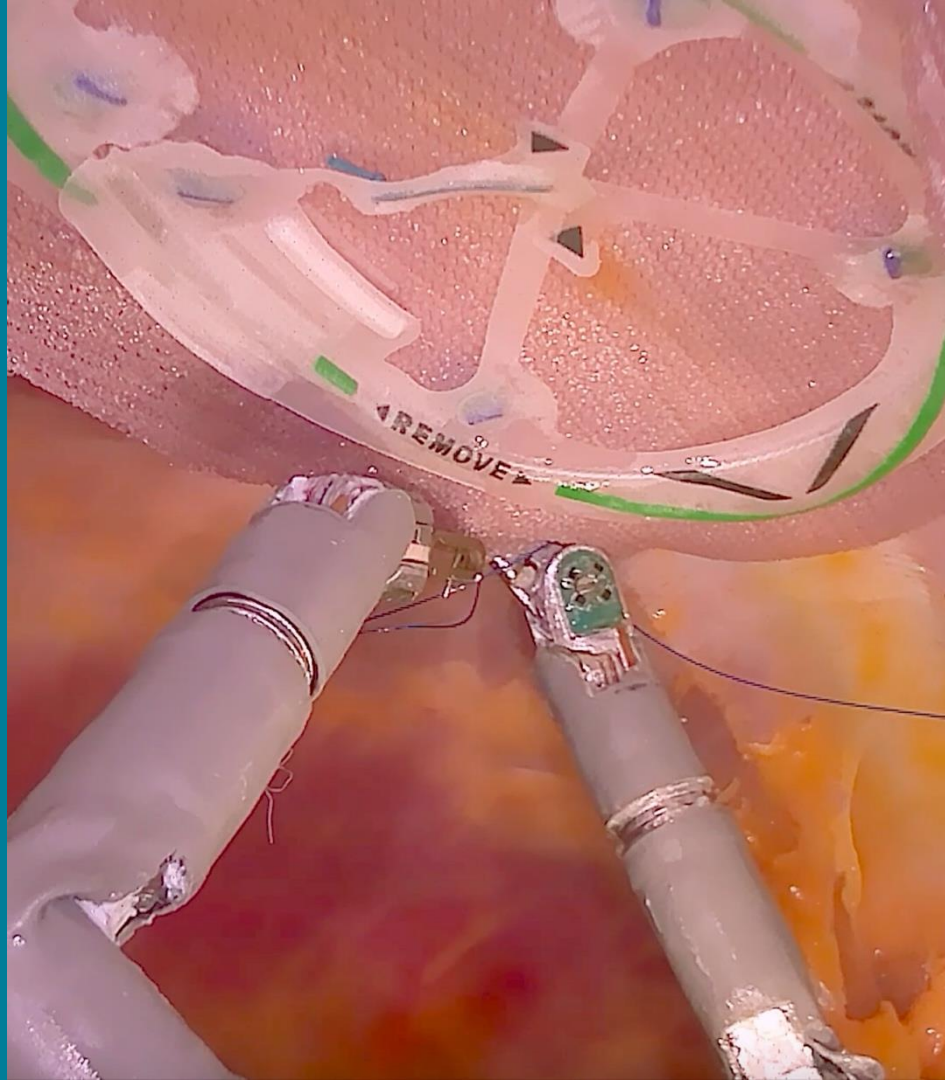
VICARIOUS SURGICAL

# Transforming Surgery: *Open-like Access, Minimally Invasive*



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All surgical images contained in this presentation are sourced from cadaveric procedures.

# Redefining Access, Expanding Markets & **Advancing to Commercialization**

**Open-like Access, Minimally Invasive:** Single-port, 18 mm trocar, open-surgery reach & dexterity.

**Large Untapped Market:** >5.6M U.S. abdominal procedures annually, with 82% still performed open or laparoscopic.[1]

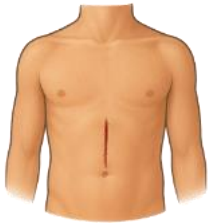
**Proprietary Technology & IP Moat:** 160 patents granted & pending[2]; including decoupled actuators & 13-DOF[3] instruments.

**On the Path to Commercialization:** Multiple controlled builds completed; advancing to design freeze & production-equivalent system.

*"Large market, protected technology, and clear path to launch."*

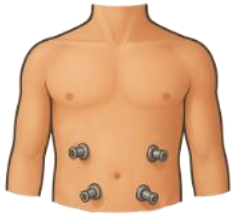
1: VS ESTIMATES FROM 2021-2024 LSI GLOBAL MARKET DATA AND 2019 BANK OF AMERICA GLOBAL MARKET RESEARCH. INCLUDES HERNIA, GALLBLADDER, GI & GYNECOLOGIC PROCEDURES.
2: 50 GRANTED/ALLOWED, 110 PENDING
3. DOF=DEGREES OF FREEDOM

# Today, Surgeons Choose Between *Anatomical Access* & *Invasiveness*



**Open Surgery**

Full anatomical access, but high complications and difficult recovery.



