# The Role Of Women In Vascular Surgery: What Has It Been And Where Is It Going?

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Disclosure(s):

- **The obvious conflict of interest**

Duke Vascular & Endovascular Surgery

Throughout history, the ability of women to effectively practice surgery has been a **reflection of their status in society**

Even before written history, female surgeons challenged gender stereotypes and discrimination, often at enormous personal cost, **including their lives**

**The first female vascular surgeon?**
**A Greek woman surgeon "lets blood" (500 BC)**

(reproduced from: Mead KC. A History of Women in Medicine From the Earliest Times to the Beginning of the Nineteenth Century. Haddam, Conn: Haddam Press; 1938:20

**Medieval time – Decline in Western Society**

- During the middle ages women were excluded from education and leadership roles
- **Those who attempted to practice medicine and surgery were often burned at the stake as witches**

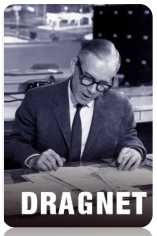
❖ Garrison FH. An Introduction to the History of Medicine. Philadelphia, Pa: WB Saunders Co; 1914:113.

## Contemporary era - notable resurgence

- In the mid-1800s, pioneering women like **Elizabeth Blackwell,** MD, Ann Preston, MD, and Mary Edwards Walker, MD, laid the foundation for the education and progress of American women in the field of surgery.
- Nevertheless, women were only able to perform battlefield surgery in the Civil War **by pretending to be men**

***Currently, while women who want to practice surgery no longer risk their lives and personal safety, there is still much work to be done to achieve equity***

Is it real?




"Just the facts, ma'am"

## Present (The ABS Data) – July 2024, update

THE AMERICAN BOARD OF SURGERY

| | |
|---|---|
| 5,098 | Total Number of Surgeons that have been Certified in Vascular Surgery |
| 3,998 | Total Number of Surgeons Currently Certified in Vascular Surgery |
| 14.38% 733 | Total Number of Women Surgeons Currently Certified in Vascular Surgery |

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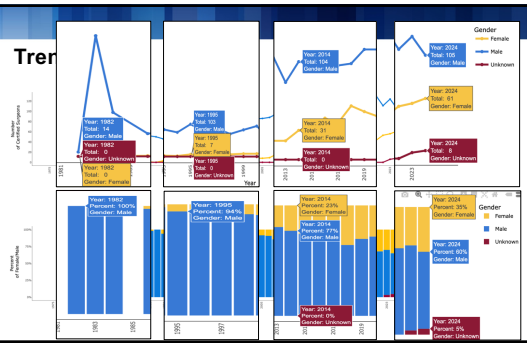
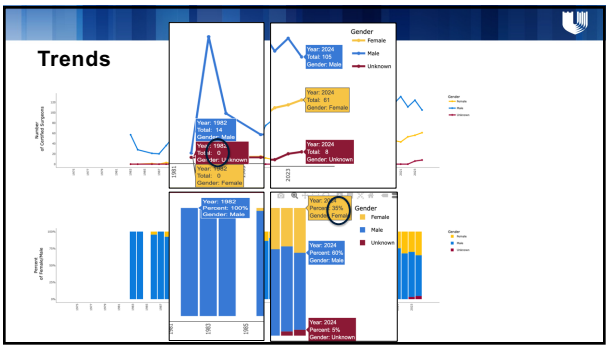






## Impact of complications on referrals: a business school perspective

Interpreting Signals in the Labor Market: Evidence from Medical Referrals

Heather Sarsons*

November 28, 2017

Click here for most recent version

Abstract

This paper provides evidence that a person's gender influences the way others interpret information about his or her ability and documents the implications for gender inequality in labor markets. Using data on physicians' referrals to surgical specialists, I find that the referring physician views patient outcomes differently depending on the performing surgeon's gender. Physicians become more pessimistic about a female surgeon's ability than a male's after a patient death, indicated by a sharper drop in referrals to the female surgeon. However, physicians become more optimistic about a male surgeon's ability after a good patient outcome, indicated by a larger increase in the number of referrals the male surgeon receives. After a bad experience with one female surgeon, physicians also become less likely to refer to new female surgeons in the same specialty. There are no such spillovers to other men after a bad experience with one male surgeon. Consistent with learning models, physicians' reactions to events are strongest when they are beginning to refer to a surgeon. However, the empirical patterns are only consistent with Bayesian learning if physicians do not have rational expectations about the true distribution of surgeon ability.

