**Robotic Surgery and its Legal Implications**

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## A. Introduction

Robotic surgery has been an abundantly discussed and researched topic in the medical field, among both patients and providers, since its inception. The procedures are known for their reduced recovery times and increased patient satisfaction.[1] Specifically, the robot assisted surgeries are celebrated by both patients and medical providers for their, "[e]fficiency, fewer incisions, less bleeding, and lower possibility of infections."[2]

However, even with these benefits to patient recovery and satisfaction, there are legal and ethical challenges to the use of robotic tools in surgery.[3] Namely, there are concerns surrounding informed consent and potential liabilities.[4] Just like many other medical procedures, patients who undergo robotic surgery must be made aware of the potential risks of the procedures, and how they differ from more traditional treatment plans.

## B. Background on Robotic Surgery

Robotic surgery is a technological advance in healthcare that has improved the experience and quality of life for both patients and medical professionals alike. In robotic surgery procedures, skilled surgeons use robotic tools to operate remotely on their patients.[5] The most common types of surgery that utilize robotic tools are abdominal and thoracic surgery, such as hernia repair or removing cancerous cells in the lungs or lymph nodes.[6] However, medical providers in fields such as orthopedics and neurology have used robotic tools to advance their practice for procedures such as knee replacements and brain ablations.[7]

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[1]Rathnayake Ap, *Legal and Ethical Facets of Robotic Surgery: A Suggestion for a Guideline*, SRI LANKA J. OF FORENSIC MED., SCI. & LAW 29 (2024), https://www.researchgate.net/publication/381670959_Legal_and_ethical_facets_of_robotic_surgery_A_suggestion_for_a_guideline [https://perma.cc/5CT3-VYGU].

[2] *Id.*

[3] *Id.* at 30.

[4]Satvik N. Pai et al., *In the Hands of a Robot, From the Operating Room to the Courtroom: The Medicolegal Considerations of Robotic Surgery*, 15 CUREUS 1 (2023), https://pmc.ncbi.nlm.nih.gov/articles/PMC10504870/ [https://perma.cc/M7NE-Z5X3] [hereinafter *In the Hands*].

[5] David Power, *Ethical considerations in the era of AI, automation, and surgical robots: there are plenty of lessons from the past*, 4 DISCOVER A.I. 65 (Oct. 1, 2024), https://link.springer.com/article/10.1007/s44163-024-00166-9 [https://perma.cc/4J4N-NS4P] [hereinafter *Ethical considerations*]

*Id.; See Gastrointestinal Robotic Surgery*, UC DAVIS HEALTH (n.d.), https://health.ucdavis.edu/surgery/specialties/gastro/robotic_surgery.html [https://perma.cc/PAD6-S6AL]; *See Robotic Thoracic Surgery,* AM. LUNG ASS'N (Nov. 20, 2024), https://www.lung.org/lung-health-diseases/lung-procedures-and-tests/robotic-thoracic-surgery [https://perma.cc/G2ZS-C63B].

[7] *Ethical considerations, supra* note 5; *Robotic Orthopedic Surgery*, MAYO CLINIC (Oct. 2, 2024), https://www.mayoclinic.org/departments-centers/robotic-orthopedic-surgery/overview/ovc-20472153 [https://perma.cc/Z6UK-BP9X]; *See Laser Ablation Surgery for Epilepsy and Brain Tumors,* Seattle Children's Hospital (n.d.), https://www.seattlechildrens.org/clinics/neurosciences/services/laser-ablation-surgery-epilepsy-brain-tumors/ [https://perma.cc/3QUT-8S62].

Similar to traditional surgery, robotic surgery requires practicing skills for proficiency.[8] Extra practice is especially important due to the loss of binocularity and lack of tactile feedback that is characteristic of robotic surgery.[9] Physicians who are in training practice both basic skills and complex tasks on simulators before being allowed to use actual robotic tools in the operating room.[10] Increasingly, residency programs across the country have used robotic surgery as a part of their curriculum, including the University of California, San Francisco, Vanderbilt University, and the plastic surgery program at Mt. Sinai.[11]

One of the most widely used robotic tools is the da Vinci Surgical System, which has been utilized by the medical community since July 2000.[12] This specific tool operates using multiple arms and a camera to decrease incision size and ideally, reduce the number of wound complications and length of recovery time.[13] The da Vinci robot is used for common procedures including tonsillectomies, hysterectomies, gallbladder removal, and polypectomy.[14] The da Vinci system has served over 775,000 patients across the globe, and over 1,700 hospitals utilize this technology.[15] Other medical robots include the PARO Therapeutic Robot, used for improving the mental health of those recovering from procedures and the CyberKnife, used for cancer radiation therapy.[16] In addition to practical medical assistance, the TUG robot is used to help employees move supplies around the hospital.[17]