**Minimally Invasive Surgery**

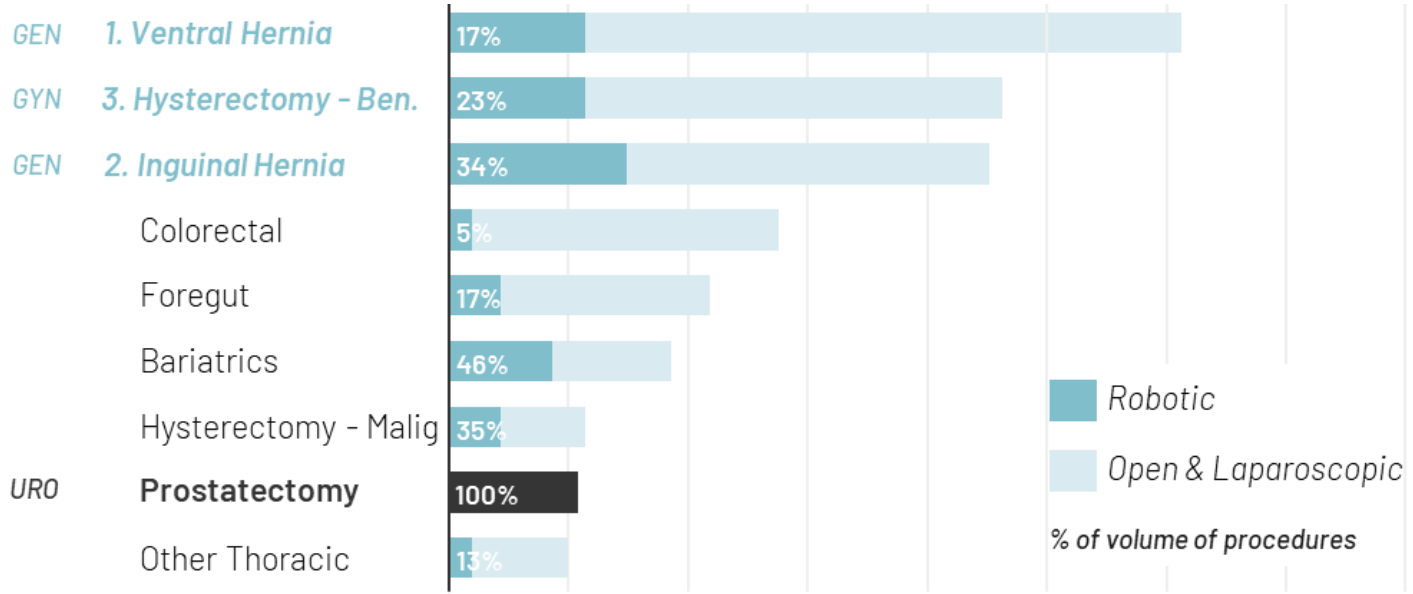
Small incisions, but limited anatomical access, visualization and reach, especially in the abdomen.

***Result: Many abdominal surgeries are still performed open, despite the known and agreed upon benefits of MIS.***

*"We eliminate the tradeoff:* ***open-surgery experience through a single incision."***

# *Beyond Prostatectomy:* Adoption Drops Sharply

**Data collected from a center of excellence partner hospital system (24 Midwest hospitals).**




*First 3 indications Vicarious Surgical seeks.*

# Legacy Robot Adoption is Heavily Concentrated in Prostatectomy *Not By Design, But By Limitation*

## Current Robotics:

**Built as a General-Purpose System**

Multi-port entry, rigid arms, and limited freedom of motion.

One size fits all approach.

## Prostatectomy:

**The Dominant Robotic Procedure**

>95% adoption rate[1]

Confined pelvic anatomy aligns with robot's strengths:

- Operates well in a small, narrow space
- Straightforward setup & triangulation
- Stable visualization
- Tremor reduction

*"There is potential upside in procedures that don't fit existing systems."*

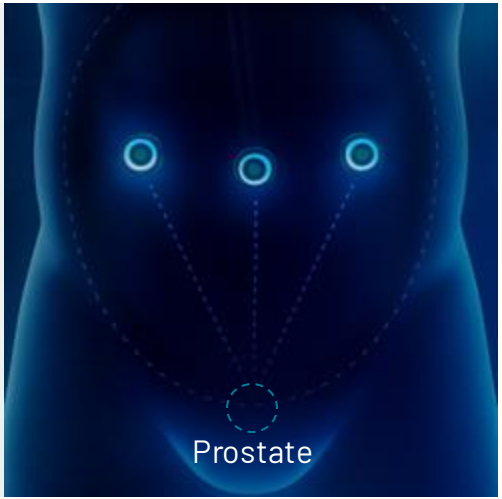
1: BERNSTEIN US ROBOTIC-ASSISTED SURGERY TAM MODEL - 12 MARCH 2021. U.S. ONLY.

