

Use of canalith repositioning manoeuvres and vestibular rehabilitation: a GP survey

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ABSTRACT

Objective: To investigate the use of canalith repositioning manoeuvres and vestibular rehabilitation (VR) by GPs and to assess reasons for not using these techniques in patients with vertigo.

Design: Online survey.

Setting: GPs in the western and central part of the Netherlands.

Subjects and method: Of GPs, 1169 were approached to participate in the survey. A sample of 426 GPs filled out the questionnaire (36.4% response rate). The 22-item questionnaire contained both multiple choice and free-text questions on the Epley manoeuvre, the Brandt-Daroff exercises and VR. Results of the survey were descriptively analyzed.

Main outcome measures: The use of the Epley manoeuvre, the Brandt-Daroff exercises and VR by GPs; reasons that deter GPs from using these techniques.

Results: The repositioning manoeuvres (Epley manoeuvre and Brandt-Daroff exercises) were used by approximately half of all GPs (57.3 and 50.2%), while only a small group of GPs applied VR (6.8%). The most important reason for GPs not to use the Epley manoeuvre, Brandt-Daroff exercises and VR was that they did not know how to perform the technique (49.5, 89.6 and 92.4%).

Conclusions: Despite the proven effectiveness, repositioning manoeuvres and VR are remarkably underused by Dutch GPs. Not knowing how to perform the technique is the most important reason for GPs not to use these techniques. Efforts should be made to increase the knowledge and skills of GPs regarding canalith repositioning manoeuvres and VR.

KEY POINTS

- Dizziness is a common symptom with limited therapeutic options.
- Canalith repositioning manoeuvres and vestibular rehabilitation represent the best treatment options currently available for vertigo.
- Canalith repositioning manoeuvres and vestibular rehabilitation are still widely underused by GPs.
- The most important reason for GPs not to use these techniques is that they do not know how to perform them.
- Efforts should be made to increase the knowledge and skills of GPs regarding canalith repositioning manoeuvres and vestibular rehabilitation.

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Introduction

Dizziness is a common and challenging complaint in general practice [1]. The prevalence of dizziness among adults has been reported to be 20–30% [2–4], increasing to more than 50% in the oldest old [5]. People who experience dizziness often report occupational consequences, a lower quality of life and substantial interference with their daily activities [6]. The

economic burden of dizziness is considerable, due to a decrease in work productivity of the patient and costs of medical care [4].

The most common cause of dizziness in general practice is peripheral vestibular disease, including benign paroxysmal positional vertigo (BPPV), Ménière's disease (MD) and vestibular neuronitis [7,8]. In BPPV, a canalith repositioning technique called the Epley

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manoeuvre is preferred, in which vestibular debris is shifted from the semilunar canal by rapidly putting the patient in various positions. The treatment has been proven to be safe and effective and can easily be performed by a trained healthcare professional [9]. BPPV can also be treated with Brandt-Daroff exercises, a canalith repositioning technique that can be performed by the patient at home [10]. However, evidence for its effectiveness is weak and Brandt-Daroff exercises have been shown to be inferior to the Epley manoeuvre [9,11]. Vestibular rehabilitation (VR) is an exercise-based therapy, which consists of various eye, head and body movements to stimulate the vestibular system. According to a recently updated Cochrane review, there is moderate-to-strong evidence that VR is a safe and effective treatment for chronic peripheral vestibular disease [8].

More than 90% of all dizzy patients are treated by their GP without any involvement of a specialist [12]. Despite the scientific evidence for the effectiveness of canalith repositioning manoeuvres and VR, previous research suggests that these techniques are hardly used in general practice [13–16]. The latest Dutch GP guideline on dizziness (2002) mentions the Epley manoeuvre and Brandt-Daroff exercises as an optional treatment, VR is not mentioned in the guideline [17]. Over the last 15 years, the evidence for canalith repositioning manoeuvres and VR has substantially increased [8,9]. The aim of this study was to investigate if GPs nowadays use repositioning manoeuvres or VR to treat dizziness and to assess which reasons deter them from applying these techniques.

