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ABSTRACT & COMMENTARY

USPSTF Recommendation: Screening for Cervical Cancer

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Dr. Brewer reports no financial relationships relevant to this field of study.

SOURCE: US Preventive Services Task Force; Curry SJ, et al. Screening for cervical cancer: US Preventive Services Task Force Recommendation Statement. *JAMA* 2018;320:674-686.

The U.S. Preventive Services Task Force (USPSTF) recently updated its recommendations for cervical cancer screening. Practitioners currently following guidelines published by ASCCP (and supported by ACOG) will not find any discrepancies in the new USPSTF position. The revised USPSTF guidelines recommend against screening women younger than 21 years of age (D recommendation = USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits). This is in line with what most practitioners already have adopted. The Surveillance, Epidemiology, and End Results (SEER) database[1] estimates that 0.01% of all cervical cancers occur in this young age group, and the prevalence of CIN 3 is 0.2%. The false-positive rate of cytology is 3.2%, leading to a very small benefit in screening women younger than 21 years of age. Moreover, there is the risk of overtreatment affecting fertility or obstetrical outcomes when aggressive treatment, such as a cone biopsy or loop electrical excision procedure, is performed in these young women. The USPSTF also recommends against (D recommendation) screening women older than 65 years of age with a history of adequate screening (e.g., three consecutive negative cytology results or two consecutive negative co-testing results within 10 years). However, for women older than 65 years of age without a history of adequate screening, or those with new risk factors, screening should continue. The task force also recommends against (D) screening women with a history of total hysterectomy (with prior adequate screening).

The new USPSTF guidelines recommend screening women between 21 and 29 years of age every three years with cytology alone (A recommendation = USPSTF recommends the service. There is high certainty that the net benefit is substantial). Since the majority of human

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papillomavirus (HPV) infections are transient in this age group, and overtreatment can lead to undue morbidity (as in the younger than 21 years of age group), HPV testing generally is not helpful or recommended.

In contrast, the guidelines recommend screening women 30-65 years of age every three years with cytology alone, or every five years with either high-risk HPV testing alone or co-testing (A recommendation). The task force concluded that all three of these strategies offer a reasonable balance between benefits and harms for women aged 30 to 65 years, and encouraged women to discuss the pros and cons of each approach with their healthcare provider. It noted that evidence from randomized clinical trials and decision-modeling studies suggest that while screening with cytology alone results in lower detection rates for CIN 2 and CIN 3 than screening with high-risk HPV testing (alone or with co-testing), use of HPV testing results in more colposcopy exams (potential for harm) without an increase in cancer detection.

■ COMMENTARY

So how should we interpret these recommendations? The commentary section of the USPSTF paper notes that the majority of cervical cancer cases and deaths occur in women who have not been screened. It also states there is a lack of evidence that vaccination prevents cervical cancer. For this reason, the USPSTF recommends screening all women with a cervix, regardless of sexual history or HPV vaccination status. The task force also points out that these recommendations only apply to low-risk women with no prior diagnosis of a high-grade squamous lesion or cervical cancer. By focusing our attention to screening of high-risk women, we have the opportunity to improve health outcomes without enormous unnecessary cost. Based on these recommendations, clinicians should consider carefully who needs screening and avoid unnecessary screening of younger and older women. Investing limited healthcare dollars in outreach programs and in the follow-up of abnormal results makes sense. Hispanic, African-American, and Native American women have an increased mortality from cervical cancer compared to white women; we must address this health disparity.

Clinicians also should advocate for HPV vaccination of all girls and boys. Although we lack data showing a reduction in mortality from cervical cancer among vaccinated women, studies have shown a decrease in high-grade dysplasia among women who received the HPV vaccine over 10 years of follow-up.[2] There is ample evidence that the precursor lesion for cervical cancer is high-grade dysplasia.

We now understand the biology of cervical cancer well and know what to do to prevent death and morbidity from this disease: 1) the majority of cervical cancers are caused by high-risk HPV infections; 2) these infections can be prevented with early vaccination; and 3) the majority of cervical cancers occur in women who are not regularly screened with either HPV testing or with cytology. Therefore, our healthcare investment should be focused on educating and vaccinating all young people and on providing outreach to encourage screening in underserved populations. We don't need more randomized trials of screening approaches for cervical cancer. Instead, we should invest our precious healthcare dollars in vaccination and screening. ■

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ABSTRACT & COMMENTARY

Primary HPV Screening: Ready for Prime Time?

