

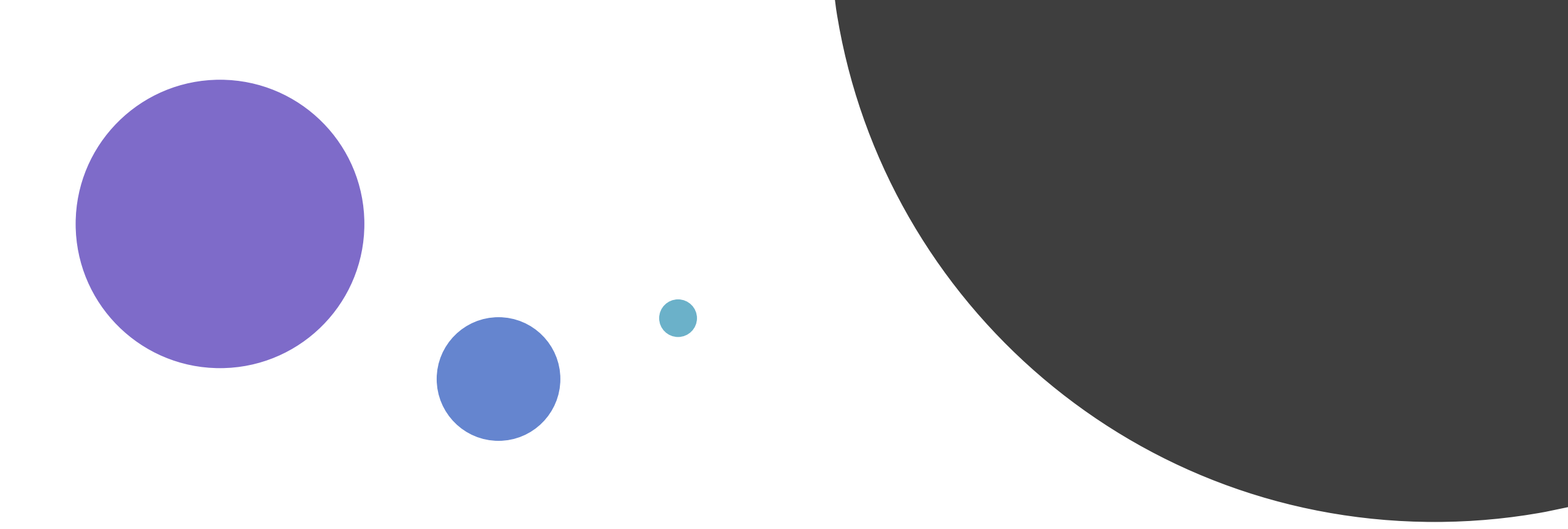
# Neuronavigation and Robotic Spine Surgery

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## Disclosures

- Consultant: Innovasis, Medyssey, Valorem Surgical
- Royalties: Innovasis
- Nothing to do with Brainlab, Mazor, Medtronic, Stryker



