Supplemental Documents

Table of Contents

though unique to the individual, is based in part on the specific etiology of the complaint. The continued development of a classification scheme and practice patterns for patients with dizziness will enhance the quality and precision of physical therapy intervention.

Appendix 1. Sample Dizziness Questionnaire

1. Describe the onset of your dizzy symptoms
   a. Symptoms developed ___ suddenly ___ gradually
   b. Date of onset (if known):
   c. If your first symptoms were preceded by an infection or other notable event (accident, medical condition, etc.), please describe:
   d. What other symptoms did you initially have?
2. Check the term that best describes your CURRENT dizziness

   Improvement
   ___ better now than at first
   ___ same as at first
   ___ worse now than at first

   Timing
   ___ constant symptoms (steady or fluctuating)
   ___ occasional symptoms with normal periods in between episodes
3. Which of the following descriptions best fits the dizzy sensation that you experience? (Pick only one)
   ___ feeling faint or about to pass out
   ___ sensation of spinning or motion
   ___ general unsteadiness / feeling "off balance"
   ___ other (describe):
4. If you have occasional episodes with normal periods in between
   How often? (several times / day, once a week, etc.):
   How long did the FIRST one last?
   Was the FIRST spell your worst spell?
   How long do your spells last now?
   When was your last one?
5. Describe any particular activity or movement of the head or body that provokes your dizziness:
6. What other symptoms are you having with your dizziness? Check all that apply.

   ___ nausea and / or vomiting
   ___ headache
   ___ unsteadiness
   ___ indoors ___ outdoors
   ___ on stairs ___ turning around
   ___ in the dark ___ on uneven terrain
   ___ problems with falling
   ___ increased fatigue
   ___ weakness
   ___ hot flashes or chills
   ___ hearing loss: (right / left / both ears)
   ___ fullness in the ear: (right / left / both ears)
   ___ ringing in the ear: (right / left / both ears)
   ___ ear pain: (right / left / both ears)
   ___ shortness of breath
   ___ feeling faint or actually fainting
   ___ feeling of panic or extreme anxiety
   ___ numbness or tingling
   ___ chest pains
   ___ heart palpitations
7. List your current medications:
8. List medications taken IN THE PAST for control of your dizziness (if different from #7.)
9. Do you have or have you had any of the following?

   ___ diabetes
   ___ stroke
   ___ heart attack
   ___ heart problems
   ___ hip / leg problems
   ___ kidney problems or disease
   ___ eye / vision problems
   ___ nerve injuries in the legs
   ___ ear infections
   ___ brain injury
   ___ seizures
   ___ migraine headaches
   ___ high blood pressure
   ___ thyroid disease
   ___ tumor or cancer
   ___ blood problems
   ___ whiplash or neck injury
   ___ arthritis
   ___ ear drainage
   ___ concussion
   ___ back problems
   ___ sinus problems
   ___ allergies
   ___ depression / anxiety
   ___ panic attacks
   ___ vascular disease in your legs
   ___ spinal cord injury
   ___ brain infection (meningitis, encephalitis)
10. List past surgeries:

Classifying Possible Sources of Dizziness
Tempo-Symptoms-Circumstance

<table>
<tr><td colspan="3">Seconds to minutes (episodes)</td><td colspan="3">Minutes to hours (episodes)</td><td colspan="3">Hours to days</td></tr>
<tr><td>Presyncope</td><td colspan="2">Vertigo</td><td colspan="2">Vertigo</td><td>Presyncope/ other</td><td colspan="2">Vertigo</td><td colspan="2">Disequilibrium/other</td></tr>
<tr><td rowspan="2">Could indicate:

-Orthostatic hypotension

-Transient arrhythmias

-Vasovagal-attacks

-Heart conditions, valvular disease

-Hyperventilation

-Seizures

-Psychogenic disorder (e.g. anxiety)</td><td colspan="2">Position induced?</td><td colspan="2">Migraine?</td><td rowspan="2"></td><td>Spontaneous</td><td>Movement induced</td><td colspan="2">Worse when standing/walking in dark?</td></tr>
<tr><td>Yes</td><td>No</td><td>Yes</td><td colspan="2">No</td><td>Could indicate:

-Medication side effects

-Anemia

psychogenic dizziness (e.g. panic attack)</td><td>Exacerbated by head movements?