Material and methods

Participants and data collection

We performed a web-based survey among a convenience sample of $N=1169$ Dutch GPs, including 301 GPs involved in the vocational GP training program of the VU University Medical Center and 868 GPs practicing in and around Amsterdam and Utrecht. Between October and November 2012, we sent them an e-mail with a short introduction and a link to an online questionnaire. They were asked to complete the questionnaire anonymously within 2 weeks. An e-mail reminder was sent after 2 weeks to participants who had not yet completed the survey.

Questionnaire

The internet-based questionnaire was written in Dutch and hosted by a well-known survey company (www.

surveymonkey.com). The questions were designed by P.D.N., J.V.D.W., H.V.D.H. and O.M., and were piloted among five GPs from the Academic Network of General Practice of the VU University Medical Center. The survey contained up to 22 multiple choice and free-text questions, depending on the responses of the participant (Appendix 1). The time needed to complete the survey was ~ 5 min. We divided the questions into four thematic sections. The first section included characteristics of the participants such as age, gender, number of years of work experience and whether the participant was a GP trainer. Sections two, three and four included questions about the Epley manoeuvre, the Brandt-Daroff exercises and VR, respectively.

Statistical analysis

In 2012, the total population of active Dutch GPs consisted of 8884 physicians [18]. We calculated a minimal sample size of $n=368$ for a 95% confidence interval with an error margin of 5% (<http://www.surveysystem.com/sscalc.htm>). We used SPSS (version 21.0)[®] to descriptively order and analyze the data. GP trainers were overrepresented in our sample in comparison to the GP population in the Netherlands. We performed a Pearson's chi-squared test to assess if answers of GP trainers significantly differed from those of other GPs. The median number of days before participants responded was 13 days. Participants that took more than 13 days to respond were characterised as late responders. We compared early to late responders by using Pearson's chi-squared test to assess response bias. Several free-text comments were added as quotes in the results section to illustrate our findings.

Results

We received a completed questionnaire from 426 out of 1169 GPs, which constitutes a 36.4% response rate. No significant differences were found between early and late responders in their use of the Epley manoeuvre, Brandt-Daroff exercises or VR. The majority of responders were female (56.6%). The median age of the participants was 46 years; the median work experience as a GP was 12 years. The majority of GPs were GP trainers (59.2%). The characteristics of the respondents are summarized in Table 1.

Epley manoeuvre

More than half of the responding GPs (57.3%) used the Epley manoeuvre to treat dizziness (Table 2). There was a significant difference between GP-trainers and

non-trainers; GP-trainers were more likely to use the Epley manoeuvre (Table 2). The majority of GP that used the Epley manoeuvre chose to apply the treatment themselves (74%), while a smaller group of GPs chose to refer the patient for the manoeuvre (26%) (Table 3). In case of referral, GPs predominantly referred to a physical therapist (85.7%). The most commonly reported indication for using the Epley manoeuvre was BPPV (97.5%). In the free-text comments, several GPs indicated that they used the Epley

manoeuvre as a diagnostic tool to distinguish between vestibular and non-vestibular dizziness.

The most common reason (49.5%) for GPs not to use the Epley manoeuvre was that they did not know how to perform the technique (Table 4). The second most cited reason was not being convinced of its effectiveness (29.7%). In the free-text answers several GPs stated that they had forgotten how to perform the technique or lacked confidence that they could execute it adequately.

Table 1. Characteristics of responding GPs, $N = 426$.

