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World Federation of Neurosurgical Societies - Neuroendoscopy Committee (WFNS)
Società Italiana di Neurochirurgia (SINCh)
Chinese Society for NeuroEndoscopy (CSNE)

In collaboration with



IFNE-JSNE-GLEN-NESI-CSNE Hands-on Workshop on CEREBRAL, VENTRICULAR AND SKULL BASE NEUROENDOSCOPY

Naples, Italy
January 23-27, 2023

Workshop Venue
Centro di Biotecnologie - A.O.R.N. "Antonio Cardarelli"

PROGRAM

www.ifneworkshop.org

10th IFNE World Congress of Neuroendoscopy

19-22 November

2023

Marina Bay Sands
Singapore

www.ifnecongress.org



International
Federation
of Neuroendoscopy

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PRE-CONGRESS
WORKSHOP

18 November 2023



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Mobile application

Scan the below QR code using your Android or iOS device. Download the application. When you are prompted for a code upon launching the App, insert **ifneworkshop2023**.

The App may be used without logging in. If you do decide to log in, you will be able to use some additional features, such as messaging other attendees (having consent to) and your personalized agenda.

In order to log in, tap the **Log In** icon and insert your email address and the **4-digit PIN** that you can see on your badge.



Sponsored by: **Medtronic**



Welcome Message

Dear friends and colleagues,

We hope that you are all in good health and good spirits.

The 2023 IFNE- JSNE- GLEN- NESI-CSNE Hands-on Workshop on Cerebral, Ventricular and Skull Neuroendoscopy will be held in Naples-Italy from 23 to 27 January 2023.

For another year, we have the implicit support of Japanese Society of Neuroendoscopy (JSNE), Grupo Latinoamericano de Estudios en Neuroendoscopia (GLEN), Neuroendoscopy Society-India (NESI), Chinese Society for Neuroendoscopy (CSNE), Societa Italiana Neurochirurgia (SINCH), The European Association of Neurosurgical Societies (EANS) and World Federation of Neurosurgical Societies (WFNS). A special thanks goes to Centro di Biotecnologie A.O.R.N. "Antonio Cardarelli" that will help the realization of our event for another year. Thanks to extensive works of enlargement of working surfaces in the hands-on area, we will be able to offer excellent social distancing during hands-on still maintaining a good number of trainees (40) for 20 working stations.

As usual, enthusiastic faculty participation will allow the excellent Tutor/Trainees ratio of 1x2 confirming the presence of a world expert at each hands-on workstation for two trainees. This year, the Scientific Program will bring a rich assortment of lectures, video presentations, live demonstration on anatomical models and dissection videos. You will find educational sessions exploring ventricular endoscopy, cerebral endoscopy and skull base endoscopy delivered by world-renowned international faculty. Our workshop welcomes senior, students and recent graduate neurosurgeons who practice or want to practice neuroendoscopic surgery. Between each session, participants will have the opportunity to network and connect with other scientists from all over the world.

The transfer of knowledge knows no boundaries and throughout this evolving situation, we are here with the goal of making learning more accessible and inspire interaction. Your active participation will undoubtedly contribute to a successful and productive meeting.

With warm regards,

Prof. Giuseppe Cinalli
Chair of the Organizing Committee

Prof. Luigi Maria Cavallo
Co-Chair of the Organizing Committee

Prof. Henry Schroeder
IFNE President 2021-2023

Organization

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en Neuroendoscopia (GLEN)



World Federation of
Neurosurgical Societies (WFNS)
Neuroendoscopy Committee



Neuroendoscopy Society - India
(NESI)



Società Italiana di Neurochirurgia
(SINCh)

Local Organizing Committee

Chair: **Giuseppe Cinalli**

Co-Chair: **Luigi Maria Cavallo**

IFNE Administrative Secretariat & Workshop Organizing Bureau



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E. info@ifneworkshop.org | E. info@ifneuroendoscopy.org



