



PREVALENCE OF EPLEY'S MANEUVER IN PRIMARY CARE PHYSICIANS IN CATALONIA

DEGREE'S FINAL PROJECT

AUTHOR: ANTONIO DE LA MORENA ISASI
TUTOR: MIQUEL QUESADA SABATÉ

GIRONA, FEBRUARY 2018

AKNOWLEDGEMENTS

A mi familia, mi tutor y todas las personas que han hecho ésto posible,

*“Al bien hacer nunca le falta recompensa”,
Don Quijote de la Mancha*

ÍNDEX

1. ABSTRACT.....	5
2. ABBREVIATIONS	6
3. INTRODUCTION	7
3.1 DEFINITION.....	7
3.2 EPIDEMIOLOGY.....	9
3.3 ETIOLOGY	10
3.4 PHYSIOPATHOLOGY.....	11
3.5 CLINICAL MANIFESTATIONS	11
3.6 DIAGNOSIS.....	12
3.6.1 DIX HALLPIKE MANEUVER	13
3.6.2 DIAGNOSIS OF BPPV	14
3.7 TREATMENT.....	15
3.7.1 EPLEY MANEUVER	16
3.7.2. SELF-ADMINISTERED CRP	18
3.7.3 COMPLICATIONS OF TREATMENT	19
3.7.3 POSTPROCEDURAL RESTRICTIONS	19
4. RECURRENCE.....	21
5. JUSTIFICATION	22
6. HYPOTHESIS.....	23
7. OBJECTIVE	24
7.1 MAIN OBJECTIVE	24
7.2 SECONDARY OBJECTIVE.....	24
8. METHODOLOGY.....	25
8.1 STUDY DESIGN.....	25
8.2 STUDY POPULATION.....	25
8.3 INCLUSION AND EXCLUSION CRITERIA.....	25
8.4 SAMPLE SELECTION AND SAMPLE SIZE	25
8.4.1 SAMPLE SELECTION	25
8.4.2 SAMPLE SIZE	26
8.5 VARIABLES	26
8.6. MEASURE INSTRUMENTS.....	29
8.6.1 SURVEY DESIGN	29
8.6.2 EXPERTS SELECTION AND CONTACT	31
8.7 DATA COLLECTION	32
8.8DATA ANALYSIS	33

9. ETHICAL ASPECTS	34
10. STRENGTH AND LIMITATIONS	35
11. WORKING PLAN	36
12. STUDY CHRONOGRAM	39
13. BUDGET	40
14. PROJECT RELEVANCE	41
15. BIBLIOGRAPHY	42
16. ANNEXES.....	44
ANNEX 1: INFORMATIVE DOCUMENT ABOUT DELPHI'S TECHNIQUE.....	44
ANNEX 2: INFORMATION DOCUMENT.....	45
ANNEX 3: INFORMED CONSENT	46
ANNEX 4: QUESTIONNAIRE	47

1. ABSTRACT

BACKGROUND: benign paroxysmal positional vertigo (BPPV) is the most common peripheral vertigo and posterior semicircular canal is the main responsible. In primary care is a frequent reason for consultation and requires several visits because the symptoms appear and disappear. The first line treatment are canalith repositioning procedure (CRP) that includes Epley's maneuver for the posterior semicircular canal (PSC).

OBJECTIVE: to estimate the performance of the Epley maneuver by primary care physicians in Catalonia by creating and validating a questionnaire to explore the causes that may lead professionals not to perform the maneuver in the consultation.

METHODS: this protocol proposes a descriptive cross-sectional study that will be carried out in the primary care centers of Catalonia. A validated survey will be sent by e-mail from responsible for research and training of "Dirección de atención primaria" (DAP) and "Colegio oficial de médicos" (COM) to every general practitioners (GPs), and it will be necessary at least 224 subjects randomly selected to estimate with a 95% confidence the prevalence of GPs that perform the maneuver.

CONCLUSION: through the application of the questionnaire, different strategies can be developed to improve the training of professionals in this topic and reduce the number of re-visits, referrals to specialists and prescription of medications.

KEY WORDS: vertigo, Benign Paroxysmal Positional Vertigo, BPPV, Epley, maneuver, Primary Care, Semicircular Canal

2. ABBREVIATIONS

ASC	Anterior semicircular canal
BPPV	Benign paroxysmal positional vertigo
CEIC	Clinical research ethics committee
CI	Confidence interval
CRP	Canalith repositioning procedure
COM	Colegio oficial de medicos
DAP	Dirección de atención primaria
D-H	Dix-Hallpike
GPs	General practitioners
HSC	Horizontal semicircular canal
ICC	Intraclass correlation coefficient
ICS	Institut català de la Salut
IDIAP	Instituto de investigación en atención primaria
NNT	Number needed to treat
OR	Odds ratio
PCP	Primary care physicians
PSC	Posterior semicircular canal
RD	Royal decree

3. INTRODUCTION

3.1 DEFINITION

Dizziness is a common complaint in patients presenting to the primary care office and the emergency department; it means a disorder of spatial orientation. Vertigo is a subtype of dizziness, defined as an illusion of motion caused by a mismatch of information from the visual, vestibular and proprioceptive systems. There are two categories of vertigo: central and peripheral Vertigo. Central vertigo is generally more serious, whereas peripheral vertigo is usually benign. It has been estimated that 45 to 54% of the patients who attend the primary care physician with dizziness are suffering from vertigo⁽¹⁾.

The three most common causes of vertigo (accounting for 93% of all patient presentations) are: acute peripheral vestibulopathy (vestibular neuritis and labyrinthitis), Ménière's disease and benign paroxysmal positional vertigo, the latter being the most frequent^(2,3).

Benign paroxysmal positional vertigo (BPPV) is a short-lived episodic vestibular syndrome, triggered by movements of the head, and secondary to the displacement of the otoconia that are floating freely inside the semicircular canals. It manifests with an intense sensation of rotation of objects accompanied by a characteristic nystagmus depending on the channel stimulated by otoconia⁽⁴⁾.

It usually resolves spontaneously, but it can become a chronic and recurrent problem with important effects on the quality of life of patients. It

originates more frequently in posterior semicircular canal (PSC) (90%) followed by horizontal semicircular canal (HSC) (7%), although it can originate in any of the semicircular canals of the inner ear. Sometimes several canals are affected at the same time (2%) or exceptionally located in the upper or anterior semicircular canal (ASC) (3%)⁽⁴⁾.

Most patients with vertigo have benign disorders and can be successfully managed by the primary care physician. A low percentage of the disorders require laboratory testing, advanced testing or referral to a specialist⁽³⁾.

