

## Saudi Vestibular Rehabilitation Protocol And Pathway of Service

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## First: Service Overview

### 1) Service Name: Vestibular Rehabilitation

Vestibular Rehabilitation is a specialized field within medical rehabilitation - physical therapy. It is provided by a physical therapy consultant specialized in vestibular rehabilitation or by a senior physical therapist specialized in vestibular rehabilitation.

### 2) Importance of the Medical Service for the Patient

Inner ear and balance disorders can lead to disability, affecting the patient ability to lead a normal life, perform daily tasks, and in some cases, work. Scientific studies have shown that balance issues and vertigo can lead to decreased mobility and walking ability in patients, resulting in overall health decline and a reduced quality of life, impacting productivity and social participation. Loss of balance and falls can also lead to serious complications such as spinal, pelvic, head injuries, and bleeding, potentially resulting in fatalities.

### 3) Economic Importance of the Service:

Global studies indicate the high medical costs incurred by patients suffering from vertigo and balance disorders when they do not receive the correct treatment promptly.

- Multiple unnecessary radiological tests and laboratory analyses are conducted, which do not contribute to accurate diagnosis.
- Many cases experiencing dizziness or vertigo are unnecessarily hospitalized for several days.

- Patients are not directly referred to specialists for diagnosis and treatment, resulting in unnecessary costs due to unnecessary tests and hospitalizations.
- These costly procedures and hospitalizations can be avoided by providing medical services at specialized dizziness and balance disorder clinics.

A scientific study conducted in the United States by Wang (2014) measured the financial cost of diagnosing cases suffering from benign paroxysmal positional vertigo (BPPV) that are not promptly referred to dizziness clinics or do not directly reach dizziness clinics, at an average cost of two thousand dollars per case for unnecessary diagnostic procedures. The annual cost of unnecessary healthcare services for these cases was estimated at two billion dollars per year.

Unnecessary diagnostic procedures, medications, hospitalizations, and procedures are undertaken due to the patient's inability to access specialized clinics that streamline the therapeutic cost provided by the state, as well as provide the correct evidence-based procedures for the patient promptly.

#### **4) Current medical practices dealing with cases suffering from inner ear and balance disorders:**

A local scientific study was conducted to assess the extent to which healthcare practitioners utilize proper clinical examinations to diagnose and treat cases of benign paroxysmal positional vertigo (BPPV) in outpatient clinics, emergency departments, or inpatient clinics. The study included 413 physicians in the following specialties: Otolaryngology, Neurology, Family Medicine, and Primary Care Physicians.

The study focused on diagnostic trends and treatment options for benign paroxysmal positional vertigo (BPPV) among healthcare practitioners in Saudi Arabia. A total of 413 physicians in the following specialties:

Otolaryngologists, Neurologists, Primary Care Physicians, and Family Physicians completed a structured questionnaire to measure the study's objectives.

- The results showed that 258 (62.5%) of the physicians do not use positional diagnostic procedures such as Dixhalpike and Roll tests, and 200 (48%) of the physicians instead rely on radiological imaging tests and other examinations.
- 243 (59%) of the physicians do not utilize canalith repositioning maneuvers with patients with BPPV.
- 362 (87%) physicians use pharmaceutical choices such as Betahistine instead of clinical therapeutic procedures.
- The reasons for not using clinical diagnostic and therapeutic procedures included: the time required to perform those clinical examinations, fear of exacerbating symptoms, and limited experience.

Furthermore, a recent study conducted in Saudi Arabia published in 2022 reported that rehabilitation services for inner ear disorders in physical therapy clinics are underutilized due to the insufficient referrals from physicians.

**From the above, it is evident that establishing a clear healthcare pathway for inner ear and balance disorders rehabilitation services is crucial. This will facilitate quick and direct access to treatment for patients suffering from inner ear disorders such as dizziness, vertigo, and balance issues, contributing to improving the quality of life for the patient. The healthcare pathway and protocol for the service provide a clear roadmap for both government and private hospitals to deliver this service effectively. Moreover, adopting and implementing this pathway for the service can lead to significant cost savings, ranging from 60% to 87%, on unnecessary diagnostic and therapeutic medical services provided for these conditions.**

## Second: Medical Service Pathway

### 1) Clinic Name:

- Vestibular Disorders Clinic
- Vestibular Rehabilitation Clinic
- Dizziness and Balance disorders Clinic

### 2) Clinic Locations:

The clinic offers its services at these locations:

- **First:** Consultant clinic within specialized outpatient clinics whether in government or private hospitals, general or specialized medical complexes, or specialized medical centers.
- **Second:** Consultant clinic within specialized government medical center clinics such as cochlear implant centers or medical rehabilitation centers.