# One Small Incision. Unlimited Access.

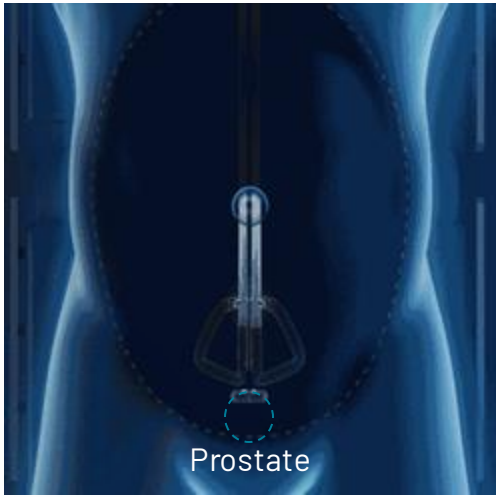
## *Open Surgery Access — Through a Single, Small Incision*

**In prostatectomy, the limitations of current robotic systems are reduced**

- Narrow working space simplifies triangulation of rigid, straight instruments
- Multi-quadrant abdominal access not required




**Current Robotic Systems**



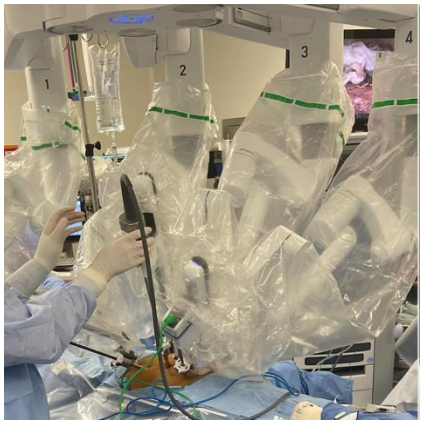

**Vicarious Surgical**

*"We are **redefining robotic surgery** — expanding access to millions[1] of procedures beyond the reach of today's systems."*

1: VS ESTIMATES FROM 2021-2024 LSI GLOBAL MARKET DATA AND 2019 BANK OF AMERICA GLOBAL MARKET RESEARCH. INCLUDES HERNIA, GALLBLADDER, GI & GYNECOLOGIC PROCEDURES.

# Simplify access, *Amplify Performance.*

**Current Robotic Systems**




## Multi-Port Docking is Cumbersome:

- Pre-op planning required
- External and internal collisions
- Poor bedside access
- Incision site trauma

**Vicarious Surgical**

## Single-Port Docking is Efficient:

- No pre-op planning
- Collision free surgery
- Superior bedside access
- Limited incision site trauma

*"Single-Port docking may streamline setup and improves procedural efficiency compared with traditional multi-port docking."*

# *Streamlined Capital Equipment: Just Two Components*

**Patient Cart**

compact footprint, easy integration

**Surgeon Console**

with integrated display, no vision cart required

*Two components instead of three. Simpler. Lower cost. Less clutter*

# *Surgeon Console* Spotlight

Immersive 3D Visualization

Ergonomic Adjustability

Familiar Hand Controllers

**Designed with function and comfort at the forefront.**

# *Patient Cart* Spotlight

Streamlined Docking & Setup

Single Port Eliminates Instrument Collisions

Unrestricted Patient Access

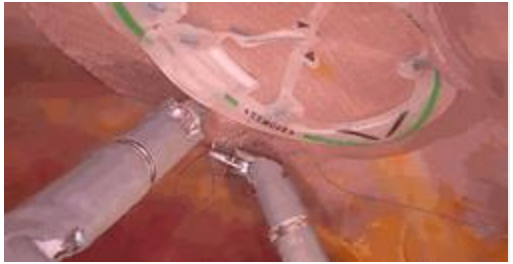
**Designed with bedside access in mind.**

# One Small Incision. Unlimited Access.

## *Open Surgery Access — Through the Smallest[1] Incision*

Decoupled actuators enable additional intra-abdominal joints with **advanced dexterity and anatomical reach.**

360° camera articulation with 120° field of view provides **expanded visualization of the operative field & self cleaning**.

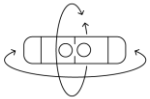


Instrument arms generate high forces needed for a **broad range of soft-tissue indications**.

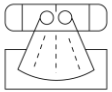
*"Unique dexterity, visualization, and strength, all through the smallest[1] incision."*

1: SMALLEST INCISION FOR A SINGLE-PORT RAS DEVICE

# *Camera* Spotlight

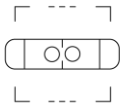


## Unprecedented Range of Motion



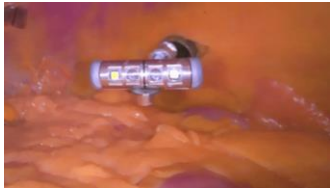
## Best in Class Visual Performance

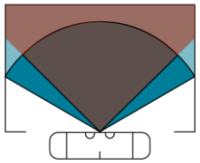
- Immersive, natural depth perception
- Wider field of view compared to competitors



