Policy Number	**SUR701.014**
Policy Effective Date	**05/15/2024**
Policy End Date	**12/31/2025**

Endoscopic, Arthroscopic, Laparoscopic, Bronchoscopic and Thoracoscopic Surgery

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Related Policies (if applicable)
None

Disclaimer

Carefully check state regulations and/or the member contract.
Each benefit plan, summary plan description or contract defines which services are covered, which services are excluded, and which services are subject to dollar caps or other limitations, conditions or exclusions. Members and their providers have the responsibility for consulting the member's benefit plan, summary plan description or contract to determine if there are any exclusions or other benefit limitations applicable to this service or supply. **If there is a discrepancy between a Medical Policy and a member's benefit plan, summary plan description or contract, the benefit plan, summary plan description or contract will govern.**

Coverage

This medical policy has become inactive as of the end date above. There is no current active version and this policy is not to be used for current claims adjudication or business purposes.

Endoscopic, arthroscopic, laparoscopic, bronchoscopic and thoracoscopic procedures **may be considered medically necessary** as an alternative to the corresponding open surgical procedures when they duplicate the same surgical techniques and principles of the corresponding open technique with the only difference being the surgical access. Some surgeries can combine an open approach with the endoscopic approach, such as a laparoscopic assisted vaginal hysterectomy.

Bronchoscopic Occlusion of Fistula
Bronchoscopic occlusion of a persistent bronchopleural fistula (BPF) **may be considered medically necessary** for patients who are not surgical candidates.

Bronchoscopic occlusion of a persistent BPF **is considered experimental, investigational and/or unproven** for all other indications.

Robotic Assistance

The surgical instruments, devices and adjuncts a surgeon selects for performing a surgical procedure are regarded as integral to achieving a successful outcome for that procedure. Robotic assistance, as an adjunct to the primary procedure, **is considered not medically necessary**.

NOTE 1: Medical records may be requested for determination of medical necessity. When medical records are requested, a letter of support and/or explanation is helpful but alone will not be considered sufficient documentation to make a medical necessity determination.

NOTE 2: A listing of patient selection criteria for each endoscopic, arthroscopic, laparoscopic, bronchoscopic and thoracoscopic procedure is beyond the scope of this policy. However, in general, candidates for such an endoscopic procedure should meet patient selection criteria for the corresponding open procedure; endoscopic procedures should not be considered an alternative to appropriate medical management.

Policy Guidelines

None.

Description

As used in this policy, endoscopic surgery is a general term describing a form of minimally invasive surgery in which access to a body cavity is achieved through several small percutaneous incisions. The surgery is performed using specialized instrumentation inserted through the incisions (i.e., trocar sites) and guided by the use of a fiberoptic endoscope that provides visualization of the body cavity on a video screen. In endoscopic surgery, the surgeon does not have direct visualization of the surgical field, and thus endoscopic techniques require specialized skills compared to the corresponding open surgical techniques. Endoscopic surgery may also refer to the use of a fiberoptic endoscope inserted through a body orifice into a body cavity such as the gastrointestinal tract, bronchi, uterus, or bladder.

While endoscopic surgery is a general term, laparoscopic, thoracoscopic, bronchoscopic and arthroscopic surgery describe endoscopic surgery within the abdomen, thoracic cavity, lungs and joint spaces, respectively. In most instances, the endoscopic technique attempts to duplicate the same surgical techniques and principles as the corresponding open techniques, with the only difference being surgical access. For example, laparoscopic cholecystectomy, performed since 1990, espouses the same surgical principles as open cholecystectomy. The advantages of endoscopic surgery include shorter hospital stays and more rapid recovery such

that the patient may be able to return to work promptly. Disadvantages include a longer operative time, particularly if the surgeon is early on the learning curve for these techniques.