### 3) Clinic Operation:

- Consultant physiotherapist specialized in inner ear and balance disorders rehabilitation.
- Senior physiotherapist specialized in inner ear and balance disorders rehabilitation.
- A physical therapist who has received training in a dizziness and balance disorders clinic under the supervision of a consultant or senior specialist physical therapist specialized in inner ear disorder rehabilitation for one year, and is required to obtain a recommendation after completing the training period and receiving the specialty certification in the specialization exam.

#### 4) Clinic Description:

The medical tools and equipment in the clinic: (Table1)

| Medical Equipment's                                     | Space and tools                                                                                         |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| - Video Head Impulse Machine                            | - A consultation clinic with an area of not less than 12 square meters.                                 |
| - Infrared red goggles or Video-Nystagmo-Graphy Machine | - A therapy clinic with an area of not less than 12 square meters. Its colors are soothing to the eyes. |
| - Balance Foam Pad                                      | - High-Low electric adjustable bed that and is adjustable from the (Head) upper part.                   |
|                                                         | - An office desk with a chair and two waiting chairs for companions.                                    |
|                                                         | - washbasin                                                                                             |

#### 5) Symptoms experienced by patients with inner ear disorders may include:

- Vertigo: Illusion of movement and spinning
- Lightheadedness /dizziness
- Disequilibrium /Imbalance
- Oscillopsia

These symptoms occur as a result of an injury to the balance system in the inner ear, according to the following classification: **(Table2)**

| 1- Reduced Vestibular Function                                                                                                                                                             | 2- Fluctuating Vestibular Function               | 3- Distorted Vestibular Function                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| Unilateral or Bilateral<br>Partial or complete<br>Acute or Chronic                                                                                                                         | Episodic diseases<br>Central Vestibular diseases | Positional Vertigo Diseases                        |
| Labyrinthitis or neuritis<br><br>Multiple Sclerosis attacks on 8 <sup>th</sup><br>CN<br><br>Anxiety Related Dizziness<br><br>Chronic Inner Ear Episodic<br>Diseases<br><br>Aging dizziness | Meniers' Disease<br>Vestibular Migraine Attacks  | Posterior BPPV<br>Horizontal BPPV<br>Anterior BPPV |

\*\*\*\*\*

**6) Patient Access to the Clinic:** (Figure 1)

1. Any patient experiencing balance disorders, dizziness, or vertigo can visit the clinic directly for necessary examinations, diagnosis, evaluation, and treatment. (Direct Access Clinic)
2. This can be done at a consultation clinic within specialized outpatient clinics: whether in government or private hospitals, general or specialized medical complexes, or specialized medical centers.
3. The clinic also receives referrals from neurology clinics, otolaryngology clinics, primary care clinics, or cases that go to the emergency department.

**7) Beneficiary Patients:**

1. Patients suffering from balance disorders or chronic dizziness due to inner ear diseases or inner ear nerves.
2. Patients suffering from acute inflammations in the inner ear or inner ear nerves.
3. Patients experiencing the following problems: vertigo, dizziness, balance disorders for undiagnosed cases.

**8) Service Delivery Method:**

1. Patient medical history is recorded
2. Patients undergo detailed examinations for inner ear balance disorders, including clinical examinations and specific medical tests based on the patient's condition to reach a diagnosis (Vestibular Examination).

3. After diagnosing cases with inner ear disorders, patients undergo an assessment of the condition and problems they are experiencing as a result, and their impact on the patient's quality of life (Vestibular Assessment).
4. Patients are given a treatment plan that includes a vestibular rehabilitation therapy program consisting of specific therapy sessions based on the medical assessment of the condition (Vestibular Rehabilitation Therapy Program).