There are multiple medical device companies that produce these devices. Intuitive, a surgical company headquartered in California and operating across the world, is the producer of the da Vinci surgical device.[18] There are many versions of the da Vinci, ranging in complexity, including the Da Vinci 5, which is the most advanced version of the device, and Da Vinci SP, used for smaller surgeries with single incisions.[19]

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[8] *Ethical Considerations*, *supra* note 5.
[9] *Id.*
[10] *Id.*
[11] *See Intuitive for Residents and Fellows,* INTUITIVE (n.d), https://www.intuitive.com/en-us/healthcare-professionals/academics/residents-fellows [https://perma.cc/F3TR-5ELJ; Hueylan Chern, *General Surgery Residency Program Curriculum for Robotic Surgery*, UCSF DEP'T OF SURGERY (Aug. 23, 2023), https://surgicalskillslab.ucsf.edu/sites/default/files/umbraco/media/14281685/ucsf-robotic-surgery-curriculum-gen-surg-updated.pdf [https://perma.cc/9KA7-7W24]; Erin Gillaspie, *Bringing Robotic Surgery into Residency Training*, VANDERBILT HEALTH (June 5, 2019), https://discoveries.vanderbilthealth.com/2019/06/bringing-robotic-surgery-into-residency-training/ [https://perma.cc/W5BR-Z2VP], *Plastic Surgery Residents Receive Unique Robotic-Assisted Microsurgery Training at Mount Sinai*, MOUNT SINAI (n.d.), https://reports.mountsinai.org/report/residency2025 [https://perma.cc/X9K8-PUK2].
[12] *da Vinci Robotic Surgery*, CLEVELAND CLINIC (Apr. 29 2025), https://my.clevelandclinic.org/health/treatments/16908-da-vinci-surgery [https://perma.cc/ZYL7-D7D9].
[13] *Id.*
[14] *Id.*
[15] *About the daVinci Surgical System*, UC HEALTH (n.d.), https://www.uchealth.com/services/robotic-surgery/patient-information/davinci-surgical-system/ [https://perma.cc/VP8J-J6Y4].
[16] *5 Medical Robots Making a Difference in Healthcare*, CASE WESTERN RESERVE UNIV. (Dec. 28, 2024), https://online-engineering.case.edu/blog/medical-robots-making-a-difference [https://perma.cc/4886-3CUQ].
[17] *Id.*
[18] *Intuitive da Vinci*, INTUITIVE (n.d.), https://www.intuitive.com/en-us/products-and-services/da-vinci [https://perma.cc/CK78-WNZ8]; *See Contact Intuitive*, INTUITIVE (n.d.), https://www.intuitive.com/en-us/about-us/contact [https://perma.cc/TG3U-L4TQ].
[19] *Id.*

### C. Informed Consent and Tort Concepts

Like most medical procedures, informed consent must be obtained prior to robotic surgery. As stated in a study published in *Cureus*, informed consent is highly important to obtain due to the lack of knowledge in the general population regarding robotic surgical procedures.[20] Patients often have misconceptions about robotic surgery, including that robotic surgery is purely automated, "[w]ithout a surgeon or human interference."[21]

There are multiple requirements for informed consent prior to a robotic surgery.[22] Medical professionals must disclose the chance of equipment malfunction and a clear disclosure of which parts of the procedure would be robot-assisted.[23]

Even in robotic procedures, a medical professional can be accused of negligence and have a legal action brought against them.[24] Four elements must be proven to succeed in bringing forth a negligence claim, "[n]on-compliance to duty of care, deviation from standards of care, lesion evidence, causal link between the lesion and the lack of care."[25] In Ohio, patients can recover through economic damages, such as compensatory damages in the form of lost wages and medical bills.

Standard of care is also consistent between traditional surgical procedures and robotic surgery.[26] Put succinctly, the concept of standard of care states that, "[l]aws must compensate people who lost the possibility to be cared for in an optimal way, but not who lost the possibility to be cared for in a better way."[27] This standard can be applied to both traditional and robotic surgeries.