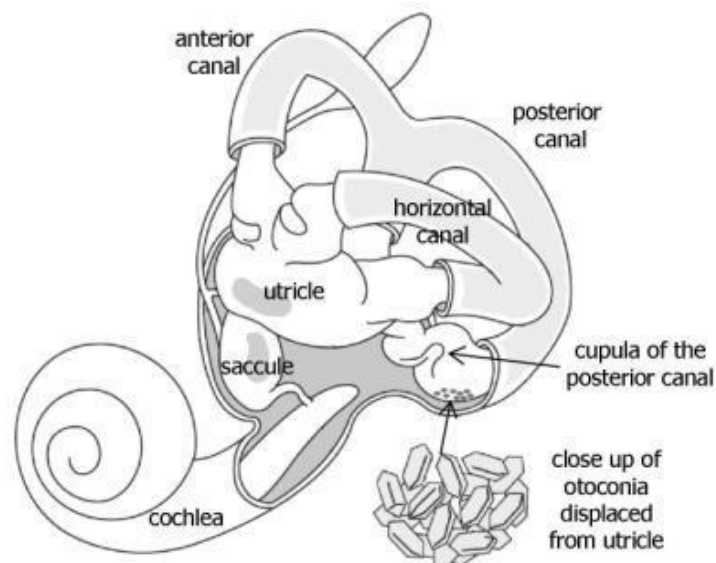


Figure 1. Mechanism of BPPV ⁽⁵⁾

3.2 EPIDEMIOLOGY

BPPV is the main cause of vertigo in primary care consultation and represents up to 25% of patients who consult for vertigo. Its incidence is estimated between 11-64 cases per 100,000 inhabitants, with an increase of 38% in each decade of life, with a prevalence of 2.4% and more frequent in women (2: 1). The idiopathic or primary form is more common between 50 and 70 years⁽⁶⁾ and is twice as frequent in women as in men, but sex differences are not found when its etiology is post-traumatic or neuritis vestibular^(4,7).

Of patients admitted to the emergency medicine department for moderate to severe vertigo or dizziness, 8% to 9% are diagnosed with BPPV^(8,9)

3.3 ETIOLOGY

50% of diagnosed cases of BPPV are of idiopathic (primary) cause. Among the secondary ones, the most frequent are post-traumatic (18%) and infectious (viral labyrinthitis) (16%). Other possible ones are: vertebrobasilar insufficiency, Menière's disease, prolonged bed rest, post-stapedectomy, ototoxicity, luetic labyrinthitis and chronic otitis media. It has also been associated with an ischemic etiology⁽⁴⁾.

Lateral semicircular canal BPPV may occur following performance of the canalith repositioning procedure (CRP) for an initial diagnosis of posterior semicircular canal BPPV⁽¹⁰⁾.

BPPV rarely involves ASC, probably because of its uppermost position in the labyrinth, where otolithic debris is unlikely to become trapped⁽⁷⁾. Is more likely associated with head trauma, accounting for between 2% and 22% in all BPPV reports⁽⁸⁾.

3.4 PHYSIOPATHOLOGY

It is important to know the pathophysiology of BPPV to understand the why of the applied treatment. The most accepted theory to explain BPPV is canalolithiasis, the presence of otoliths (calcium carbonate crystals) detached from the utricle that enter the semicircular canals (especially the posterior canal) and, through inappropriate sensory stimulation with the movements of the head, cause the vertigo. This theory explains the BPPV of the PSC (85-95% of cases of BPPV) and probably of the superior or anterior canal.

3.5 CLINICAL MANIFESTATIONS

In the case of BPPV, patients may also present with lightheadedness, unsteadiness, loss of balance, blurred vision, nausea and vomiting, without hearing loss or tinnitus; they may come and go, frequently lasting from 10 to 30 seconds. The symptoms are usually accompanied by nystagmus. Some patients, however, may feel vertiginous for several minutes and the imbalance and nausea may last several hours. The average duration of each episode is two weeks but 30% of patients refer episodes longer than a month⁽³⁾.

Forty-four per cent of BPPV cases experience a single episode of dizziness while 56% are recurrent⁽⁹⁾. Activities that bring about the signs and symptoms of BPPV can vary from person to person but are almost always brought on by a change in the position of the head: turning in bed, neck extension and tilting the head forward.

3.6 DIAGNOSIS

The diagnostic approach to vertigo relies on the quality of symptoms reported. Physical examination is the next and the last step to make an accurate diagnosis. The equipment needed for the physical examination is simple and available in every primary care examination room: stethoscope, otoscope, sphygmomanometer, reflex hammer, tuning fork and a flat examining bed.

Coupled with the medical history and physical examination, Dix-Hallpike (D-H) maneuver is extensively used in both the diagnosis and short- and long-term control of BPPV. The result is positive if the patient develops symptoms (vertigo) and nystagmus. It has a positive predictive value of 83% and a negative predictive value of 52%⁽²⁾. Most patients with vertigo have benign disorders and can be successfully managed by the primary care physician. A low percentage of the disorders require laboratory testing, advanced testing or referral to a specialist⁽³⁾.

3.6.1 DIX HALLPIKE MANEUVER

EQUIPMENT: a bed that can recline to horizontal position; Frenzel goggles can be useful to magnify the movements of the eyes. A mat table can be useful for elevating the shoulders and keeping the patient closer to the ground and thus, safer. Increasing the sensitivity of the Hallpike maneuver by wearing Frenzel glasses will reduce its specificity, since asymptomatic normal subjects can develop positional nystagmus on positional testing when optic fixation is removed⁽⁶⁾.

PERSONNEL: This test can be accomplished by a single practitioner.

PREPARATION: Position the patient appropriately and counsel them about what is about to happen, ready them for vertigo (and possibly nausea and vomiting) they will experience. Consider an antiemetic before implementing the test.

CONTRAINDICATIONS: D-H maneuver should be avoided in a patient with neck pathology, in whom the movements involved could be dangerous to the patient. Cervical instability, vascular problems like vertebrobasilar insufficiency and carotid sinus syncope, acute neck trauma and cervical disc prolapse are absolute contraindications⁽¹¹⁾.

TECHNIQUE: The patient begins sitting up, and their head is oriented 45 degrees toward the ear to be tested. Then, the clinician lies the patient down quickly with their head past the end of the bed and extends their neck 20 degrees below the horizontal, maintaining the initial rotation of the head. The clinician then watches the patient's eyes for torsional and up-beating nystagmus, which should start after a brief delay and persist for no more than one minute. This would

indicate a positive test. If the test is negative but clinical suspicion remains high, the patient should be given a chance to recover for at least one minute, and then testing of the other ear can be undertaken. Lateral canal pathology may not be detected by this method, and a supine roll test may be done if this is suspected⁽¹¹⁾.

COMPLICATIONS: Nausea and vomiting are common during this maneuver; it can potentially be avoided by giving an antiemetic before testing.

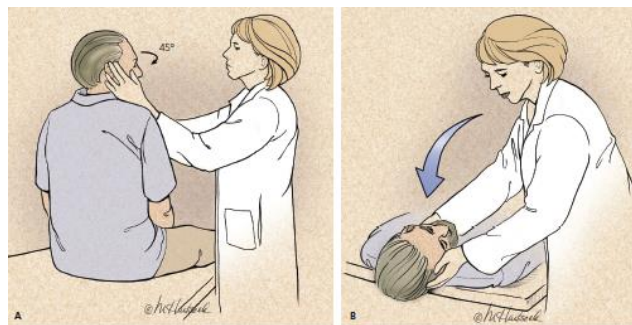


Figure 2: Dix-Hallpike maneuver⁽¹⁾

3.6.2 DIAGNOSIS OF BPPV

The physician must perform D-H maneuver to diagnose. The resulting nystagmus is upward-beating and torsional, with the top poles of the eyes beating toward the ear in the lower position (as the patient's head is turned to one side). The nystagmus usually develops after a brief latency period (2 to 5 seconds), resolves within 1 minute (typically within 30 seconds), and reverses direction when the patient sits up. With repeated testing, the nystagmus diminishes owing to fatigability. If the otoconia become attached to the cupula (cupulolithiasis), the evoked nystagmus is similar to that observed in canalolithiasis but is usually longer in duration⁽⁷⁾.