Some endoscopic approaches entail novel surgical principles, and thus raise issues of safety and effectiveness apart from the safety and effectiveness of the endoscopic approach itself. For example, open herniorrhaphy is typically done from an inguinal approach, while laparoscopic herniorrhaphy involves a unique abdominal approach. In other procedures, the surgical dissection can be done entirely with endoscopic guidance, but the resulting surgical specimen may be too large to remove through the small trocar incision. Novel approaches have been devised to overcome this limitation. For example, in laparoscopic splenectomy or nephrectomy, the resected specimens are placed into a bag intra-abdominally, morcellated, and then removed through a small muscle-splitting incision. Similarly, laparoscopic colectomy specimens can be removed through either a muscle-splitting incision or transanally for distal specimens. Surgeries can combine an open and laparoscopic approach; for example, laparoscopic-assisted vaginal hysterectomy may entail a laparoscopic surgical dissection, with removal of the specimen through a vaginal incision similar to an open vaginal hysterectomy.

In most instances, it is assumed that an endoscopic approach is a direct substitution for the corresponding open approach. However, the decreased morbidity of endoscopic surgeries in general may broaden the patient selection criteria for certain surgeries. For example, open gastric fundoplication is typically limited to those patients who have failed medical management with histamine 2 blockers and antimotility agents. Now however, laparoscopic fundoplication may be considered an alternative to lifelong medical management. Similarly, open plantar fasciotomy is typically reserved for those symptomatic patients who have failed a prolonged attempt at conservative management. The decreased morbidity of an endoscopic approach may prompt a shortened period of conservative management.

Bronchoscopic Occlusion of Fistula

A bronchopleural fistula (BPF) is a passageway between the pleural space and the lung which can be caused by various reasons such as rupture of a lung abscess, cysts, and trauma and is associated with a high mortality rate. Initial management will be individualized but may include tube thoracostomy for chest tube drainage and intravenous antibiotic therapy. Subsequent treatment will vary depending on the magnitude and duration of air leak, underlying cause, and the patient's overall medical condition. BPFs that do not heal by this method may be subjected to surgery. However, surgery may not be feasible due to extensive underlying lung disease, comorbidity, poor general condition, or advanced age. Bronchoscopy has been gaining acceptance as a therapeutic modality in patients with BPF. The bronchoscope has been successfully used to visualize the track of a BPF. By using balloons to systematically occlude the bronchial segments, the fistula can be located and sealed. Multiple modalities/devices have been cited for use in closure of the fistula including, ethanol, polyethylene glycol, lead shots, cyanoacrylate glue, fibrin glue, blood clots, antibiotics, albumin-glutaraldehyde tissue adhesive, gel foam, coils, balloon catheter occlusion, silver nitrate, and stents.

Robotic Assistance

Robotically assisted procedures are those in which a minimally invasive surgical procedure is performed from a computerized workstation, where a surgeon views the operative field through a specialized camera arrangement and manipulates robotic arms to hold and position instruments that will grasp, cut, dissect, cauterize and suture tissue via hand controls and foot switches. It may also be used in some traditional open surgical procedures.

Rationale

This medical policy was developed in 1999 and has been updated periodically with literature review. The most recent literature update was performed through February 23, 2023.

Medical policies assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function--including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Bronchoscopic Occlusion of Fistula

Although controlled trials are lacking regarding occlusion of persistent bronchopleural fistula (BPF) via bronchoscopy, the evidence thus far in case reports suggest its efficacy in selected patients not eligible for surgery. Various endoscopic options are successful in 35% to 80% of cases and have been responsible for significantly reducing the morbidity and mortality from bronchopleural fistulae. (1-4)

Cardillo et al. (2015) retrospectively reviewed the records of 3,832 patients who underwent pulmonary anatomic resections. (5) The overall incidence of BPF was 1.4% (52 of 3,832): 1.2% after lobectomy and 4.4% after pneumonectomy. Pneumonectomy vs lobectomy, right-sided vs left-sided resection, and hand-sewn closure of the stump vs stapling showed a statistically significant correlation with fistula formation. Primary bronchoscopic treatment was performed

in 35 of 52 patients (67.3%) with a fistula of less than 1 cm and with a viable stump. The remaining 17 patients (32.7%) underwent primary operation. The fistula was cured with endoscopic treatment in 80% and with operative repair in 88.2%. Cure rates were 62.5% after pneumonectomy and 86.4% after lobectomy. The cure rate with endoscopic treatment was 92.3% in very small fistulas, 71.4% in small fistulas, and 80% in intermediate fistulas. The cure rate after surgical treatment was 100% in small fistulas, 75% in intermediate fistulas, and 100% in very large fistulas. Morbidity and mortality rates were 5.8% and 3.8%, respectively. Researchers found that the bronchoscopic approach shows very promising results in all but the largest bronchopleural fistulas; very small, small, and intermediate fistulas with a viable bronchial stump can be managed endoscopically, using mechanical abrasion, polidocanol sclerosing agent, and cyanoacrylate glue. Additionally, bronchoscopic treatment can be repeated, and if it fails, does not preclude subsequent successful surgical treatment.