### D. Medical Malpractice and Liability

The complexities of medical malpractice liability are in no way reduced by using robotic surgery tools, but there are similarities in medical malpractice law between robotic methods and traditional surgical procedures. While a medical professional may believe that their liability is alleviated by using a robotic surgical tool, this is not the case.[28] Courts have held that surgeons using robotic methods must, "[b]e able to use their discretion on the proposed actions of robots and provide a level of human check on any proposed actions of the robots."[29]

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[20] *In the Hands*, *supra* note 4.
[21] *Id.*
[22] *Id.*
[23] *Id.*
[24] Alessia Farrarese et al., *Informed consent in robotic surgery: quality of information and patient perception*, 11 OPEN MED. 279 (Aug. 2016), https://pmc.ncbi.nlm.nih.gov/articles/PMC5329841/ [https://perma.cc/Q57J-R2GH].
[25] *Id.*
[26] *Id.*
[27] *Id.*
[28] *In the Hands*, *supra* note 4.
[29] *Id.*

Studies have shown that there could be an opposite impact. In cases involving autonomous vehicles, jurors were more likely to "[j]udge these cases more harshly, ascribe more blame to the automation and its creators, and be inclined to award more compensation to the victims than in a similar case where no autonomous vehicle was involved."[30]

However, the authors reason that surgeons may have a different perception than the drivers or manufacturers of autonomous vehicles. This is because surgeons are considered to have a greater sense of control and discretion over robotic tools than users of autonomous vehicles have over their car.[31] Additionally, there is minimal legal framework guiding robotic surgeries, leading to a lack of clarity on legal culpability.[32]

There is also a concern over which level of liability should be applied to legal actions taken regarding robotic surgery. If a strict liability standard were to be taken, retailers and manufacturers would be held liable in negligence actions, which in turn could promote technology improvements and reduction of errors.[33] Additionally, strict liability would encourage the medical field to continue including human perspectives on treatment and prevent medical professionals from assuming total liability in these cases.[34]

### E. Real World Examples

There have been multiple examples of individuals taking legal recourse against biotechnology companies for damages relating to their robotic surgical devices. In Florida, Sandra Sultzer passed away due to small intestine injuries resulting from a tear that occurred during a robotic surgery to treat colon cancer.[35] Her husband alleged that the biomedical company who made the device, Intuitive Surgical, "[k]new the robot had insulation problems that might cause electricity to leak out and burn internal organs but didn't disclose that risk to the Sultzers or the public."[36] NBC News reported that Intuitive was a defendant in approximately 93 lawsuits at the time of a public release of their 2014 financial report.[37]

In addition to individual claims, class action lawsuits have also been taken against biotechnology companies.[38] A class action containing four plaintiffs from New Jersey, Indiana, Arizona, and Ohio, along with a select number of their spouses, filed a lawsuit against a

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[30] *Id.*
[31] *Id.*
[32] *Id.*
[33] Frank Pasquale, *When medical robots fail: Malpractice principles for an era of automation*, BROOKINGS (Nov. 9, 2020), https://www.brookings.edu/articles/when-medical-robots-fail-malpractice-principles-for-an-era-of-automation/ [https://perma.cc/U5CB-8LV3].
[34] *Id.*
[35] Aria Bendix, *Robotic device burned a woman's small intestine during surgery, lawsuit alleges*, NBC NEWS (Feb. 8, 2024), https://www.nbcnews.com/health/health-news/robotic-device-burned-womans-small-intestine-surgery-lawsuit-alleges-rcna137998 [https://perma.cc/5P75-EL8J].
[36] *Id.*
[37] *Id.*
[38] Robert J. Boumis, *Four Robotic Hysterectomy Patients File da Vinci Robot Lawsuit*, TOP CLASS ACTIONS (Feb. 19, 2014), https://topclassactions.com/lawsuit-settlements/lawsuit-news/four-robotic-hysterectomy-patients-file-da-vinci-robot-lawsuit/ [https://perma.cc/6VRE-2X6H].

manufacturer.[39] The plaintiffs suffered injuries to their pelvic organs, despite guidance from their physicians that the robotic procedure would lessen their pain and lead to better outcomes.[40]

While these surgical tools are known for their safety, malfunctions may still occur. These examples illustrate the individual and collective actions that parties may take against manufacturers. Moving forward, it is likely that these lawsuits will continue to persist as new technology is implemented in the medical field.

### F. Conclusion

The rise of robotic surgery has led to both developments in the medical field that have greatly benefited patients and medical providers. However, robotic surgery has led to legal and ethical implications that must be examined to ensure the safest practice.

When examining concepts such as negligence and informed consent in the realm of robotic surgery, it is evident that there are both strong similarities to traditional surgical procedures, and divergences in the application of the law. As medical treatments continue to advance, lawmakers will have to continue to update statutory provisions to ensure that both patients and providers are able to pursue legal remedies when necessary.

[39] *Id.*
[40] *Id.*