To diagnose a BPPV of PSC, D-H maneuver should be repeated with the opposite ear down if the initial maneuver is negative⁽¹⁰⁾.

3.7 TREATMENT

Treatment options may be: watchful waiting, vestibular suppressant medication, vestibular rehabilitation, CRP and surgery. CRPs are the first-choice treatment for BPPV. Out of all the CRPs, the Epley's maneuver has been the most successfully used, and is particularly indicated in the treatment of posterior canal BPPV.

A meta-analysis of three high-quality clinical trials demonstrated the effectiveness of the Epley's maneuver in short-term follow-up, measured in terms of D-H test turning negative (odds ratio (OR) = 5.67; 95% confidence interval (CI) 2.21 to 14.56)⁽¹²⁾. Epley maneuver can be performed by general practitioners (GPs). Although most clinical trials on the effectiveness of this maneuver have taken place in specialized clinics, one study conducted in a primary care center demonstrated that trained GPs achieved the same results as the specialists in terms of D-H test turning negative. However, this study could not prove the subjective improvement of the patients compared to the control group^(3,13).

Medications may be used for the relief of immediate distress, such as nausea, but not for BPPV itself⁽¹⁴⁾. Surgeries such as transection of the posterior ampullary (singular) nerve and plugging of the involved canal are rarely required and should be considered only for patients whose symptoms are intractable and incapacitating and in whom there has been no response to repositioning maneuvers⁽⁷⁾.

BPPV typically resolves without treatment. A prospective longitudinal study showed that the median interval between the onset of symptoms and spontaneous resolution in untreated patients was 7 days when the horizontal canal was affected and 17 days when the posterior canal was affected⁽⁷⁾.

3.7.1 EPLEY MANEUVER

Epley first reported the CRP in 1992. The sequential head movements of the Epley maneuver cause otoconial debris to move from the semicircular canal to the utricle⁽¹⁴⁾ and reported a success rate of 90-97%⁽¹⁵⁾.

The success rate with Epley's maneuver is about 80% after one session and increases to 92% with repetition up to four times. A meta-analysis of five randomized, controlled trials showed that patients with BPPV involving the posterior canal who were treated with Epley's maneuver, as compared with patients treated with sham maneuvers and untreated controls, had significantly higher rates of improvement in symptoms (OR, 4.4; 95% CI, 2.6 to 7.4) and in nystagmus (OR, 6.4; 95% CI, 3.6 to 11.3)⁽⁷⁾. In elderly patients with BPPV, the number of falls reduces after the particles repositioning maneuvers⁽¹⁶⁾.

The Epley maneuver is contraindicated in patients who suffer from cervical vertebral disease. The maneuver should be canceled when patients feel neck pain, sensory disturbance and disturbance of consciousness⁽¹⁴⁾.

Steps of Epley Maneuver:

1. The patient is placed in the upright position with the head turned 45° toward the affected ear (the ear that was positive on the Dix-Hallpike testing).
2. The patient is rapidly laid back to the supine head-hanging 20° position which is then maintained for 20-30 seconds.
3. Next, the head is turned 90° toward the other (unaffected) side and held for about 20 seconds.
4. Following this, the head is turned a further 90° (usually necessitating the patient's body to also move from the supine position to the lateral decubitus position) such that the patient's head is nearly in the facedown position. This is also held for 20-30 seconds.
5. Then, the patient is brought into the upright sitting position, completing the maneuver⁽¹⁰⁾.



Figure 3. Epley maneuver ⁽¹⁷⁾

Clinicians should educate patients regarding the impact of BPPV on their safety, the potential for disease recurrence, and the importance of follow-up. Clinicians should reassess patients within 1 month after an initial period of observation or treatment to document resolution or persistence of symptoms.

3.7.2. SELF-ADMINISTERED CRP

CRP (Epley) has been modified for self-administration by patients for the treatment of BPPV. Modified Epley maneuver is considered domiciliary choice. The maneuver is the same, but it is the patient who performs the sequential movements of the head in four positions, staying in each position for about 30 seconds. Each cycle lasts 2 and a half minutes (lying down for 30 seconds and sitting for 1 minute). Normally three cycles are performed just before going to sleep. It is better to do it at night because if dizziness persists after the exercises, it can be resolved while you are sleeping⁽¹⁷⁾.

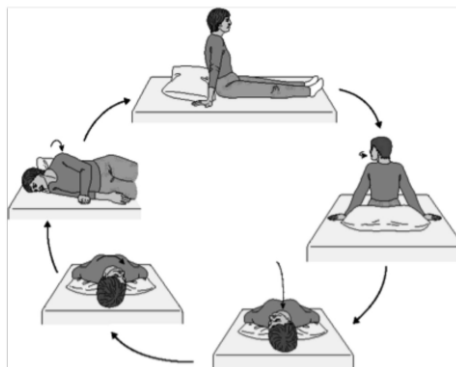


Figure 4: modified Epley maneuver ⁽¹⁸⁾

Self-administered CRP appears to be more effective (64% improved) than self-treatment with Brandt-Daroff exercises (23% improvement). Another trial reported that self-administered CRP (Epley) resulted in 95% resolution of positional nystagmus 1 week after treatment, compared with 58% for patients self-administered Lempert Maneuver⁽¹⁰⁾.

3.7.3 COMPLICATIONS OF TREATMENT

CRP is associated with mild and generally self-limiting adverse effects in about 12% of those treated. Some patients may experience an immediate falling sensation within 30 minutes after the maneuver and may benefit from counseling prior to the maneuver⁽¹⁰⁾.

The most commonly encountered complications include nausea, vomiting, fainting, and conversion to lateral canal BPPV while treatment (so-called canal switch or conversion). Canal conversion occurs in about 6% to 7% of those treated with CRP, underscoring the importance of recognizing the lateral canal variant of BPPV and the need for more unique and different CRPs⁽¹⁰⁾.

Another potential side effect after the CRP is postural instability that can last 24 hours with a tendency to fall backward or forward.

3.7.3 POSTPROCEDURAL RESTRICTIONS

Postprocedural postural restrictions after CRP for PSC should not be recommended⁽¹⁰⁾. However, it seems prudent that they remain at rest in an upright position for about 15 minutes after treatment and then walk cautiously⁽¹⁷⁾. Cochrane's review shows there is evidence to suggest that post-Epley postural restrictions are more effective than Epley maneuver alone in terms of the D-H responses in BPPV, although the effect size is small with a number needed to treat (NNT) of 10⁽¹⁹⁾.