YES, could indicate:
-Vestibular Neuritis
-Labyrinthitis
-Meniere’s disease
Perilymphatic fistula
-cervical vertigo

NO, could indicate:
-Mal de debarquement
-Psychogenic dizziness</td><td>Could indicate:

-Motion sickness

-Migraine associated dizziness</td><td>Yes</td><td>No</td></tr>
<tr><td></td><td>Could indicate:

-BPPV

-Migraine associated dizziness

-Vestibular paroxysmia</td><td>Could indicate:

-Psycho-genic dizziness</td><td>Could indicate:

-Migraine associated dizziness</td><td colspan="2">Hearing loss?</td><td></td><td></td><td></td><td>Could indicate:

-Bilateral vestibular loss

-Sensory loss (vision, neuropathy)

-unilateral vestibular deficit (Acoustic neuroma, neuritis, etc)</td><td>Could indicate:

-Basal ganglia disease

-Motor or Cerebellar lesion

-Other neuro diseases (e.g. MS, ALS)

-LE weakness

- psychogenic dizziness (eg. Chronic subjective dizziness)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Yes</td><td>No</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>Could indicate:

Meniere’s disease

Labyrinth-itis</td><td>Could indicate:

-Vestibul-ar neuritis

-Stroke

-TIA

-Degene-rative disease</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Megan Eyler 2013

Modified Borg Rating Scale for Dizziness

0	Nothing At All
0.5	Very Very Weak
1	Very Weak
2	Weak
3	Moderate
4	Somewhat Strong
5	
6	
7	Very Strong
8	
9	
10	Maximal

MOTION SENSITIVITY SCORE

Positional Testing

Position Change	Symptoms Intensity	Symptom Duration	Score (I+D)	Nystagmus
Baseline Symptoms		_____	_____	
1. SittingÞSupine				
2. SupineÞLeft side				
3. ÞÞRight side				
4. SupineÞsitting				
5. Left Dix-Hallpike				
6. ÞÞSitting				
7. Right Dix-Hallpike				
8. ÞÞSitting				
9. SittingÞNose to left knee				
10. ÞÞSitting erect				
11. SittingÞNose to right knee				
12. ÞÞSitting erect				
13. SittingÞNeck rotation				
14. SittingÞNectkflexion & extension				
15. 180 degree turn to the right				
16. 180 degree turn to left				
		Total		
		MSQ		

a. symptom intensity: subjective (patient report) scale from 0 to 5
(0 = no symptoms, 5 = severe symptoms)
b. symptom duration: scale from 0-3
(5-10 sec = 1 point; 11-30 sec = 2 points; >30 sec = 3 points)
c. total score = intensity + duration for each position change
d. MSQ (motion sensitivity quotient) = **(#Positons Total Score) / 20.48**

ADAPTED FROM RICHARD A. CLENDANIEL LECTURE'98

Abbott: 0-10% = mild; 11-30% = moderate; 31-100% = severe
Improvement indicated by:

- Decreased number of provoking positions
  - Increased number of reps before symptom occurrence
  - Decreased intensity of symptoms
  - Shorter duration of symptoms

Vestibular Disorders Activities of Daily Living Scale

Name/ID_____ Rater_____ Date_____

Instructions

This scale evaluates the effects of vertigo and balance disorders on independence in routine activities of daily living. Please rate your performance on each item. If your performance varies due to intermittent dizziness or balance problems please use the greatest level of disability. For each task indicate the level which most accurately describes how you perform the task. If you never do a particular task, please check the box in column NA. The rating scales are explained on bottom of page.

