Hysterectomy, the surgical removal of all or part of the uterus, is one of the most common procedures performed on women in the United States. It has been overutilized as the primary treatment option for benign indications without prior conservative therapies. The choice of surgical approach (abdominal vs. vaginal vs. laparoscopic with and without robotic assistance) is also at issue. Hysterectomy approaches and modalities have been compared for short- and long-term outcomes and cost-effectiveness. Payment for surgery has been addressed by multiple third-party payers through alternative payment models, such as episode groups, to incentivize appropriate resource use, increase provider accountability, and optimize patient outcomes. The American Congress of Obstetricians and Gynecologists (ACOG) convened a multi-stakeholder panel to develop an episode group and corresponding performance measure concepts for hysterectomy for benign indications.

The settings where hysterectomies are performed have shifted away from inpatient to outpatient ambulatory facilities. Using the Nationwide Inpatient Sample (NIS) from the Agency for Healthcare Research and Quality (AHRQ), the number of inpatient hysterectomies was estimated to be 681,234 in 2002 which decreased to 433,621 in 2010. The median hospital case volume also declined from 83 to 50 procedures per year, respectively. The number of inpatient hysterectomies has continued to decline, to 311,820 in 2012. Nevertheless, this is not indicative of the total number of hysterectomies performed, since many procedures are now performed in an outpatient setting. It is expected that the number of outpatient hysterectomies has increased over the last decade. A study of statewide databases in 2012 showed outpatient hysterectomies in hospital-owned ambulatory surgery facilities represented approximately 40 percent of the hysterectomies. Nevertheless, the prevalence of same-day in hospital surgery and outpatient hysterectomy over the same time period is not found as conveniently in national databases and therefore not published widely in the scientific literature. The continuing shift from inpatient to outpatient settings provides an opportunity to reduce costs for the health system because of the lower overhead costs associated with outpatient settings.
Hysterectomies may address cervical and uterine cancer as well as a variety of benign indications. The most common benign indications for hysterectomy include uterine fibroids, abnormal uterine bleeding, pelvic organ prolapse, and endometriosis. The number of inpatient hysterectomies for cancer has remained relatively stable at 12 percent of cases in 2010 and 15 percent of cases in 2012.\(^2\) Of inpatient hysterectomies, uterine fibroids accounted for 55 percent in 2002 and 45 percent in 2010; abnormal uterine bleeding accounted for 40 percent in 2002 and 45 percent in 2010; pelvic organ prolapse accounted for 18 percent in 2002 and 17 percent in 2010; endometriosis accounted for 35 percent in 2002 and 19 percent in 2010.\(^1\) These indications are not exclusive of each other and may present concurrently in women. For example, uterine fibroids may be associated with abnormal bleeding.

In addition, benign indications have a variety of alternative medical and uterine-sparing surgical management options including hormonal therapy, endometrial ablation, and uterine artery embolization. These alternative options may be underutilized prior to performing surgery. A state-wide surgical quality collaborative analyzing 3,397 women from 52 hospitals found no documentation of alternative treatments prior to hysterectomy in 32 percent of patients under 40 years of age, in 38 percent of patients between 40 and 50 years, and in 45 percent of the patients over 50 years of age. In addition, white women were more likely than black women to receive alternative treatment.\(^4\) Most alternatives would be offered to patients in an outpatient visit, sometimes by the same surgeon who may perform a subsequent hysterectomy or by a referring surgeon or physician. In a 10-year randomized trial of embolization versus hysterectomy, it was shown that as many as two-thirds of the patients with symptomatic uterine fibroids could avoid hysterectomy with uterine artery embolization and, therefore, maintain long-term health-related quality of life and patient satisfaction.\(^5\)

This clearly presents an opportunity for improvement. The surgical episode group is intended to encourage cost-effective choices in surgical route, setting, and accountability for surgery-related complications but does not address the overuse of hysterectomy. To address this, ACOG drafted a performance measure concept with the goal of promoting conservative medical
and uterine-sparing surgical management prior to hysterectomy for women under 55 years of age with abnormal uterine bleeding and fibroids. The goal of this measure will not be to reach 100 percent but to encourage less invasive procedures and treatments and allow time for shared decision making and appropriate patient counseling prior to hysterectomy.

For women who are unsatisfied with prior medical or uterine-sparing surgical management, there are multiple options among surgical approaches including vaginal, laparoscopic (with or without robotic assistance), and abdominal. Additionally, these surgical approaches may be supracervical, leaving the cervix intact. In most cases, surgical approach is dependent on physician preferences and decisions resulting from physician counseling of surgical candidates. Regardless of the surgeon’s initial plan, s/he may need to convert to another approach intraoperatively if there are unanticipated anatomic or technical challenges or unexpected clinical findings.