Vestibular rehabilitation exercises may be useful in treatment in some circumstances:

- In cases of early recurrence of BPPV, these exercises have shown some efficacy as a complement after new repositioning maneuver.
- If PCR cannot be performed in consultation due to contraindications, patient characteristics or availability of time.

Patient will be referred to the specialist (otolaryngologist or neurologist) in the following situations⁽¹⁸⁾:

- Suspicion of BPPV of lateral or anterior canal
- Very frequent recurrences
- In case of bilaterally in diagnostic maneuvers
- When there is no answer to replacement after several maneuvers
- After performing the D-H maneuver, an atypical nystagmus appears or there is neurological focus: diplopia, dysarthria, paresis, loss of consciousness, seizures)

4. RECURRENCE

BPPV is a recurring disease with a recurrence rate of approximately 15% per year. However, BPPV recurrence rate of 56% affected individuals was reported in a 1-year cross-sectional study⁽⁸⁾. The success rate after one session is of 97.70% for the Epley's maneuver⁽²⁰⁾.

In cases of BPPV recurrence, maneuver repetition is useful to reduce the duration of dizziness. Nonetheless, persistent form does not respond to Epley treatment, and additional strategies may be necessary, such as vestibular rehabilitation exercises, vestibular function suppressive drugs and surgical procedures.

Despite Epley failure and BPPV persistence, the following mechanisms may be involved⁽²⁰⁾:

- 1) Thinning and weakening of the mucopolysaccharide gelatinous layer on the utricle's otolithic membrane
- 2) Intralabyrinthine fibrosis or ossification involving the endolymphatic space
- 3) Utricular macula lesion or lesion involving the membranous labyrinth
- 4) Increase in endolymphatic calcium content
- 5) Cupula lithiasis
- 6) Endolymphatic hydrops
- 7) Statocone adherence to the membranous labyrinth
- 8) Vestibular atelectasis

5. JUSTIFICATION

BPPV is a frequent reason for consultation in primary care. It is known and demonstrated that the Epley maneuver constitutes the first line treatment in BPPV of the posterior canal and has demonstrated its effectiveness. The importance of this study is aimed at knowing the number of GPs who perform the maneuver in their consultation, and study what are the potential causes that lead them to decide on other treatment options, with the aim of acting on them to achieve greater realization of the technique. Epley's maneuver achieves the resolution of vertigo in 90-95% of cases, acting directly on the physio pathological mechanism that produces it (pharmacological treatment only acts in the resolution of symptoms). During the bibliographic search, no data were found about performance of the technique in primary care, so it would be important to know what the situation in the sanitary area of Catalonia is, to achieve the greatest number of doctors who perform it through different strategies.

6. HYPOTHESIS

The Epley maneuver is considered the first line treatment for the resolution of BPPV; it reverts the otolith to its utricular position with an efficacy of 90-97%. It is a simple maneuver that requires 3 minutes on average in the consultation for its realization and has few contraindications. In the absence of data to support it, a low-used maneuver is assumed based on the personal experience of primary care professionals, being BPPV a reason for frequent referral to the specialist and using medicaments to treat a health problem that does not really need it. This protocol proposes a study to determine if it is really a low used maneuver and which are the reasons that justify it.

7. OBJECTIVE

7.1 MAIN OBJECTIVE

To determine the use of the Epley maneuver in primary care consultation through a questionnaire that evaluates the knowledge and attitude of the physician in a BPPV.

7.2 SECONDARY OBJECTIVE

- To analyze the factors that determine the low utilization of the Epley maneuver in primary care
- To prepare an ad-hoc questionnaire and then validate it
- To elaborate an informational brochure about the Epley maneuver and remind professionals of the basic aspects of BPPV
- To take advantage of the creation of the questionnaire to improve knowledge of the maneuver by professionals

8. METHODOLOGY

8.1 STUDY DESIGN

The type of study is a descriptive cross-sectional focused on knowing the attitude and knowledge of primary care physicians in Catalonia about the Epley maneuver in the BPPV of the posterior canal.

8.2 STUDY POPULATION

Primary care physicians (PCP) who are part of the CatSalut database and the Official Medical Colleges of Barcelona, Girona, Lleida and Tarragona.

8.3 INCLUSION AND EXCLUSION CRITERIA

Inclusion Criteria: all primary care physicians registered at the COM of Barcelona, Girona, Lleida, Tarragona, and CatSalut database.

Exclusion criteria: doctors of other specialties that are not Primary Care, or non-health personnel are not included in the study.

8.4 SAMPLE SELECTION AND SAMPLE SIZE

8.4.1 SAMPLE SELECTION

To select the study population, responsible for research and training of “Direcció de atenció primària” (DAP) and “Colegio oficial de médicos” (COM) of each province will be asked to send informative e-mails about the study and the survey to the email addresses of all PCP contracted (more than 3400 contracted by “Institut català de la salut” (ICS)⁽²¹⁾). With this objective, a request will be drafted explaining the study to be carried out and its importance. This request will inform about respect to the rights and duties established by the

Organic Law 15/1999 of Protection of Personal Data and RD 994/99 on security measures for automated files that contain personal data. Only the persons responsible for the preparation of the study will have access to the data provided.

8.4.2 SAMPLE SIZE

To calculate the sample size, the power calculator GRANMO⁽²²⁾ have been used to study a population estimate of the proportion of doctors who use the maneuver.

A sample size of 224 subjects randomly selected will suffice to estimate with a 95% confidence and a precision +/- 10 per cent units, a population percentage considered to be around 50%. It has been anticipated a replacement rate of 60%. This percentage is estimated from the usual response rates of questionnaires by email⁽²³⁾.

8.5 VARIABLES

Although in a cross-sectional study there is no causality and we cannot know which our dependent variable would be, we will consider the perform of Epley's maneuver as our dependent variable.

Dependent Variable

- Perform Epley maneuver: is a qualitative dichotomy variable that will be assessed using a simple question with three options as answer (yes, no, don't know / no answer)

Independent variables

- Theoretical knowledge of the maneuver: this independent variable will be evaluated through four questions of the questionnaire:
 - Knowledge of the indications of the maneuver: it is evaluated by question 2, with three answer options (yes, no, don't know / no answer)
 - Adequate clinical preparation: it is evaluated with question 4, with three answer options possible (yes, no, don't know / no answer)
 - Practical experience: is evaluated with question 5, through two answer options (yes, no, don't know / no answer)
 - Knowledge of efficacy data of the maneuver: it is evaluated by question 9, with three possible answer options (yes, no, don't know / no answer)
- Attitude towards a BPPV: this independent variable will be measured through a question in which the respondent will have to order the therapeutic options that are presented from 1 to 5 in order of use, and if any one does not use it, it will leave it unfilled.
- Responsibility for training: this independent variable will assess who is, for the physician, the responsible to teach about this maneuver through two questions (questions 6 and 7) of the survey with three possible answer (yes, no, don't know / no answer).

