Off balance –
Persistant Postural-Perceptual dizziness

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This is me!

Formal training in oto-rhino-laryngology 1988 – 1993

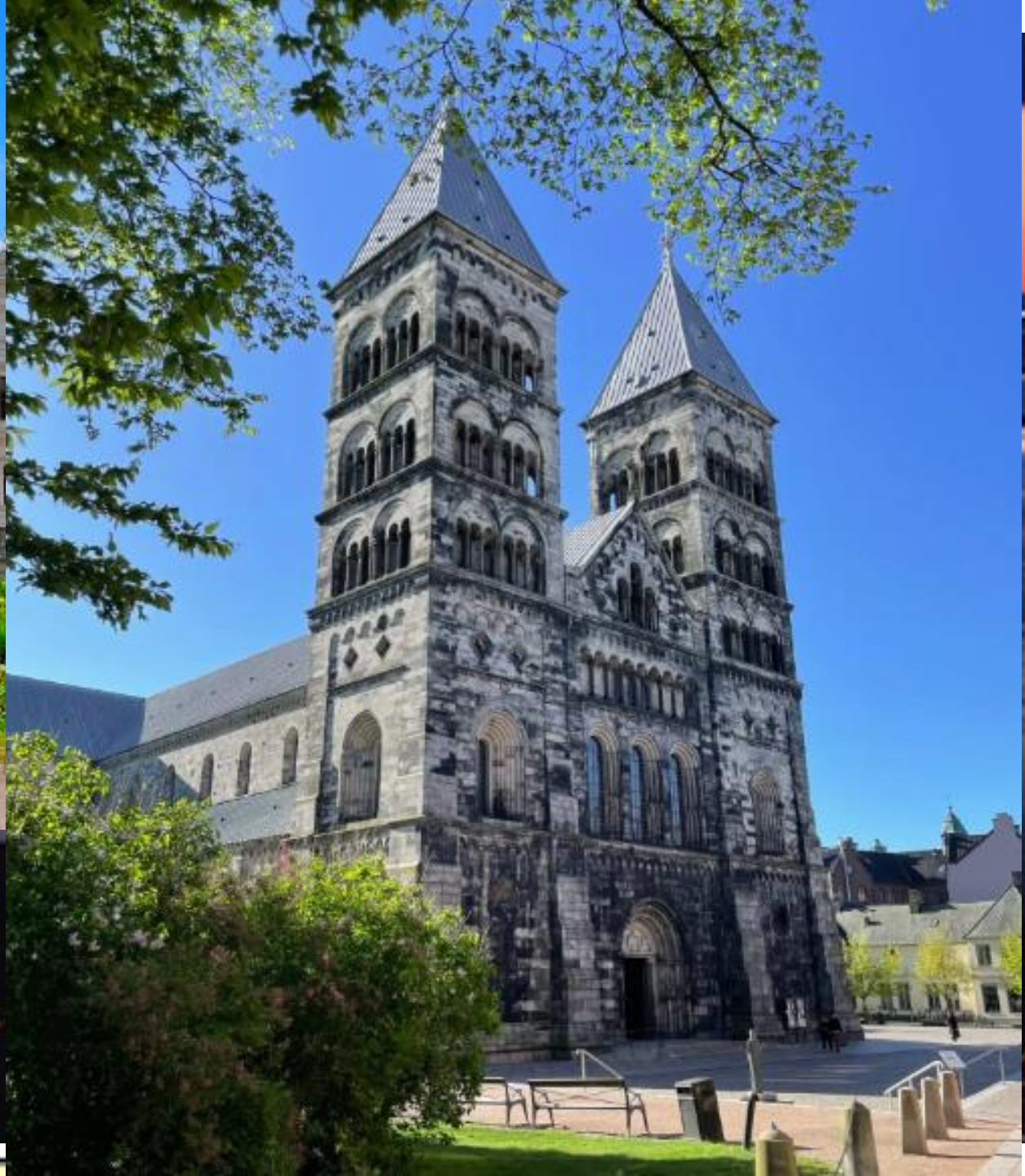
Since start of training focused on oto-neurology (non-surgical)