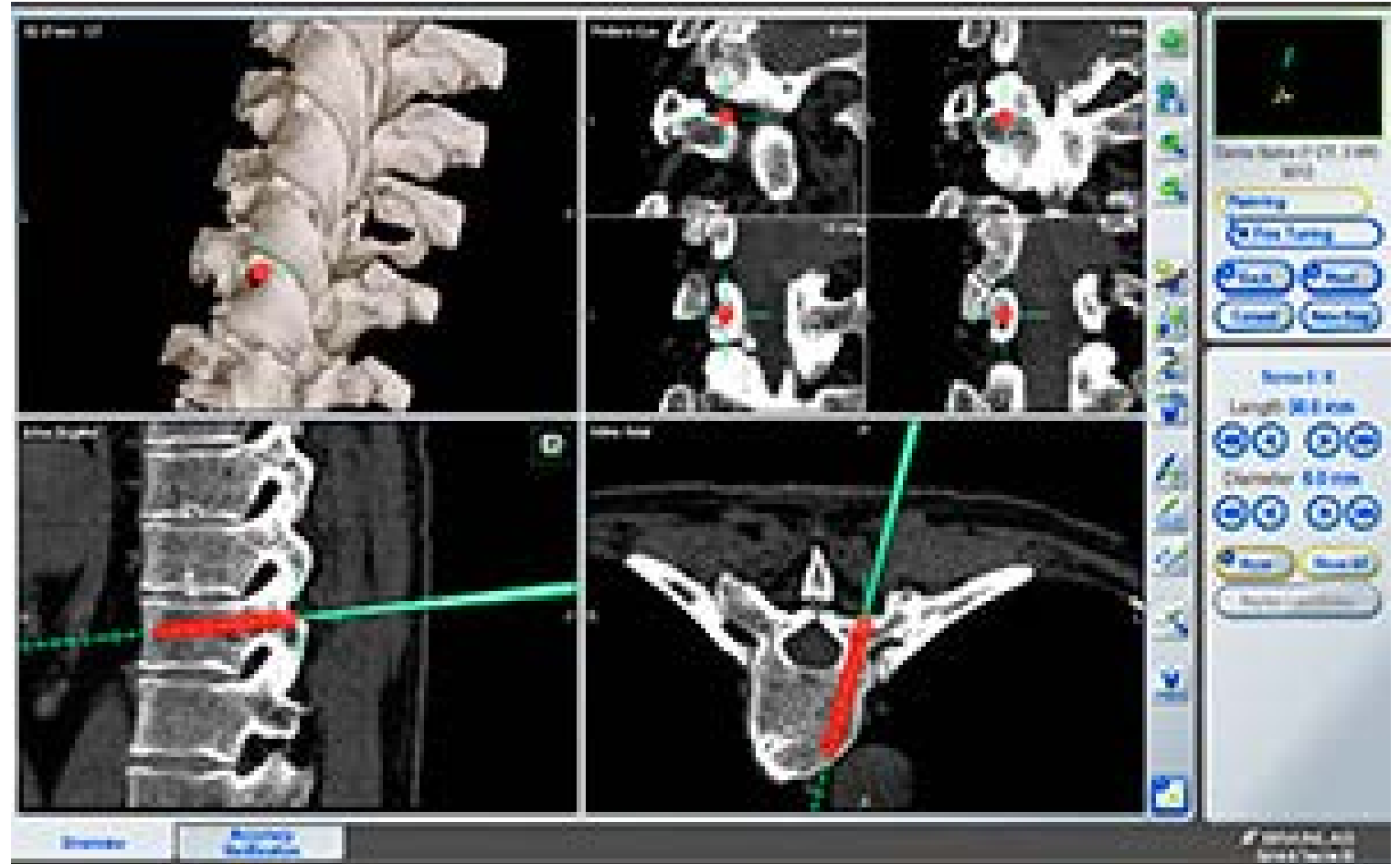
# How I do place my screws in the spine?

