Management of Vertigo

Alexander Ring
Vestibular Physiotherapist

Private Rooms – 54 Farrington Road, Leeming, WA 6149

Clinical Senior Lecturer, Otolaryngology Unit, School of Surgery, UWA

Adjunct Research Fellow, School of Physiotherapy and Exercise Science, Faculty of Health Sciences, CURTIN

Email: alexander.ring@uwa.edu.au

There can be few physicians so dedicated to their art that they do not experience a slight decline in spirits on learning that their patient’s complaint is of dizziness (giddiness)

- Prof. W B Mathews

Balance is the Key to Life
What are you experiencing?

Which system is affected?

"It may be his inner ear."

Assessing Dizziness

The assessment of Dizziness

..... a diagnostic challenge.

This usually arises from the perception... ....that the complaint of dizziness indicates a single pathology.
What does the term Dizziness mean?
As a patient and clinician?

- Eg:
- Is it a diagnostic lead?
- or a wild goose chase?

What will the patient tell you?

“I feel dizzy”

Dizziness - spatial disorientation
Disequilibrium - Imbalance, off balance, walking on uneven surfaces
Oscillopsia
Physiologic dizziness
Presyncope
Psychophysologic
Occular dizziness
Multi-sensory dizziness
Central dizziness
or Vertigo
So...
What do you ask your patient?

Not to use the word Dizzy

Now....
What will your patient tell you?

“When I walk the horizon tends to bounce”

Now....
What will your patient tell you?

“I cannot turn in bed without feeling like the room is spinning”
Now....
What will your patient tell you?

“I feel scared to walk in public as I fear I might look drunk or fall”

Now....
What will your patient tell you?

“I am unable to turn my head quickly from side to side, it makes me sway”

You now know the patient has certain symptoms....

What do you do next?
**Analyse** the symptoms

**Tempo:** length of symptoms
- short lived
- constant
- fluctuate
- seconds, minutes, hours, days

---

**Analyse the symptoms**

**Circumstances:** What brings it on
- lying
- sitting up
- head turns
- bending down
- walking.....jogging

---

So with “Dizzy patients” ask them

to describe the symptom without
using the word -DIZZY
then ask about -TEMPO
and -CIRCUMSTANCE
So by now we have a specific history of the “Dizzy patients”

Next – examination

Anatomy and Physiology

[Image: Diagram of vestibular system]
Vestibular System Components
A functioning Vestibular System consists of:
- Peripheral Vestibular (sensory) Apparatus
- Central Processing Unit
- Motor Output

Vestibular Anatomy

- There are 5 sensory organs that detect acceleration and velocity of the head.
  - Semicircular Canals
    - Anterior
    - Posterior
    - Horizontal
  - Otoliths
    - Utricle
    - Saccule
Central Processing of Vestibular Input

CNVIII (VN) afferents have 2 primary CNS targets

- Vestibular Nucleus Complex (Para / Medulla)
- Cerebellum (+ indirect from VNC)

NB: VN / Cerebellum also process Somatosensory and V/visual sensory input = This all occurs simultaneously

- Efferent activity from the VNC forms basis for VOR (SVN & MVN) and VSR (LVN + MVN)

The Vestibular Ocular Reflex

a.k.a.

The window to the inner Ear
Physiology - Vestibular Ocular Reflex (VOR)

Dizziness – spatial disorientation
Disequilibrium – Imbalance, off balance, walking on uneven surfaces
Oscillopsia
Physiologic dizziness
Presyncope
Psychophysiological
Ocular dizziness
Multi-sensory dizziness
Central dizziness

Vertigo

Terminology
• Vertigo
  – distortion of static gravitational orientation
  – perception of motion of either the sufferer or the environment.
    - Thomas Brandt
• Nystagmus
  – Involuntary oscillation of the eye
  – Fast Phase (resets eye position)
  – Slow Phase (pathological component)
What is Vertigo?

an illusion of movement.

Spinning (SCC)
Rocking, tilting or sudden drop (Otoliths)

Common causes of Vertigo: Peripheral:
- BPPV (25-40%)
- Perilymphatic fistula
- Meniere’s disease
- Vestibular neuronitis (neuritis)/ labyrinthitis
- Bilateral vestibular failure
- Superior Canal Dehiscence Syndrome

Common causes of Vertigo Central:
- Tumours (vestibular schwanomas)
- Vertebro Basilar Insufficiency (VBI)
- Multiple Sclerosis (MS)
- Trauma
- Migraine
- Multisensory dizziness & disequilibrium.
### Key items in history: tempo & circumstances