By Rebecca H. Allen, MD, MPH

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Dr. Allen reports she is a Nexplanon trainer for Merck.

SYNOPSIS: In this randomized, controlled trial of more than 25,000 women, participants with negative high-risk human papillomavirus testing at baseline had rates of CIN 3+ at 48 months that were lower compared to negative liquid-based cytology testing.

SOURCE: Ogilvie GS, et al. Effect of screening with primary cervical HPV testing vs. cytology testing on high grade cervical intraepithelial neoplasia at 48 months: The HPV FOCAL Randomized Clinical Trial. *JAMA* 2018;320:43-52.

This was a multisite, randomized, controlled trial conducted to evaluate high-risk human papillomavirus (HPV) testing for cervical cancer screening in British Columbia. Inclusion criteria were non-pregnant women 25 to 65 years of age who had not had a Papanicolaou test in the previous 12 months, were HIV-negative, and were not receiving immunosuppressive therapy. Exclusion criteria included women with a total hysterectomy, invasive cervical cancer, or a history of cervical intraepithelial neoplasia (CIN) 2 or more in the previous five years. Women were randomized 1:1:1 to an intervention, control, or safety group. The intervention group underwent primary HPV screening followed by reflex liquid-based cytology (LBC) testing if the results were positive. If their HPV was positive and LBC was negative, the women had 12-month repeat HPV and LBC screening. If either was positive (LBC ≥ ASCUS [atypical typical squamous cells of undetermined significance]), the women were referred for colposcopy. If their HPV was negative at baseline, they were recalled at 48 months for repeat HPV and LBC testing. The control group underwent LBC testing and, if negative, had repeat LBC in 24 months, in accordance with the British Columbia cervical cancer screening guidelines. If this was negative, they were recalled at 48 months for LBC and HPV testing. The LBC was reflexed for HPV in the setting of ASCUS. Women with ASCUS HPV-positive results, as well as any woman with low-grade squamous intraepithelial lesion (LSIL) or greater, were referred to colposcopy. Women with ASCUS HPV-negative results had repeat LBC testing and were referred for colposcopy if this was ASCUS or greater. The safety group and the intervention group were managed the same; however, if the baseline HPV was negative, they were recalled for LBC at 24 months and exited the trial. The primary endpoint was the rate of CIN 3 or greater at 48 months after baseline testing in both groups.

Women were recruited between January 2008 and May 2012. A total of 25,223 women were enrolled — 9,457 in the control group, 6,214 in the safety group, and 9,552 in the intervention group. Only 0.6% of women self-reported any doses of the HPV vaccine. Median follow-up time was 77 months in the intervention group and 77 months in the control group. There was no difference between the two groups regarding sociodemographic and lifestyle characteristics, such as smoking. In the first round of screening, more CIN 3+ cases were detected in the intervention group compared with the control group (relative risk [RR], 1.61; 95% confidence interval [CI], 1.09-2.37). By 48 months, fewer CIN 3+ cases were detected in the intervention compared to the control group (RR, 0.42; 95% CI, 0.25-0.69). Among baseline HPV- or LBC-negative women, rates of CIN 3+ at 48 months were lower in the intervention compared to control group (RR, 0.25; 95% CI, 0.13-0.48). These results also were true for rates of CIN 2+. Cumulative colposcopy referral rates were similar in the two groups (intervention 106/1,000 women vs. control 102/1,000 women), but were higher initially in the intervention group (57/1,000 women vs. 31/1,000 women).

■ COMMENTARY

This study shows that primary HPV screening detects cervical dysplasia earlier and more accurately than cytology alone. It also confirms that a negative HPV test provides greater reassurance of low CIN 3+ risk than a negative cytology result. Study strengths included a large population, the use of a central laboratory minimizing inter-observer bias, blinding of pathologists, and standardized colposcopy procedures. One design component that limits the evaluation of how well HPV compares to cytology alone for screening is that all participants received both tests at the 48-month exit visit. Nevertheless, the authors reported that adding cytology to the intervention group at 48 months detected an additional three CIN 2+ lesions, while adding HPV testing to the control group at 48 months detected an additional 25 CIN 2+ lesions.

