

# How to treat

**B**enign

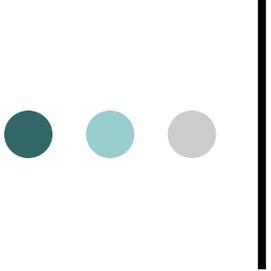
**P**aroxysmal

**P**ositional

**V**ertigo of any canal



**Daniele Nuti**  
**Siena University,**  
**Italy**



# BPPV

- Most frequent vestibular disease
- Most common cause of vertigo in humans
- Lifetime prevalence: 2.4%
- 1 year incidence: 0.6% (von Brevern, 2007)

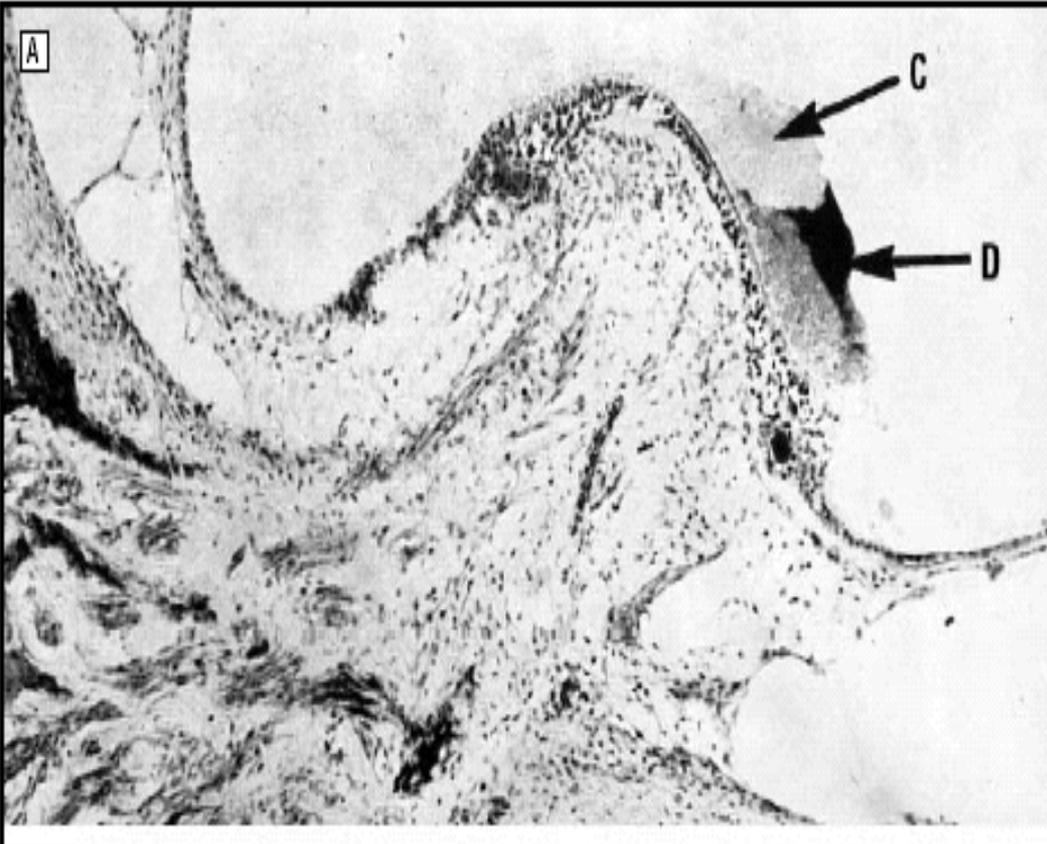


*this means that every year, in a city like Calcutta, there are about 50000 adults suffering from **BPPV** for the first time*



# Cupulolithiasis (Schuknecht HF, 1969)

*Histopatologic finding of basophilic deposits (calcium carbonate) in the cupula of the PC of 2 patients with history of BPPV. Probably otoconia dislodged from the utricular macula*



**Development of the heavy-cupula concept  
PN is generated by a PC-cupula sensitive to gravity**

# Canalolithiasis (Hall, Ruby and Mc Clure 1979)



*Suggestion that the pathogenetic mechanism is due to something moving inside the endolymph of the canal, rather than adhering to the cupula of the PC*

*Concept of canalolithiasis supported by the intraoperative observation of abundant free-floating debris in the endolymph of the PC*

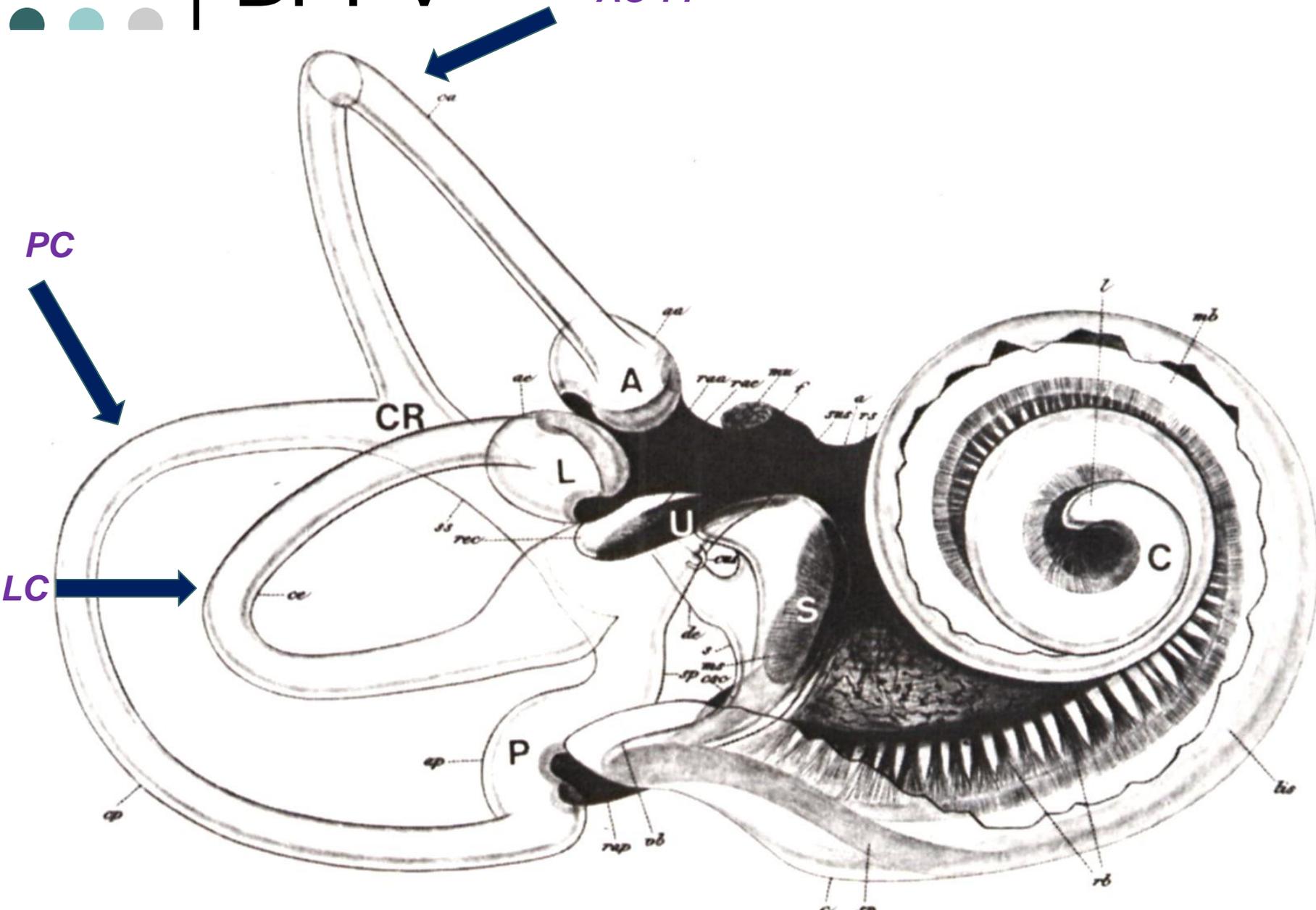
*(Parnes & McClure, 1992)*

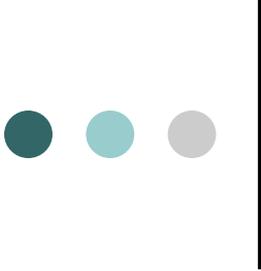
# BPPV

AC ??

