

Adult dizziness and fall risk screening protocol for patients being investigated/evaluated for Cochlear implant candidacy.

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Please note this protocol is a guide for screening adult patients (18years and older) who may present with dizziness and/ or are risk for falling. Patients that are present with dizziness and / at risk of falling and are being investigated for cochlear implantation need to ensure their balanced is assessed prior to implantation and have been referred for prehabilitation with a trained vestibular specialist. Adults that indicate not concerns but have been improved for bilateral implantation should have a basic bedside assessment and SAS completed prior to implantation. The protocol will continue to be trialed and refined. Limited input has been provided from other programmes based on their experience. The purpose of this screening guideline is to improve on the early identification of vestibular disorders and decrease fall risk within our cochlear implant candidates. Early identification of vestibular involvement prior to surgery may contribute to the selection of ear for implantation (West et al., 2021).

1. Case History

- a. Each Cochlear Implant programme has their own format of obtaining case history. It is recommended that the following three pre-screening questions be used. If the patient is 60 years and younger and indicates “no” to all three questions listed below, they will not need to continue to the primary screen (See appendix A)
 - i. Have you ever experienced dizziness / unsteadiness / imbalance?

- ii. Have you had a fall (slips / trips / near misses) in the last 12 months? If yes, how many?
 - iii. Have you ever experienced a spinning or dizzy sensation?
- b. Primary Screen questionnaire for fall risk and vestibular assessment: Adapted questionnaire (Colin, et al., 2018) (See appendix A)
- c. Two parts to the primary screen (both need to be completed if the patient indicated yes to any of the initial pre-screening questions)

Part 1: Dizziness

Part 2: Fall risk

- i. Dizziness: if concern for any of the 6 questions for vestibular symptoms / imbalance or poor rating of own balance they will need to proceed to the secondary screening for dizziness.
- ii. Fall risk: if concerns raised indicating high level of fall risk (2 or more falls in past 12 months; rating of 6 or more on Likert Scale; average walking/gait speed with values of 0.6 – 1.0m/s (suggested risk of fall)(See appendix B) and 4 or more medications listed from (fall risk medication list) (see appendix C), to proceed to the secondary screening for fall risk.

2. Secondary screen

- a. Dizziness: Patient to complete two screening questionnaires: The dizziness handicap inventory (See appendix D) and Dizziness Symptom Profile (See appendix E).
 - i. Dizziness handicap inventory: Total score of 36 points or more, patient to be referred for further testing (Moderate to Severe Handicap).
 - ii. The dizziness symptom profile: The DSP is a useful self-report questionnaire tool, designed to generate one or more differential diagnoses. Depending on

the differential diagnosis rated on the excel spreadsheet scoring tool this will need to be attached to your referral for further investigation.

- iii. Further investigation that involves full bedside examination and potentially objective testing can be either be to a vestibular audiologist or ENT specialist.
- b. Fall risk: Patient to complete the FES-I (Total score of 20 points or more, patient to be referred for further testing) (Appendix F) and a review of the persistent use of vestibular sedatives and/or medications which will increase risk of falls (4 or more from list of concerned medications).
- i. Further testing will either be to a vestibular audiologist or physiotherapist who is trained and know how to administer the Mini-Best and to appropriately manage fall risk.
 - ii. A referral to a physician to review general health and to review current medications that has previously been prescribed.

*Please see dizziness and fall risk flow chart (Appendix G) for further guidelines.

Appendix B

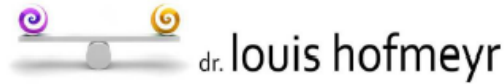
NORMATIVE DATA

Age (Men and Women)	Average Walking Speed (m/s)
20-29	1.36-1.34 m/s
30-39	1.43-1.34 m/s
40-49	1.43-1.39 m/s
50-59	1.43-1.31 m/s
60-69	1.34-1.24 m/s
70-79	1.26-1.13 m/s
80-990	0.97-0.94 m/s

Gait speeds	
> 1 m/s	<ul style="list-style-type: none"> ↔ 1.1 m/s predictive of completing yard work ↔ 1.3 m/s climb flights of stairs¹⁶
< 1 m/s	<ul style="list-style-type: none"> • benefit from fall prevention²⁴ • > 0.67 m/s to complete self care • > 0.89 m/s for household activities
< 0.60 m/s	<ul style="list-style-type: none"> • predicts future risk of falls and hospitalization • tend to require assistance with ADL and IADL¹⁸ • ≥ 0.49 m/s to cross street²³
< 0.40 m/s	<ul style="list-style-type: none"> • longer length of stay in acute care • likely to discharge to skilled nursing, inpatient rehab, or nursing home setting or with home health services^{27,28}

Values of 0.6 - 1.0m/s suggested risk of fall
 Gait speed = distance / time

Appendix C: Medication



13 October 2022

List of medication

General

The list may not be comprehensive, and if it is unknown whether a specific drug may pose a risk, the treating medical doctor should be consulted. The list excludes allergic reactions to medicine as well as non-scheduled medication. Some of the medications may not require a prescription. It excludes alcohol, supplements, illicit drugs and health products.