Vaginal hysterectomy, the least invasive procedure, is the recommended route based on lower risks of complications as well as lower total cost. In comparison to abdominal hysterectomy, vaginal hysterectomy is associated with shorter operating room time, shorter hospital stays, and quicker return to normal activities. However, vaginal hysterectomy accounted for only 16.7 percent of all inpatient hysterectomies in 2010; and, it accounted for 16.9 percent of inpatient hysterectomies for benign indications in 2012. Unfortunately, vaginal hysterectomy remains underutilized despite practice recommendations from the American College of Obstetricians and Gynecologists. Even in training, the average was 25 for vaginal hysterectomy cases and 46 for abdominal hysterectomy cases in 2016, both decreases from 2003 averages of 35 cases and 89 cases, respectively.

Laparoscopic hysterectomy may be a better choice than vaginal hysterectomy in cases evaluating adnexal masses or with severe endometriosis. It is generally subcategorized as: laparoscopic-assisted vaginal hysterectomy, where the laparoscopic component of the operation does not involve division of the uterine vessels; laparoscopic hysterectomy, where the uterine vessels are ligated laparoscopically but part of the procedure is completed vaginally; and total
laparoscopic hysterectomy, where the entire operation is performed laparoscopically and the only vaginal component is the removal of the uterus. There are also single-port laparoscopic and mini-laparoscopic hysterectomy (incisions less than 3mm). In comparison with abdominal hysterectomies, laparoscopic hysterectomies are associated with shorter hospital stays, fewer wound or abdominal wall infections, and fewer febrile episodes. In comparison with vaginal hysterectomy, laparoscopic hysterectomies are associated with longer operating room time.

Robotic-assisted hysterectomy, the newest modality, has a laparoscopic approach using remote controlled endoscopic assistance. In a study comparing robotic-assisted hysterectomies against non-robotic (including abdominal, vaginal, and laparoscopic), patients were more likely to have post-operative inpatient readmissions, emergency department visits, or outpatient visits after both inpatient and ambulatory robotic-assisted hysterectomies. In a retrospective cohort study, robotic-assisted hysterectomies had shorter hospital stays and fewer readmissions even compared to laparoscopic procedures. In comparison to laparoscopic hysterectomy, robotic-assisted hysterectomy is associated with longer operating room time. Cumulative surgical volume for robotic hysterectomies did not have a negative direct relationship with total cost per procedure for benign indications as can be shown in procedures for endometrial cancer. The introduction of robotic-assisted hysterectomy has contributed to a decrease in abdominal hysterectomies, but has also exacerbated the underuse of vaginal hysterectomy.

In 2014, a Food and Drug Administration (FDA) Safety Communication highlighted problems occurring where morcellated tissue with unrecognized leiomyosarcoma was unintentionally left behind during laparoscopic hysterectomies. Where the uterus is too large to be removed intact vaginally, the uterus was often morcellated using a power instrument and removed through the laparoscopic instrument incision(s). A pre- and post-FDA communication analysis of one regional hospital system was shown to change provider practice – increasing abdominal hysterectomy rates of generalist obstetrician-gynecologists and minimally-invasive gynecologic surgeons. This was mostly influenced by a 60 percent reduction in laparoscopic supracervical hysterectomies.
Abdominal hysterectomy is the most invasive option for patients. It accounted for 54.2 percent of the inpatient hysterectomies in 2010;\textsuperscript{1} and for 51.2 percent of inpatient hysterectomies for benign indications in 2012.\textsuperscript{2} It is traditionally performed when endometriosis or adhesions are present or where the uterus is enlarged. In one analysis of a state-wide, all-payer database, the following patient, facility, and provider characteristics were associated with providing abdominal hysterectomy: older age (over 45), black and Hispanic women, smaller hospitals, medium hospital hysterectomy volume, and medium surgeon caseload. Unfortunately, women undergoing abdominal hysterectomy were three times as likely to have a complication as compared to those undergoing minimally invasive approaches.\textsuperscript{17} In the American College of Surgeons National Surgical Quality Improvement Program database, abdominal hysterectomy was associated with increased risk of venous thromboembolism and surgical site infections.\textsuperscript{18,19} Of 25,119 hysterectomies in the same database (estimating 29 percent abdominal, 51 percent laparoscopic, 20 percent vaginal), reasons for unplanned readmissions after surgery included 29 percent surgical site infections, 13 percent ileus or obstruction, 8 percent bleeding, 6 percent venous thromboembolism, 3 percent urinary tract infection.\textsuperscript{20} Despite known risks for complications, abdominal hysterectomy rates remain higher than expected.