PC

LC





# BPPV Patients

- **Unilateral PC**: *about 75% (>60% right)*
- **Bilateral PC**: *5-7% (3% post-traumatic)*
- **Lateral Canal**: *15-20%*
  - *geotropic: about 3/4*
  - *apogeotropic: about 1/4*
- **Atypical forms** (*anterior canal??*): *3-5%*
- **Multiple canals**: *<2%*

*Caruso & Nuti (2005)  
Epidemiological data from 2270 PPV patients*

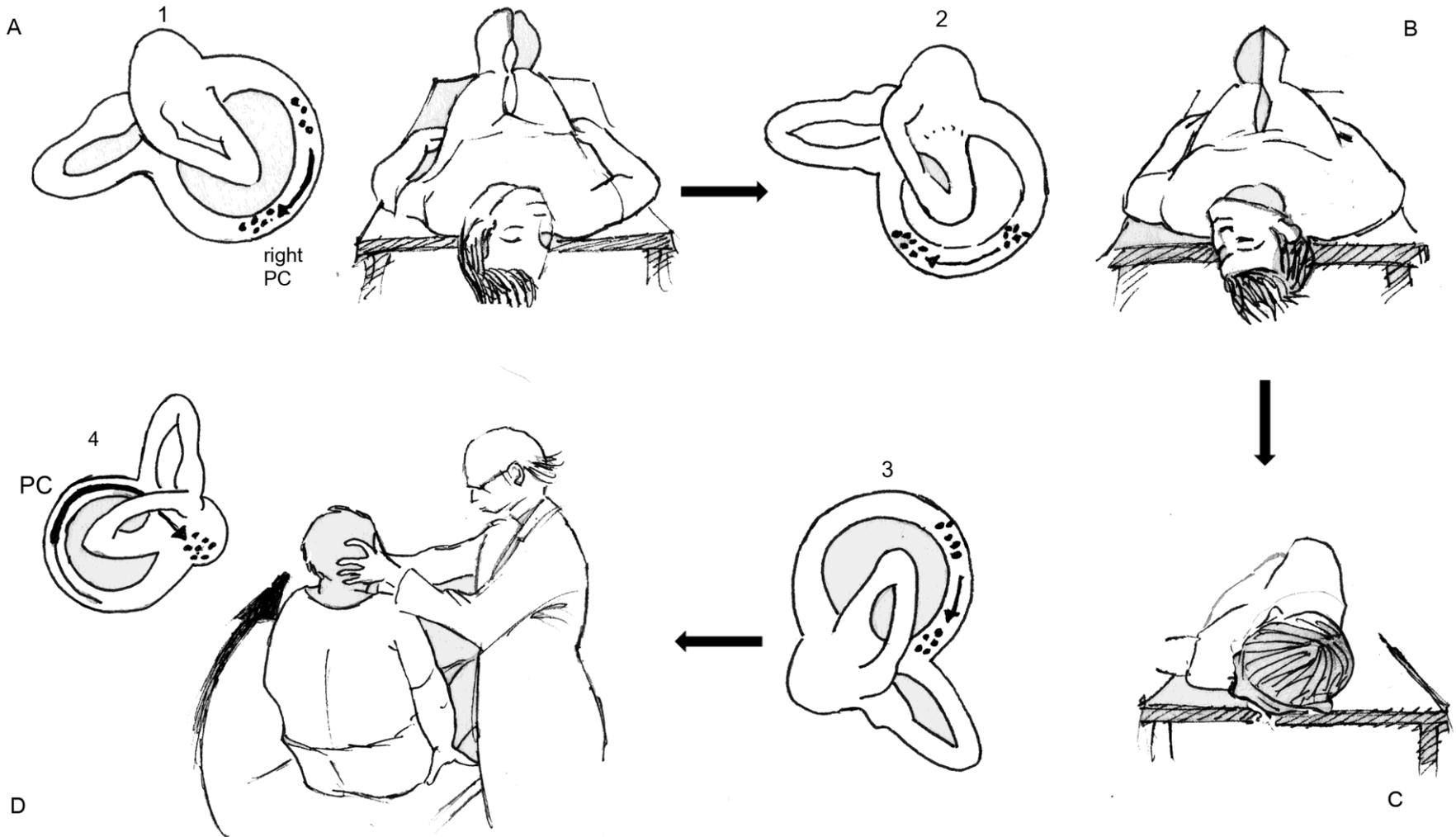
# Treatment for PC BPPV: *The Canalith Repositioning Procedure (CRP) by John Epley*