TABLE 4: IMPACT OF EVENT ON REFERRALS TO PERFORMING SURGEON

| | Referrals | | Medicare Pay ($) | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Event | Bad | Good | Bad | Good |
| Post | 0.006 | 0.509*** | -80.05*** | 145.29*** |
| | (0.058) | (0.069) | (25.09) | (45.21) |
| Female × Post | -0.291*** | -0.222** | -136.97*** | -22.86 |
| | (0.087) | (0.100) | (32.54) | (64.14) |
| Time Trend | 0.099*** | 0.073*** | 31.84*** | 27.58*** |
| | (0.011) | (0.011) | (5.84) | (8.07) |
| Female × Time Trend | -0.009 | -0.010 | 13.67*** | -6.08 |
| | (0.013) | (0.015) | (4.65) | (8.59) |
| Post × Time Trend | -0.072*** | -0.046*** | -35.51*** | -41.83*** |
| | (0.012) | (0.012) | (6.00) | (8.82) |
| *Average Post Effect On:* | | | | |
| Male Surgeons | 0.101 | 0.604 | -92.90 | 95.42 |
| Female Surgeons | -0.222 | 0.346 | -184.02 | 51.26 |
| Mean of Outcome Var. | 0.65 | 0.48 | 309.17 | 264.86 |
| Observations | 34,053 | 29,214 | 34,053 | 29,214 |
| Clusters | 3,425 | 2,948 | 3,425 | 2,948 |
| R-Squared | 0.265 | 0.325 | 0.237 | 0.249 |

Impact on a **group** of surgeons – based on gender

- After a **complication** with one female surgeon, physicians also become *less likely to refer to **other** female surgeons*
- There are **no such spillovers** to other men after a bad experience with one male surgeon

## Representation in Academic Vascular Societies

Journal of Vascular Surgery
Volume 74, Number 2S

Humphries et al 17S

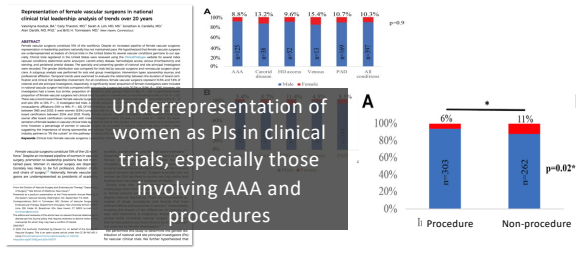
**Table I.** Mean percentage of women in each category broken down by early (1999-2009) or late (2010-2019) time periods

| | Mean Percentage of Women, 1999-2009 | Mean Percentage of Women, 2010-2019 | P value |
|---|---|---|---|
| Presenters | 10.9 | 20.6 | < .001 |
| Senior authors | 8.7 | 11.5 | .22 |
| Moderators | 7.8 | 17.2 | < .001 |
| Committee members | 10.9 | 20.3 | .003 |
| Committee chairs | 10.9 | 16.9 | .13 |
| Officers | 6.4 | 14.8 | .002 |

- Over the past two decades: while women are increasingly represented as presenters, moderators and committee members, there has not been such an increase in major leadership roles

Humphries MD, Representation of women in vascular surgery science and societies. J Vasc Surg. 2021 Aug;74(2S):15S-20S

## Clinical Trials Leadership




Underrepresentation of women as PIs in clinical trials, especially those involving AAA and procedures

Kvstiuk, et al. Representation of female vascular surgeons in national clinical trial leadership: analysis of trends over 20 years. Journal of Vascular Surgery - VI, 2024:

## Performance metrics – Postoperative outcomes: short term

Wallis C, et al. Comparison of postoperative outcomes among patients treated by male and female surgeons: a population based matched cohort study. BMJ. 2017

**Comparison of postoperative outcomes among patients treated by male and female surgeons: a population based matched cohort study**

OPEN ACCESS

Christopher JD Wallis *resident*[1], Bheeshma Ravi *surgeon and assistant professor*[2], Natalie Coburn *surgeon and*[3] *associate professor*[4], Robert K Nam *surgeon and professor*[5], Allan S Detsky *internist and professor*[3,6], Raj Satkunasivam *surgeon and assistant professor*[7,8]

104 630 patients (774 female surgeons / 2540 male surgeons)
Multivariable-adjusted rates
Composite end point (death, readmission, complications) at 30 days:
More likely in patients treated by male surgeons:
11.6% vs 11.1%, AOR 0.96, 95% CI: 0.92 - 0.99, P=0.02
Mortality at 30 days:
Patients treated by male surgeons more likely to die:
1.0 vs. 0.9 AOR 0.88; 95% CI: 0.78 - 0.99, P=0.04

## Performance metrics – Postoperative outcomes: mid/long term

Wallis CJD, et al. Surgeon Sex and Long-Term Postoperative Outcomes Among Patients Undergoing Common Surgeries. JAMA Surg. 2023 Nov 1.

