



Online Basic Cranial Approaches Diploma Program with practical exercises using Augmented and Virtual Reality

Introduction

In recent years neurosurgical training has become more difficult, both due to regulations in Europe and the USA that limit the working hours of residents in neurosurgical departments, and to the very high cost of cadaver labs around the world. Therefore, worldwide, neurosurgeons are exposed to a limited number of surgical procedures, both during the training period and during the activity in the wards.

In the past, especially for some difficult surgical approaches, many neurosurgeons used to go to centers of high caseloads, where the great masters of neurosurgery knew how to teach the surgical procedure. When trainees returned to the Department of origin it was clear to them how to carry out the procedure, however, from a practical point of view they were faced with problems that were not as easy to solve as they thought with nobody around who could advise them anymore.

A single surgical approach, even as simple as a pterional approach, is developed differently in different centers with the option to compare them. There is a need to teach a standard surgical approach and to compare the different techniques in the different centers. Many studies show that errors related to surgical procedures can be prevented with a step-by-step checklist of the procedure, therefore a step-by-step teaching approach is useful.

The Global Neuro Foundation, as one of the leading groups worldwide to offer continuous medical education for neurosurgeons and neurosurgical residents, recognizes this issue and is offering a solution through Online teaching and virtual reality which has the potential to significantly increase the surgical experience of neurosurgeons. Taking advantage of its global network of expert faculties in this field, Global Neuro has developed an online training certificate program.

The online certification program will allow participants to learn surgical approaches from masters of Neurosurgery. This will give many neurosurgeons and neurosurgical residents a unique opportunity to acquire educational experience, in order to improve fundamental knowledge to develop basic and advanced decision-making capabilities.



Objectives of the program / Learning outcomes

By completing this course, participants will be better able to:

- Identify the surgical anatomy of the cranial approaches.
- Determine the surgical instruments and the surgical theater setting for each step of the cranial approaches.
- Describe basic surgical information to perform a cranial approach (preparation of the patient, disinfection, anesthesiology setting, skin preparation and incision, as well as skin, muscles, and bone flap preservation during the procedure).
- Perform 5 different cranial surgical procedures and their basic variants, in particular: Ventricular Shunt, Pterional Approach, Subtemporal Approach, Retrosigmoid Approach and Decompressive Craniectomy.
- Assess the technical difficulties and the possible mistakes related to any single approach.
- Recognize the importance of performing the approach step by step to avoid mistakes.
- Identify how to modify an approach and what kind of advantage can be obtained by this change.
- Develop decision-making skills and formulate which approaches can be performed for a specific case.

Course description

Module 1 Basic technical and surgical information to perform a cranial approach

Module 2 External Ventricular Drainage (EVD) and Ventricular-Peritoneal Shunt (VPS)

Module 3 Pterional Approach

Module 4 Subtemporal Approach

Module 5 Retrosigmoid Approach

Module 6 Decompressive Craniectomy

Final Exam

The teaching will be preceded by practical lessons about surgical instruments needed for each approach, surgical theater setting and the basic surgical information about performing a cranial approach (preparation of the patient, disinfection, anesthesiology setting, skin preparation and incision, skin, muscles and bone flap preservation during the procedure). Any module and therefore any approach will be available in a repository for remote access.



Course program

The program is organized in 6 modules. Module duration 2 hrs. (app. 20 minutes per part).

MODULES

Module 1 Basic technical information to perform a cranial approach

Coordinators/Masters: Andreas Demetriades, Marco Fontanella, Talat Aziz, Mohammad Zahir Resuli, Ioannis Tsonis and John Emelifeonwu

- C1: Surgical theater setting for cranial procedures
- C2: Anesthesiology setting and preparation of the patient
- C3: Surgical instruments needed for every approach
- C4: The use of drills
- C5: The use of microscopes
- Intermediate exam

The participant follows the module online on the moodle platform.

Module 2 External Ventricular Drainage (EVD) and Ventricular-Peritoneal Shunt (VPS)

Coordinator/Master: Andrés Rubiano and Diana Sanchez

- C1: Anatomy of ventricular system and peritoneal wall
- C2: Necessary equipment, main entry points and patient positioning (EVD)
- C3: Surgical video demonstrating step by step the VPS procedure
- C4: Technical problems and solutions about the approach
- Intermediate exam

The participant follows the module online on the moodle platform.

Module 3 Pterional approach (Including UpSurgeOn box)

Coordinator/Master: Peter Vajkoczy from Berlin and Marco Cenzato from Milan

- C1: Anatomy of the pterional region
- C2: Patient positioning
- C3: App demonstrating step by step the pterional approach
- C4: Surgical video demonstrating step by step procedure
- C5: Pterional approach procedure, performed on Upsurgeon box
- C6: Technical problems and solutions about the approach
- Intermediate exam

The participant follows the modules online on the moodle platform. Also in this module s/he will practice on the Brain box from Upsurgeon following the instructions shared in C3 (with the support of the app) and C5 (with the support of the brain box).



Module 4 Subtemporal approach (Including UpSurgeOn box)

Coordinator/Master: Sébastien Froelich from Paris

- C1: Anatomy of the temporal and temporo-basal region
- C2: Patient positioning
- C3: App demonstrating step by step the Subtemporal approach
- C4: Surgical video demonstrating step by step the procedure
- C5: Subtemporal approach procedure, performed on Upsurgeon box
- C6: Technical problems and solutions about the approach
- Intermediate exam

The participant follows the modules online on the moodle platform. Also in this module s/he will practice on the Brain box from Upsurgeon following the instructions shared in C3 (with the support of the app) and C5 (with the support of the brain box).

Module 5 Retrosigmoid approach (Including UpSurgeOn box)

Coordinators/Masters: Carlo Schaller and Florian Bernard from Geneva

- C1: Anatomy of the latero-occipital region and CP angle
- C2: Patient positioning in different ways
- C3: App demonstrating step by step retrosigmoid approach
- C4: Surgical video demonstrating step by step the procedure
- C5: Retrosigmoid approach procedure, performed on Upsurgeon box
- C6: Technical problems and solutions about the approach
- Intermediate exam

The participant follows the modules online on the moodle platform. Also in this module s/he will practice on the Brain box from Upsurgeon following the instructions shared in C3 (with the support of the app) and C5 (with the support of the brain box).

Module 6 Decompressive Craniectomy, Dura Cutting and Suturing, Bone flap repositioning and Cranioplasty

Coordinator/Master: Franco Servadei and Corrado Iaccarino

- C1: Surgical Management of Brain Edema
- C2: Technical aspects of performing a decompressive craniectomy
- C3: Wetlab: decompressive craniectomy 3D video
- C4: Bone flap repositioning and different materials for cranioplasty
- C5: Video of a cranioplasty with a custom implant (OR video)
- C6: Technical problems and solutions about decompressive craniectomy
- Intermediate exam



The participant follows the module online on the moodle platform.

Module 7: Final Exam

Exam

The learning objectives will be evaluated with a multiple-choice test with a minimum required score of 70%. At the end of course a final exam evaluating the content of the whole program will be performed online. For three modules the trainee will be asked to perform a surgical approach on the “virtual specimen”. The final grade will be a sum of the module’s exams (50%) and the final exam (50%). The minimum required score to obtain the certification will be 7.0 / 10 (70%).

Accreditation

In support of improving patient care, this activity has been planned and implemented by CME Outfitters, LLC and Global Neuro Foundation. CME Outfitters, LLC is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

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