Summary of Evidence-Bronchoscopic Occlusion of Fistula

Although controlled trials are lacking regarding occlusion of persistent bronchopleural fistula (BPF) via bronchoscopy, the evidence thus far suggests efficacy in carefully selected patients.

Robotic Assistance

Wright and colleagues analyzed complications, transfusion, reoperation, length of stay, death and cost for women who underwent robotic hysterectomy compared with both abdominal and laparoscopic procedures, in a cohort study of 264,758 women who had a hysterectomy performed for benign gynecologic conditions at 441 hospitals in the United States from 2007 to 2010. The results noted use of robotically assisted hysterectomy increased from 0.5% in 2007 to 9.5% of all hysterectomies in 2010. Three years after the first robotic procedure at hospitals where robotically assisted hysterectomy was performed, robotically assisted hysterectomy accounted for 22.4% of all hysterectomies. The authors also noted the following results: In a propensity score-matched analysis, overall complication rates were similar for robotic-assisted and laparoscopic hysterectomy (5.5% vs 5.3%; relative risk [RR], 1.03; 95% confidence interval [CI], 0.86-1.24). Although patients who underwent a robotic-assisted hysterectomy were less likely to have a length of stay longer than 2 days (19.6% vs 24.9%; RR, 0.78, 95% CI, 0.67-0.92), transfusion requirements (1.4% vs 1.8%; RR, 0.80; 95% CI, 0.55-1.16) and the rate of discharge to a nursing facility (0.2% vs 0.3%; RR, 0.79; 95% CI, 0.35-1.76) were similar. The authors also note in their conclusions that robotically assisted and laparoscopic hysterectomy has similar morbidity profiles, but the use of robotic technology resulted in substantially more costs (6).

Magheli et al. examined the pathological and biochemical outcomes of patients who underwent robot-assisted radical prostatectomy (RARP), laparoscopic radical prostatectomy (LRP), and radical retropubic prostatectomy (RRP). Between 2003 and 2008, five hundred twenty-two consecutive patients who underwent RARP were matched by propensity scoring on the basis of patient age, race, biopsy Gleason score, preoperative prostate-specific antigen, and clinical stage with an equal number of patients who underwent LRP and RRP at a single institution. The authors reported that overall positive surgical margin rates were lower among patients who underwent RRP (14.4%) and LRP (13.0%) compared to patients who underwent RARP (19.5%) (P= 0.010). There were no statistically significant differences in positive margin rates between

the three surgical techniques for pT2 disease (P= 0.264). Kaplan-Meier analysis did not show any statistically significant differences with respect to biochemical recurrence for the three surgical groups. The authors concluded that RRP, LRP and RARP represent effective surgical approaches for the treatment for clinically localized prostate cancer. A higher overall positive surgical margin (SM) rate was observed for the RARP group compared to RRP and LRP; however, there was no difference with respect to biochemical recurrence-free survival between groups. The authors also noted that further prospective studies are warranted to determine whether any particular technique is superior with regard to long-term clinical outcomes (7).

Broholm et al. (2016) evaluated the available evidence from RCTs comparing robot-assisted surgery with open and laparoscopic surgery regardless of surgical procedure. (8) The meta-analyses, which included 20 studies comprising 981 patients, found no significant differences between robot-assisted and laparoscopic surgery regarding blood loss, complication rates, and hospital stay. The reviewers noted in their results that open vs robot- assisted surgery was investigated in 3 studies. A lower blood loss and a longer operative time were found after robot-assisted surgery. No other difference was detected.