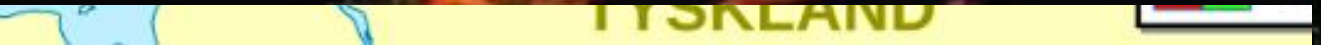
1995 Ph.D. ”The neck and human balance – an experimental and clinical approach to ”cervical vertigo”

1999-2000 Fellowship in otoneurology –
Ian Curthoys & Michael Halmagyi, Sydney, Australia

2001 associate professor Lund University, Lund, Sweden

2024 President of the Bárány Society – the International Society for Vestibular Medicine, Oto-Neurology & Vestibular Science




TYSKLAND

A true story! My house!!

…and my own experience of ”my mind playing theatre on my body!”

It was the autumn of 1990…..
Swedish economic crisis
Interest rate 500%

The patient who made me an ”oto-psychiatrist”

50-years old ”real” man – road builder
on sick leave > 2 years because of Meniere disease

Intra-tympanic gentamicin at ”St Elsewhere” – ”dead” ear
Attacks continue – What to do?

Give more gentamicin!!! 6 injections!!!

Attacks continue – What to do?

Thorough ”analysis” of his attacks:
= conditioned panic attacks?!

SSRI (sertraline) ”Start low, go slow!”

1 month later: His body language gives away a ”new man”
”Doctor, can I go back to work?”
50% work OK!
2 months later: 100% work OK!

1 year later: Should we try to stop your sertraline?
”No way doctor! I havn´t felt this good in years!”
”And so he lived happily ever after!”

His long history of Meniere disease had induced a secondary anxiety disorder that was communicated, not as anxiety, but as ”vertigo”!!

And when his panic anxiety was treated he was feeling OK!!

32-years old woman, teacher
Previously healthy – no history of psychiatric problems
Acute vestibular syndrome in a shopping mall
…chronic dizziness, nausea, fatigue
All examinations normal
100% sick leave

3 months later I saw her
Normal oto-neurology / audiology / vestibular / neuroradiology
No anxiety / depression (Hospital Anxiety & Depression Scale –HADS)

Cognitive behavioural therapy, vestibular rehabilitation
Slowly back to work 50% - 75% after a year

June 2008 (3,5 years after onset)
SSRI (escitalopram 5 mg x 1 2 weeks, then 10 mg x 1)

Follow-up 2 months later

”I feel 95% better!!!!”

”like comparing a bilateral pneumonia
with a slight common cold”

Has continued with escitalopram 5 mg. When she tries to stop medication her symptoms gets worse!

Diagnosis?
Masked depression?

Diagnostic criteria for persistent postural-perceptual dizziness (PPPD): Consensus document of the committee for the Classification of Vestibular Disorders of the Bárány Society

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Journal of Vestibular Research 2017 (free access)

1870:s

Europe´s cities undergo big changes: large squares, esplanades

M Benedict ”Uber Platzschwindel” Allg Wien Med Zeit 1870
Vertigo/dizziness in open spaces neuro-ophtalmologic background

E Cordes ”Die Platzangst (Agoraphobie)” Zeit Psych Berlin 1872
Dyscomfort/anxiety in open spaces psychologic background

Westphal C ”Die Agoraphobie” Zeit Psych Berlin 1871
postural control + motion + spatial orientation + threat =
all parts in a process leading up to agoraphobia

20th century specialisation of medicine: Otology / Neurology / Psychiatry

Agoraphobia – psychiatric term (vertigo / ”space and motion context” disappears)

Late 20th century some different case series:

”supermarket syndrome”	McCabe BF 1975
”space phobia”	Marks I 1981
”motorist´s vestibular disorientation syndrome”	Page & Gresty 1985
”visually induced motion symptoms”	Hoffman & Brookler 1978
”physiologic height vertigo”	Bles W, Brandt T m fl 1980