- Concrete reasons to not performing the maneuver: to evaluate this variable the survey includes two questions:
 - A specific question about the time in the consultation will be used (question 3). This question asks if the doctor has enough time in the consultation to perform a maneuver that requires an average of 3 minutes. There are three possible answer options (yes, no, don't know / no answer)
 - A question in which the concrete reason will be detailed if it is none of those that evaluate the previous questions

Sociodemographic covariables

- Age: is a discrete quantitative variable measured in interval scale (seven possible answer options).
- Gender: is a binary qualitative variable analyzed as a closed answer with two options, male or female.
- Years of experience in the work place: is a quantitative variable measured in interval scale (three possible answer options).
- Type of health center (rural, urban and half-urban): is a qualitative variable with six options as answer.
- Professional category: is a qualitative variable with three options as answer.

8.6. MEASURE INSTRUMENTS

To collect all data, an ad-hoc self-created questionnaire have been specially designed for this study ([annex 4](#)). The survey proposed it is a simple, brief and easy understandable instrument. It consists of 10 questions about the maneuver and 5 to know sociodemographic aspects.

8.6.1 SURVEY DESIGN

It Will be developed in three phases^(24–27):

1. **FIRST PHASE**

- A review of literature will be used to perform the questionnaire. Based on this, an ad-hoc, self-administered and semi-structured questionnaire is designed for PCP in Catalonia
- Survey's design will be made in two parts:
 1. Collection of sociodemographic data
 2. Questions about the attitude of the doctors and the performance of the Epley maneuver.

2. **SECOND PHASE**

➤ Reliability

Two types of reliability will be assessed:

❖ Internal consistency and test-retest reliability.

- Internal consistency is the way individual items relate to each other, it reflects the homogeneity of items in the scale.

- Internal consistency of each domain will be evaluated using the Cronbach α value (it calculates the average of correlations between all the items in the measure), and the ones with poor internal consistency will be deleted (if it is <0.70).

❖ Test-retest reliability

- Test-retest reliability measures stability of an instrument over time with repeated testing.
- It can be measured by administering the instrument to respondents on two separate occasions and examining the correlation between scores using an intraclass correlation coefficient (ICC) (the ICC will be used because the same results in the score of the instrument will be needed in the two times). ICC should be 0.70 or more.
- Test-retest reliability will be used to random selected respondents and repeating it after 2 weeks or repeating the test to the selected physicians after two or three days.

➤ Validity

Validity indicates if the instrument appears to be assessing the desired qualities. Delphi technique is used: the problem is submitted to the assessment of the experts who need to evaluate the ability of all the dimensions that we want to measure. There is no consensus in the literature regarding the number of experts that should be used for content validation. Rubio et al. (2003) recommends using 6-10 experts⁽²⁴⁾

3. THIRD PHASE

Once the Delphi technique is completed, questionnaire piloting is carried out. It is the final phase of the elaboration of the questionnaire before its administration to the extended group (target population).

Once the questionnaire is validated, next step is contact the COMs of Barcelona, Girona, Lleida and Tarragona to present the study want to be carried out and request contact information of the PCPs of Catalonia that meet the inclusion criteria and do not violate those of exclusion to participate. For the questionnaire to be more successful, COMs will be asked to endorse the study with their seal.

8.6.2 EXPERTS SELECTION AND CONTACT

Independent, isolated experts from different hospitals and care levels and different geographical areas are selected to guarantee independence in their decisions. Selection is made intentionally. Criteria for their selection are based on their clinical experience in hospital, primary care, teaching experience in dizziness and / or advanced knowledge in research methodology and validation of questionnaires.

It is contacted by email, which includes a project information sheet and the voluntary nature of its participation in it ([annex 1](#)). Regarding the number of experts selected, in this case 7 will be selected⁽²⁴⁾.

8.7 DATA COLLECTION

All data will be collected prospectively using the survey validated by experts with the aim to collect data about Epley's maneuver in primary care.

Principal investigator will meet with the heads of the DAP of Catalonia and explain the project. After approval, they will send the corresponding documentation and questionnaires to each e-mail of the contracted doctors. Participants will be informed of the study, the objectives they intend to achieve and what it will consist of. They will also receive the final data of the study when they are analyzed to be able to know the results and in this way, motivate them to participate. By completing the questionnaire, the participant accepts the informed consent ([annex 3](#)). When the questionnaire is completed, the data will be sent to a database of data storage for further statistical analysis.

Participants should be encouraged to read the questions carefully and choose the alternative that they consider as correct. No patient information will be used without their previous consent. To maintain the confidentiality and data security, no names, postcodes, addresses, birth dates or other numbers will be collected. The security of data will be ensured on locked network which only will be accessible for the principal responsible researchers of the project. According to the national and international laws regarding patient's autonomy, the study will be governed by "Organic Law 15/1999, of December 13th, Protection of Personal Data" and RD 994/99 of security measures for automated files that contain personal data.

8.8 DATA ANALYSIS

The data will be analyzed using IBM SPSS for Windows.

DESCRIPTIVE ANALYSIS

Qualitative variables will be expressed in proportions. Continuous quantitative variables will be expressed in medians, and the categorical quantitative variables will be shown in percentages.

BIVARIATE ANALYSIS

The purpose of this analysis is to determine the empirical relationship between the variables. It will be used the chi-square test (X^2) to compare proportions, for example, qualitative variables. Between qualitative and quantitative variables, the test used will be T-student in the case of our variables not being normally distributed, we will use non-parametric test.

MULTIVARIATE ANALYSIS

We will use a logistic regression analysis between the main variable and the independent variables to know how they are related. The objective is to evaluate, with a logistic regression model, the relationship (not the causality) between certain characteristics of the surveyed group (independent variables) and the performance of the maneuver (dependent variable).

9. ETHICAL ASPECTS

The research protocol will be presented to Clinical research ethics committee (CEIC) of the “Instituto de investigación en atención primaria” (IDIAP) Jordi Gol, the main ethical committee of clinical research in primary care in Catalonia before the study begins to be evaluated and get its approval.

No subject information will be used without their previous consent. Study information and purposes will be explained to each person and they will be invited to sign the informed consent. To maintain the confidentiality and data security, no names, postcodes, addresses, birth dates or other numbers will be collected. The security of data will be ensured on locked network which only will be accessible for the principal responsible researchers of the project. According to the national and international laws regarding autonomy, the study will be governed by “Organic Law 15-1999 of December 13th, of protection of personal data and RD 994/99 on security measures for automated files that contain personal data”.

All participants will be personally informed and an information document about the study will be given to them ([annex 2](#)). Participants will have to sign voluntarily the informed consent ([annex 3](#)) before being included in the study.

This study will be conducted according to the ethical principles for medical research established by the World Medical Association (WMA) in the *Declaration of Helsinki of Ethical Principles for Medical Research Involving Human Subjects* (1964). Last revision was in 2013⁽²⁸⁾

The authors have to declare that they have no conflicts of interest.

10. STRENGTH AND LIMITATIONS

As any study design, there are different limitations that may interfere in the proper study performance and their end results.

Using a survey may cause an information bias due to the Hawthorne effect because doctors will think that they are being evaluated so they may change their decisions. However, using a survey is an effective way to standardize information and to reduce missing information. So, participants will be taught how to fill the data collection sheet by the instructions sheet.

