no discharge prescription and 4 consumed their discharge prescription. There were 3 ED visits for pain (0.7%): 2 from constipation after appendectomy (no opioid prescription), and 1 from urinary retention after circumcision. Lack of a discharge opioid prescription was not associated with poor pain control (opioid: 3 of 88 respondents [3.4%]; no opioid: 15 of 315 respondents [4.8%]; $P = .77$), postdischarge opioid prescription (opioid: 4 of 88 respondents [4.6%]; no opioid: 4 of 316 respondents [1.3%]; $P = .07$), or pain-related ED visit (opioid: 1 of 88 respondents [1.1%]; no opioid: 2 of 316 respondents [0.6%]; $P = .52$).

Discussion | Postoperative opioid prescribing for children is unnecessary following umbilical/epigastric herniorrhaphy, appendectomy, inguinal herniorrhaphy/hydrocelectomy, and adenoidectomy with adequate analgesia on nonopioid analgesics. Circumcision, elbow fracture, and orchiopexy had the highest opioid use; yet only 1 in 3 patients used an opioid, typically for 3 days or less. Excess opioid medication was often kept unlocked and undisposed. Although more than half of patients were prescribed an opioid in prior studies, postdischarge analgesia and analgesic use were not captured.[3-5] This study is limited by the single-center, nonrandomized design; however, the low rates of prescribing and consequent adverse outcomes may supersede the clinical equipoise needed for future randomization. Given the iatrogenic risks of excess opioid, these findings suggest that safe opioid stewardship necessitates elimination of opioid exposure after many common children's operations.[2,6]

Calista M. Harbaugh, MD, MS
Gracia Vargas, BA
Courtney Shepard Streur, MD, MS
G. Ying Li, MD
Aaron L. Thatcher, MD
Jennifer F. Waljee, MD, MPH, MS
Samir K. Gadepalli, MD, MBA, MS

Author Affiliations: Michigan Opioid Prescribing Engagement Network, University of Michigan, Ann Arbor (Harbaugh, Vargas, Waljee); Department of Surgery, Michigan Medicine, Ann Arbor (Harbaugh, Waljee); Division of Pediatric Urology, Department of Urology, Michigan Medicine, Ann Arbor (Streur); Section of Pediatric Orthopaedic Surgery, Department of Orthopaedic Surgery, Michigan Medicine, Ann Arbor (Li); Division of Pediatric Otolaryngology, Department of Otolaryngology–Head and Neck Surgery, Michigan Medicine, Ann Arbor, (Thatcher); Section of Pediatric Surgery, Department of Surgery, Michigan Medicine, Ann Arbor (Gadepalli).

Corresponding Author: Calista M. Harbaugh, MD, MS, Department of General Surgery, Michigan Medicine, 1500 E Medical Center Dr, Taubman Center Room 2110, Ann Arbor, MI 48109-5346 (calistah@med.umich.edu).

Published Online: September 4, 2019. doi:10.1001/jamasurg.2019.2529

Author Contributions: Dr Harbaugh had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: Harbaugh, Vargas, Li, Thatcher, Waljee, Gadepalli.
Acquisition, analysis, or interpretation of data: Harbaugh, Vargas, Streur, Thatcher, Waljee, Gadepalli.
Drafting of the manuscript: Harbaugh, Vargas, Waljee.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Harbaugh.
Administrative, technical, or material support: Vargas, Gadepalli.
Supervision: Streur, Li, Waljee, Gadepalli.

Conflict of Interest Disclosures: Dr Gadepalli reported grants from Blue Cross Blue Shield foundation during the conduct of the study. Dr Waljee receives research funding from the American College of Surgeons, the American Foundation for Surgery of the Hand, the National Institutes of Health (R01DA042859), the Substance Abuse and Mental Health Services Administration (E20180568-001), the Centers for Disease Control, and the Michigan Department of Health and Human Services.

Funding/Support: This study was supported in part by Blue Cross Blue Shield of Michigan.