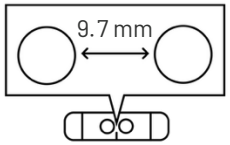
## Self Cleaning

- Improves efficiency of surgical workflow

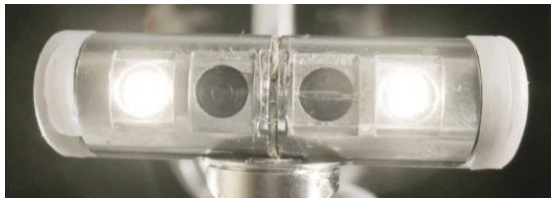




VS Camera: 120° FOV




Extended Interaxial Lens Distance



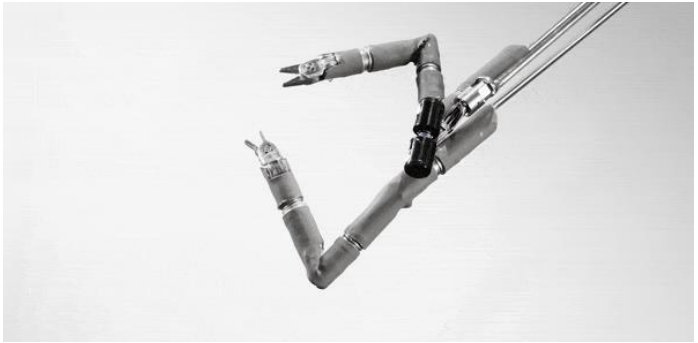
**Physician can see the entire abdomen with immersive clarity all from a single access point.**

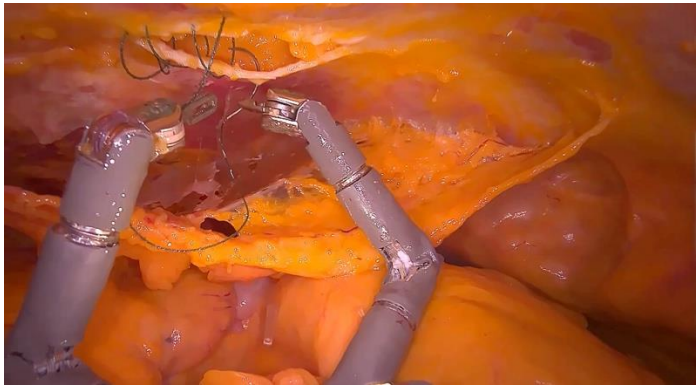
# *Instrument* Spotlight

Precision & Control

Unmatched Access, Reach & Strength

28 Sensors Per Arm Provides a Rich Set of Data for Future Advancements



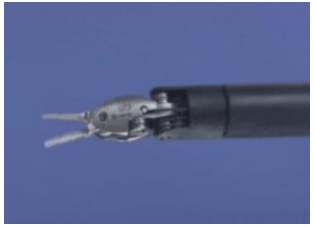


**Putting the wrists, elbows, and shoulders within the abdomen provide access to all desired anatomical locations.**

# Why Vicarious Surgical is Different: *Maneuverability & Vision.*

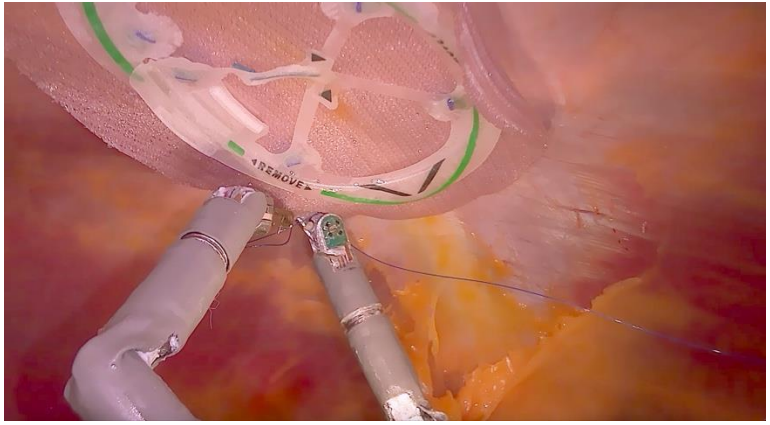
**Conventional Laparoscopy**

- ✕ Like chopsticks, limited motion
- ✕ Assistant driven rigid scope



**Da Vinci / Multi-port RAS**

- ✕ Chopsticks with wrists, added dexterity
- ✕ Robotic driven rigid scope



**Vicarious Surgical**

- ✓ Miniaturized shoulders, elbows and wrists, as if a full arm was operating inside the abdomen
- ✓ Fully articulating robotic camera enables full abdominal visualization