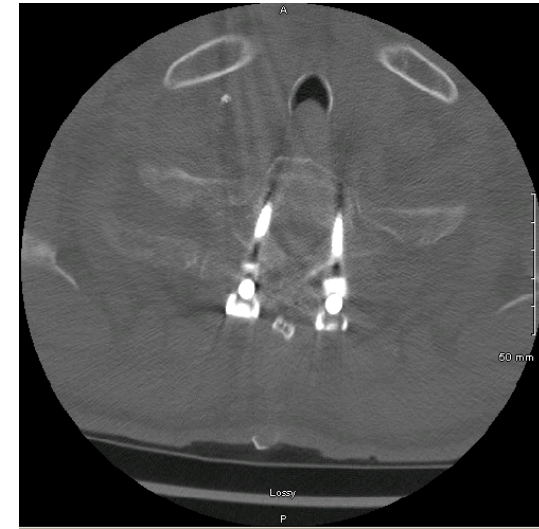
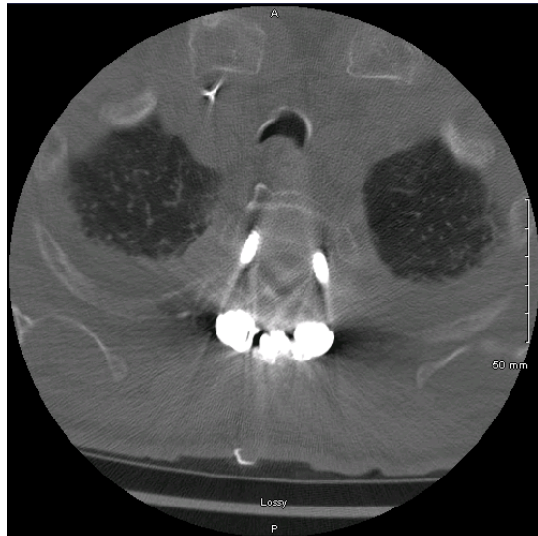
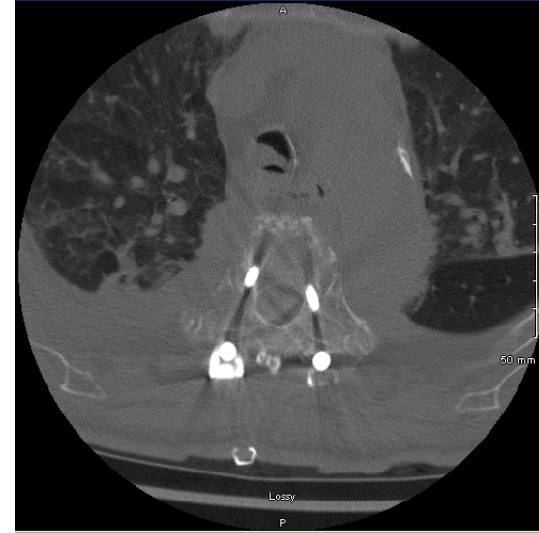
I always use  
Neuronavigation or  
Image Guidance.

Let's take a sample case.