Independence Rating

Task	1 *Independent*	2 *Uncomfortable, No Change in Ability*	3 *Decreased Ability, No Change in Manner of Performance*	4 *Slower, Cautious, More Careful*	5 *Prefer Using an Object for Help*	6 *Must Use an Object for Help*	7 *Must Use Special Equipment*	8 *Need Physical Assistance*	9 *Dependent*	10 *Too Difficult, No Longer Perform*	NA
F-1 Sitting up from lying down											
F-2 Standing up from sitting on the bed or chair											
F-3 Dressing the upper body (eg, shirt, brassiere, undershirt)											
F-4 Dressing the lower body (eg, pants, skirt, underpants)											
F-5 Putting on socks or stockings											
F-6 Putting on shoes											
F-7 Moving in or out of the bathtub or shower											
F-8 Bathing yourself in the bathtub or shower											
F-9 Reaching overhead (eg, to a cupboard or shelf)											
F-10 Reaching down (eg, to the floor or a shelf)											
F-11 Meal preparation											
F-12 Intimate activity (eg, foreplay, sexual activity)											
A-13 Walking on level surfaces											
A-14 Walking on uneven surfaces											
A-15 Going up steps											
A-16 Going down steps											
A-17 Walking in narrow spaces (eg, corridor, grocery store aisle)											
A-18 Walking in open spaces											
A-19 Walking in crowds											
A-20 Using an elevator											
A-21 Using an escalator											
I-22 Driving a car											
I-23 Carrying things while walking (eg, package, garbage bag)											
I-24 Light household chores (eg, dusting, putting items away)											
I-25 Heavy household chores (eg, vacuuming, moving furniture)											
I-26 Active recreation (eg, sports, gardening)											
I-27 Occupational role (eg, job, child care, homemaking, student)											
I-28 Traveling around the community (car, bus)											

Explanation of Independence Rating Scale

This scale will help us to determine how inner ear problems affect your ability to perform each task. Please indicate your current performance on each task, as compared to your performance before developing an inner ear problem, by checking one of the columns in the center of the page. Pick the answer that most accurately describes how you perform the task.

1. I am **not disabled,** perceive no change in performance from before developing an inner ear impairment.
2. I am **uncomfortable** performing the activity but **perceive no difference** in the quality of my performance.
3. I **perceive a decrement** in the quality of my performance, **but have not changed** the manner of my performance.
4. I **have changed** the manner of my performance, eg, I do things more slowly or carefully than before, or I do things without bending.
5. I **prefer using an ordinary object** in the environment for assistance (eg, stair railing) but I am not dependent on the object or device to do the activity.
6. I **must use** an ordinary object in the environment for assistance, but I have not acquired a device specifically designed for the particular activity.
7. I must use **adaptive equipment** designed for the particular activity (eg, grab bars, cane, reachers, bus with lift, wedge pillow).
8. I require another person for **physical assistance** or, for an activity involving 2 people, I need unusual physical assistance.
9. I am **dependent** on another person to perform the activity.
10. I **no longer perform** the activity due to vertigo or a balance problem.

NA. I **do not usually perform this task** or **I prefer not to answer** this question.

EVIDENCE TABLE

PICO: In patients with vertigo due to peripheral vestibular impairments, does the addition of vestibular-specific exercises to standard medical care result in reduced symptoms of imbalance and increased functional mobility?

Vestibular Rehabilitation (VR) or Vestibular ; Gaze stabilization exercises (GSE); Base of support (BOS), Eyes closed (EC), Eyes open (EO); Dynamic Gait Index (DGI), Disability Handicap Index (DHI); Vertigo Symptom Scale (VSS); Vertigo Handicap Questionnaire (VHQ); Vestibular Disorders Activities of Daily Living (VDADL); Computerized digital posturography (CDP); sensory organization tests (SOTs)

