



# VERTIGO ACADEMY INTERNATIONAL

by the affiliation of Vestibular Italian Society

Joint meeting

2<sup>nd</sup> VIRT<sup>M</sup> Vestibular Implant and Related  
Technologies Meeting

March 09-11, 2023 • Hyatt Regency Belgrade, Serbia

PROGRAM AND ABSTRACT BOOK

Delivered by  
UEMS:  
17 CME  
Credits



[www.vai2023.org](http://www.vai2023.org)





# V. VERTIGO ACADEMY INTERNATIONAL in your pocket!



All the scientific and social content of the meeting is at your fingertips with the mobile app. Mobile app is right with you with its extensive media content from abstract book to meeting photographs!

## HOW CAN I USE THE MOBILE APPLICATION?

For handhelds using iOS (iPhone, iPad); go to the App Store and search for "VAI2023" on the search bar. You can download and install the free application.

For handhelds using Android; first select Google Play. Click on the "Search" button at the right top corner and search for "VAI2023". You can download and install the free application.





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## WELCOME MESSAGES

### V. VERTIGO ACADEMY INTERNATIONAL MEETING



Dear Colleagues, Friends,

I am having the great pleasure of physically meeting again, in Belgrade where its history dates back to at least 7000 BC. This was one of the largest prehistoric cultures of Europe. Thraco-Dacians, Romans, Slavs and Ottomans left their marks on the city. The Danube and Sava rivers encircle this beautiful city.

Within the compelling atmosphere of Covid 19 epidemics we could only proceed with virtual summits to keep our connection online.

As well known the previous meetings of VAI have been held in Antalya, Moscow, Mumbai, and Minsk. Additionally, I wish to mention here that "Vertigo Academy International" (VAI) has been assigned as Scientific Organization of International Vestibular Society.

Currently 129 distinguished vestibular scientists create the faculty of this congress to contribute within three rooms simultaneously for two and a half days. The topics are assigned due to the needs of today's learning objectives.

The most important aspect of the meeting is hosting the second "Vestibular Implant Related Technologies Meeting" which the eminent scientists will discuss on the electrical stimulation of the labyrinth. This is surely the future of treating intractable dizziness problems.

Instructional courses will be part of scientific program as was the case in previous meetings.

I wish to you all inspire the nice atmosphere of Belgrade while being harmonized with the vestibular science that is presented by the masters of the topic.

**Prof. O. Nuri Ozgirgin**

*Chairman*

*V. Vertigo Academy International*



## WELCOME MESSAGES

### 2<sup>ND</sup> VIRTM - VESTIBULAR IMPLANT AND RELATED TECHNOLOGIES MEETING

**Morgana Sluydts & Angel Ramos de Miguel**  
(Chairpersons)



**Raymond van de Berg**  
(Scientific Advisor)



**Angel Ramos Macias**  
(Scientific Advisor)



**O. Nuri Ozgirgin**  
(Honorary Chairman)



Dear Audience,

The vestibular implant is one of the currently examined treatment options for patients with bilateral vestibulopathy. This chronic vestibular syndrome is known for its big impact on the health and quality of life of the patient. Therefore, during the last two decades, the scientific and clinical interest in vestibular implants has increased, leading to more and more scientists becoming involved in this area.

In order to keep up with the progress of the research but also with the future challenges of the vestibular implant, the 2nd Vestibular Implant and Related Technologies meeting (VIRTm) is organized on Friday March 10, 2023 as part of the Vertigo Academy International 2023.

The topics of the lectures and the round table at the end of the day are the following:

- Diagnosis of bilateral vestibulopathy
- Development of the vestibular implant
- Surgical approaches for vestibular implantation
- Intra-operative monitoring
- Alternative approaches for treating bilateral vestibulopathy
- Eligibility and the need for vestibular implantation

Looking forward to seeing you and to discussing the presented data,  
Sincerely,





## ORGANIZING INSTITUTION

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**International Vestibular Society** - <http://www.intvest.org/>



International Vestibular Society was founded in 2018.

While Vertigo Academy International Meetings were progressing with great success there has been a need to create an organization to cover it.

The primary task was to introduce educational perspectives to the field.

The awareness and the level of the knowledge was aimed to be elevated among the physicians in the field. The learning objectives are constituted, a certification program is prepared.



## THE BOARD AND COMMITTEES

### International Executive Committee



**Honorary President**  
Jacques Magnan (France)



**President**  
O. Nuri Ozgirgin (Turkey)



**Vice President**  
Angel Ramos Macias (Spain)



**Secretary**  
Soumit Dasgupta (UK)

### Members



Robert Gurkov (Germany)



Michel Lacour (France)



J. Antonio López Escamez (Spain)



Carmona Sergio (Argentina)



Badr El Din Mostafa (Egypt)



Avi Shupak (Israel)



Maurizio Barbara (Italy)



Anirban Biswas (India)

### Local Registered Committee



**President**  
O. Nuri Ozgirgin (Turkey)



**Vice President**  
Tayfun Kirazlı (Turkey)



**Secretary**  
Nazım Korkut (Turkey)



**Treasurer**  
Orhan Yılmaz (Turkey)



Levent Naci Özlüoğlu (Turkey)



Neşe Çelebisoy (Turkey)



Enis Alpin Güneri (Turkey)



### V. VAI ORGANIZING COMMITTEE

#### Chairman



O. Nuri Ozgirgin (Turkey)

#### Vestibular Italian Society



Augusto Pietro Casani (Pisa), President

#### Scientific Secretaries



Soumit Dasgupta (UK)



F. Necdet Ardic (Turkey)

#### Organizing Secretary



Tuncay Özçelik (Turkey)

#### Local Committee



Nenad ARSOVIC, M.D



Milan STANKOVIC, M.D

### V. VAI MEETING INFORMATION

Vertigo Academy International Meetings is a Scientific Organization of International Vestibular Society. Its Academic Program and learning objectives offer substantial opportunities to the fellows interested with the topic.

Following four successive previous meetings in Turkey, Russia, India and Belarus, the V. Vertigo Academy International Meeting will be held in Belgrade.



I. Vertigo Academy International  
16-17 November 2013 Antalya, Turkey



II. Vertigo Academy International  
22-23 May 2015 Moscow, Russia



III. Vertigo Academy International  
02-04 March 2017 Mumbai, India



IV. Vertigo Academy International  
25-28 April 2019 Minsk, Belarus





# 2<sup>nd</sup> VIRTM Vestibular Implant and Related Technologies Meeting

## 2<sup>nd</sup> VIRTM ORGANIZING COMMITTEE



**Honorary President**  
O. Nuri Ozgirgin (Turkey)



Angel Ramos de Miguel



Morgana Sluydts

## Scientific Advisory Board Directors



Angel Ramos Macias



Raymond van de Berg

## 1<sup>st</sup> VIRTM April 16, 2021



## SCIENTIFIC INFORMATION

### Registration and Information Desk

The registration and information desk is located in the lobby area (main floor) of the Hyatt Regency Belgrade Hotel during the following hours:

March 9 <sup>th</sup> , 2023	10:00-20:00
March 10 <sup>th</sup> , 2023	08:00-19:30
March 11 <sup>th</sup> , 2023	08:00-18:30

### Official Language of the Meeting

Official language of the meeting and of correspondence is English. There will be no simultaneous translation.

### Name Badges

Please wear your name badges at all times during the Meeting. Badges are color coded as follows:

<b>Speaker, Organizing Committee Members</b>	<b>: Red</b>
<b>Participants</b>	<b>: Dark Blue</b>

### Speakers' Room

Speakers should hand in presentations in the slide check and speakers' room as soon as possible after their arrival. The name is **KALEMEGDAN ROOM** and located ground floor of the Hyatt Regency Belgrade Hotel. Speakers must ensure that all files needed for the presentation are included in the media of their choice (USB Device etc.) and they should be tested on a computer other than that on which it was created. Prior to the scientific session, the authors should review their presentations to ensure that it transferred properly.

### CME Accreditation



The V. Vertigo Academy International & 2nd VIRTUM Vestibular Implant and Related Technologies Meeting, Belgrade, Serbia, 09/03/2023-11/03/2023 has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) with **17 European CME credits (ECMEC®s)**.

Each medical specialist should claim only those hours of credit that he/she actually spent in the educational activity."

"Through an agreement between the Union Européenne des Médecins Spécialistes and the American Medical Association, physicians may convert EACCME® credits to an equivalent number of AMA PRA Category 1 Credits™. Information on the process to convert EACCME® credit to AMA credit can be found at [www.ama-assn.org/education/earn-credit-participation-international-activities](http://www.ama-assn.org/education/earn-credit-participation-international-activities).

"Live educational activities, occurring outside of Canada, recognised by the UEMS-EACCME® for ECMEC®s are deemed to be Accredited Group Learning Activities (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

### Certificates of CME

CME Certificates will be available in the lobby area (ground floor) of the Hyatt Regency Belgrade Hotel. To receive your CME Certificate, please first complete the questionnaire on the laptop provided. Your certificate will be printed upon completion of the questionnaire.

### Certificates of Attendance

Certificates of attendance will be available at the Congress Registration and Information Desk.

### E-Posters

E-posters kiosks will be located at the e-Poster Area between 09 and 11 March 2023 in the foyer of the Main Hall (Crystal I+II Hall). The presentation date and times are listed below. e-Poster presentations will take place during coffee breaks.

March 10<sup>th</sup>, 2023 between 10:45-11:15

March 10<sup>th</sup>, 2023 between 14:45-15:15

&

March 11<sup>th</sup>, 2023 between 10:45-11:15

March 11<sup>th</sup>, 2023 between 14:45-15:15

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### Official Airline Partner



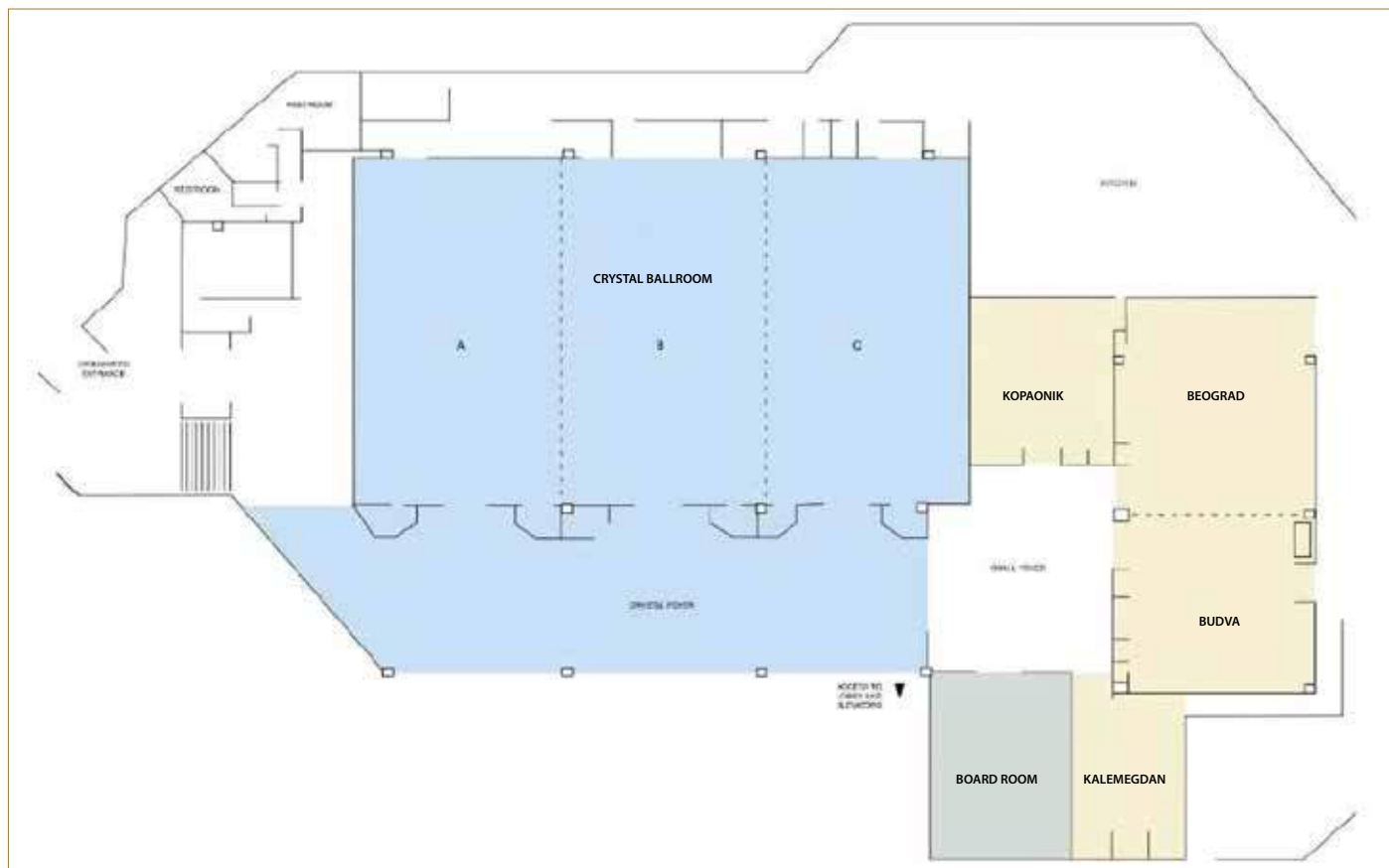
**TURKISH AIRLINES**

Turkish Airlines is the official airline of "V. Vertigo Academy International", special discounts are offered for all delegates. To proceed with the online booking tool, please visit Turkish Airlines promocode website and use the event code "030TKM23" under the Promotion code section



## LOCATION OF ACTIVITIES

### Hyatt Regency Belgrade Hotel (Meeting Venue)



**Registration and Information Desk**

**Speaker Ready Room**

**Mail Hall**

**Room II**

**Workshop Room I**

**Workshop Room II**

**Free Papers Room**

**Opening Ceremony Dinner (Cocktail Prolonge)**

**Exhibition and Poster Area**

**Coffee Break Area**

**Lunch Area**

**IVS International Committee Meeting Room**

**Organizing Secretariat & Storage**

: Hotel Lobby Area

: Kalemegdan

: Crystall I-II

: Crystall III

: Beograd – Budva

: Studio II

: Studio I

: Foyer of the Main Hall

: Foyer of the Main Hall

: Foyer of the Main Hall

: Foyer of the Orchid Ballroom & Oasis Café

: Board Room

: Kopaonik Room





## FACULTY LIST

Akdal, Gülden	Turkey
Anand, Rajiv	India
Ardıç, Fazıl Necdet	Turkey
Arjundas, Deepak	India
Armato, Enrico	Italy
Arsovic, Nenad	Serbia
Asprella, Giacinto	Italy
Assaban, Franck	France
Barbara, Maurizio	Italy
Barin, Kamran	USA
Bassim, Marc	UAE
Battelino, Saba	Slovenia
Bayramoglu, İsmet	Turkey
Bencsik, Beáta	Hungary
Bhandari, Anita	India
Bisdorff, Alexandre	Luxembourg
Biswas, Anirban	India
Bozanic Urbancic, Nina	Slovenia
Casani, Augusto Pietro	Italy
Castellucci, Andrea	Italy
Castillo Bustamente, Melissa	Colombia
Ceranic, Borka	Serbia
Chen, Zheng-Yi	USA
Covelli, Edoardo	Italy
Çelebisoy, Neşe	Turkey
Çelik, Onur	Turkey
Cisneros, Juan Carlos	Mexico
Dasgupta, Soumit	UK
de Linera Alperi, Marta Alvarez	Spain
Della Volpe, Antonio	Italy
Długaiczek, Julia	Switzerland
Devocht, Elke	The Netherlands
Dorasala, Srinivas	India

El Din Mostafa, Badr	Egypt
Elsherif, Mayada	Egypt
Faralli, Mario	Italy
Felipe, Franco Carlos	Colombia
Gadre, Arun	USA
Garaycochea, Octavio	Spain
Gimmon, Yaov	Israel
Giannuzzi, Anna Lisa	Italy
Giroto, Giorgia	Italy
Görür, Kemal	Turkey
Guerkov, Robert	Germany
Guinand, Nils	Switzerland
Güneri, Enis Alpin	Turkey
Hamid, Mohamed	USA
Hedjoudje, Abderrahmane	USA
Hermann, Ruben	France
Ikezono, Tetsuo	Japan
Imai, Takao	Japan
Kameswaran, Mohan	India
Kaplan, Daniel	Israel
Kheradmand, Amir	USA
Kiroğlu, Mete	Turkey
Kingma, Herman	The Netherlands
Kirazlı, Tayfun	Turkey
Koç, Ahmet	Turkey
Koo, Ja-won	South Korea
Korkut, Nazım	Turkey
Kumar, Ajay	India
Lacour, Michel	France
Lauda, Lorenzo	Italy
Leblans, Marc	Belgium
Lee, Ambrose	Canada
Lennox, Amy	UK



## FACULTY LIST

Lesinskas, Eugenijus	Lithuania
Loos, Elke	Belgium
Magnan, Jacques	France
Magnusson, Mans	Sweden
Mandala, Marco	Italy
Manzari, Leonardo	Italy
Margani, Valerio	Italy
Martellucci, Salvatore	Italy
Martin-Sanz, Eduardo	Spain
Martinez, Norberto	Phillippines
Matsushima, Junichi	Japan
Meldrum, Dara	Ireland
Milkov, Mario	Bulgaria
Nuti, Daniele	Italy
Özgirgin, Nuri	Turkey
Pawar, Vishal	UAE
Perez, Ronen	Israel
Perez, Nicolas	Spain
Plontke, Stefan	Germany
Prepageran, Narayanan	Malaysia
Quaranta, Nicola	Italy
Ramos de Miguel, Angel	Spain
Ramos Macias, Angel	Spain
Ratnayake, Sudhira	UK
Ricci, Giampietro	Italy
Richard-Vitton, Thomas	France
Saeed, Shakeel	UK
Saliba, Issam	Canada
Salman, Nour	UAE
Sanna, Mario	Italy
Sanz, Eduardo Martin	Spain
Satar, Bülent	Turkey
Savundra, Peter	UK

Sergio, Carmona	Argentina
Shupak, Avi	Israel
Skarzynsky, Piotr	Poland
Sluydts, Morgana	Belgium
Staab, Jeffrey	USA
Stankovic, Milan	Serbia
Sung Kwang, Hong	South Korea
Szigeti, Judit F.	Hungary
Szirmai, Agnes	Hungary
Teggi, Roberto	Italy
Trabalzini, Franco	Italy
Umaiorubahan, Meenakshisundaram	India
Vajda, Dóra	Hungary
Van de Berg, Raymond	The Netherlands
Wiener Vacher, Sylvette	France
Villegas-Gonzalez, Mario Jesús	Mexico
Volpe, Benjamin	Belgium
Vundavalli, Pradeep	Italy
Widdershoven, Josine	The Netherlands
Wuyts, Floris L	Belgium
Yacovino, Dario	Argentina
Yagi, Chihiro	Japan
Yalçın, Şinasi	Turkey
Yalınay-Dikmen, Pınar	Turkey
Yigit, Ozgur	Turkey
Zarowski, Andrej	Belgium
Zaytoun, George	Lebanon
Zee, David	USA