Brandt T & Dieterich M Munch Med Wschr 1986
Phobischer Attacken-Schwankschwindel (Phobic Postural Vertigo)

Postural dizziness & fluctuating unsteadiness
Mild anxiety / depression
Obsessive / compulsive personality traits

Common, persistent, possible to distinguish from other balance disorders

Background: Perceived mis-match between ”efference-afference”
inducing ”stiffened postural control strategy”
(like when standing on a high cliff)

Jacob RG et al J Anxiety Disorders 1989
Space and motion phobia / intolerance / dyscomfort

Symptoms are triggered by:
active / passive movements in ”visually-rich” environments
moving visual objects / scenes

Interaction: standing dizziness / vestibular ”lesions”/ anxiety

Associated with ”somatosensory dependence” (*EquiTest* posturography)

Bronstein AM J Neurol Neurosurg Psychiatry 1995
Visual vertigo syndrome

After peripheral / central vestibular lesion vertigo/unsteadiness triggered by: exposure to moving / complex visual stimuli

Background: increased ”visual dependency” (down-regulation of vestibular?)

2009 Barany Society ICVD created a term for this condition:
Visually induced dizziness

Staab JP et al Laryngoscope 2004
Chronic subjective dizziness

A lot like ”phobic postural vertigo” but more focused on
physical instead of psychological symptoms

Long-standing dizziness/unsteadiness (not ”vertigo”)
Increased sensitivity to self-motion or movement of visual surroundings
Dyscomfort ”visual precision work”: reading, scrolling on computer/mobile etc

High sensitivity (>85%) / specificity (>90%) separating it from
Meniere disease, vestibular migraine & BPPV

Features of PPV, SMD, VV, and CSD that informed the definition of PPPD

	PPV [13]	SMD [39]	VV [15]	CSD [79, 81]
Primary Symptoms (criteria A.1–3)				
Dizziness	✓✓	✓	✓✓ [22, 23]	✓✓
Unsteadiness	✓✓	✓✓	✓✓	✓✓
Non-spinning vertigo	✓✓	✓✓	✓✓	✓
Temporal profile (Criteria A.1–3)	Fluctuating with momentary flares	Situational (provoked)	Situational (provoked), Persistent [23]	Persistent with diurnal variability [27]
Provocative factors (Criteria B.1–3)				
Upright posture	✓✓			✓ [75]
Active or passive motion	✓	✓	✓	✓✓
Moving visual stimuli or complex patterns	✓	✓	✓✓	✓✓
Precipitants (Criterion C.1)				
Vestibular syndromes	✓	✓	✓	✓
Other medical illnesses	✓			✓
Psychological distress	✓	✓		✓
Course of illness (Criteria C.1.a-b)	Long-standing, waxing/waning [18]	May be long-standing	May be long-standing	Chronic
Physical exam and laboratory findings (Criterion E)	Normal	Somatosensory dependence on posturography [41]	Central or peripheral vestibular deficits	Abnormalities related to comorbid conditions [75]
Features not incorporated into PPPD				
Anxiety	Part of PPV	Associated with SMD [41]	Associated with prolonged VV [23]	May be comorbid with CSD [80]
Depression	Part of PPV			May be comorbid with CSD [80]
Personality traits	Obsessive-compulsive traits are part of PPV			Neurotic, introverted traits may be risk factors for CSD [76]

Committee for Classification Vestibular Disorders of the Bárány Society (CCBS) 2006
International Classification of Vestibular Disorders (ICVD)

2010 ”behavioural subcommittee”
Investigate primary & secondary psychiatric disorders causing or increasing ”vestibular problems” &
Investigate background/evidence for PPV, SMD, VV och CSD

