



Robots Doing Surgery?

The thought of your surgeon using a robot during surgery can be scary. Here are a few things you might want to know as you prepare.

Many patients may be frightened by the thought of Robot-Assisted Surgery and may become anxious when considering it for themselves or for one of their family members. Fear of this type of procedure often arises because the use of robots in surgery can seem new and strange. Questions about how long this type of surgery has existed, how experienced the surgeon is with Robot-Assisted Surgery and what the robot actually does to assist during the operation are common. Other fears might involve questions like “what happens if the electricity goes out” or “what if the robot malfunctions” or “how does the surgeon know how to control the robot”. The truth is that Robot-Assisted Surgery is used more frequently than you might think, by surgeons who believe in the potential benefits for their patients.

Brief History of Robot-Assisted Surgery

Robot-Assisted Surgery was first introduced in 1985 when it was used in a very delicate non-laparoscopic neurosurgical biopsy. Then, in 1987, the first case of a Laparoscopic Robotic Cholecystectomy (gall bladder removal) was successfully accomplished with a TURP prostate operation done robotically in 1988. By the year 1999, the da Vinci Robotic Surgical System³ was introduced for general laparoscopic surgery using much smaller 1 cm diameter surgical arms. As of 2017, iData Research reported that there were over 693,000 Robot-Assisted Surgeries in the **United States** alone.²

Surgeon Training in Robot-Assisted Surgery

More and more general surgery residency programs are incorporating training in Robot-Assisted Surgery. According to a study described in an article published by National Institutes of Health¹, a survey of 20 surgical residency program directors reported that 73.68% of the surgical residency programs now have formal Robot-Assisted Surgery curriculums with 63.16% of the programs surveyed having Robot-Assisted Surgery simulation training. On top of that, specific robot manufacturers often require extensive training on their particular device prior to allowing use.

Role of the Surgeon in Robot-Assisted Surgery

The role of surgeon and robot will vary depending on the specific robot in use, but it's good to remember that the robot is a tool that the surgeon uses... it doesn't replace your surgeon. Most robots typically don't operate on their own. That means, it doesn't move unless your surgeon prompts it to. Your surgeon is still in the operating room the entire time and is making all the decisions throughout your surgery.

Some robots have multiple "arms" on which miniature surgical instruments and cameras are mounted for the surgeon to use for visualization and manipulation of the surgical site.³ Other robots may only have one "arm" on which surgical instruments are used. During your surgery, the surgeon often controls these "arms" from a centralized console.

Conditions Treated by Robot-Assisted Surgery

The following are some of the conditions in which Robot-Assisted Surgeries can be performed:

- Lung and breathing conditions³
- Cancers and tumors^{3,4}
- Colorectal, digestive, and gastrointestinal conditions^{3,4}
- Head and neck diseases^{3,4}
- Heart conditions³
- Urologic illnesses^{3,4}
- Reproductive conditions and diseases^{3,4}
- Neurosurgical conditions³
- Obesity and weight loss surgery³
- Total knee replacement surgery⁵

Advantages of Robot-Assisted Surgery

Many surgeons utilize robots to provide additional visualization and measurements to facilitate accuracy and precision for things like cuts, tissue balancing, and alignment of implantable medical devices.

Risks of Robot-Assisted Surgery

Risks of robotic surgery vary with robot and surgery types. You should always ask your surgeon to discuss the risks of the specific robot being used for your individual surgery.

Safeguards

Many Robot-Assisted devices come with some form of emergency battery backup in case of a power outage or battery failure. Hospitals are also equipped with power generators in case of power outage. In the event that both the hospital and the robot would lose power, the surgeon could simply complete the surgery by hand without use of the robot.

Many robots also have some form of antivirus protection. If a technical problem would occur, many robots will not allow any functionality until the error is resolved.

Conclusion

Robot-Assisted Surgery is becoming more and more accepted for many different types of surgery. In addition, more and more general surgery and specialty surgical training programs are incorporating Robot-Assisted Surgical training as a part of their residency programs. Don't be afraid to ask your surgeon about the details of Robot-Assisted Surgery if they mention they plan to use a robot, or if you are interested in whether or not you are a candidate.

References

1. George, L., et al. "Residency Training in Robotic General Surgery: A Survey of Program Directors." *Minimally Invasive Surgery*. Volume 2018; Article ID 8464298. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5964613/>
2. iData Research Staff. "Robotic Surgery Statistics Show Movement Towards More Minimally Invasive Procedures." iData Research. August 8, 2018. <https://idataresearch.com/robotic-surgery-statistics-show-movement-towards-more-minimally-invasive-procedures/> Da Vinci® is a trademark of Intuitive Surgical Operations, Inc.
3. Da Vinci Surgery Website. Intuitive Surgical. www.davincisurgery.com
4. Rush Staff. "Robotic Surgery." Rush University Medical Center. <https://www.rush.edu/services/test-treatment/robotic-surgery>
5. Moon, Y., et al. Comparison of robot-assisted and conventional total knee arthroplasty: a controlled cadaver study using multiparameter quantitative three-dimensional CT assessment of alignment. *Comput Aided Surg*. 17(2): 86-95; 2012. <https://www.ncbi.nlm.nih.gov/pubmed/22348661>

Disclaimer

This material is intended for patients. All content herein is protected by copyright, trademarks and other intellectual property rights, as applicable, owned by or licensed to Zimmer Biomet or its affiliates unless otherwise indicated, and must not be redistributed, duplicated or disclosed, in whole or in part, without the express written consent of Zimmer Biomet. ©2021 Zimmer Biomet.

Zimmer Biomet is a medical device manufacturer that provides products and related services. Zimmer Biomet is not a medical professional and does not practice medicine.

The persons in these advertisements are models and not actual recipients of Zimmer Biomet products and services.

Not for distribution in France.

Results are not necessarily typical, indicative, or representative of all recipient patients. Results will vary due to health, weight, activity and other variables. Not all patients are candidates for this product and/or procedure. Only a medical professional can determine the treatment appropriate for your specific condition. Appropriate post-operative activities and restrictions will differ from patient to patient. Talk to your surgeon about whether joint replacement is right for you and the risks of the procedure, including the risk of implant wear, infection, loosening, breakage or failure, any of which could require additional surgery.

xxxx-EMEA-en | 08.12.2021