow: a. History and clinical examination, including Dix-Hallpike and head impulse test, are key in the diagnosis of vertigo; b. Patients referred for vestibular physiotherapy input may be appropriate for medical review particularly if there are diagnostic uncertainty, medication issues, and syncope; c. Referrals

should be screened for medical concerns or a medical opinion sought before vestibular physiotherapy review.

Otherwise, vestibular physiotherapists should consider medical review if there was uncertainty or concerns that the referred patients did not have straightforward vestibular problems.

## Ethical Considerations

### Compliance with ethical guidelines

This review did not require the Ethics Committee review, as it did not reach the threshold of greater than minimal risk as per Item 11.3 in Ethical Guidelines for Observational Studies, National Ethics Advisory Committee. ([http://www.neac.health.govt.nz/moh.nsf/pagescm/520/\\$File/ethicalguidelines.pdf](http://www.neac.health.govt.nz/moh.nsf/pagescm/520/$File/ethicalguidelines.pdf))

### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

### Acknowledgements

Thanks the following people for support with this review: Helen Bryant, OPRS Community Team Leader, also Catherine Korte, Mairead Magee, and Victoria Sali, as vestibular physiotherapists.

## References

- [1] Kwong ECK, Pimlott NJG. Assessment of dizziness among older patients at a family practice clinic: A chart audit study. *BMC Family Practice*. 2005; 6(1):2. [DOI:10.1186/1471-2296-6-2] [PMID] [PMCID]
- [2] Bird JC, Beynon GJ, Prevost AT, Baguley DM. An analysis of referral patterns for dizziness in the primary care setting. *British Journal of General Practice*. 1998; 48(437):1828-32. [PMID] [PMCID]
- [3] Hanley K, O'Dowd T, Considine N. A systematic review of vertigo in primary care. *British Journal of General Practice*. 2001; 51(469):666-71. [PMID] [PMCID]
- [4] Kroneke K, Lucas CA, Rosenberg ML, Scherokman B, Herbers Jr JE, Wehrle PA, et al. Causes of persistent dizziness. A prospective study of 100 patients in ambulatory care. *Annals of Internal Medicine*. 1992; 117(11):898-904. [DOI:10.7326/0003-4819-117-11-898] [PMID]



- [5] Brandt T, Strupp M. General vestibular testing. *Clinical Neurophysiology*. 2005; 116(2):406-26. [DOI:10.1016/j.clinph.2004.08.009] [PMID]
- [6] Halmagyi GM, Cremer PD. Assessment and treatment of dizziness. *Journal of Neurology, Neurosurgery & Psychiatry*. 2000; 68(2):129-36. [DOI:10.1136/jnnp.68.2.129] [PMID] [PMCID]
- [7] Luxon LM. Evaluation and management of the dizzy patient. *Journal of Neurology Neurosurgery and Psychiatry*. 2004; 75(Suppl. 4):iv45-iv52. [DOI:10.1136/jnnp.2004.055285] [PMID] [PMCID]
- [8] Labuguen RH. Initial evaluation of vertigo. *American Family Physician*. 2006; 73(2):244-51. [PMID]
- [9] Bhattacharyya N, Baugh RF, Orvidas L, Barrs D, Bronston LJ, Cass S, et al. Clinical practice guideline: Benign paroxysmal positional vertigo. *Otolaryngology-Head and Neck Surgery*. 2008; 139(Suppl 5):47-81. [DOI:10.1016/j.otohns.2008.08.022] [PMID]
- [10] Kaski D, Seemungal BM. The bedside assessment of vertigo. *Clinical Medicine*. 2010; 10(4):402-5. [DOI:10.7861/clinmedicine.10-4-402] [PMID] [PMCID]

---

This Page Intentionally Left Blank

---