Characteristic	$N = 426$	N (%)
Sex	Female	241 (56.6)
	Male	185 (43.4)
Age category (years)	<35	63 (14.8)
	35–45	139 (32.6)
	46–55	120 (28.2)
	>55	104 (24.4)
	GP trainer	Yes
	No	174 (40.8)
Work experience (years)	0–5	130 (30.5)
	6–10	63 (14.8)
	11–15	56 (13.1)
	16–20	60 (14.1)
	21–25	35 (8.2)
	26–30	43 (10.1)
	>30	39 (9.2)

Brandt-Daroff exercises

Half of the GPs (50.2%) reported to advise patients to apply the Brandt-Daroff exercises (Table 2). BPPV was mentioned most often as medical indication for Brandt-Daroff exercises (97.2%) (Table 3). Several GPs stated that they explain the exercises and show the patients how to perform the exercises at home. Most GPs that use Brandt-Daroff exercises do not refer their patients for this treatment (89.3%). Brandt-Daroff exercises are to be performed by the patient at home after adequate instructions, which might explain this low referral rate.

Not knowing how to perform the treatment (89.6%) was the most important reason for GPs not to

Table 2. Use of the Epley manoeuvre, Brandt-Daroff exercises and VR by responding GPs.

	Total population of GPs ($N = 426$)	GP trainer ($N = 252$)	Non-trainer ($N = 174$)	p Value
Epley manoeuvre, %	57.3	62.7	49.4	0.006 ^a
Brandt-Daroff exercises, %	50.2	48.4	52.9	0.365
VR, %	6.8	9.1	3.4	0.022 ^a

^aSignificant difference in use between GP trainers and non-trainers ($p < 0.05$).

Table 3. GPs using vestibular treatment: medical indications, form of treatment and referral strategy.

Treatment modalities	Epley manoeuvre ($N = 244$ users)	Brandt-Daroff exercises ($N = 214$ users)	VR ($N = 29$ users)
Medical indication			
Patients with Ménière's disease, %	2.9	2.8	6.9
Patients with benign paroxysmal positional vertigo, %	97.5	97.2	82.8
Patients with vestibular neuritis, %	17.2	17.3	41.4
Patients with chronic dizziness, %	10.7	16.8	41.4
Patients with dizziness of unknown origin, %	33.6	25.2	41.4
Elderly patients (>65 years) with vestibular dizziness, %	22.5	21.0	58.6
Treatment without referral, N (%)	181 (74.2%)	191 (89.3%)	19 (65.5%)
Form of treatment			
I perform the treatment myself, %	82.3	24.1	15.8
I give the patient oral instructions during the consultation, %	54.1	74.9	73.7
I provide the patient with written instructions, %	30.4	41.4	57.9
I provide the patient with the name of a website which explains how to perform the treatment, %	16.6	21.5	10.5
Other, %	9.4	8.4	5.3
Referral for treatment, N (%)	63 (25.8%)	23 (10.7%)	10 (34.5%)
Choice of referral			
Physical therapist, %	85.7	95.6	80.0
Neurologist, %	9.5	0.0	10.0
ENT-doctor, %	15.9	4.3	10.0
Specialized clinic for dizziness, %	0.0	0.0	0.0
Other, %	14.3	21.7	40.0

Table 4. GPs' reasons for not using vestibular treatment.

Treatment modalities	Epley manoeuvre (N = 182 nonusers)	Brandt-Daroff exercises (N = 212 nonusers)	VR (N = 397 non-users)
Reasons not to use the treatment			
This takes too much time, %	19.2	4.2	7.1
I do not know how to perform the treatment, %	49.5	89.6	92.4
I am not convinced by the effectiveness of this treatment, %	29.7	11.8	6.3
Our national guidelines do not recommend the treatment, %	11.5	6.1	4.5
This treatment does not belong in primary care, %	0.0	0.0	0.8
Other, %	31.3	8.0	4.0

instruct patients the Brandt-Daroff exercises (Table 4). A smaller part of the respondents did not advise the Brandt-Daroff exercises because they were not convinced of their effectiveness (11.8%). Some GPs answered in the free-text section that they had their own set of exercises slightly different from the Brandt-Daroff exercises.

VR

Only few respondents (6.8%) used VR to treat patients with dizziness, mostly for treating BPPV (Table 2). GP trainers significantly more often chose to use VR compared to non-trainers (Table 2). The majority of GPs that used VR as a treatment modality performed the treatment themselves (65.5%) (Table 3). GPs who referred dizzy patients for VR most often referred them to a physical therapist to perform the treatment.