1. **Vestibulotoxic medication - High risk**
 - a. Aminoglycosides (Gentamicin, Tobramycin, Dibekacin, Streptidine)
 - b. Chemotherapeutic drugs
 - i. Platinum-based such as cisplatin, carboplatin and oxaliplatin
 - ii. Vincristine
 - iii. Nitrogen mustard
2. **Vestibulotoxic medication - Low risk, temporary or uncertain**
 - a. Ototoxic aminoglycosides (Kanamycin, Neomycin and Amikacin)
 - b. Loop diuretics (Bumetanide, Furosemide and Etacrynic acid)
 - c. Aspirin
 - d. Non-steroidal anti-inflammatories (NSAIDs)
 - e. Anti-malarials such as Quinine and Quinine based derivates
 - f. Antibiotics ending on "-mycin" or "-micin"
 - g. Blood thinners
3. **Medication that may lead to falls**
 - a. Anti-hypertensives
 - b. Anti-epileptics
 - c. Sedatives
 - d. Benzodiazepines
 - e. Anti-histamines
 - f. Anxiolytics
 - g. Anti-psychotics
4. **Exposure to vestibulotoxic chemicals and solvents**
 - a. Toluene
 - b. Styrene
 - c. Xylene
 - d. Trichloroethylene
 - e. Ethyl benzene

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- f. Metals and compounds (mercury, lead and germanium dioxide)
- g. Others

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Appendix D: Dizzy Handicap Inventory (DHI)

Dizziness Handicap Inventory

INSTRUCTIONS: The purpose of this questionnaire is to identify difficulties that you may be experiencing because of your dizziness. Please answer every question. Please do not skip any questions. Place an X in the box which applies to you.

		Yes	Sometimes	No
P	1. Does looking up increase your problem?			
E	2. Because of your problem, do you feel frustrated?			
F	3. Because of your problem, do you restrict your travel for business or recreation?			
P	4. Does walking down the aisle of a supermarket increase your problem?			
F	5. Because of your problem, do you have difficulty getting into or out of bed?			
F	6. Does your problem significantly restrict your participation in social activities such as going out to dinner, going to movies, dancing, or to parties?			
F	7. Because of your problem, do you have difficulty reading?			
P	8. Does performing more ambitious activities like sports, dancing, household chores such as sweeping or putting dishes away increase your problem?			
E	9. Because of your problem, are you afraid to leave home without having someone with you?			
E	10. Because of your problem, have you been embarrassed in front of others?			
P	11. Do quick movements of your head increase your problem?			
F	12. Because of your problem, do you avoid heights?			
P	13. Does turning over in bed increase your problem?			
F	14. Because of your problem, is it difficult for you to do strenuous housework or yard work?			
E	15. Because of your problem, are you afraid people may think you are intoxicated?			
F	16. Because of your problem, is it difficult for you to go for a walk by yourself?			
P	17. Does walking down a pavement increase your problem?			
E	18. Because of your problem, is it difficult for you to concentrate?			
F	19. Because of your problem, is it difficult for you to go for a walk around your house in the dark?			
E	20. Because of your problem, are you afraid to stay home alone?			
E	21. Because of your problem, do you feel handicapped?			

E	22. Has your problem placed stress on your relationship with members of your family or friends?			
E	23. Because of your problem, are you depressed?			
F	24. Does your problem interfere with your job or household responsibilities?			
P	25. Does bending over increase your problem?			

DHI Scoring Instructions

The patient is asked to answer each question as it pertains to dizziness or unsteadiness problems, specifically considering their condition during the last month. Questions are designed to incorporate functional (F), physical (P), and emotional (E) impacts on disability.

To each item, the following scores can be assigned:
No=0 Sometimes=2 Yes=4

Scores:

Scores greater than 10 points should be referred to balance specialists for further evaluation.