## TIME TABLE OF THE PROGRAM

INSTRUCTIONAL COURSES					
March 09, 2023 - Thursday					
ARRIVALS					
	MAIN HALL (CRYSTAL I – II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
14:30 – 15:20	Instructional Course 1	Instructional Course 3	Instructional Course 5		Hands-on Course 1
15:20 – 15:30	Break				
15:30 – 16:20	Instructional Course 2		Instructional Course 6	Instructional Course 8	Hands-on Course 2
16:20 – 16:30	Break				
16:30 – 17:20		Instructional Course 4	Instructional Course 7		Hands-on Course 3
17:20 – 18:00	Break				
18:00 – 18:15	Opening Speech				
18:15 – 18:30	Opening Speech				
18:30 – 18:45	Live Music Performance with Habanera Quartet				
18:45 – 19:15	Opening Lecture Jack Magnan (France)				
19:15 – 20:15	Opening Ceremony at the Main Hall Foyer with Habanera Quartet Live Performance				

MEETING PROGRAM					
March 10, 2023 – Friday					
	MAIN HALL (CRYSTAL I – II)	ROOM II - 2 <sup>nd</sup> VIRTM HALL (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
		Invited Lecture 1			
08:30 – 09:45	Plenary Panel 1	Invited Lecture 2			
09:45 – 10:45	Industry Sponsored-Session	Plenary Session 1			
10:45 – 11:15	Coffee Break				
11:15 – 12:30	Italian Vestibular Society Session	Plenary Session 2	Keynote Lectures 1	Debate Session 1	Hands-on Course 4
12:30 – 13:30	Lunch				
13:30 – 14:45	Plenary Panel 2	Plenary Session 3	Prize Session		
14:45 – 15:15	Coffee Break				
15:15 – 16:30	Round Table 1	Plenary Session 4	Keynote Lectures 2	Round Table 2	Free Papers 1-5
16:30 – 16:45	Break				
16:45 – 18:00	Invited Lectures	Round Table	Consensus Forum: International Positional Statement on Treatment of Posterior Canal BPPV	Debate Session 3	Free Papers 6-10





MEETING PROGRAM					
March 11, 2023 – Saturday					
	MAIN HALL (CRYSTAL I – II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
08:00 – 08:45	Instructional Course 9	Instructional Course 10	Instructional Course 11	Instructional Course 12	
08:45 – 09:00	Break				
09:00 – 09:45	Lecture 1	Debate Session 2			
09:45 – 10:45	Mini Round Table 1	Mini Round Table 2			
10:45 – 11:15	Coffee Break				
11:15 – 12:30	Barany Society Session	Panel 1	How I Do It 1?	How I Do It 2?	Hands-on Course 5
12:30 – 13:30	Lunch				
13:30 – 14:45	Panel 2	Neurotology Equilibrimetric Society Session	Round Table 5	Keynote Lectures 3	Hands-on Course 6
14:45 – 15:15	Coffee Break				
15:15 – 16:30	Round Table 3	Round Table 4	Round Table 6	Keynote Lectures 4	Free Pappers 11-15
16:30 – 16:45	Break				
16:45 – 18:00	Keynote Lectures 6	Keynote Lectures 5		Free Papers 16-19	Free Papers 20-23



## SCIENTIFIC PROGRAM

March 09, 2023 - Thursday					
	MAIN HALL (CRYSTAL I – II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
14:30 – 15:20	<b>Instructional Course 1</b>  <b>Eyeing the eyes in Vertigo</b>  <i>Meenakshisundaram Umaiorubahan (India)</i>	<b>Instructional Course 3</b>  <b>Minimum Stimulus Strategy: A step-by-step diagnostic approach to BPPV</b>  <i>Salvatore Martellucci (Italy)</i>  <i>Andrea Castellucci (Italy)</i>	<b>Instructional Course 5</b>  <b>Enlarged Vestibular Aqueduct</b>  <i>Franco Carlos Felipe (Colombia) (Online presentation)</i>		<b>Hands-on Course 1</b>
15:20 – 15:30	<b>Break</b>				
15:30 – 16:20	<b>Instructional Course 2</b>  <b>Current surgical approaches for the treatment of Ménière's disease</b>  <i>Juan Carlos Cisneros (Mexico) (Online presentation)</i>		<b>Instructional Course 6</b>  <b>Dynamic Posturography</b>  <i>Norberto Martinez (Phillippines)</i>	<b>Instructional Course 8</b>  <b>Motion Sickness Mal de Barquement Syndrome</b>  <i>Avi Shupak (Israel)</i>	<b>Hands-on Course 2</b>
16:20 – 16:30	<b>Coffee Break</b>				
16:30 – 17:20		<b>Instructional Course 4</b>  <b>SHIMP</b>  <i>Leonardo Manzari (Italy)</i>	<b>Instructional Course 7</b>  <b>Evaluation and management of BPPV by TRV Chair</b>  <i>Thomas Richard Vitton (France)</i>		<b>Hands-on Course 3</b>
17:20 – 18:00	<b>Break</b>				
18:00 – 18:15	<b>Opening Speech</b>  <i>Nuri Özgirgin (Turkey)</i>				
18:15 – 18:30	<b>Opening Speech</b>  <i>Morgana Sluydts (Belgium)</i>				
18:30 – 18:45	<b>Live Music Performance with Habanera Quartet</b>				
18:45 – 19:15	<b>Opening Lecture</b>  <i>Jack Magnan (France)</i>				
19:15 – 20:15	<b>Opening Ceremony at the Main Hall Foyer with Habanera Quartet Live Performance</b>				



March 10, 2023 - Friday					
	MAIN HALL (CRYSTAL I – II)	ROOM II - 2nd VIRTM HALL (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
		<b>08:00 - 08:15</b> Introduction of invited speakers and program of the day  <i>Morgana Sluydts (Belgium),</i>  <i>Angel Ramos de Miguel (Spain)</i>			
08:30 - 09:45	<b>Plenary Panel 1</b>  <b>Horizontal Semicircular Canal</b>  <b>Chairperson:</b> <i>Nuri Özgirgin (Turkey)</i>  <b>Moderator:</b> <i>Anita Bhandari (India), Augusto Pietro Casani (Italy), Octavio Garaycochea (Spain) (Online presentation), Daniele Nuti (Italy)</i>	<b>08:15-09:00</b> Invited Lecture 1  <b>Cochleovestibular Implantation: Results</b>  <i>Nils Guinand (Switzerland)</i>  <b>09:00-09:30</b> Invited Lecture 2  <b>Virtual Reality Head Impulse Testing: A New Tool for Diagnosis And Research of The Vestibular System</b>			
09:45 - 10:45	<b>Industry Sponsored-Session</b>  <b>Current Practices in the Management of Vestibular Vertigo with focus on BPPV</b>  <b>Moderator:</b> <i>Nuri Özgirgin (Turkey)– 10 minutes introduction</i>  <b>Speakers:</b>  <b>Treatment of BPPV reconsidered</b> <i>Herman Kingma (The Netherlands)– 20 minutes</i>  <b>Clinical Benefits of Betahistine in post-CRM BPPV patients</b> <i>Leonardo Manzari (Italy)– 20 minutes</i>  <b>Q&amp;A: All – 10 minutes</b>	<i>Ruben Hermann (France)</i>  <b>09:30-10:45</b> Plenary Session 1  <b>Results Part I</b>  <b>Chairpersons:</b> <i>Angel Ramos de Miguel (Spain), Morgana Sluydts (Belgium)</i>  <b>The Otolith Implant</b> <i>Angel Ramos de Miguel (Spain)</i>  <b>Cochleo-Otolith Implantation: Functional Impact</b> <i>Morgana Sluydts (Belgium)</i>  <b>Relationship Electrode Position and Vestibular Implant Responses</b> <i>Elke Loos (Belgium)</i>			





March 10, 2023 - Friday					
	MAIN HALL (CRYSTAL I – II)	ROOM II - 2nd VIRTM HALL (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
10:45 - 11:15	Coffee Break				
11:15 - 12:30	Italian Vestibular Society Session  Clinical and instrumental evaluation of vestibular migraine and headache related dizziness  Moderator: Augusto Pietro Casani (Italy)  Speakers: Roberto Teggi (Italy) (Online presentation), Marco Mandala (Italy), Mario Faralli (Italy)	Plenary Session 2	Keynote Lectures 1	Debate Session 1	Hands-on Course 4
		Surgical Techniques & Implant Design	Chairperson: Fazıl Necdet Ardiç (Turkey)	Vestibular Neuritis	
		Chairpersons: Morgana Sluydts (Belgium), Marta Alvarez de Linera Alperi (Spain)	KL1 - Recurrent falls in a dwindling age (falls in elderly)  Deepak Arjundas (India)	Moderator: Avi Shupak (Israel)  Alexandre Bisdorff (Luxembourg) (Pre-recorded) ,	
		Surgical Approaches in Vestibular Implantation  Marta Alvarez de Linera Alperi (Spain)	KL2 - Posterior Canal BPPV - How to resume the classification  Nuri Özgirgin (Turkey)	Leonardo Manzari (Italy),  Daniel Kaplan (Israel),  Yaov Gimmon (Israel)	
		Feasibility Fluoroscopy-Guided Electrode Insertion  Benjamin Volpe (Belgium)	KL3 - Core Laws in Vestibular Physiology  Srinivas Dorasala (India)		
		Vestibular implant imaging  Abderrahmane Hedjoudje (USA)	KL4 - Large variability of head angulation during the Epley manoeuvre: Use of a head-mounted guidance system with visual feedback to improve outcomes  Anita Bhandari (India)		
		Results in Patients With an Otolith Implant  Marta Alvarez de Linera Alperi (Spain)	KL5 - Hypermobile and Membranous Stapes Footplate: A new Etiology for vertigo  Arun Gadre (USA)		
12:30 - 13:30	Lunch				



March 10, 2023 - Friday					
	MAIN HALL (CRYSTAL I – II)	ROOM II - 2nd VIRTM HALL (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
13:30 - 14:45	<b>Plenary Panel 2</b>  <b>Vestibular Rehabilitation</b>  <b>Chairperson:</b> Tayfun Kirazlı (Turkey) <b>Moderator:</b> Anita Bhandari (India)  Anna Lisa Giannuzzi (Italy), Hong Sung Kwang (South Korea), Michel Lacour (France), Nuri Özgirgin (Turkey)	<b>Plenary Session 3</b>  <b>Related Technologies &amp; Diagnostic Tools</b>  <b>Chairperson:</b> Angel Ramos de Miguel (Spain) <b>Vibrotactile Feedback</b>  Herman Kingma (The Netherlands)  <b>Noisy galvanic vestibular stimulation in the treatment of bilateral vestibulopathy</b>  Julia Długaiczek (Switzerland)  <b>Inner Ear Hair Cell Regeneration</b>  Zheng-Yi Chen (USA) (Pre-recorded)	<b>Prize Session</b> <b>Chairpersons:</b> Soumit Dasgupta (UK), Fazıl Necdet Ardiç (Turkey), Milan Stankovic (Serbia)  <b>OP-09 Dizziness and Vertigo in an Online Tele-Clinic: A Clinician's Experience</b> <u>Melanie Grace Yap Cruz</u> , <u>Ma. Natividad Almazan</u>  <b>OP-11 The Effect of Sleep Deprivation on Passive Function, Active Function and Distance Modulation of the Vestibulo-Ocular Reflex</b> <u>Hadas Ben-Rubi Shimron</u> , <u>Yoav Gimmon</u>  <b>OP-12 Progression of the limits of stability measurement during vestibular rehabilitation treatment</b> <u>Laura Flix Díez</u> , <u>Melisa Blanco Pareja</u> , <u>Nicolás Pérez Fernández</u>  <b>OP-17 Vestibular symptoms following cochlear implantation with the Cochlear Nucleus CI 632 Slim Modiolar Array</b> <u>Hesham Khalid</u> , <u>Alice Gargan</u> , <u>Kostas Tsioulos</u> , <u>Robert Harris</u> , <u>David Selvadurai</u>  <b>OP-18 Gentamicin-induced inner ear injury: preservation of vestibular functions under alpha1-antitrypsin-rich conditions</b> <u>Amit Amar</u> , <u>Sabri El-Saied</u> , <u>Benyamin M Kaminer</u> , <u>Daniel Kaplan</u> , <u>Eli C Lewis</u>  <b>OP-28 Evaluation of The Coexistence of Olfactory Disorder and Vestibular Disorder in Covid-19 Patients</b> <u>Altan Kaya</u> , <u>Serap Bulut Çöbden</u> , <u>Serkan Altıparmak</u> , <u>Yunus Kantekin</u> , <u>Meryem Mutlu</u> , <u>İbrahim Özcan</u> , <u>İlhami Çelik</u>		
14:45 – 15:15	Coffee Break				



March 10, 2023 - Friday					
	MAIN HALL (CRYSTAL I – II)	ROOM II - 2nd VIRTM HALL (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
15:15 - 16:30	<p><b>Round Table 1</b></p> <p><b>Third window and dizziness</b></p> <p><b>Chairperson:</b> Özgür Yiğit (Turkey)</p> <p><b>Moderator:</b> Ja-Won Koo (South Korea)</p> <p>Andrea Castellucci (Italy),</p> <p>Soumit Dasgupta (UK),</p> <p>Kemal Görür (Turkey),</p> <p>Robert Guerkov (Germany),</p> <p>Andrzej Zarowski (Belgium)</p>	<p><b>Plenary Panel Results Part II</b></p> <p><b>Chairpersons:</b> Angel Ramos Macias (Spain),</p> <p>Morgana Sluydts (Belgium)</p> <p><b>Optimizing fitting/ fitting procedures</b></p> <p>Angel Ramos de Miguel (Spain)</p> <p><b>Perception in Vestibular Implants</b></p> <p>Elke Devocht (The Netherlands)</p> <p><b>Vestibular Co-Stimulation in Cochlear Implants</b></p> <p>Morgana Sluydts (Belgium)</p> <p><b>Cross-talk in cochleovestibular implants: neural response telemetry</b></p> <p>Marc Leblans (Belgium)</p>	<p><b>Keynote Lectures 2</b></p> <p><b>Chairperson:</b> Ronen Perez (Israel)</p> <p><b>KL6 – Vestibulotoxicity</b></p> <p>Ronen Perez (Israel)</p> <p><b>KL7 - Balance and psychological comorbidities</b></p> <p>Jeffrey Staab (USA)</p> <p><b>KL8 - Presbyvestibulopathy and rehabilitation</b></p> <p>Kamran Barin (USA)</p> <p><b>KL9 - Vestibular Challenges from an Otopathologic perspective</b></p> <p>Melissa Castillo Bustamante (Colombia) (Online presentation)</p> <p><b>KL10 - Remote diagnosis in Dizziness: Democratising Specialist Care - Anita Bhandari (India)</b></p>	<p><b>Round Table 2</b></p> <p><b>Evaluation of the vestibular system</b></p> <p><b>Chairperson:</b> Ahmet Koç (Turkey)</p> <p><b>Moderator:</b> Marco Mandala (Italy)</p> <p>Mario Faralli (Italy),</p> <p>Eduardo Martin-Sanz (Spain) (Online presentation),</p> <p>Amy Lennox (UK),</p> <p>Mario Milkov (Bulgaria),</p> <p>Pradeep Vundavalli (India)</p>	<p><b>Free Papers 1-4</b></p> <p><b>Chairperson:</b> Nenad Arsovic (Serbia)</p> <p><b>OP-05 Recurrent Vestibulopathy: Comparison of Vestibular Test Results with Ménière's Disease and Vestibular Migraine</b></p> <p><u>Neşe Çelebisoy, Melis Kaçan, Gülce Kirazlı, Fidan Balayeva</u></p> <p><b>OP-06 Vestibular Migraine And Persistent Postural Perceptual Dizziness: Handicap, Emotional Comorbidities, Quality Of Life And Personality Traits</b></p> <p><u>Neşe Çelebisoy, Aysın Kısabay Ak, Hüseyin Nezi Özdemir, Figen Gökay</u></p> <p><b>OP-07 Spectrum of Presentations in Carbamazepine Responsive Vertigo Patients - A Study of 100 Cases</b></p> <p><u>Sandeep Kumar</u></p>
16:30 - 16:45	Break				





March 10, 2023 - Friday					
	MAIN HALL (CRYSTAL I – II)	ROOM II - 2nd VIRTM HALL (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
16:45 - 18:00	<p><b>Invited Lectures 1</b></p> <p><b>Moderator:</b> <i>Augusto Pietro Casani (Italy)</i></p> <p><b>Central positional Downbeating nystagmus and vertigo</b></p> <p><i>Dario Yacovino (Argentina) (Pre-recorded)</i></p> <p><b>Intralabyrinthine schwannoma management with respect to vestibular function</b></p> <p><i>Stefan Plontke (Germany) (Pre-recorded)</i></p> <p><b>Vestibular Rehabilitation</b></p> <p><i>Franck Assaban (France)</i></p>	<p><b>Round Table</b></p> <p><b>The need for VI and the clinical impact</b></p> <p><b>Moderator:</b> <i>Andrzej Zarowski (Belgium)</i></p> <p><b>Necessity, epidemiology and impact on clinical practice of Bilateral Vestibulopathy and Vestibular Implantation</b></p> <p><i>Andrzej Zarowski (Belgium)</i></p> <p><b>Discussion with:</b></p> <p><i>Angel Ramos Macias (Spain),</i></p> <p><i>Nils Guinand (Switzerland),</i></p> <p><i>Morgana Sluydts (Belgium),</i></p> <p><i>Marta Alvarez de Linera Alperi (Spain),</i></p> <p><i>Herman Kingma (The Netherlands)</i></p>	<p><b>Consensus Forum: International Positional Statement on Treatment of Posterior Canal BPPV</b></p> <p><i>Nuri Ozgirgin (Turkey),</i></p> <p><i>Neşe Çelebisoy (Turkey),</i></p> <p><i>Enis Alpin Güneri (Turkey),</i></p> <p><i>Fazil Necdet Ardic (Turkey),</i></p> <p><i>Anirban Biswas (India),</i></p> <p><i>Robert Guerkov (Germany),</i></p> <p><i>Herman Kingma (The Netherlands),</i></p> <p><i>Antonio Lopez Escamez (Spain) (Online presentation),</i></p> <p><i>Badr Eldin Mostafa (Egypt),</i></p> <p><i>Angel Ramos Macias (Spain),</i></p> <p><i>Avi Shupak (Israel),</i></p> <p><i>Anita Bhandari (India)</i></p> <p><b>(Participation limited to Working Group Members Only)</b></p>	<p><b>Debate Session 3</b></p> <p><b>Vestibular System &amp; Cochlear Implantation</b></p> <p><b>Moderator:</b> <i>Mohan Kameswaran (India)</i></p> <p><i>Antonio Della Volpe (Italy),</i></p> <p><i>Ja-won Koo (S. Korea),</i></p> <p><i>Piotr Skarzynsky (Poland)</i></p>	<p><b>Free Papers 5-8</b></p> <p><b>Chairperson:</b> <i>Ahmet Koç (Turkey)</i></p> <p><b>OP-03 Therapeutic effect of autogenic training on ear fullness from the viewpoint of Eustachian tube function test</b></p> <p><i>Junichi Matsushima</i></p> <p><b>OP-04 Improvement of verbal working memory as a treatment for age-related hearing loss</b></p> <p><i>Junichi Matsushima</i></p> <p><b>OP-14 Study of the characteristics of prefrontal EEG in tinnitus patients</b></p> <p><i>Jaeok Hwang, Byungwoon Park, Heedong Lee, Byunggon Jung, Yusook Maeng, Jungho Seo</i></p> <p><b>OP-23 A cognitive behavioral therapy-based integrative group intervention in tinnitus patients</b></p> <p><i>Bencsik Beáta</i></p>