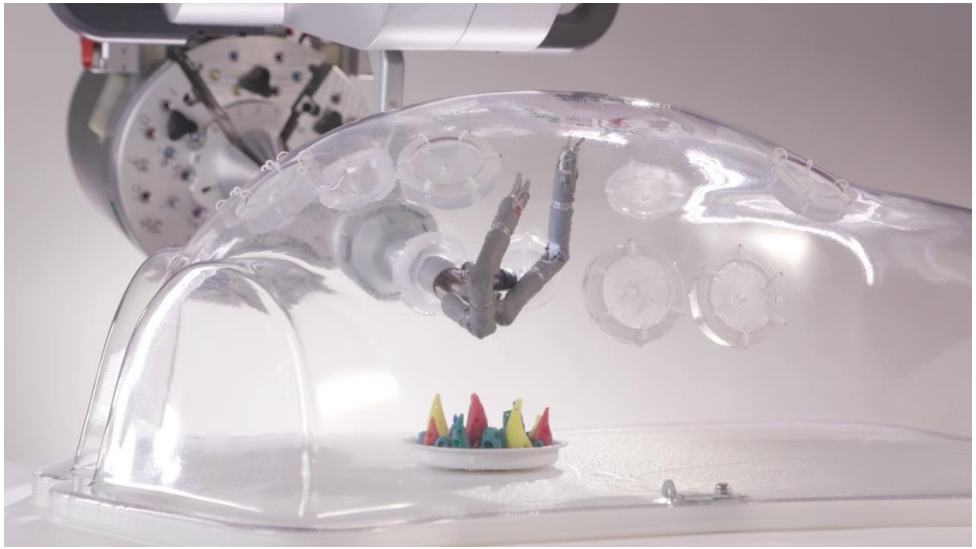
*"Unmatched Dexterity + Breakthrough Vision = A Step Change in Robotic Surgery."*

# *Motion Profile* Spotlight

Intelligent Motion Control

Minimal Learning Curve

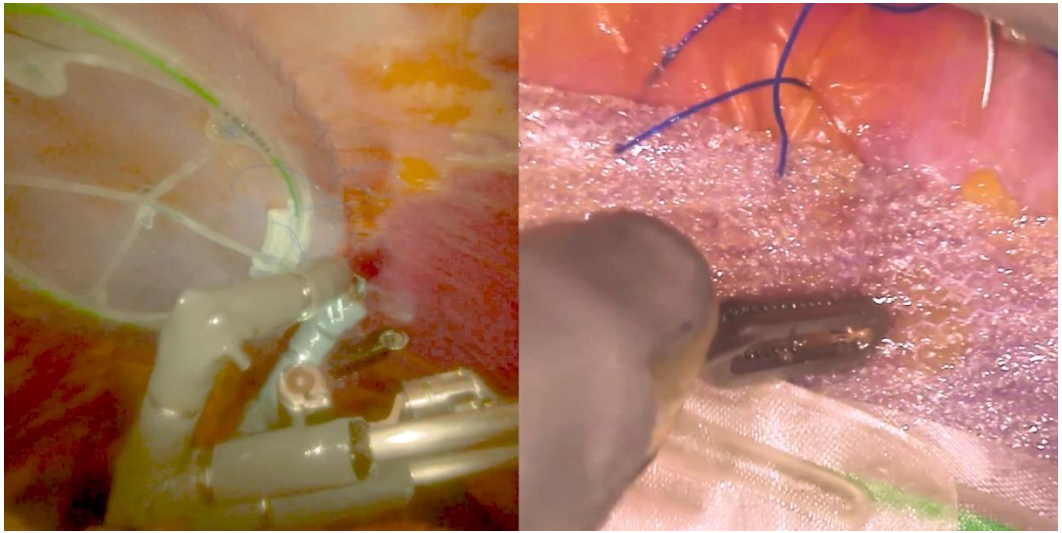
Multi-quadrant Access



**Seamless, intelligent motion control providing an efficient and effective user experience.**

# Redefining Robotic Surgery To *Address What Matters Most*

**Miniaturization of the full robotic arms and camera within the abdomen** provides unmatched efficiency, limitless anatomic access, and immersive visualization all through a single small port – creating a new standard for **scalable, high-performance surgical robotics**.



Through technological innovation, Vicarious Surgical will convert open abdominal procedures to MIS.

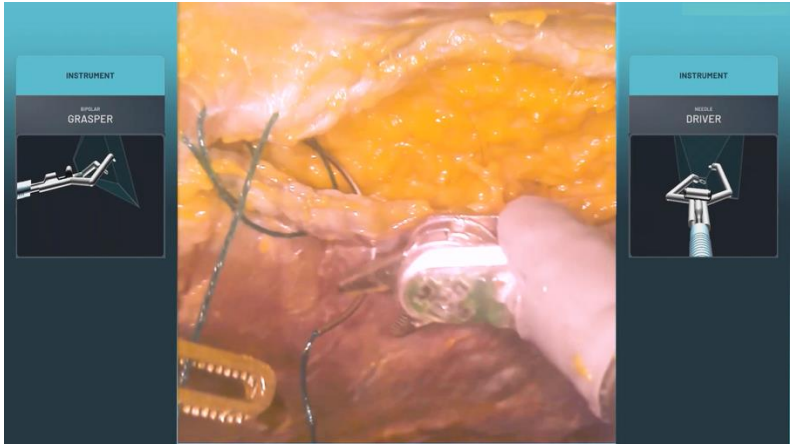
# We Are Launching in *Ventral Hernia Repair*

## Starting Where Others Can't Go: Redefining Abdominal Access

> With the ability to work up, down and even backwards, *Vicarious Surgical can reach areas of the abdominal wall that are currently difficult or even impossible with other systems.*