Current ACOG recommendations for cervical cancer screening are to initiate screening at age 21.[1] From ages 21 to 29 years, ACOG recommends cytology only every three years. From ages 30 to 65 years, ACOG recommends co-testing with high-risk HPV and cytology every five years. Primary screening with HPV testing starting no earlier than age 25 years also is acceptable per the guidance, as long as the HPV test chosen is FDA-approved for that purpose.[2] Per ACOG, primary HPV screening should not be repeated more often than every three years, although the optimal interval is unknown.

In August 2018, the U.S. Preventive Services Task Force (USPSTF) released final guidance on cervical cancer screening that recommended testing with cervical cytology alone every three years or HPV testing alone every five years in women ages 30 to 65 years.[3] The USPSTF is balancing the fact that cytology alone is slightly less sensitive for detecting CIN 2+, but HPV testing alone is more sensitive, resulting in more diagnostic colposcopies per case detected. Therefore, the task force recommended that women discuss which testing strategy was best for them. According to one decision analysis, screening every five years with high-risk HPV testing alone in women ages 30 to 65 years translates into a slightly lower mortality rate than screening every three years with cytology alone but results in more colposcopies and follow-up tests (39 colposcopies per each cancer case averted for cytology alone vs. 640 additional colposcopies per additional cancer case averted for high-risk HPV testing alone).[4] For co-testing with both HPV and cytology, the USPSTF concluded that co-testing increases the number of colposcopies without resulting in improved detection of CIN 3+ compared to HPV testing alone, so it did not include co-testing in its recommendations. ACOG's response was to uphold its current screening guidelines until further review.[5]

Most likely, I believe ACOG will move toward recommending primary high-risk HPV testing alone for cervical cancer screening, but it is unclear at what interval and for what ages. Based on this study, I would guess starting at age 30 years and at four-year intervals. Removing cytology from testing likely will make some providers and patients uncomfortable, given that there can be false-negatives with HPV testing depending on test performance and specimen adequacy. As long as women are screened adequately for cervical cancer with any modality, then cervical dysplasia and cancer will be prevented. Most cases of cervical cancer in the United States occur in women who have been screened inadequately.[3] Therefore, we need to do a better job at prevention with the HPV vaccine and screening, especially in underserved populations who face insurance, language, and access barriers. ■

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ABSTRACT & COMMENTARY

Intrauterine Devices and Cervical Cancer

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Dr. Allen reports she is a Nexplanon trainer for Merck.

SYNOPSIS: In this case-control study, levonorgestrel IUD use was associated with a slightly increased rate of CIN 2 but not CIN 3. Copper IUD use was not associated with CIN 2 or CIN 3.

SOURCE: Averbach S, et al. Recent intrauterine device use and the risk of precancerous cervical lesions and cervical cancer. *Contraception* 2018; Apr 17. doi: 10.1016/j.contraception.2018.04.008. [Epub ahead of print].

This was a case-control study of women enrolled in a single healthcare system (Kaiser Permanente Northern California) from 1996 to 2014. Cases were defined as women between 18 to 49 years of age with biopsy-proven cervical intraepithelial neoplasia (CIN) 2, CIN 3, adenocarcinoma in situ, or cervical cancer, and who had been enrolled at least 18 continuous months in Kaiser Permanente prior to the first CIN 2+ diagnosis (index date). Controls were women between 18 to 49 years of age with cytology screening and no diagnosis of CIN 2+ as of December 31 of the year (index date) of CIN 2+ diagnosis of the matched case. Five controls were matched to each case on age, cytology test in the system ≤ 12 months prior to the case's CIN 2+ diagnosis, years in the health plan, and date of first health plan cytology test. Women who underwent a total hysterectomy prior to the index date were excluded. Recent intrauterine device (IUD) use was defined as IUD use for at least one month or more in the 18-month period prior to the diagnosis of CIN 2+ for cases and the index date for controls. Ever use of IUD was defined as IUD use at any time prior to the index date. The authors stratified their analysis for levonorgestrel and copper IUDs. Confounding variables, including sexually transmitted infection screening in the past 18 months as a proxy for sexual activity, smoking status, human papillomavirus (HPV) vaccination, other hormonal contraceptive use, parity, race/ethnicity, and number of outpatient visits in the health system, were collected.