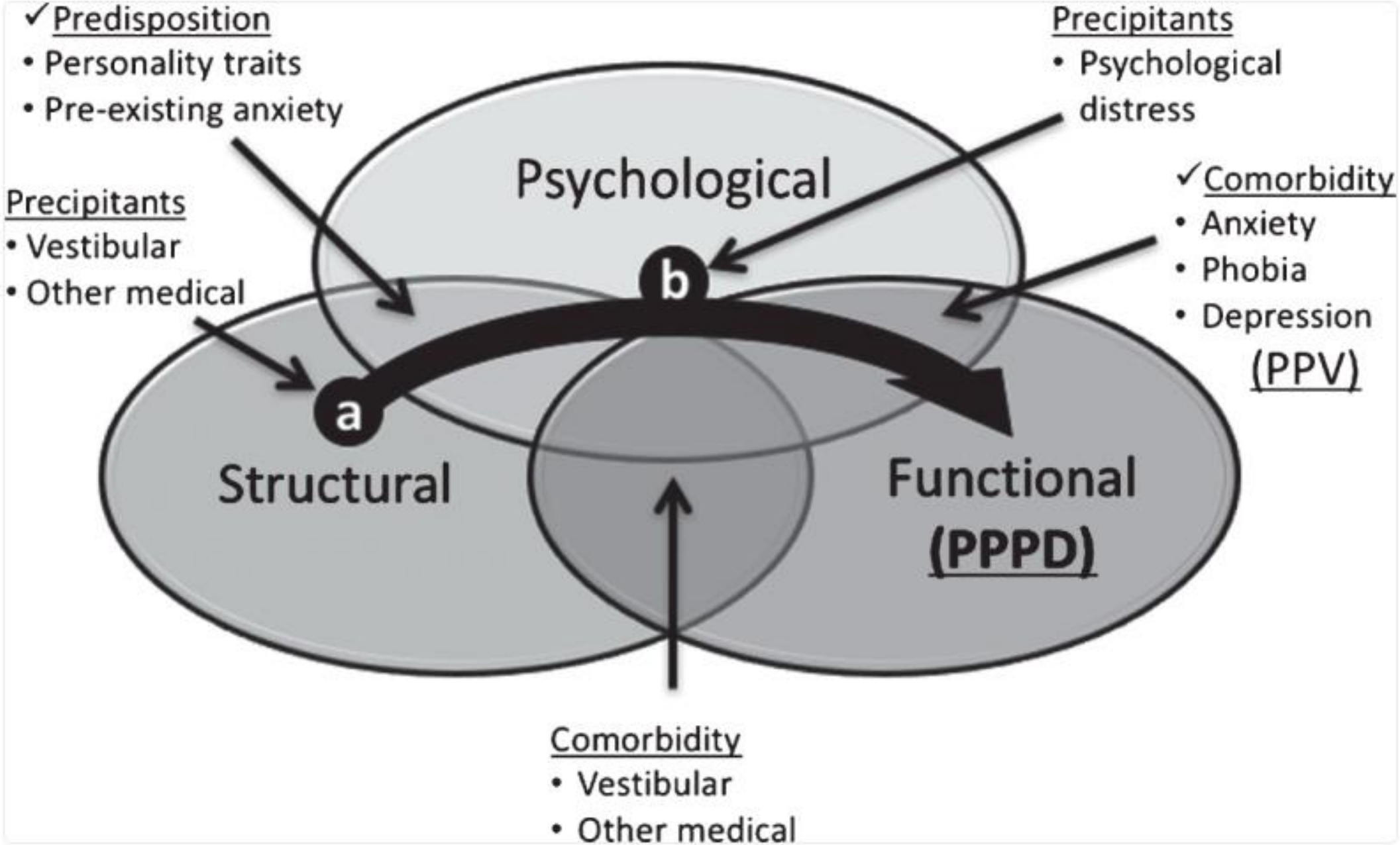
Otology / neurology / psychosomatic medicine / psychiatry
Asia / Europe / North America

+ 2 ”senior” oto-neurologists as advisers (T Brandt (PPV) & A Bronstein (VV)

”..named *persistent postural-perceptual dizziness*
to reflect its main diagnostic criteria of:

Persistent = long-standing (but possible to treat = not ”chronic”)
non-vertiginous *dizziness*, unsteadiness, and non-spinning vertigo
exacerbated by *postural* challenges
perceptual sensitivity to space-motion stimuli.”

