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# BENIGN PAROXYSMAL VERTIGO IN CHILDHOOD

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# BENIGN PAROXYSMAL VERTIGO IN CHILDHOOD

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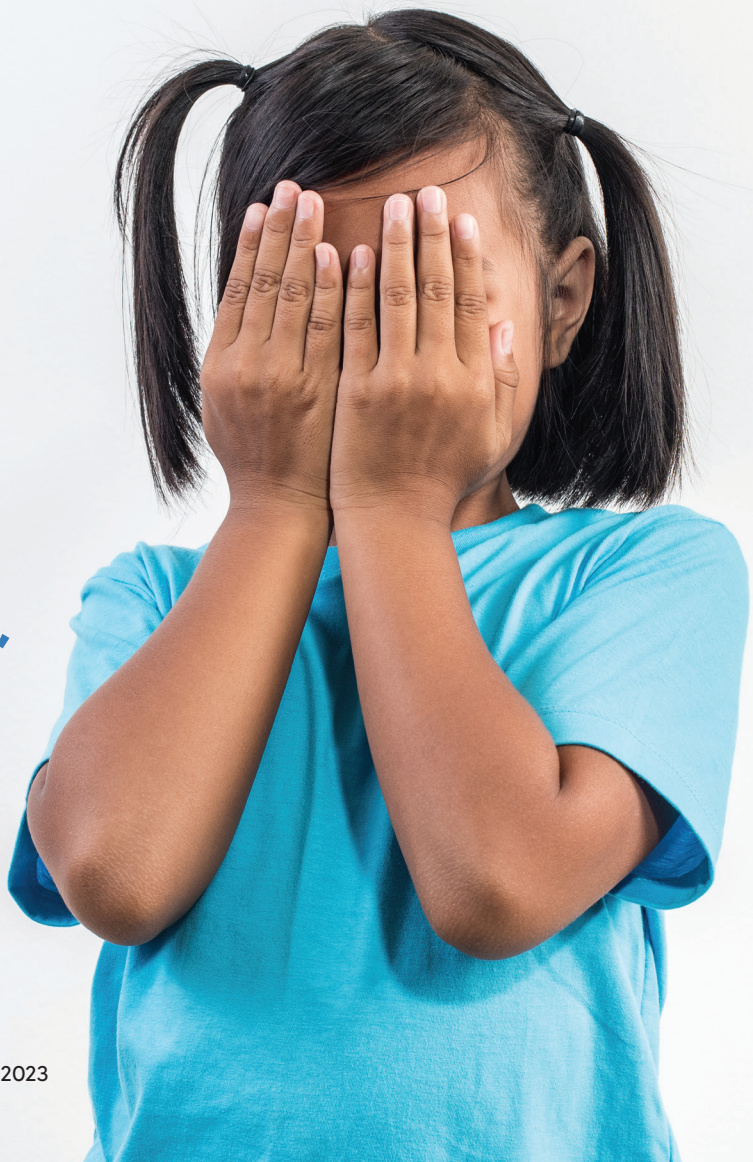
This month's bulletin presents a brief report on Benign Paroxysmal Vertigo of Childhood (BPVC). BPVC is the most common vestibulopathy in children, often starting around 3 to 4 years of age, in which the child has sudden attacks of vertigo lasting from minutes to days.