T1 – T6  
Instrumented  
Stabilization





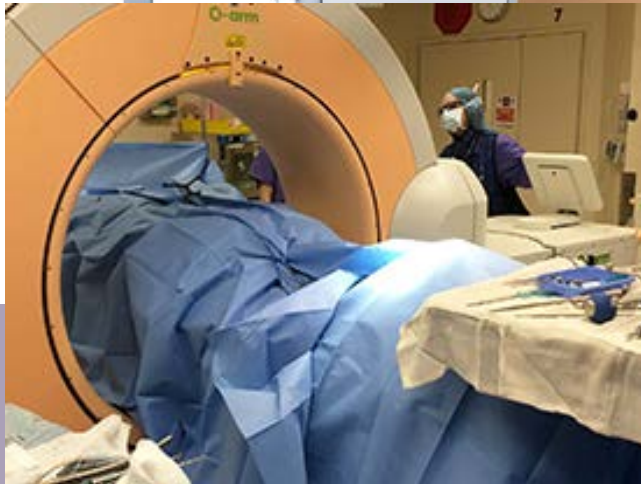
# Brainlab



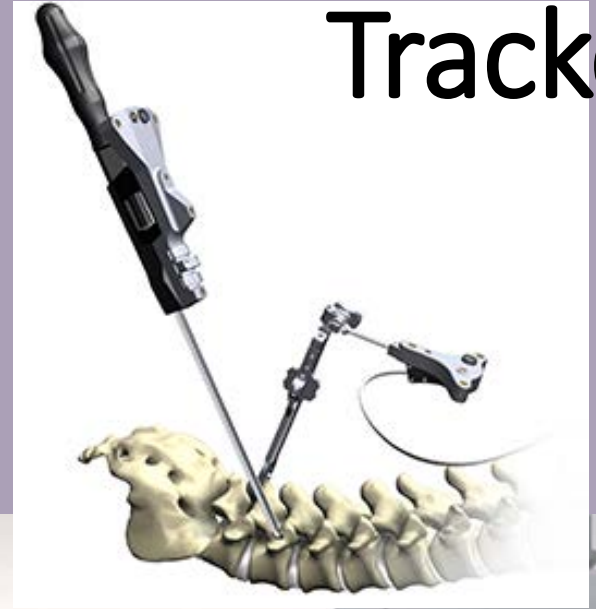
# Mazor



# Medtronic Stealth



# Stryker Spine Mask Tracker



# Why should you use Image Guidance in Spine Surgery?

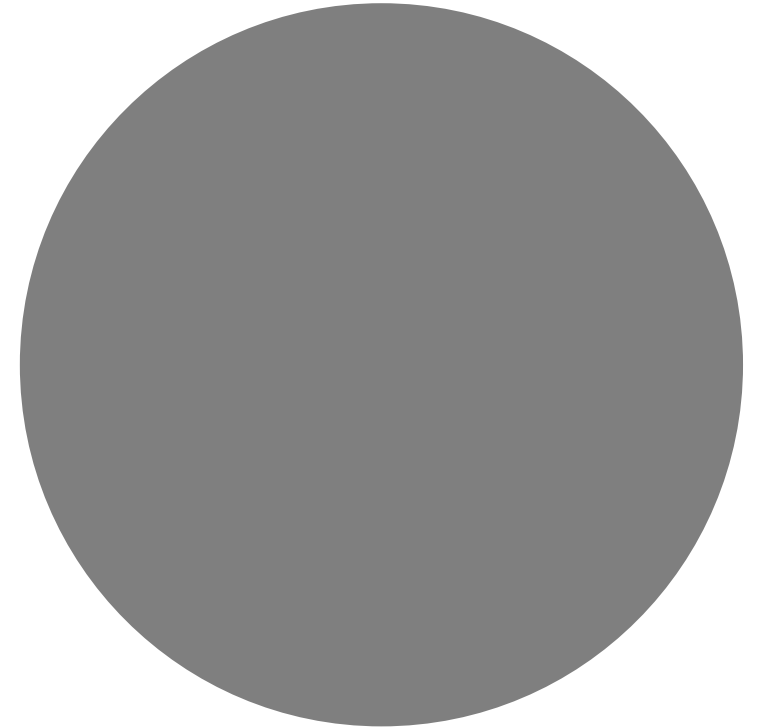
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**Abundance of literature support for safety and accuracy.**

