It’s about time

Learn about your hernia repair options.

About me

Presented by

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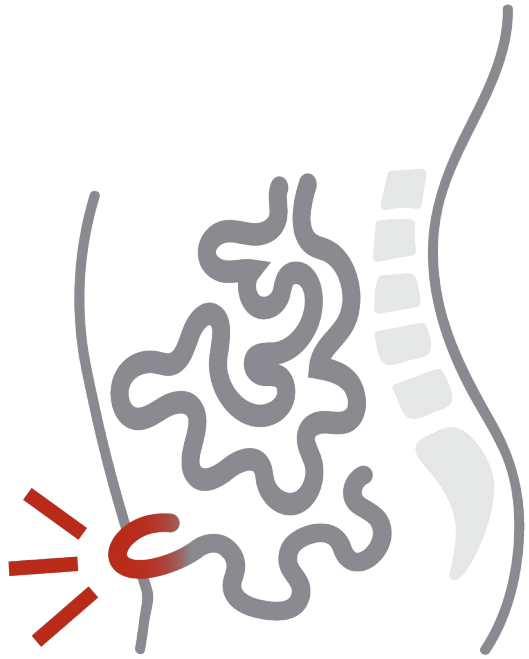
How common are hernias?

There are more than

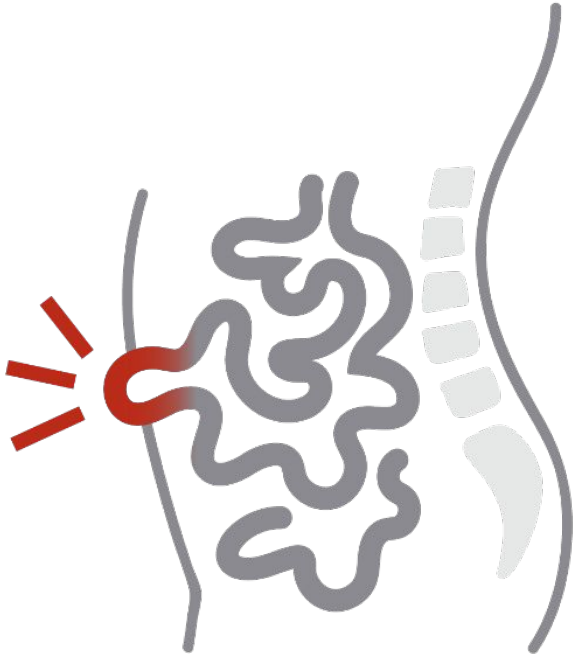
One million

abdominal wall hernia repairs performed in the U.S. each year.[1]

What is a Hernia?



Inguinal hernia



Ventral hernia

One or more of these might lead to a hernia[2,3]:

- Frequent heavy lifting
- Prior abdominal surgery
- Obesity
- Weak connective tissue
- Pregnancy

Symptoms

Some of the common symptoms in the groin or abdomen that may indicate you have an abdominal wall hernia are[2,3]:

- Pain or pressure at the hernia site
- Visible bulge on the abdomen or groin area, especially when coughing or straining

How are hernias diagnosed?[2, 3]

- Physical exam
- Ultrasound
- CT scan
- Blood test
- Urinalysis
- Electrocardiogram (ECG)

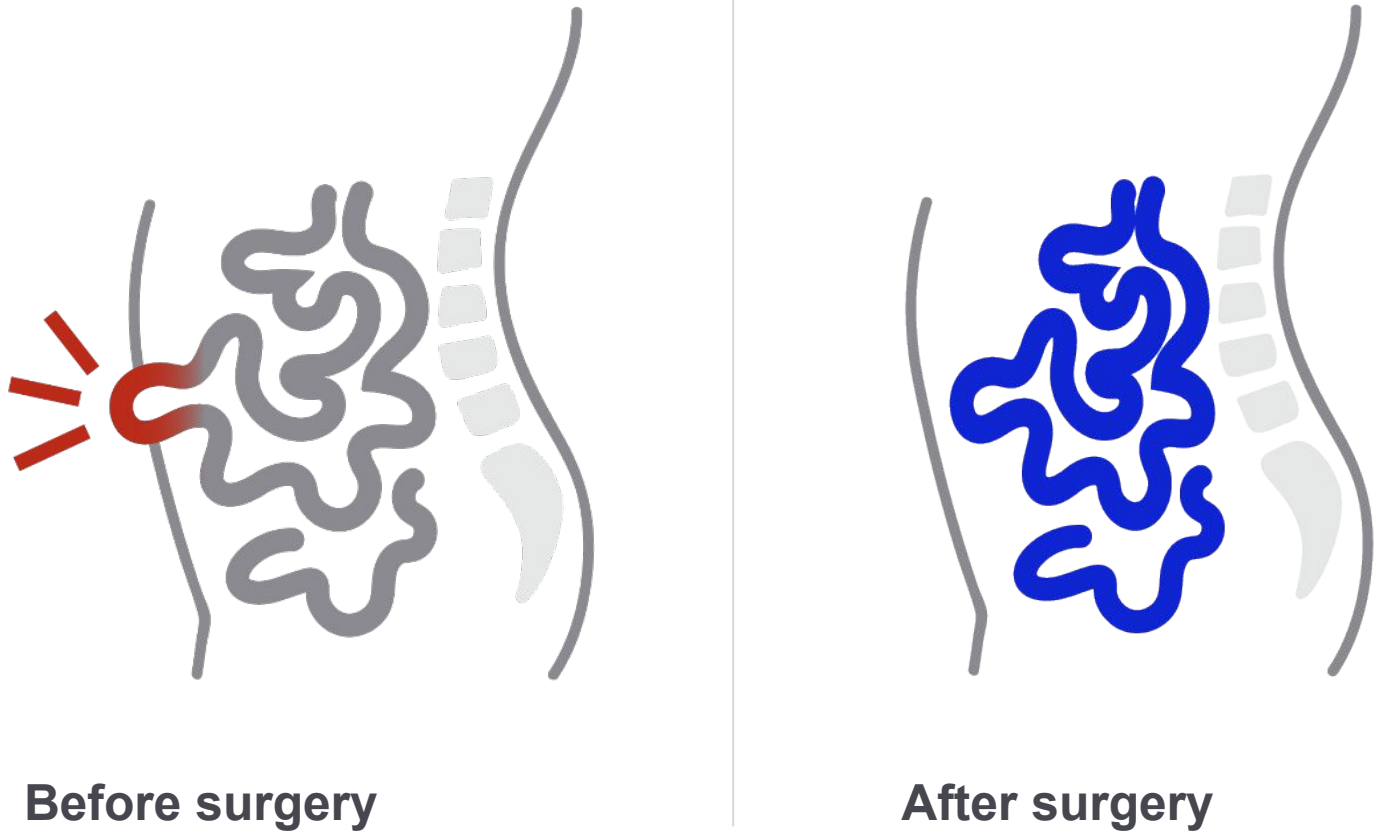
What are some of your options?[2, 3]