Authors (Year)	Title	Purpose & Design	Participants	Intervention	Outcomes: Frequency and Results	Author Conclusions	Clinical Relevance & Relevance to PICO
Horning E, Gorman S. (2007)	Vestibular rehabilitation decreases fall risk and improves gaze stability for an older individual with unilateral vestibular hypofunction.	The purpose was to describe the development of an individualized plan with accompanying HEP for individual with unilateral vestibular hypofunction. Case Study	80yo. male with confirmed unilateral vestibular loss, decreased balance and gaze stability and increased fall risk.	1st session: instruction of GSE and exercise of standing with wide BOS and EC with dynamic head turns for 30 seconds in each direction. Each to be part of HEP to completed 3x a day. 2nd session: correction of GSEs and HEP progressed to include narrow base of support with arms cross over chest for all 3 conditions described above. 3rd/4th session: sharpened Romberg position w/ EO. Progression of GSE to include busy background and to stand with narrow BOS during this exercise.	Measured at baseline and 4 other times during 5 wk period. By end of treatment patient met all PT goals: - DGI increased to 20/24 (from 11/24 @ baseline) - Dynamic visual acuity with 1 line discrepancy (from 4-line discrepancy @ baseline) - DHI score decreased to 12 (from 30) - Improved to Negative Romberg in EO and EC positions (from positive sharpened/tandem Romberg with EO @ baseline)	Concluded that the model of VR via HEP with periodic in clinic VR sessions to assess, correct and progress HEP is effective in decreasing fall risk and increasing gaze stability in patient with vestibular hypofunction.	A HEP including GSE and balance tasks can compliment VR provided in the clinic as effective means to reduce falls risk and imbalance associated with vestibular hypofunction -This case study performed on high functioning patients and this concept may not generalize to patients with higher levels of vestibular dysfunction.
Corna S, Nardone A, Prestinari A, Galante M, Grasso M, Schieppati M. (2003)	Comparison of Cawthorne-Cooksey exercises and sinusoidal support surface translations to improve balance in patients with unilateral vestibular deficit.	To compare VR using Cawthrone-Cooksey exercises to VR using moving platform that provides continuous perturbations. quasi-experimental	N=32 (16 women); age 58.9±12.9 yrs) - Inclusion: imbalance due to unilateral vestibular deficit, no prior VR, or pharmacologic treatment in past 3 mo. - Exclusion: central or peripheral neurologic disease and BPPV	2 VR sessions/day for 30 minutes for 5 days a week in inpatient setting. Group A: Cawthrone-Cooksey exercises completed 5x with EO then EC. Complexity inc as pt able. Group B, instrumental training: standing EO and EC platform moving in A-P or M-L directions.	Measured at baseline, throughout treatment, 11 subjects tested 1 mo prior (to control for spontaneous recovery w/o VR) and 9 tested 1 mo following d/c (to test persistence of effect). - Reduced body sway and decreased subjective reports of imbalance improvement significantly improved in both groups -Significantly greater improvement in head and hip displacement noted with VR with platform compared to C-C VR. -DHI and POMA (Tinetti) scores improved significantly in both groups -No significant difference in balance outcomes for patients tested 1month prior to study.	- The authors concluded that both types of VR are effective - by improving patient gait and balance significantly. - Instrumental VR may be more effective for improving stability during quiet stance due to improved head and hip control. - Balance improvement was not due to natural history of disease.	- Use of VR with moving platform may improve balance and functional mobility to greater extent than C-C exercises but these instruments are not available in all VR facilities. - Balance did not improve over 1 month prior to initiation VR, further study warranted to confirm that VR is more effective than standard medical treatment or no VR treatment.

Prepared by Megan Eyler, November 2012.