> The anterior abdominal wall is a conundrum for "straight", rigid technology and as a result *66% of all Ventral Hernias in the U.S. are still performed open.*[1]

> Vicarious Surgical's unique capabilities may lead to *better patient outcomes and operational efficiency in a procedure where it matters most.*




Cadaveric IPOM+ Procedure, Dr. Igor Belyansky

*"Unlocking ventral hernia repair, enabling access to 66% of cases still performed open."*

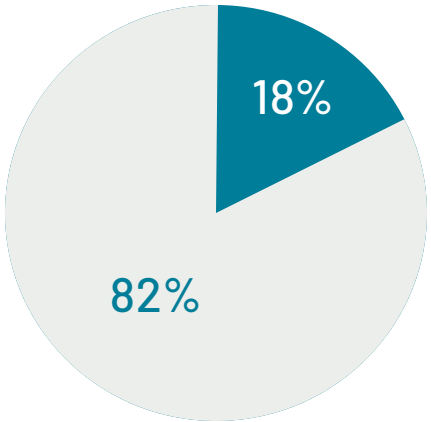
1: FRY BT, HOWARD RA, THUMMA JR, NORTON EC, DIMICK JB, SHEETZ KH. SURGICAL APPROACH AND LONG-TERM RECURRENCE AFTER VENTRAL HERNIA REPAIR. JAMA SURG. 2024;159(9):1019–1028. DOI:10.1001/JAMASURG.2024.1696

# We Are *Addressing Procedures* That Are Not Currently Being Done with Today's Robotics

**Indications:**
Hernia, Gallbladder, GI, Gynecology.

**Why:**

- ➞ Current robotics: **limited anatomical access with a steep learning curve**
- ➞ Vast majority of these procedures are still performed open, leading to a **large white-space opportunity**




**5.6 Million**
abdominal procedures performed annually in the US[1]

**82%**
are still non-robotic[1]

*Vicarious Surgical is expanding the TAM for robotic surgery, not fighting for a slice of the current pie.*

1: VS ESTIMATES FROM 2021-2024 LSI GLOBAL MARKET DATA AND 2019 BANK OF AMERICA GLOBAL MARKET RESEARCH. Includes Hernia, Gallbladder, GI & Gynecologic procedures.

# *Vicarious Surgical* is Positioned for a Different TAM

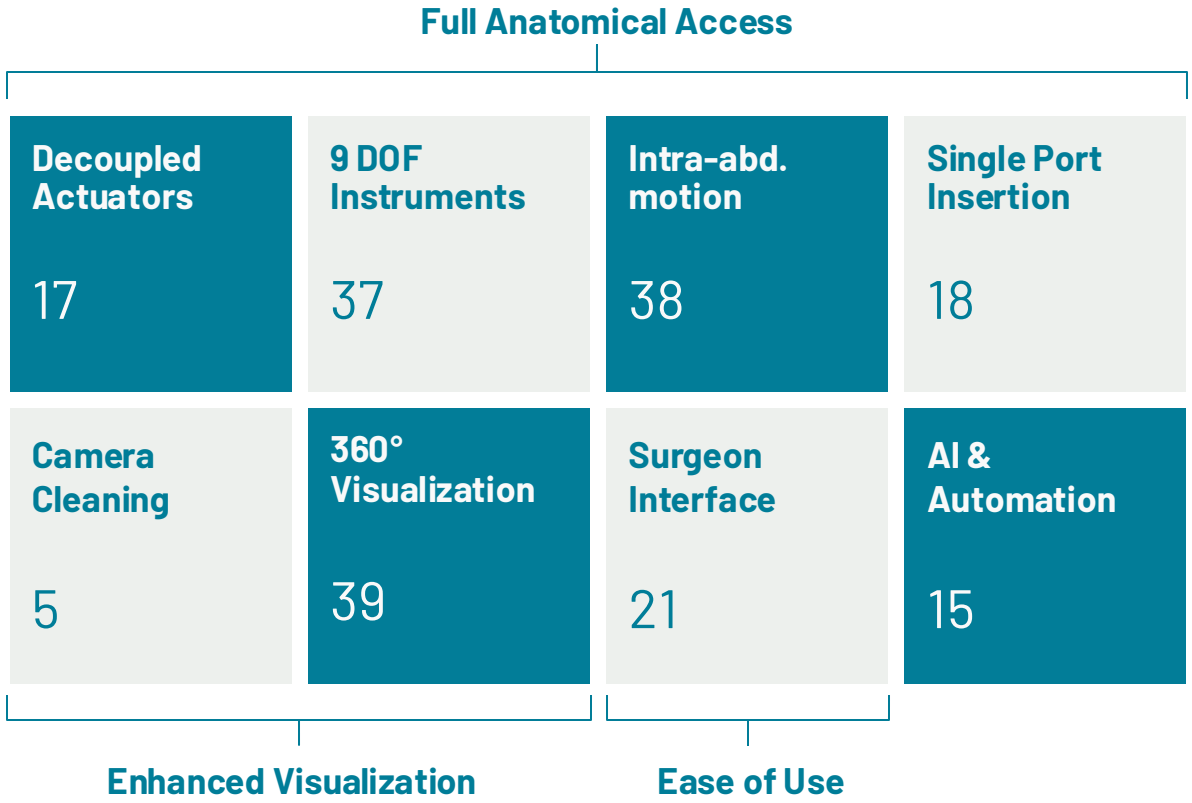

1: VS ESTIMATES FROM 2021-2024 LSI GLOBAL MARKET DATA AND 2019 BANK OF AMERICA GLOBAL MARKET RESEARCH. Includes Hernia, Gallbladder, GI & Gynecologic procedures.