The participation rate can be low because it is a voluntary questionnaire. This may be due to reasons such as for example the doctor has no interest in the subject of study, has few time or does not usually review the e-mail.

The questionnaire is also anonymous and for this reason, doctors who do not participate will not know their situation about the maneuver, so if they don't participate, information about the possible reasons will be lost and it will be more difficult to improve them.

Hawthorne effect can also be a strong point because it can make professionals rethink the use of the maneuver and begin to learn and use it

The diptych to be provided aims to change the way physicians behave towards BPPV, improving their therapeutic management.

A descriptive study cannot establish causal relationships and therefore the results and conclusions should in the future be assessed with other types of studies.

11. WORKING PLAN

The study will be performed in 17 months and it will be composed of 8 phases with different objectives and activities in each part. The outline of the study and plan proposed and the activities that will be done are described in detail below.

- **Phase 0: study design**

- Exhaustive bibliographic research and protocol elaboration (3 months).

- **Phase 1: study setting up and coordination**

- In this phase (1 month), the main investigator will constitute a multidisciplinary team of collaborators to work on this project. The team will be formed by 7 experts in different subjects, who will also be responsible for validating the questionnaire:
 - Main investigator
 - 3 GPs
 - 2 otolaryngologists
 - Nurse
- Main investigator will send the document about Delphi's participation ([annex 1](#)) to the candidates, and once their participation is confirmed, they will call a meeting to explain the project.

- **Phase 2: brochure`s, meetings with the DAP, and validation of questionnaires**
 - Before the validation of the questionnaire, the work team will conduct an updated bibliographic search to review new publications of data concerning the subject of study (1month).
 - The questionnaire will be validated following the phases described in point 8.6.1 (2months).
 - Likewise, information will be collected to prepare a brochure that will be provided to all family doctors who are part of the study sample. In this way, the aim is to disseminate the maneuver in a brief and accessible manner. Collaborators will be responsible for endorsing these brochures with the stamps of the Catalan Society of Otolaryngology and Catalan Society of Family Physicians (3 months).

- **Phase 3: meeting with the DAP and COM of each province**
 - Principal investigator will arrange meetings with the DAP and COM of Catalonia, explaining the study he wants to carry out and the importance of it (3months).
 - If the completion of the study is approved, the DAP will be responsible for sending the questionnaire, brochure and results documents to the family doctors of each area.
 - The DAP and COM will be asked to endorse the study with their stamp to achieve greater confidence and rate of questionnaire responses.

- **Phase 4: computer services for the development of the website to access the survey. Contact and contracting of database**
 - Collaborators will look for a company of computer services with experience in elaboration of web sites and collection and storage of survey data to create the platform (2 months).

- **Phase 5: start of the sending of links and opening of the questionnaire with the corresponding reminders (1 month)**
 - With the approval of the DAP, COM, diptychs prepared in digital format and the computer resources prepared, the process of sending the survey begins.
 - DAPs will send all the doctors an e-mail where they will attach the informed consent (which they accept when being part of the study), the brochure and the personal link to carry out the online survey.
 - After 15 days it will be resent to reminder mode for all those who have not yet participated.
 - Two days before the deadline, the e-mail will be resent for those who have not yet participated. These reminders are a mechanism to increase participation⁽²³⁾.
 - After 30 days, the participation period will close, and the website will not be available.

- **Phase 6: collection and analysis of results (5 months)**
 - Data analysis: a statistician will take all collected data and will proceed to analyze it with a specific statistical program (2 months).

- With the statistical data obtained, the investigators will analyze and discuss about the collected data (3 months).
- **Phase 7: results publication and dissemination (4 months)**
 - Results publication: results will be presented to specific national and international conferences and meetings (2 months).
 - Final report dissemination: final report will be submitted to scientific journals to be published (2 months).

12. STUDY CHRONOGRAM

TASK	2017		2018												2019		
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR
Stage 0: study design																	
Bibliographic research																	
Stage 1: study setting up and coordination																	
Creation of multidisciplinary team																	
Stage 2: brochure's elaboration, meetings with the DAP and validation of questionnaires																	
Bibliographic research																	
Validation of the questionnaire																	
Brochure's elaboration																	
Stage 3: meeting with the DAP and COM of each province																	
Meetings with DAP coordinators																	
Stage 4: contact and contracting of computer services																	
Webpage creation																	
Stage 5: opening of the questionnaire																	
Sending links and reminders																	
Stage 6: collection and analysis of results																	
Data analysis																	
Analysis and discussion of the data																	
Stage 7: results publication and dissemination																	
Result publication																	
Final report dissemination																	

13. BUDGET

DESCRIPTION	COST (€)	AMOUNT
PERSONAL		
Digital diptych design	300€	
Database and web design	5000€	
Statistical analyses	2800€	
		Subtotal: 8100€
OTHER JUSTIFIED COSTS		
Fungible goods	50€	
Travel and subsistence expenses	300€	
		Subtotal: 350€
PUBLICATION AND DIFFUSION COSTS		
Article publication and diffusion	1400€	
		Subtotal: 1400€
		TOTAL: 9850€

14. PROJECT RELEVANCE

Studies have shown that the maneuver described by Epley has greater efficacy and is really the only curative treatment for the disease since it acts by reversing the pathophysiologic mechanism that originates it, while the drugs are used only for the symptomatic treatment of the acute phase and they do not prevent the appearance of new BPPV events⁽²⁹⁾. The medical cost of treating BPPV prior to referral has been calculated at 364€ per individual (mostly for non-specific medical treatments) instead of the 136€ needed for effective positional treatment⁽³⁰⁾.

As we have seen, it is a simple maneuver to carry out and even the training strategies could be focused not only to the medical staff, but also to the nursing staff that is part of the primary care center and could thus decongest the consultations.

This project will have a high impact in vertigo management, helping to decrease pharmacological prescription and specialist derivation and, therefore, improving patients' safety and increasing their quality of life.

Knowing the GPs that perform the maneuver will remark the importance of changing the clinical practice and will help doctors to be more conscious of the real necessity of pharmacological treatment.