Role of the Funder/Sponsor: The funding source had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Contributions: The authors thank Lauren Bohm, MD, and David Zopf, MD (Division of Pediatric Otolaryngology, Department of Otolaryngology, Michigan Medicine, Ann Arbor), for clinical expertise and Kenneth Sloss, BA, Anne Patterson, BA, and Kylie Schafer, BA (Michigan Opioid Prescribing Engagement Network, University of Michigan, Ann Arbor), for data collection, for which they were not compensated beyond their usual salary.

1. Gaither JR, Shabanova V, Leventhal JM. US national trends in pediatric deaths from prescription and illicit opioids, 1999-2016. *JAMA Netw Open*. 2018;1(8):e186558. doi:10.1001/jamanetworkopen.2018.6558

2. Chung CP, Callahan ST, Cooper WO, et al. Outpatient opioid prescriptions for children and opioid-related adverse events. *Pediatrics*. 2018;142(2):e20172156. doi:10.1542/peds.2017-2156

3. Cartmill RS, Yang DY, Fernandes-Taylor S, Kohler JE. National variation in opioid prescribing after pediatric umbilical hernia repair. *Surgery*. 2019;165(4):838-842. doi:10.1016/j.surg.2018.10.029

4. Sonderman KA, Wolf LL, Madenci AL, et al. Opioid prescription patterns for children following laparoscopic appendectomy. *Ann Surg*. 2018. doi:10.1097/SLA.0000000000003171

5. Nelson SE, Adams AJ, Buczek MJ, Anthony CA, Shah AS. Postoperative pain and opioid use in children with supracondylar humeral fractures: balancing analgesia and opioid stewardship. *J Bone Joint Surg Am*. 2019;101(2):119-126. doi:10.2106/JBJS.18.00657

6. Harbaugh CM, Nalliah RP, Hu HM, Englesbe MJ, Waljee JF, Brummett CM. Persistent opioid use after wisdom tooth extraction. *JAMA*. 2018;320(5):504-506. doi:10.1001/jama.2018.9023

Association of Sex With Perceived Career Barriers Among Surgeons

Women account for 19.2% of practicing general surgeons[1] and 9.8% of professors in academic surgery.[2] While the origin of this disparity is multifactorial, we hypothesize that women and men experience different barriers to a surgical career. We investigated sex differences in perception of career barriers among faculty and resident physicians at our academic institution.

Methods | The institutional review board at the University of Washington approved the administration of an anonymous, modified Career Barriers Inventory[3] to faculty and resident physicians in the Divisions of General Surgery, Cardiothoracic Surgery, Plastic Surgery, and Vascular Surgery at the University of Washington, Seattle. The inventory was administered via RedCap to faculty physicians and on paper to resident physicians during January and February 2017. Using a 5-point Likert scale, the survey queried demographics, perceived career barriers, and the confidence to overcome barriers. Data were analyzed within 5 domains: career, social support, family, children, and sex. Women and men were compared within the resident and faculty physician cohorts.

Table. Demographics of Resident and Faculty Physician Survey Participants

Characteristic	Physicians, No. (%)		*P* Value
	Women	Men	
Resident Physicians (n = 67)			
Total	25	42	NA
Rank			
Intern	4 (16)	12 (29)	.41
Junior	10 (40)	14 (33)	
Senior	11 (44)	14 (33)	
No answer	0	2 (5)	
Relationship status			
Single	6 (24)	16 (38)	.53
Partnered	5 (20)	7 (17)	
Married	14 (56)	18 (43)	
Divorced	0	1 (2)	
Children	5 (20)	8 (19)	.71
Career goals 1			
Fellowship	23 (92)	37 (88)	.25
No fellowship	1 (4)	0	
No answer	1 (4)	5 (12)	
Career goals 2			
Academics	12 (48)	15 (36)	.68
Academics and private practice	0	1 (2)	
Private practice	3 (12)	7 (17)	
No answer	10 (40)	19 (45)	
Faculty Physicians (n = 73)			
Total	25	48	NA
Academic rank			
Acting/assistant professor	14 (56)	7 (15)	<.001
Associate professor	7 (28)	14 (29)	
Professor	4 (16)	27 (56)	
Relationship status			
Single	2 (8)	3 (6)	.49
Partnered	1 (4)	0	
Married	21 (84)	41 (85)	
Divorced	1 (4)	4 (8)	
Children	20 (80)	43 (90)	NA

Abbreviation: NA, not available.