Invited Faculty

- Aliberti Ferdinando, Italy**
Arcas Navarrete Esperanza, Spain
Azab Waleed, Kuwait
Bruneau Michaël, Belgium
Brusius Carlos, Brazil
Cappabianca Paolo, Italy
Cavallo Luigi Maria, Italy
Chico-Ponce de Leon Fernando, Mexico
Cinalli Giuseppe, Italy
Cordoba Alvaro, Uruguay
Cozzolino Santolo, Italy
Da Cunha Artur Henrique Galvão Bruno, Brazil
De Notaris Matteo Gabriele, Spain
Delye Hans, The Netherlands
Di Rocco Concenzio, France
Di Somma Alberto, Spain
Doglietto Francesco, Italy
Elbabaa Samer, USA
Enseñat Joaquim, Spain
Esposito Felice, Italy
Felleti Alberto, Italy
Fontanella Marco Maria, Italy
Fornari Maurizio, Italy
Galzio Renato, Italy
Gellner Verena, Austria
Giussani Carlo, Italy
Gui Songbai, China
Hecht Nils, Germany
Herrada-Pineda Tenoch, Mexico
Hinojosa Jose, Spain
Iaccarino Corrado, Italy
Iacoangeli Maurizio, Italy
Imperato Alessia, Italy
Lam Sandi, USA
Lechanoine Francois, France
Locatelli Davide, Italy
Mazzatenta Diego, Italy
Meling Torstein, Norway
Minniti Giuseppe, Italy
Mirone Giuseppe, Italy
Montserrat Almaguer Ascencio, México
Murai Hisayuki, Japan
Nishiyama Kenichi, Japan
Oertel Joachim, Turkey
Oppido Piero Andrea, Italy
Padayachy Llewellyn, South Africa
Panigrahi Manas, India
Penner Federica, Italy
Peraio Simone, Italy
Peron Stefano, Italy
Procaccini Emiddio, Italy
Roth Jonathan, Israel
Sala Francesco, Italy
Sankhla Fornari, India
Santos De Oliveira Ricardo, Brazil
Schonauer Claudio, Italy
Schroeder Henry, Germany
Senger Sebastian, Germany
Seow Wan Tew, Singapore
Sgouros Spyros, Greece
Solari Domenico, Italy
Spennato Pietro, Italy
Takeuchi Kazuhito, Japan
Tamburrini Gianpiero, Italy
Thomale Ulrich-Wilhelm, Germany
Venkataramana Neelam, India
Wolfsberger Stefan, Austria
Zebian Bassel, United Kingdom
Zhang Yazhuo, China
Zhao Peng, China



General Information

Venue

Centro di Biotecnologie – A.O.R.N. “Antonio Cardarelli”

9, Via Antonio Cardarelli, 80131 Naples, Italy

T./F. +39 081 7473433/-2037/-2158/-3526

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Compliance

The IFNE- JSNE- GLEN- NESI-CSNE Hands-on Workshop on Cerebral, Ventricular and Skull Base Neuroendoscopy, Naples, Italy, 23-27 January, 2023 has been compliant with the MedTech Europe Code of Ethical Business Practice.

Name Badges

Registration badges will be used during the Workshop. Participants will receive their badges upon check-in at the Registration Desk. For identification purposes and admission to session halls, participants are requested to wear their badges at all times. Admission to Workshop areas will not be allowed without badge identification.

Important note: Delegates are requested to check-in at the Workshop Secretariat and scan their badges' barcodes on a daily basis.

Official Language

The official language of the Course is English. No simultaneous interpretation will be provided.

Certificate of Attendance

All registered delegates having attended the Workshop will receive an electronic Certificate of Attendance by e-mail.

Coffee and Lunch Breaks

Coffee and Lunch Breaks will be served in the designated venue areas according to the Workshop schedule.

Insurance

Neither the Organizing Committee nor the Workshop Secretariat accepts any liability for damages and/or loss of any kind which may incur to Workshop participants throughout Workshop dates. Participation is at one's own risk. Participants are advised to take out insurance against loss, accidents or damage that could be incurred during the Workshop. Verbal agreements will not be binding unless confirmed in written.

Internet access

Wireless internet connection is available in all Workshop areas.

Photography, Filming and Video Recordings

Please note, by registering for the workshop, you agree to your image and personal information being passed to the Organizing Secretariat and being used in materials, either online or in hard copy, for publicity and promotional purposes.