March 11, 2023 - Saturday					
	MAIN HALL (CRYSTAL I - II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
08:00 – 08:45	<b>Instructional Course 9</b>  <b>Pitfalls in the diagnosis of Vertigo</b>  <i>Daniel Kaplan (Israel)</i>	<b>Instructional Course 10</b>  <b>Vestibular testing: what can they tell us and how to choose?</b>  <i>Marc Bassim (UAE)</i>	<b>Instructional Course 11</b>  <b>Anatomy of vestibular system with illustrations</b>  <i>Rajiv Anand (India)</i>	<b>Instructional Course 12</b>  <b>Augmented reality for vestibular assessment by Valerio Margani (Italy),</b>  <i>Edoardo Covelli (Italy), Maurizio Barbara (Italy) (Online presentation)</i>	
08:45 – 09:00	<b>Break</b>				
09:00 – 09:45	<b>Lecture 1</b>  <b>Management of Acoustic Schwannoma: The Gruppo Otologico experience</b>  <b>Chairperson: Jacques Magnan (France)</b>  <i>Mario Sanna (Italy)</i>	<b>Debate Session 2</b>  <b>A new concept: Persistent Postural-Perceptual Dizziness</b>  <b>Moderator: Avi Shupak (Israel)</b>  <b>Postural-Perceptual Dizziness</b>  <i>Jeffrey Staab (USA)</i>  <b>Brain imaging studies on PPPD</b>  <i>Chihiro Yagi (Japan) (Online presentation)</i>			
09:45 – 10:45	<b>Mini Round Table 1</b>  <b>Meniere Disease</b>  <b>Moderator: Nicolas Perez (Spain) (Online)</b>  <b>Vestibular Recruitment in Meniere's disease</b>  <i>Milan Stankovic (Serbia) (Pre recorded)</i>  <b>Cochrane reviews on Meniere's Disease</b>  <i>Ambrose Lee (Canada)</i>  <b>Meniere's disease Diagnostic criteria</b>  <i>Mans Magnusson (Sweden)</i>	<b>Mini Round Table 2</b>  <b>VEMP's</b>  <b>Moderator: Leonardo Manzari (Italy)</b>  <i>Bülent Satar (Turkey)</i>  <i>Nicola Quaranta (Italy)</i>  <i>(Online Presentation)</i>			
10:45 – 11:15	<b>Coffee Break</b>				



March 11, 2023 - Saturday					
	MAIN HALL (CRYSTAL I - II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
11:15 – 12:30	<p><b>Barany Society Session</b></p> <p><b>Chairperson and Moderator:</b> <i>Mans Magnusson (Sweden)</i></p> <p><b>Trans tympanic treatment in Meniere's disease</b> <i>Mans Magnusson (Sweden)</i></p> <p><b>Acute vertigo in Emergency Department: the STANDING approach</b> <i>Nicolas Perez (Spain) (Online presentation)</i></p> <p><b>Diagnostic criteria for Meniere's disease</b> <i>Marco Mandala (Italy)</i></p> <p><b>Diagnostic criteria and quick review of treatment options for persistent postural-perceptual dizziness (PPPD)</b> <i>Jeffrey Staab (USA)</i></p>	<p><b>Panel 1</b></p> <p><b>Imaging in vestibular disorders</b></p> <p><b>Chairperson:</b> <i>Nazım Korkut (Turkey)</i></p> <p><b>Moderator:</b> <i>Daniele Nuti (Italy), Robert Guerkov (Germany), Mayada Elsherif (Egypt) (Online presentation), Ja-won Koo (S. Korea), Floris L Wuyts (Belgium) (Online Presentation), Marta Álvarez de Linera (Spain)</i></p>	<p><b>How I do it 1?</b></p> <p><b>Chairperson:</b> <i>Enis Alpin Güneri (Turkey)</i></p> <p><b>Surgical management of vertigo: labyrinth fistulas</b> <i>Narayanan Prepageran (Malesia) (Online presentation)</i></p> <p><b>Surgery for Vestibular Disorders</b> <i>Shakeel Saeed (UK) (Online presentation)</i></p> <p><b>Surgical approach for vestibular disorders Drug Delivery</b> <i>Marta Álvarez de Linera (Spain)</i></p> <p><b>Vestibular paroxysmia</b> <i>Giampietro Ricci (Italy)</i></p>	<p><b>How I do it 2?</b></p> <p><b>Video Head Impulse Test</b></p> <p><b>Moderator:</b> <i>Eduardo Martin-Sanz (Spain) (Online)</i></p> <p><i>Amy Lennox ((UK)), Enrico Armato (Italy), Kamran Barin (USA), Ahmet Koç (Turkey)</i></p>	<p><b>Hands – on Course 5</b></p>
12:30 – 13:30	Lunch				



March 11, 2023 - Saturday					
	MAIN HALL (CRYSTAL I - II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
13:30 – 14:45	<b>Panel 2</b>	<b>Neurootological and Equilibrimetric Society Session</b>	<b>Round Table 5</b>	<b>Keynote Lectures 3</b>	<b>Hands – on Course 6</b>
	<b>Trauma to the vestibular system</b>		<b>Vestibular Disorders in Pediatric Population</b>	<b>Chairperson:</b> <i>Soumit Dasgupta (UK)</i>	
	<b>Chairperson:</b> <i>Milan Stankovic (Serbia)</i>	<b>Challenges in neurootology. Tinnitus</b>	<b>Chairperson:</b> <i>Nina Bozanic Urbancic (Slovenia)</i>	<b>KL11 - History of vestibular medicine</b>	
	<b>Moderator:</b> <i>Maurizio Barbara (Italy) (Online presentation)</i>	<b>Moderator:</b> <i>Agnes Szirmai (Hungary)</i>	<b>Moderator:</b> <i>Soumit Dasgupta (UK)</i>	<i>Soumit Dasgupta (UK)</i>	
	<i>Mohan Kameswaran (India),</i>	<b>Usefulness of different questionnaires in the treatment of vestibular disorders</b>	<b>Development of the vestibular system</b>	<b>KL12 - Meniere’s and Meniere’s/Migraine clinical overlap</b>	
	<i>Saba Battelino (Slovenia),</i>	<i>Agnes Szirmai (Hungary), Beáta Bencsik (Hungary)</i>	<i>Nina Bozanic Urbancic (Slovenia)</i>	<i>Borka Ceranic (Serbia)</i>	
	<i>Badr El Din Mostafa (Egypt),</i>	<b>Challenges in Neurootology</b>	<b>Examination of the vestibular system in children</b>	<b>KL13 - Vestibulo-ocular reflex and its correlates in Meniere’s disease</b>	
	<i>Oleg Borysenko (Ukraine) (Online presentation)</i>	<i>Mohamed Hamid (USA) (Online presentation)</i>	<i>Sylvette Wiener Vacher (France)</i>	<i>Mete Kiroğlu (Turkey)</i>	
		<b>VESTIBULAR FUNCTION TESTS- do they really help us in clinical practice?</b>	<b>Aetiology of paediatric vestibular disorders-</b>	<b>KL14 - Vertebrobasillary disease</b>	
		<i>Anirban Biswas (India)</i>	<i>Josine Widdershoven (The Netherlands)</i>	<i>Pınar Yalınay-Dikmen (Turkey)</i>	
	<b>PHARMACOTHERAPEUTIC CHALLENGES IN NEUROTOLOGICAL PRACTICE-what are the solutions?</b>	<b>Management of paediatric vestibular disorders</b>			
	<i>Anirban Biswas (India)</i>	<i>Soumit Dasgupta (UK)</i>			
	<b>A cognitive behavioral therapy-based integrative group intervention in tinnitus patients</b>	<b>Ototoxicity in children</b>			
	<i>Beáta Bencsik (Hungary), Judit Szigeti F. (Hungary), Dóra Vajda (Hungary)</i>	<i>Soumit Dasgupta (UK)</i>			
	<b>An attempt to treat auditory processing disorder</b>				
	<i>Junichi Matsushima (Japan)</i>				
14:45 – 15:15	Coffee Break				





March 11, 2023 - Saturday					
	MAIN HALL (CRYSTAL I - II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
15:15 – 16:30	<b>Round Table 3</b>  <b>Migraine Vestibulopathy</b>  <b>Chairperson:</b> <i>Badr El Din Mostafa (Egypt)</i> <i>Neşe Çelebisoy (Turkey)</i> <i>Amir Kheradmand (USA) (Online presentation),</i> <i>Anirban Biswas (India),</i> <i>Melissa Castillo Bustamente (Colombia) (Online presentation),</i> <i>Roberto Teggi (Italy) (Online presentation)</i>	<b>Round Table 4</b>  <b>Meniere Disease: Treatment Strategies</b>  <b>Chairperson:</b> <i>Fazıl Necdet Ardiç (Turkey)</i> <b>Moderator:</b> <i>Onur Çelik (Turkey)</i> <i>Eduardo Martin-Sanz (Spain) (Online presentation),</i> <i>Issam Saliba (Canada) (Online presentation),</i> <i>Franco Tralbalzini (Italy),</i> <i>Mario Jesús Villegas-Gonzalez (Mexico)</i>	<b>Round Table 6</b>  <b>BPPV – Posterior Canal</b>  <b>Chairperson:</b> <b>Moderator:</b> <i>Marco Mandala (Italy)</i> <i>Ajay Kumar (India),</i> <i>Salvatore Martellucci (Italy),</i> <i>Andrea Castellucci (Italy),</i> <i>Nenad Arsovic (Serbia)</i>  <b>Development of the vestibular system</b> <i>Nina Bozanic Urbancic (Slovenia)</i>  <b>Examination of the vestibular system in children</b> <i>Sylvette Wiener Vacher (France)</i>  <b>Aetiology of paediatric vestibular disorders</b> <i>Josine Widdershoven (The Netherlands)</i>  <b>Management of paediatric vestibular disorders</b> <i>Soumit Dasgupta (UK)</i>  <b>Ototoxicity in children</b> <i>Soumit Dasgupta (UK)</i>	<b>Keynote Lecture 4</b> <b>Chairperson:</b> <i>Nazım Korkut (Turkey)</i>  <b>KL15 - Vestibular Paroxysmia</b> <i>Nazım Korkut (Turkey)</i>  <b>KL16 - Enlarged vestibular aqueduct</b> <i>Sudhira Ratnayake (India)</i>  <b>KL17 - Dizziness in the emergency department</b> <i>Ambrose Lee (Canada)</i>  <b>KL18 - Apogeotropic Horizontal Canal BPPV- Determining the sick side and the choice of the treatment manoeuvre</b> <i>Enis Alpin Güneri (Turkey)</i>  <b>KL19 - Central vestibular disorders</b> <i>Vishal Pawar (UAE)</i>	<b>Free Papers 9-13</b>  <b>Chairperson:</b>  <b>OP-13 Intrinsic and Extrinsic Factors that Manipulate VOR Function</b> <i>Hadas Ben-Rubi Shimron, Yoav Gimmon</i>  <b>OP-29 Vestibular Evoked Myogenic Potentials Recorded From Trapezus Muscle: Preliminary Report</b> <i>Bülent Satar, Ceren Karacayli, Ercan Karababa</i>  <b>OP-15 Vestibular Neurectomy for Intractable Vertigo in Menieres Disease</b> <i>Pradeep Vundavalli, Bhavin Parikh, Jacques Magnan</i>  <b>OP-08 Eye Movements in CANVAS Patients: Video-oculographic Assessment</b> <i>Alexandra Belyakova-Bodina, Ekaterina Larina, Evgenii Nyzhnyi, Nataliya Abramychyeva, Sergey Klyushnikov, Amayak Broutian</i>
16:30 - 16:45	Break				



March 11, 2023 - Saturday					
	MAIN HALL (CRYSTAL I - II)	ROOM II (CRYSTAL III)	WORKSHOP ROOM I (BEOGRAD – BUDVA)	WORKSHOP ROOM II (STUDIO II)	FREE PAPERS ROOM (STUDIO I)
16:45 – 18:00	<b>Keynote Lectures 5</b>  <b>Chairperson :</b> <i>Nuri Ozgirgin (Turkey)</i>  <b>KL20 - The balance belt in Bilateral Vestibular Loss</b>  <i>Herman Kingma (The Netherlands)</i>	<b>Keynote Lectures 6</b>  <b>Chairperson:</b> <i>Pinar Yalinay Dikmen (Turkey)</i>  <b>KL25 - Vestibular rehabilitation in the geriatric population</b>  <i>Nour Salman(UAE) (Online presentation)</i>		<b>Free Papers 14-16</b>  <b>Chairperson:</b> <i>Kemal Görür (Turkey)</i>  <b>OP-01 Disability and Handicap in Patients with Unilateral Vestibular Hypofunction: A Retrospective Study</b>  <i>Mustafa Karabulut, Wahid Noori, Marie-Cecile Gerards, Ali Melliti, Mohamad Alfarghal, Angelica Perez Fornos, Nils Guinand, Vincent Van Rompaey, Raymond Van de Berg</i>	<b>Free Papers 17-19</b>  <b>Chairperson:</b> <i>Bülent Satar (Turkey)</i>  <b>OP-10 Idiopathic labyrinthitis: symptoms, clinical characteristics and prognosis</b>  <i>Fieke Oussoren, Tjard Schermer, Tjasse Brintjes, Roeland van Leeuwen</i>
	<b>KL21 - Eyes open – Eyes closed: Precise localization of lesions using the effects of fixation</b>  <i>David Zee (USA) (Pre-recorded)</i>	<b>KL27 - Genetic diagnosis</b>  <i>Giorgia Girotto (Italy) (Online presentation)</i>		<b>OP-02 Chronic Symptoms in Patients with Unilateral Vestibular Hypofunction: A Systematic Review</b>  <i>Mustafa Karabulut, Lien Van Laer, Ann Hallemans, Luc Vereeck, Vincent Van Rompaey, Wolfgang Viechtbauer, Mohamad Alfarghal, Nils Guinand, Angelica Perez Fornos, Raymond Van de Berg</i>	<b>OP-27 Assessment of vestibular function in group of patients with partial deafness</b>  <i>Magdalena Sosna, Grażyna Tacikowska, Katarzyna Pietrasik, Henryk Skarżyński, Piotr Henryk Skarżyński, Ewa Tomanek, Ewelina Bukato</i>
	<b>KL22 – The evolution of linear vestibulo-ocular reflex</b>  <i>Takao Imai (Japan) (Pre-recorded)</i>	<b>KL28 - Mal de Barquenent Syndrome</b>  <i>Catho Schoenmaekers (Belgium)</i>			<b>OP-16 Use of the Video Head Impulse Test to Identify Vestibulopathy in Multiple Sclerosis Patients with Relapsing Remitting Disease</b>  <i>Emel Tahir, Asuman Küçüköner, Sedat Şen, Esra Kavaz, Murat Terzi</i>
	<b>KL23 - Perilymphatic Fistula</b>  <i>Tetsuo Ikezono (Japan) (Pre-recorded)</i>				
	<b>KL24 - Is Vestibular Acute Truncal Ataxia (ATA)</b>  <i>Carmona Sergio (Online Presentation) (Argentina)</i>				
18:00	End of the program				



## INDUSTRY RECOGNITION AND SESSION

### Industry Sponsored - Abbott Satellite Meeting



**Date** : March 10, 2023  
**Time** : 09:45 - 10:45  
**Hall** : Main Hall (Crystal I – II)

**Title** : **Current Practices in the Management of Vestibular Vertigo with focus on BPPV**

*Moderator*

**Nuri Özgirgin** (Turkey)

*Speakers*

**Treatment of BPPV reconsidered**

**Herman Kingma** (The Netherlands)– 20 minutes

**Clinical Benefits of Betahistine in post-CRM BPPV patients**

**Leonardo Manzari** (Italy)– 20 minutes

Q&A: All – 10 minutes



## ACCEPTED ORAL PRESENTATIONS LIST

### **OP-01 Disability And Handicap In Patients With Unilateral Vestibular Hypofunction: A Retrospective Study**

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(Division of Balance Disorders, Department of Otorhinolaryngology and Head and Neck Surgery, School for Mental Health and Neuroscience, Maastricht University Medical Center+, Maastricht, The Netherlands)

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## ACCEPTED ORAL PRESENTATIONS

### Assessment of the Vestibular Function

#### OP-01

#### DISABILITY AND HANDICAP IN PATIENTS WITH UNILATERAL VESTIBULAR HYPOFUNCTION: A RETROSPECTIVE STUDY

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**Aim:** To evaluate the disability and handicap reported by patients with unilateral vestibular hypofunction (UVH).

**Material and Methods:** We retrospectively analyzed 200 UVH patients with symptoms  $\geq 3$  months. Diagnosis of UVH was made with caloric irrigation, (asymmetry rate between two ears  $\geq 25\%$ , the absolute value of the healthy side should be  $> 25^\circ/\text{s}$  and  $\leq 83^\circ/\text{s}$ ). The vestibular function test results (i.e., caloric irrigation, rotatory chair test, and (video) head impulse tests) were collected. Disability and handicap levels were assessed by the following patient-reported outcome measures (PROMs): Dizziness Handicap Inventory (DHI), Hospital Anxiety and Depression Scale (HADS), and European Quality of Life 5 Dimension 5 Level (EQ-5D-5L). Furthermore, the correlation between the objective vestibular test results and the outcomes of the questionnaires was investigated.

**Results:** A heterogeneous group of UVH patients was evaluated with etiologies varying from e.g., a history of acute unilateral vestibulopathy and Menière's disease, to vestibular schwannoma. The mean  $\pm$  SD total scores of DHI, HADS, and EQ-5D-5L were  $52.13 \pm 21.38$ ,  $13.67 \pm 8.41$ , and  $61.94 \pm 21.49$ , respectively. The mean scores of the emotional and functional subdomains of the DHI were strongly correlated ( $r: 0.720$ ,  $p < 0.0001$ ). The total mean score of the DHI moderately correlated with the total mean score of the HADS ( $r: .575$ ,  $p < 0.0001$ ). In addition, both the depression and anxiety subdomains of the HADS moderately correlated with the functional subdomain of the DHI ( $r: .481$ ;  $r: .432$ ,  $p < 0.0001$ , respectively). No significant correlation was found

between objective vestibular test results and outcomes of the questionnaires ( $p > 0.05$ ).

**Discussion and conclusion:** This study showed that UVH can be disabling in a subgroup of patients. Furthermore, underlying psychological comorbidities (e.g., depression, anxiety) significantly impact the experienced functional handicap related to UVH. This might (partially) explain the lack of correlation between objective vestibular test results and the outcomes of questionnaires. It also emphasizes the importance to screen and treating any psychological co-morbidities in patients with disabling UVH.

