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## Clinical Need

Current approaches in percutaneous MIS procedures are unreliable and imprecise, leading to operating room inefficiencies and suboptimal patient outcomes.

**3.1mm**

Average insertion deviation away from surgical targets<sup>1</sup>

**40%**

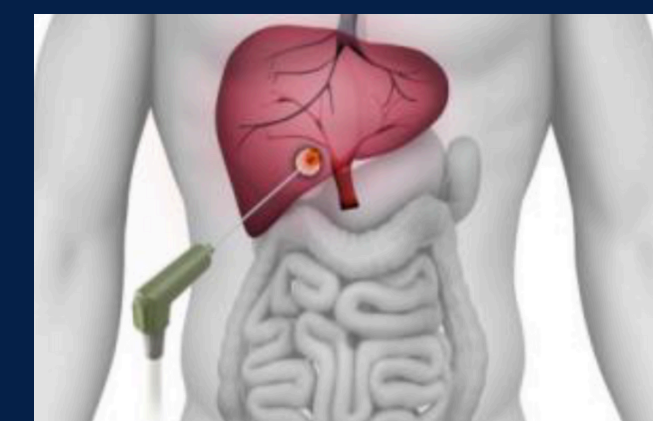
Increase in radiation due to repeat scans<sup>2</sup>

**3.28**

Needle re-insertions with conventional guidance modalities<sup>1</sup>

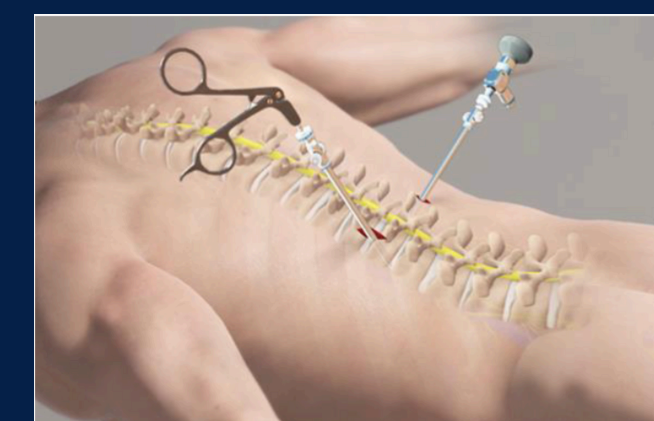
## Who are we helping?