Authors (Year)	Title	Purpose & Design	Participants	Intervention	Outcomes: Frequency and Results	Author Conclusions	Clinical Relevance & Relevance to PICO
Black FO, Angel CR, Pesznecker SC, Gianna C (2000)	Outcome analysis of individualized vestibular rehabilitation protocols.	To determine if individualized VR programs are effective in subjects with peripheral vestibular dysfunction as compared to control groups. Prospective, Cross sectional	N=124 - Group A: >18 years old, c/o of persistent imbalance and dx of peripheral vestibular disorder, abnormal CDP and SOTs. - Control groups: Group B: subjects with same characteristics as group A but did not receive VR - Group C: age and gender matched controls - Exclusion: <18 years, other medical conditions, prior VR.	Group A; individualized VR program with PT supervised sessions 1x week for 60 mins with HEP, phone contact with PTs during week. Assessed and progression through out based on subject. Group B: no VR; typical medical care Group C: age-matched controls taken from previous longitudinal study.	Measures taken for Groups A and B at baseline and every 6 wks. -Significant dec in # falls in Group A, no diff in Group B. -Significant inc in SOTs in Group A, no diff in Group B -Significantly more improvement in balance and sxs in Group A vs B. -Greatest subjective improvement in ADLs reported in Group A -Group A post SOTs and Group C SOTs were both in normal range, but Group C significantly higher than Group A.	- Subjects with wide range of vestibular dysfunction benefit from individualized VR program to reduce imbalance, functional mobility and performance of ADLs.	-VR in form of individualized protocol is more effective than standard medical care in reducing symptoms and functional performance of ADLs -Reinforcement of VR therapy through HEP and phone calls may improve benefits of VR -Even with VR, patients with vestibular dysfunction may not reach as high of SOT scores as patients w/o vestibular dysfunction. -Selection bias of 21 women vs 7 men -Some patients took medication during study which can suppress compensation.
Cohen, HS, Kimball KT (2003)	Increased independence and decreased vertigo after vestibular rehabilitation.	The purpose of this study was to determine if a minimal HEP of VR habituation exercises was sufficient to decrease vertigo and improve independence and psychosocial function in patients with chronic vestibular dysfunction. Quasi-experimental	N= 71 (38 female, 15 male); mean of 51 ±13.6 y.o. -Inclusion: hx of vertigo for last 2 months, dx of chronic vestibulopathy w/o disequilibrium, neck ROM WFL, ambulatory w/o aid -Exclusion: Meniere's disease, BPPV, acute vestibular neuronitis, orthopedic limitations.	Subjects instructed to complete HEP plan of VR habituation exercises with written instructions and diagrams 5x/day. Subjects performed HEP for 4 weeks prior to post-testing. Group1: slow head movements @ 0.04 Hz seated, started with 2 reps and gradually increased repetitions and cycles. Group 2: rapid head movements @1.5Hz seated and standing. Started with 10 repetitions and increased by 5 as able. Group 3:rapid head movements as described in Group 2. Subjects received weekly telephone call to encourage compliance.	Measures taken periodically over 4 wk intervention and up to 160 days after baseline measure. - "Exponentially" significant decreased in vertigo intensity in all groups, most change occurring in first 30-45 days. -Significant decrease in vertigo frequency, most occurring in first 30-45 days. No significant difference between groups. - Significant decreased in VADL, DHI, and VSS scores from pretest to posttest. Trend for Group 1 score to dec faster than Groups 2 and 3. - No significant changes in Vertigo Handicap Questionnaire in any groups. - Significance defined as ($p<0.001$)	-Authors conclude that vestibular habituation head movement HEP is effective in reducing vertigo and increases independence of ADLs.	- A HEP can be effective in reducing frequency and intensity of vertigo and functional impairment. - HEP provides patients with benefits of flexibility and simplicity but compliance and correct performance of VR exercise may arise. No control comparisons were made against subjects who received outpatient VR. - 18 subjects excluded or dropped out decreased sample size significantly, authors did not comment on how this affected results.

