



Mixed Reality Simulation
for Microsurgical Training

Cranial Series

Surgical Training Technologies
for Cranial Neurosurgery



Interactive Brochure 2023



PterionalBox

3

Neurosurgical simulator for frontotemporal approaches to the anterior and middle cranial fossa equipped with mobile AR and navigation.



Tap here



TemporalBox

4

Neurosurgical simulator for temporal approaches to the middle cranial fossa equipped with mobile AR and navigation.



RetrosigmoidBox

5

Neurosurgical simulator for retrosigmoid approaches to the posterior cranial fossa equipped with mobile AR and navigation.



InterhemisphericBox

6

Neurosurgical simulator for interhemispheric approaches to the midline equipped with mobile AR and navigation.



SuboccipitalBox

7

Neurosurgical simulator for suboccipital approaches to the craniocervical junction equipped with mobile AR and navigation.



BrainTumorBox

8

Neurosurgical simulator of glioblastoma resection equipped with 5-ALA, active bleeding, ultrasound compatibility, mobile AR and navigation.



AneurysmBox

9

PterionalBox (see above) enhanced with 5 clippable aneurysms.



FluorescentBox

10

AneurysmBox (see above) enhanced with 5-ALA, Fluorescein and ICG fluorescence.



TNS Box

11

Neurosurgical simulator for endoscopic approaches to a pituitary adenoma, equipped with mobile AR.



Mycro

12

Training System for microvascular Anastomosis and Microsutures.



NavigationHead

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Tool for enabling compatibility of PterionalBox, AneurysmBox and FluorescentBox with head clamps and standard neuronavigation.

PterionalBox

Frontotemporal approaches to the anterior and middle cranial fossa



Augmented Reality App



Mobile/Standard Navigation



Disposable Skulls



What you can explore

II: Optic Nerve

CA: Internal Carotid Artery

ACA: Anterior Cerebral Artery

A1: First segment of ACA

AcomA: Anterior Communicating Artery

MCA: Middle Cerebral Artery

III: Oculomotor Nerve

PComA: Posterior Communicating Artery

PCA: Posterior Cerebral Artery

Ophthalmic Artery

Pituitary Stalk

Perforating Arteries

Lamina Terminalis

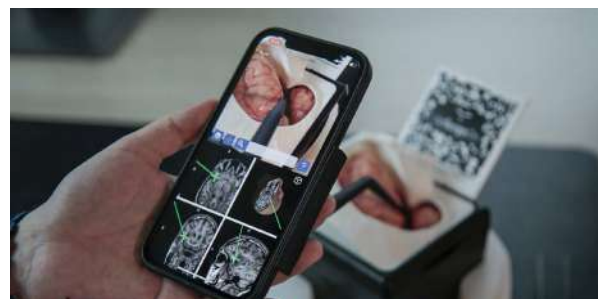
Insula Heubner Artery (origin)

Optic Chiasm

Basilar Tip

Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.



* Included with the Box

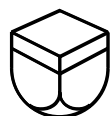
** NavigationFrame and NavigationHead are sold separately. Check the compatibility with your navigation technology.

Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Pterional-Skull. Then replace it and start again.



Box
Reusable

+



Skull
Disposable

TemporalBox

Temporal approaches to the middle cranial fossa



Augmented Reality App



Mobile/Standard Navigation



Disposable Skulls



What you can explore

II: Optic Nerve

ICA: Internal Carotid Artery

ACA: Anterior Cerebral Artery

AComA: Anterior Communicating Artery

III: Oculomotor Nerve

PComA: Posterior Communicating Artery

PCA: Posterior Cerebral Artery

Pituitary Stalk

Perforating Arteries

Optic Chiasm

Basilar Tip

Basal vein

Internal Cerebral veins

Vein of Galeno

SCA: Superior Cerebellar Artery

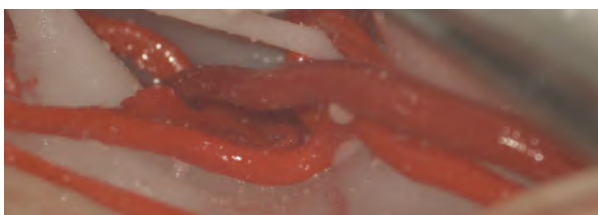
IV: Trochlear nerve

Mesencephalus

Tentorium

Middle skull base fossa

Temporal lobe



Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.