General Information

On-site Secretariat Desk

The Secretariat Desk will be operating at the venue during Workshop dates as follows:

Monday , January 23, 2023	07:30-18:30
Tuesday , January 24, 2023	07:30-18:30
Wednesday , January 25, 2023	07:30-18:30
Thursday, January 26, 2023	07:30-18:30
Friday , January 27, 2023	07:30-18:30

On-site registration

Category Fee	Basic	Advanced
Auditor registration	350 €	350 €
Auditor registration • Medical student	200 €	200 €
Auditor registration • Advanced & Basic Techniques	600 €	
Auditor registration • Medical students Advanced & Basic Techniques	300 €	

PROGRAM OVERVIEW

CEREBRAL AND VENTRICULAR NEUROENDOSCOPY

Monday • January 23, 2023 / Endoscopic 3rd, ventriculostomy and septostomy BASIC TECHNIQUES

Time	Main Hall	Rooms 1-2-3-4
08:00-10:30	SESSION 1: Instruments - Anatomy - Applied technologies (available during hands-on)	
10:35-11:35	SESSION 2: ETV	
11:35-11:50	Coffee Break	
11:50-13:00		Hands-on Anatomical and Animal models
13:00-14:00	Lunch Break	
14:00-16:30		Hands-on Anatomical and Animal models
16:30-16:45	Coffee Break	
16:45-17:45	SESSION 3: ETV & Septostomy	
17:45-18:30	SESSION 4: Clinical Cases ETV & Septostomy	

Tuesday • January 24, 2023 / Complex hydrocephalus ADVANCED TECHNIQUES

Time	Main Hall	Rooms 1-2-3-4
08:00-10:15	SESSION 5: Complex Hydrocephalus	
10:15-11:30	SESSION 6: Arachnoid cysts	
11:30-11:50	Coffee Break	
11:50-13:00		Hands-on Anatomical and Animal models
13:00-14:00	Lunch Break	
14:00-16:30		Hands-on Anatomical and Animal models
16:30-16:45	Coffee Break	
16:45-18:15	SESSION 7: Clinical Cases: Complex Hydrocephalus and Arachnoid Cysts & Video Session	

Wednesday • January 25, 2023 ADVANCED TECHNIQUES

Time	Main Hall	Rooms 1-2-3-4
08:00-09:20	SESSION 8: Endoscope - assisted surgery	
09:20-10:20	SESSION 9: Endoscopy in tumor management	
10:20-11:35	SESSION 10: Craniopharyngiomas - Miscellaneous	
11:35-12:00	Coffee Break	
12:00-13:00		Hands on-Anatomical and Animal models
13:00-14:00	Lunch Break	
14:00-16:30		Hands-on Anatomical and Animal models
16:30-16:45	Coffee Break	
16:45-18:15	SESSION 11: Clinical Cases: Endoscopic Tumor Surgery & Video Session	



ADVANCED SKULLBASE SEGMENT

Thursday • January 26, 2023 Endoscopic endonasal and trans-orbital approaches

Time	Main Hall	Rooms 1-2-3-4
08:00-08:15	Welcome and event presentation	
08:15-08:30	Addresses of the Presidents IFNE and SINch	
08:30-10:15	SESSION 12: Endoscopic Endonasal approach to Sellar Region and Cavernous Sinus	
10:15-10:30	Coffee Break	
10:30-13:30		Hands-on Cadaveric Specimens
13:30-14:00	Lunch Break	
14:00-16:15		Hands-on Cadaveric Specimens
16:15-16:30	Coffee Break	
16:30-17:45	SESSION 13: Advanced Endoscopic approaches to Skull base	

Friday • January 27, 2023 Endoscopic skull base techniques

Time	Main Hall	Rooms 1-2-3-4
08:30-10:30	SESSION 14: Miscellaneous	
10:30-10:40	Networking Break	
10:45-13:30		Hands-on Cadaveric Specimens
13:30-14:00	Lunch Break	
14:00-16:15		Hands-on Cadaveric Specimens
16:15-16:30	Coffee Break	
16:30-17:45	SESSION 15: Video & Clinical cases	
18:00	Adjourn	

Detailed Scientific Program

BASIC TECHNIQUES

Monday • January 23, 2023 / Endoscopic 3rd ventriculostomy and septostomy

08:00-10:30 **SESSION 1: Instruments – Anatomy – Applied technologies** Main Hall

(available during hands-on)

Chairpersons: **Giuseppe Cinalli, Suresh Sankhla**

08:00-08:05 **Maurizio Fornari:** *Welcome from the President of the SINch*

08:05-08:10 **Giuseppe Cinalli:** *Organisation and objectives of the course*

08:10-08:20 **Santolo Cozzolino:** *Presentation of the Center*

08:20-08:30 **Giuseppe Mirone:** *Endoscope: basic principles and instrumentation*