- Watch and wait
- Wear a truss or belt
- Surgery

The care pathway for every patient is different. Decisions about your care should be made between you and your doctors. Should your pathway include surgery, the following information is designed to provide you with additional knowledge about your surgical options.

What is hernia surgery?

Hernia repair surgery basics



Before surgery

After surgery

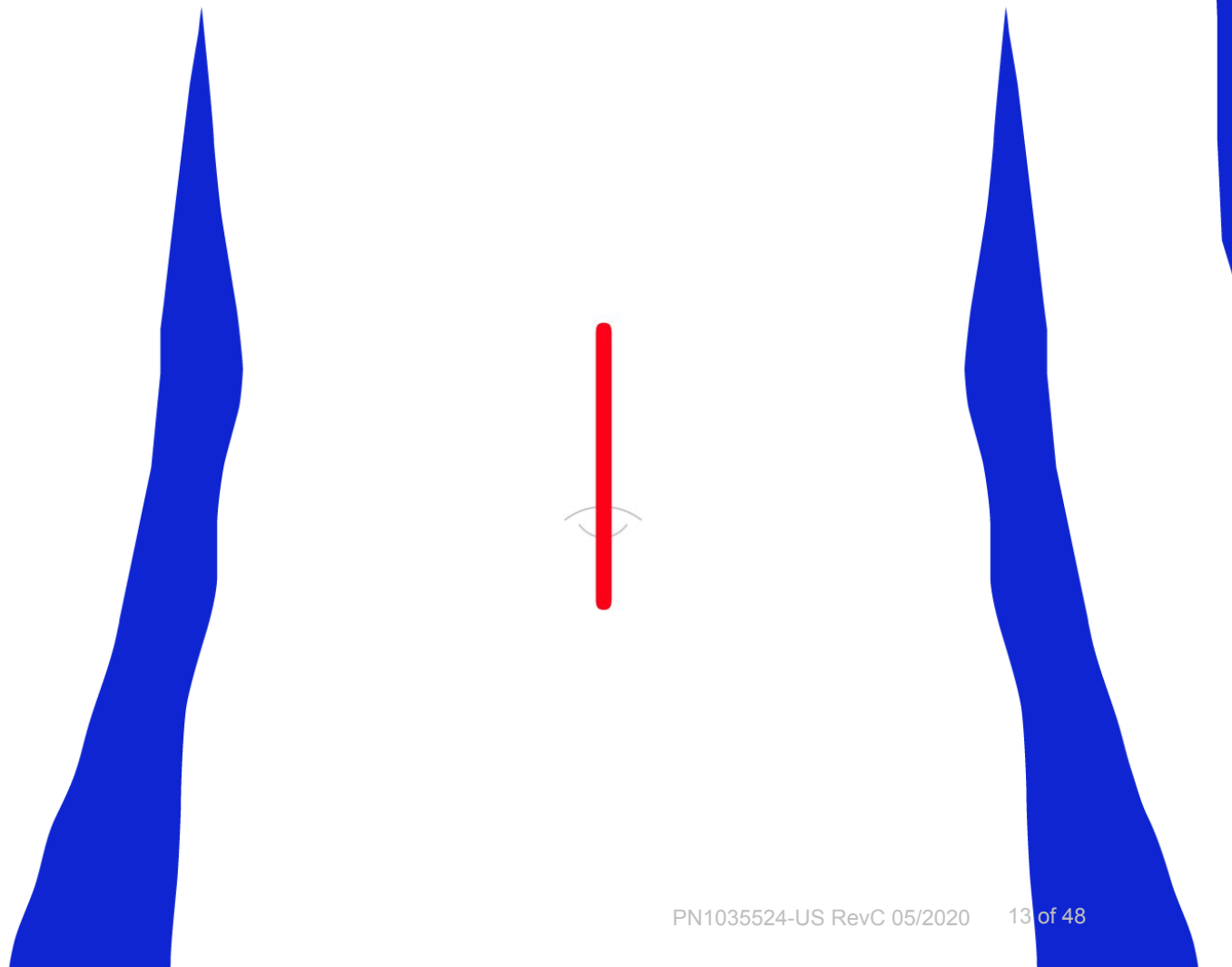
Surgery can be performed through:

Traditional open surgery

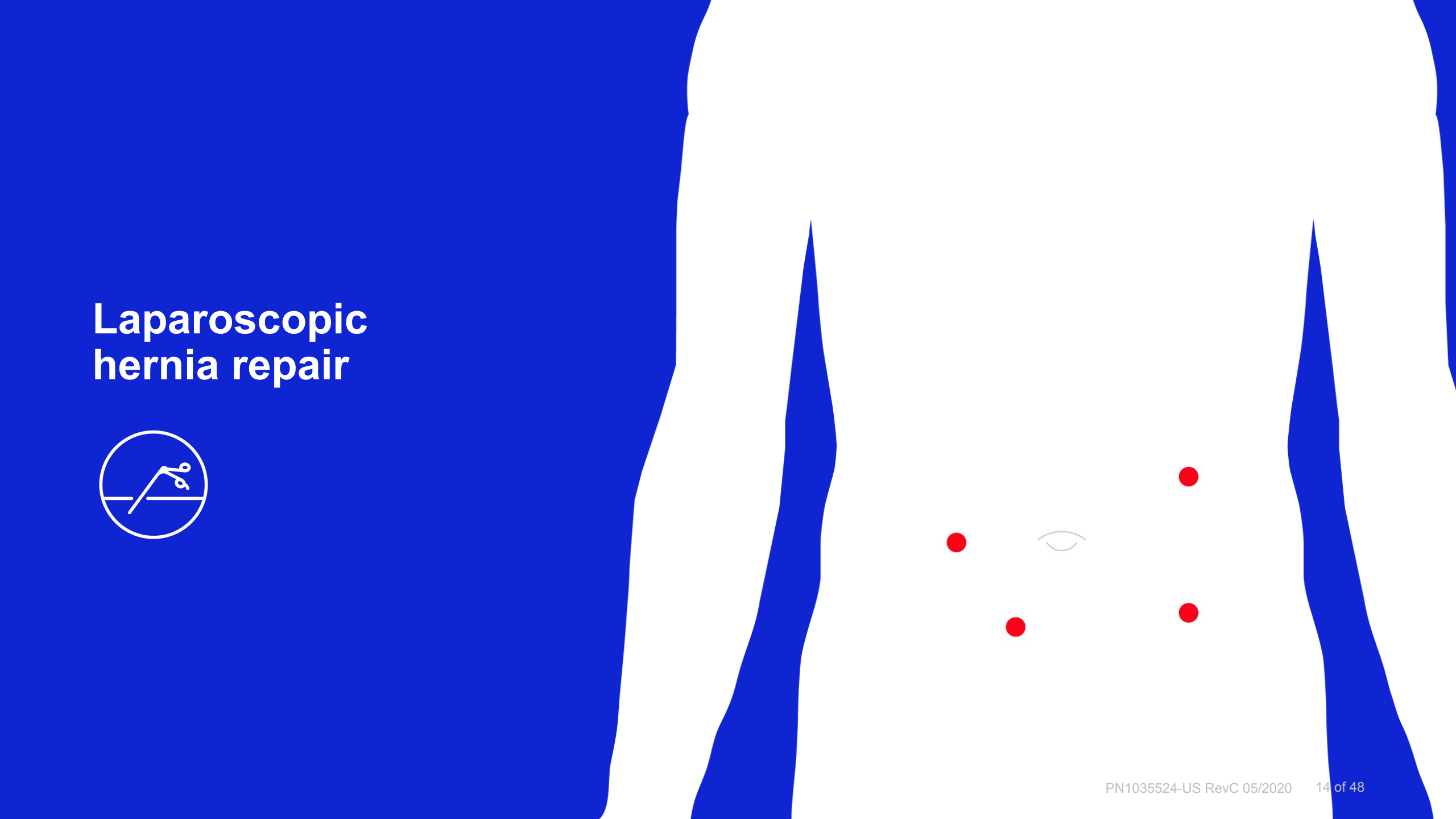
Minimally invasive surgery:

- Laparoscopic surgery
- Robotic-assisted surgery

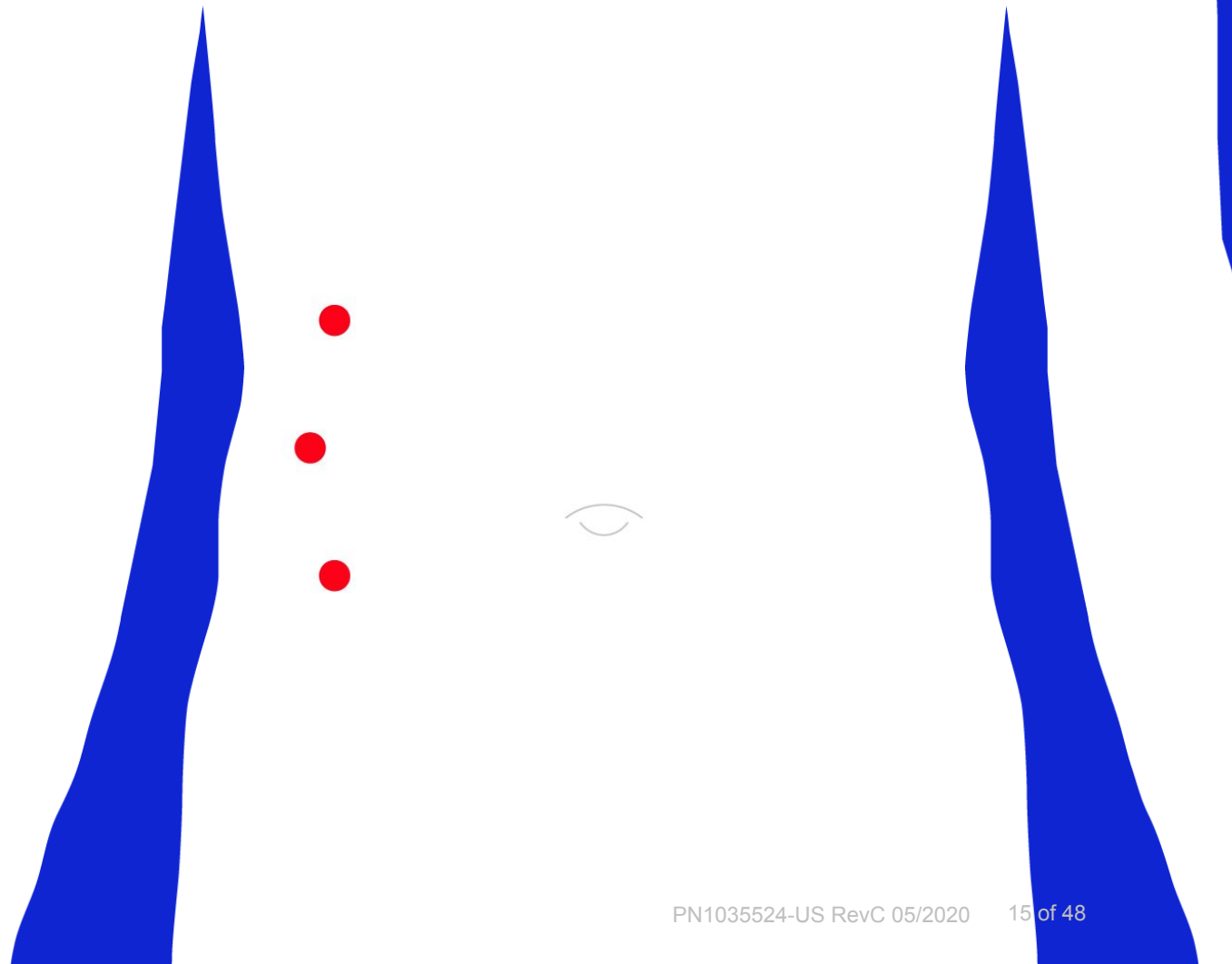
Open hernia repair



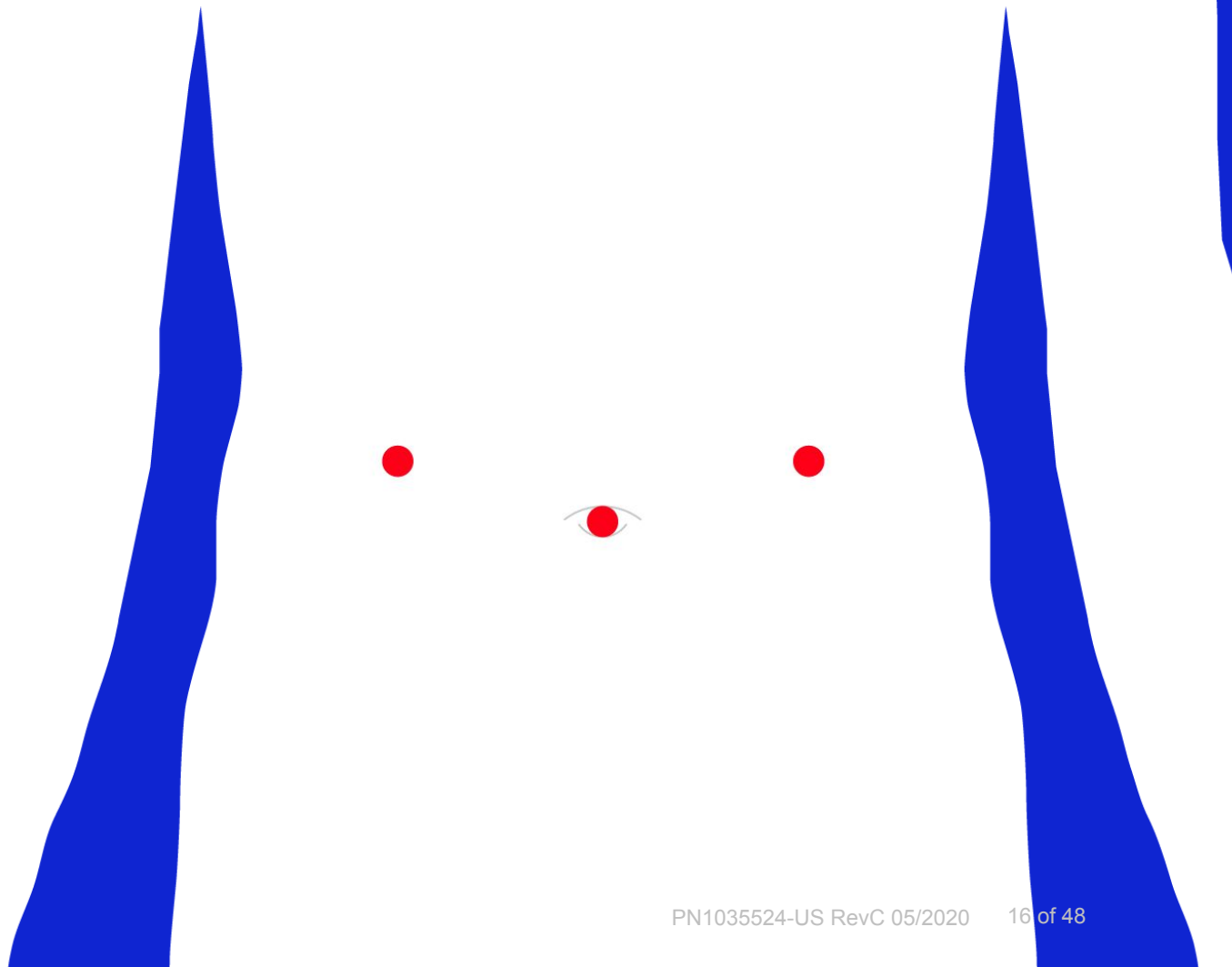
Laparoscopic hernia repair



Robotic-assisted ventral hernia repair



Robotic-assisted inguinal hernia repair



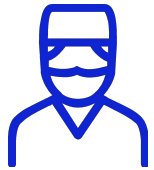
Robotic-assisted hernia repair

What is robotic-assisted surgery?

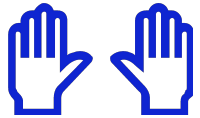
If you and your doctor decide that robotic-assisted surgery is right for you, here is what to expect.

Actual incision size

During robotic-assisted surgery, your surgeon makes a few small incisions, then uses a 3DHD camera for a crystal-clear, magnified view of the surgical area.



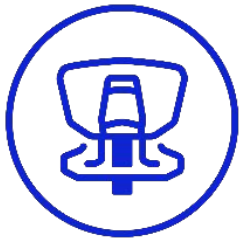
Your surgeon sits at a console next to you and operates through the incisions using tiny instruments and the camera.



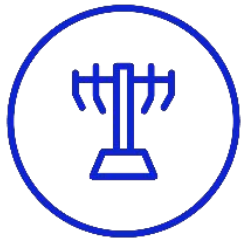
Every hand movement your surgeon makes is translated by the da Vinci system in real-time, bending and rotating the instruments so he or she can repair your hernia.

What is the robotic-assisted surgical system?

This suite of da Vinci® technology may be in your surgeon's operating room.



The surgeon console is where your surgeon sits during the procedure, has a close-up 3D view of your anatomy, and controls the instruments. The instruments are "wristed" and move like a human hand, but with a far greater range of motion.