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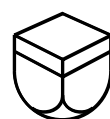
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Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Temporal Skull. Then replace it and start again.



Box
Reusable

+



Skull
Disposable



RetrosigmoidBox

Retrosigmoid approaches to the posterior cranial fossa



Augmented Reality App



Mobile/Standard Navigation



Disposable Skulls



What you can explore

III: Oculomotor Nerves

PCoA: Posterior Communicating Artery

PCA: Posterior Cerebral Artery

Pituitary Stalk

Perforating Arteries

Basilar artery

Vertebral artery

SCA: Superior Cerebellar Artery

AICA: Anterior Inferior Cerebellar Artery

PICA: Posterior Inferior Cerebellar Artery

Mammillary bodies

IV: Trochlear nerve

V: Trigeminal nerve

VI: Abducens nerve

VII/VIII: Facial/vestibular nerves

IX-X-XI: Mixed cranial nerves

XII: Hypoglossal nerve

Mesencephalus

Pons

Medulla oblongata

Tentorium

Posterior skull base fossa



Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.

* Included with the Box

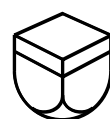
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Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Retrosigmoid Skull. Then replace it and start again.



Box
Reusable

+



Skull
Disposable



InterhemisphericBox

Interhemispheric approaches to the midline



Augmented Reality App



Mobile/Standard Navigation



Disposable Skulls

What you can explore

Mid frontal hemisphere

Mid parietal hemisphere

Third and fourth segment of the anterior cerebral artery (ACA)

Corpus callosum



Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.

* Included with the Box

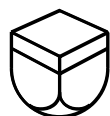
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Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Interhemispheric Skull. Then replace it and start again.



Box
Reusable

+



Skull
Disposable



Suboccipital Box

Suboccipital approaches to the craniocervical junction



Augmented Reality App



Mobile/Standard Navigation



Disposable Skulls



What you can explore

Basilar artery

Vertebral artery

SCA: Superior Cerebellar Artery

AICA: Anterior Inferior Cerebellar Artery

PICA: Posterior Inferior Cerebellar Artery

Mammillary bodies

V: Trigeminal nerve

VII/VIII: Facial/vestibular nerves

IX-X-XI: Mixed cranial nerves

XII: Hypoglossal nerve

Mesencephalus

Pons

Medulla oblongata

Posterior skull base fossa



Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.

* Included with the Box

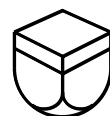
** NavigationFrame and NavigationHead are sold separately. Check the compatibility with your navigation technology.

Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Suboccipital Skull. Then replace it and start again.



Box
Reusable

+







Skull
Disposable



BrainTumorBox

Bleeding 5-ALA-enhanced Glioblastoma for US-guided resection

-  Augmented Reality App
-  Mobile/Standard Navigation
-  Ultrasound
-  Disposable Skulls / Cartridges



What you can do

Learn how to handle microsurgical instruments

Learn how to perform a white matter dissection

Learn how to perform a microsurgical resection under the microscope/exoscope

Learn how to perform an ultrasound guided resection

Learn how to manage intraoperative bleeding

Resect and remove a fluorescence-guided (5-ALA) intraparenchymal glioblastoma with epicenter in the frontal white matter



Fluorescence: 5ALA

With the BrainTumorBox you can resect an intraparenchymal glioblastoma guided by 5-ALA fluorescence and Ultrasounds.



Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI.

* Included with the Box

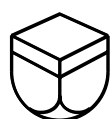
** NavigationFrame is sold separately. Check the compatibility with your navigation technology.

Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Cartridges and Skulls

Perform a craniotomy and remove the tumor. Then replace the cartridge and the skull and start again.



Box
Reusable

+



Skull
Disposable

+



Cartridges
Disposable



AneurysmBox

Aneurysm clipping



Augmented Reality App



Mobile/Standard Navigation



Disposable Skulls



AneurysmBox is a PterionalBox (p. 3) with the addition of 5 aneurysms.