15. BIBLIOGRAPHY

1. Post RE, Dickerson LM. Dizziness: A diagnostic approach. *Am Fam Physician*. 2010;82(4):361–8.
2. Dommaraju S, Perera E. An approach to vertigo in general practice. *Aust Fam Physician*. 2016;45(4):190–4.
3. Ballve Moreno JL, Carrillo Muñoz R, Villar Balboa I, Rando Matos Y, Arias Agudelo OL, Vasudeva A, et al. Effectiveness of the Epley's maneuver performed in primary care to treat posterior canal benign paroxysmal positional vertigo: Study protocol for a randomized controlled trial. *Trials*. 2014;15(1):1–10.
4. Dorado Amor JC, Castiñeira Pérez C, Costa Ribas C. Vértigo posicional paroxístico benigno [Internet]. Elsevier; 2017. Available from: <https://www.fisterra.com/guias-clinicas/vertigo-posicional-paroxistico-benigno/>
5. Odry Helminski J, Samuel Zee D, Janssen I, Carl Hain T. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review (Provisional abstract). *Phys Ther* [Internet]. 2010;90(5):663–78. Available from: <http://onlinelibrary.wiley.com/o/cochrane/cldare/articles/DARE-12010004341/frame.html>
6. Hilton M, Pinder D. The Epley manoeuvre for benign paroxysmal positional vertigo. *Cochrane Database Syst Rev*. 2014;(12):1–38.
7. Kim J-S, Zee DS. Benign Paroxysmal Positional Vertigo. *N Engl J Med* [Internet]. 2014 [cited 2017 Dec 20];370(12):1138–47. Available from: <http://www.nejm.org/doi/10.1056/NEJMcp1309481>
8. Marom T, Oron Y, Watad W, Levy D, Roth Y. Revisiting benign paroxysmal positional vertigo pathophysiology. *Am J Otolaryngol* [Internet]. 2009 [cited 2017 Dec 3];30(4):250–5. Available from: <http://dx.doi.org/10.1016/j.amjoto.2008.06.009>
9. von Brevern M, Radtke A, Lezius F, Feldmann M, Ziese T, Lempert T, et al. Epidemiology of benign paroxysmal positional vertigo: a population based study [Internet]. Vol. 78, *Journal of Neurology, Neurosurgery & Psychiatry*. 2006 [cited 2017 Dec 15]. p. 710–5. Available from: <http://jnnp.bmj.com/cgi/doi/10.1136/jnnp.2006.100420>
10. Bhattacharyya N, Gubbels SP, Schwartz SR, Edlow JA, El-Kashlan H, Fife T, et al. Clinical Practice Guideline: Benign Paroxysmal Positional Vertigo (Update). *Otolaryngol Neck Surg* [Internet]. 2017 [cited 2017 Dec 17];156(3_suppl):S1–47. Available from: <http://journals.sagepub.com/doi/10.1177/0194599816689667>
11. Talmud JD, Dulebohn SC. Dix Hallpike Maneuver [Internet]. *StatPearls*. 2017 [cited 2018 Jan 17]. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29083696>
12. Hilton MP, Pinder DK. The Epley (canalith repositioning) manoeuvre for benign paroxysmal positional vertigo. In: Hilton MP, editor. *Cochrane Database of Systematic Reviews* [Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2004 [cited 2018 Jan 22]. p. CD003162. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15106194>
13. Munoz JE, Miklea JT, Howard M, Springate R, Kaczorowski J. Canalith repositioning maneuver for benign paroxysmal positional vertigo: randomized controlled trial in family practice. *Can Fam Physician*. 2007;53(6):1049–53, 1048.
14. Imai T, Takeda N, Ikezono T, Shigeno K, Asai M, Watanabe Y, et al. Classification, diagnostic criteria and management of benign paroxysmal positional vertigo. *Auris Nasus Larynx* [Internet]. 2017 [cited 2017 Dec 20];44(1):1–6. Available from: <http://dx.doi.org/10.1016/j.anl.2016.03.013>
15. Sridhar S, Panda N, Raghunathan M. Efficacy of Particle Repositioning Maneuver in BPPV: A Prospective Study. *Am J Otolaryngol - Head Neck Med Surg*. 2003;24(6):355–60.
16. Ganança FF, Gazzola JM, Ganança CF, Caovilla HH, Ganança MM, Cruz OLM. Elderly falls associated with benign paroxysmal positional vertigo. *Braz J Otorhinolaryngol* [Internet]. 2010 [cited 2017 Dec 10];76(1):113–20. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1808-86942010000100019&nrm=iso
17. Villar Balboa I, Carrillo Muñoz R, Rando Matos Y. Maniobras de Dix-Hallpike y Epley en atención primaria. *FMC Form Medica Contin en Aten Primaria* [Internet]. 2016 [cited 2017 Dec 10];23(6):347–51. Available from: <http://dx.doi.org/10.1016/j.fmc.2016.01.004>
18. Abril BC, Gisbert CM, Martínez MS, Aguilar JG. Tratamiento del vértigo posicional

- benigno. FMC Form Medica Contin en Aten Primaria [Internet]. 2016 [cited 2017 Dec 15];23(8):480–5. Available from: <http://dx.doi.org/10.1016/j.fmc.2016.01.009>
19. Hunt WT, Zimmermann EF, Hilton MP. Modifications of the Epley (canalith repositioning) manoeuvre for posterior canal benign paroxysmal positional vertigo (BPPV). Cochrane Database Syst Rev [Internet]. 2012 [cited 2017 Dec 16];(4). Available from: <http://doi.wiley.com/10.1002/14651858.CD008675.pub2>
20. Dorigueto RS, Mazzetti KR, Gabilan YPL, Ganança FF. Benign paroxysmal positional vertigo recurrence and persistence. Braz J Otorhinolaryngol [Internet]. 2009 [cited 2017 Dec 20];75(4):565–72. Available from: [http://dx.doi.org/10.1016/S1808-8694\(15\)30497-3](http://dx.doi.org/10.1016/S1808-8694(15)30497-3)
21. SIDIAP. Entorn i població de referència [Internet]. SIDIAP; 2015 [cited 2018 Jan 23]. Available from: <http://www.sidiap.org/index.php/component/content/article/16-base-de-dades/33-base-de-dades>
22. Marrugat J, Vila J. Calculadora de grandària mostral GRANMO [Internet]. 2012 [cited 2018 Jan 22]. Available from: <https://www.imim.cat/ofertadeserveis/software-public/granmo/>
23. Aerny Perreten N, Domínguez-Berjón M a F, Astray Mochales J, Esteban-Vasallo MD, Blanco Ancos LM, Lópaz Pérez M a ángeles. Tasas de respuesta a tres estudios de opinión realizados mediante cuestionarios en línea en el ámbito sanitario. Gac Sanit [Internet]. 2012 [cited 2018 Jan 20];26(5):477–9. Available from: <http://dx.doi.org/10.1016/j.gaceta.2011.10.016>
24. Artino AR, La Rochelle JS, Dezee KJ, Gehlbach H. Developing questionnaires for educational research: AMEE Guide No. 87. Med Teach. 2014;36(6):463–74.
25. Carvajal A, Centeno C, Watson R, Martínez M, Sanz Rubiales Á. ¿Cómo validar un instrumento de medida de la salud? An Sist Sanit Navar. 2011;34(1):63–72.
26. Cunningham CT, Quan H, Hemmelgarn B, Noseworthy T, Beck CA, Dixon E, et al. Exploring physician specialist response rates to web-based surveys. BMC Med Res Methodol. 2015;15(1):4–11.
27. Agrawal V, Garimella PS, Roshan SJ, Ghosh AK. Questionnaire survey of physicians: Design and practical use in nephrology. Indian J Nephrol [Internet]. 2009 Apr [cited 2018 Jan 23];19(2):41–7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20368922>
28. WMA. Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects. Ferney-Voltaire: World Medical Association; 2013.
29. Gaur S, Awasthi SK, Bhadouriya SKS, Saxena R, Pathak VK, Bisht M. Efficacy of Epley's Maneuver in Treating BPPV Patients: A Prospective Observational Study. Int J Otolaryngol [Internet]. 2015 [cited 2017 Dec 14];2015:487160. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4606415/?tool=pmcentrez>
30. Pérez P, Covadonga M, Álvarez MJ, Aldama P, Álvarez JC, Fernández ML, et al. Evaluation of benign paroxysmal positional vertigo in primary health-care and first level specialist care. Acta Otorrinolaringol Esp [Internet]. 2008 [cited 2017 Dec 20];59(6):277–82. Available from: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=2008317636>