Patients who are currently served in the Chinese Market annually



**4M Cancer Patients<sup>3</sup>**

Biopsy, drainage, ablation and brachytherapy



**5M Arthropathy Patients<sup>4</sup>**

Spinal endoscopy, arthroscopy



**500K Neurosurgery Patients<sup>5</sup>**

Drainage, deep brain stimulation, vagus nerve stimulation

## Market Opportunity

Total Addressable Market: 123M Patients/yr

Serviced Addressable Market: 10M Patients/yr

Serviceable Obtainable Market: 100K Patients/yr

Global Cancer, Arthropathy and Cerebral Hemorrhage Patients aggregated

Interventional Radiology Procedures

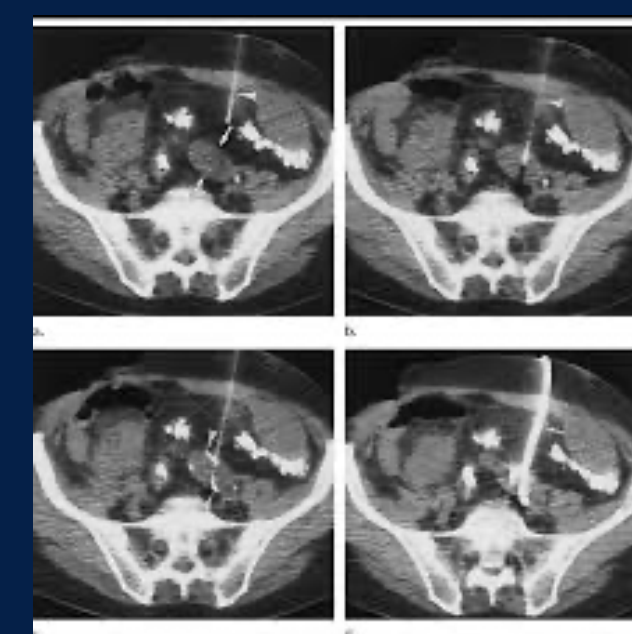
Xper Patient Population

## Our Solution



RapidNav: Existing CT image guided solution for percutaneous MIS procedures

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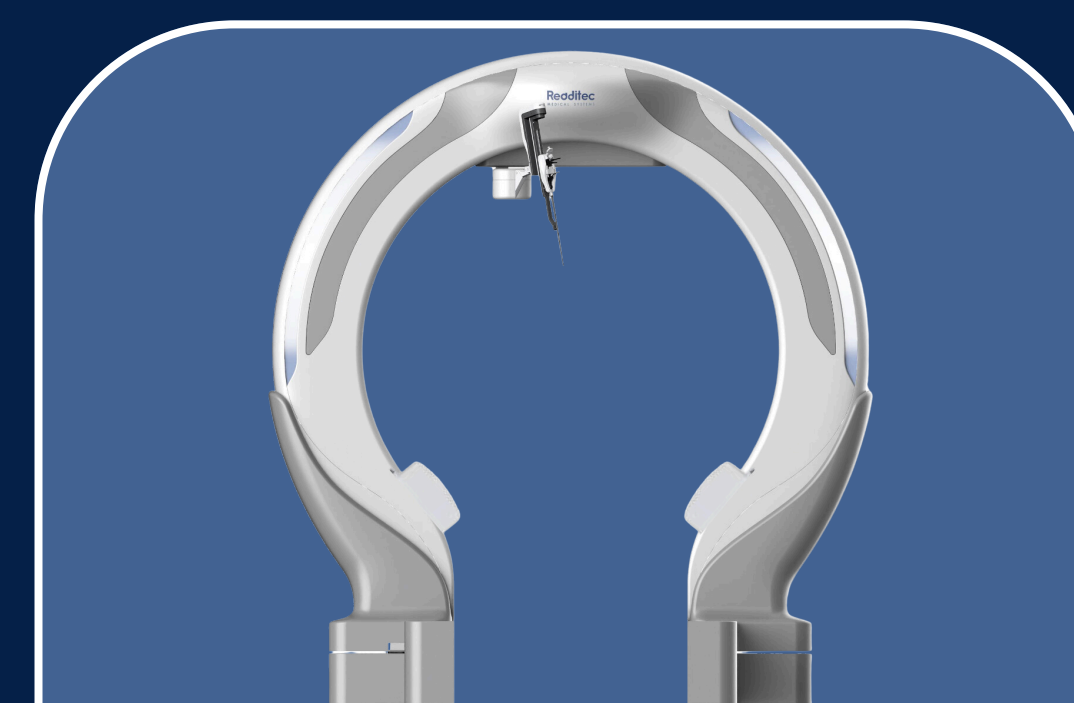


Real-time CT fluoroscopic imaging technology

+

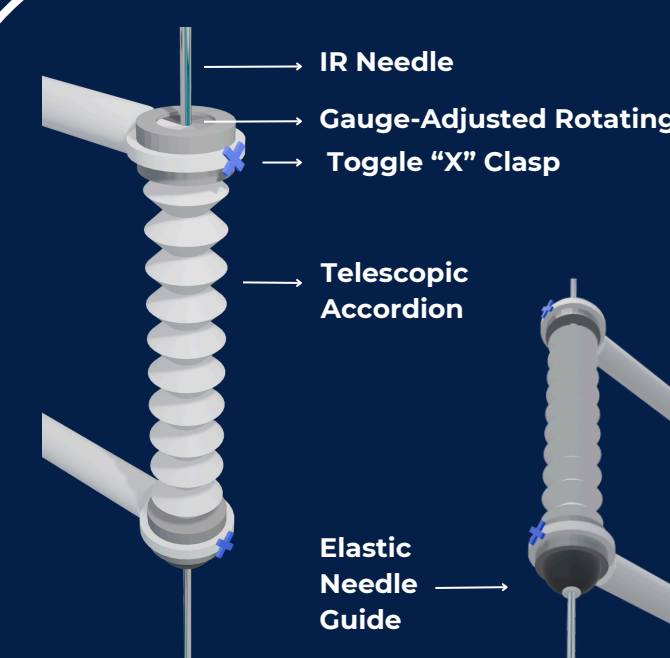


Surgical robotic arm for intraoperative, percutaneous probe insertion during MIS procedures