#### **9) Therapeutic Approach at the Vestibular Disorders Clinic**

The latest medical advancements are utilized to examine the patient and provide therapeutic programs for rehabilitating inner ear and balance disorders based on evidence-based medicine. The medical service contributes to rehabilitating and treating the medical condition in the shortest possible time so that the patient can achieve a high-quality life. Rehabilitation programs for inner ear disorders heavily rely on therapeutic exercises, where specific exercises are customized for each patient based on their condition.

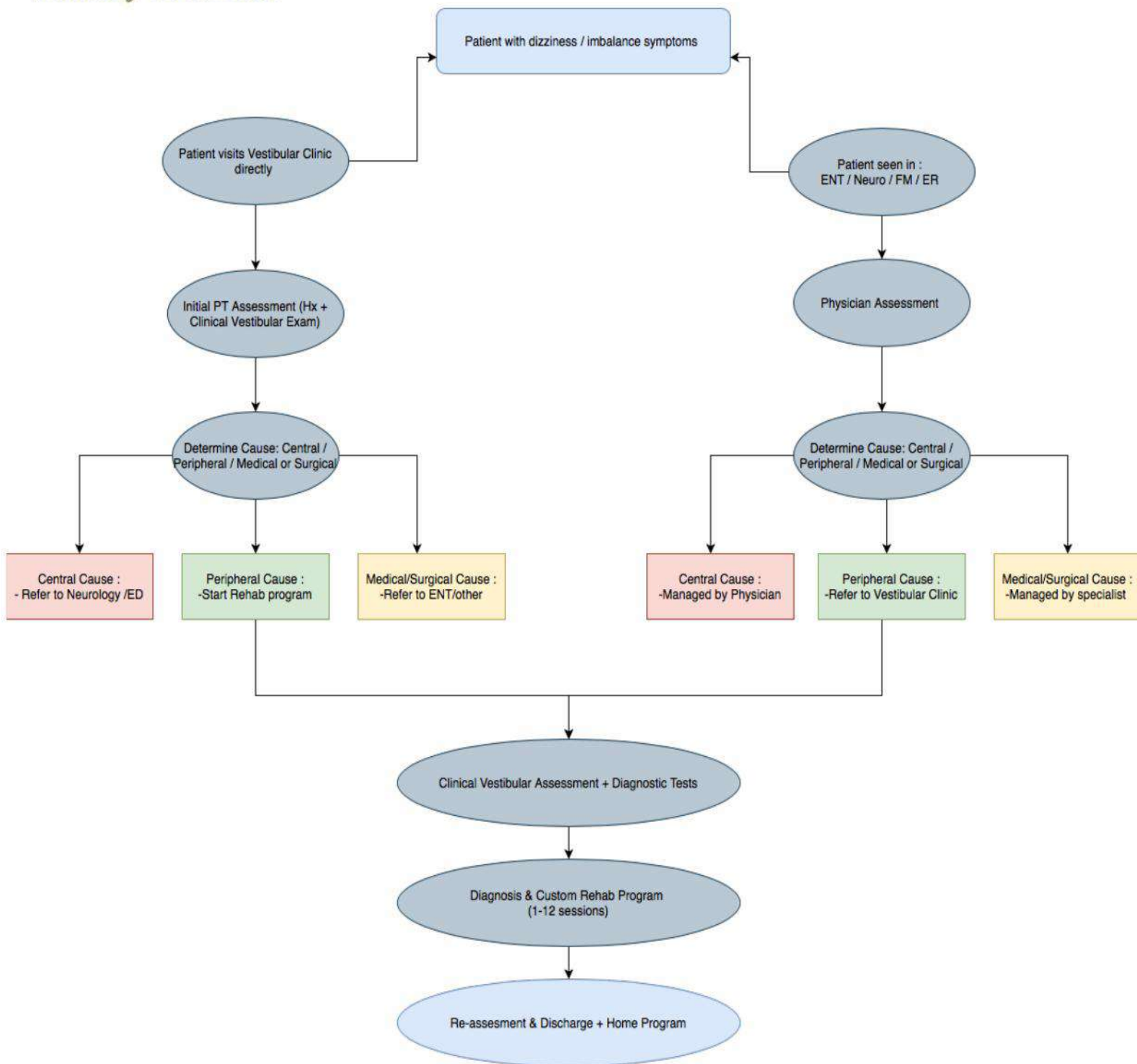


Figure 1 ; Patient Pathway To Vestibular Clinics

### Third: Vestibular Rehabilitation Clinic Services

First: Dizziness and balance disorders examination services (Table3)