*Devised 1979  
Published 1992*

- Probably the most widely adopted treatment in the world

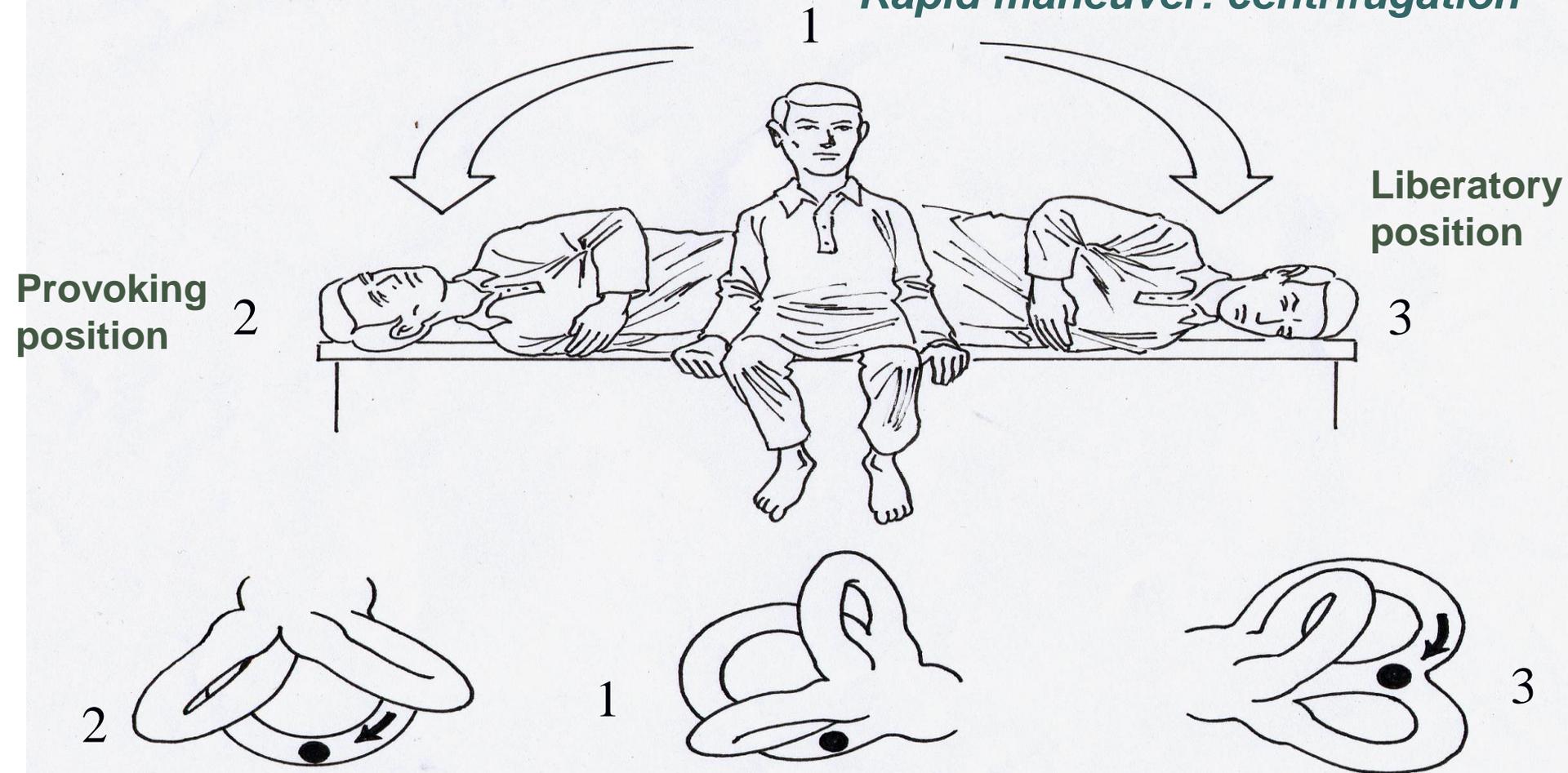


Designed to allow debris to migrate by *gravity* out of the PC through the common crus



# Treatment for PC BPPV: The Sémont liberatory manoeuvre (1983-1988)

*Rapid maneuver: centrifugation*

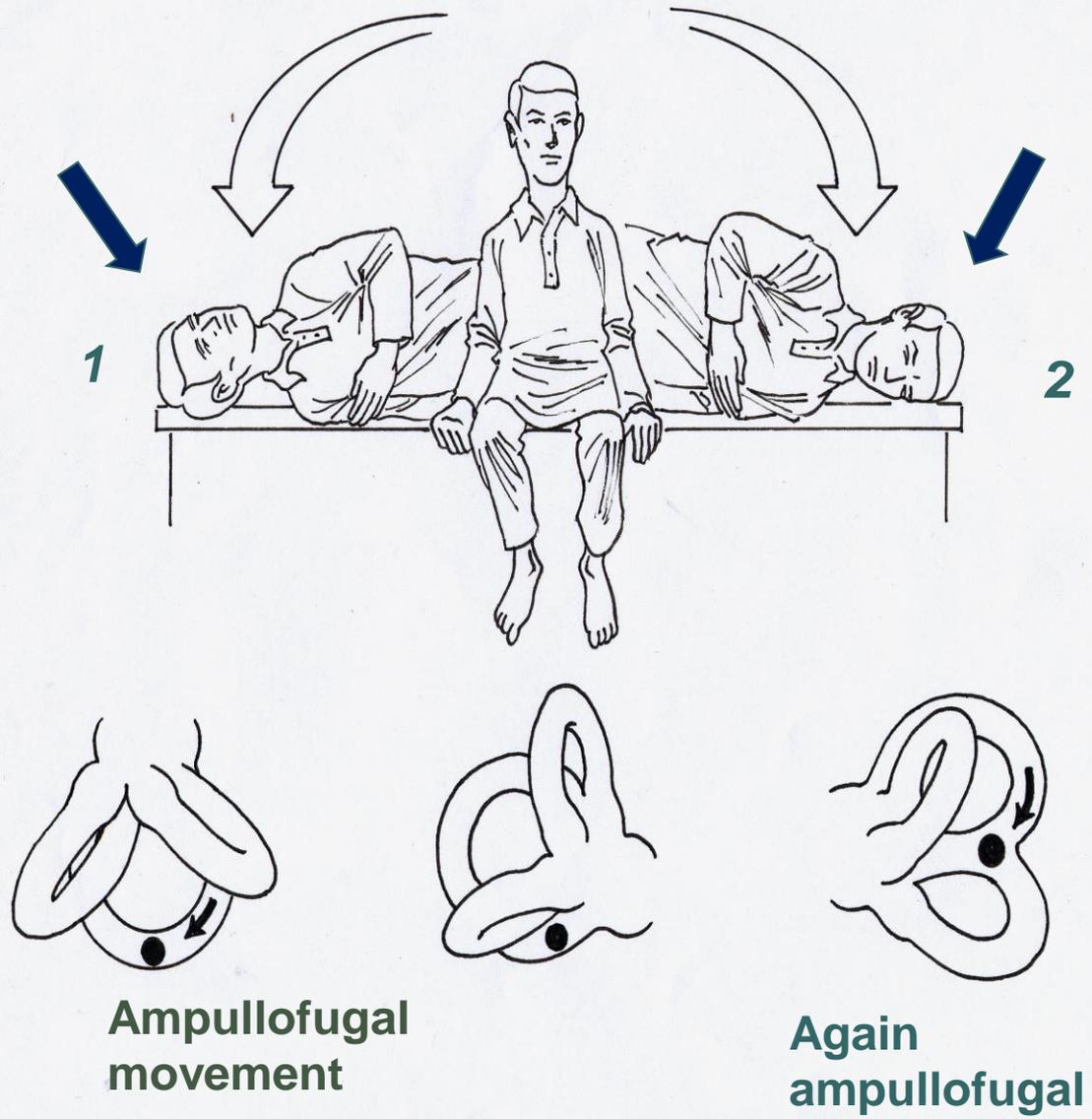


# Sémont manoeuvre

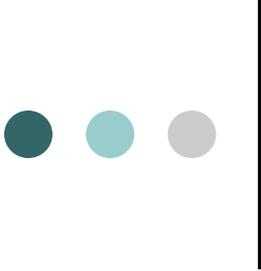
- **Provoking position (1):**  
episode of vertigo with up-beat  
PN, rotating towards the  
pathological ear

- **Liberatory position (2):**  
another episode of vertigo and  
PN with the *same* direction of  
rotation as in the provoking  
position (**liberatory nystagmus**)

**Liberatory nystagmus is nearly  
always a good prognostic sign**

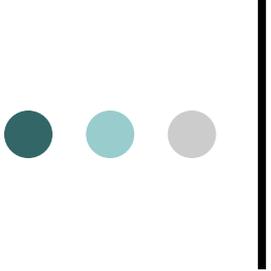






# PC treatment

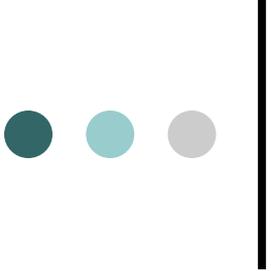
- Double blind randomized trials on CRP (Lynn et al, 1995; von Brevern et al, 2006) and Sémont maneuver (Mandalà et al, 2012; Chen et al, 2012) allow to consider both treatments as effective and safe therapy that should be offered to patients of all ages
- They belong to the level A of the Classification of Recommendations of the American Academy of Otolaryngology and of Neurology
- Level A: Treatments with established efficacy



# PC treatment

- 70-80% of patients symptom-free with one or two therapeutic session
- 10-15% need more than two sessions
- It is necessary to re-evaluate the patient after 5 ineffective therapeutic attempts
- Around 5%: conversion to LC-BPPV or pDBN



