



# Evaluation of the Dizzy Patient

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Family Medicine Refresher Course

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Nothing to Disclose



# Goals

- Understand Nystagmus
- Differentiate Peripheral vs Central
  - When to worry about stroke/image
- Know about Common Causes of Dizziness



# Objectives

- Nystagmus:
  - describe and document
  - Peripheral: COWS
  - Central: all others
  - You know 90% of nystagmus!
- Dizziness Conditions:
  - Acute Vestibular Syndrome: Peripheral vs stroke
    - Red flag
    - HINTS
  - BPPV: always suspect, AM, specific nystagmus
  - Vestibular Migraine: use criteria
    - International headache society

# Why nystagmus is important

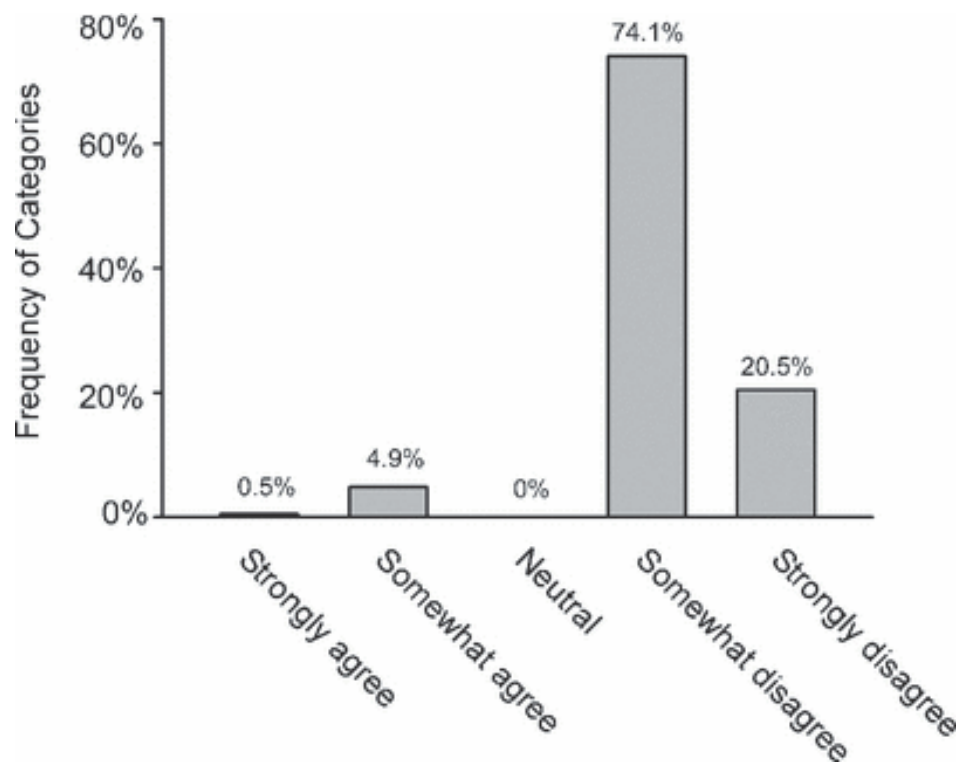
- Dizziness very common
- Nystagmus common with dizziness
- Most doctors not trained enough to describe and diagnose nystagmus/dizziness
  
- Common disease.... Little training



**BAD OUTCOME**

# Why nystagmus is important

- Study\* of 185 pts:
  - 95% of charts inadequate nystagmus description
- Study in ER:
  - 1/3 of dizzy pts with TIA/stroke missed



\*Kerber. Academic Emerg Med 2011  
Kerber. Stroke 2006; 37: 2484-7



# HOW TO DESCRIBE NYSTAGMUS



# How to Examine for Nystagmus

- Describe: do a **slow** version of the extra-ocular exam
- Document: can use epic template  
**ERDIZZINESS**