The patient cart is positioned near the patient on the operating table. It is where the instruments used during the operation move in real time in response to your surgeon's hand movements at the surgeon console.

The vision cart makes communication between the components of the system possible and supports the latest 3D high-definition vision system.

Please talk with your doctor to understand all outcomes related to hernia surgery.

Every surgery has risks.
Some of the potential risks for hernia repair are:

Risks associated with hernia repair (ventral, incisional, umbilical, inguinal) include recurrence, bowel injury, infection of mesh, erosion of mesh, urinary retention, chronic pain. For inguinal hernia repair: testicular injury

Serious complications may occur in any surgery, up to and including death. Serious risks include, but are not limited to, injury to tissues and organs and conversion to other surgical techniques which could result in a longer operative time and/or increased complications.

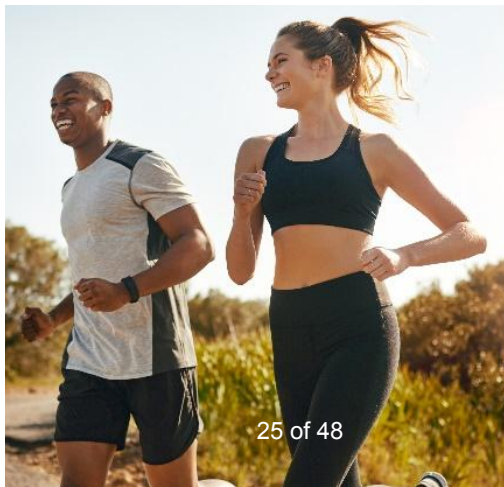
Individuals' outcomes may depend on a number of factors, including but not limited to patient characteristics, disease characteristics and/or surgeon experience.

Questions to consider asking your surgeon:

1. Which surgical approaches—open, laparoscopic, or robotic-assisted—are available to me?
2. How can I prepare for surgery?
3. What can I expect after surgery?
4. What is your surgical training and experience?
5. What is your experience with robotic-assisted surgery?
6. What are your patient outcomes?