There were 17,559 cases (3,080 women with CIN 2, 4,706 with CIN 2/3, 8,914 with CIN 3, and 859 with cancer) matched to 87,378 controls. Cases were more likely to be white and to smoke cigarettes than controls. After adjusting for sexually transmitted infection testing, smoking, HPV vaccination, other hormonal contraceptive use, parity, race, and number of outpatient healthcare system visits, recent IUD users had an increased rate of CIN 2+ (rate ratio [RR], 1.12; 95% confidence interval [CI], 1.05-1.18) but not CIN 3+ (RR, 1.02; 95% CI, 0.93-1.11) compared to non-IUD users. Levonorgestrel IUD use was associated with an increased rate of CIN 2+ (RR, 1.18; 95% CI, 1.08-1.30) but not CIN 3+ (RR, 1.05; 95% CI, 0.91-1.21). Copper IUD use was not associated with CIN 2+ (RR, 0.88; 95% CI, 0.75-1.04) or CIN 3+ (RR, 0.81; 95% CI, 0.64-1.02).

■ COMMENTARY

As the use of IUDs increases, it is important to understand any effect they may have on cervical dysplasia and cervical cancer. IUDs are known to cause inflammation in the genital tract. The levonorgestrel IUD may influence the cervix hormonally to make it more or less susceptible to HPV infection. There always has been a possible link between hormonal contraception and cervical cancer. Pooled data from 24 studies, including more than 16,000 women with cervical cancer and 35,000 women without cervical cancer, found that for current combined oral contraceptive pill users, the risk of invasive cervical cancer rose with

increasing duration of use (RR for ≥ 5 years' use vs. never use = 1.90; 95% CI, 1.69-2.13). The risk declined after use ceased; after 10 or more years, it returned to the risk level of never users.[1] However, it is unclear to what degree sexual activity is a confounder in this relationship. In terms of IUDs, recent meta-analyses have found a decreased risk of cervical cancer associated with IUD use.[2,3] Because these studies are limited by using an ever/never IUD exposure classification and evaluated only copper or inert IUD types, they have limitations. Averbach et al wanted to analyze the relationship between IUDs, cervical dysplasia, and cancer that could account for the type of IUD used and the timing of IUD exposure.

Similar to previous studies, this analysis did not find any association between copper IUDs and cervical dysplasia or cancer. In contrast, there was a slightly increased risk for CIN 2 with the levonorgestrel IUD but not CIN 3. Given the timing of this study, the only levonorgestrel IUD included was the 52 mg device. The authors speculated that this weak association might be due to residual confounding. Therefore, they performed another analysis comparing hormonal contraceptive users to IUD users (excluding women not using contraception), which failed to show any association between IUD use and CIN 2. This supports the possibility that sexual activity leading to HPV infection is a confounding factor. Furthermore, a relative risk of 1.18 indicates a very weak association that is unlikely to be clinically meaningful. It is unclear how levonorgestrel would affect the ability of the cervix to clear HPV infection. There is some speculation that levonorgestrel's anti-inflammatory properties may hinder HPV clearance.[4]

This study had several strengths, including a large, well-screened population and the ability to identify IUD use before cervical dysplasia was diagnosed. Limitations include that IUD type was only able to be ascertained for 54% of the study population and that longer durations of IUD use were not accounted for. In addition, condom use could not be evaluated. Finally, the distinction between CIN 2 compared to CIN 3 is poorly reproducible among pathologists. Overall, the findings are reassuring for IUD users of both types. A history of cervical intraepithelial neoplasia or genital HPV infection is not a contraindication for hormonal contraception or IUD use.[5] Women should be screened for cervical cancer according to national guidelines, regardless of contraceptive use. ■

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ABSTRACT & COMMENTARY

Vaginal Progesterone vs. Cerclage to Prevent Preterm Birth

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SYNOPSIS: A recent indirect comparison meta-analysis has shown that vaginal progesterone is as useful in decreasing preterm birth and its associated adverse outcomes as cervical cerclage in patients with a history of preterm birth and short cervices.

SOURCE: Conde-Agudelo A, et al. Vaginal progesterone is as effective as cervical cerclage to prevent preterm birth in women with a singleton gestation, previous spontaneous preterm birth, and a short cervix: Updated indirect comparison meta-analysis. *Am J Obstet Gynecol* 2018;219:10-25.