08:30-08:40 **Kenichi Nishiyama:** *Endoscopic anatomy of the ventricles*

08:45-08:55 **Corrado Iaccarino:** *Neuronavigation and Neuroendoscopy*

09:00-09:10 **Piero Andrea Oppido:** *Laser in Neuroendoscopy*

09:15-09:25 **Bassel Zebian:** *Ultrasonic aspirator in Neuroendoscopy*

09:30-09:40 **Carlo Giussani:** *3D Exoscopy*

09:45-09:55 **Emidio Procaccini:** *Robot assisted Neuroendoscopy*

10:00-10:15 **Nils Hecht:** *Minimally Invasive Endoscopic Evacuation of Intracerebral Hematomas*

10:20-10:30 **Stefan Wolfsberger:** *Stealth Autoguide Robotic system*

10:35-11:35 **SESSION 2: ETV** Main Hall

Chairperson: **Tenoch Herrada-Pineda**

10:35-10:45 **Concezio di Rocco:** *Preoperative evaluation of hydrocephalus*

10:50-11:00 **Sebastian Senger:** *ETV: Indications*

11:05-11:15 **Esperanza Arcas Navarrete:** *ETV: Surgical technique*

11:20-11:30 **Tenoch Herrada-Pineda:** *ETV: Complications avoidance*

11:35-11:50 Coffee Break

11:50-13:00 **Hands on-Anatomical and Animal models** Rooms 1-2-3-4

13:00-14:00 Lunch Break

14:00-16:30 **Hands on-Anatomical and Animal models** Rooms 1-2-3-4

16:30-16:45 Coffee Break

16:45-17:45 **SESSION 3 ETV & SEPTOSTOMY** Main Hall

Chairperson: **Stefan Wolfsberger**

16:45-16:55 **Ricardo Santos de Oliveira:** *ETV: long-term results*

17:00-17:10 **Llewellyn Padayachy:** *ETV + CPC*

17:15-17:25 **Suresh Sankhla:** *Septostomy: indications*

17:30-17:40 **Bassel Zebian:** *Septostomy: surgical technique*

17:45-18:30 **SESSION 4: CLINICAL CASES | ETV & Septostomy** Main Hall

Instructors: **Llewellyn Padayachy, Bassel Zebian, Ricardo Santos de Oliveira**

Each instructor presents 3 cases and is allotted 15'.

CEREBRAL AND VENTRICULAR NEUROENDOSCOPY

ADVANCED TECHNIQUES

Tuesday • January 24, 2023 / **Complex hydrocephalus**

08:00-10:15	SESSION 5: Complex Hydrocephalus Chairperson: Kenichi Nishiyama	Main Hall
08:00-08:10	Gianpiero Tamburrini: <i>Multiloculated hydrocephalus: classification / radiology</i>	
08:15-08:25	Simone Peraio: <i>Multiloculated hydrocephalus: surgical techniques</i>	
08:30-08:40	Manas Panigrahi: <i>ETV and shunt malfunction</i>	
08:45-08:55	Samer Elbabaa: <i>ETV in spina bifida</i>	
09:00-09:10	Ulrich-Wilhelm Thomale: <i>Ventricular washing in PHH in prematures</i>	
09:15-09:25	Artur da Cunha: <i>Choroid plexus coagulation: indications, technique, results</i>	
09:30-09:40	Tenoch Herrada-Pineda: <i>Neurocysticercosis</i>	
09:45-09:55	Fernando Chico Ponce de Leon: <i>Endoscopic treatment of brain abscess and ventriculitis</i>	
10:00-10:10	Neelam Venkataramana: <i>ETV in post-tuberculosis hydrocephalus</i>	
10:15-11:30	SESSION 6: Arachnoid cysts Chairperson: Samer Elbabaa	Main Hall
10:15-10:25	François Lechanoine: <i>Arachnoid cysts: classification and radiology</i>	
10:30-10:40	Gianpiero Tamburrini: <i>Sylvian cysts: endoscopic surgical technique</i>	
10:45-10:55	Jonathan Roth: <i>Suprasellar cysts: endoscopic surgical technique</i>	
11:00-11:10	Pietro Spennato: <i>Interhemispheric cysts: endoscopic surgical technique</i>	
11:15-11:25	Giuseppe Mirone: <i>Posterior fossa cysts: endoscopic surgical technique</i>	
11:30-11:50	Coffee Break	
11:50-13:00	Hands on-Anatomical and Animal models	Rooms 1-2-3-4
13:00-14:00	Lunch Break	
14:00-16:30	Hands on-Anatomical and Animal models	Rooms 1-2-3-4
16:30-16:45	Coffee Break	
16:45-18:15	SESSION 7: CLINICAL CASES Complex Hydrocephalus and Arachnoid Cysts Chairperson: Spyros Sgouros Instructors: Jonathan Roth, Simone Peraio, Ricardo Santos de Oliveira Each instructor presents 3 cases and is allotted 15'.	Main Hall
17:45-18:15	VIDEO SESSION Complex hydrocephalus Chairperson: Gianpiero Tamburrini Instructors: Samer Elbabaa, Ulrich-Wilhelm Thomale, Artur da Cunha Each instructor presents 3 videos and is allotted 15'.	