Committee disagreed on PPPD vs Phobic Postural Vertigo
(PPV a subtype of PPPD? Voted against)


✓Predisposition
• Personality traits
• Pre-existing anxiety
Precipitants
• Psychological distress
Psychological
Precipitants
• Vestibular
• Other medical
✓Comorbidity
• Anxiety
• Phobia
• Depression
(PPV)
b
a
Structural
Functional
(PPPD)
Comorbidity
• Vestibular
• Other medical

BODY = ”SOUL”!

Everything we perceive has an underlying physical / physiological correlate!

(something happens in CNS!)

(but we cannot measure it by lab tests or see it with CT / MRI!)

As soon as we stand up on two legs we are: UNSTABLE!

Upright stance must
be analysed &
controlled
ALL the time!

Without us
having to think
about it!

2 leg stance = “anxiety”?

Some “uncertainty” inherent in 2 leg stance

Bottom-up?

Anxiety = uncertainty?

Anxiety disorders affect standing (flight- freight?)

Context dependent!

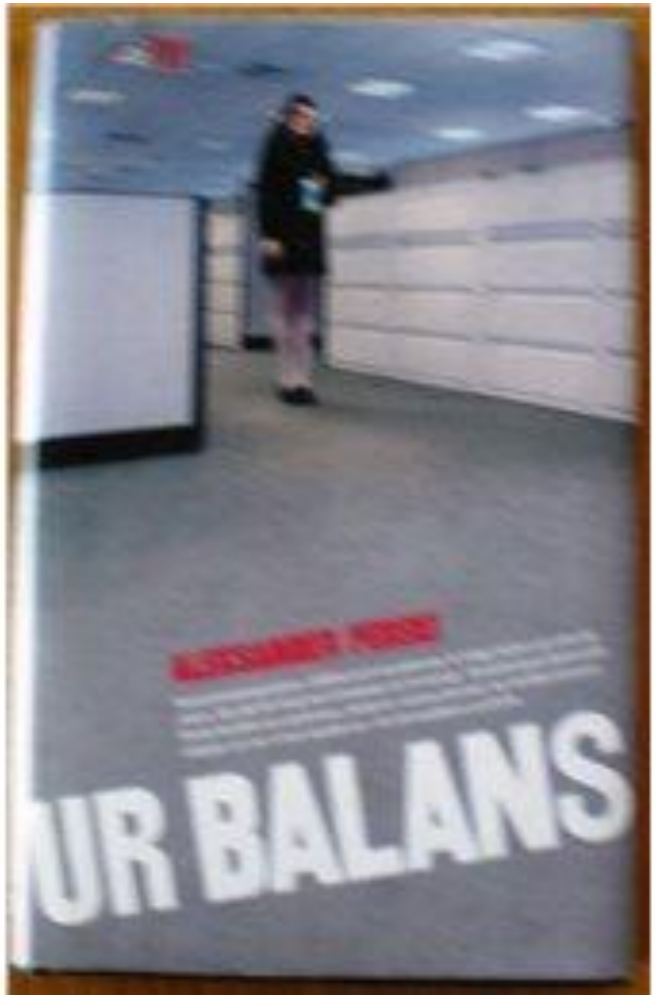
Top-down?

Freight & Flight?

Flight =
“panic attack”

Freight = “freeze”
= unsteadiness =

“Lie down or someone will eat you!”



Anxiety
and
depression
can give unsteadiness!

(And unsteadiness can give anxiety and depression!)