# NYSTAGMUS: PERIPHERAL VS CENTRAL

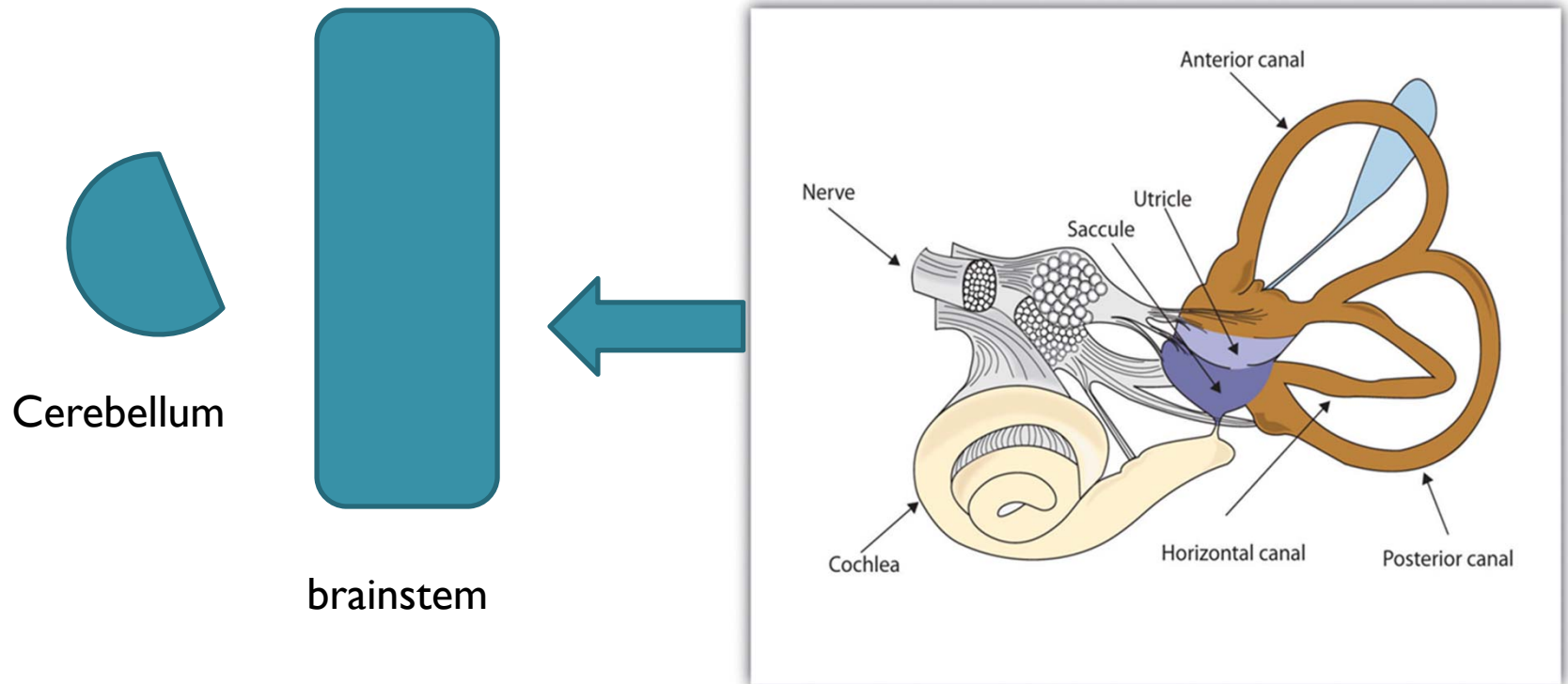




# Nystagmus Case

- Patient has 2 hrs of dizziness
- ER exam during spell: “ vertical nystagmus on left gaze”
- By time you see her, no nystagmus.
  
- Is this central?
- Peripheral?
- Inadequate information to differentiate for sure?

