

ZIMMER BIOMET

A white robotic arm with red accents, labeled 'ROSA' on its upper section, holding a surgical instrument. The arm is positioned diagonally across the frame.

## Deep Brain Stimulation Procedure

**ROSA ONE<sup>®</sup>**

BRAIN APPLICATION

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\*06/01/98;6Y  
STUDY 1  
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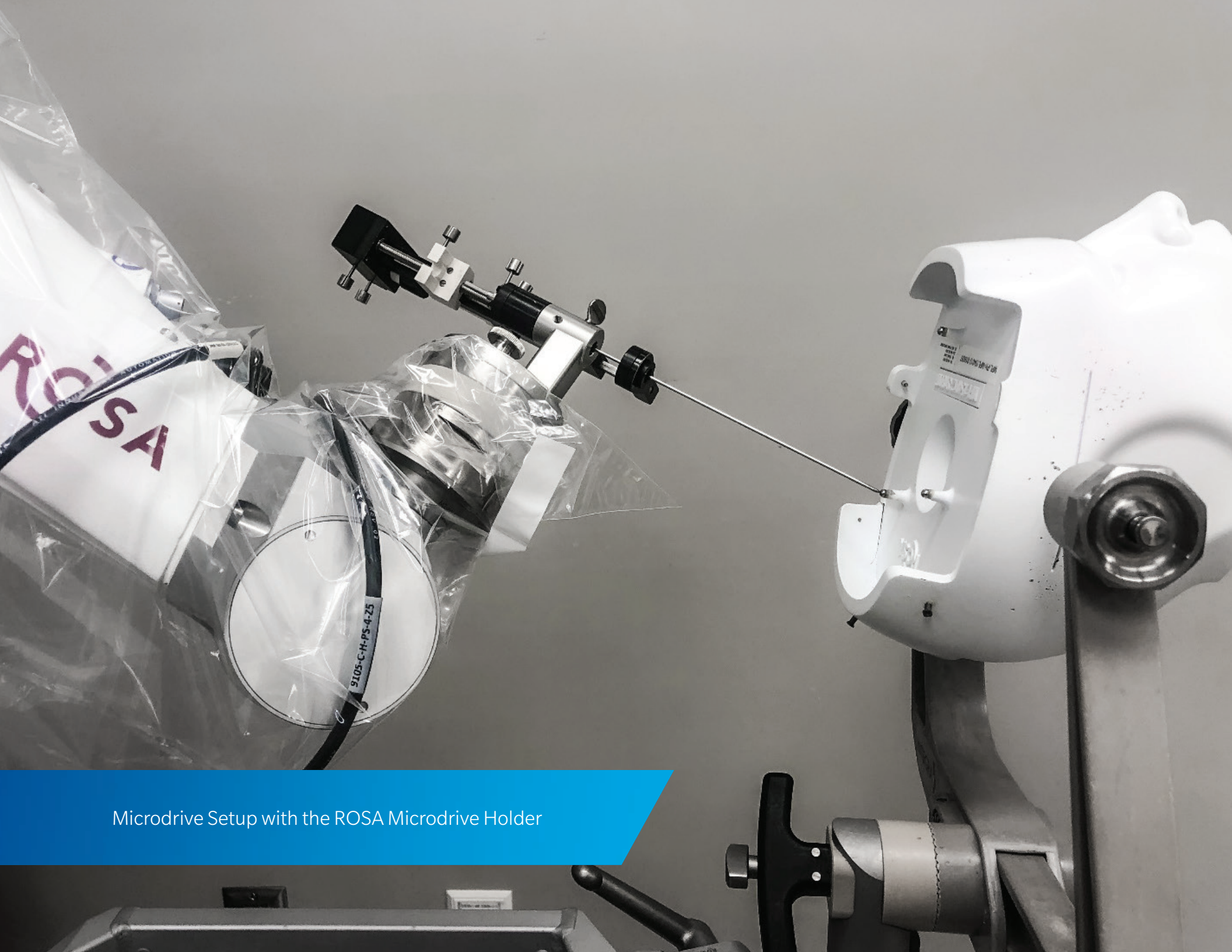
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# ROSA ONE<sup>®</sup> BRAIN

# BRAIN APPLICATION

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ROSA One Brain Application provides an accurate<sup>1-6</sup> and versatile platform for placement of Deep Brain Stimulation (DBS) leads. ROSA One is intended to guide a DBS Microdrive to the planned trajectory and hold it firmly at the correct position and orientation while the Microdrive advances electrodes.



Microdrive Setup with the ROSA Microdrive Holder

## Accurate Lead Placement

ROSA One's rigid robotic arm and secure patient fixation provide high accuracy in lead placement, as demonstrated by numerous clinical publications.