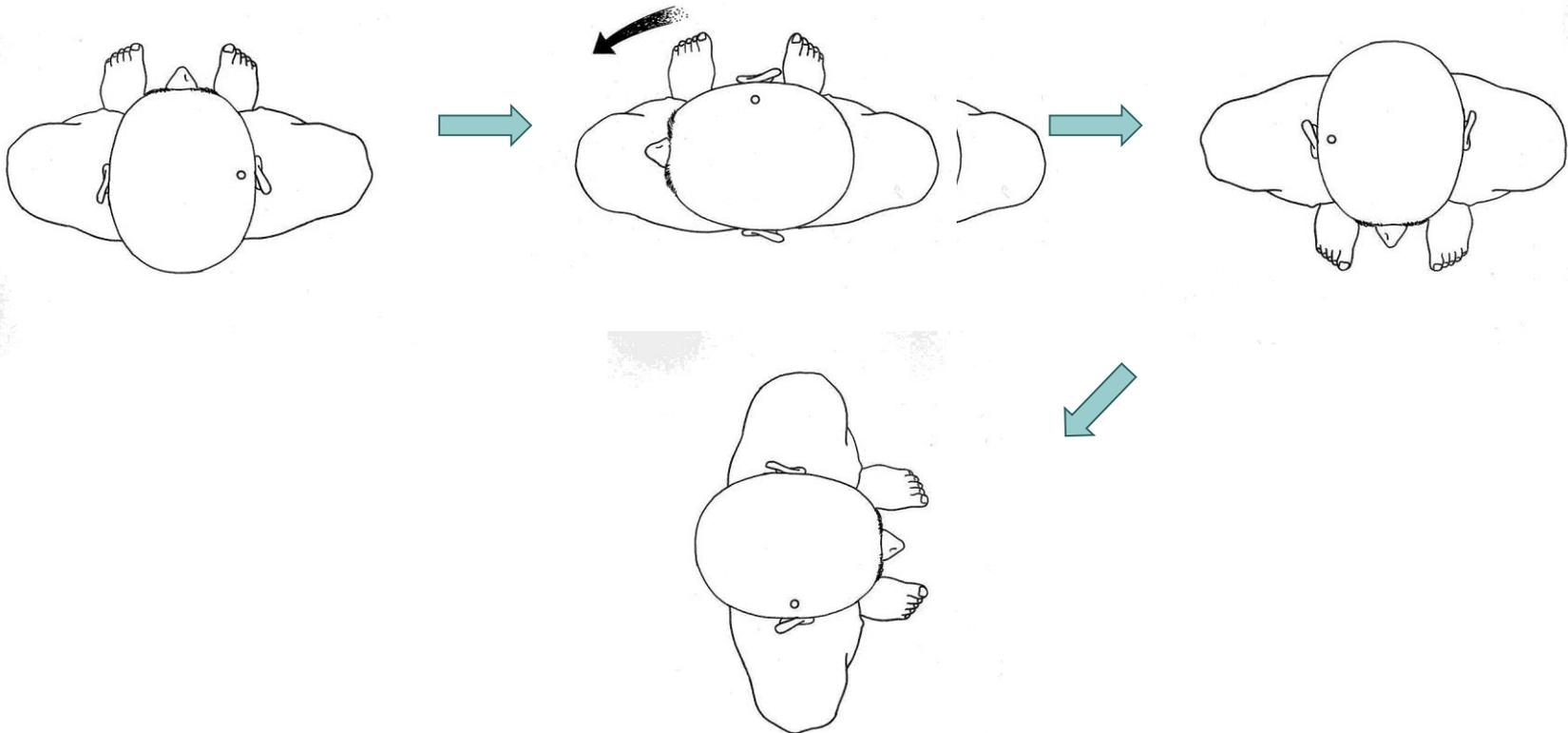


# LATERAL CANAL BPPV MANAGEMENT (geotropic)

- Barbecue rotation (Lempert-Tiel Wilck, 1994)
- Forced Prolonged Position (FPP) (Vannucchi et al., 1994)
- Liberatory manoeuvre (Gufoni-Mastrosimone (1999)

# Barbecue rotation by Lempert (1994)

*Lempert's barbecue maneuver consists of a 270-degree rotation to the healthy side in a lying patient*



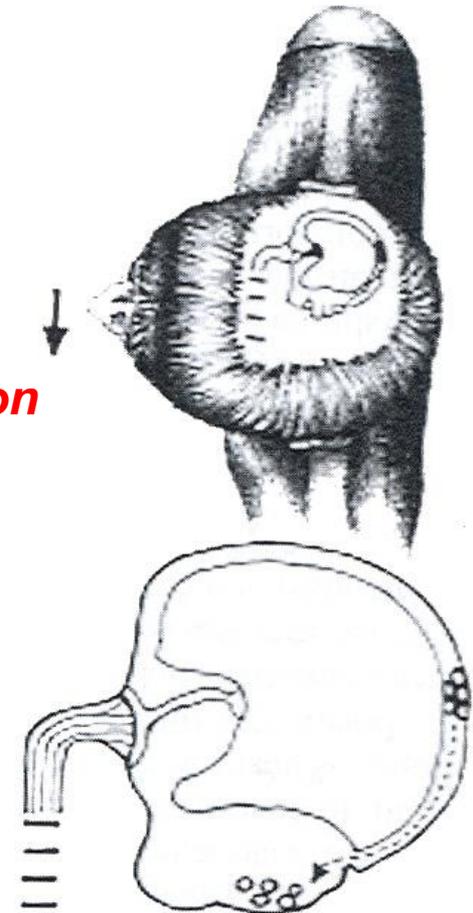
# Forced Prolonged Position

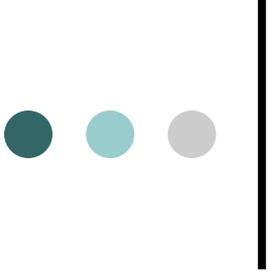
Very simple method: patient merely has to lie on the healthy side (**with affected side up**) for as long as possible.

Outcome treatment: 1-2 days later



*Exit by  
gravitation*





# Barbecue vs FPP

## Barbecue (Lempert)

- 38 patients
- 24 symptom free (63%)
- 4 PC
- 2 apogeotropic

## FPP (Vannucchi)

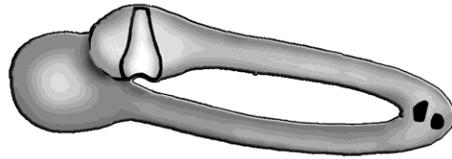
- 56 patients
- 41 symptom free (73%)
- 2 PC

*Nuti D. et al. The management of horizontal-canal paroxysmal positional vertigo. Acta Otolaryngol. (Stockh.), 1998 118: 445–460*



# *Gufoni's maneuver for left LC BPPV (geotropic)*

A



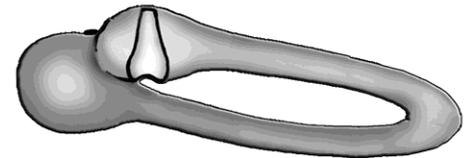
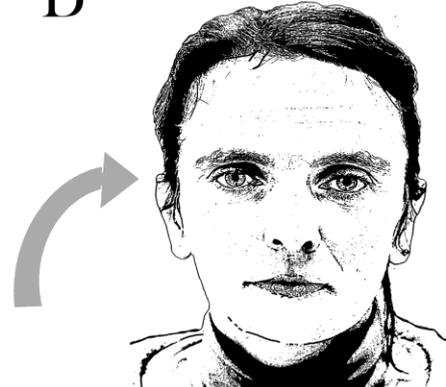
B