Not knowing how to perform the technique was the most important reason not to use VR (92.4%) (Table 4). Other reasons that were mentioned by GPs were that VR takes too much time (7.2%) and that GPs were not convinced of the effectiveness of VR (6.3%). A few of the free-text comments by GPs who did not use VR are quite vivid. One of the GPs, who reported to be a BPPV patient himself, described the VR exercises as "a living hell". Two other GPs mentioned that they did not expect that patients would follow through with these exercises.

Discussion

1. Statement of principal findings

The Epley manoeuvre and Brandt-Daroff exercises for treating dizziness are used by approximately half of all GPs (57.3 and 50.2%), while only a very small group of GPs applies VR (6.8%). The most often-mentioned indication for the repositioning manoeuvres and VR is BPPV. Respondents who are familiar with repositioning manoeuvres and VR often treat patients themselves, a minority of GPs choose to refer their patients for the Epley manoeuvre, Brandt-Daroff exercises and VR (25.8,

10.7 and 34.7%). When referral does take place the physical therapist is the most popular choice for all three techniques. Not knowing how to perform the technique is the most important reason for GPs not to use or advise the Epley manoeuvre, Brandt-Daroff exercises and VR (49.5, 89.6 and 92.4%). Although some GPs are not convinced of the effectiveness of the Epley manoeuvre, Brandt-Daroff exercises and VR (29.7, 11.8 and 6.3%), <1% of GPs thinks these techniques should not be applied in primary care.

2. Strengths and weaknesses of the study

To our knowledge, this is the largest survey among GPs on the use of repositioning manoeuvres and VR to treat dizziness. Our survey is the first study that assesses which reasons deter GPs from using these techniques. With our study we have reached a substantial sample of the Dutch GP population. The survey had a response rate of 36.4%. Surveys under physicians are often characterized by low response rates and online surveys generally have lower response rates than traditional mail surveys [19]. A scientifically proven minimal acceptable response rate was never developed, because a lower response rate does not directly indicate a higher chance of non-response bias [20]. Unfortunately, we had limited data about our non-responders. Since the non-responders in our study did not reply to our invitation or reminder e-mails, no comparison could be made with the characteristics of our responders. An attempt to assess non-response bias was made by comparing early to late responders. Late responders are believed to more closely resemble non-responders than early responders [20]. This comparison showed no significant difference in the use of canalith reposition techniques and VR. Still, GPs who are already interested in canalith repositioning techniques and VR may be more likely to fill out the survey and be over-represented in our convenience sample. These GPs will probably use these techniques more frequently than other GPs. In our sample, 56.6% of participants was female and 59.2% of participants had

a role as a GP trainer. The percentage of women in the total GP population in 2012 was considerably lower with 42.8%, and the percentage of GP trainers in the total population was estimated at only 19.2% [18]. The high percentage of GP trainers in our convenience sample can be explained by the fact that more GP trainers were approached than non-trainers to participate. GP trainers may be more willing to participate in research, since they are already affiliated with the university. Our additional analysis confirms that GP trainers significantly more often choose to use the Epley manoeuvre and VR, while no difference was found for the use of Brandt-Daroff exercises. There is substantially more evidence for the effectiveness of the Epley manoeuvre and VR in comparison to Brandt-Daroff exercises [8,9]. GP trainers are expected to have up-to-date knowledge of the latest (and most effective) treatments, such as repositioning manoeuvres and VR therapy for teaching purposes. This might explain why GP trainers are more likely to use the Epley manoeuvre and VR. We expect that the number of Epley and VR users in the general GP population is even lower because of the overrepresentation of GP trainers in our sample. This can be demonstrated by adjusting for the high percentage of GP trainers in our sample (59.2%) compared to the overall Dutch GP population (19.2%). These adjusted numbers suggest a 52% use of both Brandt-Daroff exercises and the Epley manoeuvre and a 4.5% use of VR in the overall Dutch GP community.