# Vestibular Anatomy





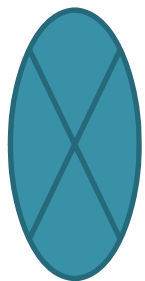
# HOW PERIPHERAL NYSTAGMUS IS GENERATED: VESTIBULAR PHYSIOLOGY



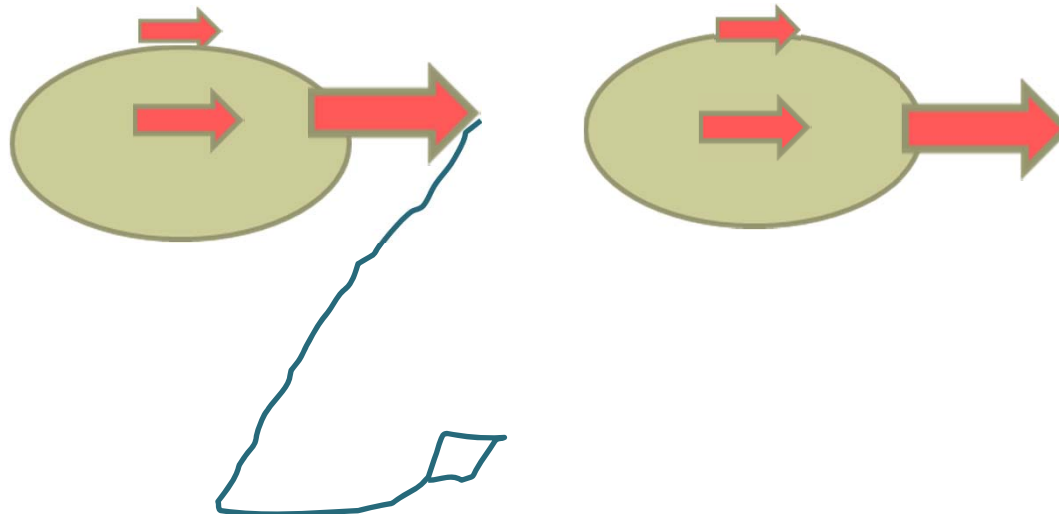
 **COLD COWS?**

# Peripheral Nystagmus

- Mainly Horizontal (+/- little torsional)
- Unidirectional (**away** from “cold”/sick ear)
- Transient (one to few days)
- Most prominent if gazing towards its direction



Bad ear





 **CENTRAL NYSTAGMUS**

# Central Nystagmus

- Central: everything else

- Gaze evoked 

- Vertical

- downbeat, upbeat



- Pure torsional

- Pendular 

- <http://www.youtube.com/watch?v=AEaalGJH0Ys>

- “Bizarre”