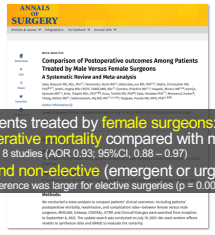
Table 2. Multivariable Adjusted Event Rates and Outcomes[a]

| Outcome | Outcome within 90 d: Adjusted event rate (95% CI)[b] Male surgeons | Female surgeons | Adjusted odds ratio (95% CI)[c] | Outcome within 1 y: Adjusted event rate (95% CI)[b] Male surgeons | Female surgeons | Adjusted odds ratio (95% CI)[c] |
|---|---|---|---|---|---|---|
| Composite end point | 13.9 (11.3-17.2) | 12.5 (9.9-15.6) | 1.08 (1.03-1.13) | 25.0 (22.4-27.9) | 20.7 (17.2-24.8) | 1.06 (1.01-1.12) |
| Death | 0.8 (0.4-1.6) | 0.5 (0.3-1.1) | 1.25 (1.12-1.39) | 2.4 (1.2-4.8) | 1.6 (0.8-3.1) | 1.24 (1.13-1.36) |
| Readmission | 8.4 (7.0-10.2) | 7.1 (6.0-8.4) | 1.05 (1.01-1.10) | 19.6 (16.7-23.1) | 15.5 (12.8-19.1) | 1.04 (0.98-1.10) |
| Complications | 6.1 (4.2-8.9) | 6.0 (4.0-9.0) | 1.09 (1.03-1.16) | 7.4 (5.4-10.1) | 7.0 (4.9-10.0) | 1.09 (1.03-1.14) |

Multivariable-adjusted rates:
Composite end point (death, readmission, complications):
- More likely in patients treated by male surgeons:
  - 90 days (13.9% vs 12.5%; AOR, 1.08; 95% CI, 1.03-1.13) P<0.05
  - 1 year (25.0% vs 20.7%; AOR, 1.06; 95% CI, 1.01-1.12) P<0.05

Mortality:
Patients treated by male surgeons more likely to die:
- 90 days (0.8% vs 0.5%; AOR 1.25; 95% CI, 1.12-1.39) P<0.05
- 1 year (2.4% vs 1.6%; AOR, 1.24; 95% CI, 1.13-1.36) P<0.05

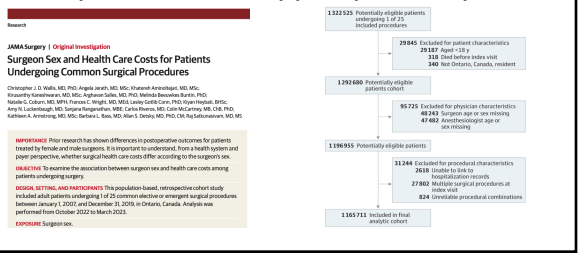
## A new (2024) Systematic review and Meta-analysis




Patients treated by female surgeons:
- Lower post-operative mortality compared with male surgeons
  8 studies (AOR 0.93; 95%CI, 0.88 – 0.97)
- Both elective and non-elective (emergent or urgent) surgeries
  The difference was larger for elective surgeries (p = 0.003)

## Performance metrics – Healthcare cost

Wallis CJD, et. al. Surgeon Sex and Health Care Costs for Patients Undergoing Common Surgical Procedures. JAMA Surg. 2024 Feb 1.



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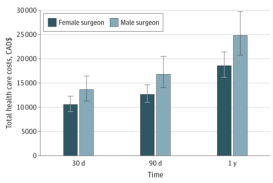


- Multivariable regression accounting for patient-, surgeon-, anesthesiologist-, and hospital-level covariates:
- 30 days, 90 days and 1-year adjusted total health care costs were significantly lower for patients treated by female surgeons

## Future?....I don't know the answer

- We've come a long way, but still have a lot to do but how?
- The data is pretty clear that the current trajectory is unacceptable – 150 years is too long
- Unconscious bias training?
- Upstanders and allies?
- **Get everyone involved in the process, because we all benefit from progress and we all lose without it**

## THANK YOU!