What you can do

II: Optic Nerve

CA: Internal Carotid Artery

ACA: Anterior Cerebral Artery

A1: First segment of ACA

AcomA: Anterior Communicating Artery

MCA: Middle Cerebral Artery

III: Oculomotor Nerve

PComA: Posterior Communicating Artery

PCA: Posterior Cerebral Artery

Ophthalmic Artery

Pituitary Stalk

Perforating Arteries

Lamina Terminalis

Insula Heubner Artery (origin)

Optic Chiasm

Basilar Tip

Aneurysm Cases

Case 1: Middle Cerebral Artery;

Case 2: Basilar Tip;

Case 3: Carotid Bifurcation;

Case 4: Anterior Communication Artery;

Case 5: Posterior Communication Artery;

Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.

* Included with the Box

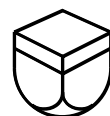
** NavigationFrame and NavigationHead are sold separately. Check the compatibility with your navigation technology.

Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Pterional-Skull. Then replace it and start again.



Box
Reusable

+






Skull
Disposable



FlourescentBox

5-ALA, Fluorescein and ICG fluorescence

-  Augmented Reality App
-  Mobile/Standard Navigation
-  Disposable Skulls



FlourescentBox is an AneurysmBox (p. 9) with the addition of 5-ALA, Fluorescein, ICG and fluorescence.

What you can explore

FlourescentBox is designed to simulate 3 different fluorescences:

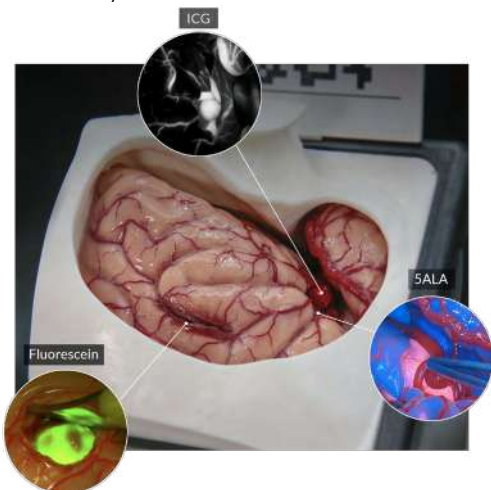
FLUORESCHEIN, 5ALA and ICG

Fluorescein: 1 deep frontal tumor glioma

5ALA: 1 superficial insular glioma

ICG: 5 fluorescent (ICG) aneurysms in different locations (Carotid bifurcation, MCA, AComA, PComA, Basilar tip)

With the FluorescentBox you can explore all the anatomy of the PterionalBox and all 5 aneurysms of the AneurysmBox.



Mobile/Standard Navigation

Use the NavigationPen* in conjunction with the Neurosurgery App for mobile neuronavigation. Alternatively, use the NavigationFrame** along with the included MRI or the NavigationHead** with the included MRI for standard neuronavigation.

* Included with the Box

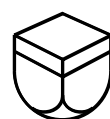
** NavigationFrame and NavigationHead are sold separately. Check the compatibility with your navigation technology.

Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Pterional-Skull. Then replace it and start again.



Box
Reusable

+






Skull
Disposable



TNSBox

Endoscopic Transsphenoidal approaches to a pituitary adenoma

-  Mobile endoscope and instruments included
-  Augmented Reality App
-  Disposable Cavities



What you can do

Septal Cartilage

Vomer

Mucosa

Perpendicular plate of Ethmoid Bone

Sphenoidal Crest

Nasal Cavity

Inferior Choana

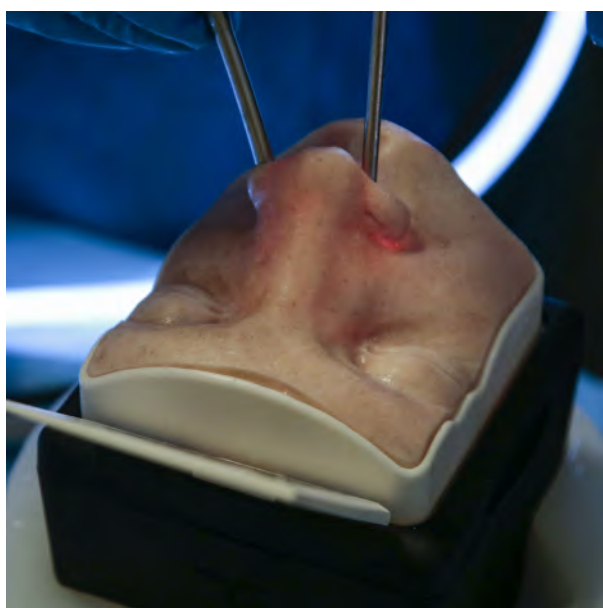
Middle Choana

Superior Choana

Sphenoid Sinus

Pituitary Tumor

Polyposis



Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.