# Nystagmus Videos





# Nystagmus Case

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# Questions about Nystagmus

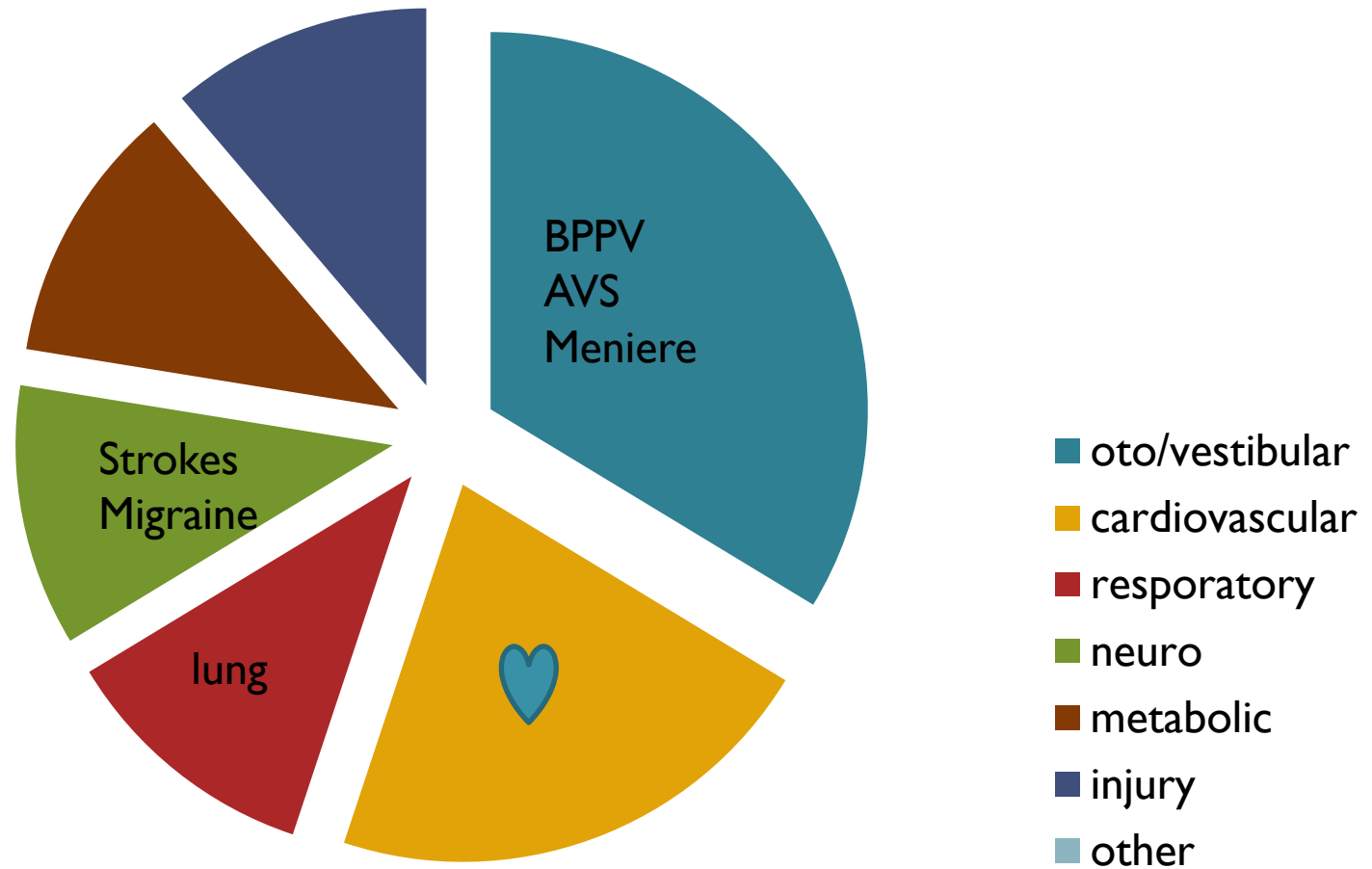


Dizziness



# **CENTRAL VERSUS PERIPHERAL CAUSES**

# Common Dizziness Causes in ER



# Most Common Causes in ER

- **Oto/vestibular 26-33%**
  - BPPV
  - viral inner ear
  - meniere
- Cardiovascular 16.5-21%
- Metabolic/nutritional 9-11%
- Respiratory 9-11%
- Injury 8-10%
- **Neuro 5% (migraine)**
- **Cerebrovascular 3.1%**
- Psych 5-7%
- GI 5-7% , GU 5%, Infection 3%

# Dangerous Causes

- 15% of all cases are dangerous
  - So for most patients it is OK to do watchful waiting (transient causes of viral, stress, etc)
- Most common (most to least):
  - Fluid and electrolyte disorders
  - **TIA**
  - Hypoglycemia
  - Angina
  - MI
  - **Stroke**/intracerebral hemorrhage
  - Carbon monoxide poisoning



## A word about Cardiovascular causes

- MI, hypotension, syncope
- 63% of such patients have dizziness
- 37% have vertigo as their only dizziness
- 8% of MI have vertigo
- 17% of syncope have vertigo
- 37% of Orthostatic intolerance have vertigo

Newman-Toker. How Often is Dizziness from Primary Cardiovascular Disease True Vertigo? A Systematic Review. **2008**