Roh et al. (2018) conducted a comprehensive comparison of treatment outcomes between robot-assisted laparoscopic surgery (RLS) and conventional laparoscopic surgery (CLS) based on RCTs. (9) A search was conducted for RCTs in PubMed, EMBASE, and Cochrane databases from 1981 to 2016. Among a total of 1,517 articles, 27 clinical reports with a mean sample size of 65 patients per report (32.7 patients who underwent RLS and 32.5 who underwent CLS), met the inclusion criteria. CLS showed significant advantages in total operative time, net operative time, total complication rate, and operative cost ($p < 0.05$ in all cases), whereas the estimated blood loss was less in RLS ($p < 0.05$). As subgroup analyses, conversion rate on colectomy and length of hospital stay on hysterectomy statistically favored RLS ($p < 0.05$). The reviewers concluded that despite higher operative cost, RLS does not result in statistically better treatment outcomes, with the exception of lower estimated blood loss. Operative time and total complication rate are significantly more favorable with CLS.

Ting Ng et al. (2019) conducted a review to determine whether robotic-assisted laparoscopic surgery (RAS) has better clinical outcomes for colorectal cancer patients than conventional laparoscopic surgery (CLS). (13) Seventy-three studies (6 RCTs and 67 observational studies) were eligible (n = 169,236). Patients who received RAS had a significantly shorter duration of hospitalization ($\rho < 0.001$, I2 = 94%; REM: MD - 0.77; 95% CI 1.12, - 0.41; day), time to oral diet ($\rho < 0.001$, I2 = 60%; REM: MD - 0.43; 95% CI - 0.64, - 0.21; day) and lesser intraoperative blood loss ($\rho = 0.01$, I2 = 88%; REM: MD - 18.05; 95% CI - 32.24, - 3.85; ml). However, RAS cohort was noted to require a significant longer duration of operative time ($\rho < 0.001$, I2 = 93%; REM: MD 38.19; 95% CI 28.78,47.60; min). This meta-analysis suggests that RAS provides better clinical outcomes for colorectal cancer patients as compared to the CLS at the expense of longer duration of operative time. However, the inconclusive trial sequential analysis and an overall low level of evidence in this review warrant future adequately powered RCTs to draw firm conclusion.

UpToDate

Robot-assist laparoscopy has features that overcome some of the difficulties associated with conventional laparoscopy and may also introduce new surgical options (e.g., remotely performed surgery). However, the cost for this type of surgery is high and operative time is typically longer, especially when the surgeon is new to using the technique. RLS has its own sort of unique complications that may occur, including "mechanical breakdown of the robotic equipment, use of excessive pressure on various tissues due to lack of tactile feedback, erroneous activation of a control, errant movement or positioning of a robotic arm, or loss of a needle outside of direct vision while the console surgeon is zooming in on various structures." Newer system designs have reduced or eliminated some of these complications. (10)

Practice Guidelines and Position Statements

Society of Gynecologic Surgeons

In a Committee Opinion (2020) (11), the Society of Gynecologic Surgeons stated that "Although the quality of data for robot-assisted surgery is still low to moderate, the use of robot-assisted surgery has rapidly increased since its approval, which highlights the need to develop effective and thoughtful strategies for its implementation", and that "Well-designed studies are needed to determine which patients are most likely to benefit from robot-assisted surgery over other minimally invasive approaches."

Society of Gynecologic Oncology

In 2012, the Society of Gynecologic Oncology developed a consensus statement document regarding robotic-assisted surgery in gynecologic oncology. The document addressed several considerations regarding robotic surgery, including clinical impact, training impact, and quality of life. The authors noted "The need for randomized controlled trials to compare outcomes of robotic technology to other forms of minimally invasive surgery is a topic of debate. Robotics simply represents a new tool to accomplish a minimally invasive procedure. As with other tools for minimally invasive surgery, their broad-based use has been largely incorporated into standard surgical practice based on retrospective analysis and surgeon preference." The authors' concluded that current evidence supports equivalence of robotic surgery and laparoscopy in many perioperative outcome measures (12).

Summary of Evidence for Robotic Assistance

The literature does not support that robotic technology is superior to minimally invasive surgical approaches. It is a tool for minimally invasive surgery, subject to the surgeon's preference, therefore, robotic assistance as an adjunct to the primary procedure is considered not medically necessary.