Data were analyzed from May 2017 to September 2017 using Excel 2010 (Microsoft) and SPSS version 19.0 (SPSS Inc). Categorical data were compared using Pearson χ^2 test analysis. Differences were considered statistically significant when $P < .05$.

Results | The overall response rate was 70.2% (73 of 110 faculty physicians and 73 of 98 resident physicians). Six resident physicians did not indicate sex and were excluded (**Table**). There were no sex differences in resident rank distribution. However, 14 of 25 female respondents (56%) were acting or assistant professors, compared with 7 of 48 male respondents (15%), and 4 of 25 female respondents were professors (16%), while 27 of 48 men were professors (56%; $P < .001$).

Career. Barriers identified by women included lack of mentors or role models, as well as a lack of confidence. Among women, 10 of 25 faculty physicians (40%) and 6 of 25 resident physicians (24%) identified lack of mentorship as a barrier, compared with 6 of 48 male faculty physicians (13%) and 4 of 42 male resident physicians (9.5%) (**Figure**, A). More than half of resident physicians of both sexes felt confident that they could overcome the mentorship barrier (women, 16 of 25 [64%]; men, 24 of 39 [62%]). More women faculty and resident physicians endorsed low confidence as a barrier than men (women, 18 of 49 [37%]; men, 8 of 89 [9%]; Figure, B).

Social Support, Family, and Children. Lack of support from family or friends was not an important barrier for faculty or resident physicians. Women noted the desire to have children as a career barrier more often than men did (faculty physicians: women, 9 of 24 [38%]; men, 2 of 40 [5%]; $P = .007$; resident physicians: women, 19 of 24 [79%]; men, 7 of 39 [18%]; $P < .001$). Childcare concerns were also more prominent with women than men (faculty physicians: women, 15 of 23 [65%]; men, 9 of 43 [21%]; $P = .001$; resident physicians: women, 12 of 23 [52%]; men, 8 of 38 [21%]; $P = .03$).

Sex Discrimination. More women than men experienced sex discrimination (Figure, C). None of the men identified their sex as a career barrier, while 5 of 25 female faculty physicians (20%) and 8 of 23 female resident physicians (35%) did. More resident physicians than faculty physicians noted confidence to overcome the sex barrier (resident physicians, 31 of 67 [46%]; faculty physicians, 29 of 73 [40%]).