|     | Procedure name                                                                                                                                                                    | Procedure time /<br>Therapy duration | Procedure Type                                           |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------|
| 1   | Medical Consultation                                                                                                                                                              | 20 minutes                           | Screening Procedure                                      |
| 2   | Clinical Vestibular Assessment: Oculomotor/ Positional Vertigo/ Vestibular Ocular Reflex /Static Balance /Functional Gait Assessment: (Bedside clinical Examinations, 35 minutes) |                                      |                                                          |
| 2.1 | Oculomotor Examinations                                                                                                                                                           | Normal / Abnormal                    | Abnormal: To do VHIT and VNG                             |
| 2.2 | Bow Lean/DixHalpike Test/Supine Roll Test                                                                                                                                         | Normal / Abnormal                    | Abnormal: To do VNG Positional                           |
| 2.3 | Vestibular Ocular Reflex (VOR)                                                                                                                                                    | Normal / Abnormal                    | Abnormal: To do VHIT and Computerized Visual Acuity Test |
| 2.4 | mCTSIB                                                                                                                                                                            | Normal / Abnormal                    | Abnormal: To do Computerized Posturography               |
| 2.5 | Dynamic Visual Acuity Test                                                                                                                                                        | Normal / Abnormal                    | Abnormal: To do Computerized Visual Acuity Test          |
| 2.6 | Functional Gait Assessment                                                                                                                                                        | Normal / Abnormal                    | Abnormal: To do VHIT and VNG                             |

|   |                                                                                                                                  |            |                                                                                            |
|---|----------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|
| 3 | Video-Head-Impulse Test                                                                                                          | 30 minutes | Diagnostic Procedure for Vestibular Hypo-<br>function                                      |
| 4 | Video-Nystagmo-Graphy:<br>Central and Peripheral Vestibular<br>System Testing: Oculomotor Testing,<br>Positional Vertigo Testing | 45 minutes | Diagnostic/ Therapeutic Procedure<br>Differentiate central from peripheral / Treat<br>BPPV |
| 5 | Computerized Posturography                                                                                                       | 30 minutes | Diagnostic/prognostic Procedure<br>Vestibular test for balance                             |
| 6 | Computerized Visual Acuity Test                                                                                                  | 30 minutes | Diagnostic/Prognostic Vestibular Procedure:<br>tests for Gaze stability and asymmetry      |

Second: The therapeutic program for inner ear and balance disorders (Table4)

|   | Procedure name                          | Procedure time /<br>Therapy duration | Procedure Type        |
|---|-----------------------------------------|--------------------------------------|-----------------------|
| 1 | Positional vertigo                      |                                      |                       |
|   | Vertigo Therapy Session<br>(BPPV cases) | 1 hour session<br>1 to 6 sessions    | Therapeutic Procedure |

