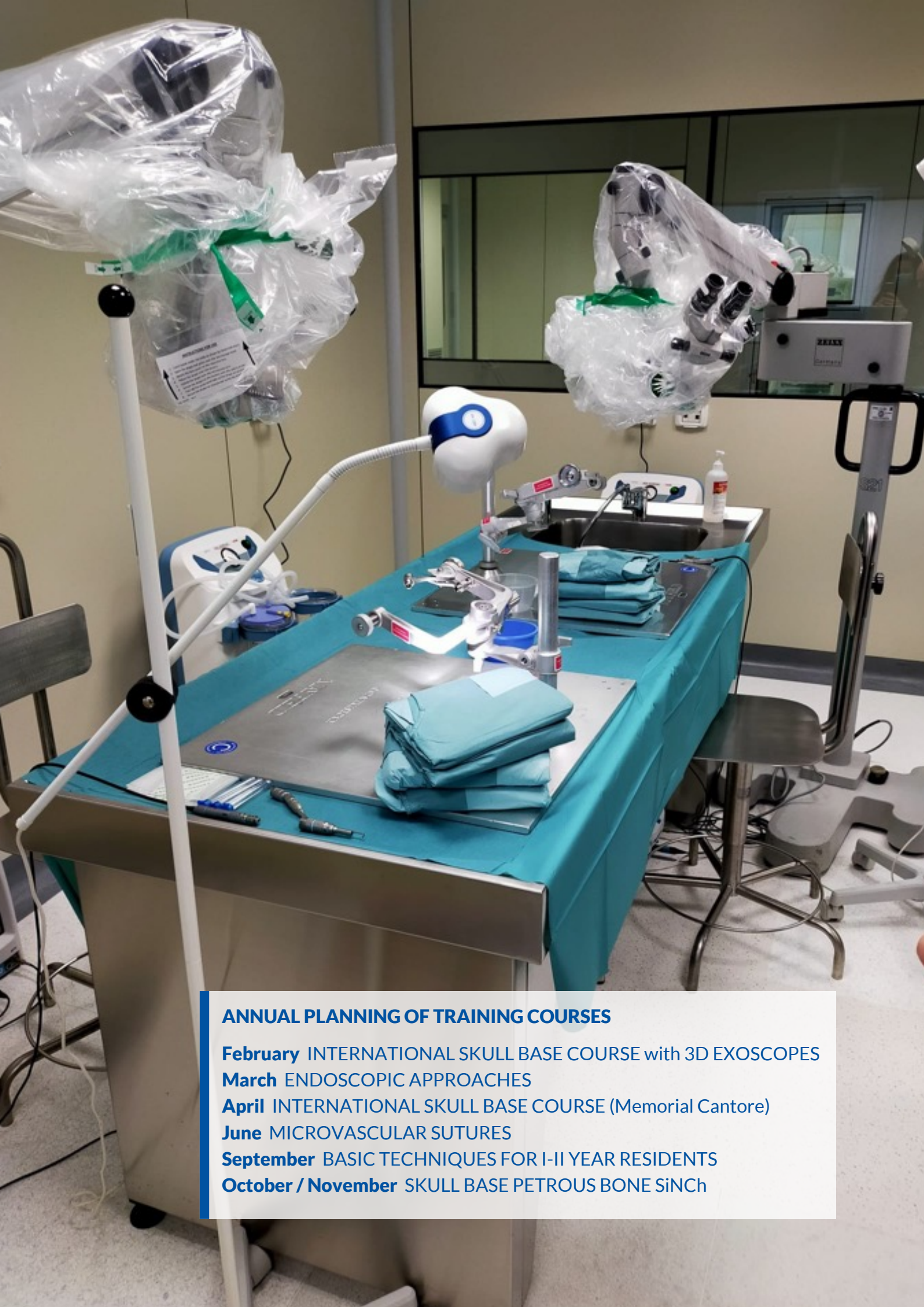




NECROSCOPY LAB – UNIT OF  
NEUROANATOMY AND SURGICAL  
TRAINING “G. CANTORE”



## **ANNUAL PLANNING OF TRAINING COURSES**

**February** INTERNATIONAL SKULL BASE COURSE with 3D EXOSCOPES

**March** ENDOSCOPIC APPROACHES

**April** INTERNATIONAL SKULL BASE COURSE (Memorial Cantore)

**June** MICROVASCULAR SUTURES

**September** BASIC TECHNIQUES FOR I-II YEAR RESIDENTS

**October / November** SKULL BASE PETROUS BONE SiNCh


# Necroscopy Laboratory – Unit of Neuroanatomy and Surgical Training “G. Cantore”

The study of neuroanatomy represents the basis of the Neurosurgeon’s knowledge. In particular, knowing the anatomical details of the different intracranial areas constitutes the essential starting point for the correct treatment of skull base tumors and vascular lesions.

The Neuroanatomy Lab – Unit of Training, Surgery and Educational “G. Cantore” of the I.N.M. NEUROMED I.R.C.C.S. was established in December 2021 and is unit space dedicated to training and research activities on human cadaveric specimen in neurosurgery. The laboratory is located in the Technology Park a few minutes away from the hospital. “Hands-on” courses focused on the main surgical techniques of the Skull Base, and Vascular Micro-suture courses are held every year. The objective, in the following years, is to increasingly expand the training offering, including other surgical branches.

This state -of the-art Laboratory for anatomical dissection, developed for the “practical” training of surgeons, is divided into two fields: surgical anatomy and surgical technique. Starting from the anatomical dissection, both young neurosurgeons and residents, under the guidance of a Team of experts, experiment how to optimize surgical techniques in specific anatomical regions derived from human cadaveric specimen.