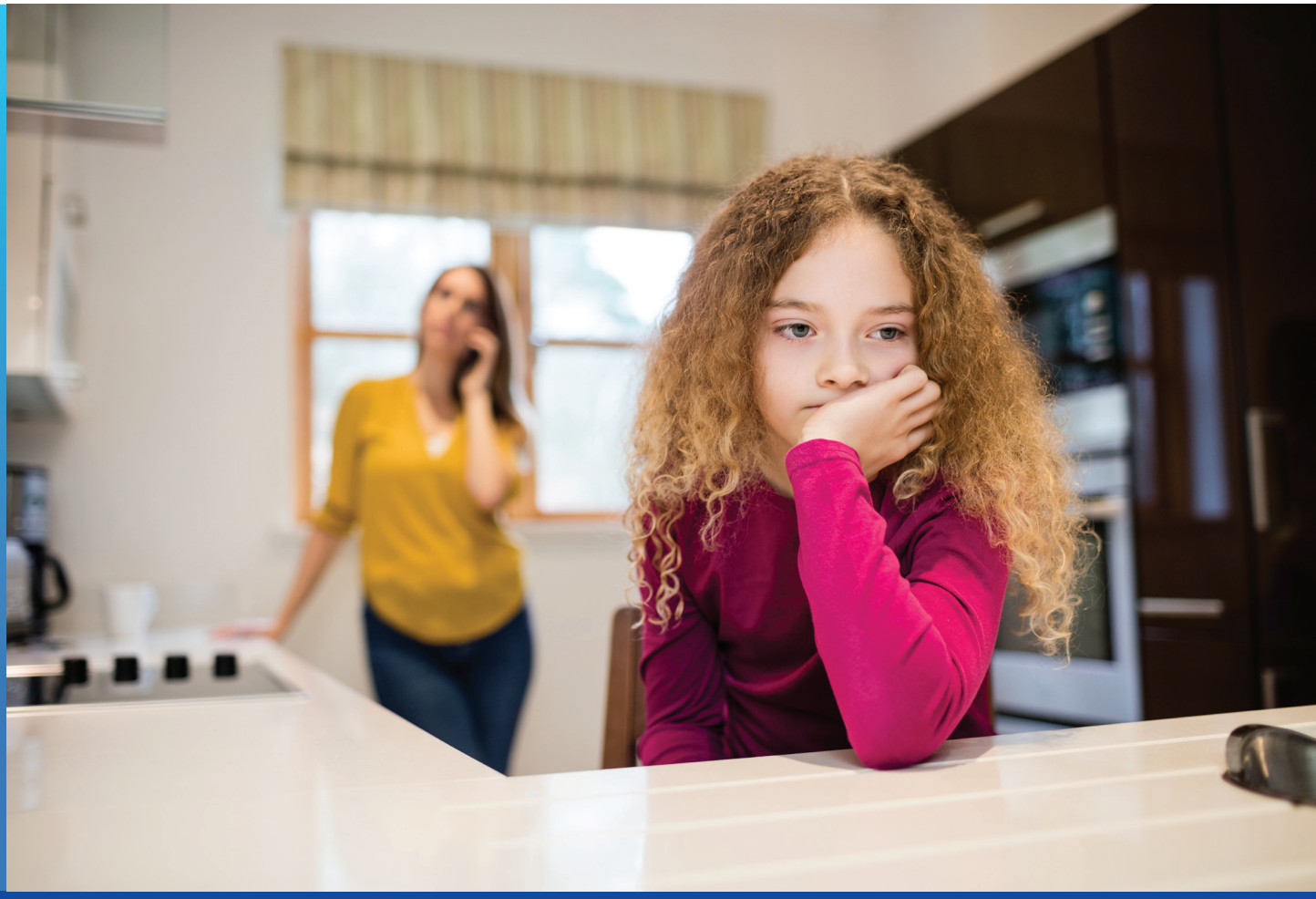
**THESE EPISODES MAY BE ACCOMPANIED BY NAUSEA, VOMITING, NYSTAGMUS (RHYTHMIC EYE MOVEMENTS), AND PALLOR, AS WELL AS INTOLERANCE TO SOUNDS (PHONOPHOBIA), SMELLS (OSMOPHOBIA), AND LIGHT (PHOTOPHOBIA).**



Children with BPVC typically develop vestibular migraine in adolescence, meaning that the condition can be considered a migraine precursor.

Faced with this conclusion, the Bárány Society and the International Headache Society decided to change the term BPVC to vestibular migraine of childhood (VMC).

**Parents, family members, and close friends often report that children with vestibulopathy are very agitated, inattentive, and clumsy.**