**Keywords :** Dizziness, comorbidity, unilateral vestibular hypofunction, disability, handicap

### Assessment of the Vestibular Function

#### OP-02

#### CHRONIC SYMPTOMS IN PATIENTS WITH UNILATERAL VESTIBULAR HYPOFUNCTION: A SYSTEMATIC REVIEW

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**Aim:** To systematically review the full spectrum of chronic symptoms in patients with unilateral vestibular hypofunction (UVH).

**Material and Methods:** A systematic review was conducted following the guidelines of the Preferred Reporting Items for Systematic Review and Meta-Analysis Statement (PRISMA). An extensive literature search was performed in Pubmed, Web of Science, Embase, and Scopus to investigate self-reported symptoms and self-report questionnaire-based symptoms in patients with UVH. All original studies ranging from full-text clinical trials to case reports, written in English, German, and French, were included. A descriptive statistic was applied to show the frequency of



self-reported symptoms. Regarding self-report questionnaire-based symptoms, a meta-analysis was carried out and a random-effects model was used.

**Results:** A total of 2110 studies were retrieved from four different databases. Forty-seven studies were included after title-abstract selection and full-text selection by two independent reviewers. The frequency of self-reported symptoms of UVH patients included chronic dizziness (98%), imbalance (80%), symptoms worsened by head movements (75%), visually induced dizziness (61%), symptoms worsened in darkness (51%), and oscillopsia (22%). Additionally, UVH could be accompanied by recurrent vertigo (77%), tiredness (68%), cognitive symptoms (58%), and autonomic symptoms (46%). Regarding self-report questionnaires, UVH resulted on average in a moderate handicap, with the estimated mean total scores of the Dizziness Handicap Inventory (DHI) and Vertigo Symptom Scale (VSS) of 46.31 (%95 CI: 41.17-51.44) and 15.50 (%95 CI: 12.59-18.41), respectively. In the studies that investigated the effect of the vestibular intervention, it was demonstrated that interventions significantly decreased estimated mean total DHI scores from 51.79 (%95 CI: 46.61-56.97) (pre-intervention) to 27.39 (%95 CI: 23.16-31.62) (post-intervention). In three studies, the estimated mean total Visual Analog Scale (VAS) scores were 7.05 (%95 CI: 5.64-8.46) (pre-intervention) and 2.56 (%95 CI: 1.15-3.97) (post-intervention).

**Discussion and conclusion:** A spectrum of symptoms is associated with UVH, of which chronic dizziness and imbalance are most frequently reported. However, semi-structured interviews should be conducted to define the whole spectrum of UVH symptoms more precisely, in order to establish a validated patient-reported outcome measure (PROM) for UVH patients. Furthermore, vestibular rehabilitation can significantly decrease self-reported handicap, but a subgroup of patients persists with at least a moderate handicap, despite vestibular rehabilitation. For this subgroup, it could be considered to explore new treatment strategies like vibrotactile feedback or the vestibular implant.

**Keywords :** Unilateral vestibular hypofunction, chronic symptoms, dizziness, imbalance, vertigo, patient-reported outcome measures

## Other

### OP-03

#### THERAPEUTIC EFFECT OF AUTOGENIC TRAINING ON EAR FULLNESS FROM THE VIEWPOINT OF EUSTACHIAN TUBE FUNCTION TEST

**Junichi Matsushima<sup>1</sup>**

<sup>1</sup>Matsushima Ent Clinic

Ear fullness is an unpleasant sensation that is often associated with acute low tone hearing loss and Eustachian tube dysfunction, but was improved by autogenic training and VB12 battery

treatment (presented in NES). In this study, we showed that ear fullness, which was a chief complaint or comorbid symptom, could be improved by the therapeutic battery, and the mechanism was discussed.

Forty-nine patients (53 ears) with ear fullness as the main or comorbid symptom were treated with approximately one hour of autogenic training combined with VB12 infusion. As a test battery, audiometry, tympanometry, and Eustachian tube function tests were performed before and after initial treatment and weighted against changes in ear fullness.

The average age was 55.5 years (SD: 18.9). The subjective ear fullness was unchanged in 5 ears, disappeared in 31 ears, quite good in 6 ears, and slightly in 11 ears. The comorbid diseases were dizziness in 11 patients and tinnitus in 19 ears. These symptoms improved independently of changes in ear fullness. In particular, symptoms of vertigo improved in all cases. Before treatment, 33 ears were able to confirm the complaint of hearing loss exacerbation on Audiogram before treatment, and 17 ears that did not change after treatment. Eustachian tube dysfunction had 38 ears, 12 of which could not be confirmed to improve. In Tympanometry, there were 16 ears and 5 ears, respectively.

The combination of autogenic training and VB12 drip not only improves Eustachian tube function but also improves tinnitus, dizziness, and hearing loss. It was presumed to have improved these symptoms by improving blood flow.

**Keywords:** Ear Fullness, autogenic training, eustachian tube function, tympanometry, audiometry

## Other

### OP-04

#### IMPROVEMENT OF VERBAL WORKING MEMORY AS A TREATMENT FOR AGE-RELATED HEARING LOSS

**Junichi Matsushima<sup>1</sup>**

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Aging affects not only the inner ear but also the central auditory system. In speech, sound information encoded in the inner ear is processed by the central executive system in verbal working memory, which consists of the phonological loop and the central executive system. The phonological loop of the underlying structure is crystallized intelligence, but the central executive system is fluid intelligence, which is considered to be affected by aging as language processing.

**Aim:** It is to examine whether the function of verbal working memory in the elderly could be improved with treatment.

**Methods and subjects:** A listening span test via headphones was performed before and after treatment to see improvements in verbal working memory. 67s Speech Intelligibility Test for Monosyllables (Courtesy of Audiology Japan) and 20 sentences



consisting of 4 phrases that are grammatically correct but non-sense was examined before and one week after initial treatment. Autogenic training and intravenous VB12 drip were given to 39 patients (79.2 years  $\pm$  6.8). The treatment is usually given to patients with tinnitus, hearing loss, dizziness, and Eustachian tube dysfunction on our outpatient basis.

**Result:** There was statistically significant improvement after treatment in monosyllables and nonsense sentences. The number of people maladapted to hearing aids with a monosyllable intelligibility of 60% or less decreased from 50% to 30%, and in the nonsense sentences, the fourth segment had the largest number of improvements, indicating an improvement in short term memory.

**Discussion:** Hearing loss in the elderly is affected not only by inner ear function, but also by attention and consciousness level, psychomotor speed, social cognition and judgment, and language. In this study, we showed that verbal working memory, which forms the basis of language recognition, could be improved with conventional treatment.

**Keywords:** Verbal working memory, age-related hearing loss, Autogenic training

## Vestibular Disorders Related with Headache Syndromes

### OP-05

## RECURRENT VESTIBULOPATHY: COMPARISON OF VESTIBULAR TEST RESULTS WITH MÉNIÈRE'S DISEASE AND VESTIBULAR MIGRAINE

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<sup>1</sup>Ege University Medical School

**Introduction:** Recurrent and episodic vestibular symptoms not fulfilling criteria for known episodic vestibular syndromes are named as recurrent vestibulopathy (RV). We aimed to compare the vestibular test results of RV patients with vestibular migraine (VM) and Ménière's disease (MD).

**Methods:** Twenty patients with MD, 20 patients with VM, 18 patients with RV, and 20 healthy volunteers (HC) were evaluated. Pure-tone hearing thresholds (PTHTs), video head impulse test (vHIT), functional head impulse test (fHIT), and cervical vestibular evoked myogenic potentials (cVEMPs) were studied.

**Results:** PTHT of the MD-affected ears were significantly high, and cVEMP-corrected amplitudes were low when compared with the VM, RV, and HC ( $p < 0.001$  for all). Amplitude asymmetry ratio was significantly high in MD-affected ears when compared with the HC ( $p = 0.014$ ), VM ( $p = 0.038$ ), and RV ( $p = 0.045$ ). VEMP latencies and lateral canal vHIT gain were not different between groups ( $p > 0.05$ ). The percentage of correctly identified optotypes on fHIT of the MD ( $p > 0.001$ ), VM ( $p = 0.004$ ), and RV ( $p = 0.001$ ) patients were low in comparison with the HC.

**Conclusion:** Apart from hearing loss, low cVEMP amplitudes on the affected side were the main feature in MD differentiating

it from VM and RV. Vestibular test results of patients with RV and VM were similar. Low fHIT results in all groups indicate a functional deficit in gaze stabilization. Disabling vertigo attacks disturbing attention may be the cause of this functional impairment. MD, VM, and RV may be parts of a broad-spectrum disorder, RV patients representing milder forms not associated with cochlear or migrainous features.

**Keywords:** Cervical vestibular evoked myogenic potentials; Functional head impulse test; Ménière's disease; Recurrent vestibulopathy; Vestibular migraine; Video head impulse test.

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Figure 1

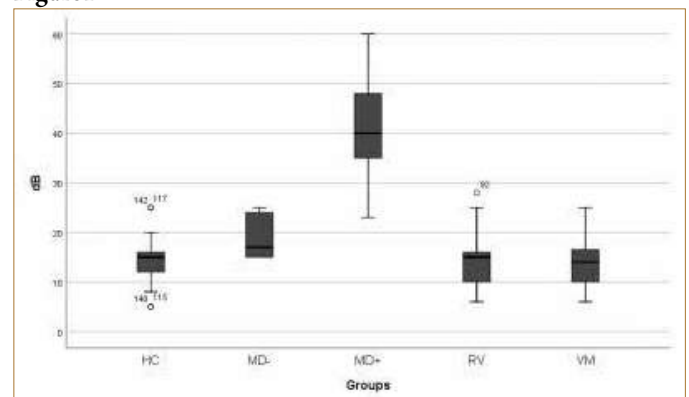
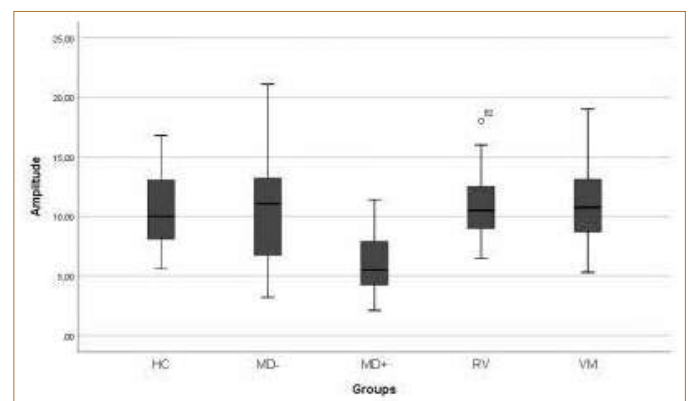


Figure 2







## Vestibular Disorders Related with Headache Syndromes

### OP-06

#### VESTIBULAR MIGRAINE AND PERSISTENT POSTURAL PERCEPTUAL DIZZINESS: HANDICAP, EMOTIONAL COMORBIDITIES, QUALITY OF LIFE AND PERSONALITY TRAITS

Nese Celebisoy<sup>1</sup>, Aysin Kisabay Ak<sup>1</sup>, Hüseyin Nezh Ozdemir<sup>1</sup>, Figen Gokcay<sup>1</sup>

<sup>1</sup>Ege University Medical School

**Objective:** To compare vestibular migraine (VM) and persistent postural-perceptual dizziness (PPPD) regarding dizziness associated handicap, emotional and somatic disorders, health-related quality of life (QoL) and personality traits.

**Methods:** Thirty patients for each group [VM, PPPD and healthy volunteers (HC)] were studied. Dizziness Handicap Inventory (DHI), Beck depression and anxiety scales, Somatic Symptom Scale-8 (SSS-8), Short Form (36) Health Survey (SF 36) and the Big Five Inventory (BFI) were used.

**Results:** DHI sub-scores were significantly high in both patient groups in comparison with the HC ( $p < 0.001$  for all). Emotional ( $p = 0.001$ ) and functional ( $p = 0.022$ ) sub-scores of the PPPD patients were worse. Anxiety and somatic symptom scores of VM ( $p = 0.026$  and  $p < 0.001$  respectively) and PPPD ( $p < 0.001$  for both) and depression scores of the PPPD ( $p = 0.003$ ) were higher than the HC. Both anxiety ( $p = 0.009$ ) and somatization ( $p = 0.005$ ) scores of the PPPD patients were higher than the VM. SF-36 subscales were affected in both groups ( $p < 0.05$ ). Vitality ( $p = 0.002$ ), mental health ( $p = 0.045$ ) and social role functioning ( $p = 0.006$ ) of the PPPD group were worse than the VM. Higher scores for neuroticism ( $p < 0.001$ ) was present for both groups. Scores for extraversion was low in PPPD patients ( $p = 0.010$ ) in comparison with the HC.

**Conclusion:** Dizziness associated handicap, anxiety and somatic symptom burden is high in both groups, even higher in PPPD with additional depression. Severe impairment in QoL is present with more severe impairment in emotional aspects in patients with PPPD. Neuroticism is a common personality trait for both groups with additional introversion in PPPD. **Objective:** To compare vestibular migraine (VM) and persistent postural-perceptual dizziness (PPPD) regarding dizziness associated handicap, emotional and somatic disorders, health-related quality of life (QoL) and personality traits.

**Methods:** Thirty patients for each group [VM, PPPD and healthy volunteers (HC)] were studied. Dizziness Handicap Inventory (DHI), Beck depression and anxiety scales, Somatic Symptom Scale-8 (SSS-8), Short Form (36) Health Survey (SF 36) and the Big Five Inventory (BFI) were used.

**Results:** DHI sub-scores were significantly high in both patient groups in comparison with the HC ( $p < 0.001$  for all). Emotional ( $p = 0.001$ ) and functional ( $p = 0.022$ ) sub-scores of the PPPD patients were worse. Anxiety and somatic symptom scores of VM

( $p = 0.026$  and  $p < 0.001$  respectively) and PPPD ( $p < 0.001$  for both) and depression scores of the PPPD ( $p = 0.003$ ) were higher than the HC. Both anxiety ( $p = 0.009$ ) and somatization ( $p = 0.005$ ) scores of the PPPD patients were higher than the VM. SF-36 subscales were affected in both groups ( $p < 0.05$ ). Vitality ( $p = 0.002$ ), mental health ( $p = 0.045$ ) and social role functioning ( $p = 0.006$ ) of the PPPD group were worse than the VM. Higher scores for neuroticism ( $p < 0.001$ ) was present for both groups. Scores for extraversion was low in PPPD patients ( $p = 0.010$ ) in comparison with the HC.

**Conclusion:** Dizziness associated handicap, anxiety and somatic symptom burden is high in both groups, even higher in PPPD with additional depression. Severe impairment in QoL is present with more severe impairment in emotional aspects in patients with PPPD. Neuroticism is a common personality trait for both groups with additional introversion in PPPD.

**Keywords:** Vestibular migraine, persistent postural-perceptual dizziness, depression, anxiety, personality traits

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## Vestibular Paroxysmia

### OP-07

#### SPECTRUM OF PRESENTATIONS IN CARBAMAZEPINE RESPONSIVE VERTIGO PATIENTS - A STUDY OF 100 CASES

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We all are aware of the Barany Society Criteria for Diagnosis of Vestibular Paroxysmia. We are likely to miss majority of cases supposedly of similar aetiology (Paroxysmia & related conditions) if we follow these guidelines strictly. Here we shall be presenting our observations in 100 cases with radiological evidence of cross compression of 7<sup>th</sup>-8<sup>th</sup> nerve complex with positive response to carbamazepine.

**Keywords:** Cross-compression, vestibular paroxysmia



## Genetics and Vestibular Diseases

OP-08

### EYE MOVEMENTS IN CANVAS PATIENTS: VIDEO-OCULOGRAPHIC ASSESSMENT

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**Aim:** CANVAS is an adult-onset autosomal recessive syndrome presenting with cerebellar ataxia, neuropathy, and vestibular areflexia. Large biallelic intronic AAGGG expansions in RFC1 gene were identified as disease-causing [1, 2]. Cerebellar ataxia is usually evident. Sensory ataxia could often be suspected during the bedside neurological examination, whereas symmetrical vestibulo-ocular reflex (VOR) loss often remains unnoticed. Our preliminary data suggested CANVAS to be a relatively frequent condition in patients with adult-onset progressive cerebellar diseases (nearly 10.9% of tested cohort), so the decision was made to screen patients with cerebellar ataxias for oculomotor abnormalities using video-oculography (VOG). Genetically confirmed CANVAS cases were then analyzed in attempt to clarify oculographic features of CANVAS.

**Materials and Methods:** 20 patients with established CANVAS (40% males and 60% females, mean age 66.0 years [58.75; 72.0]) had undergone VOG study using EyeSeeCam Sci system (EyeSeeTec GmbH, Germany). VOG study included horizontal and vertical saccade tests, horizontal and vertical smooth pursuit test, gaze test, VOR suppression test, and video head-impulse test (vHIT). In one patient vHIT could not be performed because of the history of cervical spine trauma. Three other patients hadn't undergone a full VOG protocol.

**The following parameters were analyzed:** saccadic peak velocity to identify slowing of saccades and its severity, saccadic gain to detect dysmetria (either hypometria or hypermetria), saccade latency, gain of smooth pursuit, presence of saccadic intrusions and/or nystagmus in gaze test, sufficiency of VOR suppression, and horizontal vHIT gain.

**Results:** Only 5.3% of patients did not have any signs of bilateral vestibulopathy in vHIT. In other cases vHIT gain met the Bárány Society diagnostic criterion [3] (Fig. 1). In some patients vestibular areflexia could be seen (Fig. 2). In all patients additional VOG abnormalities were identified including decreased gain in smooth pursuit (100%), 77.8% of patients having both horizontal and vertical alterations, the rest having isolated vertical smooth pursuit abnormalities; 72.2% of patients had increased number of square-wave jerks (SWJ) in gaze test; evident nystagmus was seen in 61.1% of patients; saccadic dysmetria was identified in 66.7% including 7 patients with hypermetric saccades, 4 patients with hypometric saccades, and 1 patient with co-existing hypo- and hypermetria; 38.9% of patients had increased saccade latencies; 38.9% had slowing of saccades, and in all but one case this slowing was not very pronounced. Of 7 patients for whom the assessment of VOR suppression test was possible, only 14.3% had impaired VOR

suppression. VOG findings are summarized in Table 1.

**Discussion:** VOG features of CANVAS were previously described [4], and our results go along with existing data. Instead of testing visually enhanced vestibulo-ocular reflex (VVOR), in our study discrete tests on every system were performed. Smooth pursuit was impaired in all tested patients, but saccadic accuracy and VOR suppression were sometimes intact. It should be stressed that VOR suppression could not be assessed in patients with severe VOR abnormalities. But in those subjects in whom VOR was relatively spared, preserved VOR suppression could be elicited in some cases. If VOR suppression was non-informative, absence of cerebellar nystagmus and/or saccadic dysmetria could be seen frequently. That means relatively preserved cerebellar function in some CANVAS patients, making vestibular rehabilitation physiologically justified. Elicited saccadic slowing in our cohort of patients suggests additional brainstem oculomotor nuclei impairment.