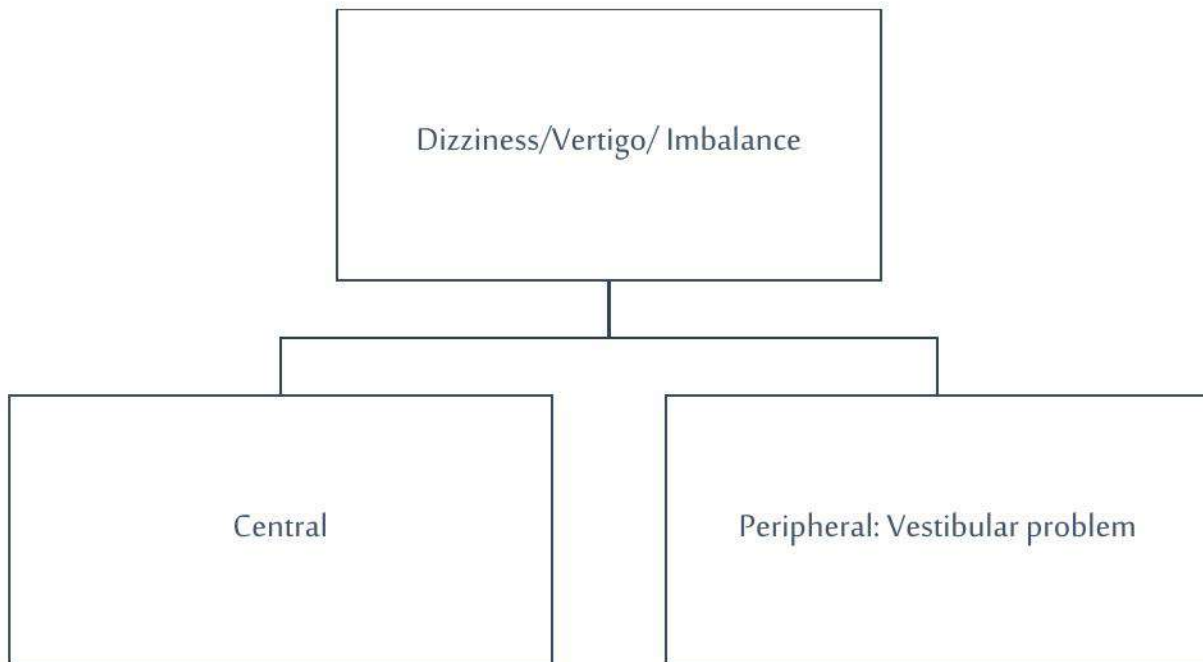
|   |                                                 |                                                      |                       |
|---|-------------------------------------------------|------------------------------------------------------|-----------------------|
| 2 | Acute Peripheral vestibular dysfunction         |                                                      |                       |
|   | Vestibular Therapy 6 weeks program              | 1 hour session<br>2 to 6 sessions<br>6 weeks Program | Therapeutic Procedure |
| 3 | Chronic Unilateral Vestibular Hypo-function     |                                                      |                       |
|   | Vestibular Therapy 6 weeks program              | 1 hour session<br>2-6 sessions<br>2-6 weeks Program  | Therapeutic Procedure |
| 4 | Chronic Bilateral Vestibular Hypo-function      |                                                      |                       |
|   | Vestibular Therapy 3 months program             | 1 hour session<br>8-12 session<br>8-12 weeks         | Therapeutic Procedure |
| 5 | Mixed Peripheral Central Vestibular Dysfunction |                                                      |                       |
|   | Vestibular Therapy 8 weeks program              | 1 hour session<br>6-8 sessions<br>6-8 weeks Program  | Therapeutic Procedure |

|   |                                          |                                                         |                       |
|---|------------------------------------------|---------------------------------------------------------|-----------------------|
| 6 | Central Vestibular Dysfunction           |                                                         |                       |
|   | Vestibular Therapy 8 weeks program       | 1 hour session<br><br>8 sessions<br><br>8 weeks Program | Therapeutic Procedure |
| 7 | Persistent Postural-Perceptual Dizziness |                                                         |                       |
|   | Vestibular Therapy 8 weeks program       | 6-10 sessions<br><br>6-10 weeks Program                 | Therapeutic Procedure |

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**Fourth: The medical protocol for dealing with new cases based on global best practices for individuals suffering from dizziness, vertigo, and balance problems:**