Questions?

Thank you.



References

1. Rutkow, I.M. Demographic and socioeconomic aspects of hernia repair in the United States in 2003. Surg Clin North Am. 2003 Oct;83(5):1045-51, v-vi.
2. Groin Hernia Repair: Inguinal and Femoral. American College of Surgeons. Web. 27 April 2020. https://www.facs.org/~/media/files/education/patient%20ed/groin_hernia.ashx
3. Ventral Hernia Repair. American College of Surgeons. Web. 27 April 2020. https://www.facs.org/~/media/files/education/patient%20ed/ventral_hernia.ashx

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Appendix A

Instructions: Copy individual outcome in its entirety, including citations and footnotes, to the slides indicated earlier in this presentation. Please provide patients with access to the reference list, if asked.

Da Vinci Inguinal Hernia Repair may present the following outcomes compared to open surgery:

- Patients who have an outpatient robotic-assisted inguinal hernia repair with da Vinci may stay in the hospital for a comparable[A2] or longer[A16] length of time compared to patients who have open surgery.
- Patients who have an inpatient robotic-assisted inguinal hernia repair with da Vinci may stay in the hospital for a shorter[A1,A2,A6] or comparable[A16] length of time compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A2] blood transfusion rates compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A2,A3] rates of complications during surgery compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A2] rates of complications after surgery through hospital discharge compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience lower[A2,A4] or comparable[A16] rates of complications after surgery compared to patients who have open surgery. One study reported a higher[A5] rate of major post-operative complications with robotic-assisted inguinal hernia surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience lower[A6] or comparable[A2,A3,A16] rates of readmission compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A2] rates of reoperation in the post-operative to discharge timeframe compared to patients who have open surgery.

These outcomes are not all outcomes of surgery. There are additional outcomes that surgeons and patients may want to discuss.

Intuitive conducted a systematic literature review to support these outcomes. On file at Intuitive.

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Da Vinci Inguinal Hernia Repair may present the following outcomes compared to open surgery:

- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience lower[A2] rates of reoperation from discharge through 30 days compared to patients who have open surgery.*
    - *This statistically lower rate of reoperations was not observed in the propensity matched analysis. The results of the propensity matched analysis showed comparable reoperation rates from discharge through 30 days
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A3] or higher[A5] risk that the hernia will recur following surgery compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A2,A6] mortality rates compared to patients who have open surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience longer[A2,A3,A5,A16] operating times compared to patients who have open surgery.

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Appendix A

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Da Vinci Inguinal Hernia Repair may present the following outcomes compared to laparoscopic surgery:

- Patients who have an outpatient robotic-assisted inguinal hernia repair with da Vinci may stay in the hospital for a comparable[A5,A8,A9,A11-A13] length of time compared to patients who have laparoscopic surgery, although one study reporting shorter[A16] and one study reported longer[A14] hospital stays.
- Patients who have an inpatient robotic-assisted inguinal hernia repair with da Vinci may stay in the hospital for a shorter[A1] or comparable[A6,A16] length of time compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A5,A8,A15] overall complication rates compared to patients who have laparoscopic surgery, although one study reported a lower[A6] complication rate with robotic-assisted surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A4,A10,A13,A15,A16] rates of complications after surgery compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A7] rates of complications during surgery compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A8-A10,A16] rates of conversion to open surgery compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A6,A10] or higher[A8] rates of readmission in the first 30 days following surgery compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A7] or higher[A8] rates of reoperation compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A5,A12] risk that the hernia will recur following surgery compared to patients who have laparoscopic surgery.

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Da Vinci Inguinal Hernia Repair may present the following outcomes compared to laparoscopic surgery:

- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A6,A7] mortality rates compared to patients who have laparoscopic surgery.
- Patients who have a robotic-assisted inguinal hernia repair with da Vinci may experience comparable[A7,A10] or longer[A5,A8,A9,A11-A14,A16] operating times compared to patients who have laparoscopic surgery.

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Appendix A References

A1. Janjua H, Cousin-Peterson E, Barry TM, Kuo MC, Baker MS, Kuo PC. The paradox of the robotic approach to inguinal hernia repair in the inpatient setting. Am J Surg. 2020;219(3):497-501. doi:10.1016/j.amjsurg.2019.09.012

A2. Gamagami R, Dickens E, Gonzalez A, et al. Open versus robotic-assisted transabdominal preperitoneal (R-TAPP) inguinal hernia repair: a multicenter matched analysis of clinical outcomes. Hernia. 2018;22(5):827-836. doi:10.1007/s10029-018-1769-1

A3. Kosturakis AK, LaRusso KE, Carroll ND, Nicholl MB. First 100 consecutive robotic inguinal hernia repairs at a Veterans Affairs hospital. J Robot Surg. 2018;12(4):699-704. doi:10.1007/s11701-018-0812-7

A4. Henriksen NA, Jensen KK, Muysoms F. Robot-assisted abdominal wall surgery: a systematic review of the literature and meta-analysis. Hernia. 2019;23(1):17-27. doi:10.1007/s10029-018-1872-3