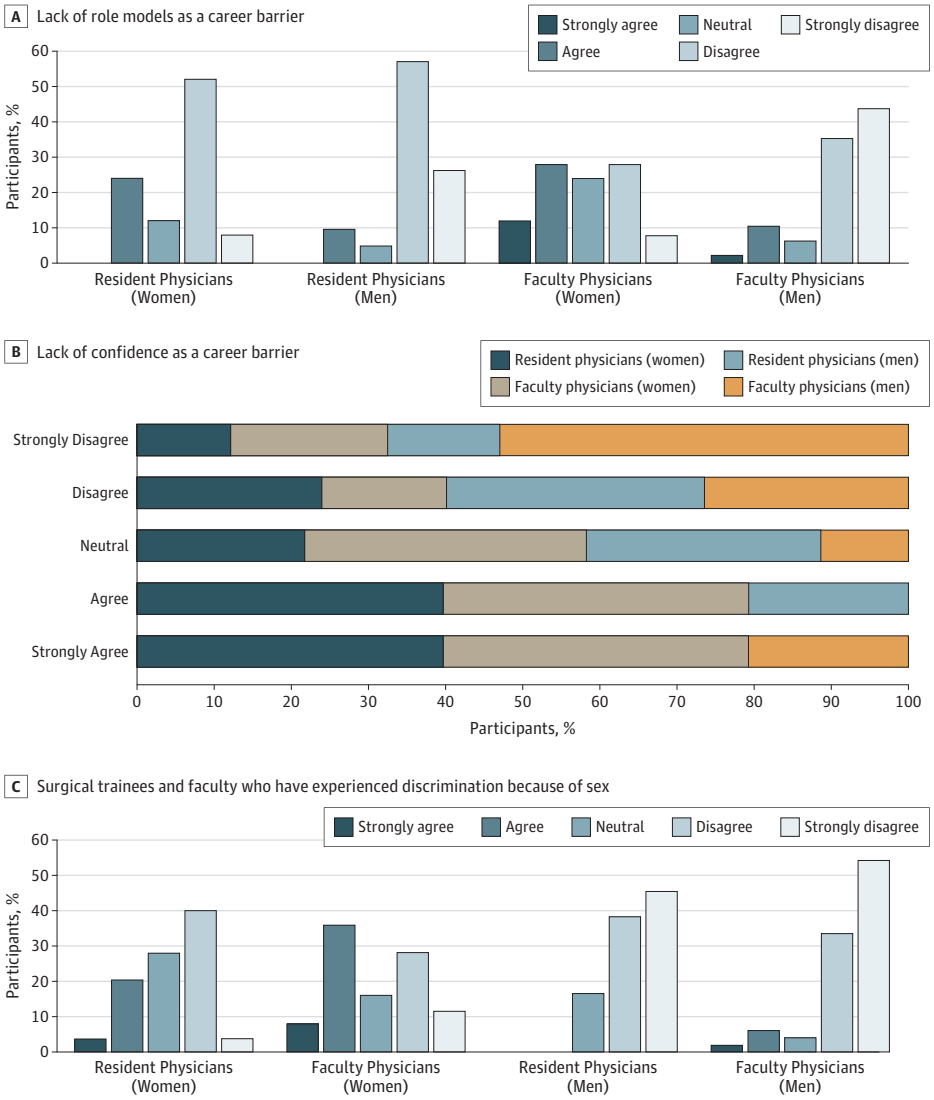
Discussion | Among academic surgeons and resident surgeons, women reported specific career barriers at significantly higher rates than men. The differences were more notable among faculty physicians, especially barriers associated with career, children, and sex. Resident physicians, but not faculty physicians, reported confidence to overcome these barriers. This may be attributable to the glass-ceiling effect experienced as women advance in leadership positions.[4]

The lack of mentorship as a career barrier is not new. Cochran et al[5] identified this barrier for faculty physicians of both sexes but noted it is more prominent among women. We found this to be a barrier for faculty but not resident physicians. This may be attributable to training paradigms that include assigned mentorship, or because resident physicians have not yet had sufficient career experience to identify a deficit in mentorship.

This study is potentially limited because the survey was completed by members of a single department at a single institution. However, these findings mirror an extensive body of literature dating back to 1990.[6] This survey also does not address intersectionality.

Identification of barriers to a career in surgery should foster guidance, support, and mentorship beginning at the resident physician level. This may help curb attrition rates of young academic surgical faculty physicians of both sexes.

Figure. Perceived Career Barriers per Survey Response



Nicole K. Zern, MD
Sherene Shalhub, MD, MPH
Douglas E. Wood, MD, FRCSEd
Kristine E. Calhoun, MD

Author Affiliations: Division of General Surgery, Department of Surgery, University of Washington, Seattle (Zern, Calhoun); Division of Vascular Surgery, Department of Surgery, University of Washington, Seattle (Shalhub); Department of Surgery, University of Washington, Seattle (Wood).

Accepted for Publication: June 3, 2019.

Corresponding Author: Nicole K. Zern, MD, Division of General Surgery, Department of Surgery, University of Washington, 1959 NE Pacific St, PO Box 356410, Seattle, WA 98195 (nkzern@uw.edu).