Authors (Year)	Title	Purpose & Design	Participants	Intervention	Outcomes: Frequency and Results	Author Conclusions	Clinical Relevance & Relevance to PICO
Simhardi S, Panda N, Raghunath a M (2003)	Efficacy of particle repositioning maneuver in BPPV: a prospective study.	The purpose of this study was to compare short and long term efficacy of particle repositioning maneuver (PRM) (also known as Epley maneuver), to placebo. RCT, single blind, prospective	N=40 - 18-72 yo; 20 female, 14 right side involved, various etiologys of BPPV. - No inclusion/exclusion criteria provided.	- PRM group: PRM/Epley maneuver performed. Instruction to avoid positions <45 deg given to subjects for next 48 hrs and to resume normal activities after 2 days. PRM performed as needed at follow-ups after initial visit. - Control group: maneuver without vestibular significant performed.	Measures taken at baseline, 1 wk, 4 wks, and then every 3 mo for 1 year. -At 1 wk, 95% resolution of sxs in PRM group compared to 15% of controls -At 6 mo., 5% of PRM group had recurrence compared to 75% of control group -At 1 yr, 90% of PRM group reports no sxs and 10% were positive on Hallpike compared to 15% with no sxs and control group with 90% positive on Hallpike.	-Concluded that PRM is effective in short and long-term to management of BBPV. - BBPV is not likely to spontaneously resolve without PRM.	-VR is more effective than no treatment at 1 week, 6 months and 1 year. -Relatively infrequent PRM treatments can lead to significant improvements in balance and symptoms. -BPPV symptoms are not likely to resolve w/o treatment (standard medical care) and reoccurrence is high -Future research should include a larger sample size to improve power of results
Krebs DE, Gill-Body KM, Parker SW, Ramirez JV, Wernick-Robinson M (2003)	Vestibular rehabilitation: useful but not universally so.	The purpose of the study was to determine if VR improves gait stability and if improvement is retained after 1 year. RCT, prospective	.N=124; 27 returned for long-term follow up -Inclusion: unilateral vestibular hypofunction (UVH) or bilateral vestibular hypofunction (BVH), normal visual exam, amb w/o AD, no prior VR or gait training. -Exclusion: BPPV, Meniere's disease, unstable vestibulopathies	Group A: 6wks of 1x week VR, followed by 6 wks of HEP VR exercises (performed 1x day, 5+days/wk). VR included GSE and balance retaining exercises, VOR substitution exercises. Strategy individualized to patient. Group B: 6 wks of 1x weekly outpatient placebo (isometric strengthening exercise), followed by 6 wks of HEP VR exercises (per above). Both groups encouraged to continue HEP up to 1 year follow up.	Baseline, 6 wks, 12 wks, 1 year -At 6 wks, Group A had significant inc in gait velocity and stability compared to Group B ($p<0.01$) -At 12 wks, after both groups had 6wks of HEP VR, significant improvement in gait stability in Group A compared to B, but less than at 6 wks ($p = 0.05$) -At 1 year, no significant difference between Groups A and B. -61% of Group A had clear gait stability gains at 1 yr.	-VR increases gait stability patients with UVH and BVH more quickly than in patients w/o VR. But long-term, VR does not have significant impact on gait stability. -VR programs should include strategies that decrease vertical CM displacement during gait	-Individualized VR followed by generalized VR HEP is successful in most patients. -VR should be individually tailored to patient's needs because some VR treatment strategies are better depending on dx of BHV or UVH. -Heterogeneous subject population led to lower success rates because VR was more generalized. -Studies that study VR efficacy with more homogenous patient population may provide stronger support for VR -Further, 38 subjects dropped out between baseline measures and 1 year follow up leading to dec power of results