CEREBRAL AND VENTRICULAR NEUROENDOSCOPY

ADVANCED TECHNIQUES

Wednesday • January 25, 2023

08:00-09:20	SESSION 8: Endoscope-assisted surgery Chairperson: Alvaro Cordoba 08:00-08:10 Hisayuki Murai: <i>Endoscopy in parenchymal haemorrhage</i> 08:15-08:25 Alberto Feletti: <i>Endoscopy in intraventricular haemorrhage</i> 08:30-08:40 Alvaro Cordoba: <i>Endoscope-assisted microsurgery in brain tumors</i> 08:45-08:55 Renato Galzio: <i>Endoscope-assisted microsurgery in vascular surgery</i> 08:55-09:05 Sandi Lam: <i>Endoscopic callosotomy and hemispherotomy</i> 09:05-09:15 Hans Delye: <i>Endoscopic repair of craniosynostosis</i>	Main Hall
09:20-10:20	SESSION 9: Endoscopy in tumor management Chairperson: Henry Schroeder 09:20-09:30 Jose Hinojosa: <i>ETV and posterior fossa tumors</i> 09:35-09:45 Wan Tew Seow: <i>ETV in pineal tumors: indications, technique</i> 09:50-10:00 Kazuhiro Takeuchi: <i>Tumor biopsy / removal: surgical technique</i> 10:05-10:15 Piero Spennato: <i>Tumor biopsy with normal ventricles</i>	Main Hall
10:20-11:35	SESSION 10: Craniopharyngiomas – Miscellaneous Chairperson: Davide Locatelli 10:20-10:30 Hisayuki Murai: <i>Craniopharyngiomas: ventricular approach</i> 10:30-10:40 Stefano Peron: <i>Minimally Invasive Endoscopic Removal of Colloid Cysts</i> 10:40-10:50 Henry Schroeder: <i>Pure endoscopic management of intraventricular tumors</i> 11:50-11:00 Henry Schroeder: <i>Dryfield technique in intraventricular surgery</i> 11:05-11:15 Kazuhiro Takeuchi: <i>Cylinder tumor surgery</i> 11:20-11:30 Joachim Oertel: <i>Endoscopic Eyebrow approach</i>	Main Hall
11:35-12:00	Coffee Break	
12:00-13:00	Hands on-Anatomical and Animal models	Rooms 1-2-3-4
13:00-14:00	Lunch Break	
14:00-16:30	Hands on-Anatomical and Animal models	Rooms 1-2-3-4
16:30-16:45	Coffee Break	
16:45-18:15	SESSION 11: CLINICAL CASES: ENDOSCOPIC TUMOR SURGERY & VIDEO SESSION Chairperson: Kazuhiro Takeuchi 17:15-17:30 Peng Zhao: <i>Endoport technique in Intraventricular tumor</i> (video presentation) 17:30-17:45 Joachim Oertel: <i>Endoscope assisted microsurgery in aneurysm surgery</i>	Main Hall
17:45-18:15	VIDEO SESSION Endoscopic Tumor surgery Instructors: Sandi Lam, José Hinojosa, Claudio Schonauer Each instructor presents 3 videos and is allotted 15'.	