Emergency department (USA)

100 chronic dizzy patients

50% vestibular system

25% psychogenic

25% diverse causes

Kroenke et al

Tertiary vertigo clinic (Munich)

4214 patients 1989-2002

BPPV	19%
Phobic postural vertigo	16% (= PPPD)
CNS vestibular	13%
Vestibular migraine	9%
Vestibular neuritis	8%
Meniére disease	7%
	75%

Strupp & Brandt

Psychogenic dizziness or ”otogenic anxiety”?

132 patients with ”psychogenic dizziness”

How did it all start?????

1/3 a primary anxiety disorder (panikångest+-agoraphobia) causes dizziness

1/3 a primary vertigo disorder (BPPV, vest neuritis, vestibular migraine)
exacerbates an underlying psychiatric disorder (panic anxiety +-agoraphobia)

1/3 a primary vertigo disorder (BPPV, vest neuritis, vestibular migraine)
induces a psychiatric disorder (panic anxiety +-agoraphobia)

Staab & Ruckenstein, Laryngoscope 2003

The most common causes of vertigo / dizziness

Benign Paroxysmal Positional Vertigo -BPPV

Vestibular migraine (vertigo attacks as a manifestation of migraine)

Persistent Postural Perceptual Dizziness (”3PD”) (functional)

These 3 diagnosis = 2/3rds of all dizzy patients!

The more specialized your clinic is,
the more patients with functional disorders you will meet!
(around 50% in a ”dizziness clinic”!)

Persistent Postural Perceptual Dizziness ”PPPD / 3PD”

Criteria according to Barany Society CVD committee

J Vest Res 2017

All criteria A-E must be fulfilled

A. Dizziness / unsteadiness most days for more than 3 months

1. Long duration (hours) but might vary in intensity
2. Not necessarily present all the time

B. Symptoms without specific provocation but worsened by:

1. Standing still / walking
2. Active and / or passive movements
3. Moving visual stimuli / complex visual patterns

Persistent Postural Perceptual Dizziness ”PPPD / 3PD”

Criteria according to Barany Society CVD committee

J Vest Res 2017

All criteria A-E must be fulfilled

C. Symptoms preceded by a condition that gives vertigo / unsteadiness,

-acute, episodic or chronic, or other neurologic / medical condition, or emotional strain

1. In preceding acute/episodic vertigo, the initial vertigo gradually become PPPD symptoms
2. In other preceding conditions gradual onset of PPPD symptoms

D. Symptoms give significant suffering / decreased function

E. Symptoms not better explained by another condition

Persistent postural perceptual dizziness 3PD

Dizziness ”quality”:

- disturbed spatial orientation (”dizziness”)
- unsteadiness while standing or walking (running usually better!)
- illusion of rocking, swaying (”non-rotatory vertigo”)

Duration:

- At least on 15 of 30 days
- Symptoms usually worsening during the day (BPPV the opposite!)

Attacks:

- Short (seconds) attacks with increasing symptoms

Exacerbating factors

- Sensitive persons can have symptoms in sitting
- Active motion = own body movements
- Passive motion = car, bus, elevator, pushed in crowd
- Visual stimuli = traffic, big screens, pattern on wall / floos
- or small close objects: reading, scrolling on computer, mobile phone

Persisterande postural perceptuell yrsel 3PY

Exacerbating conditions:

- Vestibular disorder (25-30%)
- Vestibular migraine (15-20%)
- Panic attack (15%)
- Anxiety disorders (15%)
- Autonomic disorder (POTS, vaso-vagal loss of consciousness) (7%)
- Other (arrythmia, side-effect medicine etc) (ca 3%)
- You can not always find an exacerbating cause!

OBS! Can co-exist with other disorders!