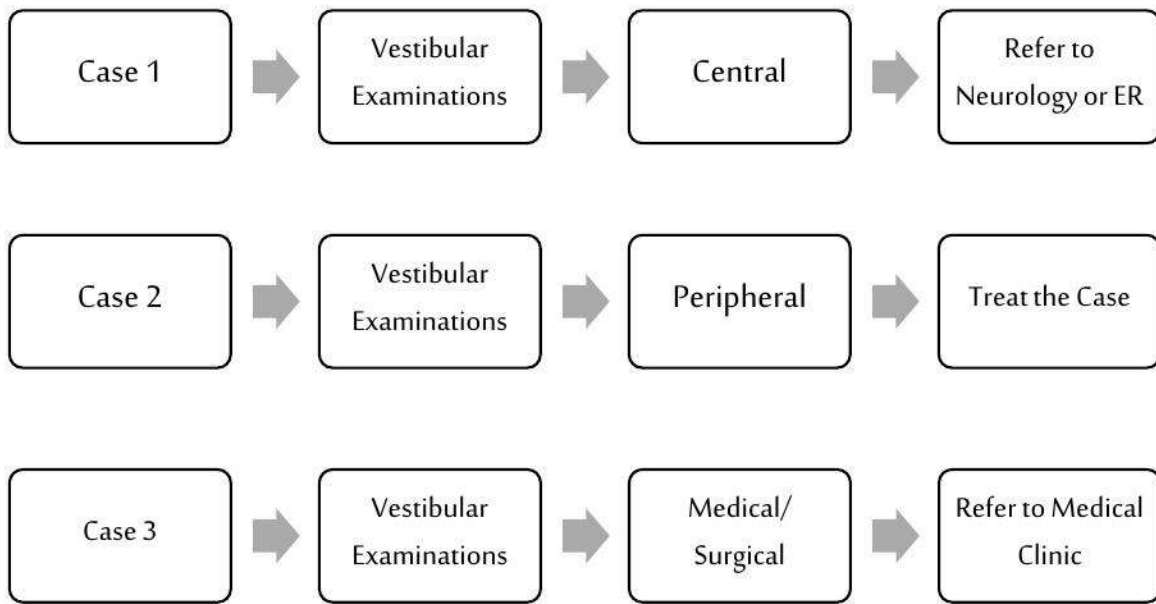
These symptoms occur as a result of an injury to the balance system in the inner ear or brain injury, according to the following classification:



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**Medical pathways for patients suffering from dizziness, vertigo, and balance disorders:**

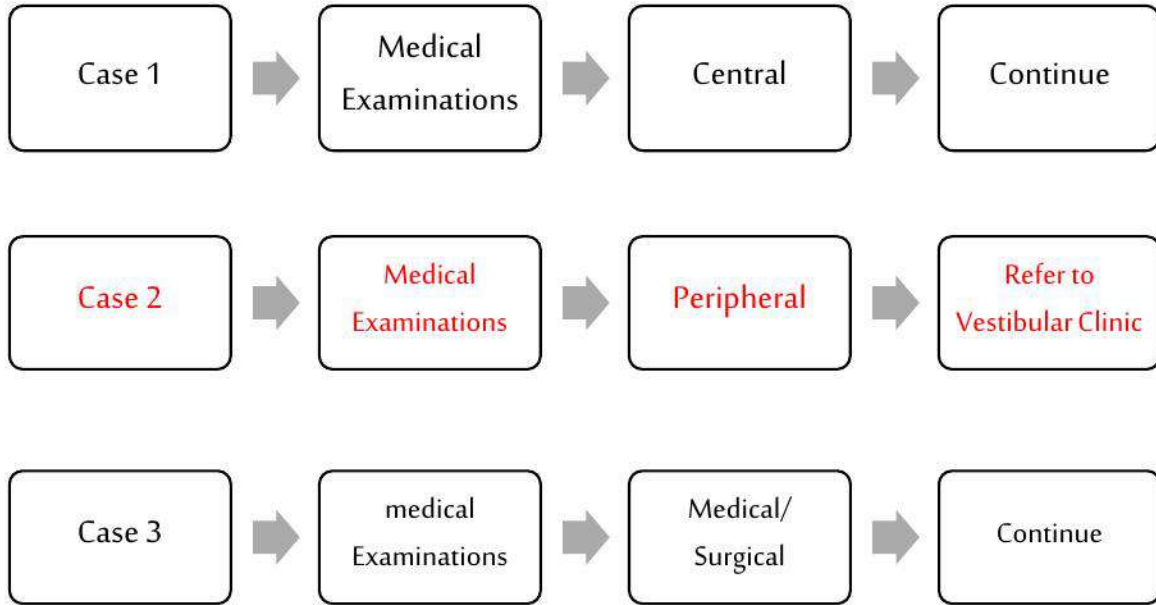
1- The first pathway: The patient suffering from balance disorders, dizziness, or vertigo directly goes to the Dizziness and Balance Disorders Clinic.