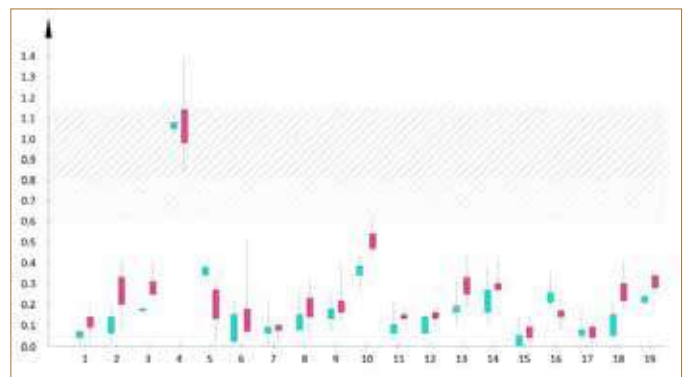
**Conclusion:** Extensive VOG features of CANVAS were obtained, leading to the need of further investigation of vestibular rehabilitation possibilities in this group.

**Keywords:** bilateral vestibulopathy, movement disorders, cerebellar diseases, sensory ataxia, DNA repeat expansion

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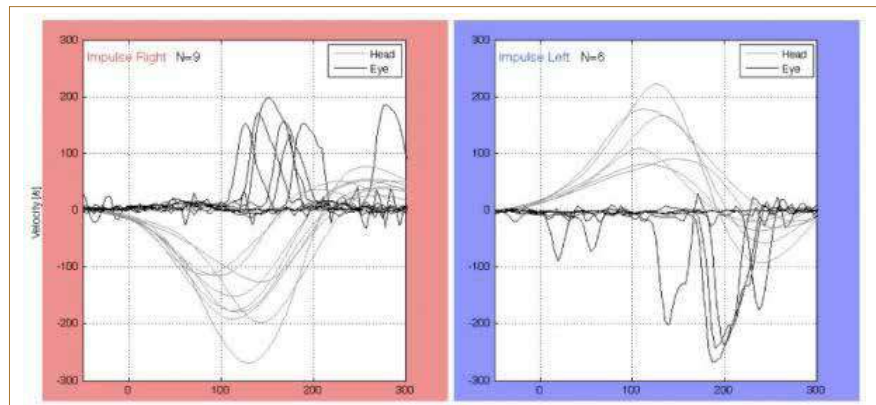
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**Figure 1:** Horizontal vHIT gain of 19 patients with CANVAS syndrome. The vHIT gain is represented in boxplots (y-axis) for each of the patient (x-axis). Magenta boxes are for the rightward impulses, and cyan ones are for the leftward impulses. Hatched area represents values not meeting vHIT bilateral vestibulopathy criterion of Bárány society. Only patient number 4 with incomplete CANVAS syndrome (cerebellar ataxia and sensory neuropathy with no signs of vestibulopathy) has normal vHIT gain.





**Figure 2:** Horizontal vHIT graphs of patient number 7, having one of the most prominent vHIT gain decrease. X-axis represents time, and y-axis represents velocity. Gray lines are for head movements, and black lines are for eye movements. The eyes almost don't move in response to head displacement, showing nearly absent vestibulo-ocular reflex. Covert and overt compensatory saccades are seen



**Table 1:** Summary of video-oculographic findings in each of 20 patients with CANVAS syndrome. Vert. - vertical, hor. - horizontal, SWJ - square-wave jerks, VOR - vestibulo-ocular reflex, N – normal, “↑” - increased, “+” – present, “-” – absent.

Patient ID	Sex	Age, years	Disease duration, years	Saccade velocity	Saccadic dysmetria	Saccade latency	Smooth pursuit abnormalities	Nystagmus	Number of SWJ	vHIT gain <0.6 on both sides	VOR suppression
1	f	72	10	N	-	N	hor. and vert.	+	↑	+	non-informative
2	f	68	22	N	-	N	hor. and vert.	+	↑	+	non-informative
3	m	61	8	N	-	↑	hor. and vert.	-	N	+	N
4	f	63	15	N	hypermetric	N	hor. and vert.	+	↑	-	impaired
5	f	58	9	mild slowing	-	↑	hor. and vert.	+	↑	+	non-informative
6	f	50	10	mild slowing	hypermetric	↑	hor. and vert.	+	↑	+	non-informative
7	m	75	30	mild slowing	hypometric	↑	hor. and vert.	+	↑	+	non-informative
8	f	72	22	N	hypermetric	N	hor. and vert.	+	↑	+	non-informative
9	m	59	14	N	hypometric	↑	hor. and vert.	-	↑	+	non-informative
10	m	38	2	slowing	hypometric	↑	hor. and vert.	-	↑	+	non-informative
11	f	67	7	mild slowing	hypermetric	N	hor. and vert.	-	↑	+	non-informative
12	m	62	10	N	-	N	vert.	-	N	+	N
13	f	72	14	not performed	not performed	not performed	not performed	not performed	not performed	+	non-informative
14	f	66	2	N	hypermetric	N	vert.	+	N	+	N
15	f	52	10	mild slowing	hypermetric	N	hor. and vert.	+	↑	+	non-informative
16	m	77	17	N	hypometric	↑	hor. and vert.	-	N	+	N
17	m	77	7	mild slowing	hypometric	N	vert.	+	N	+	not performed
18	m	70	8	not performed	not performed	not performed	not performed	not performed	not performed	+	not performed
19	f	66	10	N	both hypo- and hypermetric	N	hor. and vert.	+	↑	+	N
20	f	40	8	N	-	N	vert.	-	↑	not performed	N

## Assessment of the Vestibular Function

OP-09

### DIZZINESS AND VERTIGO IN AN ONLINE TELECLINIC: A CLINICIAN'S EXPERIENCE

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**Introduction:** Traditional in-person vertigo assessments can be time-consuming and expensive and may be inaccessible in remote or underserved areas. Telemedicine has emerged as a viable alternative to in-person assessments, allowing patients to receive care remotely while improving access, lowering costs, and increasing patient satisfaction.

**Methodology:** This retrospective study involving records of patients seen by the author saw in an online clinic between January 2021 and December 2022 aims to discuss the prevalence of dizziness in an online teleclinic and investigate the diagnostic process involved in evaluating patients. All patients with dizziness who agreed to a video consultation were included, regardless of location in the Philippines. The study utilized data from the year-end census. The information gathered included age, gender, chief complaint, and diagnosis. Incomplete entries and those with non-vestibular etiologies were excluded. Because secondary data was used, no identifying information was collected. For ease of access, each entry was assigned an alphanumeric code. Other details were kept private to protect the patients' privacy. The protected datasheet is only accessible to the author.

**Results:** Out of the 973 cases seen during the study period, 89 (9.1%) complained of dizziness. Seventeen accounts were eliminated based on the exclusion criteria, leaving 72 entries. The mean age of the patients was 43, with a range of 13 to 89 years and a median of 38 years. The majority of patients (75%) were female (n=54). Out of the 72 remaining cases with dizziness complaints, 47 (65%) had a single diagnosis, and 25 had multiple diagnoses (35%). BPPV (34.7 %) is the most common primary diagnosis, followed by Vestibular Migraine (30.6 %), Functional dizziness (15.3%), Acute Unilateral Vestibulopathy (9.7%), and Meniere's Disease (4.2%). When all diagnoses, including secondary impressions, are considered, the most common cause is still BPPV (27.3 %), followed by Vestibular Migraine (26.3 %) and Functional Dizziness (24.2 %).

**Limitations:** Since all information is derived from online consultation, and no physical examination was done, the accuracy of the diagnosis may be limited. Similarly, because a single clinician evaluated all patients, the findings may be limited in their generalizability.

**Discussion:** Dizziness is a common complaint, with an incidence of 11% per year and a lifetime prevalence of 30%. It may be described as unsteadiness, lightheadedness, vertigo, and syncope, which may represent underlying disease pathologies. Two extensive

studies involving 34,860 and 21,166 patients from Germany and Korea agree that the top six most common causes of dizziness and vertigo are BPPV, Psychiatric or Functional Dizziness, Vascular (Central), Vestibular Migraine, Meniere's Disease, and Vestibular Neuritis (Unilateral Vestibulopathy). This study's findings are consistent with the existing literature. The various causes of dizziness are evaluated based on the patient's history and clinical examination. However, a comprehensive physical examination is impossible due to the limitation of online consultation. To augment the limitation, greater emphasis is placed on history and targeted physical examination. Approaches that may be used include guides, questionnaires, and evaluation through virtual platforms. The latter involves looking into the camera and giving instructions to patients to check for nystagmus, saccades, pursuit, binocular alignment, and Head Impulse.

**Conclusion:** Dizziness and vertigo are still one of the most common complaints in ENT clinics, even if it is online. BPPV, Vestibular Migraine, Functional Dizziness, and Acute Unilateral Vestibulopathy are the most common causes, primarily affecting women. Disease processes can coexist. Although a thorough history and physical examination are required for proper assessment, using various tools, algorithms, and guidelines allows for a more systematic and evidence-based approach.

**Keywords:** Dizziness, vertigo, lightheadedness

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**Figure:** Demographic data and causes of vertigo

	Total Consults	Patients with Dizziness	%
2021	663	57	8.6%
2022	310	32	10.3%
TOTAL	973	89	9.1%
	n	72	
	Male	18	25%
	Female	54	75%

DIAGNOSIS		n	%
	Single diagnosis	47	65%
	Multiple diagnosis	25	35%

PRIMARY DIAGNOSIS		n	%
	BPPV	25	34.7%
	Vestibular Migraine	22	30.6%
	Functional Dizziness	11	15.3%
	Acute Unilateral Vestibulopathy	7	9.7%
	Meniere's Disease	3	4.2%
	Bilateral Vestibulopathy	2	2.8%
	Cervicogenic	1	1.4%
	Central	1	1.4%

ALL DIAGNOSES INCLUDED		n	%
	BPPV	27	27.3%
	Vestibular Migraine	26	26.3%
	Functional Dizziness	24	24.2%
	Acute Unilateral Vestibulopathy	7	7.1%
	Central	5	5.1%
	Meniere's Disease	4	4.0%
	Bilateral Vestibulopathy	2	2.0%
	SSCD	2	2.0%
	Cervicogenic Vertigo	2	2.0%

**Figure:** Diagnostic tools for evaluation of dizziness

[illegible]

## Acute Vestibulopathy

**OP-10**

## IDIOPATHIC LABYRINTHITIS: SYMPTOMS, CLINICAL CHARACTERISTICS AND PROGNOSIS

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**Aim:** Labyrinthitis is an inner ear disorder of unknown incidence, characterized by sudden hearing loss and concurrent vertigo. Cohort studies of patients diagnosed with labyrinthitis are non-existent. This study aims to describe the clinical characteristics and prognosis of patients diagnosed with idiopathic labyrinthitis.

**Method:** Patients with labyrinthitis in the absence of a clear viral, bacterial or auto-immune pathogenesis were retrospectively identified from the Apeldoorn Dizziness Centre database. Symptoms at presentation and results from vestibular testing were retrieved. The 9-item Vestibular Activity Avoidance Instrument<sup>1</sup>, administered during follow-up interviews by telephone, was used to assess the presence of persistent balance problems and activity avoidance behavior.

**Results:** Sixty-one patients with idiopathic labyrinthitis were included. All patients had vestibular weakness at presentation. After a median of 61 months of follow-up (IQR 81), 72.5% of patients still experienced balance problems. Subjective hearing recovery only occurred in 20% of cases.

**Conclusion:** Patients presenting in a tertiary dizziness clinic with idiopathic labyrinthitis have a poor prognosis for both hearing recovery and balance function. These results highlight the importance of vestibular testing and vestibular rehabilitation in the case of vestibulopathy, to improve functional outcomes in patients with idiopathic labyrinthitis.

**Keywords:** Labyrinthitis, vestibulopathy, sensorineural hearing loss

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## Assessment of the Vestibular Function

### OP-11

#### THE EFFECT OF SLEEP DEPRIVATION ON PASSIVE FUNCTION, ACTIVE FUNCTION AND DISTANCE MODULATION OF THE VESTIBULO-OCULAR REFLEX

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**Background:** Sleep deprivation correlates with cognitive impairments, increased risk of human errors, car accidents, and falls. The Vestibulo-Ocular Reflex (VOR) has a key role in human function by enabling gaze stabilization during passive and active head movements and is required to constantly adapt to the changing environment. An interruption to the proper function of the VOR (i.e., leading to unstable gaze and blurry vision) not only compromises normal human activity but may also be a significant risk factor when performing tasks that require maximal accuracy (e.g., driving). This reinforces the need to investigate aspects that may alter VOR function. This study aims to provide an important perspective on sleep deprivation and VOR function for the benefit of clinical and vestibular research.

**Aims:** To assess the effect of acute sleep deprivation on the physiological function of the Vestibulo-ocular reflex in healthy adults, compared to full night sleep. To evaluate the effect of sleep deprivation on passive and active vestibular function, to determine the difference between passive and active VOR function following sleep deprivation and to evaluate the vergence mediated modulation (adaptation) of the VOR following sleep deprivation. Secondary aim, to re-assess the effect of sleep deprivation on behavioral VOR function.

**Material and Methods:** Seventeen healthy adults, 32-42 years old, were recruited, 14 completed the protocol. Participants were evaluated for two nights: (1) normal sleep; (2) sleep deprivation of 24 hours. Tests included physiological VOR assessments using the Video Head Impulse Test (vHIT) in four conditions: Far and close targets, performed with active and passive head movements. A behavioral VOR test (using computerized dynamic visual acuity test) was performed following each night. Participants were monitored by an ActiGraph watch during both nights.

**Results:** VOR gain adaptation significantly decreases ( $p=0.013$ ) following sleep deprivation. VOR gain did not change following sleep deprivation. Increase in the VOR gain in the middle of the night (sleep deprivation protocol) was indicated. Active movement produced a higher VOR gain than passive movement and was not affected by sleep deprivation

**Conclusion:** Sleep deprivation does not affect physiological nor behavioral VOR function but decreases its adaptation abilities to vergence modulation. Circadian rhythm might explain the increase in VOR gain during the night.

**Keywords:** VOR, vergence modulation, sleep deprivation, vestibular function, adaptation

## Vestibular Rehabilitation

### OP-12

#### PROGRESSION OF THE LIMITS OF STABILITY MEASUREMENT DURING VESTIBULAR REHABILITATION TREATMENT.

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<sup>1</sup>Clínica Universidad De Navarra

**Aim:** Instability is one of the main symptoms in patients with vestibular disorders who require vestibular rehabilitation. To assess this symptom, the evaluation of the limits of stability (LOS) can be a helpful tool as it is an easy way to evaluate dynamic balance. Therefore, the aim of this work is to analyze the progression of the LOS during vestibular rehabilitation process.

**Material and Methods:** Data of patients that underwent vestibular rehabilitation because of chronic instability. In all of them, measurement of LOS before initiating the program, during therapy, at the end and 1-2 months after ending was obtained. Vestibular rehabilitation consisted of balance and vestibulo-ocular coordination exercises to improve their symptoms and functionality.

**Results:** There is a progressive increase in the LOS through vestibular rehabilitation process in those patients. This improvement decreases in the follow-up of 1-2 months, but still being higher than the initial measurements.

**Discussion:** LOS can be modified by balance training during vestibular rehabilitation process in those patients. Besides, the reliability of this test and its impact on the daily activities of the patients must be considered.

**Conclusion:** The LOS measurement is a good tool to use for the evaluation of instability in vestibular patients. Therefore, it can be used as an objective to improve through balance training during the vestibular rehabilitation process. Furthermore, it is interesting to take into consideration the retention of this improvement too.

**Keywords:** Rehabilitation, postural balance, vestibular diseases



## Assessment of the Vestibular Function

## OP-13

## INTRINSIC AND EXTRINSIC FACTORS THAT MANIPULATE VOR FUNCTION

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**Background:** The Vestibulo-Ocular Reflex (VOR) has a central role in human function by enabling gaze stabilization during head movements. An accurate assessment of the VOR is essential for a better diagnosis of vestibular dysfunction and balance disorders. Awareness of the effects of personal and environmental factors on VOR function can improve the accuracy of vestibular assessment and test analysis. It can also offer an essential perspective on the safety of occupations that are exposed to VOR manipulating factors. Exploring the impact of the different elements on the VOR, can lead to a better understanding of the underlying pathology and VOR function mechanism. This understanding can assist while planning comprehensive rehabilitation programs.

**Objective:** This review aims to present the intrinsic and extrinsic factors that might influence VOR function test results measured by VOR gain.

**Material and Methods:** We reviewed the effect of different variables on the function of the VOR during testing. We included papers that tested the angular VOR function using common vestibular laboratory tests such as caloric tests, rotatory chair tests, and video head impulse tests. The selected papers were divided into those that measure intrinsic factors, which are related to the patient, and extrinsic factors, which are in the control of the clinic or clinician.

**Results:** Intrinsic factor that manipulated VOR function by increasing or decreasing VOR gain was alcohol. Extrinsic factors that influenced VOR gain were the distance from the target, target contrast level, and non-visual inputs such as sound, which differed its effect according to the speaker placement (moving vs. fixed). Non-visual inputs' effect on VOR were related to attention mechanisms. Target size, head rotation type (active vs. passive), sleep deprivation, and age showed no or minor impact on the VOR gain.

**Conclusion:** Clinicians and researchers should create a clean and uniform testing environment by controlling patient-related or clinic-related factors that affect VOR. Unawareness of these factors can mislead test results. Awareness of these factors should also be considered while refining the rehabilitation process. This review also emphasizes the complexity of the VOR function by presenting the divert factors that interfere with the three-neuron VOR arc.

**Keywords:** VOR, Vestibular system

## Other

## OP-14

## STUDY OF THE CHARACTERISTICS OF PREFRONTAL EEG IN TINNITUS PATIENTS

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**Aim:** We measured the prefrontal EEG of tinnitus patients with a two-channel electroencephalography to find out the EEG characteristics that can be observed due to tinnitus. Through this, we wanted to establish that the occurrence of tinnitus may also be related to the brain.

**Material and Methods:** EEG was measured in Fp1 and Fp2 of the prefrontal lobe with Fz as the ground electrode and A1 as the reference electrode. 95 tinnitus patients whose ages ranged from the 30s to the 80s were participated. The ratio of men to women was 51 to 44. The spectral power was obtained by the Fourier transform to find out the dominant frequency and amplitude. The absolute and relative power values for each band were obtained for each channel, and the coherence value between the brain waves of Fp1 and Fp2 was obtained. Average ratios for 2 channel between secondary peak power to primary peak power were obtained. It was compared with the EEG of 100 healthy adults.

**Results:** In addition to the primary domination frequency occurring within the range of 9~11Hz, tinnitus patients showed a secondary dominating frequency occurring in the range of 5~7Hz, which does not occur in healthy adults. According to ratios, the patients were divided into two groups, one is higher than 1.0 and the other is lower than 0.6. We found that high ratio group showed lower median frequency, about 6.77~6.85Hz than low ratio group, about 8.47~8.41Hz. The average coherence value was significantly lower, 0.53 to 0.74, and the average relative strength of the alpha band (8.0~12.0Hz) was significantly lower, 11.30~12.36 vs 23.65~23.94. These results were confirmed to be age-independent.