C



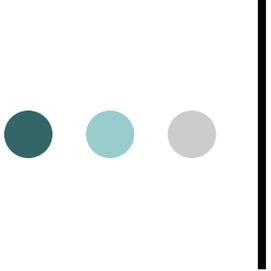
D



*Left LC-BPPV*

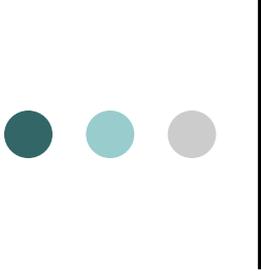






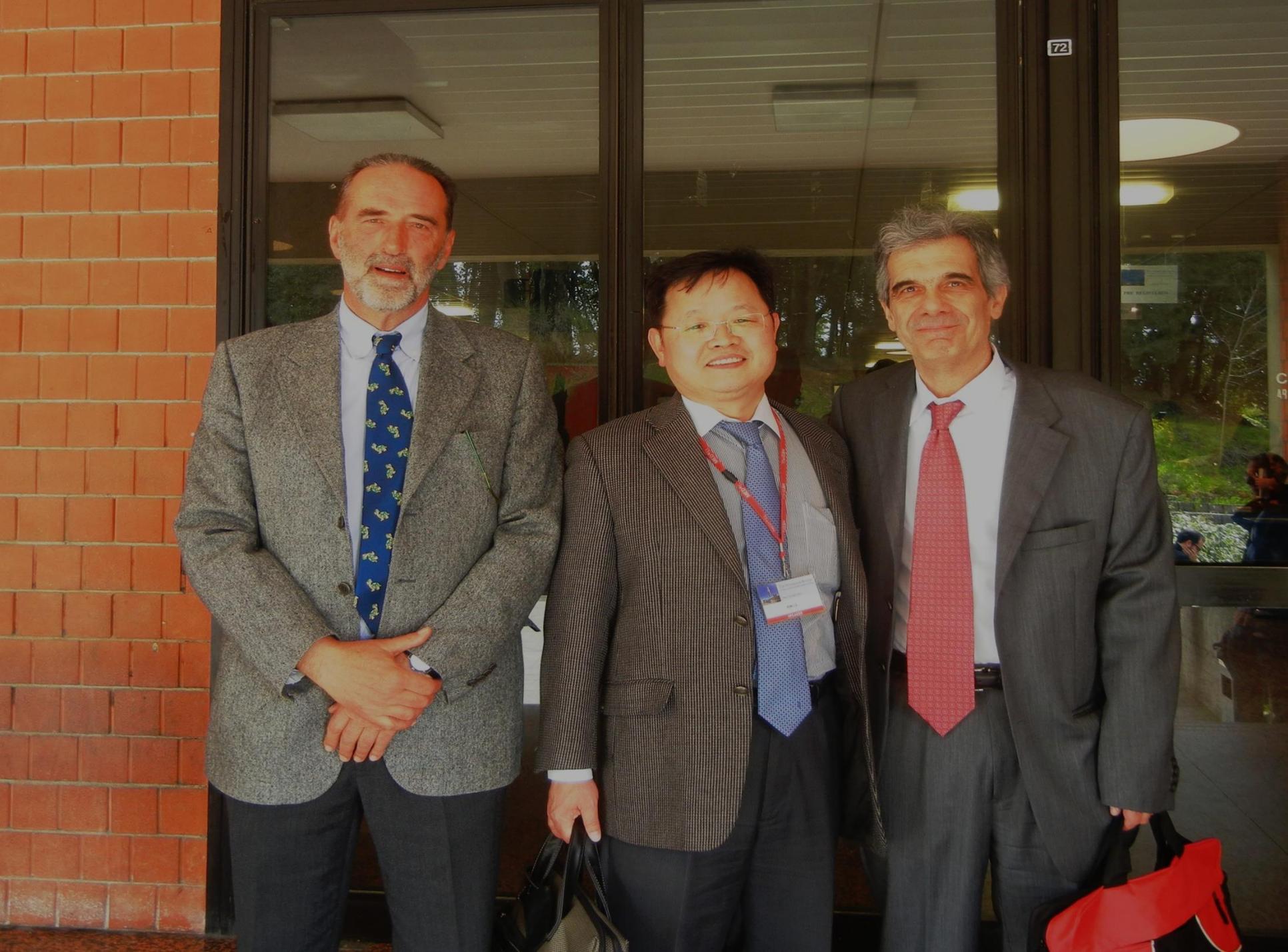
# Lateral canal treatment

- Gufoni's maneuver has been validated with randomized double blind trials (Mandalà et al, 2013; Kim JS, 2013)
- Level A of the Evidence Based Medicine (treatment with established efficacy)

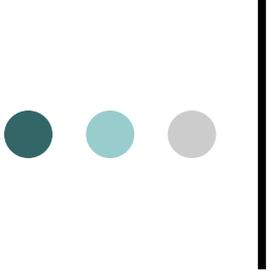


# Lateral canal BPPV management

- We usually perform a single liberatory manoeuvre and then suggest the patients to lie on the healthy side the following night

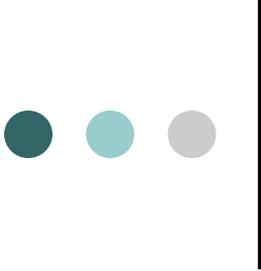


72



# Apogeotropic nystagmus

- Horizontal
- Direction changing
- Beats towards the **uppermost** ear on the two sides
- Usually more intense towards one side (affected side)
- 1) Persistent and long lasting
- 2) Paroxysmal and transitory (lasting longer than in PC-BPPV)



## How to manage LC BPPV in the apogeotropic form?

- Many suggestions in recent years
- FPP and/or Gufoni's maneuver on the affected side and then on the healthy side if apogeotropic nystagmus has become geotropic (two steps procedure)
- Gufoni's modified maneuver (one step)
- Zuma e Maya, 2016 (one step)