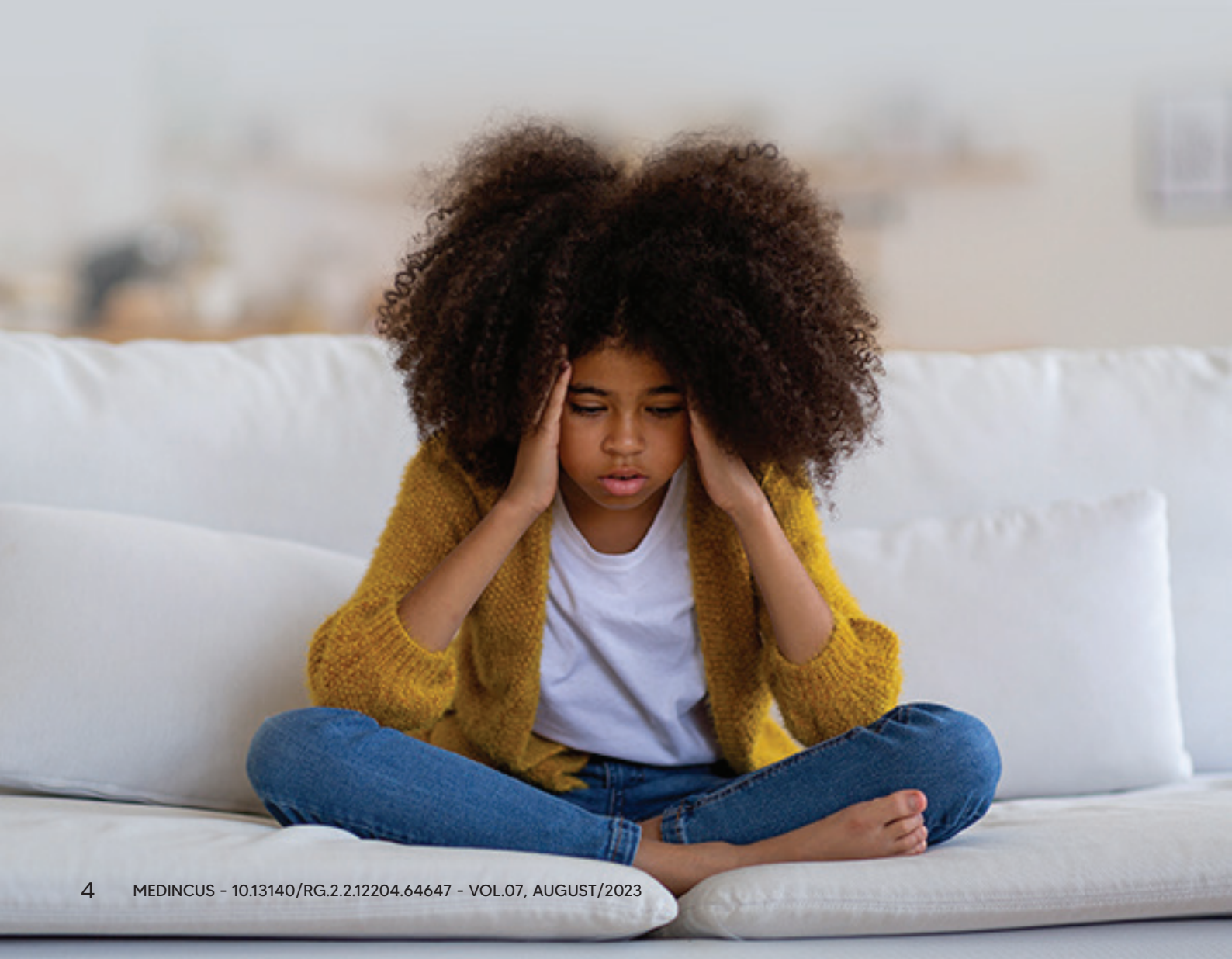


They often fall and frequently hit furniture, toys, or stairs. In addition, they may show changes in neuropsychomotor development – delays in crawling, walking, or holding their head upright. There are reports of associated difficulties in learning, speech, and reading and writing.

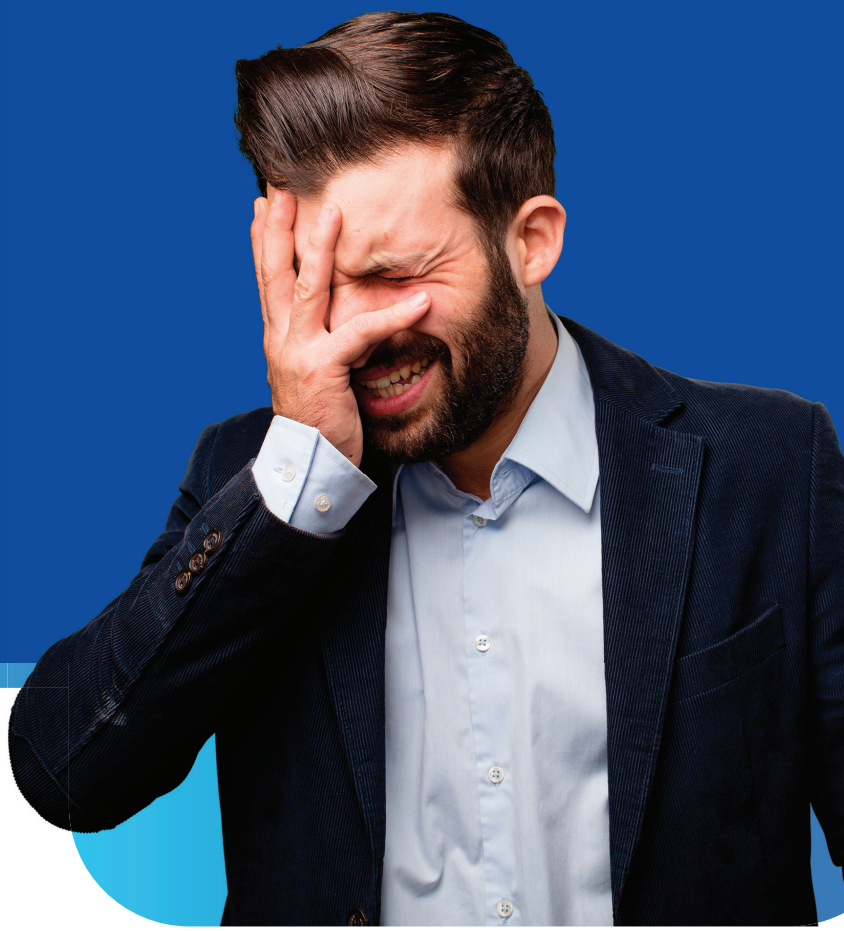
Some authors consider vestibulopathy in the pediatric population as a rare disease with a prevalence between 0.4% and 8%, but others observe almost 15% involvement.