ADVANCED SKULLBASE SEGMENT

Thursday • January 26, 2023 / Endoscopic endonasal and trans-orbital approaches

08:00-08:15	Welcome and event presentation Giuseppe Cinalli, Luigi Maria Cavallo	Main Hall
08:15-08:30	Addresses of the Presidents IFNE and SINch	
08:30-10:15	SESSION 12: Endoscopic Endonasal approach to Sellar Region and Cavernous Sinus Chairperson: Luigi Maria Cavallo	Main Hall
08:30-08:42	Matteo De Notaris: <i>Endoscopic endonasal anatomy of the midline skull base</i>	
08:45-08:57	Francesco Doglietto: <i>Current strategies for functioning pituitary adenomas</i>	
09:00-09:12	Luigi Maria Cavallo: <i>Endonasal approach for craniopharyngiomas</i>	
09:15-09:27	Diego Mazzatenta: <i>Endonasal approach to Cavernous Sinus</i>	
09:30-09:42	Waleed Azab: <i>Endonasal approach for uncommon sellar and clival lesions</i>	
09:45-09:57	Verena Gellner: <i>Complications of endonasal skull base surgery</i>	
10:00-10:15	Henry Schroeder: <i>The value of the endoscope in MVD</i>	
10:15-10:30	Networking Break	
10:30-13:30	Hands-on Cadaveric Specimens	Rooms 1-2-3-4
13:30-14:00	Lunch Break	
14:00-16:15	Hands-on Cadaveric Specimens	Rooms 1-2-3-4
16:15-16:30	Coffee break	
16:30-17:45	SESSION 13: Advanced Endoscopic approaches to Skull base Chairperson: Waleed Azab	Main Hall
16:30-16:42	Gui Songbai: <i>Endonasal approach for pituitary adenomas (video presentation)</i>	
16:45-16:57	Luigi Maria Cavallo: <i>Endonasal approaches for ASB meningiomas</i>	
17:00-17:12	Michael Bruneau: <i>Minimally invasive approaches for ACF meningioma</i>	
17:15-17:27	Joaquim Enseñat: <i>Endoscope assisted skull base surgery</i>	
17:30- 17:45	Alberto Di Somma: <i>Transorbital eyelid approach</i>	

ADVANCED SKULLBASE SEGMENT

Friday • January 27, 2023 / Endoscopic skull base techniques

08:30-10:30 **SESSION 14: Miscellaneous** Main Hall

Chairperson: **Michael Brunëau**

08:30-08:42 **Federica Penner:** *Neuronavigation for skull base approaches*

08:45-08:57 **Francesco Sala:** *Intraoperative monitoring for skull base surgery*

09:00-09:12 **Yazhuo Zhang:** *Endonasal approaches for clival chordomas* (video presentation)

09:15-09:27 **Maurizio Iacoangeli:** *The Endonasal approach for CVJ*

09:30-09:42 **Marco Maria Fontanella:** *Endoscopic supraorbital approach*

09:45-09:57 **Davide Locatelli:** *Combined approaches to anterior cranial base*

10:00-10:12 **Felice Esposito:** *Tips and tricks for skull base reconstruction*

10:15-10:27 **Giuseppe Minniti:** *Radiotherapy for Skull base tumors*

10:30-10:40 Networking Break

10:45-13:30 **Hands-on Cadaveric Specimens** Rooms 1-2-3-4

13:30-14:00 Lunch Break

14:00-16:15 **Hands-on Cadaveric Specimens** Rooms 1-2-3-4

16:15-16:30 Coffee Break

16:30-17:45 **SESSION 15: Video & Clinical cases** Main Hall

Chairperson: **Felice Esposito**

Case discussion & video presentation (faculty and attendees)

18:00 **Adjourn**

Sponsors Acknowledgements

The Organizing Committee would like to thank the following companies for their support of the Workshop:

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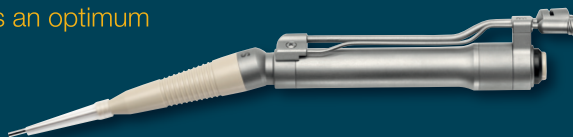


The only comprehensive product assortment for ultrasonic tumor aspiration

LEVICS ultrasonic aspirator:

Excellent instrument design for precise working

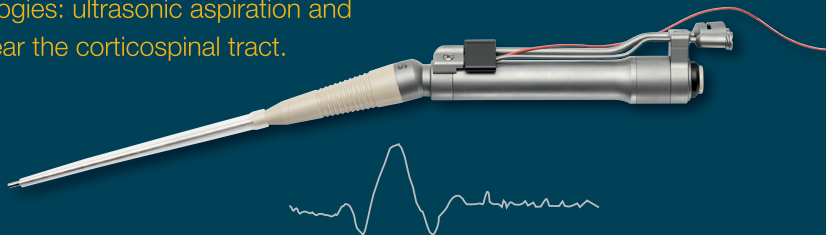
The low weight supports a safe working over long periods of surgery while the angled instrument ensures an optimum view of the surgical field.