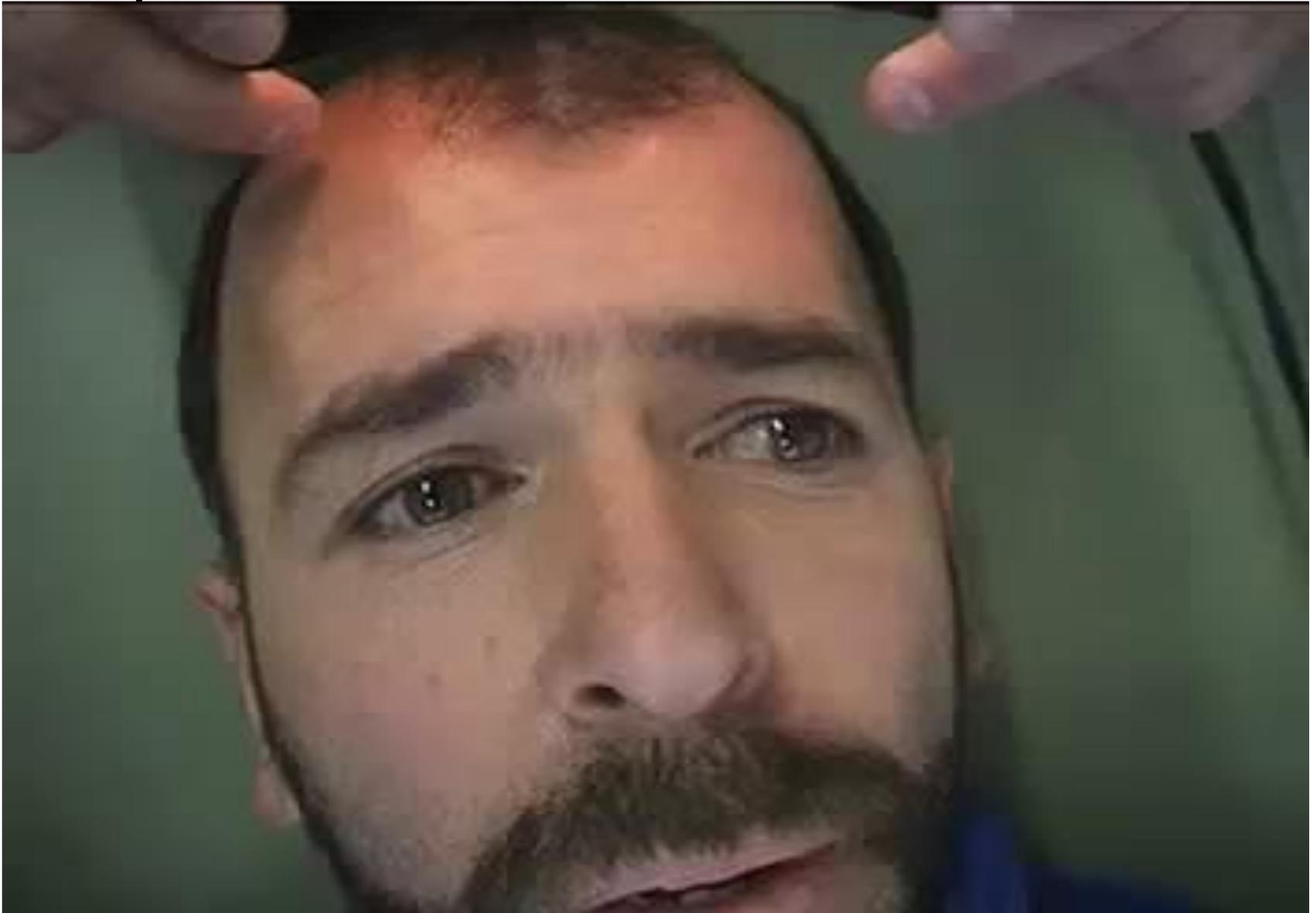
*Left LC BPPV (apogeo)*



*Gufoni to the affected side (left)*



*Left LC BPPV (geo)*

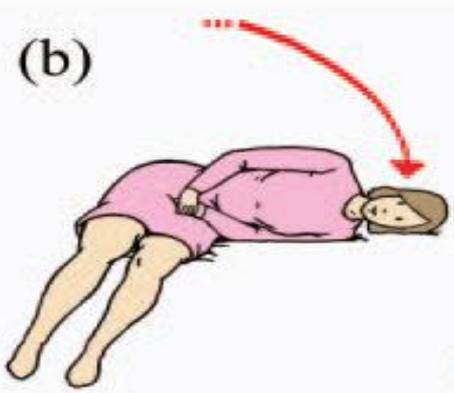


A

(a)



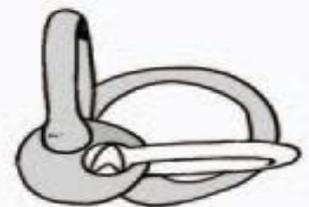
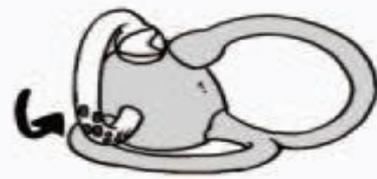
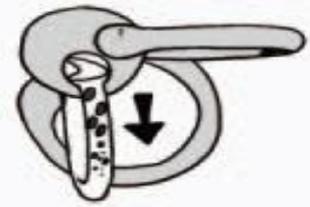
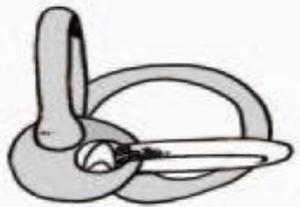
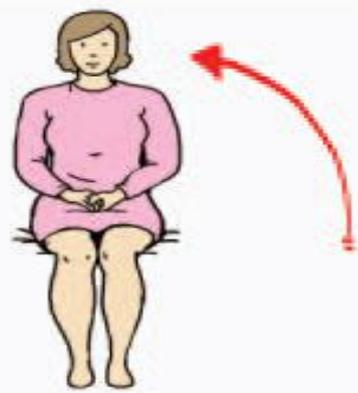
(b)



(c)

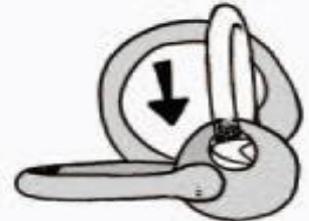
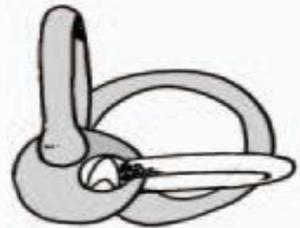
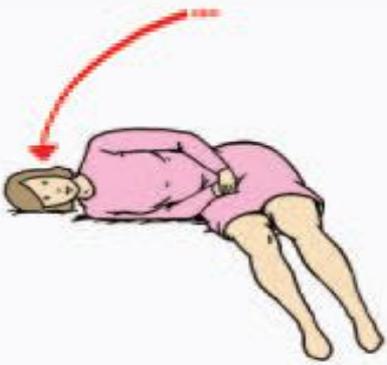


(d)