**(Table5)**

| Case   |                  | Protocol                                            |
|--------|------------------|-----------------------------------------------------|
| Case 1 | Central          | Refer the case to Neurology or Emergency department |
| Case 2 | Peripheral       | Start Vestibular Rehabilitation Service             |
| Case 3 | Medical/surgical | Refer the case to the specialized clinic            |

2- The second pathway: The patient goes to one of the specialized clinics (such as neurology clinics, ear, nose, and throat clinics, family and community medicine clinics, and emergency departments).



(Table6)

| Case   |                  | Protocol                                                     |
|--------|------------------|--------------------------------------------------------------|
| Case 1 | Central          | Start medical procedure                                      |
| Case 2 | Medical/surgical | Start medical procedure                                      |
| Case 3 | Peripheral       | Refer the case to the Dizziness and balance disorders clinic |

**Fifth: Health Licenses for a specialized balance clinic or center:**

Immediate licensing for a specialized clinic or center

Clinic and Center for the Treatment of Inner Ear Disorders, Dizziness, and Balance

First: Clinic Description:

Clinic Name: Vestibular Rehabilitation Clinic - Dizziness and Balance Disorders Clinic

- Located in outpatient clinics within a hospital or medical complex. Directly receiving cases, diagnosing, and treating all cases related to inner ear disorders, dizziness, and balance.
- It provides services for the following cases: Vestibular Disorders

Clinical Staff (in a hospital or medical complex):

- Specialized physiotherapy consultant in inner ear and balance disorders, with 1 nurse.
- A senior specialized physiotherapist in inner ear and balance disorders, with 1 nurse.
- A physical therapist who has received training in a dizziness and balance disorders clinic under the supervision of a consultant or senior specialist physical therapist specialized in inner ear disorder rehabilitation for one year, with 1 nurse.

Medical equipment and facilities in the clinic: (Table7)

| Medical Equipment's                                   | Space and tools                                                                                       |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Video Head Impulse Machine                            | A consultation clinic with an area of not less than 12 square meters.                                 |
| Infrared red goggles or Video-Nystagmo-Graphy Machine | A therapy clinic with an area of not less than 12 square meters. Its colors are soothing to the eyes. |
| Balance Foam Pad                                      | High-Low electric adjustable bed that and is adjustable from the (Head) upper part.                   |
|                                                       | An office desk with a chair and two waiting chairs for companions.                                    |
|                                                       | Washbasin                                                                                             |
|                                                       | Cabinet                                                                                               |

Second: Center Description:

Center Name: Vestibular Rehabilitation Center

- Affiliated with a hospital, medical complex, or independent: Diagnoses and treats all cases related to inner ear disorders, dizziness, and balance.
- Provides physical therapy services for the following cases: Vestibular Disorders

General Requirements:

- 1) Reception and appointment desk
- 2) Waiting room
- 3) Patient restrooms

Clinics and Therapy Rooms:

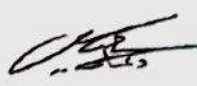
- 1) Consultation room (at least one) with a minimum area of 12 square meters (furniture and equipment included in clinic setup)
- 2) Therapy rooms (at least one) with a minimum area of 12 square meters
- 3) Necessary equipment:
  1. Video Head Impulse Machine
  2. VideoNystagmoGraphy Machine
  3. Balance Foam Pad
  4. Dynamic Visual Acuity
  5. Bucket Test
  6. Gait assessment (Functional/Dynamic Gait assessment)
  7. Portable Balance Board Machine (Optional)
  8. Balance Rehabilitation Unit (Optional)

9. Vertigo Treatment and Rehabilitation Chair (Optional)
10. Subjective Visual Vertical (Optional)
11. Computerized Visual Acuity (Optional)

**Minimum Staffing Requirements:**

- For a Dizziness and Balance Disorders Treatment Center (affiliated with a hospital, medical complex, or independent), the following is required:
- Specialized physiotherapy consultant in inner ear and balance disorders, with 1 nurse
- A senior specialized physiotherapist in inner ear and balance disorders, with 1 nurse.
- A physical therapist who has received training in a dizziness and balance disorders clinic under the supervision of a consultant or senior specialist physical therapist specialized in inner ear disorder rehabilitation for one year, with 1 nurse.

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