3. Findings in relation to other studies

The results from our study show that repositioning manoeuvres and VR are still underused in the Netherlands. Research from other countries suggests that this underuse is comparable to other countries [13,14,21]. The high spontaneous resolution rate of BPPV might be a reason why only a small percentage of patients are treated. Even though a natural resolution of symptoms often occurs in weeks to months, the vertigo complaints can be debilitating and warrant treatment early on. The highest level of evidence [22] exists for the effectiveness of the Epley manoeuvre to treat BPPV [9]. Early diagnosis and treatment by a well-trained GP can prevent a lot of discomfort and provide an economic benefit due to lower medical costs and less occupational disability [15]. When canalith repositioning manoeuvres are performed by trained GPs, the improvement rates after treatment are comparable to those of specialist centers [23]. The highest level of evidence [22] also exists for the effectiveness of VR. In a survey in the UK among GPs about

dizziness management, only 5.8% of the participating GPs had used VR as a treatment modality for their patients [13]. A primary care trial that targeted patients with chronic dizziness found that only 3% of the patients, who had a mean duration of 8 years of symptoms, were offered VR in the past [14].

Widespread adoption of new treatments in clinical practice can be challenging. Even GPs who are aware of the effectiveness and economic benefits of a treatment might still not use the technique for a variety of reasons. The performance of the repositioning manoeuvres and VR require certain skills, which should not only be trained but also practiced on a regular basis. Several GPs stated in the free-text comments that they were afraid to harm the patient with their treatment. GPs might not perform repositioning manoeuvres and VR often enough to gain confidence in their execution. Since almost all vertigo patients are primarily managed by their GP, several authors have suggested that GPs should be better trained to perform repositioning manoeuvres and VR [23,24]. Treatment manoeuvres that require less skill are faster adopted and require less practice [25]. A smartphone app-based training aid for the Epley manoeuvre has already been shown to be more effective than written instructions [26]. Modern teaching aids (internet-based or app-based) might be able to speed up the uptake of repositioning manoeuvres and VR in our daily practice.

4. Meaning of the study: implications for clinicians and policy makers

The results of these survey show that canalith repositioning manoeuvres and VR are underused by GPs. This underuse is also found in previous studies in other countries, which suggests that the underuse of these techniques in general practice is a global problem. Repositioning manoeuvres and VR are inexpensive to perform and represent the best treatment currently available for vertigo. We need to increase the knowledge and skills of GPs regarding these techniques. Repositioning manoeuvres and VR should feature more prominently in our dizziness guidelines. Recently, stronger evidence for these treatments has surfaced and an update of our guidelines should reflect this [8,9]. In addition to this, courses should be organized to learn and practice these techniques so GPs and GP trainees get and maintain confidence in the ability to perform the treatment. Future research should aim at inventive methods to introduce these techniques to GPs such as web-based or smartphone applications. An online guide for the Epley manoeuvre, including a link to a video on how to perform the technique, is

already freely accessible on the website of the Royal Australian College of General Practitioners (RACGP) [27]. Such learning tools might enable GPs to better perform the repositioning manoeuvres and VR.