**Discussion:** If the power intensity of the secondary dominant frequency generated in the 5.0~7.0Hz band is stronger than that of the 9.0~11.0Hz band, damage or deterioration of brain function can be thought to be the cause of tinnitus. Since brain waves are measured in the prefrontal lobe, it is thought that the primary dominant frequency refers to the active brain waves of the prefrontal lobe, and the secondary frequency is thought to be the brain waves generated in the temporal lobe, where the auditory cortex is located.

**Conclusion:** It was found that if the secondary domination frequency generated in the theta band is stronger than the primary domination frequency generated in the alpha band at the frequency of the EEG measured in the prefrontal lobe, the cause of tinnitus



can be thought of as damage or functional deterioration of the auditory cortex of the temporal lobe.

**Keywords:** Tinnitus, EEG

## Endolymphatic Sac and Meniere's Disease

OP-15

### VESTIBULAR NEURECTOMY FOR INTRACTABLE VERTIGO IN MENIERES DISEASE

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<sup>2</sup>Bharathi Ent Hospital

Menieres disease is presented with vertigo, Tinnitus, aural fullness, hard of hearing. There are numerous treatment options that are suggested for menieres disease. Medical management with vestibular suppressants, Intratympanic steroid injection, Intratympanic gentamycin injection, Endolymphatic sac decompression / duct clipping, Labyrinthectomy, Vestibular neurectomy. The enumerated treatment options might provide temporary improvement of symptoms. Vestibular neurectomy among these options will help to retain the hearing as well as complete remission of symptoms. Vestibular neurectomy also helps in prevention of development of disease on the opposite side in 1/3rd of the cases. The authors hereby present their experience of vestibular neurectomy for intractable vertigo in menieres disease in 94 cases from June 2015 to March 2021. All the cases are done through retrosigmoid approach. Out of these 94 cases, surgical failure (?) happened in 2 cases which might be due to neurinoma formation of the cut ends of the nerve. All the cases published here are after minimum 1 year of followup.

**Keywords:** Menieres disease, vestibular neurectomy, labyrinthectomy, vestibular deafferentation, Retrosigmoid approach

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**Figure:** Vestibular neurectomy



## Clinical Utility and Interpretation of the vHIT

OP-16

### USE OF THE VIDEO HEAD IMPULSE TEST TO IDENTIFY VESTIBULOPATHY IN MULTIPLE SCLEROSIS PATIENTS WITH RELAPSING REMITTING DISEASE

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No significant correlation was found between EDSS, disease duration and number of attacks and VOR gain value of any channel. Objective: Multiple Sclerosis (MS), an autoimmune demyelinating disease of the central nervous system, is a major cause of disability worldwide. The objective of this study was to evaluate the vestibular system with a video Head Impulse Test (vHIT) and detect the impairment of the Vestibulo-ocular Reflex (VOR) in Relapsing Remitting Type of MS (RRMS) patients compared to healthy controls.

**Material and Methods:** Thirty five (35) RRMS patients and 35 healthy volunteers were included in the study. Extended disability status score (EDSS), disease duration and number of attacks were determined. Fifteen head impulses for each SSC were performed to the participants. For all SSCs, VOR gains (calculated by dividing eye velocity to head velocity) and the latencies and gains of covert saccades (occur during the head impulse) were measured. Mann-Whitney U test was used to compare the patient and control groups. Spearman's correlation coefficient was used to find an association between the number of attacks, EDSS scores, disease duration and the VOR gains.

**Results:** No significant difference was found between the patient (male/female=5/30; mean age=) and control group (male/female=10/25) in terms of age and sex distribution ( $p=0.066$  and  $p=0.244$  respectively). The VOR gains for most of the canals were higher in healthy controls compared to patients with MS. VOR gain values of LL, RA, LP and RP channels were found to be lower than normal population ( $p<0.001$ ,  $p=0.026$ ,  $p<0.001$ ,  $p=0.013$  respectively). When abnormal saccades were analysed, abnormal saccades (overt/covert) were observed in 6 patients in the patient group only in the LA canal ( $p<0.001$ ), while there was no difference between the patient and control groups in the other semicircular canals. No significant correlation was found between EDSS, disease duration and number of attacks and VOR gain value of any channel.

**Conclusion:** This study shows that the vestibulo-ocular system can be affected in RRMS patients and recommends using vHIT to detect any potential vestibular impairment.

**Keywords:** Multiple sclerosis vestibulo-ocular reflex, video head impulse test





## Cochlear implants and its impact on vestibular system

OP-17

## VESTIBULAR SYMPTOMS FOLLOWING COCHLEAR IMPLANTATION WITH THE COCHLEAR NUCLEUS CI 632 SLIM MODIOLAR ARRAY

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**Introduction:** Vestibular symptoms are commonly reported following cochlear implantation and have attracted significant academic review (1-4). However the development of the new slim modiolar array (Cochlear Nucleus CI 632) may render previous data less relevant.

**Material and Methods:** To determine whether the new electrode was associated with clinically significant vestibular symptoms we retrospectively reviewed the case notes of 59 consecutive patients (36 adults and 23 children), implanted in a single centre between May 2019 and January 2022 using the Nucleus CI 632. Data was collected on pre and postoperative vestibular symptoms, other neurological conditions and surgical approach. Data on duration of admission and reasons for delayed discharge were analysed.

**Results:** The average length of stay for all patients was 0.8 days, 18.6% were discharged on the day of surgery. No patient's discharge was delayed by vestibular symptoms. One patient was delayed by one night for unspecified illness. Three patients had round window approaches vs 55 cochleostomy. We observed minor vestibular symptoms on discharge in 1 adult (3%) and 2 children (9%). We observed vestibular symptoms at later follow up in 6 adults (17%) and 1 child (4%). Two patients required referral for vestibular physiotherapy at follow-up.

**Conclusions:** Vestibular symptoms are uncommon following cochleostomy insertion with the CI 632 and did not prevent safe discharge in under 24 hrs following surgery in adults or children. Some patients developed symptoms during their recovery but within the range described for other electrode types and surgical approaches.

**Keywords:** Cochlear implant, CI632, slim modiolar array, vestibular function, vestibular dysfunction, dizziness, vertigo, length of stay, delayed discharge

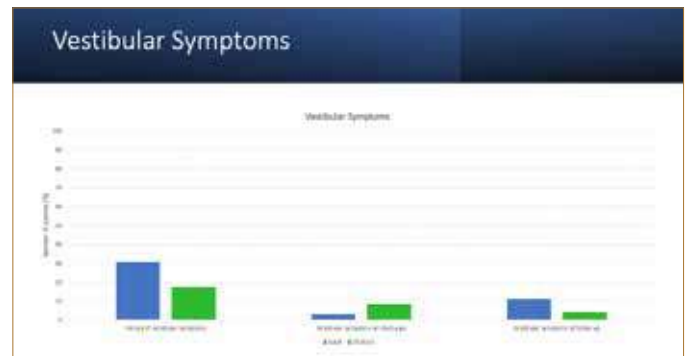
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**Figure:** Vestibular Symptoms pre-op, post-op and at long term follow up



## Vestibular Toxicity in Daily Medical Practice (medicines, alcohol, drugs, etc.)

OP-18

## GENTAMICIN-INDUCED INNER EAR INJURY: PRESERVATION OF VESTIBULAR FUNCTIONS UNDER ALPHA1-ANTITRYPSIN-RICH CONDITIONS

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**Introduction:** Aminoglycosides are the single most known ototoxic antibiotic agent, leading to vestibular dysfunction and hearing loss. The ototoxic mechanism involves excessive inflammation, tissue damage, reactive oxygen species (ROS) and apoptotic events that lead to irreparable cell damage. Currently, there is no clinical approach to address this entity. Alpha1-antitrypsin (AAT) is a circulating tissue protective-molecule that is elevated during inflammatory conditions, diverts excessive inflammation towards resolution, decreases ROS levels and interferes with apoptosis in several cell types. It is presently indicated for genetic AAT deficiency. Mice that carry two alleles of transgenic hAAT (hAAT+/+) exhibit life-long elevated circulating hAAT and are protected from inflammatory flares. These attributes motion an investigation of vestibular preservation under hAAT-rich conditions.

**Aim:** To characterize molecular aspects of gentamicin-induced vestibulotoxicity under hAAT-rich conditions.



**Material and Methods:** Both hAAT+/+ and wild-type (WT) mice received daily intraperitoneal gentamicin injections (100 mg/kg, 9 days). Vestibular functions were determined and inner ear organs collected for analysis.

**Results:** Expectedly, gentamicin caused significant hearing (60 versus 20-30 dB threshold in healthy mice), and a profound decline in vestibular performance (2.6 severity score). However, by day 9, the AAT group displayed early signs of functional restoration and subsequent complete recovery. According to the rotarod test, hAAT group had a longer latency to fall time compared to the WT group, as well as a 13-fold lower vestibular score, suggesting superior vestibular functionality. Expression of Bax/Bcl2 and caspase-3 in the vestibular organs of WT mice had a clear apoptotic profile, while the hAAT group was unchanged from control conditions. Conclusion. The beneficial outcomes of circulating AAT on vestibular functional preservation hold therapeutic opportunities. Ongoing studies explore additional mechanistic avenues using recombinant AAT formulations, as well as local treatment outcomes.

**Keywords:** Aminoglycosides, gentamicin, vestibulotoxicity, alpha1-antitrypsin, tissue repair, drug-induced vestibulotoxicity

Other

OP-23

## A COGNITIVE BEHAVIORAL THERAPY-BASED INTEGRATIVE GROUP INTERVENTION IN TINNITUS PATIENTS

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Among the treatment options for tinnitus, psychotherapy is the preferred procedure, based on the literature. Within this, cognitive behavioral therapy (CBT) has the greatest evidence base in terms of reducing the psychological symptoms of those affected. This method is limited in access in Hungary, especially in a social security funded, group format.

We started using CBT-type group psychotherapy with individuals affected by tinnitus in January 2022, at our clinic. The therapy lasts for seven weeks, an hour and a half per occasion, involving 4-8 patients per group. The effect of the intervention is tested in a pre-post arrangement, using self-administered measurement scales along the following psychological constructs: tinnitus-related quality of life, anxiety, somatization and depressive symptoms, personality traits, perceived stress, somatosensory amplification. Tinnitus self-evaluation is also done on visual analog scales.

The results of the first pilot study are encouraging: while the participants do not notice a decrease in volume, the bothersomeness

of the tinnitus tends to decrease in both ears after the therapy, and the quality of life associated with tinnitus also tends to improve. As the number of subjects increases, the significance of the results can be hoped for.

**Keywords:** tinnitus, quality of life, cognitive behavioral therapy

## Assessment of the Vestibular Function

OP-27

## ASSESSMENT OF VESTIBULAR FUNCTION IN GROUP OF PATIENTS WITH PARTIAL DEAFNESS

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**Aim:** The assessment of the vestibular status in group of patients with partial deafness undergo cochlear implantation.

**Material and Methods:** A total group of 225 patients with profound hearing loss in one ear (with or without low frequency residual hearing) were enrolled in this study. The patients were divided into four groups according to their low frequency residual hearing. Vestibular function were assessed through: cVEMP, oVEMP, caloric test and vHIT.

**Results:** For the caloric test we have received normal responses in 88.9% of Group 1; 81.6% of Group 2; 57.9% of Group 3; 53.3% of Group 4. The rates of cVEMP were as follows: in Group 1: 59.3%, in Group 2: 57.5%, in Group 3: 35.2%, in Group 4: 7.7 %. For oVEMP the percentage of correct outcomes was: Group 1: 70.8%; Group 2: 56%, Group 3: 40%, Group 4: 14.3%. For vHIT we also found markedly better results in Group 1 followed by Group 2 and much worse in Group 3 and 4.

**Discussion:** The relationship between cochlear and vestibular function has been a field to investigation for many years. Both of these organs may be susceptible to the same noxious factors. This is largely due to significant anatomical and phylogenetical correlation between cochlea and vestibular organ. Indications for cochlear implantation have fixedly broadened, especially in group of partial deafness and this fact raise questions of vestibular status patients undergo this kind of operation.

**Conclusion:** In our study we have observed that patients with the better low frequency residual hearing have also the better vestibular functions. In summary, patients with partial deafness have a better cochlea and also better vestibular status, which needs to be more protected.

**Keywords :** Cochlear implantation, partial deafness, vestibular evoked myogenic potential, video head impulse test





## Assessment of the Vestibular Function

OP-28

### EVALUATION OF THE COEXISTENCE OF OLFACTORY DISORDER AND VESTIBULAR DISORDER IN COVID-19 PATIENTS

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**Aim:** The aim of this study is to evaluate the effects of COVID-19 on the auditory vestibular system and the olfactogustatory system with objective methods and to investigate the coexistence of these two systems.

**Material and Methods:** 30 covid-19 patients with olfactory loss (group1) and 30 without olfactory loss (group 2) were included in the study. High frequency audiometry test was used to evaluate hearing function and Vestibular Evoked Myogenic Potentials (VEMP), Video Head Impulse Test (vHIT) and Caloric Test was used to evaluate the vestibular system for eligible patients. The audiometric results and vestibular test results of the group with and without olfactory disorders were compared.

**Results:** In this study, in which the audiovestibular test results of patients with and without olfactory disorders were compared, it was observed that there was no significant difference between the two groups ( $p < 0.05$ ).

**Discussion:** Due to the neurotropic and neuroinvasive properties of coronaviruses, neurological manifestations concerning the central nervous system and the peripheral nervous system have been reported in hospitalized patients with COVID-19. Reported in a study; the most common otolaryngological findings of covid-19 were hyposmia/anosmia (37.9%) and hypogeusia/ageusia (41.37%), and the rate of otological/vestibular symptoms of covid-19 dizziness (31.8%), tinnitus (11%), true vertigo (6%), and hearing impairment (5.1%), respectively (Korkmaz et al). In the literature, many articles have been published on the effects of covid 19 on both olfactory and vestibular system dysfunction, especially with olfactory disorder. To the best of our knowledge, there is a limited number of studies examining the relationship between these two dysfunctions in the literature. Study on healthcare workers with covid-19, reported that the prevalence of neurotological manifestations of covid-19 was 18.6%, the most frequent symptoms were vertigo (61.5%), tinnitus (43.5%), imbalance (43.5%), and one case of facial paralysis (2.5%); neurotological manifestations were associated predominantly with asthenia, loss of smell and taste dysfunction (Espinoza-Valdez et al). In Espinoza-Valdez's study, it was reported that neurootological symptoms were most frequently associated with olfactory disorder, however, in our study which is based on objective tests, we did not find a significant difference between the two.

**Conclusion:** In this study, we investigated whether the neurological involvement of covid 19 affects more than one cranial nerve. It is possible to say according to our results that the cranial nerve involvement of covid-19 tends to be isolated.

**Keywords:** Covid-19, vestibular disorders, olfactory dysfunction

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## Assessment of the Vestibular Function

OP-29

### VESTIBULAR EVOKED MYOGENIC POTENTIALS RECORDED FROM TRAPEZIUS MUSCLE: PRELIMINARY REPORT

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**Aim:** The aim of this study is to measure cervical vestibular evoked myogenic potentials (cVEMP) from trapezius muscle (TM).

**Material and Methods:** We enrolled 10 patients all men between the age of 20 to 27. All of the patients had a normal otological examination, normal audiogram, and tympanometric evaluations. Patients with vestibular symptoms were excluded from the study. Vestibular evoked myogenic potentials were recorded from both sternocleidomastoid (SCM) and trapezius muscles. While recording cVEMPs, active electrode was placed onto the middle portion of the SCM. Ground electrode was placed onto glabella and vertex electrode was placed onto suprasternal notch. Similarly, while recording trapezius VEMPs (tVEMPs), active electrode was placed onto the middle portion of the trapezius muscle, 1.5 centimeters away from midline. Vertex electrode was placed onto the spinous process of the seventh cervical vertebrae and ground electrode was placed onto glabella. Electrode placements were shown in figure 1. The impedance of the electrodes was less than 5 ohms. Participants were instructed to contract their trapezius muscle during the test. 500 Hz tone burst stimuli was used at an intensity of 95 nHL in both cVEMPs and tVEMPs. The insert



**Table 1:** P1 and N1 latencies of both left and right sides (SD: standard deviation, Min: minimum, Max: maximum, ms: millisecond)

		Sternocleidomastoid	Sternocleidomastoid	Trapezius	Trapezius				
		Mean±SD	Median (Min-Max)	Mean±SD	Median (Min-Max)	Difference	r	Test Stats.	p
Right	P1 (ms)	15.63±0.93	15.48 (14.67-17.3)	15.48 (14.67-17.3)	26.67 (19.67-39.33)	-12.49±6.49	-0.106	-5.775	<0.001a
Right	N1 (ms)	25.78±2.85	25.72 (21.67-30.67)	36.83±7.14	36.83 (27.67-48.67)	-10.97±7.1	0.224	-4.634	0.002a
Left	P1 (ms)	15.67±0.94	15.67 (14.33-17.33)	25.38±7.21	23.17 (20-41.67)			-2.524	0.012b
Left	N1 (ms)	25.26±2.56	24.84 (22-30)	34.67±8.25	32.83 (26-51)	-9.01±8.55	0.053	-2.980	0.021a

**Table 2:** tVEMP and cVEMP amplitudes and amplitude asymmetries of left and right side (SD: standard deviation, Min: minimum, Max: maximum, µV: microvolt)

		cVEMP	cVEMP	tVEMP	tVEMP				
		Mean±SD	Median (Min-Max)	Mean±SD	Median (Min-Max)	Difference	r	Test Stats.	p
Right	Amplitude	94.81±18.15	94.81 (59.01-125.8)	46.87±20.93	46.13 (21.12-82.28)	44.5±31.05	-0.447	4.299	0.003
Left	Amplitude	77.76±17.51	74.61 (49.31-104.6)	29.09±9.12	26.81 (18.6-48.68)	54.97±13.38	0.293	11.617	<0.001
	Amplitude Asymmetry	0.13±0.14	0.09 (0.01-0.44)	0.24±0.2	0.19 (0.01-0.56)	-0.17±0.21	-0.049	-2.294	0.055

earphones (Ear Tone ABR 3A; 3M, Minneapolis, MN, USA) and Interacoustic Eclipse EP 15 (Interacoustics Eclipse EP15; Assens, Denmark) utilized in the tests. Over 200 sweeps, responses were averaged out.

**Results:** The individuals' ages ranged from 20 to 27 years, with a mean age of  $22.30 \pm 2.21$  years. cVEMP recordings were obtained from both right and left side in all patients. We couldn't obtain both left and right tVEMP from one patient. In another patient we could only obtain right side tVEMP response. P1 and N1 latencies were found significantly longer in tVEMP than cVEMP (Table 1). tVEMP amplitudes were found significantly lower than cVEMP amplitudes in both right and left side recordings as shown in table 2 ( $p=0.003$  and  $p<0.001$ , respectively).