A5. Huerta S, Timmerman C, Argo M, et al. Open, Laparoscopic, and Robotic Inguinal Hernia Repair: Outcomes and Predictors of Complications. J Surg Res. 2019;241:119-127. doi:10.1016/j.jss.2019.03.046

A6. Pokala B, Armijo PR, Flores L, Hennings D, Oleynikov D. Minimally invasive inguinal hernia repair is superior to open: a national database review. Hernia. 2019;23(3):593-599. doi:10.1007/s10029-019-01934-8

A7. 510(k) 170713**

A8. Khoraki J, Gomez PP, Mazzini GS, et al. Perioperative outcomes and cost of robotic-assisted versus laparoscopic inguinal hernia repair [published online ahead of print, 2019 Sep 30]. Surg Endosc. 2019;10.1007/s00464-019-07128-8. doi:10.1007/s00464-019-07128-8

A9. Abdelmoaty WF, Dunst CM, Neighorn C, Swanstrom LL, Hammill CW. Robotic-assisted versus laparoscopic unilateral inguinal hernia repair: a comprehensive cost analysis. Surg Endosc. 2019;33(10):3436-3443. doi:10.1007/s00464-018-06606-9

A10. Kudsi OY, McCarty JC, Paluvoi N, Mabardy AS. Transition from Laparoscopic Totally Extraperitoneal Inguinal Hernia Repair to Robotic Transabdominal Preperitoneal Inguinal Hernia Repair: A Retrospective Review of a Single Surgeon's Experience. World J Surg. 2017;41(9):2251-2257. doi:10.1007/s00268-017-3998-3

A11. Waite KE, Herman MA, Doyle PJ. Comparison of robotic versus laparoscopic transabdominal preperitoneal (TAPP) inguinal hernia repair. J Robot Surg. 2016;10(3):239-244. doi:10.1007/s11701-016-0580-1

A12. Zayan NE, Meara MP, Schwartz JS, Narula VK. A direct comparison of robotic and laparoscopic hernia repair: patient-reported outcomes and cost analysis. Hernia. 2019;23(6):1115-1121. doi:10.1007/s10029-019-01943-7

A13. Prabhu AS, Carbonell A, Hope W, et al. Robotic Inguinal vs Transabdominal Laparoscopic Inguinal Hernia Repair: The RIVAL Randomized Clinical Trial [published online ahead of print, 2020 Mar 18]. JAMA Surg. 2020;e200034. doi:10.1001/jamasurg.2020.0034

A14. Higgins RM, Frelich MJ, Bosler ME, Gould JC. Cost analysis of robotic versus laparoscopic general surgery procedures. Surg Endosc. 2017;31(1):185-192. doi:10.1007/s00464-016-4954-2

A15. Muysoms F, Van Cleven S, Kyle-Leinhase I, Ballecer C, Ramaswamy A. Robotic-assisted laparoscopic groin hernia repair: observational case-control study on the operative time during the learning curve. Surg Endosc. 2018;32(12):4850-4859. doi:10.1007/s00464-018-6236-7

A16. LeBlanc K, et al. Prospective, multicenter, pairwise analysis of robotic-assisted inguinal hernia repair with open and laparoscopic inguinal hernia repair: early results from the Prospective Hernia Study. Hernia. 2020. doi: 10.1007/s10029-020-02224-4

Appendix B

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Da Vinci Ventral Hernia Repair may present the following outcomes compared to open surgery for non-complex procedures:

- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may stay in the hospital for a comparable[B1] length of time compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of complications during surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] blood transfusion rates during and after surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of complications in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of readmission in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience lower[B1] rates of returning to clinic in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of returning to the emergency room in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of reoperation in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] mortality rate in the first 30 days following surgery compared to patients who have open surgery.

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Da Vinci Ventral Hernia Repair may present the following outcomes compared to open surgery for complex procedures:

- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may stay in the hospital for a shorter[B1-B4] length of time compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B3,B4] rates of complications during surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] blood transfusion rates during surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B4] blood transfusion rates after surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of complications in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience lower[B4] or comparable[B1,B3] rates of complications after surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B3] rates of readmission in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience lower[B1] rates of returning to clinic in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of returning to the emergency room in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of reoperation in the first 30 days following surgery compared to patients who have open surgery.

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Da Vinci Ventral Hernia Repair may present the following outcomes compared to open surgery for complex procedures:

- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] surgeon-reported rates of hernia recurrence in the first 30 days following surgery compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B3,B4] mortality rates compared to patients who have open surgery.
- Patients who have a complex robotic-assisted ventral hernia repair with da Vinci may experience longer[B3,B4] operating times compared to patients who have open surgery, although one study reported comparable[B2] operative times.

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Da Vinci Ventral Hernia Repair may present the following outcomes compared to laparoscopic surgery for non-complex procedures*:

- *Published literature may not have distinguished procedures as solely being non-complex repairs, however, based on data from registries, most laparoscopic ventral hernia repairs are non-complex.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may stay in the hospital for a shorter[B5,B7,B12,B13] or comparable[B6,B8-B11] length of time compared to patients who have laparoscopic surgery, although one study reported longer[B14] hospital stays.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience lower[B5,B7] overall complication rates during surgery compared to patients who have laparoscopic surgery, although one study reported higher a higher[15] rate.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B7] rates of complications during surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience higher[B7] or comparable[B1] blood transfusion rates compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B9] rates of conversion to open surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B8,B9,B14] rates of complications after surgery compared to patients who have laparoscopic surgery, although one study reported a lower[B10] rate of postoperative complications.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B8] rates of complications in the first 30 days following surgery compared to patients who have laparoscopic surgery, although one study reported a lower[B10] rate of postoperative complications.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B5,B7,B10,B12] rates of readmission in the first 30 days following surgery compared to patients who have laparoscopic surgery.