The 2003 sentinel study by Meis et al showing that 17 hydroxyprogesterone caproate (17P) decreased the rate of recurrent preterm birth (PTB)[1] gave hope that progress was being made in combating a major cause of perinatal mortality and morbidity. A later study by Hassan et al suggested that vaginal progesterone could diminish PTB by about one-third in patients with singletons and short cervices.[2] The authors of a 2011 meta-analysis of randomized, controlled trials (RCTs) suggested that a mechanical deterrent, cervical cerclage, could diminish the chances of PTB in patients with cervical length < 2.5 cm.[3] Since then, only two small RCTs have emerged that have compared cerclage to vaginal progesterone (with no differences found).[4,5] All other studies have compared progesterone to placebo or cerclage to no treatment. Conde-Agudelo et al recently fashioned an individual patient data

meta-analysis from information mined from these studies to indirectly compare the ability of these two methods to prevent PTB.

The authors scanned the literature for RCTs published between October 2011 and March 2018, in which patients with singletons, a history of PTB, and a transvaginal cervical length (CL) of < 2.5 cm were enrolled in studies comparing cerclage to no cerclage or vaginal progesterone to placebo. If data were incomplete or unclear regarding the individual patients in these studies, the original authors were asked to submit the missing data for inclusion.

Thirty-nine studies were considered. Of these, the authors determined there was enough data to evaluate 10 (five cerclage and five progesterone). Individual patient data were collected, combined, and analyzed to assess outcome variables such as birth prior to 37 weeks, 32 weeks, and 28 weeks; respiratory distress syndrome; intraventricular hemorrhage (IVH); necrotizing enterocolitis; sepsis; and composite adverse neonatal outcome. Other endpoints included birth weight < 2,500 g, < 1,500 g, and admission to the newborn special care unit. The indirect analysis compared cerclage to control and vaginal progesterone to control.

The direct analysis for vaginal progesterone showed significant reductions for PTB < 35 weeks (relative risk [RR], 0.68; 95% confidence interval [CI], 0.50-0.93) and < 32 weeks (RR, 0.60; 95% CI, 0.39-0.92), composite neonatal morbidity (RR, 0.43; 95% CI, 0.20-0.94), and admission to newborn unit (RR, 0.46; 95% CI, 0.30-0.70). For cerclage, the direct analysis showed significant reductions in birth < 35 weeks (RR, 0.70; 95% CI, 0.55-0.89) and < 32 weeks (RR, 0.66; 95% CI, 0.48-0.91), composite neonatal adverse outcome (RR, 0.64; 95% CI, 0.45-0.91), and birth weight < 1,500 g (RR, 0.64; 95% CI, 0.45-0.90). Interestingly, the numbers needed to treat to attain one or more of the above triumphs was between five to 16 patients for progesterone vs. six to 14 patients for cerclage. All other comparisons showed no statistically significant difference.

The indirect analysis addressed the authors' investigative query. For every outcome variable, no significant differences were noted between the two treatment regimens, although a few non-significant variables showed trends that were somewhat discrepant. For example, for composite neonatal adverse outcome, the RR favored progesterone (0.48), but for grade 3 to 4 IVH, the RR favored cerclage (1.79). However, most results mirrored the results for delivery < 35 weeks, where the RR for progesterone was 0.97 (95% CI, 0.66-1.44).

■ COMMENTARY

After sifting through the data, one should conclude that patients with short cervices (< 2.5 cm) and histories of previous PTB would benefit equally from either method. However, there are downsides to each method. Vaginal progesterone is messy and requires daily application. Occasionally, there is a complaint of vaginal irritation. Cerclage has been associated with rupture of membranes, chorioamnionitis, bleeding, and lacerations. It is invasive, requiring a procedure in a hospital setting. Not surprisingly, 80% of simulated cost analyses have shown it to be more expensive than vaginal progesterone. Its advantage is that it is a one-time only method, obviating the hassle of daily administration, and it gives the patient a sense of security that something has been done to mechanically strengthen her "weak" cervix.