Comparisons between vaginal, laparoscopic and robotic-assisted hysterectomies may be confounded by the overall experience and annual volume of the surgeon in any one modality compared to the others. In addition, procedures are performed by both generalist obstetrician-gynecologists as well as minimally invasive gynecologic surgeons, reproductive endocrinologists, specialists in female pelvic medicine and reconstructive surgery (urogynecologists), and gynecologic oncologists. Procedures may be done in an outpatient surgical facility, inpatient community hospital, or inpatient tertiary care center. Case mixes are expected to be quite different among provider types and in different settings. Outpatient hysterectomies would not be measured within the denominator of inpatient readmission rates and presents a unique opportunity for improvement across settings.
UnitedHealthcare, in an effort to promote outpatient vaginal hysterectomy, introduced prior authorization requirements for other routes of hysterectomy in any setting in 2015. However, they discontinued this policy in 2017. Depending on the data source, robotic-assisted hysterectomies averaged between $1,617 and $2,189 more per procedure than laparoscopic hysterectomies. Operating room and post-anesthesia care unit costs comprise the largest proportion of inpatient costs for minimally invasive approaches and can range from $8,974 for robotic-assisted to $4,980 for total vaginal hysterectomies of $13,429 and $7,903 in total hospital costs, respectively. Both minimally invasive approaches may cost more for the operative encounter than abdominal hysterectomies, but generally have reduced lengths of stay in comparison. Further, they can be shown to potentially have cost savings in 30-day post-operative readmissions with the average cost per readmission at $5,491 for robotic-assisted hysterectomy, $4,572 for laparoscopic hysterectomy, $6,408 for vaginal hysterectomy, and $7,815 for abdominal hysterectomy. Fee-for-service payment models have created an underlying incentive for more care and more expensive procedures. ACOG’s episode group for benign hysterectomy attempts to remove this incentive and offers health insurance payers a standardized payment model that can be applied across the breadth of surgeon practice patterns, care settings, and patient populations.

In addition, not all post-operative complications will require admission (after an outpatient procedure) or readmission (for an inpatient procedure). To promote the optimization of candidates prior to surgery and shared decision making prior to an invasive procedure as well as accountability for surgical management and outcomes, ACOG drafted a performance measure concept with the goal of attributing emergency room visits, inpatient admissions, and outpatient hospital visits for conditions and complications related to the hysterectomy within 45 days of the procedure. This measure can be applied after both inpatient and outpatient hysterectomies for benign indications.

Regardless of surgical approach, the ultimate goal for elective surgeries for benign indications is to improve the patient’s quality of life. ACOG’s multi-stakeholder panel included...
discussion of measurement of shared decision making, patient satisfaction, and patient-reported outcomes. Based on the discussion, ACOG prioritizes the measurement of pain, regret, fatigue, sexual function, and satisfaction following hysterectomy for benign indications. Collecting patient-reported outcomes through patient portals, within the electronic health record by a clinician at subsequent visits after the post-operative period, or through innovative models such as smart phone applications will need to be scaled across the health care system to satisfy minimum response rates and be applied fairly for accountability.

During ACOG’s multi-stakeholder panel discussion as well as ACOG’s review of patient blogs, web sites, and social media, patient advocates expressed concern about the overuse of elective oophorectomy at the time of hysterectomy for benign indications. In an analysis of 2005 NIS data, ovarian preservation for pre-menopausal women undergoing benign hysterectomy has been shown in 60 percent of women ages 40 to 44 and 37 percent of women ages 45 to 49.\textsuperscript{22} Although the number has been decreasing in the last decade, concomitant oophorectomies are still performed in about half of the hysterectomies for all causes across inpatient and hospital-based ambulatory surgery facilities.\textsuperscript{23} Concomitant prophylactic oophorectomy may decrease the risk of subsequent breast and ovarian cancer but is associated with an increase in risk for cardiovascular disease, lung cancer, and all-cause mortality.\textsuperscript{24} To address this, ACOG drafted a performance measure concept with the goal of promoting ovarian preservation in women under age 65 without a family history of relevant cancer. The goal of this measure is to encourage ovarian preservation in younger women who are not at high risk of relevant cancer; it is not to reach 100 percent in performance.

The multi-stakeholder panel included two patients who have had hysterectomies as well as physician representatives from the AAGL, the American Urogynecologic Society, Society of Gynecologic Oncology, Society of Gynecologic Surgeons, and the American Congress of Obstetricians and Gynecologists. Based on their input, ACOG developed 1) an episode group triggered by the surgical encounter with a list of relevant services and diagnoses and sequelae for a proposed 45-day post-operative period; 2) performance measure concepts to address post-
operative revisits, more conservative treatment options prior to hysterectomy, and ovarian preservation in younger women who are not at high risk of relevant cancer; and 3) priority patient-reported outcomes for pain, regret, fatigue, sexual function, and satisfaction. These draft concepts (including code tables) are open for public comment through 19 June 2017. Public comment feedback will be considered by the multi-stakeholder panel before moving the project forward.
Literature Summary Supporting an Episode Group and Performance Measures for Hysterectomy for Benign Indications

References:

11. Friedman B, Barbash GI, Glied SA, Steiner CA. Hospital revisits within 30 days after conventional and robotically assisted hysterectomy. Medical Care 2016; 54: 311 – 318.