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Tempo</th>
<th>Symptoms</th>
<th>Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BPPV</strong></td>
<td>Spells:</td>
<td>Unbalance, Vertigo, lightheaded, nausea</td>
<td>Positional: lying down, sitting up or turning over in bed, bending</td>
</tr>
<tr>
<td><strong>UVL (e.g., vestibular neuritis)</strong></td>
<td>Acute</td>
<td>Vertigo, disequilibrium, NV, oscillopsia</td>
<td>Spontaneous, exacerbated by head movements</td>
</tr>
<tr>
<td><strong>Orthostatic hypotension</strong></td>
<td>Spells:</td>
<td>Lightheaded</td>
<td>Positional: standing up</td>
</tr>
<tr>
<td><strong>BVL or &gt;3 days from a UVL</strong></td>
<td>Chronic dizziness (&gt;3 days)</td>
<td>Dizzy, disequilibrium, occasionally oscillopsia</td>
<td>Induced by head movements, walking, exacerbated when walking in the dark or on uneven surfaces</td>
</tr>
<tr>
<td><strong>TIs</strong></td>
<td>Spells:</td>
<td>Vertigo, lightheaded, disequilibrium</td>
<td>Spontaneous</td>
</tr>
<tr>
<td><strong>Migraine</strong></td>
<td>Spells:</td>
<td>Vertigo, diziness, motion sickness</td>
<td>Usually head movement-induced motion sensitivity</td>
</tr>
<tr>
<td><strong>Meniere’s disease</strong></td>
<td>Spells:</td>
<td>Vertigo, disequilibrium, ear fullness, hearing loss, tinnitus becomes worse</td>
<td>Spontaneous, exacerbated by head movement</td>
</tr>
</tbody>
</table>
Assessments

• Physical
  – Ocular Motor Exam
  – VORs
  – Eye ROM / smooth pursuit
  – Saccades
  – Spontaneous / gaze-evoked (with fixation removed)
    – Frenzel / gonioscopy / ophthalmoscope / IR goggles cross-cover
  – Head thrust (lag / hypofunction) (Halmagyi)
  – Head shaking (metacusis)
  – Spot fixation / VOR Cancellation
  – Dynamic visual acuity (DVA)

Eye exam with Infra Red Video Goggles
VORs  head thrust/head impulse (lag / hypofunction)

Assessments

• Physical...
  • Provocation tests
    • Dix-Hallpike
      • latency
      • duration
      • direction
      • vertigo
      • nausea
      • tinnitus
  • [Horizontal] Roll Test
  • ASV

LEFT Dix-Hallpike Test

Alexander Ring  
#0401675209
Rolling the crystal back

Roll Test

Roll Test
Canalith or Particle Repositioning Manoeuvre (BBQ Roll)

(Right) Horizontal, (lateral) Canal

Spit / BBQ Repositioning Manoeuvre (BBQ Roll)

Right HCC Canalithiasis
- Cupulolithiasis
- Inc. speed of move
- HCC Orientation
  - 30 degree til

Treatment for BPPV

CR/PR Manoeuvre (Epley)

- Epley 3D Chair
- Semont Liberatory Manoeuvre
- Spit/Barbecue repositioning manoeuvre
- Habituation exercises

Managment of Vertigo

Alexander Ring

#0401675209
Post treatment (Homework)
- Head position upright 6-24hrs
- Up to 4 nights stay off the affected side
- Review in a week

1st Review
- Commencement of targeted habituation
  (Habituation – CRM Exercises, Brandt-Droroff)
- Teach Self Management – further attacks

Treatment Outcomes
- 2-3 visits
  - 80%
  - 99%
General Characteristics of Central Vs Peripheral Nystagmus

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Central</th>
<th>Peripheral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latency</td>
<td>None</td>
<td>2-15s</td>
</tr>
<tr>
<td>Duration</td>
<td>30-120s</td>
<td>5-30s</td>
</tr>
<tr>
<td>Fatigability</td>
<td>+/–</td>
<td>+</td>
</tr>
<tr>
<td>Vertigo</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Direction</td>
<td>Pure Vertical</td>
<td>Horizontal, Tortional</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Direction changing</td>
<td>Direction fixed</td>
</tr>
</tbody>
</table>

Assessments

Physical...

- Higher level Balance tests
  - Rhomberg's
  - Sharprowd Rhomberg's
  - Single leg Tests
  - Functional Reach
  - SOT / mCTSIB
  - Unterberger / Fukuda (vestibular stepping test)

Assessments

- Physical
  - Walking Tests
    - Gait assessment
    - Timed up and Go
    - Berg's Balance scale (6 modified)
    - Dynamic Gait Index (validated)
      - Add 360 turns
      - Turning test
Red flags

The presence of focal neurological signs
diplopia, dysarthria, dysphasia, visual field loss,
Ataxia and nystagmus
(out of proportion to vertigo)
Direction change or / horizontal gaze evoked
nystagmus (acute)
Pure vertical nystagmus
Upbeating or downbeating
Other eye movement abnormalities
Eg; Gaze palsies, skew deviation

Conclusions

1. Ask the patient not to use the word “dizziness”,
   rather ask them to describe the sensation
2. Detailed History – key
   1. Temp, symptoms, circumstance
3. Quick vestibular assessment (& Treatment)
   (VOR as a window to test the inner ear)
   1. Head thrust/Impulse Test
   2. Dix-Hallpike / Roll Tests