Authors (Year)	Title	Purpose & Design	Participants	Intervention	Outcomes: Frequency and Results	Author Conclusions	Clinical Relevance & Relevance to PICO
Venosa AR, Bittar RS (2007)	Vestibular rehabilitation exercises in acute vertigo	To determine if VR using VOR adaption type-exercises are effective in early stages of peripheral vestibular disorder. RCT, prospective	N = 87 (50 female) - Inclusion: >18 years, episode of vertigo in past 5 days, abnormal results on 2 vestibular tests, free of vestibular disease in past 6 mo. - Exclusion: use of medication that could interfere with vestibular system in past 7 days, CNS disorder or BPPV, or perilymatic fistula.	- Study group (SG), n=45: VOR adaption exercises including X1 and X2 in horz and vertical planes for 1 min, 3x day, for 3 wks. Subjects start exercises at slow velocity and progressed during 3 wks. -Control group (CG), n=42: placebo exercise; fixation of gaze of visual target without moving head while blinking eyes. Performed 1x day, 3x week, for 3 weeks. Both groups instructed to use dimenhydriante (up to 150mg/dl) as needed if symptomatic.	Measures taken at baseline and once during 3 time periods: 3-5 days, 7-10days, 18-21 days. -Intensity of symptoms was significantly less in SG than CG at 2nd and 3rd evaluations compared to CG. This effect decreased by 4th and final evaluations no significant difference between groups found. - Medication use dec I both groups but by 10-14 days 67% of SG and 3% of CG were not using medication, by follow up, 86% of SG and 14% of study group were not using medication. -Nystagmus and abnormal Rhomberg tests dec in SG significantly faster than CG -@ 3rd and 4th evaluations CG performed better than CG on Fukuda and PHSN test.	-Adaption VOR exercises are effective in reducing duration of symptoms and use of medication in acute vestibular disorders. -VR including adaption exercises results in faster improvement than placebo treatment.	-If patients can tolerate VR, in form of adaption VOR exercises they should be given to patients with acute vestibular dysfunction -Positive effects include reduction of symptoms, increased balance, and decreased reliance on medication. -Possible sources of investigator bias because they were not blinded to group type during initial and follow up assessments.
Yardley L, Beech S, Zander L, Evans T, Weinman J. (1998)	A randomized controlled trial of exercise therapy for dizziness and vertigo in primary care.	To determine if VR is feasible and more beneficial than standard medical care for patients reporting dizziness. RCT, prospective	N=143 Mean age 60.1+/-15.2, 115 women (81%) -No inclusion or exclusion criteria provided but stated that duration of illness ranged from under two years to over years and that a 1/3 of patients had dx of Meniere, labyrinthitis, and. BPPV.	- VR group, n=67: RN provided 30-40min VR sessions including education, 8 sets of standard head and body movements. No specifics were provided about exercises used. Subjects instructed to perform HEP 2x day. (no details of HEP provided) - Control group, n=76: No details provided, assumed that typical course of medical care provided to these controls	Measures taken at baseline, 6 wks and 6 mo. -Trend of greater improvement as measured by subjective questionnaire after VR (p=0.02) which became significant at 6 mo (p=0.002) -Significant change observed at 6 mo for Hospital Anxiety and Depression scale, Sharpened Romberg but not VHQ. -Control group did not demonstrate significant improvement in any outcome measure.	-With VR symptoms and balance improve in short term (at 6 weeks) and further improvement is seen long-term (at 6 mo.) -Improvements in balance were modest, VR does not totally eliminate all symptoms	-VR is more effective in reducing symptoms and balance compared to standard medical care. - Further studies needed to address optimal treatment regimen and if a more tailored program would be more effective. -Problem of “motivation” of subjects led to high drop out rate, methods to reduce this effect are needed.

Cawthorne Cooksey Exercises

In bed or sitting
- Eye movements -- at first slow, then quick
  - up and down
  - from side to side
  - focusing on finger moving from 3 feet to 1 foot away from face
- Head movements at first slow, then quick, later with eyes closed
  - bending forward and backward
  - turning from side to side.

Sitting
- Eye movements and head movements as above
- Shoulder shrugging and circling
- Bending forward and picking up objects from the ground

Standing
- Eye, head and shoulder movements as before
- Changing from sitting to standing position with eyes open and shut
- Throwing a small ball from hand to hand (above eye level)
- Throwing a ball from hand to hand under knee
- Changing from sitting to standing and turning around in between

Moving about (in class)
- Circle around center person who will throw a large ball and to whom it will be returned
- Walk across room with eyes open and then closed
- Walk up and down slope with eyes open and then closed
- Walk up and down steps with eyes open and then closed
- Any game involving stooping and stretching and aiming such as bowling and basketball

Diligence and perseverance are required but the earlier and more regularly the exercise regimen is carried out, the faster and more complete will be the return to normal activity. Ideally these activities should be done with a supervised group. Individual patients should be accompanied by a friend or relative who also learns the exercises.

Tim Hain: http://www.dizziness-and-balance.com/treatment/rehab/cawthorne.html
(Adapted from Dix and Hood, 1984 and Herdman, 1994; 2000)