LEVICS ultrasonic aspiration merged with IONM:

Clinical outcome maximized. Safety optimized.

The combination of two technologies: ultrasonic aspiration and IONM for resection of tumors near the corticospinal tract.



ENP Endoscopic Micro instrument:

Advanced neuroendoscopy with ultrasonic aspiration

The world's only endoscopic ultrasonic aspirator for the unique resection of intraventricular tumors and cysts.



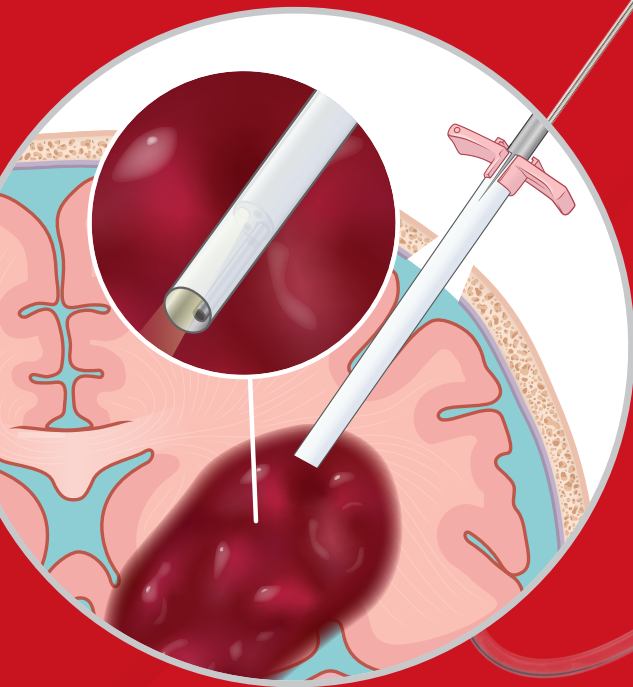
Experience surgical precision and book your individual demo!

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Artemis™

Neuro Evacuation Device

Minimally Invasive
Haematoma Evacuation



86%
patients with a
postoperative haematoma
 $\leq 15 \text{ ml}^1$
N = 100

88%
mean evacuation
percentage¹
N = 100 | SD = 20

1. Kellner CP, Song R, Pan J, et al. Long-term functional outcome following minimally invasive endoscopic intracerebral hemorrhage evacuation. *Journal of NeuroInterventional Surgery* 2020;12:489-494.

Prior to use, please refer to the Instructions for Use for complete product indications, contraindications, warnings, precautions, potential adverse events, and detailed instructions for use.

ARTEMIS Neuro Evacuation Device – Intended Use

The ARTEMIS Neuro Evacuation Device is used for the controlled aspiration of tissue and/or fluid during surgery of the Ventricular System or Cerebrum for patients age 18 or older in conjunction with a Penumbra Aspiration Pump.

Penumbra Aspiration Pump:

The Penumbra Aspiration Pump is indicated as a vacuum source for the Penumbra Aspiration Systems.

Potential Adverse Events

Possible complications include, but are not limited to, the following: hematoma expansion, fever, headaches, vomiting, hyperglycemia, edema, re-bleeding, death, bleeding, increased blood pressure, infections, seizures, intraventricular hemorrhage, hydrocephalus, thromboembolic events, decreased consciousness, craniotomy, unintended removal of tissue leading to neurological and/or sensory deficit.

Penumbra Pump MAX – Intended Use

The Penumbra Pump MAX is intended as a vacuum source for the Penumbra Aspiration Systems.

Product availability varies by country. Rendering for illustrative purposes only. Individual results may vary depending on patient-specific attributes and other factors. Please contact your local Penumbra representative for more information.

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Penumbra 

Medtronic

Engineering the extraordinary



Alleviate pain.
Restore health.
Extend life.

Six powerful words that inspire us to engineer the extraordinary, innovate life-transforming technologies, and create better outcomes for our world.

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