MITRAL VALVE REPAIR

Solutions for minimally invasive cardiac surgery
The *da Vinci* Surgical System

**Surgeon Benefits**

Enables surgeons to offer a minimally invasive surgical approach for mitral valve prolapse

The visualization, precision, dexterity and control provided by the *da Vinci* Surgical System offers the following potential surgeon benefits:

- Similar immediate repair success rates as conventional surgery with significantly shorter recovery times
- Extend the benefits of minimally invasive surgery to more patients with similar outcomes and patient satisfaction
- Surgical autonomy and efficiency with control of the camera and three operative arms from the surgeon console

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**TilePro™ Multi-Input Display**

Allows the surgeon and the OR team to view 3D video of the operative field along with up to two additional video sources, such as ultrasound and EKG.

**Available exclusively on the *da Vinci* Si™**

Dual console capability allows an additional surgeon to provide an assist or can facilitate teaching and proctoring by connecting a second surgeon console.

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*da Vinci* Mitral Valve Repair is a technically complex procedure, which may result in longer operative times.
Four ways *da Vinci* technology facilitates a precise mitral valve repair:

1. **Lateral Approach**
   - Obtain a 3DHD® view of the mitral valve anatomy and minimize valve distortion or rib spreading with a minimally invasive lateral approach.

2. **Dynamic Atrial Retraction™**
   - *da Vinci*-controlled *Dynamic Atrial Retraction* provided by the 3rd instrument arm allows the surgeon to adapt and optimize exposure of the entire mitral valve from the console.

3. **Complex Repair**
   - The precision and dexterity offered by *EndoWrist* instrumentation facilitates a surgeon’s ability to use innovative techniques, including subvalvular chord transposition or Gore-Tex® chord insertion, on complex abnormalities.

4. **Sutured Annuloplasty**
   - *EndoWrist* instrumentation enables sutured annuloplasty with conventional rigid, semi-rigid, and/or flexible annuloplasty band and ring technologies along with a running horizontal mattress or interrupted technique depending on surgeon preference.

For technology videos visit [www.daVinciSurgeryCommunity.com](http://www.daVinciSurgeryCommunity.com)
Quality of life after early mitral valve repair using conventional and robotic approaches.


The time between the operation and return to full-time or part-time employment was shorter for patients who had robotic repair (p <0.001).

Study limitations include but are not limited to: retrospective pilot study; single assessment of quality of life with no baseline or follow-up; unmeasured factors could account for observed treatment differences.

Robotic repair of posterior mitral valve prolapse versus conventional approaches: potential realized.


Among propensity matched patients in the robotic (n=261) and mini thoracotomy (n=114) groups, those in the robotic group had the shortest postoperative stay (median, 4.2 days) and 0.9 less days than the mini thoracotomy group (p <0.001).

Study limitations include but are not limited to: retrospective nature; single institution; outcomes analysis limited to post-operative stay.

The clinical evaluation of the da Vinci Surgical Systems (Models IS1200, IS2000, IS3000) supporting its use for mitral valve repair was not performed totally endoscopically. Introduction and manipulation of the endoscopic instruments were controlled by the da Vinci Surgical System through port incisions (< 1 cm) while accessory technologies, e.g., atrial retractor and cardioplegia line, etc, were introduced through a mini-thoracotomy. Performance characteristics of totally endoscopic mitral valve repair using the da Vinci System have not been established.
POSSIBLE BENEFITS COMPARED TO OPEN SURGERY:

- Less blood loss and need for transfusions
- Less time in intensive care
- Shorter hospital stay
- Lower rate of atrial fibrillation after surgery (rapid/irregular heartbeat)
- Lower rate of pleural effusions after surgery (excess fluid around the lung)
- Faster recovery and return to normal daily activities, including work
- Faster improvement of physical & mental health following surgery
- Small incisions for minimal scarring

POSSIBLE RISKS INCLUDE:

- Heart attack or stroke
- Heart rhythm problems
- Infection in the kidneys, chest, valves or bladder
- Fever and chest pain (together called post-pericardiotomy syndrome)
- Memory loss and/or loss of mental clarity

In addition to the above risks, there are risks related to minimally invasive surgery, including da Vinci Mitral Valve Repair Surgery, such as damage to nearby organs or nerves and conversion to open surgery.

EndoWrist® Instruments Offered for da Vinci® Mitral Valve Repair

<table>
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<tr>
<th>STANDARD/S,SI PN</th>
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<tr>
<td>Curved Scissors 400178/420178</td>
<td>Curved jaws, Narrow cutting profile, Tapered atraumatic tip</td>
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<tr>
<td>Resano Forceps 400181/420181</td>
<td>Resano-style jaw design, Tip-closing jaw</td>
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<td>Atrial Retractor 400204/420204</td>
<td>EndoWrist technology, Robotic control, Low profile, narrow 45mm blades</td>
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<tr>
<td>Valve Hook 400192/420192</td>
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<td>DeBakey Forceps 400036/420036</td>
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<td>Large Needle Driver 400006/420006</td>
<td>Crosshatch pattern, Strong jaw design</td>
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<td>Large SutureCut Needle Driver 420296</td>
<td>Carbide-insert style jaws, Diamond pattern jaw profile</td>
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All surgeries carry risks of adverse outcomes. While clinical studies support the use of the da Vinci® Surgical System as an effective tool for minimally invasive surgery for specific procedures, individual results may vary. Training provided by Intuitive Surgical is limited to the use of the da Vinci System. Intuitive is not responsible for procedure descriptions. Unless otherwise noted, products featured are cleared for commercial distribution in the U.S. and bear the CE mark. For availability and clearances outside the US, please check with your local representative or distributor. For complete technical and labeling information, including indications, contraindications, warnings, precautions and safety information, please refer to www.intuitivesurgical.com/safety.

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