**Discussion:** One electrical test utilized in the diagnosis of some particular vestibular diseases is the cVEMP which is assumed to evaluate function of the saccule. This test needs an intact vestibulo-collis reflex and neck extensors. The most commonly used muscle for VEMP testing is the SCM muscle. But alternatively, VEMP responses can be recorded from the trapezius muscle as well. Sakakura et al. measured VEMP responses from neck extensors without proper muscle contraction and found a negative peak at 13 ms on normal subjects. We found a positive peak with a mean latency of 28 ms for right and 25.38 ms for left side followed by a negative peak with a mean latency of 36.83 ms for right and 34.67 for left side. Feber-Viart et al. also measured VEMP responses from TM and compared them to cVEMPs. They found a positive peak with a mean latency of 13.3 ms for both right and left side followed by a negative peak with a mean latency of 21.8 ms for right and 22.9 for left side which is shorter than our study. Interestingly, they obtained higher amplitudes from TM which is not consistent with our preliminary study. The distance between the active and reference electrodes could be the cause of that difference between these two studies. Although there are different results in terms of latency and amplitude, the tVEMP test can be still valuable in patients with neck problems.

**Figure:** Electrode montage of the VEMPs



**Conclusion:** VEMPs can be recorded from trapezius muscle alternative to SCM. Although latencies of P1 and N1 are significantly longer than cVEMP and amplitudes were significantly lower than cVEMP, tVEMP can still replace cVEMP in patients with neck problems.

**Keywords:** VEMP, trapezius muscle, sternocleidomastoid muscle



## ACCEPTED POSTER PRESENTATIONS LIST

### **PP-01 Skull Vibration-Induced Nystagmus**

Melissa Blanco Pareja, Nicolas Pérez Fernández, Laura Flix

(Department of Otorhinolaryngology, Clínica Universidad de Navarra, 28015 Madrid, Spain)

### **PP-02 Central Signs in A Case of BPPV**

Sandeep Kumar

(Bharti Ent Clinic, India)

### **PP-04 The Case Report of Tinnitus Patient Treated By Using Combination of Multiple Korean Medicine Including Acupuncture and Acupotomy**

Hyeyeong Kang

(Songpa Sejong Korean Medicine Clinic)

### **PP-10 Diagnostic Assistant to be Added to The International Diagnostic Criteria**

Haider Alsarhan

(College of medicine /Mustansiriyah University)

### **PP-15 Diagnostic Significance of Using Pulse Wave Meter for Tinnitus**

Kyoung Yoon Lee

(Dongsuwan Korean Medicine Hospital)

### **PP-18 Vestibular and Visual Acuity Outcomes in Patients After Stapedotomy**

Emelina Andrea Ruiz, Francisco Javier Gonzalez, Pedro Abel Blanco

(Valley University Hospital)

### **PP-19 Adverse Events of Vaccines and Drugs Used in The Prevention and Treatment Of COVID-19 From The Perspective of an Otolaryngologist**

Magdalena Beata Skarżyńska, Monika Matusiak, Piotr Henryk Skarżyński, Ewa Tomanek, Ewelina Bukato

(Institute of Physiology and Pathology of Hearing, Warsaw, Poland)

### **PP-20 Vestibular Status in Group of Patients Undergo Partial Deafness Treatment- Electro Acoustic Stimulation (PDT-EAS)**

Magdalena Sosna, Grażyna Tacikowska, Katarzyna Pietrasik, Henryk Skarżyński, Artur Lorens, Piotr Henryk Skarżyński,

Ewa Tomanek, Ewelina Bukato (Institute of Physiology and Pathology of Hearing, Warsaw, Poland)



## ACCEPTED POSTER PRESENTATIONS

### Other

#### PP-01

### SKULL VIBRATION-INDUCED NYSTAGMUS

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Skull vibration-induced nystagmus (SVIN) is a nystagmus evoked by the application of vibration to the mastoid process, forehead, or sternocleidomastoid muscle. This condition is observed in patients with peripheral or central vestibulopathies. SVIN can offer invaluable help due to its high sensitivity and specificity.

**Aim:** The aim of the study is to analyze whether or not the SVIN is also suppressed by visual fixation and characterize an index of visual fixation.

**Material and Methods:** We performed a retrospective study. We included 37 patients seen for intermittent dizziness or chronic disequilibrium.

Skull vibration-induced nystagmus (SVIN) was evoked with the patient in a sitting position in a completely dark environment by stimulating both mastoid processes for 10 s using a 100 Hz hand-held vibrator (VVIB 100; Synapsys, France). Then the most intense side of the nystagmus was chosen and SVIN was again applied now for 10 seconds in darkness and 10s fixating in a light projected in the left eye.

Nystagmus was recorded using videonystagmography (VisualEyes™ 525, Interacoustics). Baseline eye movements were recorded prior to stimulation of the mastoid processes. Subjects were instructed to continue looking straight ahead while stimulation was applied for approximately 10 s.

The SPV with fixation and SPV without fixation ( $SPV_{wf}$  and  $SPV_{wof}$  respectively) of the horizontal and vertical components of the SVIN were obtained by calculating the slope of the slow-phase eye movement in the 10s window each one. The fixation suppression index is the quotient of  $SPV_{wf}$  and  $SPV_{wof}$ .

At the time of the visit, a vHIT was performed with Otometrics ICS Impulse equipment. The patient was seated and eye position was calibrated immediately before testing. The instruction for the test was to maintain gaze on an earth-fixed visual target located at a distance of 1 m straight ahead at eye level. The clinician stood behind the patient and manually rotated the head abruptly and unpredictably to the left or right through a small angle (10–20) in the horizontal plane to stimulate the left or right horizontal SCC to measure the VOR gains of both ears.

**Results:** The median age was 57 years (range: 36 – 84 years). They were 15 male (M) and 22 female (F). In 7/30 patients, there was no SVIN during otoneurological testing. So we excluded, while

in 26/30, induced nystagmus was mainly horizontal, in 3/30 there was vertical up-beating and in 1/30 there was vertical down-beating. The mean  $SPV_{wf}$  was 4.7°/s and, the mean  $SPV_{wof}$  was 9.5°/s. The mean VFI was 0.43. In 13 patients VFI was 0 (complete suppression of SVIN with visual fixation) and in 17 patients it was  $0 < VFI < 1$  (mean value for that group 0.75) which indicates partial suppression. In no case VFI was  $\geq 1$  which indicates no suppression or visual increment of SVIN.

**Conclusion:** We shall review the importance of this data and the simple way to obtain. Given our results, we propose the assessment both with and without visual fixation as part of the routine vestibular examination.

**Keywords:** Skull vibration-induced nystagmus; SVINT; vestibular disorders, vertigo, high frequencies

### Positional Vertigo

#### PP-02

### CENTRAL SIGNS IN A CASE OF BPPV

Sandeep Kumar<sup>1</sup>

<sup>1</sup>Bharti Ent Clinic, India

Benign Paroxysmal Positional Vertigo is considered primarily a disease of Otoliths in SemiCircular Canals with no Central signs & symptoms. Here We present a Case of Lateral Canal BPPV in which various central signs (Like Positive Hyperventilation Test, Positive Romberg Test, Deranged Subjective Visual Vertical & Positional Periodic Alternating Nystagmus) could be detected on VNG. All these signs disappeared after successful correction of BPPV. Imaging of Posterior Fossa was perfectly Normal. There was no Personal/Family History of Headaches in Past or present.

**Keywords:** BPPV, central signs

#### Figure: Hyperventilation Test







Other

## PP-04

## THE CASE REPORT OF TINNITUS PATIENT TREATED BY USING COMBINATION OF MULTIPLE KOREAN MEDICINE INCLUDING ACUPUNCTURE AND ACUPOTOMY

Hyeyeong Kang<sup>1</sup><sup>1</sup>Songpa Sejong Korean Medicine Clinic

**Purpose:** The purpose of this study is to report the 4 cases of patients who has been diagnosed with tinnitus and treated by using acupuncture and acupotomy.

**Methods:** We analyzed 4 patients who were treated by using acupuncture and acupotomy. Using points of acupuncture and acupotomy were sub-occipital muscles, cervical spine, thoracic spine and TE-17(Yifeng), and also Other medical cares were done. The evaluations of medical-improvement was checked through pure tone audiometry of the patient, broad band noise of the patient and patient self-reports.

**Results:** Peripheral tinnitus was improved through other medical cares and acupuncture and acupotomy of points Which are sub-occipital muscles, the cervical spine, thoracic spine, and nerves involved in the ear, such as the vagus nerve, the glossopharyngeal nerve, the facial nerve(chorda tympani nerve, geniculate ganglion), the trigeminal nerve, sphnopalatine ganglion(SPG), superior cervical ganglion and the auditory nerve. More specially, broad band noise of the patient decreased and 4-divided method, 6 band test of patients on pure tone audiometry was mostly improved. Lastly subjective statement of patients about tinnitus have been improved.

**Conclusion:** Acupuncture, acupotomy and other medical-cares can be a tretment strategies for tinnitus

**Keywords:** Acupotomy, tininitus, hearing loss

Other

## PP-10

## DIAGNOSTIC ASSISTANT TO BE ADDED TO THE INTERNATIONAL DIAGNOSTIC CRITERIA

Haider Alsarhan<sup>1</sup><sup>1</sup>College of Medicine / Mustansiriyah University

**Aim:** Diagnostic criteria of Barany society is great to guideline the vestibulogist to reach the diagnosis , but in many clinical scenarios is not sufficient, this presentation is to establish some roles to suggest diagnosis of cases that not fit the diagnostic criteria of barany society.

**Materials and Methods:** two researches were conducted and was published concerning these cases one is concerned with early onset of Meniere's disease (probable Meniere's disease) and the other concerned with possible vestibular migraine. The first suggest modulation of diagnostic criteria of possible Meniere's disease to

add details, the second suggest the diagnostic chart by which the scope obtained from that chart when more than 5 my highlight the diagnosis of possible VM the higher score the higher possibility of that diagnosis

**Results:** since publication of these 2 researches I use to use them with the patients and was successful

**Conclusions:** The diagnostic criteria of barany are great assistant to diagnosis but there are some other tools needed to facilitate the clinician to the diagnosis of the cases that cannot fit these criteria

**Keywords:** Meniere's disease, vestibular migraine, diagnostic criteria

Other

## PP-15

## DIAGNOSTIC SIGNIFICANCE OF USING PULSE WAVE METER FOR TINNITUS

Kyoung Yoon Lee<sup>1</sup><sup>1</sup>Dongsuwon Korean Medicine Hospital

**Objective:** The objective is to explain that diagnosis using a pulsimeter has diagnostic value in treating patients with tinnitus.

**Introduction:** Tinnitus is not simply an ear disease, but can be caused by bodily problems such as fatigue or stress.

Pulse diagnosis is a traditional method used in Korean medicine to diagnose the human body. The pulsimeter made the traditional method of pulse diagnosis into a diagnostic tool using a machine. A pulsimeter is a useful diagnostic tool to identify problems in the body.

### Main Subject

#### 1. Description of pulse diagnosis

The communication status of Qi is a life phenomenon.

Qi communicates with each organ along the 12 meridians.

External stimuli or emotional changes cause changes in the flow of Qi.

The change of Qi can be seen through the image of the pulse wave in the radial artery.

The human body maintains a healthy state when the communication of the Qi of the 12 meridians is smooth.

When the communication of Qi is hindered by external stimuli or emotional stimuli, it becomes a pathological state.

By analyzing the pulse wave of each organ, the state of the Qi of each organ can be identified and the cause of tinnitus can be identified.

#### 2. Diagnosis of tinnitus using pulsimeter

After the cause of tinnitus is treated and the symptoms are improved, pulse diagnosis can be performed to confirm changes in the communication of Qi.

It can be seen that the treatment of tinnitus simultaneously changed the pulse wave and symptoms.





**Conclusion:** Since the pulse wave of patients with tinnitus can explain diagnosis, treatment, and changes in symptoms with a consistent theory, the pulsometer can be used as a tool for diagnosing tinnitus. The pulsometer is not only a useful diagnostic tool for diagnosing patients with tinnitus, but can also be used to diagnose all diseases caused by changes in Qi in the organs.

**Keywords:** Pulse, pulsometer, tinnitus

## Vestibular Disorders Following Otolgic and Neurotologic Surgery

### PP-18

#### VESTIBULAR AND VISUAL ACUITY OUTCOMES IN PATIENTS AFTER STAPEDOTOMY

**Emelina Andrea Ruiz<sup>0</sup>, Francisco Javier Gonzalez<sup>0</sup>, Pedro Abel Blanco<sup>0</sup>**

<sup>0</sup>Valley University Hospital

Stapes surgery is a well-established and effective procedure for the treatment of conductive hearing loss in patients affected by otosclerosis. Surgery is the treatment of choice. Vertigo and dizziness is the commonest complication after stapes surgery. The prevalence of postoperative vertigo has been reported to be 3.4–55% after conventional stapedotomy. The assessment of post-operative vestibular deficit has traditionally been difficult. Different tests like ocular and cervical vestibular- evoked myogenic potential to assess utricle and saccule function, the video head impulse test to assess semicircular canal function and tests of visual acuity, including dynamic visual acuity and the gaze stabilization test, that provides measurement of the overall effectiveness of not only VOR but also catch-up saccades and the other visually-driven responses and provides a clinically valuable measurement of overall functional impairment.

This is a prospective clinical study carried out on a cohort of 20 patients who underwent primary stapedotomy, at the Unit of Otorhinolaryngology of a Colombian tertiary university hospital, between January 2019 and October 2021.

The study population comprised of clinically diagnosed Otosclerosis patients fulfilling the eligibility criteria and undergoing surgery. All patients of Otosclerosis undergoing Stapedotomy for first time and aged between 20 and 60 years were included in the study. All patients were evaluated with the Dizziness Handicap Inventory in Spanish (DHI) at the all outpatient visit.

20 patients completed the following vestibular function tests before surgery and 1-3 months after; Ocular and cervical vestibular-evoked myogenic potential, the video head impulse test, dynamic visual acuity and the gaze stabilization test which allow us to evaluate structural and functional deficit of the vestibular system.

All patients had a good audiological result (air-bone gap < 10 dB). We did not observe complications. After surgery, 14 patients (70%) experienced vertigo associated with dizziness, 2 patients (10%) suffered from dizziness without vertigo. In 4 patients (20%) we did not highlight any signs of vestibular impairment. After 1 month of follow-up, 10% of the patients complained about vestibular symptoms that persisted until month 3 with a moderate degree of severity.

At the vestibular tests we don't evidenced alteration in Ocular and cervical vestibular- evoked myogenic potential, either the video head impulse test; In two patients with persistence of symptoms

it is evident (SVA) was  $-0.24 \pm 0.12$  logMAR, mean of  $0.3 \pm 0.15$  logMAR for left horizontal DVA score,  $0.3 \pm 0.15$  logMAR for right horizontal DVA score,  $0.2 \pm 0.15$  logMAR for upward vertical DVA score, and  $0.2 \pm 0.13$  logMAR for downward vertical DVA score.

Vestibulo-Ocular Reflex (VOR) is an indicator of proper functioning vestibular ocular system that allows the eyes fix on the tracked object during high speed head movements. Dynamic visual acuity (DVA) test is a behavioral measurement of functioning vestibulo-ocular reflex. This functional test provides measurement of the overall effectiveness of not only VOR but also catch-up saccades and the other visually-driven responses and provides a clinically valuable measurement of overall functional impairment.

An increase in DVA scores indicating functional loss of VOR in patients with migraine has been described. This functional loss of the vestibulo ocular reflex in migraine may explain the pathological link between migraine and the vestibular system and is attributable to impaired visuo-vestibular cortical interactions. Reciprocal connection between brainstem vestibular nuclei and structures involved in modulation of trigeminal nociceptive inputs may explain abnormalities of dynamic visual acuity scores in migraineurs.

Since migraine is a very prevalent pathology in our population, we consider these findings may be related.

**Table:** The characteristics of group

Age (mean $\pm$ SD)	38 $\pm$ 6
Gender (F/M)	16/4
SVA logMAR	$-0.24 \pm 0.12$
l-DVA score logMAR	$0.3 \pm 0.15$
r-DVA score logMAR	$0.3 \pm 0.15$
u-DVA score logMAR	$0.2 \pm 0.15$
d-DVA score logMAR	$0.2 \pm 0.13$

**Keywords:** Stapes surgery, vestibular, vestibular-evoked myogenic potential, video head impulse test, visual acuity, otosclerosis, vertigo

## Vestibular Toxicity in Daily Medical Practice (medicines, alcohol, drugs, etc.)

### PP-19

#### ADVERSE EVENTS OF VACCINES AND DRUGS USED IN THE PREVENTION AND TREATMENT OF COVID-19 FROM THE PERSPECTIVE OF AN OTOLARYNGOLOGIST

**Magdalena Beata Skarżyńska<sup>1,2</sup>, Monika Matusiak<sup>3</sup>, Piotr Henryk Skarżyński<sup>1,3</sup>, Ewa Tomanek<sup>3</sup>, Ewelina Bukato<sup>4</sup>**

<sup>1</sup>Institute of Sensory Organs, Warsaw, Poland

<sup>2</sup>Center of Hearing and Speech Medincus, Warsaw, Poland

<sup>3</sup>Institute of Physiology and Pathology of Hearing, Warsaw, Poland

<sup>4</sup>Institute of Physiology and Pathology of Hearing, Department of Teleaudiology and Screening, Warsaw, Poland



**Aim:** The aim of this study was to review briefly pharmacological treatments for COVID-19 approved by the EMA and FDA and highlight their potential audio-vestibular side effects as an ototoxic adverse reaction.

**Material and Methods:** A database search was conducted including: PubMed, ResearchGate, Scopus, Science Direct and in summaries of product data sheets.

**Results:** According to Evidence-Based Medicine the treatment of COVID-19 by using lopinavir/ritonavir, chloroquine and hydroxychloroquine, azithromycin, favipiravir, amantadine, oseltamivir and ivermectin is no longer recommended for patients suffering from COVID-19 due to a lack of clinical data, publications and recommendations. Adverse events could be permanent or transitional. Following treatment for COVID-19, the most frequent adverse audio-vestibular reactions reported in clinical trials and publications in the area of audiology and otorhinolaryngology were: dizziness, blurry vision with dizziness, nasopharyngitis, dysgeusia and tinnitus. As far as vaccines are concerned dizziness as ototoxic effect was uncommon and occurs only in hypersensitive people who experience anaphylactic shock. The gold standards in ototoxicity testing are TEOAE and DPOAE.

**Discussion:** literature search is a key step in performing good authentic research. Based on various models of pharmacotherapy, clinical trials are designed and conducted in a way that we can understand treatment mechanisms from a therapeutic perspective. Ototoxicity relates not only sensorineural hearing loss, but can cause tinnitus and involve toxicity to the vestibule and cochlea.

**Conclusion:** Many of drugs approved by EMA and FDA are new and not every side-effect is known. The ototoxicity of the drugs presented here does not have such severe symptoms as some drugs used in the treatment of COVID-19 in 2020 and relates mainly to disorders of the vestibulocochlear system.

**Keywords:** ototoxicity, COVID-19, vaccine, hearing loss, tinnitus, dizziness, audio-vestibular side-effects

## Vestibular Disorders Following Otologic and Neurologic Surgery

### PP-20

#### VESTIBULAR STATUS IN A GROUP OF PATIENTS UNDERGO PARTIAL DEAFNESS TREATMENT-ELECTRO-ACOUSTIC STIMULATION (PDT-EAS)

Magdalena Sosna<sup>1</sup>, Grażyna Tacikowska<sup>1</sup>, Katarzyna Pietrasik<sup>1</sup>, Henryk Skarżyński<sup>1</sup>, Artur Lorens<sup>1</sup>, Piotr Henryk Skarżyński<sup>1,2</sup>, Ewa Tomanek<sup>1</sup>, Ewelina Bukato<sup>1</sup>

<sup>1</sup>Institute of Physiology and Pathology of Hearing, Warsaw, Poland

<sup>2</sup>Institute of Sensory Organs, Kajetany, Poland

**Aim:** The aim of this study was to evaluate postoperative vestibular function in group of patients after partial deafness treatment – electro acoustic stimulation cochlear implantation.