In general, the prevalence is probably underestimated and underdiagnosed because of the difficulty in diagnosing young children, since the complaint that “things are spinning”, the classic symptom of vertigo in adults, cannot be easily verbalized by children.

**Children are often unable to understand and describe the illusory sensation of movement, and so it is important that parents and the evaluator are aware of other signs, such as fear of the dark, bedwetting that persists into advanced childhood, isolation, and aversion to spinning toys.**



**YOU MAY HAVE HEARD ABOUT BENIGN PAROXYSMAL POSITIONAL VERTIGO (BPPV), THE WELL KNOWN DISEASE AFFECTING SENSING CRYSTALS IN THE INNER EAR.**



**BPPV IS RELATED TO HEAD MOVEMENT, WHICH CAUSES BRIEF AND INTENSE EPISODES OF VERTIGO IN ADULTS AND IS THE MOST FREQUENT CAUSE OF DIZZINESS IN ADULTS.**

However, BPVC/VMC differs from BPPV, since BPVC/VMC is not caused by the displacement of crystals in the inner ear, but instead is a specific childhood disease with pathophysiology or marker not yet determined.

**It should also be noted that children can in fact also have BPPV; however, in this case the condition is more likely to be related to head trauma.**

We strongly recommend an article by Galluzzi and Garavello (2022) which gives a good narrative review of BPVC/VMC.

In their Table 1, the authors present, among other important data, the differences in the diagnosis between BPVC/VMC and BPPV.

For the latter, it is diagnosed using positional maneuvers such as Dix–Hallpike and Pagnini–McClure. According to the International Classification of Headaches (ICHD-2) we can meet the following criterion for BPVC/VMC:

**a) at least 5 episodes that meet criterion b;**

**b) Several episodes of severe vertigo that occur without prior notice and resolve spontaneously;**

**c) Neurological examination within normal limits and audiological and vestibular evaluations between attacks, and**

**d) Normal electroencephalogram.**

For children with suspected BPVC/VMC, it is recommended that there be a specialized multidisciplinary clinical evaluation and complementary audiological and vestibular tests.

**It is essential to begin with a complete anamnesis, directed to both the child and the guardian, including a symptom diary from the parents containing:**

- **observed triggers;**
- **presence of loss of consciousness,**
- **muscle tone, paralysis, or other associated neurological symptoms;**
- **neuropsychomotor development,**
- **school performance, language, socialization;**
- **previous perinatal, delivery, and postnatal history;**
- **presence of risk indicators for hearing loss;**
- **any family history of migraine, vestibulopathies, or hearing loss.**

When performing an otoneurological assessment of children, neuropsychomotor development should be assessed using the Denver II scale or Lefrev's evolutionary neurological examination. In addition, a physical examination is essential and should include neurological assessment for age, description of posture and vital signs, and bedside tests. Audiological evaluations (tone audiometry, speech audiometry, immittance, otoacoustic emissions, electrocochleography, and brainstem auditory evoked potentials) are also indicated, as these are important to rule out associated hearing losses. An ophthalmological evaluation makes it possible to detect visual impairments that may interfere with the vestibulo-ocular reflex or affect the symptoms of visual vertigo.

Depending on the symptomatology and clinical history of each patient, one can also request laboratory tests (for analysis of metabolic disorders), imaging (for investigation of congenital malformations, infectious conditions, and neurological pathologies), and vestibular tests.
When considering vestibular tests, attention should be paid to those that are able to be performed at each age, taking into account the child's cooperativeness, and physical and emotional maturity. The level of neural maturation is also a factor. The entire evaluation needs to be adapted to the child, always thinking about how it can be done playfully. Testing children always requires considering the specific situation and what are the normal parameters for the child's age. It is important to use trained and specialized professionals.