Published Online: September 11, 2019. doi:10.1001/jamasurg.2019.2648

Author Contributions: Drs Zern and Shalhub had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: All authors.
Acquisition, analysis, or interpretation of data: Zern, Shalhub, Calhoun.
Drafting of the manuscript: Zern, Shalhub.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Shalhub.
Administrative, technical, or material support: Wood.
Supervision: Wood, Calhoun.

Conflict of Interest Disclosures: None reported.

Additional Contributions: The following members of the University of Washington Department of Surgery Women's Council contributed to the survey content and design (without compensation): Kathleen Berfield, MD, Division of Cardiothoracic Surgery, University of Washington; Greta Bernier, MD, Division of General Surgery, University of Washington; Eileen Bulger, MD, Division of Trauma, Burn and Critical Care Surgery, University of Washington; Shannon Colohan, MD, MS, Division of Plastic Surgery, University of Washington; Heather L Evans, MD, Medical University of South Carolina; Sara Javid, MD, Division of General Surgery, University of Washington; Lacey Lagrone, MD, University of Washington; Lorrie Langdale, MD, VA Medical Center, University of Washington; Erin O. Lange, MD, Division of General Surgery, University of Washington; Elina Quiroga, MD, Division of Vascular Surgery, University of Washington; Lena Sibulesky, MD, Division of Transplant Surgery, University of Washington.

1. American Association of Medical Colleges. Active physicians by sex and specialty, 2015: table 1.3, number and percentage of active physicians by sex and specialty, 2015. https://www.aamc.org/data/workforce/reports/458712/1-3-chart.html. Published December 2015. Accessed January 2, 2019.

2. Abelson JS, Chartrand G, Moo TA, Moore M, Yeo H. The climb to break the glass ceiling in surgery: trends in women progressing from medical school to surgical training and academic leadership from 1994 to 2015. *Am J Surg*. 2016; 212(4):566-572.e1. doi:10.1016/j.amjsurg.2016.06.012

3. Swanson JL, Daniels KK, Tokar DM. Assessing perceptions of career-related barriers: the Career Barriers Inventory. *J Career Assess*. 1996;4:219-244. doi:10.1177/106907279600400207

4. Seemann NM, Webster F, Holden HA, et al. Women in academic surgery: why is the playing field still not level? *Am J Surg*. 2016;211(2):343-349. doi:10.1016/j.amjsurg.2015.08.036

5. Cochran A, Hauschild T, Elder WB, Neumayer LA, Brasel KJ, Crandall ML. Perceived gender-based barriers to careers in academic surgery. *Am J Surg*. 2013;206(2):263-268. doi:10.1016/j.amjsurg.2012.07.044

6. Neumayer L, Konishi G, L'Archeveque D, et al. Female surgeons in the 1990s: academic role models. *Arch Surg*. 1993;128(6):669-672. doi:10.1001/archsurg.1993.01420180071013

Trends in Chronic Opioid Use Around Inpatient Surgery Within the Veterans Health Administration

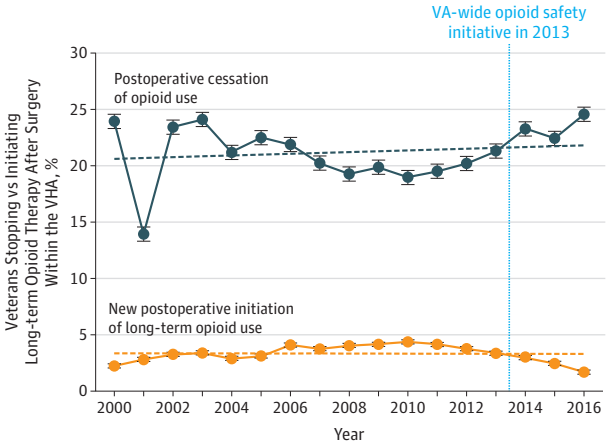
In a large national sample within a managed care organization, incident long-term opioid therapy (LTOT) after surgery occurred in approximately 6% of preoperatively opioid-naive patients between 2013 and 2014.[1] Because veterans have more chronic pain than the general population,[2] incident LTOT may be more common within the Veterans Health Administration (VHA). We sought to examine incident postoperative LTOT and incident postoperative cessation of opioid use between 2000 and 2016 within the VHA, a time frame spanning the prescription opioid epidemic.[3]

The opioid safety initiative (OSI) was rolled out across the VHA between August and October 2013.[4] This intervention used dashboards for audit and feedback targeted toward primary care professionals.[4] The OSI has been effective in reducing risky prescriptions.[4] We sought to determine the association of the OSI with long-term opioid use (initiation in preoperatively opioid-naive patients and cessation in long-term preoperative opioid users) in a relatively homogeneous subset of veterans, those undergoing total knee arthroplasty (TKA).