Newman-Toker. Nature Clinical Practice Neurol **2006**



# **DIZZINESS DISORDERS**





# Common Neuro-otological causes

- **AVS**
  - Peripheral
  - Central (stroke)
- **BPPV**
- **Migraine**
- **Meniere-dizziness spells with otological symptoms.**



# Acute Vestibular Syndrome

- New onset of dizziness
- More than 24 hours
- Associated with:
  - Unsteadiness
  - Sweating
  - Nausea and/or vomiting
  - +/- blurred vision
- Nystagmus on exam



# Acute Vestibular Syndrome

- 75% Peripheral (inner ear)
- 25% Central (stroke in posterior fossa)
- If unsteady/vomiting: admit
- Worst symptoms first few days
- Back to work in a week
- Back to normal in a month
- Rx: symptomatic (meclizine, valium for 1-2 wk) and vestibular rehabilitation

# AVS DDX

- Viral inner ear (vestibular neuritis or labyrinthitis)
- Stroke/bleed
- Bacterial inner ear/brainstem infection
- Brainstem encephalitis
- Ramsay Hunt
- Wernicke encephalopathy
- Miller Fisher
- Less urgent: MS and Vestibular migraine (27% sxp last > 24 hours)

# Red flags on history that point to central

- Hyper acute onset
- Central findings on exam
- Moderate to severe imbalance (Crawled)
- Imbalance out of proportion to dizziness (or imbalance without dizziness)
- Nausea/vomiting > dizziness and worse with head movement
- Occipital Headache/neck Pain (new, days)
- >50 yr, but do not forget young (1/10 had dangerous dx, such as dissection)
- Stroke risk factor(s)



# Red Flags on EXAM: HINTS

- Head Impulse
- Nystagmus Test
- Skew



# Video: head Impulse, Skew

# Stroke-AVS

- AVS + one of the signs below:
- Head impulse (normal ie negative; patient remains focused on nose)

*or*

- Nystagmus (central)

*or*

- Skew (abnormal ie present; eyes shift up/down)
- Sensitivity for stroke 100% and specificity 96% (better than MRI in first 24 hr)



# Case

- A 45-year-old man presented to the emergency department with 24 hours of new continuous vertigo, nausea, vomiting, and unsteady gait. He preferred to lie motionless. He denied auditory or neurologic symptoms, headache, neck pain, or recent trauma. He had no relevant medical or exposure history, including no cerebrovascular or vestibular disorders, no recent or remote ear surgery, and no smoking or other vascular risk factors. He took no medications. He had no family history of vestibular disease or recurrent dizziness. The patient's general neurologic examination was normal, including no limb ataxia or dysmetria, compatible with a peripheral cause. He felt unsteady when standing but was able to sit with arms crossed unaided. Eye examination revealed direction-fixed, left-beat, horizontal nystagmus that was worse in left gaze and no skew deviation on alternate cover testing. The h-HIT was normal bilaterally.
- Peripheral vs central?



# Post Acute Vestibular Syndrome

- If patients do not do PT and become inactive, and/or use chronic vestibular suppressants, then they will snowball into more and more dizziness, less and less activity and you will see them months or years later walking **VERY VERY SLOW**.
- 15% get BPPV
- Chronic subjective dizziness



# BPPV

- **Always suspect it**
- **Most patients will not present with textbook hx**
- Dizziness (any time, spin or not, unsteady, just dizzy, “wow”, etc)
- **B**rief (the worst dizziness is brief)
- **B**ad in Morning
- Position change:
  - **B**ed: getting in bed in PM and getting out over night or in AM
  - **B**ed: rolling to left or right
  - **B**ending
  - **B**athroom visits overnight
  - Looking up
- Recurrent weeks, months, years