The Hospital IRCCS Neuromed is known for best practice institute for the study and treatment of pathologies relating to Neurosurgery, Neurology, Neurorehabilitation and for all applications relating to Neuroscience. Furthermore, it is also a national center for neurosurgery with a constantly increasing operating activity, more than 2000 surgical procedures performed each year.



Improvement and evolution has been made in the history of the cadaver dissection. From the first dissections performed for anatomical research purposes early in the III century BC, passing through the Da Vinci study of “human machine” in the Renaissance era, human anatomy 2.0 opens today to scientifically advanced learning to allow the surgeon to refine their skills to operate on patient.

There are very few dedicated centers to this activity in the world and even rarer in Italy. But, the Neuromed IRCCS has always been attentive to high standards and training, thanks to Prof. Giampaolo Cantore who decided to undertake this challenge and has passed on to his fellows the importance of specialized “practical training” above all in the field of neurosurgery.



*Lab Team: Nicola Gorgoglione, Paolo di Russo, Prof. Vincenzo Esposito, Arianna Fava, Michelangelo De Angelis*





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# Key role of microsurgical dissections on cadaveric specimens in neurosurgical training: Setting up a new research anatomical laboratory and defining neuroanatomical milestones

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**Introduction:** Neurosurgery is one of the most complex surgical disciplines where psychomotor skills and deep anatomical and neurological knowledge find their maximum expression. A long period of preparation is necessary to acquire a solid theoretical background and technical skills, improve manual dexterity and visuospatial ability, and try and refine surgical techniques. Moreover, both studying and surgical practice are necessary to deeply understand neuroanatomy, the relationships between structures, and the three-dimensional (3D) orientation that is the core of neurosurgeons' preparation. For all these reasons, a microsurgical neuroanatomy laboratory with human cadaveric specimens results in a unique and irreplaceable training tool that allows the reproduction of patients' positions, 3D anatomy, tissues' consistencies, and step-by-step surgical procedures almost identical to the real ones.

**Methods:** We describe our experience in setting up a new microsurgical neuroanatomy lab (IRCCS Neuromed, Pozzilli, Italy), focusing on the development of training activity programs and microsurgical milestones useful to train the next generation of surgeons. All the required materials and instruments were listed.

**Results:** Six competency levels were designed according to the year of residency, with training exercises and procedures defined for each competency level: (1) soft tissue dissections, bone drilling, and microsurgical suturing; (2) basic craniotomies and neurovascular anatomy; (3) white matter dissection; (4) skull base transcranial approaches; (5) endoscopic approaches; and (6) microanastomosis. A checklist with the milestones was provided.

**Discussion:** Microsurgical dissection of human cadaveric specimens is the optimal way to learn and train on neuroanatomy and neurosurgical procedures before performing them safely in the operating room. We provided a "neurosurgery booklet" with progressive milestones for neurosurgical residents. This step-by-step program may improve the quality of training and guarantee equal skill acquisition across countries. We believe that more efforts should be made to create new microsurgical laboratories, popularize the importance of body donation, and establish a network between universities and laboratories to introduce a compulsory operative training program.

# High quality training for today's and tomorrow's professionals

Having the opportunity to use an Italian center for advanced training on human cadaveric specimen, where it is possible to learn and simultaneously carry out surgical practices on an anatomical specimen within a hospital, is a great opportunity not only for the new generations of surgeons but also to improve the skills of experienced medical professionals.

The Neuroanatomy Lab – Unit of Training, Surgery and Educational is ready to welcome all surgeons who long for taking advantages of high level education courses. There are 4 dissection tables, on each of them 2-3 specialists can work on the cadaver, depending on of the course level. The experts from the master station teaching-table is connected through the audio-video system at all stations. The lab is also equipped with cameras, allowing a real time and very detailed vision of the different surgical techniques. Through a step-by-step approach, each of the station is also assigned to a tutor, an expert surgeon of the lab team, who verifies and supports the work of the trainees, intervening, if necessary, without interfering with the activities of the attendings. The primary objective is the reduction of the gap between the learning of the intervention techniques on the cadaver and their application in the operating room.







# SKULL BASE LAB FELLOWSHIP PROJECT



# THE PROJECT

The institute Neuromed IRCCS together with the Asino Foundation for the training and education in Neurosurgery.

With a strong willing between two entities, an agreement has been reached to offer two Fellowships for two candidates at the “Neuroanatomy Laboratory” G. Cantore of the IRCCS Neuromed, funded by the Asino Foundation.

At the basis of this collaboration is the assumption that anatomical dissections are currently irreplaceable for training in neurosurgery and allow us to achieve a real knowledge of three-dimensional anatomy.

**Fellowship Period:**

- January – June
- July – December

**Number of positions available per year: 2.**

**Duration: 6 months.**

# LAB TEAM

## **NUEROSURGEONS**

Dott. di Russo Paolo  
Prof. Esposito Vincenzo  
Dott.ssa Fava Arianna  
Dott. Gorgoglione Nicola

## **CLINICAL ENGINEERING**

Ing. Cortellessa Roberta

## **SECRETARIAT**

Berardi Domenica



# COURSES FACULTY

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Aureli Viviana (Lausanne, Switzerland)  
Barbagli Giovanni (Firenze)  
Bartolo Andrea (Pozzilli, IS)  
Bernardo Antonio (New York, USA)  
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Bove Ilaria (Napoli)  
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Di Carlo Davide (Pisa)  
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