### Mean Error in DBS Lead Placement Reported in the Literature

Date	Authors	# of Leads	Mean Error (mm)	Measurement Method
Aug-2014	Lefranc et. al. <sup>1</sup>	52	0.81±0.39	Radial Error
Oct-2018	Neudorfer et. al. <sup>2</sup>	80	0.76±0.37	Lateral Deviation
Jul-2019	Liu et. al. <sup>3</sup>	192	0.75±0.04	Radial Error
Aug-2019	Paff et. al. <sup>4</sup>	36	1.59±0.82	Vector Error
Mar-2020	Faraji et. al. <sup>5</sup>	20	1.46±0.19 (First 10) 0.86±0.09 (Second 10)	Radial Error
Oct-2020	Jin et. al. <sup>6</sup>	306	0.71±0.25 (Asleep) 0.76±0.23 (Awake)	X-Y Vector Error

## Versatile Workflow and Compatibility

ROSA ONE Brain DBS module is designed to integrate seamlessly with your existing workflow and instrumentation: ROSA One is compatible with most common Microdrives, head frames, and workflows, making the switch to a ROSA-based DBS simple.

## Options Supported by ROSA DBS

### Registration

- Bone Fiducials
- Leksell Frame Registration

### Microdrives

- FHC
- Alpha Omega
- Inomed

### Head Fixation

- Leksell
- CRW

### Lead verification

- Microelectrode Recordings (MER)
- Intra-Operative CT

### Access

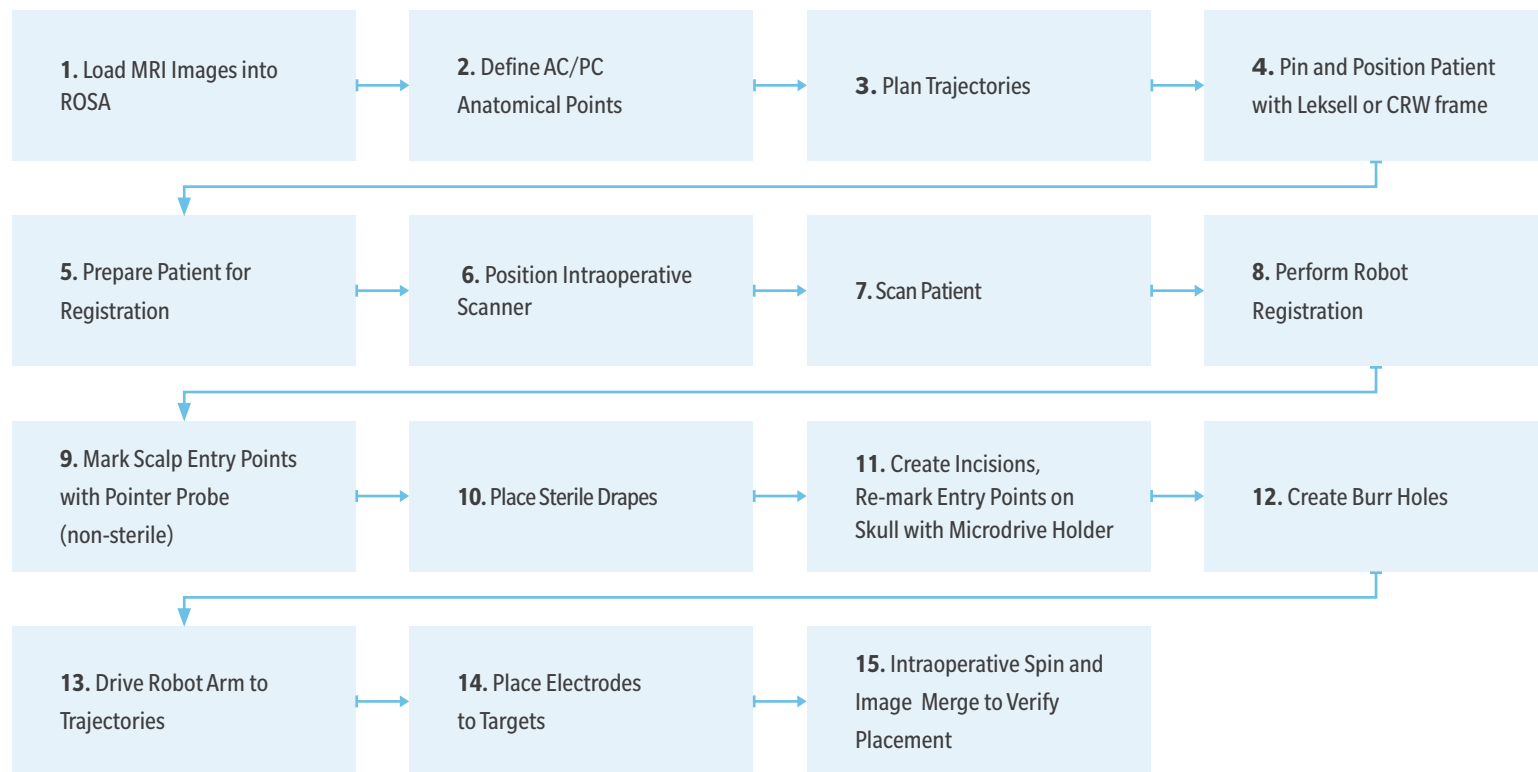
- Burr Hole
- Twist Drill

### Anesthesia<sup>6</sup>

- Asleep
- Awake

# DBS Workflow

Below is one option of a standard bilateral workflow for an asleep, burr-hole approach using an intra-operative CT scanner for registration and post-operative verification.



## Efficient Operating Times

Streamlined robotic workflow may lead to reduced operation times when compared to traditional frame-based DBS implantation.<sup>2</sup>

## Advantages of ROSA DBS

Eliminates need to change/check manual frame coordinates

No frame assembly or moving parts to adjust before or during the procedure

Rapid switching between right and left sides for bilateral approach

Easy for surgeon and assistant to work simultaneously

No expensive per-case disposable cost

Rigid support arm prevents head movement during the procedure



# Simple and Intuitive Planning

Quickly create the surgical plan using the MRI and CT imaging of your choice and AC/PC coordinates. Easily adjust or modify your plan intraoperatively without cumbersome calculations or manual hardware adjustments.





Standard ROSA DBS Setup with Intra-Operative CT Scanner.

## Required Equipment

ROSA One Brain Device	ROSA Frame Adapter	Registration Method <ul style="list-style-type: none"><li>- Bone Fiducials</li><li>- ROSA Leksell Frame Registration Module</li></ul>