**Material and Methods:** To the study were included 55 patients, all of them were undergo cochlear implantation in Institute of Physiology and Pathology of Hearing in Kajetany (Warsaw). This group of patients included: 30 females, 25 males; in age 11-80. Vestibular function were assessed through: cVEMP, oVEMP, caloric

test and vHIT. cVEMP and oVEMP were performed preoperatively and 1-3 months after cochlear implantation. Caloric and vHIT tests were conducted preoperatively and 4-6 months after cochlear implantation.

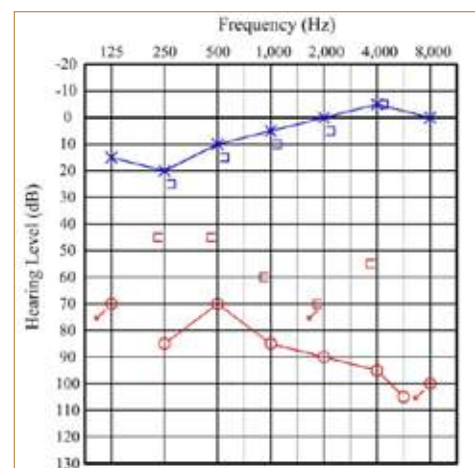
**Results:** In our experience, based on a wide range of electrodes, use of PDT-EAS is protective in terms of preserving vestibular functions. This study shows rate of utricular damage of 19.04%, saccular damage of 15.79% and a horizontal semicircular canal response reduction of 15.79%.

**Discussion:** The battery of otoneurological tests, that are currently in clinical use enables us to assess each part of vestibulum separately: saccus with cVEMP, utricle with oVEMP, lateral semicircular canal with caloric test, rotatory chair or vHIT for high-frequency stimulus as well as superior and posterior semicircular canal. Such a wide range of tests allows us to determine with precision the place of damage of vestibular.

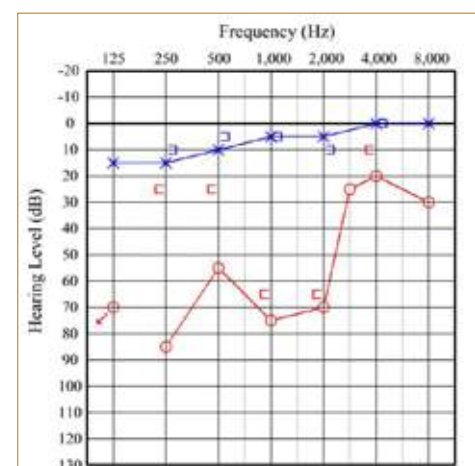
**Conclusion:** It should be emphasized that the risk of vestibular damage can be decreased, but never totally eliminated, even cases that hearing preservation techniques are adopted. Partial deafness treatment is protective in terms of preserving vestibular function.

**Keywords:** Partial deafness treatment, Cochlear implantation, Balance, Vestibule, Atraumatic, Electro-acoustic stimulation.

**Figure:** pre-operative pure tone audiometry



**Figure:** Post-operative pure tone audiometry



## SUPPORTED COMPANIES

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### Hybrid Meeting Sponsor



### Exhibitors

**NeuroEquilibrium Diagnostic Systems Pvt. Ltd.**



NeuroEquilibrium is a leading provider of Vestibular diagnostic equipment that helps doctors establish specialized Vertigo and Dizziness clinics. The company offers a comprehensive range of reliable and user-friendly equipment, enabling doctors to diagnose and treat vestibular disorders accurately.

**Corporate Office :** 140, Shrigopal Nagar, Gopalpura Bypass Road, Jaipur 302015, Rajasthan, India

**Contact :** +91-9773355456

**Website :** [www.neuroequilibrium.in](http://www.neuroequilibrium.in)





## GENERAL INFORMATION FOR MEETING VENUE



### Hyatt Regency Belgrade

**Address:** PO Box 067 Milentija Popovica 5, 11070, Belgrade, Serbia.

**Phone:** +381 11 301 1234    **Web:** belgrade.regency.hyatt.com



Hyatt Regency Belgrade is the preferred upscale hotel for leisure and business travelers, conveniently located in the heart of New Belgrade, the capital's main business and entertainment district.

Close to the city center and well connected to Belgrade Nikola Tesla Airport. Enjoy long walks along the Sava river, have fun in the largest shopping mall in the city or just relax at the hotel's Club Olympus Fitness facilities.

With 282 modern rooms including 37 suites, Hyatt Regency Belgrade allows you to choose the perfect accommodation while visiting Belgrade.



**CHECK-IN** : 3:00 PM  
**CHECK-OUT** : 12:00 PM





## Meeting Halls



Crystal Ballroom, Full



Crystal Ballroom, I-III



Studio I



Studio II



Studio Kitchen



Studio Foyer





## Meeting Halls



Budva



Beograd



Kopaonik



Kalemegdan



Boardroom



Foyer in Front of Crystal Ballroom



## AREA ATTRACTIONS

Belgrade, the capital of Serbia, is located at the confluence of the Sava and Danube rivers. It is one of the oldest cities in Europe, known for its wide selection of museums, galleries, exhibitions and events.

### Unique Belgrade Attractions

- Belgrade Fortress / 2,4 mil / 3.84 km away**

The Belgrade fortress and the surrounding Kalemegdan park are located on the point where the river Sava flows into Danube, with an amazing panorama overlooking on the Great War island.

**Website :** <http://www.beogradskatvrđjava.co.rs/?lang=en> **Phone:** +381 11 2633747

#### DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL:

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.82350199348497%2C20.44944726392645>

- Skadarska Street / 2,1 mil / 3.38 km away**

Skadarska Street is famous for its bohemian history and friendly ambience, preserving the tradition of former times. Many legendary Serbian artists, poets, writers, actors, and musicians lived there and frequented its restaurants and taverns.

#### DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.818246%2C20.464989>

- Zemun City / 3,3 mil / 5.28 km away**

Zemun is a historical town in the city of Belgrade and home to a Homeland museum and the Madlenianum Opera and Theatre. Gardoš tower is the most recognizable symbol of Zemun and a unique attraction with its cobblestone surrounding and famous Serbian taverns.

#### DIRECTIONS FROM HYATT REGENCY HOTEL

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.84561582626884%2C20.41416284798727>

- Belgrade Floating River Clubs / 1,1 mil / 1.84 km away**

Belgrade is most recognizable for its nightlife and especially for the floating river clubs or barges (splavovi) that are spread along the banks of Sava and Danube rivers. You can have an unforgettable day and night experience on Belgrade river clubs.

#### DIRECTIONS FROM OUR HOTEL

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.819268%2C20.443891>

### Museums and Palaces

- National Museum / 2,0 mil / 3.29 km away**

The National Museum was founded in 1844 is the oldest, most significant and central museum of Serbia where visitors can find 34 archaeological, numismatic and historical collections. The museum is located on Republic Square in Belgrade.

**Website:** <http://www.narodnimuzej.rs/> **Phone:** +381 11 339 6000

#### DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.816646%2C20.4600047>



- **Museum of Nikola Tesla / 2,6 mil / 4.17 km away**

This museum is one of the best in the city. It preserves the heritage of the great Serbian scientist and inventor Nikola Tesla. Exhibits include his original plans, drawings and models of his inventions. English-speaking guides are available.

**Website:** <http://www.tesla-museum.org/web/index.php?l=en> **Phone:** +381 11 2433886

**DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL**

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.805131%2C20.470703>

- **Old Palace / 1,8 mil / 2.97 km away**

The Old Palace with wonderful gardens was built between 1882 and 1884 for the newly formed Kingdom of Serbia headed by King Milan Obrenović. The Old Palace building is one of the most beautiful works of Serbian academic architecture of the 19th century.

**Phone:** +381 11 3229678

**DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL**

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.810836%2C20.462545>

- **Residence of Princess Ljubica / 1,4 mil / 2.29 km away**

The Residence of Princess Ljubica was built in 1831 and presents the lifestyle of 19th century Belgrade families. Visitors can enjoy the unique program "A Coffee with Princess Ljubica".

**DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL**

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.817474470790074%2C20.452412960585377>

## Shopping

- **UŠĆE Shopping Center / 0,5 mil / 861 meter away**

UŠĆE Shopping Center, less than five minutes from the hotel, is one of the most modern shopping centers in Serbia. The shopping center has over 140 shops, supermarket, restaurants and cafés, food court, multiplex cinema, casino, and kids' playground.

**Website:** <https://uscshoppingcenter.rs/> **Phone:** +381 11 2854505

**DIRECTIONS FROM HYATT REGENCY HOTEL**

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.815554659041304%2C20.436790636941875>

- **Knez Mihailova Street / 2,1 mil / 3.45 km away**

All the well-known global brands can be found in Belgrade's Knez Mihailova. This pedestrian zone is one of the best-looking streets in town. At the top end of Knez Mihailova Street is a line of cart stalls that sell handmade gifts and souvenirs.

**DIRECTIONS FROM HYATT REGENCY HOTEL**

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.817263%2C20.457550>

- **Rajićeva Shopping Center / 1,8 mil / 2.88 km away**

In the heart of Belgrade you will find the Rajićeva Shopping Center. Designed for pleasure and shopping, it has more than 80 stores featuring brand-name goods. You can sit and relax in restaurants that offer the best views of the city.

**Phone:** +381 11 4000830

**DIRECTIONS FROM HYATT REGENCY BELGRADE HOTEL**

<https://www.google.com/maps/dir/44.812969%2C20.435326/44.820112%2C20.454513>





## ABOUT BELGRADE, SERBIA

**Serbia**, country in the west-central Balkans. For most of the 20th century, it was a part of Yugoslavia.



The capital of Serbia is **Belgrade** (Beograd), a cosmopolitan city at the confluence of the Danube and Sava rivers; Stari Grad, Belgrade's old town, is dominated by an ancient fortress called the Kalemegdan and includes well-preserved examples of medieval architecture and some of eastern Europe's most-renowned restaurants.



Serbia Map, Encyclopedia Britannica, Inc.





Belgrade is located at the convergence of three historically important routes of travel between Europe and the Balkans: an east-west route along the Danube River valley from Vienna to the Black Sea; another that runs westward along the valley of the Sava River toward Trieste and northern Italy; and a third running southeast along the valleys of the Morava and Vardar rivers to the Aegean Sea. To the north and west of Belgrade lies the Pannonian Basin, which includes the great grain-growing region of Vojvodina.



Danube River, Belgrade, Serbia

Belgrade (Beograd) has a population of around 1.6 million. It is one of the oldest cities in Europe and has since ancient times been an important focal point for traffic, an intersection of the roads of Eastern and Western Europe.

Belgrade is the capital of Serbian culture, education, science and economy. As a result of its tumultuous history, Belgrade has for centuries been home to many nationalities, with Serbs of the Orthodox Christian religion making up the majority of the population (90%). In the inner area of the City of Belgrade there are over 5,500 streets, 16 plazas and 32 squares. The oldest streets that have retained their original routes are: Vase Čarapića, Kralja Petra, Cara Dušana, Jevrejska, Narodnog fronta, Gavrila Principa, and Karađorđeva Streets. The development of the street network started in 1867, after the Turks had departed, when the regulatory plan of Belgrade was adopted, which had been drawn up by engineer Emilijan Josimović. In the territories of the 10 City municipalities, the oldest is the Student Square, and the most famous one is the Republic Square.

Knez Mihailova Street is a pedestrian zone and shopping center - protected by law as one of the oldest and most valuable monumental complexes of the city, with a large number of representative buildings and urban houses built at the end of 1870s.

High above the Sava and Danube confluence, on the rocky ridge which opens the view of Novi Beograd, Zemun and wide plains of Pannonia, there is the Belgrade Fortress with Kalemegdan, the former historical and urban center of Belgrade.

Kalemegdan represents the most beautiful and biggest park in Belgrade, which is also the most important cultural and historical complex. The name Kalemegdan applies only to the spacious plateau surrounding the Fortress, which was turned into a park in the eighties of the XIX century. When the Fortress served as Belgrade's chief military stronghold, the plateau was a place from which the enemy was kept under observation and where preparations were made for combats. Its name derives from the Turkish words kale (fort) and megdan (field) - Kalemegdan.

Kalemegdan now includes the Military Museum, Cvijeta Zuzorić Art Pavilion, City Institute for Protection of Cultural Monuments, Zoo, a children's amusement park, a large number of sports fields, restaurants and so on.

Additional important sights in Belgrade are the National Museum, the National Theatre, the Palace of the Assembly of Serbia, the White Palace, Konak Kneza Miloša, Konak Kneginje Ljubice, Kapetan-Mišino Zdanje, Pobednik monument, etc.

Belgrade is a city of culture. There are many museums, art galleries, churches and other famous buildings and sightseeing points offering interesting and original displays in the Old Town. Diverse neighborhoods will take you through the centuries, green parks will help you relax and provide outdoor activities.





## USEFUL TRAVEL INFORMATION

### Language of Serbia

The official language is Serbian, while visitors from abroad can use English to communicate.

### Currency and Foreign Exchange

The official tender in Serbia is dinar, abbreviated RSD. Money may be exchanged in all banks and post offices, as well as in authorized exchange offices. Dinar is issued in denominations of 10/20/50/100/200/500/1000/5000.

The current exchange rate may be checked on the website of the [National Bank of Serbia \(https://nbs.rs/sr\\_RS/index/\)](https://nbs.rs/sr_RS/index/)

### Weather

The average minimum temperature (usually the minimum temperature is noted during the night) in Belgrade in March is 7.0°C (44.6°F). The amount of rain in March is normal with an average of 59mm (2.3in).

The average maximum temperature lies around 17.0°C (62.6°F). You will see the sun sometimes in this month, it has 178 hours of sun. Our visitors traveling to Belgrade should plan on bringing a totally waterproof rain jacket since it will be raining some days. Plan on layering your clothes. Some days or part of the day it will be nice and warm and some moments it can be a bit chilly.

### Electricity

In Serbia the power plugs and sockets are of type F. The standard voltage is 230 V and the standard frequency is 50 Hz.

### Emergency Numbers

Police : 92 Fire Brigade : 93 Ambulance : 94

### City Public Transport

Belgrade city public transport company is GSP "Beograd" but there are also bus services run by private companies, on around 130 routes.

Single tickets can be purchased both at public transport vehicles (from the driver), at kiosks with a ticket sales sing or at GSP points-of-sale. Remember that tickets bought at kiosks are cheaper than those bought in vehicles and Tickets for night services (00-04) are more expensive. Night transport routes differ from the routes of daytime services and combine several routes which serve particular parts of town and suburban areas. For further information contact:

Belgrade City Transport Company [www.gsp.co.rs](http://www.gsp.co.rs)

Moreover there are express minibus services which are a little less cheap, but also more comfortable and faster since they do not stop at every bus stop.

Taxis in Belgrade: Taxis in Belgrade are cheap and safe, ideal for tourists. Just remember to check if the taxi driver starts the taximeter correctly. Taxi in Belgrade have not a compulsory color but they have to carry a blue city taxi sign on the roof as well as the designation of their taxi company.



## Time Difference

Greenwich mean time is 1 hour behind Belgrade, Serbia.

## Customs regulations in Belarus

Includes customs regulations and contact information for this country's customs office.

View detailed information about **customs regulations of the Republic of Serbia** (<https://www.carina.rs/en/business-community/guide-for-foreign-entrepreneurs.html> )



## BELGRADE TOURS



### Mini Pannonian Tour

#history #authentic #heritage #winetasting

⌚ Cca. 9 hrs

📅 JAN - DEC

Second largest city of Serbia, **Novi Sad**, is also known as „Serbian Athens“ because of great cultural role during XVIII and XIX century. We will explore this beautiful city from its City Core as we stroll down Zmaj Jovina pedestrian zone. Stop at the Liberty Square to hear the story of unification and admire extraordinary buildings from Baroque and Art Nouveau, such as the Cathedral, Episcopical Palace and many more.

Continue to Petrovaradin fortress, the largest fortification on Danube river. Hear the breathtaking stories of the rivalry between Ottoman and Austro-Hungarian Empires, which culminated at the ramparts of this very fortress.

Continue down the Danube to town of Sremski Karlovci, very soul of Serbian XVIII century cultural heritage. See the First Serbian Gymnasium, Patriarch's Court, stroll along the cobbled streets to the Fountain of Four Lions, visit the very first place where round table was first used in diplomacy.

At the very end, we will try out some of the best wines Balkan has to offer, made from grapes from Mt Fruska Gora. With centuries long tradition, these wines are still served on the most eminent Royal courts of Europe.



### Mini Pannonian Tour

#history #authentic #heritage #winetasting

⌚ Cca. 9 hrs

📅 JAN - DEC

**95,00 EUR per person**

#### Inclusions:

- Private transfers as per itinerary;
- English speaking guide throughout the whole program;
- Entrance fees for Chapel of Peace and winery;
- Wine tasting in Sremski Karlovci.

#### Not included:

- Meals and drinks;
- Tips and personal expenses;
- Other expenses not mentioned above.







## The Best of Singidunum

#history #architecture #heritage

🕒 Cca. 3 hrs

📅 JAN - DEC

With thousands of years of unprecedented history, Belgrade is one of the most favorite destinations in the Balkans. We will show you why...

Discover the city as we take a panoramic ride through the wider City Center. Visit **St Sava Temple**, one of the largest Christian churches in the world, and continue towards the City core. Pass by the **National Parliament** and the **Old Royal Court** to the **Republic Square** – ancient city border. Take a stroll through **Knez Mihailova** pedestrian street to the oldest tavern in the city, and follow the route between the **Orthodox Cathedral** and **Patriarch's Court** to the very soul of Belgrade – magnificent **Belgrade Fortress**.

Hear the fantastic history of the city which spreads way back to the ancient Celtic tribes and beyond.



## The Best of Singidunum

#history #architecture #heritage

🕒 Cca. 3 hrs

📅 JAN - DEC

**50,00 EUR per person**

### Inclusions:

- Private transfers as per itinerary;
- English or Turkish speaking guide throughout the program;
- Entrance fee for Temple of St Sava.

### Not included:

- Meals and drinks;
- Tips and personal expenses;
- Other expenses not mentioned above.





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# ABBOTT SATELLITE MEETING CURRENT PRACTICES IN THE MANAGEMENT OF VESTIBULAR VERTIGO WITH FOCUS ON BPPV

**Date: March 10, 2023**

**Time: 09:45 - 10:45**

Hall: Main Hall (Crystal I-II)

**MODERATOR**

**Prof. Nuri Özgirgin** (Turkey)

**PROGRAM**

Treatment of BPPV reconsidered

**Prof. Herman Kingma** (The Netherlands)  
20 minutes

Clinical Benefits of Betahistine in  
post-CRM BPPV patients

**Prof. Leonardo Manzari** (Italy)  
20 minutes

Q&A: 10 minutes







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