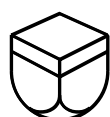
Disposable Cavities

Prepare the nasal cavities and perform an adenoma resection tumor. Then replace the cavity and start again.

TNSBox is available with two different Disposable Cavities:

Disposable Cavity with Pituitary Tumor

Disposable Cavity with Pituitary Tumor and Polyposis



Box
Reusable

+




Cavities
Disposable



Mycro

Training System for microvascular Anastomosis and Microsutures

 Augmented Reality App

 Disposable Vessels



What you can do

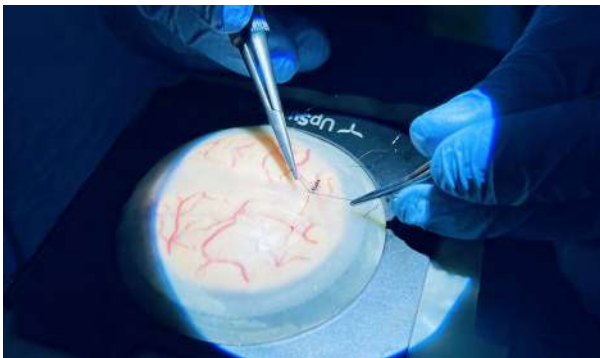
Learn how to handle microsurgical instruments

Learn how to perform a watertight anastomosis on 1 mm, 2 mm and 3 mm vessels

Learn how to perform a watertight dural microsuture

Integrate Mycro with the Box suite to simulate deep and inclined surgical fields

Mycro has disposable vessels for bypass and membranes for dural microsutures.



Augmented Reality App

Get the Neurosurgery App to explore 3D models, learn the procedure with Augmented Reality, navigate and much more.

Disposable Vessels

Thanks to the disposable vessels, available in 1mm and 2mm diameter, unlimited practice is possible. The vessels feature the adventitia and blood flow.



Box
Reusable

+



Vessels
Disposable



NavigationHead

Head clamp and standard neuronavigation of PterionalBox, AneurysmBox and FluorescentBox



What you can explore

Neuronavigation is a technology that helps neurosurgeons design the best trajectory to an intracranial pathology. It allows you to place your scenario* inside of it, fix the head with a head holder and carry out Neuronavigation.

MRI with different pathologies included (depending on the scenario)

Compatible with any neuronavigation system

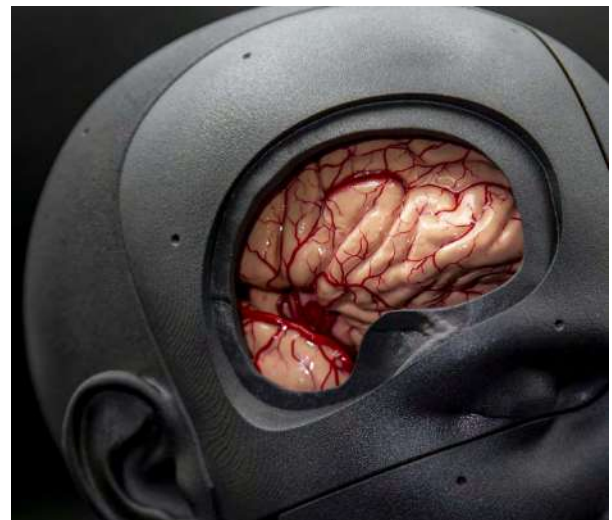
* The pterional approaches are sold separately.



Compatible Boxes

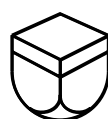
NavigationHead is compatible with all the Pterional Approaches:

PterionalBox
AneurysmBox
FluorescentBox



Disposable Skulls

Perform craniotomies, dural openings, and reconstructions using the Pterional-Skull. Then replace it and start again.



Box
Reusable

+



Skull
Disposable



Contact

For direct purchase or if you need assistance in setting up your Lab or organizing a course, feel free to contact us for a tailored quotation. **Click here to submit a request**



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UpSurgeOn is a hi-tech company specialized in psychomotor skill augmentation in microsurgeries through the use of bleeding-edge virtual and physical simulation technologies.



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