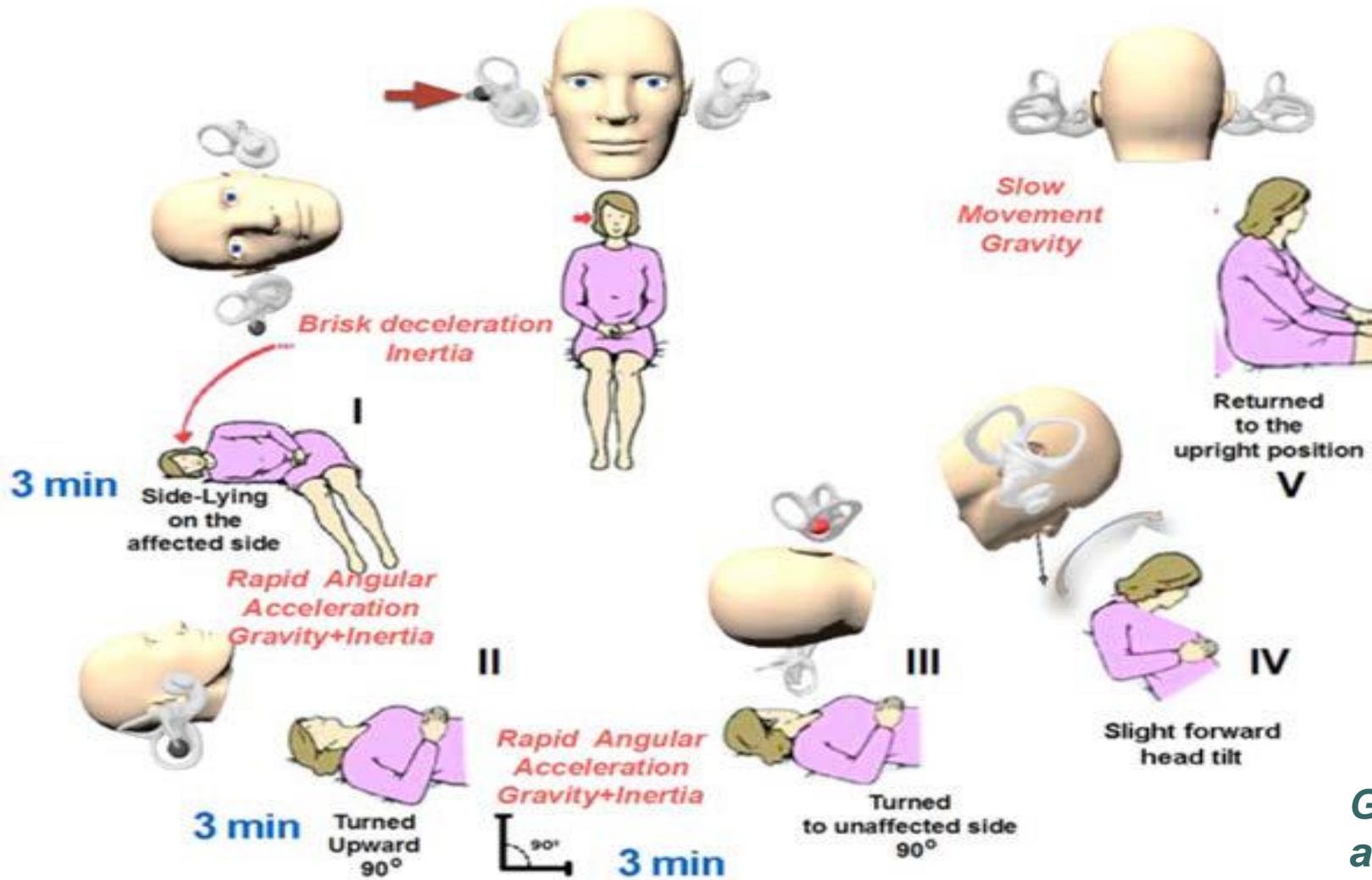


B

Sham  
maneuver



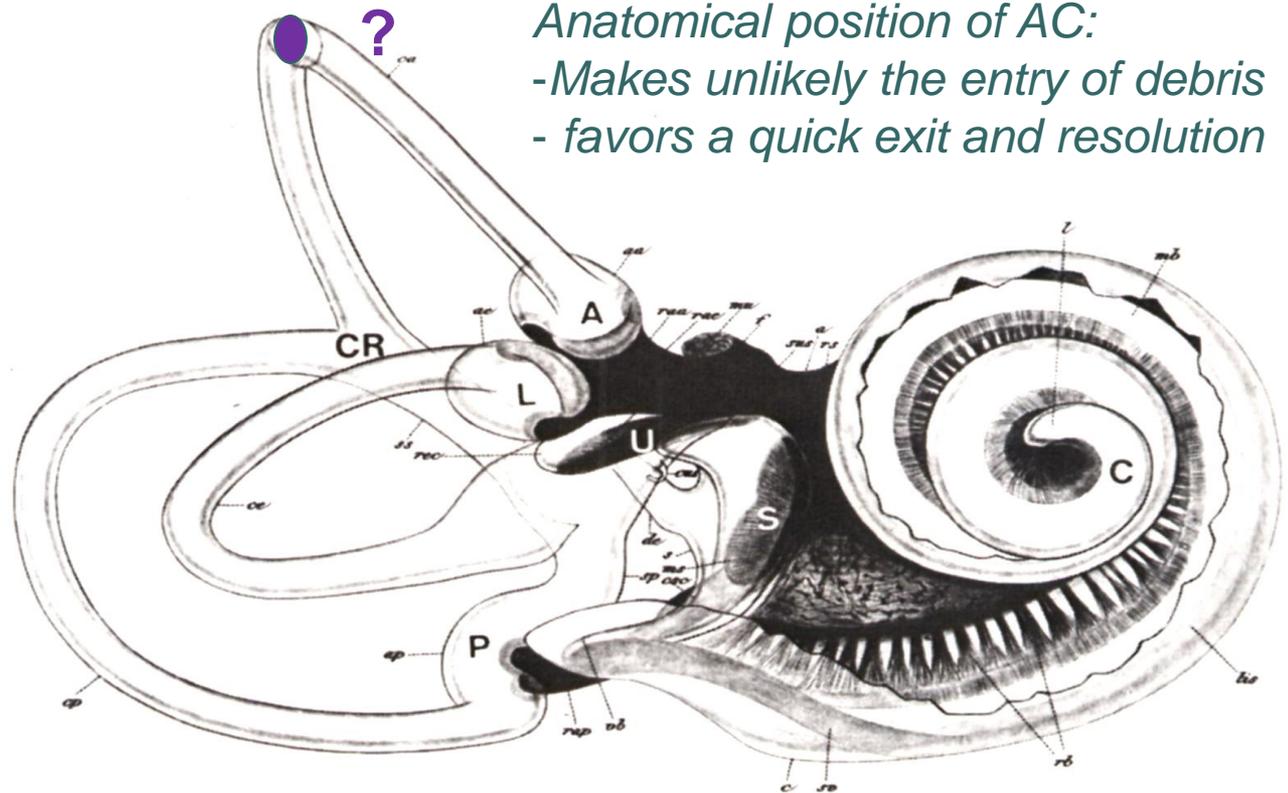
# Right apogeotropic LC BPPV (Zuma e Maia, 2016)



*Gufoni and Barbecue mixture*

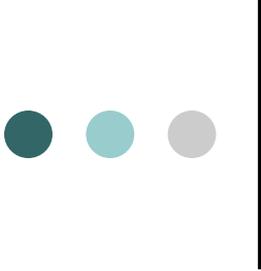
# Anterior (superior) Canal BPPV??

- Not well established entity
- Controversy as to its existence
- Controversy as to its treatment



*Anatomical position of AC:  
-Makes unlikely the entry of debris  
- favors a quick exit and resolution*





# Anterior canal BPPV ??

- **Many patients with positional downbeat nystagmus whose characteristics are difficult to justify:**
  - *PN elicited in both Dix-Hallpike positions and especially with head hanging*
  - *torsional component often not detected (vertical PN in 60%)*
  - *dynamic reversal often not detected (>80%)*
  - *lack of paroxysm*

## PAPER

Positional down beating nystagmus in 50 patients: cerebellar disorders and possible anterior semicircular canalolithiasis

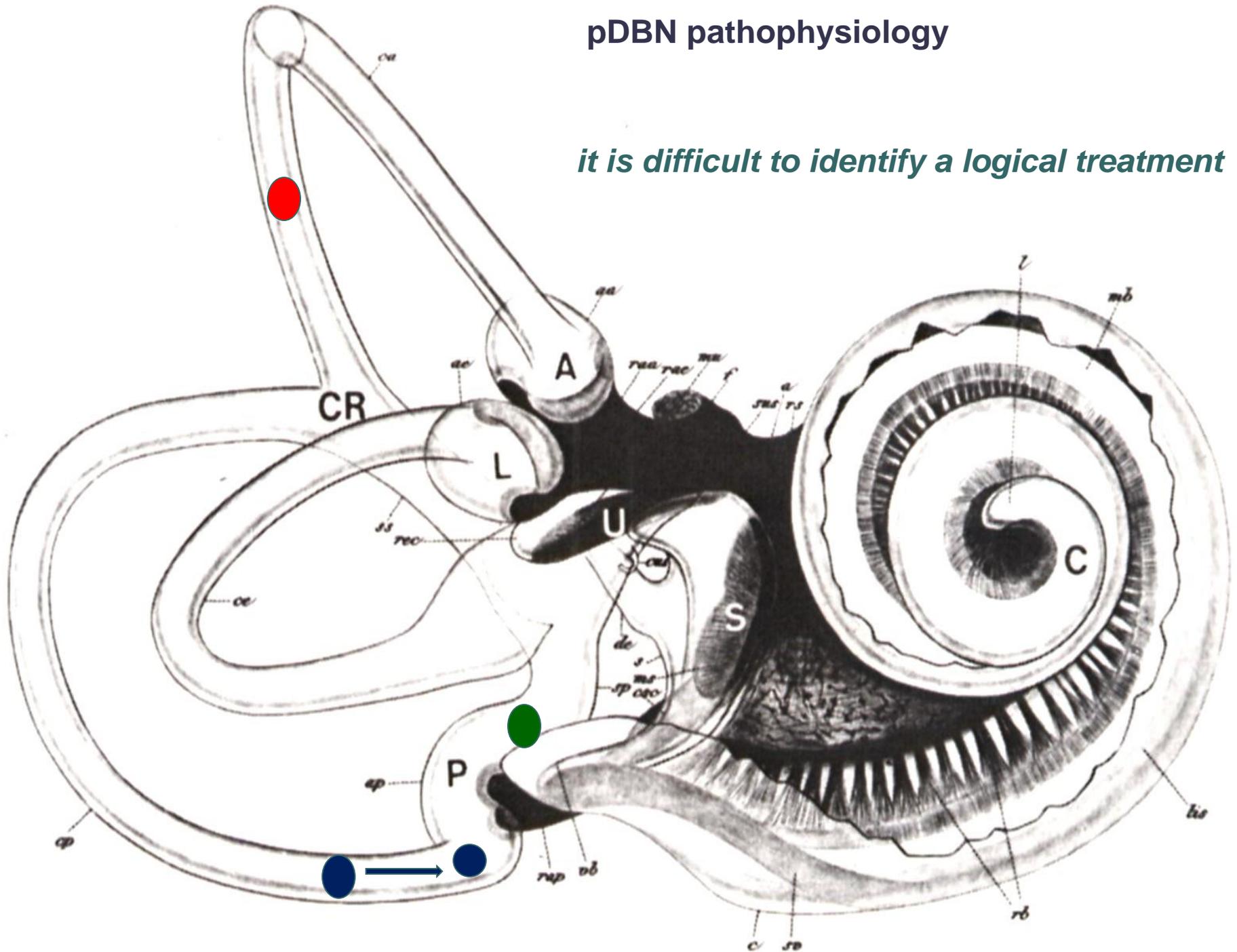
P Bertholon, A M Bronstein, R A Davies, P Rudge, K V Thilo