ROSA Pointer Probe	ROSA Microdrive Holder	

## External Equipment

Microdrive <ul style="list-style-type: none"><li>- Alpha Omega</li><li>- FHC</li><li>- INOMED</li></ul>	Head Holder* <ul style="list-style-type: none"><li>- Leksell Frame Base</li><li>- CRW Frame Base</li></ul>	Intra-operative CT scanner (optional)
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\*3-point fixation head-holders are compatible but not recommended for maximum accuracy

# ROSA ONE Brain



# Bibliography

1. Lefranc M, Capel C, Pruvot AS, et al. The impact of the reference imaging modality, registration method and intraoperative flat-panel computed tomography on the accuracy of the ROSA® stereotactic robot. *Stereotact Funct Neurosurg*. 2014; 92(4):242-250. doi:10.1159/000362936

2) Neudorfer C, Hunsche S, Hellmich M, El Majdoub F, Maarouf M. Comparative Study of Robot-Assisted versus Conventional Frame-Based Deep Brain Stimulation Stereotactic Neurosurgery. *Stereotact Funct Neurosurg*. 2018;96(5):327-334. doi:10.1159/000494736

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5) Faraji AH, Kokkinos V, Sweat JC, Crammond DJ, Richardson RM. Robotic-Assisted Stereotaxy for Deep Brain Stimulation Lead Implantation in Awake Patients. *Oper Neurosurg (Hagerstown)*. 2020;19(4):444-452. doi:10.1093/ons/opaa029

6) Jin H, Gong S, Tao Y, et al. A comparative study of asleep and awake deep brain stimulation robot-assisted surgery for Parkinson's disease. *NPJ Parkinsons Dis*. 2020;6:27. Published 2020 Oct 5. doi:10.1038/s41531-020-00130-1

AL/BIRD  
y/MR 7873  
\*06/01/98;6Y  
STUDY 1  
2/09/04  
06:37  
A 14 / 19

AF

SP F11  
SL 5.0  
FoV 201-230  
188-255  
Tra>Sag(-6.0)>Cor(4.0)  
W 37.0  
C 48.5  
+LPH  
STUDY 1  
08/09/04  
19:05:36  
2 IMA 15 / 18



# **TRANSFORM** YOUR DBS PROGRAM

## **CURRENT ROSA USERS**

Contact your local ROSA clinical representative for more information.

## **FUTURE ROSA USERS**

Connect with your local ROSA sales representative by contacting 866-ROSA-BOT.



For more information on on ROSA ONE® Brain and other Robotic Technologies, please contact us at:

**BIOMET MICROFIXATION GLOBAL HEADQUARTERS**

1520 Tradeport Drive • Jacksonville, FL 32218-2480 • Tel 904.741.4400 • Toll-Free 800.874.7711  
Fax 904.741.4500 • Order Fax 904.741.3059 • [www.zimmerbiomet.com](http://www.zimmerbiomet.com)



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ZAC Eurêka  
900, rue du Mas de Verchant • 34000 Montpellier, France

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