Enthusiasm for vaginal progesterone wavered somewhat in 2016 when the OPPTIMUM study was published.[6] The results of this randomized trial suggested no difference in outcomes when vaginal progesterone was compared with placebo. Interestingly, Conde-Agudelo et al included this negative study in their meta-analysis, which, as described above, was not enough to affect the favorable results with vaginal progesterone. The original study by Meis et al demonstrated the efficacy of 17P in patients with a history of PTB alone.[1] When this initially was endorsed by the American College of Obstetricians and Gynecologists, its use in these patients seemed to have been cast in stone.[7] However, unlike vaginal progesterone, the benefit of 17P has yet to be demonstrated in women with short cervices.[8,9] Therefore, based on current data, there is now ample evidence to favor vaginal progesterone over 17P in patients with a history of PTB and, based on the direct and indirect meta-analysis above, to use it as an alternative to cerclage in patients with short cervices. ■

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ABSTRACT & COMMENTARY

Does Every Woman Deserve a High-volume Gynecologic Surgeon?

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SYNOPSIS: Generally, gynecologic surgical complications are higher with lower-volume surgeons.

SOURCE: Ruiz MP, et al. Outcomes of hysterectomy performed by very low-volume surgeons. *Obstet Gynecol* 2018;131:981-990.

Ruiz et al used the New York Statewide Planning and Research Cooperative System to investigate the surgical outcomes for very low-volume surgeons. They defined low-volume surgeons as having an annualized volume of only one hysterectomy and higher-volume surgeons as having an annualized volume of more than one hysterectomy. They measured rates of intraoperative complications, surgical site complications, and medical complications, as well as a composite of all complications. There were 4,600 higher-volume surgeons and 3,197 low-volume surgeons between 2000 and 2014 in New York. Low-volume surgeons were more likely to perform abdominal hysterectomy (79% vs. 59%), the surgery was more likely to be emergent (31% vs. 8%), and it was more likely to be performed in a low-volume hospital. The patient was more likely to be older (> 70 years of age; 17% vs. 8%); be black (20% vs. 16%); have Medicare or Medicaid insurance (23% vs. 20%); have two or more morbidities (43% vs. 36%); and have omentectomy, small or large bowel resection, or bladder resection, and have ovarian, fallopian tube, or peritoneal cancer (7.9% vs. 4.1%). The overall complication rate was 32% for very low-volume surgeons and 9.9% for higher-volume surgeons. Complications were broken down into intraoperative (11.3% vs. 3.1%), surgical site (15.1% vs. 4.1%), medical (19.5% vs. 4.8%), and rate of transfusion (38.5% vs. 11.8%). Patients for whom very low-volume surgeons performed the operations were more likely to have a prolonged length of stay (62% vs. 22%) and excessive hospital charges (59.8% vs. 24.6%).

The authors of other studies have drawn similar conclusions. In a 2016 meta-analysis, Mowat et al evaluated the effect of operative volume on surgical outcomes in all gynecologic surgeries.[1] They reviewed 14 studies and defined low volume as performing the procedure once a month or less. The odds ratio (OR) for complications in low-volume surgeons was 1.3, which was divided into intraoperative (OR, 1.6) and postoperative (OR, 1.4) complications. Disturbingly, among low-volume gynecologic oncologists, the OR for mortality was nearly double for high-volume surgeons (OR, 1.9). In many of the studies evaluated, higher-volume surgeons cared for the patients with the most comorbidities who were more likely to have operative complications, so these differences in outcome between low- and high-volume surgeons are understated. Among all surgeons, there was a 10% complication rate with hysterectomy, which is consistent with the literature. However, low-volume surgeons had consistently higher complication rates. Low-volume surgeons had a 30% increase in risk of all complications, a 60% increase in intraoperative complications, and a 40% increase in perioperative complications.

Wright et al evaluated women with endometrial cancer between 2000 and 2014.[2] They found that surgical and hospital volume affected surgical outcome less because of the growing trend of endometrial cancer patients being cared for by gynecologic oncologists, a significant paradigm shift. They divided surgical volume rates into low volume (one to seven cases/year), medium-low volume (seven to 23 cases/year), medium-high volume (24 to 42 cases/year), and high volume (42 to 64 cases/year). They found that the morbidity rate was 14.6% among the lowest-volume surgeons, 20.8% for medium-low, 15.7% for medium-high, and 14.1% for high-volume surgeons ($P < 0.001$). They also found that the number of surgeons treating women with endometrial cancer decreased dramatically between 2000 and 2014, from 845 to 317, while the number of patients increased. Primarily, this decrease occurred because of a major shift in the number of women treated by gynecologic oncologists rather than gynecologists. The number of hospitals treating women with endometrial cancer decreased from 182 to 98. In the multivariate analysis, surgeon volume and hospital volume did not affect complication rate, because the majority of surgeons caring for patients with endometrial cancer are gynecologic oncologists who have more extensive surgical training, are less likely to have adverse outcomes, and are more likely to be high-volume surgeons compared to gynecologists. Studies in other surgical disciplines have suggested that surgeon volume affects patient outcomes similar to the Ruiz paper. In simple emergency general surgery cases, there was no difference in outcome between low- and high-volume surgeons. However, in complex cases, there was an increase in mortality (OR, 1.64) with low-volume surgeons.[3] In a study on aortic aneurysm repair, Dubois et al found that high annual surgeon volume was associated with less postoperative complications and re-operations.[4]