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References

- [1] Bailey KE, Sloane PD, Mitchell M, et al. Which primary care patients with dizziness will develop persistent impairment? *Arch Fam Med*. 1993;2:847–852.
- [2] Yardley L, Owen N, Nazareth I, et al. Prevalence and presentation of dizziness in a general practice community sample of working age people. *Br J Gen Pract*. 1998;48:1131–1135.
- [3] Hannaford PC, Simpson JA, Bisset AF, et al. The prevalence of ear, nose and throat problems in the community: results from a national cross-sectional postal survey in Scotland. *Fam Pract*. 2005;22:227–233.
- [4] Benecke H, Agus S, Kuessner D, et al. The burden and impact of vertigo: findings from the REVERT patient registry. *Front Neurol*. 2013;4:136.
- [5] Jonsson R, Sixt E, Landahl S, et al. Prevalence of dizziness and vertigo in an urban elderly population. *J Vestib Res*. 2004;14:47–52.
- [6] Neuhauser HK, Radtke A, von Brevern M, et al. Burden of dizziness and vertigo in the community. *Arch Intern Med*. 2008;168:2118–2124.
- [7] Hanley K, T OD. Symptoms of vertigo in general practice: a prospective study of diagnosis. *Br J Gen Pract*. 2002;52:809–812.
- [8] McDonnell MN, Hillier SL. Vestibular rehabilitation for unilateral peripheral vestibular dysfunction. *Cochrane Database Syst Rev*. 2015;CD005397. doi: 10.1002/14651858.CD005397.pub4.
- [9] Hilton MP, Pinder DK. The Epley (canalith repositioning) manoeuvre for benign paroxysmal positional vertigo. *Cochrane Database Syst Rev*. 2014;CD003162. doi: 10.1002/14651858.CD003162.pub3.
- [10] Amor-Dorado JC, Barreira-Fernandez MP, Aranz-Gonzalez I, et al. Particle repositioning maneuver versus Brandt-Daroff exercise for treatment of unilateral idiopathic BPPV of the posterior semicircular canal: a randomized prospective clinical trial with short- and long-term outcome. *Otol Neurotol*. 2012;33:1401–1407.
- [11] Helminski JO, Zee DS, Janssen I, et al. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review. *Phys Ther*. 2010;90:663–678.
- [12] Hanley K, O'Dowd T, Considine N. A systematic review of vertigo in primary care. *Br J Gen Pract*. 2001;51:666–671.
- [13] Jayarajan V, Rajenderkumar D. A survey of dizziness management in general practice. *J Laryngol Otol*. 2003;117:599–604.
- [14] Yardley L, Donovan-Hall M, Smith HE, et al. Effectiveness of primary care-based vestibular rehabilitation for chronic dizziness. *Ann Intern Med*. 2004;141:598–605.
- [15] Fife D, FitzGerald JE. Do patients with benign paroxysmal positional vertigo receive prompt treatment? Analysis of waiting times and human and financial costs associated with current practice. *Int J Audiol*. 2005;44:50–57.
- [16] Polensek SH, Sterk CE, Tusa RJ. Screening for vestibular disorders: a study of clinicians' compliance with recommended practices. *Med Sci Monit*. 2008;14:CR238–CR242.
- [17] van Lieshout J, Assendelft WJ, Nederlands Huisartsen G. [Summary of the Dutch college of general practitioners' practice guideline "dizziness"]. *Ned Tijdschr Geneesk*. 2003;147:331–335.
- [18] Van Hassel DTP, Kenens RJ. Cijfers uit de registratie van huisartsen - peiling 2012. Utrecht: NIVEL; 2013.
- [19] VanGeest JB, Johnson TP, Welch VL. Methodologies for improving response rates in surveys of physicians: a systematic review. *Eval Health Prof*. 2007;30:303–321.
- [20] Johnson TP, Wislar JS. Response rates and nonresponse errors in surveys. *JAMA*. 2012;307:1805–1806.
- [21] von Brevern M, Radtke A, Lezius F, et al. Epidemiology of benign paroxysmal positional vertigo: a population based study. *J Neurol Neurosurg Psychiatr*. 2007;78:710–715.
- [22] Durieux N, Vandepuut S, Pasleau F. [OCEBM levels of evidence system]. *Rev Med Liege*. 2013;68:644–649.
- [23] Munoz JE, Miklea JT, Howard M, et al. Canalith repositioning maneuver for benign paroxysmal positional vertigo: randomized controlled trial in family practice. *Can Fam Physician*. 2007;53:1049–1053,1048.
- [24] Cranfield S, Mackenzie I, Gabbay M. Can GPs diagnose benign paroxysmal positional vertigo and does the Epley manoeuvre work in primary care? *Br J Gen Pract*. 2010;60:698–699.
- [25] Glasziou P, Heneghan C. Epley and the slow boat from research to practice. *Evid Based Med*. 2008;13:34–35.
- [26] Organ B, Liu H, Bromwich M. An iPhone-assisted particle repositioning maneuver for benign paroxysmal positional vertigo (BPPV): a prospective randomized study. *J Am Board Fam Med*. 2015;28:118–120.
- [27] Glasziou P, Bennett J, Greenberg P, et al. The Epley manoeuvre - for benign paroxysmal positional vertigo. *Aust Fam Physician*. 2013;42:36–37.