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- *Published literature may not have distinguished procedures as solely being non-complex repairs, however, based on data from registries, most laparoscopic ventral hernia repairs are non-complex.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] rates of returning to clinic and emergency room in the first 30 days following surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B7,B10,B12] rates of reoperation in the first 30 days following surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1] surgeon-reported rates of hernia recurrence in the first 30 days following surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B9,B13] rates of hernia recurrence 6 months of more following surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience comparable[B1,B7,B12] mortality rates in the first 30 days following surgery compared to patients who have laparoscopic surgery.
- Patients who have a non-complex robotic-assisted ventral hernia repair with da Vinci may experience longer[B7-B14] operating times compared to patients who have laparoscopic surgery.

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Appendix B References

B1. Supporting data includes data from the Americas Hernia Society Quality Collaborative (AHSQC) registry for procedures that occurred between July 7, 2013 and January 1, 2017.

B2. Halka JT, Vasyluk A, Demare A, Iacco A, Janczyk R. Hybrid robotic-assisted transversus abdominis release versus open transversus abdominis release: a comparison of short-term outcomes. Hernia. 2019;23(1):37-42. doi:10.1007/s10029-018-1858-1

B3. Bittner JG 4th, Alrefai S, Vy M, Mabe M, Del Prado PAR, Clingempeel NL. Comparative analysis of open and robotic transversus abdominis release for ventral hernia repair. Surg Endosc. 2018;32(2):727-734. doi:10.1007/s00464-017-5729-0

B4. Martin-Del-Campo LA, Weltz AS, Belyansky I, Novitsky YW. Comparative analysis of perioperative outcomes of robotic versus open transversus abdominis release. Surg Endosc. 2018;32(2):840-845. doi:10.1007/s00464-017-5752-1

B5. Altieri MS, Yang J, Xu J, Talamini M, Pryor A, Telem DA. Outcomes after Robotic Ventral Hernia Repair: A Study of 21,565 Patients in the State of New York. Am Surg. 2018;84(6):902-908.

B6. Coakley KM, Sims SM, Prasad T, et al. A nationwide evaluation of robotic ventral hernia surgery. Am J Surg. 2017;214(6):1158-1163. doi:10.1016/j.amjsurg.2017.08.022

B7. Prabhu AS, Dickens EO, Copper CM, et al. Laparoscopic vs Robotic Intraperitoneal Mesh Repair for Incisional Hernia: An Americas Hernia Society Quality Collaborative Analysis. J Am Coll Surg. 2017;225(2):285-293. doi:10.1016/j.jamcollsurg.2017.04.011

B8. Chen YJ, Huynh D, Nguyen S, Chin E, Divino C, Zhang L. Outcomes of robot-assisted versus laparoscopic repair of small-sized ventral hernias. Surg Endosc. 2017;31(3):1275-1279. doi:10.1007/s00464-016-5106-4.

B9. Gonzalez AM, Romero RJ, Seetharamaiah R, Gallas M, Lamoureux J, Rabaza JR. Laparoscopic ventral hernia repair with primary closure versus no primary closure of the defect: potential benefits of the robotic technology. Int J Med Robot. 2015;11(2):120-125. doi:10.1002/rcs.1605.

B10. Lu R, Addo A, Ewart Z, et al. Comparative review of outcomes: laparoscopic and robotic enhanced-view totally extraperitoneal (eTEP) access retrorectus repairs [published online ahead of print, 2019 Oct 11]. Surg Endosc. 2019;10.1007/s00464-019-07132-y. doi:10.1007/s00464-019-07132-y.

B11. Walker PA, May AC, Mo J, et al. Multicenter review of robotic versus laparoscopic ventral hernia repair: is there a role for robotics?. Surg Endosc. 2018;32(4):1901-1905. doi:10.1007/s00464-017-5882-5

B12. Warren JA, Cobb WS, Ewing JA, Carbonell AM. Standard laparoscopic versus robotic retromuscular ventral hernia repair. Surg Endosc. 2017;31(1):324-332. doi:10.1007/s00464-016-4975-x.

B13. Zayan NE, Meara MP, Schwartz JS, Narula VK. A direct comparison of robotic and laparoscopic hernia repair: patient-reported outcomes and cost analysis. Hernia. 2019;23(6):1115-1121. doi:10.1007/s10029-019-01943-7

B14. Henriksen NA, Jensen KK, Muysoms F. Robot-assisted abdominal wall surgery: a systematic review of the literature and meta-analysis. Hernia. 2019;23(1):17-27. doi:10.1007/s10029-018-1872-3

B15. Armijo P, Pratap A, Wang Y, Shostrom V, Oleynikov D. Robotic ventral hernia repair is not superior to laparoscopic: a national database review. Surg Endosc. 2018;32(4):1834-1839. doi:10.1007/s00464-017-5872-7