Xper: A Real-Time Image Guided Robotic System for Minimally Invasive Surgery

Probe Holder Prototype

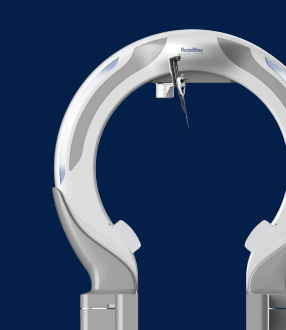


## Our Competitive Advantage

### Features

Laser Guidance  
Free Standing  
CT - Guidance  
Disposable Robotic Arm  
Emergency Removal

Xper



Freehand



Intuitive: Da Vinci<sup>6</sup>



MicroMate<sup>7</sup>



Xact: Ace<sup>8</sup>



## Our Roadmap

**1**



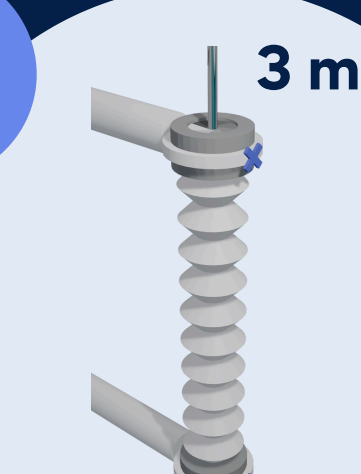
Literature Review + Stakeholder Analysis

**2**



IP Search

**3**



Prototyping

**4**



Prototype Testing

**5**



Readitec R&D Facility Visit

**6**



Apply for Funding

## Citations

1) Weigel, K., Kubik-Huch, R.A., Matthias Baer-Beck, Carsten, C. & Kostrewa, M. (2023). Evaluation of Accuracy and Performance of a Novel, Fully Cavity Integrated 3D Laser System for Computed Tomography Guided Needle Placement: A Phantom Study. *Diagnostics*, 13(2), 282-282. <https://doi.org/10.3390/diagnostics13020282>  
2) Moser, C., Becker, J., Dell, M., Busch, M., Boehme, M., & Groenemeyer, D. H. W. (2013). A novel Laser Navigation System reduces radiation exposure and improves accuracy and workflow of CT-guided spinal interventions: A prospective, randomized, controlled, clinical trial in comparison to conventional freehand puncture. *European Journal of Radiology*, 82(4), 627-632. <https://doi.org/10.1016/j.ejrad.2012.10.028>  
3) Xia, C., Deng, X., Li, H., Cao, M., Sun, D., He, S., Yang, F., Yan, X., Zhang, S., Li, N., & Chen, W. (2022). Cancer statistics in China and United States, 2022: profiles, trends, and determinants. *Chinese Medical Journal*, 135(5), 584-590. <https://doi.org/10.1097/cm9.0000000000000208>  
4) Tian, X., Li, M., & Zeng, X. (2023). The current status and challenges in the diagnosis and treatment of rheumatoid arthritis in China: An annual report of 2019. *Rheumatology and Immunology Research*, 20(1), 49-56. <https://doi.org/10.2478/irir-2021-0008>  
5) Xiao, D., Yan, C., Li, D., Xi, T., Liu, X., Zhu, D., Huang, C., Xu, J., He, Z., Wu, A., Ma, C., Long, J., Shu, K., J., H., Wang, N., Chen, G., Yang, J., Ma, H., Li, Z., & Sun, X. (2023). National Brain Tumor Registry of China (NBTRC) statistical report of primary brain tumours diagnosed in China in years 2019-2020. *The Lancet Regional Health - Western Pacific*, 34, 100715-100715. <https://doi.org/10.1016/j.lanwpc.2023.100715>  
6) BARROS, F. D., FELICIO, V. B., CAROLINE, A., & CAROLINA, A. (2021). Training in robotic surgery: initial experience using the Brazilian College of Surgeons model. *Revista Do Colegio Brasileiro de Cirurgies*, 48. <https://doi.org/10.1590/0100-6991e-20202969>  
7) Interventional Systems. (2021, September 22). Value-Based Robotics, pt.4: Bringing Usability to the Operating Room. Interventional Systems. <https://www.interventional-systems.com/blog/value-based-robotics-4-usability/>  
8) The ACE Robotic System - XACT Robotics (2022, October 14). XACT. <https://xactrobotics.com/ace-robotic-system/>