16-34 Points (mild handicap)

36-52 Points (moderate handicap)

54+ Points (severe handicap)

Appendix E: Questionnaire and scoring excel tool

- Dizziness Symptom Profile Vanderbilt
- Profile - Scoring Tool

The Dizziness Symptom Profile

The following pages contain statements with which you can agree or disagree. To what extent do you personally agree or disagree with these statements in regards to your dizziness? Use the following scale: 0 = Strongly disagree, 1 = Disagree, 2 = Not sure, 3 = Agree, 4 = Strongly Agree

		Strongly Disagree		Not Sure		Strongly Agree
1	My dizziness is intense but only lasts for seconds to minutes.	0	1	2	3	4
2	I have had a single severe spell of spinning dizziness that lasted days or weeks.	0	1	2	3	4
3	I have spells where I get dizzy and also have irregular heartbeats (palpitations).	0	1	2	3	4
4	I hear my voice more loudly in one ear compared to the other.	0	1	2	3	4
5	I am unsure of my footing when I walk outside.	0	1	2	3	4
6	I get dizzy when I turn over in bed.	0	1	2	3	4
7	I get dizzy when I am in open spaces and have nothing to hold onto.	0	1	2	3	4
8	I have a roaring sound in one ear only before or during a dizziness attack.	0	1	2	3	4
9	I am depressed much of the time.	0	1	2	3	4
10	I lost hearing in one ear after an attack of spinning dizziness.	0	1	2	3	4
11	I had a big dizzy spell that lasted for days where I could not walk without falling over.	0	1	2	3	4
12	I get dizzy when I sneeze.	0	1	2	3	4
13	There are times when I get dizzy and also have a headache.	0	1	2	3	4
14	I get dizzy when I strain to lift something heavy.	0	1	2	3	4
15	I get short-lasting, spinning dizziness that happens when I bend down to pick something up.	0	1	2	3	4

The Dizziness Symptom Profile

		Strongly Disagree		Not Sure		Strongly Agree
16	My hearing gets worse in one ear before or during a dizziness attack.	0	1	2	3	4
17	I had a single constant spell of spinning dizziness that lasted longer than 2-3 days.	0	1	2	3	4
18	When I get a headache I am very sensitive to sound (I try to find a quiet place to rest).	0	1	2	3	4
19	I get short-lasting, spinning dizziness that happens when I go from sitting to lying down.	0	1	2	3	4
20	I can trigger a dizzy spell by placing my head in a certain position.	0	1	2	3	4
21	I had a spell of spinning dizziness that lasted for days or weeks after I had a cold or flu.	0	1	2	3	4
22	I have a feeling of fullness or pressure in one ear before or during a dizziness attack.	0	1	2	3	4
23	I get headaches that hurt so badly that I am completely unable to do my daily activities	0	1	2	3	4
24	I have spells where I get dizzy and it is difficult for me to breathe.	0	1	2	3	4
25	I have a sensation of dizziness or imbalance daily or almost daily.	0	1	2	3	4
26	My vision changes before a headache begins.	0	1	2	3	4
27	I am unsteady on my feet all the time.	0	1	2	3	4
28	I am anxious much of the time.	0	1	2	3	4
29	When I cough I get dizzy.	0	1	2	3	4
30	When I get a headache I am very sensitive to light (I try to find a dark room to rest).	0	1	2	3	4
31	I feel dizzy all of the time.	0	1	2	3	4

Appendix F: FESI Questionnaire

Falls Efficacy Scale-International (English)

I would like to ask some questions about how concerned you are about the possibility of falling. For each of the following activities, please circle the opinion closest to your own to show how concerned you are that you might fall if you did this activity. Please reply thinking about how you usually do the activity. If you currently don't do the activity (example: if someone does your shopping for you), please answer to show whether you think you would be concerned about falling IF you did the activity.

		Not at all concerned 1	Somewhat concerned 2	Fairly concerned 3	Very concerned 4
1	Cleaning the house (e.g. sweep, vacuum, dust)				
2	Getting dressed or undressed				
3	Preparing simple meals				
4	Taking a bath or shower				
5	Going to the shop				
6	Getting in or out of a chair				
7	Going up or down stairs				
8	Walking around in the neighborhood				
9	Reaching for something above your head or on the ground				
10	Going to answer the telephone before it stops ringing				
11	Walking on a slippery surface (e.g. wet or icy)				
12	Visiting a friend or relative				
13	Walking in a place with crowds				
14	Walking on an uneven surface (e.g. rocky ground, poorly maintained pavement)				
15	Walking up or down a slope				
16	Going out to a social event (e.g. religious service, family gathering, or club meeting)				
Sub Total					
TOTAL					/64

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Reference: Yardley, L., Beyer, N., Hausel, K., Kempen, C., Piot-Ziegler, C., & Todd, C. (2005). Development and initial validation of the Falls Efficacy Scale-International (FES-I). *Age and Ageing*, 34(6), 614-619. doi:10.1093/ageing/af1196.