**Among the vestibular tests that can be used in children, the following should be highlighted:**

- **electronystagmography/ videonystagmography with a rotary chair test and a caloric test;**
- **cervical vestibular (cVEMP) and ocular (oVEMP) evoked myogenic potentials;**
- **posturography;**
- **video head impulse test (vHIT).**

Electronystagmography and videonystagmography are tests designed to functionally assess the vestibular system, and can identify the presence of peripheral or central changes.

**They can also detect asymmetry of the labyrinths. They can be performed from 2 months to 8 years of age, depending on the eye movement or reflex being assessed. In the case of the caloric test, it is preferable to only use it after age 7/8 years (especially if the vHIT is normal), as it can cause strong discomfort. For the rotary chair, there are few problems, as a baby can be placed on the parent's lap, allowing the test to be done as early as 6 months of age.**

The cVEMP and oVEMP tests evaluate the otolithic organs (saccule and utricle) and their related neural pathways.

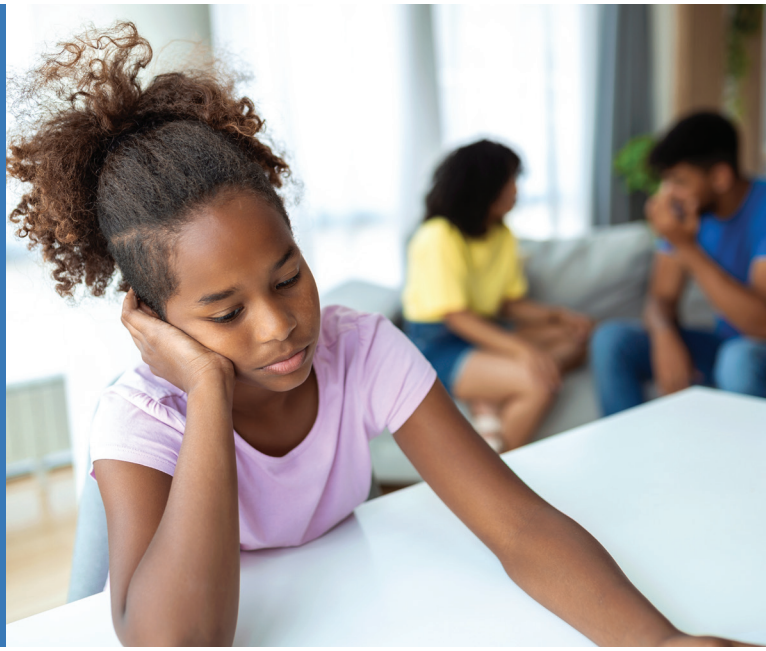
They involve the vestibulo-spinal reflex (VSR) and the vestibulo-ocular reflex (VOR). cVEMP can be performed from the first month of life, while oVEMP can be employed from 3 years of age after the VOR has completely matured. Posturography evaluates body balance through force platforms and provides relevant information about the relationship between the visual, vestibular, and proprioceptive systems.

The vHIT is a rapid test that uses video-oculography glasses and aims to detect vestibular deficits by analysing each of the six semicircular canals. It can be applied to babies from the third month of life onwards.

When investigating VMC, it is important that the professional has an understanding of childhood otoneurology, so that appropriate questions can be asked, remembering that the child may have difficulty reporting feelings of discomfort, imbalance, dizziness, and kinetosis. The child may realize that there is something wrong, but doesn't have the ability to put their feelings into words.

## THE CHILD'S MALAISE CAN END UP INTERFERING WITH FAMILY DYNAMICS, GENERATING ANXIETY, DEPRESSION, OR EXCESSIVE CONCERN WITH THE CHILD'S HEALTH.

**This means that counseling of parents is an essential part of the diagnostic process, and professionals should be ready to reassure parents about the benign nature of BPVC/VMC, as well as emphasizing the importance of early intervention in order to avoid possible motor and cognitive impairments.**



Clear, objective, direct and responsible communication allows parents to understand the subtleties and variables in cases of BPVC/VMC. Once doubts are resolved, the parents or guardians come to knowledge what vestibulopathy means, which can calm them down and consequently convey peace of mind to their children.

**We suggest you follow our publications each month, as we aim to discuss new topics in otoneurology (both for children and adults) in the future.**

**If you would like a specific topic discussed, please contact us by email: msanfins@uol.com.br or @dramisanfins (Instagram).**

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