# BPPV-Diagnosis with Dix Hallpike

Medscape



Right

Left

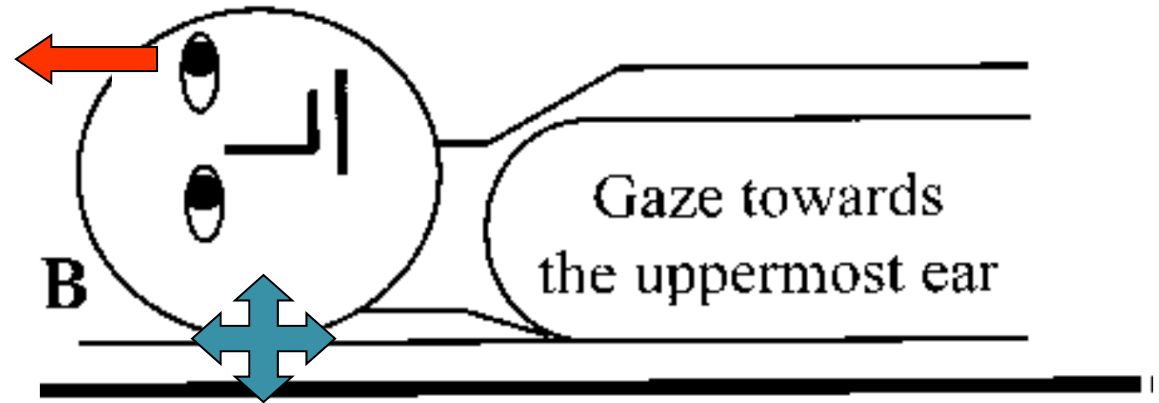


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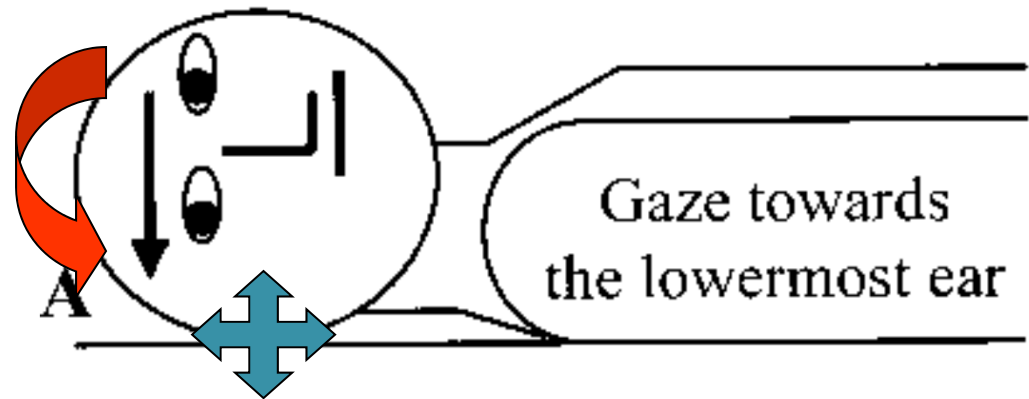
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# Provoked Nystagmus: BPPV (RIGHT)

Nystagmus looking to left:  
Upbeat to **F**orehead



Nystagmus looking to right:  
Torsional to **F**loor



But if vertical (downbeat)  
then central

Look to **f**loor: beat to **f**loor

Look **u**p (to ceiling/ to uppermost ear): beat **u**p (to forehead)