■ COMMENTARY

Given these data, how should we address surgical volume among gynecologists? Since surgical volume in the field of gynecology continues to decrease, this is an issue for both established and new surgeons in our field. Residents have less surgical volume in residency than in past years. When these new surgeons go into practice, unless they join a busy surgical group, their practices likely are dominated by obstetrics and, thus, they join the ranks of low-volume surgeons. Almost half of the gynecologic surgeons in New York perform only one case per year.

In an editorial, Walter addressed the fact that every woman deserves a high-volume gynecologic surgeon.[5] Low-volume surgeons are less likely to use a minimally invasive approach, which is associated with an increase in morbidity, higher complication rates, and a higher cost (longer operative times, increased hospital length of stay.)

Walter stated there are too many low-volume gynecologic surgeons because of many factors. Increasingly, there is limited resident experience with minimal required hysterectomies. There are more options for the approach to hysterectomy, each of which requires different surgical skills that most residents do not have because of reduced surgical volume. There are too many trainees because of the heavy obstetric load in most residencies and insufficient post-residency surgical volume. He suggested that residency programs should train fewer residents in surgical techniques by encouraging alternative practice opportunities that are nonsurgical. Training fewer gynecologic surgeons would result in more hysterectomies being done minimally invasively, particularly focusing on laparoscopic rather that robotic technique. An increase in minimally invasive hysterectomy would result in lower morbidity and faster return to work for patients and would be in line with the upcoming focus on value-based payment models. We owe it to our patients to be sure that any woman undergoing a hysterectomy, or for that matter any gynecologic surgery, has the most competent and careful surgeon available. Turning out more residents with minimal surgical expertise is not the answer to better care for women. Not all residents need to be surgeons. Our training programs need to address this gap in care and identify how to steer some residents toward nonsurgical practices. ■

REFERENCES

1. Mowat A, Surgical outcomes for low-volume vs high-volume surgeons in gynecology surgery: A systematic review and meta-analysis. *Am J Obstet Gynecol* 2016;215:21-33.
2. Wright JD, et al. Changes in surgical volume and outcomes over time for women undergoing hysterectomy for endometrial cancer. *Obstet Gynecol* 2018;132:59-69.
3. Mehta A, et al. Effect of surgeon and hospital volume on emergency general surgery outcomes. *J Am Coll Surg* 2017;225:666-675.e2.
4. Dubois L, et al. Higher surgeon annual volume, but not years of experience, is associated with reduced rates of postoperative complications and reoperations after open abdominal aortic aneurysm repair. *J Vasc Surg* 2018;67:1717-1726.e5.
5. Walter A. Every woman deserves a high-volume gynecologic surgeon. *Am J Obstet Gynecol* 2017;216:139.e1-139.e3.

CME/CE QUESTIONS

1. **In the study by Ogilvie et al, cumulative colposcopy referral rates at 48 months were:**
   a. higher in the control group.
   b. higher in the intervention group.
   c. the same in both groups.
2. **Use of the copper IUD is associated with increased rates of cervical dysplasia.**
   a. True
   b. False
3. **Studies have shown that vaginal progesterone is more effective than cerclage in preventing preterm birth.**
   a. True
   b. False
4. **Surgeon volume may affect which of the following?**
   a. Complication rate
   b. Mortality rate
   c. Cost of surgery
   d. All of the above

[IN FUTURE ISSUES]

Why Are Cesarean Deliveries Higher in IVF Pregnancies?

Nocturia: Does Salt Intake Play a Role?