Appendix 1.

Translation of Dutch questionnaire in English. Survey "Vestibular training in General Practice" (2012) Data participant:

Age: _____

Gender: M/F

For how many years have you practiced medicine as a GP?

Are you an accredited GP trainer? (YES/NO)

Questions:

1. Do you ever use the Epley manoeuvre to treat patients that present with dizziness complaints?

(Also enter yes if you specifically refer patients for the Epley manoeuvre)

(Epley manoeuvre: rapid positioning of the patient to different positions, which causes vestibular debris to shift from the semilunar canal)

1.1. YES (proceed to question 2)

1.2. NO (proceed to question 3)

2. For patients with which medical conditions do you use the Epley manoeuvre? *Multiple answers are possible*

2.1. Patients with Ménière's disease YES/NO

2.2. Patients with Benign Paroxysmal Positional Vertigo (BPPV) YES/NO

2.3. Patients with vestibular neuronitis YES/NO

2.4. Patients with chronic dizziness YES/NO

2.5. Patients with dizziness of unknown origin YES/NO

2.6. Elderly patients (>65 years) with vestibular dizziness YES/NO

2.7. Elderly patients (>65 years) with multifactorial dizziness YES/NO

2.8. Other _____

(proceed to question 4)

3. Why don't you use the Epley manoeuvre? *Multiple answers are possible*

3.1. This takes too much time YES/NO

3.2. I do not know how to perform the treatment YES/NO

3.3. I am not convinced by its effectiveness YES/NO

3.4. Our national guidelines do not recommend the treatment YES/NO

3.5. This treatment has no place in general practice YES/NO

3.6. Other _____

(proceed to question 7)

4. If you decide to treat your patient with the Epley manoeuvre, do you perform the treatment yourself?

4.1. YES (proceed to question 5)

4.2. NO, I refer these patients (proceed to question 6)

5. How do you treat dizzy patients with the Epley manoeuvre? *Multiple answers possible*

5.1. I perform the Epley manoeuvre myself YES/NO

5.2. I give the patient oral instructions during the consultation YES/NO

5.3. I provide the patient with written instructions YES/NO

5.4. I provide the patient with the name of a website which explains the Epley manoeuvre YES/NO

5.5. Other _____

(proceed to question 7)

6. To whom do you refer your patients for the Epley manoeuvre? *Multiple answers possible*

6.1. Physical therapist

6.2. ENT-specialist

6.3. Neurologist

6.4. Dizziness specialty clinic

6.5. Other _____

(proceed to question 7)

7. Do you ever use Brandt-Daroff exercises to treat patients that present with dizziness complaints?

(also enter yes if you specifically refer patients for Brandt-Daroff exercises)

(Brandt-Daroff exercises: lie alternately on your left and right flank multiple times a day until the dizzy spells disappear)

7.1. YES (proceed to question 8)

7.2. NO (proceed to question 9)

8. For patients with which medical conditions do you use Brandt-Daroff exercises? *Multiple answers are possible*

8.1. Patients with Ménière's disease YES/NO

8.2. Patients with Benign Paroxysmal Positional Vertigo (BPPV) YES/NO

8.3. Patients with vestibular neuronitis YES/NO

8.4. Patients with chronic dizziness YES/NO

8.5. Patients with dizziness of unknown origin YES/NO

8.6. Elderly patients (>65 years) with vestibular dizziness YES/NO

8.7. Elderly patients (>65 years) with multifactorial dizziness YES/NO

8.8. Other _____

(proceed to question 10)