**Is it only for the accurate placement of metal into the spine?**

**No, for me it also serves other purposes not reported in literature**

**Such as . . .**

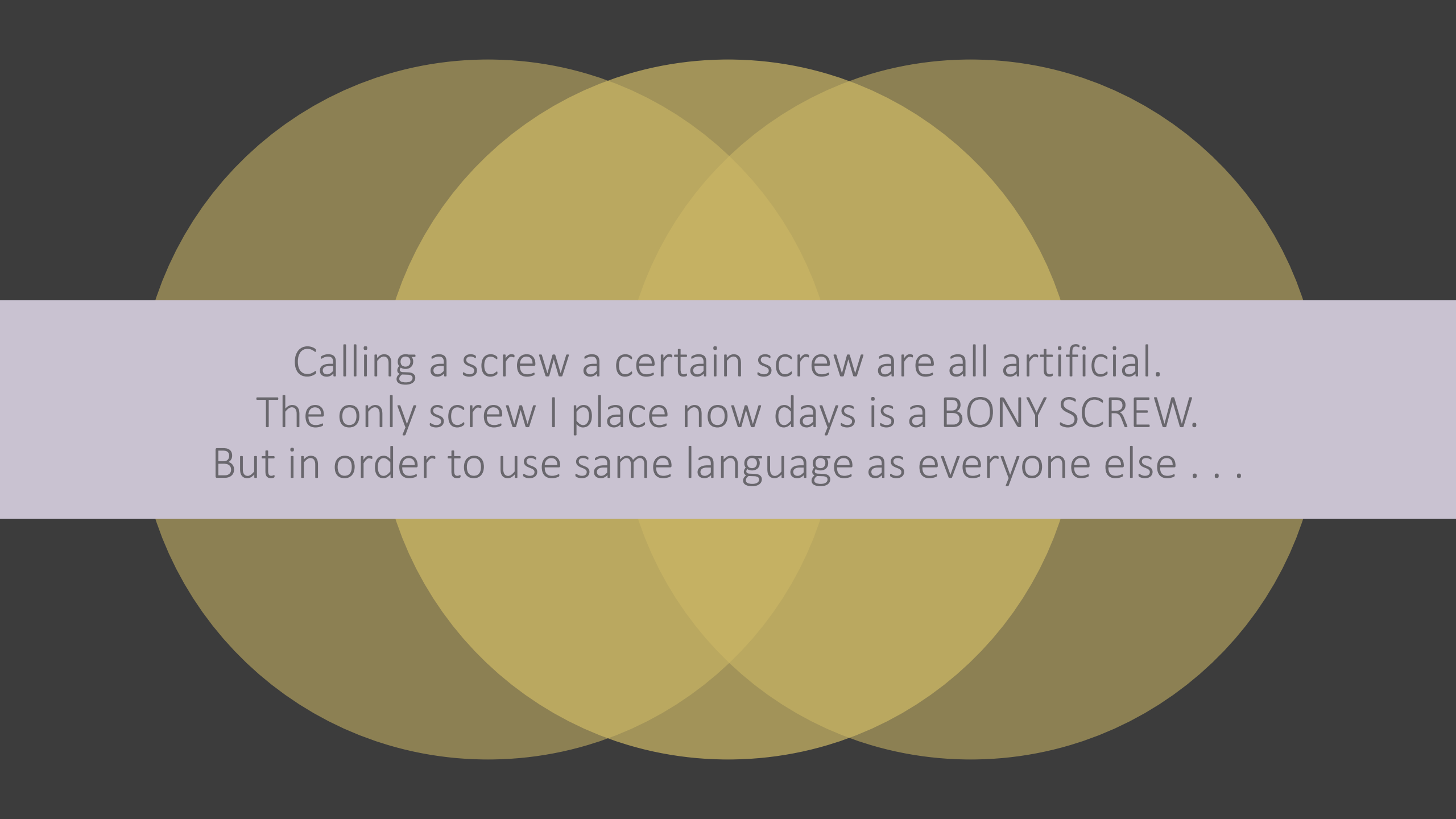




# Benefits



- Reduced intraoperative time
- Reduced radiation exposure
- Select size of implant intra-operatively
- Minimize risk of “wrong level surgery”



Calling a screw a certain screw are all artificial.  
The only screw I place now days is a BONY SCREW.  
But in order to use same language as everyone else . . .