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Name & Surname	
DOB	
TBH folder	
Audiologist	
Date of completion	

Scoring

FES-I results range from 16 (no concern about falling) to 64 (severe concern about falling).

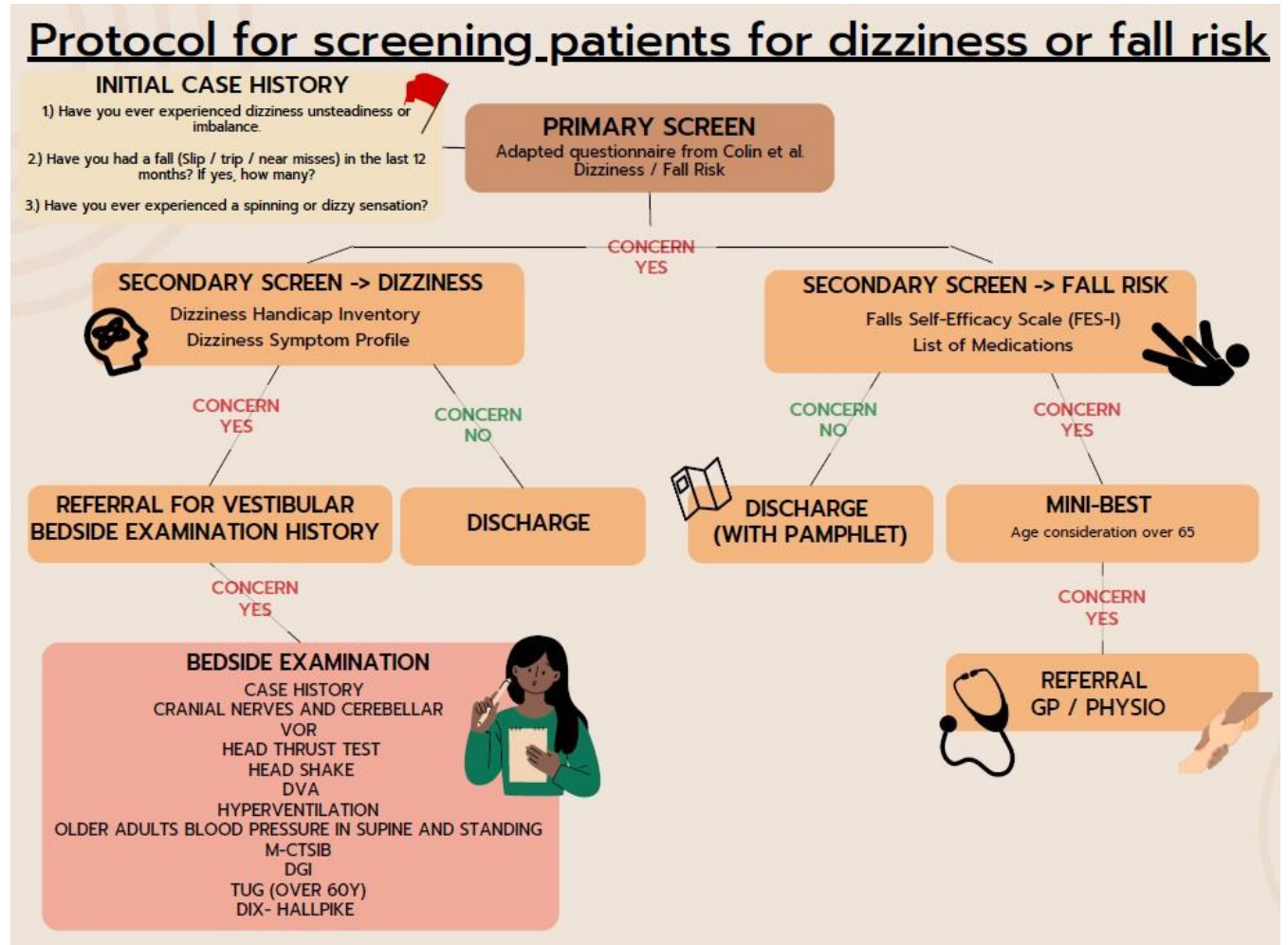
Validation by Delbaer et al proposed following cut-offs:

Low concern: 16 – 19

Moderate concern: 20 - 27

High concern: 28 - 64

Appendix G: Protocol for screening patients



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