9. Why don't you use Brandt-Daroff exercises? *Multiple answers are possible*

9.1. This takes too much time YES/NO

9.2. I do not know how to perform the treatment

YES/NO

9.3. I am not convinced by its effectiveness YES/NO

9.4. Our national guidelines do not recommend the treatment YES/NO

9.5. This treatment has no place in general practice YES/NO

9.6. Other _____

(proceed to question 13)

10. If you decide to treat your patient with Brandt-Daroff exercises, do you perform the treatment yourself?

10.1. YES (proceed to question 11)

10.2. NO, I refer these patients (proceed to question 12)

11. How do you treat dizzy patients with Brandt-Daroff exercises? *Multiple answers possible*

11.1. I perform the Brandt-Daroff exercises myself YES/NO

11.2. I give the patient oral instructions during the consultation YES/NO

11.3. I provide the patient with written instructions YES/NO

11.4. I provide the patient with the name of a website which explains the Brandt-Daroff

11.5. Exercises YES/NO

11.6. Other _____

(proceed to question 13)

12. To whom do you refer your patients for Brandt-Daroff exercises? *Multiple answers possible*
- 12.1. Physical therapist
 - 12.2. ENT-specialist
 - 12.3. Neurologist
 - 12.4. Dizziness specialty clinic
 - 12.5. Other . . . _____
- (proceed to question 13)*
13. Do you ever use vestibular rehabilitation to treat patients that present with dizziness complaints?
(also enter yes if you specifically refer patients for vestibular rehabilitation)
(Vestibular rehabilitation: daily 30 min exercise program for 6–12 weeks which consists of graded eye, head and body movements to train the vestibular system)
- 13.1. YES *(proceed to question 14)*
 - 13.2. NO *(proceed to question 15)*
14. For patients with which medical conditions do you use vestibular rehabilitation? *Multiple answers are possible*
- 14.1. Patients with Ménière's disease YES/NO
 - 14.2. Patients with Benign Paroxysmal Positional Vertigo (BPPV) YES/NO
 - 14.3. Patients with vestibular neuronitis YES/NO
 - 14.4. Patients with chronic dizziness YES/NO
 - 14.5. Patients with dizziness of unknown origin YES/NO
 - 14.6. Elderly patients (>65 years) with vestibular dizziness YES/NO
 - 14.7. Elderly patients (>65 years) with multifactorial dizziness YES/NO
 - 14.8. Other . . . _____
- (proceed to question 16)*
15. Why don't you use vestibular rehabilitation? *Multiple answers are possible*
- 15.1. This takes too much time YES/NO
 - 15.2. I do not know how to perform the treatment YES/NO
 - 15.3. I am not convinced by its effectiveness YES/NO
 - 15.4. Our national guidelines do not recommend the treatment YES/NO
 - 15.5. This treatment has no place in general practice YES/NO
 - 15.6. Other . . . _____
- (proceed to end of survey)*
16. If you decide to treat your patient with vestibular rehabilitation, do you perform the treatment yourself?
- 16.1. YES *(proceed to question 17)*
 - 16.2. NO, I refer these patients *(proceed to question 18)*
17. How do you treat dizzy patients with vestibular rehabilitation? *Multiple answers possible*
- 17.1. I show them the vestibular rehabilitation exercises myself YES/NO
 - 17.2. I give the patient oral instructions during the consultation YES/NO
 - 17.3. I provide the patient with written instructions YES/NO
 - 17.4. I provide the patient with the name of a website which explains vestibular rehabilitation YES/NO
 - 17.5. Other . . . _____
- (proceed to end of survey)*
18. To whom do you refer your patients for vestibular rehabilitation? *Multiple answers possible*
- 18.1. Physical therapist
 - 18.2. ENT-specialist
 - 18.3. Neurologist
 - 18.4. Dizziness specialty clinic
 - 18.5. Other . . . _____
 - 18.6. *(proceed to end of survey)*