# *Vicarious Surgical* Competitive Landscape*

| | Invasiveness (Incisions) | Anatomical Access (DOF) | Visualization & Display | OR Integration (# Capital Components) | Operational Efficiency | Technical Innovation/Novelty |
|---|---|---|---|---|---|---|
| VICARIOUS SURGICAL | **Single, 18mm** | **13 DOF, All Quadrant access** | **360° camera, 120° FOV, 3D, Self Cleaning** | **2** | **Easy 1 arm set-up, portable** | **Least invasive, single incision w/ greatest range of motion** |
| INTUITIVE SURGICAL | Four, 8-12mm | 7 DOF, Multi Quadrant access | 0/30° camera, 80 degree FOV, 3D | 3 | Challenging multiple arm set-up, stationary | First to Market surgical robotic platform |
| INTUITIVE SURGICAL | Single, >25mm | 7 DOF, Multi Quadrant access | 0/30° camera, 73 degree FOV, 3D | 3 | Challenging single arm set-up, stationary | First to Market single incision surgical robotic platform |
| Medtronic | Four, 8-12mm | 7 DOF, Multi Quadrant access | 0/30° camera, unknown FOV, 3D | 6 | Cumbersome multiple cart/arm set-up and mobility | "Me too" Multi-cart platform |
| CMR SURGICAL | Four, 5-12mm | 7 DOF, Multi Quadrant access | 0/30° camera, 81 degree FOV, 3D | 5 | Cumbersome multiple cart/arm set-up and mobility | "Me too" Multi-cart platform |
| ASENSUS SURGICAL | Four, 5-12mm | 7 DOF, Multi Quadrant access | 0/30° camera, unknown FOV, 3D | 5 | Cumbersome multiple cart/arm set-up, stationary | "Me too" Multi-cart platform "Lap instrument controllers" |
| RONOVO SURGICAL | TBD | 7 DOF, Multi Quadrant access) | Unknown | 4 | Cumbersome multiple cart/arm set-up and mobility | "Me too" Multi-cart platform |
| VIRTUALINCISION | Single, >25mm | 6 DOF, Multi Quadrant access | Flexible tip camera, Unknown FOV, 2D | 3 | *Easy 1arm set-up, portable | Reusable robotic arm |
| Distalmotion | Two, 8mm + 2 lap instruments | 7 DOF, Multi Quadrant only w/ additional lap instruments | Utilizes legacy 0/30 degree laparoscope | 4 | Cumbersome multiple cart/arm set-up and mobility | Hybrid Lap/Robotic |

*Source: Publicly available on company websites

# Our Proprietary Technology is Secured By A *Comprehensive IP Portfolio* Covering All Major System Innovations[1]




**30** granted/allowed patents

**87** pending

**117** total protections filed

1: PATENT APPLICATIONS MAY CLAIM MORE THAN ONE FEATURE.

# Trusted by *Leading Visionary Investors*

**Backed by the world's most forward thinking investors.**

Leading strategic investors validate Vicarious Surgical's vision of expanding the future of robotic surgery and advancing minimally invasive care.

AME CLOUD VENTURES

BILL GATES

khosla ventures

E15VC

innovation endeavors

Visionary investors share our belief:

*Vicarious Surgical will expand robotic surgery into millions of new procedures.*

# From Engineering to Production

*Transitioning from controlled builds to regulatory pathway & clinical testing.*

# Deliberate Progress Toward Clinical Readiness

November 2022 — November 2024 — April 2025 — 2026

## 1. Beta 2

Established feasibility of core kinematics & vision.

- Proof of concept demonstrated
- Instrument range of motion validated

## 2. EV2

Incorporated surgeon feedback from Beta 2.

- Reduced instrument size
- Improved camera field of view
- Redesigned patient cart boom

## 3. pDV

Proved reliability, repeatability, formative testing.

- Biocompatibility & sterilization assessed
- Ship testing
- First builds under full Quality Management System (QMS)


## Production-Equivalent

Performance at intended specs

- Designed for manufacturability
- Ready for clinical use and commercialization

Increasing functionality & decreasing risk

*QMS=Quality Management System

# Two Controlled Builds: *Foundation for Scale*


*Vicarious Surgical achieved one of the most important milestones in the development of our robotic surgical platform*

- **April 2025:** First controlled build → fully documented, traceable, auditable.
- **August 2025:** Rebuilt faster and more efficiently → demonstrated reproducibility & scalability.
- **Outcome:** Confidence in platform integration scalability.