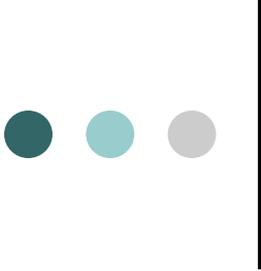
## Natural course of positional down-beating nystagmus of peripheral origin

Jacopo Cambi · Serena Astore · Marco Mandalà · Franco Trabalzini · Daniele Nuti

# pDBN pathophysiology

*it is difficult to identify a logical treatment*

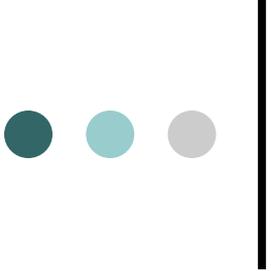




# Treatment of Anterior Canal PPV:

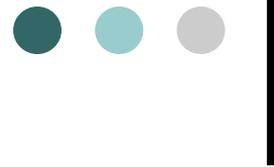
there has been growing interest over the last 20 years

- Honrubia et al. (1999) (Reverse Epley)
- Rahko T (2002)
- Crevits L (2004)
- Kim YK et al (2005)
- Yacovino (2009)
  
- Canal Plugging (Brantberg & Bergenius 2002)



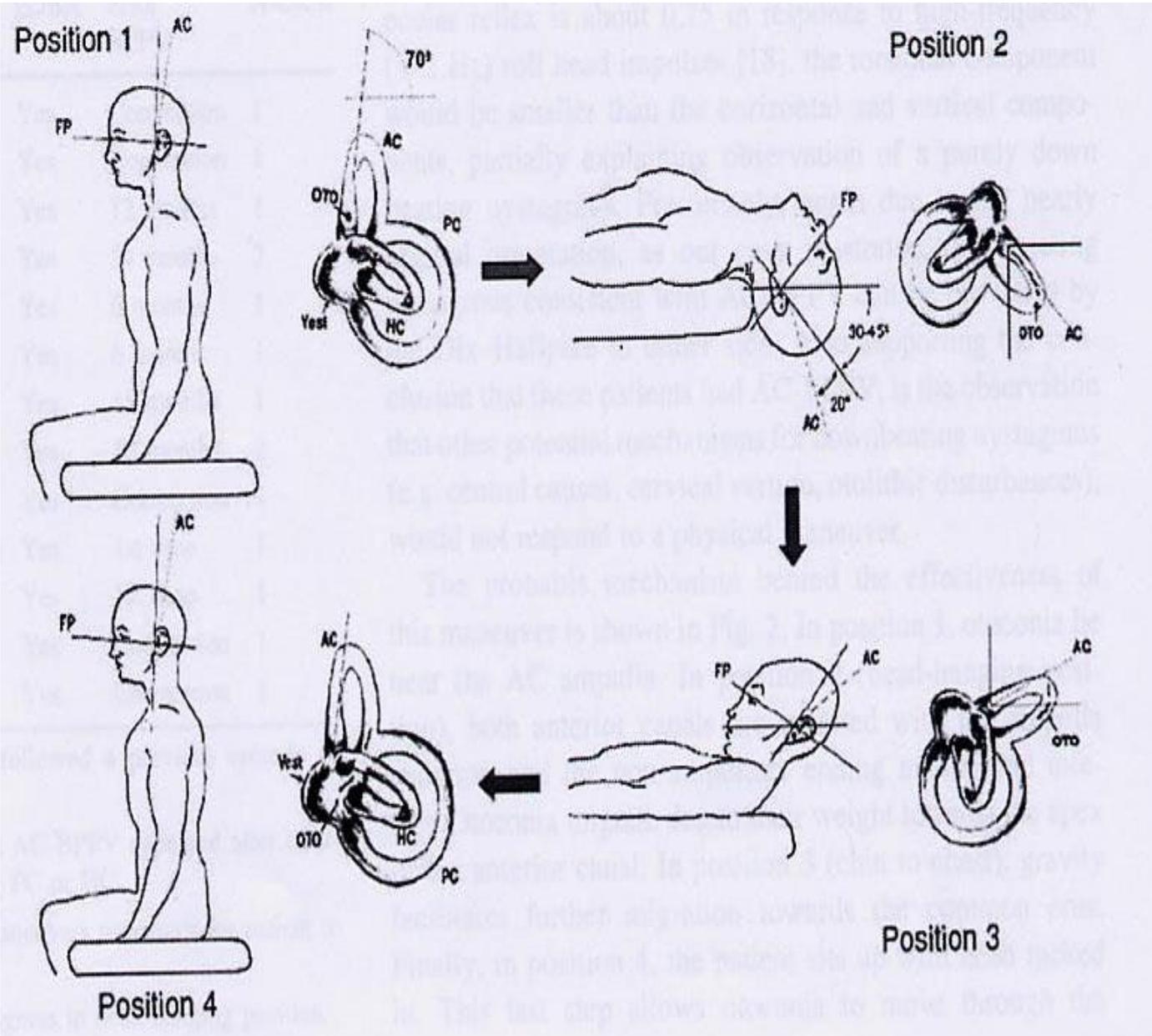
# pDBN of peripheral origin

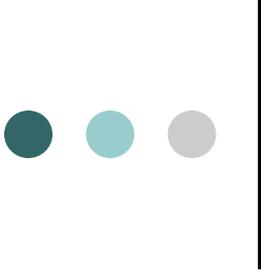
- Many physical procedures have been proposed for the treatment of AC-BPPV but at present, no controlled studies are available, and their effectiveness is sometimes questionable



*Yacovino et al, 2009*

*Rare immediate recovery*





## pDBN (50 consecutive patients)

- Spontaneous remission in 24 patients (48%) in the first week and in 48 patients (96%) within 4 weeks, without performing any specific treatment
- Important to consider when the efficacy of the physical treatment is evaluated

### **Natural course of positional down-beating nystagmus of peripheral origin**

Jacopo Cambi · Serena Astore · Marco Mandalà ·  
Franco Trabalzini · Daniele Nuti



THANK YOU!!!