Coding

Procedure codes on Medical Policy documents are included **only** as a general reference tool for each policy. **They may not be all-inclusive.**

The presence or absence of procedure, service, supply, or device codes in a Medical Policy document has no relevance for determination of benefit coverage for members or reimbursement for providers. **Only the written coverage position in a Medical Policy should be used for such determinations.**

Benefit coverage determinations based on written Medical Policy coverage positions must include review of the member's benefit contract or Summary Plan Description (SPD) for defined coverage vs. non-coverage, benefit exclusions, and benefit limitations such as dollar or duration caps.

CPT Codes	31634
HCPCS Codes	S2900

*Current Procedural Terminology (CPT®) ©2023 American Medical Association: Chicago, IL.

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Centers for Medicare and Medicaid Services (CMS)

The information contained in this section is for informational purposes only. HCSC makes no representation as to the accuracy of this information. It is not to be used for claims adjudication for HCSC Plans.

The Centers for Medicare and Medicaid Services (CMS) does have a national Medicare coverage position. Coverage may be subject to local carrier discretion.

A national coverage position for Medicare may have been changed since this medical policy document was written. See Medicare's National Coverage at <http://www.cms.hhs.gov>.

Policy History/Revision

Date	Description of Change
12/31/2025	Document became inactive.
05/15/2024	Reviewed. No changes.
05/01/2023	Document updated with literature review. Coverage unchanged. Reference 13 added.
12/01/2022	Reviewed. No changes.
07/01/2021	Document updated with literature review. Coverage unchanged. No new references added; reference 11 updated.
07/15/2020	Document updated with literature review. The following changes were made to Coverage: 1) Added “bronchoscopic” to list of procedure types addressed within policy; 2) Removed content on transanal endoscopic microsurgery, now addressed in SUR701.040; 3) Added “Bronchoscopic occlusion of a persistent BPF is considered experimental, investigational and/or unproven for all other indications”; 4) Removed content on thermally-induced capsulorrhaphy, now addressed in SUR705.041. Added references 5, 9-11; others removed. Title changed from “Endoscopic, Arthroscopic, Laparoscopic, and Thoracoscopic Surgery”.
07/01/2018	Document updated with literature review. Coverage unchanged. References 16, 17, 35, 63, and 64 were added.
04/15/2017	Reviewed. No changes.
08/01/2016	Document updated with literature review. Coverage unchanged. The Rationale section was substantially revised.
04/15/2015	Reviewed. No changes.

10/15/2014	Reviewed. The following coverage statement was removed: The following additional endoscopic, arthroscopic and laparoscopic procedures are considered experimental, investigational and unproven as the surgical technique differs significantly from the open surgical procedure: Laparoscopic or percutaneous myolysis of uterine fibroids. (Coverage has been changed.) This topic is now addressed on SUR701.033 Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids. CPT/HCPCS code(s) updated.
06/15/2013	Policy updated with literature review. The following was added: The example of "elbow" was added to the experimental, investigational and unproven coverage position for "Thermally-induced capsulorrhaphy". CPT/HCPCS code(s) updated.
01/01/2011	Policy updated with literature review. The following was added: Bronchoscopic occlusion of a persistent bronchopleural fistula may be considered medically necessary for patients who are not surgical candidates. Updated and added new 2011 CPT codes.
03/01/2010	Policy updated with literature search. Policy statement changed: TEMS may be considered medically necessary for removal of rectal adenomas and selected T1 cancers.
01/01/2009	New CPT/HCPCS Codes
10/01/2008	Codes Revised. Coverage Revised
06/01/2008	Revised/Updated Entire Document
02/15/2007	Codes Revised/Added/Deleted
01/01/2007	Coverage Revised, Codes Revised/Added/Deleted
08/01/2006	Revised/Updated Entire Document
07/14/2005	Coverage Revised
07/01/2005	Codes Revised/Added/Deleted
06/16/2005	Coverage Revised
06/14/2005	Codes Revised/Added/Deleted
05/15/2005	Revised/Updated Entire Document. Codes Revised/Added/Deleted
03/01/2004	Codes Revised/Added/Deleted
12/01/2004	Revised/Updated Entire Document
02/01/2002	Revised/Updated Entire Document
11/01/2000	Revised/Updated Entire Document
01/01/2000	Revised/Updated Entire Document
11/01/1999	Revised/Updated Entire Document
09/01/1999	New Medical Document