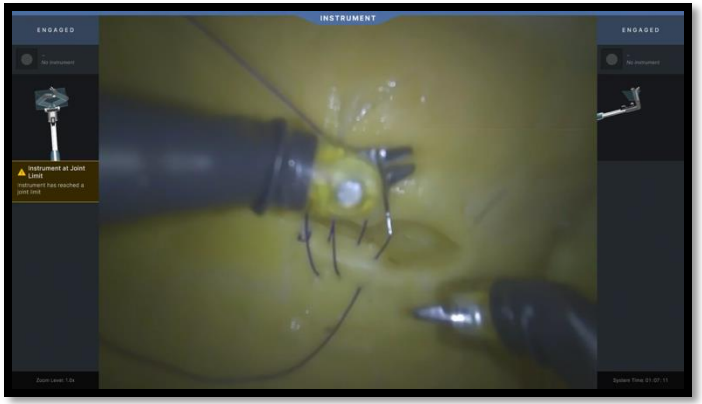
# *Progressing Toward Clinical-Grade System*


*The first system built to a standard suitable for regulatory testing and clinical use.*

- Steady incorporation of remaining design requirements.
- Functionality increased from **49% (June) → 63% (Sept) → 70% (Oct) → clear path toward 100%***.
- **2026 milestone:** First production-equivalent version of the platform.
- Built under full manufacturing & quality standards, foundation for regulatory testing & clinical trials.

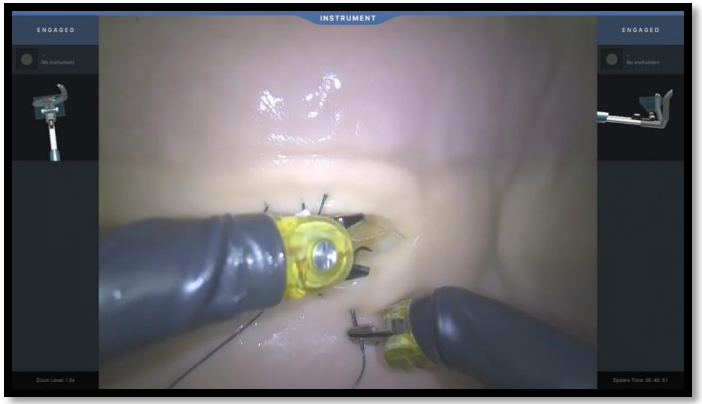
*ESTIMATE BASED ON INTERNAL DATA ON FILE

# *Demonstrated Improvements: Camera Performance*




8/19 Syndaver lab with KOL Dr. Belyansky

**Camera focus and fogging issues resolved**




9/16 Syndaver lab with KOL Dr. Belyansky

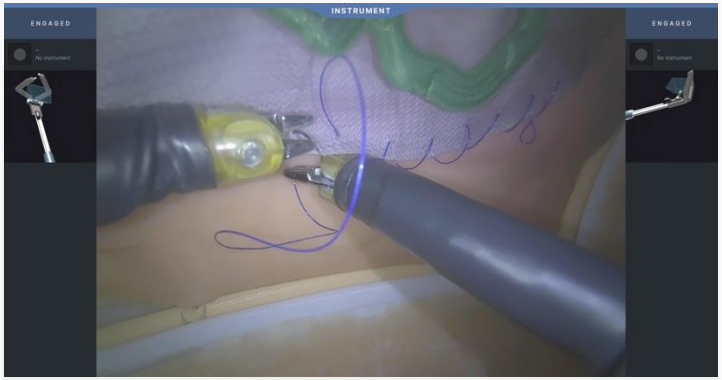
NOTE: VIDEOS AT 2X SPEED

# *Demonstrated Improvements:* Instrument Precision & Reliability


**8/19 Syndaver lab with KOL Dr. Belyansky, pDV System**

- 45 Minute mesh fixation time
- 1 IPOM completed
- 3 broken arms

**Improved surgical efficiency**




**11/4 Syndaver lab with KOL Dr. Belyansky, pDV System**

- 13 Minute mesh fixation time
- 3 IPOM's completed
- 0 broken arms

*"The progress in the last six months has been exceptional. Instrument reliability and precision have taken a major leap forward — giving me consistent, confident control in complex maneuvers. This system is quickly reaching a level of performance that can truly change abdominal surgery."*

**– Igor Belyansky, MD**
**Director, Abdominal Wall Reconstruction Program**
**Anne Arundel Medical Center**

# *Next Phase:* De-Risked Entry Into Clinical Testing


- **Year-End 2026:** Clinical Readiness milestone → all requirements frozen, hardened system, stable and reliable.
- **2027:**
  - Entering **regulatory V&V** from a de-risked position (continuous verification & usability testing already done).
  - Human factors, usability, and safety studies.
  - **Human clinical trials** → generate data to support De Novo submission & market authorization.

# Vicarious Surgical: *Bringing An Open-Surgery Experience to Robotics*

*Join Us In Transforming Surgery For Millions Of Patients Worldwide*

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