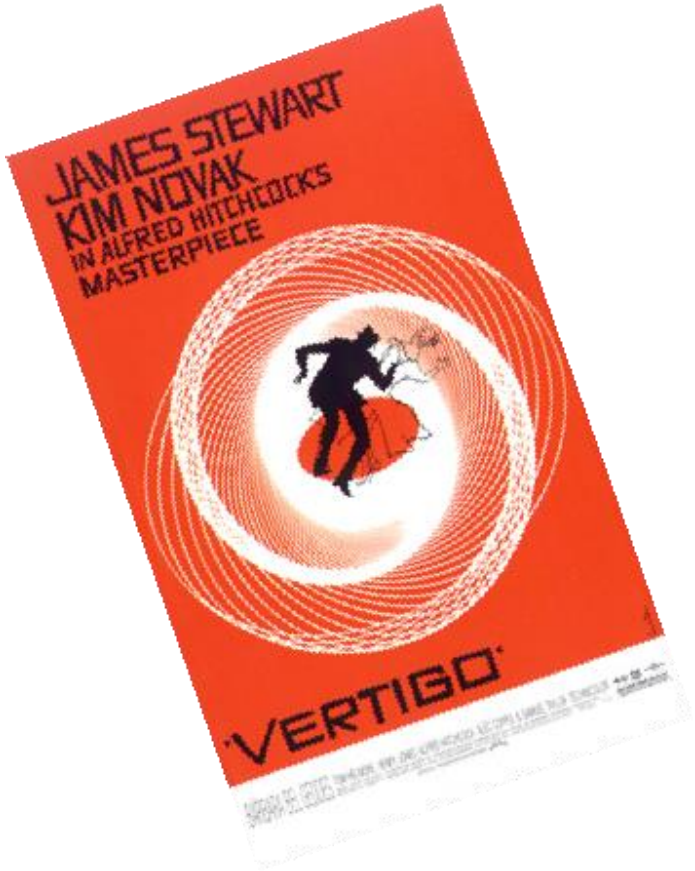
One or several disorders?
Sub-groups?

Diagnosis

No specific findings in vestibular tests
No specifc laboratory findings!
No specific radiological findings!

A history that fulfil criteria A – D!!!!!!!

Not a diagnosis of exclusion!!!
Might co-exist with another disease!
(Meniere disease, vestibular migraine..)



Treatment?

Meticoulus examination (exclusion) + explain mechanisms (”Your body tries to save you from being eaten by a tiger!”)

Self treatment: vestibular rehab / ”exposition in vivo”

Physiotherapy / VR / CBT / SSRI

75% better over time (PPV)

Huppert et al 2005

How to find these patients?

1. Knowledge about the importance of anxiety (depression) for balance disorder

2. Measure level of depression / anxiety

Hospital Anxiety and Depression Scale

Zigmond & Snaith, 1983

14 questions with 4 alternatives: 0 – 3 points / question
- 7 questions anxiety related
- 7 questions depression related

8-11 points = mild anxiety / depression (borderline)
>11 points = clinical anxiety / depression (case)

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Staab JP, Eckhardt-Henn A, Horii A, Jacob R, Strupp M, Brandt T, Bronstein A.

J Vestib Res. 2017;27(4):191-208. doi: 10.3233/VES-170622.

PMID: 29036855 **Free PMC article.**

Effect of Vestibular Rehabilitation Therapy in PPPD: Short-Term Results from a Prospective Observational Study.

Simanavicius V, Mockeviciene D, Lebedeva M, Espírito Santo RCD, Zaliene L, Staskevicius A, Agostinis-Sobrinho C.

J Clin Med. 2025 Nov 1;14(21):7761. doi: 10.3390/jcm14217761.

PMID: 41227157 **Free PMC article.**

The Presence of Serotonin in the Vestibular System: Supporting the Use of SSRIs/SNRIs in the Treatment of Vestibular Disorders-A Narrative Review.

Teggi R, Caldirola D, Neri G, Cangiano I, Viola P, Chiarella G.

Audiol Res. 2025 Nov 6;15(6):148. doi: 10.3390/audiolres15060148.

PMID: 41283491 **Free PMC article.** Review.