16. ANNEXES

ANNEX 1: INFORMATIVE DOCUMENT ABOUT DELPHI'S TECHNIQUE

Proyecto de investigación: Evaluación de la utilización de la maniobra de Epley en la consulta de Atención Primaria

La finalidad de la información que le proporcionamos es la de obtener su participación en el estudio titulado "Evaluación de la utilización de la maniobra de Epley en la consulta de atención Primaria"

El objetivo de este estudio es valorar la utilización de la maniobra y conocer los motivos que llevan a los profesionales a no realizarla. Para ello, se creará y validará un cuestionario ad hoc. Con este fin se realizará una técnica Delphi con 7 expertos en el tema. Debido a su amplia experiencia nos gustaría contar con su participación en dicho estudio.

Se le enviará por correo electrónico el cuestionario y una herramienta para su evaluación. Dispondrá del plazo de una semana para realizar dicha evaluación. Los resultados de la primera ronda de expertos, serán evaluados y se enviará de nuevo el cuestionario en una segunda ronda para matizar los aspectos que precisen ser explorados con mayor profundidad. Por último se reenviará el cuestionario en una tercera ronda para que de su conformidad.

Una vez finalizado el estudio, se le mantendrá al corriente tanto de los resultados del mismo, como de las publicaciones que de él se deriven.

Sus datos personales siempre serán tratados de forma confidencial, respetándose en todo momento los derechos y deberes que establece la Ley Orgánica 15/1999 de Protección de Datos de Carácter personal y el RD 994/99 de medidas de seguridad de los ficheros automatizados que contengan datos de carácter personal. Sólo las personas responsables de la elaboración del estudio tendrán acceso a los datos que se deriven de su participación en el mismo.

El carácter de su participación será voluntario, teniendo en todo momento la posibilidad de retirarse del mismo. Si le surge cualquier duda puede ponerse en contacto con el equipo de investigadores. Si llegado a este punto su decisión es la de no participar, sólo nos queda darle las gracias por el tiempo que nos ha concedido

ANNEX 2: INFORMATION DOCUMENT

Documento de información para el estudio:

1. **Objetivos y finalidades del estudio:** con este estudio se pretende determinar la utilización de la maniobra de Epley en la consulta de atención primaria y las posibles causas que llevarían a su no realización
2. **Participación:** su participación en el estudio es totalmente voluntaria. El participante es libre de abandonar el estudio si así lo desea en cualquier momento, sin necesidad de justificaciones. La participación en el estudio es totalmente gratuita y no se obtendrá ninguna compensación económica por la participación
3. **Confidencialidad y protección de datos:** se adoptarán las medidas para garantizar la confidencialidad de sus datos en cumplimiento de la *Ley Orgánica 15/1999* y los datos recogidos serán gestionados de forma anónima y solo utilizados con fines de investigación
4. **Función del participante en el estudio:** el participante deberá rellenar el cuestionario, garantizando en la medida de lo posible la veracidad de los datos personales y comprometiéndose con sinceridad a responder las preguntas sobre su práctica clínica
5. **Resultados y beneficios de la investigación:** el participante será informado de los resultados de la investigación. Los beneficios médicos derivados del estudio serán adecuadamente utilizados para mejorar la atención a los pacientes con VPPB y servirán de base para futuras investigaciones en este ámbito.

ANNEX 3: INFORMED CONSENT

Consentimiento informado

Declaración del participante:

Yo, _____, al participar en el estudio asumo que:

- He leído la hoja informativa sobre el estudio que se me ha enviado
- He recibido suficiente información sobre el estudio
- He sido informado de las implicaciones y finalidades del estudio
- Entiendo que mi participación es voluntaria
- Entiendo que se respetará la confidencialidad de mis datos
- Entiendo que puedo revocar mi consentimiento de participación en el estudio, sin tener que dar justificaciones
- Libremente, doy mi conformidad para participar en el estudio facilitando información personal y laboral

Firma y DNI del participante
Fecha: ____ / ____ / ____

ANNEX 4: QUESTIONNAIRE

CUESTIONARIO

El siguiente formulario es anónimo, rogamos la mayor sinceridad posible en su respuesta.
Por favor, marque con una X la casilla correspondiente en su caso

1. Edad
 - ☐ <30
 - ☐ 30-34
 - ☐ 35-39
 - ☐ 40-44
 - ☐ 45-49
 - ☐ 50-54
 - ☐ 55 ó más
2. Género
 - ☐ Hombre
 - ☐ Mujer
3. Años de experiencia en el servicio
 - ☐ <5
 - ☐ 5-15
 - ☐ >15
4. Tipo de centro asistencial
 - ☐ Hospital
 - ☐ Centro de salud Ciudad
 - ☐ Centro de salud Rural
 - ☐ Centro de salud Semiurbano
 - ☐ Residencias o centros geriátricos
 - ☐ Otros
5. Categoría profesional
 - ☐ Médico Interno Residente
 - ☐ Médico adjunto
 - ☐ Otros

Instrucciones: Valore con una X según se considere. Sólo una opción es posible por pregunta

1. **¿Realiza usted la maniobra de Epley?**
☐ Sí
☐ No
☐ Ns/Nc
2. **¿Sabe los casos en los que está indicado realizarla?**
☐ Sí
☐ No
☐ Ns/Nc
3. **¿Dispone de tiempo suficiente en la consulta para realizar la maniobra en caso de que sea necesario?**
☐ Sí
☐ No
☐ Ns/Nc
4. **¿Considera haber recibido suficiente preparación académica para llevar a cabo la maniobra?**
☐ Sí
☐ No
☐ Ns/Nc
5. **¿Ha presenciado alguna vez cómo realizaba la maniobra otro profesional y ha podido aprenderla?**
☐ Sí
☐ No
☐ Ns/Nc
6. **¿Considera que es responsabilidad suya estar bien formado para poder llevar a cabo una maniobra de Epley?**
☐ Sí
☐ No
☐ Ns/Nc
7. **¿Cree que es responsabilidad de su centro de trabajo ofrecerle formación para poder realizar esta maniobra?**
☐ Sí
☐ No
☐ Ns/Nc
8. **¿En qué orden emplea las diferentes estrategias terapéuticas para el manejo de un vértigo en su práctica habitual (numere en orden ascendente del 1 al 5, si alguna no la usa no la numere):**
☐ Medicación
☐ Conducta expectante
☐ Epley
☐ Ejercicios de rehabilitación vestibular domiciliarios
☐ Otros

9. ¿Conoce efectividad de la aplicación de la maniobra?

- ☐ Sí
- ☐ No
- ☐ Ns/Nc

10. Si no realiza la maniobra habitualmente, especifique, por favor la razón o razones: _____