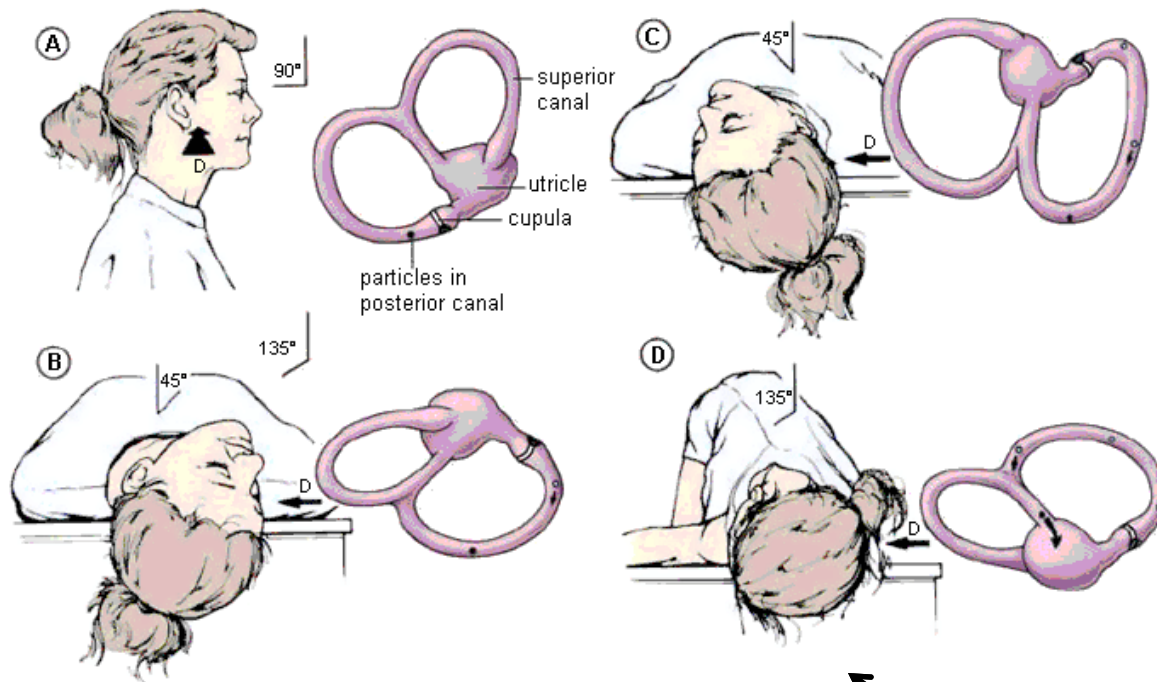
# Video: BPPV



# BPPV-workup and treatment

- Workup: **No** CT or MRI needed
- Treatment: **No** meclizine
- Treatment: Particle repositioning maneuver (“epley”)

# BPPV-Treatment



**NOSE DOWN**





# Particle Repositioning (Epley) Maneuver

- <http://www.youtube.com/watch?v=hq-IQWSrAtM>

# Vestibular Migraine

- Over half of migraineurs have dizziness
- Vertigo or motion related dizziness
- Criteria to diagnose vestibular migraine since 2001 and evolving
- Yet, remain much underdiagnosed
- 10% of dizziness clinic (or more)
- **International Headache Society website**
- [http://ihs-classification.org/en/02\\_klassifikation/](http://ihs-classification.org/en/02_klassifikation/)

# Vestibular Migraine Criteria

**At least five episodes with vestibular symptoms of moderate or severe intensity, each lasting 5 min to 72 h**

**B. Current or previous history of migraine with or without aura according to the International Classification of Headache Disorders (ICHD)**

**C. One or more migraine features with at least 50% of the vestibular episodes:**

- **headache with at least two of the following characteristics: one-sided location, pulsating quality, moderate or severe pain intensity, or aggravation by routine physical activity**

- **photophobia and phonophobia**

- **visual aura**

**D. Not better accounted for by another vestibular or ICHD diagnosis**



# Template: Dizziness in ER

- Improve documentation for example nystagmus documentation increased from 8.8% to 95% with use of template
- Dix Hallpike documented in 22% of those dx with BPPV\*

Kerber.Acad Emerg Med **2011**

\* Kerber otolaryngol head neck Surg **2013**



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# Recommended References

- Furman 2015: Vestibular Migraine
- Tarnutzer 2011: Does my dizzy patient have a stroke? A systematic review of bedside diagnosis in acute vestibular syndrome
- Kerber 2011: The evaluation of a patient with dizziness
- Kattah 2009: HINTS to diagnose stroke in the acute vestibular syndrome: three-step bedside oculomotor examination more sensitive than early MRI diffusion-weighted imaging.



**THANK YOU**