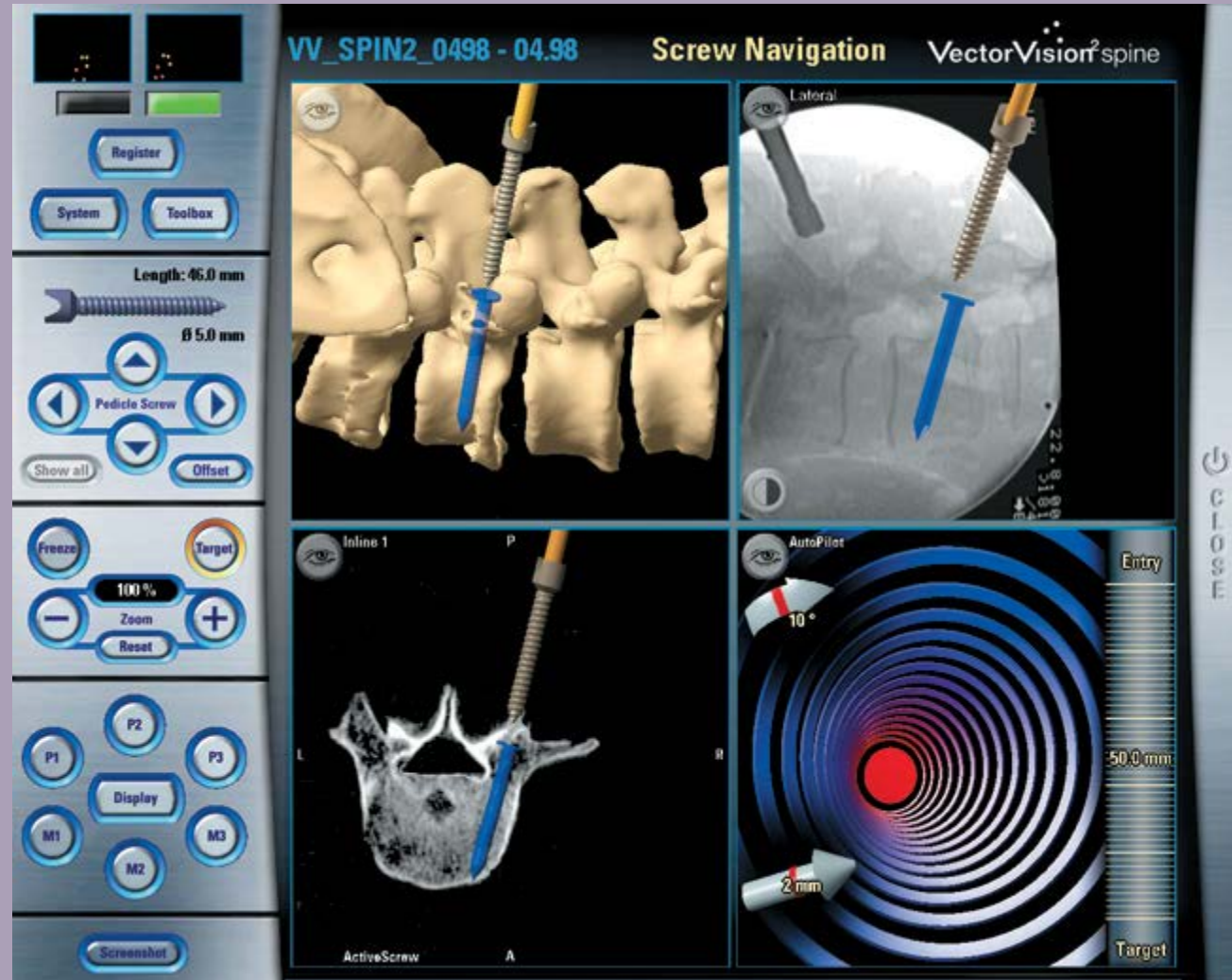
# Cervical Spine

- C1 lateral mass screws
- C2 pars or pedicle screws
- C2 laminar screws
- Lateral mass screws
- C7 pedicle screws
- Cervical pedicle screws
- Cervical cortical screws



# Thoracic and Lumbosacral Spine

- Pedicle screws
- Cortical Screws
- SAI Screws
- Iliac Screws



# Challenging Cases



- Osteoporosis
- Revision Surgeries
- Severely degenerated and deformed spine
- Localization in thoracic spine

# Robotic Spine Surgery

A photograph of a surgical team performing a robotic spine surgery. A surgeon in green scrubs is seated at a console, operating a large, white robotic arm system. The patient is lying on a table, covered with blue drapes. The operating room is brightly lit with overhead surgical lamps. The robotic arm has two main arms, labeled with circled numbers 1 and 2, and is positioned over the patient's back.

- **DaVinci Robot**

- Just about everything is done with robot

- **What does Mazor robot do for spine surgery now?**

- Robot only positions for optimal trajectory
- Surgeon has to drill hole
- And multiple other tasks in spine instrumentation

- **CHALLENGES**

- Articulation
- Degrees of freedom
- Obtaining accurate data live
- Adapting with changing anatomy
- Modifying plan on the fly

- **Matter of time**

- Medtronic to buy Mazor?
- Many many other companies entering this space

# Summary

- Image guidance is a tremendous tool.
- It will make you a better surgeon.
- It will become standard of care.