Methods | After approval from the institutional review board at the Durham VA Medical Center, we identified the cohort of patients who underwent inpatient surgery within the VHA between January 2000 and December 2016. Informed consent was not required because fully deidentified data were used. We defined LTOT as opioid prescriptions filled for more than 3 months in a 6-month window.[4] We examined pharmacy records in the 6-month period before admission (preoperative use) and in the 6-month period after discharge (postoperative use). With regard to the postoperative period, we allowed for opioid use in the first 3 months, examining dispensing between postoperative months 4 through 9.[5] We computed rates of incident postoperative LTOT (in preoperatively opioid-naive patients) and incident cessation of opioid use (in patients with preoperative LTOT) between 2000 and 2016. Both rates were calculated annually. We compared these rates with published data from the rest of the nation.[3]

To examine the association with outcomes of the OSI in veterans undergoing TKA, we examined differences in rates pre- vs post-OSI. We also examined differences in the prevalence of patient-level risk factors for opioid use. Analyses were conducted using SAS, version 9.3 (SAS Institute). The 2-sided *P* value significance threshold was set at .005 given the large sample size. Conventional *t* tests were used for continuous variables, and χ^2 tests for categorical variables. Analyses were conducted between January 2018 and February 2019.

Figure. Rates of Postoperative Cessation of Opioid Use and New Postoperative Initiation of Long-term Opioid Therapy in >1 Million Patients Undergoing Inpatient Surgery Between 2000 to 2016 Within the VHA



The dark blue line shows the rate of postoperative cessation of opioid use (ie, patients who stopped opioid use after postoperative month 3 or patients with long-term preoperative opioid use). This rate reached its lowest point of approximately 19% in 2010 and steadily increased after that reaching approximately 25% in 2016 (the rate in 2001 represents a lapse in reporting). The orange line shows the rate of new postoperative initiation of long-term opioid therapy (ie, patients who initiated long-term opioid use or preoperatively opioid-naive patients). This rate peaked at 4% in 2010 and reached a nadir of approximately 2% in 2016. Forecasted trends (dotted lines) suggest further gains in freedom from opioid use. VA indicates Veterans Affairs; VHA, Veterans Health Administration.

Results | Of 1 358 021 veterans who underwent inpatient surgery during the study, 1 037 989 (77%) were white, 1 261 487 (93%) were men, and 908 842 (67%) were older than 55 years. Overall, 708 011 (52%) were preoperatively opioid-naive, 273 455 (20%) had preoperative LTOT, and 376 555 (28%) had intermittent preoperative opioid use. As in the rest of the nation,[3] LTOT peaked and opioid cessation reached its lowest value in 2010 (**Figure**). By 2016, both rates showed significant improvements with incident LTOT reaching a rate of 2.6% (1474 of 87 494 preoperatively opioid-naive patients) and postoperative cessation of opioid use reaching 24.6% (6701 of 27 274 long-term preoperative opioid users).

Comparing veterans who underwent TKA before the OSI (31 547 between January 2010 and September 2013) vs after the OSI (31 663 between October 2013 and December 2015), we found that postoperative cessation of opioid use doubled from 4.95% (1561 of 31 547) to 8.72% (2760 of 31 663) (absolute increase, 3.77%; 95% CI, 3.38%-4.16%; $P < .001$), while incident postoperative LTOT dropped from 1.68% (511 of 31 547) to 0.88% (256 of 31 663) (absolute reduction, 0.8%; 95% CI,