Access GI Expertise, Educational Resources and Support for You and Your Patients

A Free ACG Member Benefit Designed to Help You and Your Patients!
Learn More and Join Today at GIONDEMAND.COM

ACG / LGS REGIONAL POSTGRADUATE COURSE
FEBRUARY 24-26, 2023
HILTON RIVERSIDE HOTEL
NEW ORLEANS, LOUISIANA

ACG is coming to a city near you!
Participating in the Webinar

All attendees will be muted and will remain in Listen Only Mode.

Type your questions here so that the moderator can see them. Not all questions will be answered but we will get to as many as possible.

How to Receive CME and MOC Points

LIVE VIRTUAL GRAND ROUNDS WEBINAR
ACG will send a link to a CME & MOC evaluation to all attendees on the live webinar.

ABIM Board Certified physicians need to complete their MOC activities by December 31, 2023 in order for the MOC points to count toward any MOC requirements that are due by the end of the year. No MOC credit may be awarded after March 1, 2024 for this activity.
MOC QUESTION

If you plan to claim MOC Points for this activity, you will be asked to: Please list specific changes you will make in your practice as a result of the information you received from this activity.

Include specific strategies or changes that you plan to implement. THESE ANSWERS WILL BE REVIEWED.

ACG Virtual Grand Rounds

Join us for upcoming Virtual Grand Rounds!

Week 5 – Thursday, February 9, 2023
Liver Cancer Update and Review for the Gastroenterologist
Faculty: Ayse Aytaman, MD, FACG
Moderator: Janice Jou, MD
At Noon and 8pm Eastern

Week 6 – Thursday, February 16, 2023
Post-COVID-19 Disorders of Gut-Brain Interaction/Functional Gastrointestinal Disorders
Faculty: Max L. Schmulson, MD
Moderator: Sarah K. McGill, MD, MSc, FACG
At Noon and 8pm Eastern

Visit gi.org/ACGVGR to Register
**Disclosures**

**Asmeen Bhatt, MD, PhD, FACG**
Dr. Bhatt has no relevant financial relationships with ineligible companies.

**Millie D. Long, MD, MPH, FACG**
AbbVie: Consultant; BMS: Consultant; Calibr: Consultant; Janssen: Consultant; Lilly: Consultant; Pfizer: Consultant, Grant/Research Support; Prometheus: Consultant; Takeda: Consultant, Grant/Research Support; Target PharmaSolutions: Consultant; Theravance: Consultant

**Allison R. Schulman, MD, MPH**
Apollo Endosurgery: Consultant; Boston Scientific: Consultant; GI Dynamics: Grant/Research Support; MicroTech: Consultant; Olympus America, Inc.: Consultant

*All of the relevant financial relationships listed for these individuals have been mitigated*
Promoting Gender Diversity in Non-Clinical Realms: Engaging Women in Research and Authorships

Millie D. Long, MD, MPH, FACG
Professor of Medicine
Director, Gastroenterology and Hepatology Fellowship
University of North Carolina at Chapel Hill

Outline: Engaging Women in Research and Authorships

- Describe current state of women in GI
- Identify challenges for women in GI
- Identify methods to overcome challenges for women in GI
- Review the current state of publishing for women in academic gastroenterology journals
- Example of prominent female physician scientists in GI
- Review high impact publications led by female physician scientists
- What can we do to enhance the position of women in clinical research in GI?
As of 2019, only 18.9% of gastroenterologists are women
More recently 40-50% of new GI fellows have been women; which may lessen the
gender gap over the next decade
Women comprise 37% of full-time associate professors and 25% of full professors
Women comprise 19% of fellowship PDs
Only 29% of division or section chief positions are held by women, 18.9% of
department chairs and 18% of medical school deans

Women in Gastroenterology and Hepatology
Pallardy C. Beckers GI & Endoscopy 2015
Colleges AoAM. 2018-2019

Many women (up to 40%) will reduce their commitment to part time or leave
medicine within 6 years
Competing interests between work and home life
Bias, unequal wage, pregnancy and motherhood related discrimination
“Third shift” work at home
Lack of formal leadership training for women

Challenges for Women in Gastroenterology and Hepatology
Overcoming the Gap for Women in GI

Become involved at local institution or GI society
Gain leadership experience and document on CV
Build a national reputation (committee work, research output, presentations)
Establish relationships, network, collaborate
Communicate your goals and interests to enhance opportunities for sponsorship

Rotundo LC, Gaidos JK. Dis Dis Sci. 67, 397-399.

Female authorship in major academic journals over 20 years

Of 5 major GI and Hepatology journals published in U.S., 5-year intervals were evaluated between 1992-2012
Gender of first and last author were determined by first name and confirmation strategies (web searches, institutional websites, etc.)
AMA data were used to determine proportion of women among active gastroenterologists for corresponding years
A total of 2275 articles were included
18% of first authors and 10.1% of senior authors were women
Over 20 years, proportion of female first authors increased from 9.1% to 29.3% (p for trend <0.001) over 20 years

Female authorship in major academic journals over 20 years


- Proportion of women editorial board members increased from 2.9% in 1985 to 19.8% in 2020 (p<0.001)
- Women authors of editorials increased from 0% in 1985 to 22.2% in 2020 (p<0.0001)

Female editorial board membership and editorial authorship in major academic GI journals

Determined the sex of editorial board members (n=2282) and authors of editorials (n=1705) across 6 journals from 1985-2020 at 5-year intervals

- Proportion of women editorial board members increased from 2.9% in 1985 to 19.8% in 2020 (p<0.001)
- Women authors of editorials increased from 0% in 1985 to 22.2% in 2020 (p<0.0001)

Currently, the editorial board of AJG is 25% female

Risk Factors for HCC in contemporary cohorts of patients with cirrhosis

Prospective cohorts from the Texas HCC consortium and Houston Veterans Administration Cirrhosis Surveillance Cohort

Patients w/cirrhosis enrolled from 7 centers and followed until HCC, transplant, death or June 30, 2021

2733 patients with cirrhosis included

7406 person-years of follow up

Annual incidence rate of HCC: 1.71% cured HCV, NAFLD

Risks include: cured HCC [HR 2.04], smoking [HE 1.63] and obesity [HR 1.79]


AASLD Practice Guidance: Palliative care and symptom-based management in decompensated cirrhosis

Palliative care can be provided to patients with DC at any stage

Palliative care can be delivered by any member of the care team

Palliative care does not preclude the delivery of disease-directed or even curative treatments

Hospice is different than palliative care in that it focuses exclusively on comfort, rather than disease-directed curative treatment, including only those with life expectancy measured in months

### AGA Clinical Care Pathway for the Risk Stratification and Management of Patients with NAFLD


**Phases of the AGA Clinical Care Pathway:**

1. **Step 1: Identify patients at risk**
   - 2 or more metabolic risk factors
   - Type 2 diabetes
   - Evidence of any imaging modality or ultrasonography

2. **Step 2: History and laboratory tests**
   - Complete abdinal Hx, CBC, liver function tests
   - (NB: NAFLD risk is calculated using the NAFLD fibrosis score (NAS), high risk if 
     FIB-4 ≥ 3.267 or LMC ≤ 1.2 kPa and diabetes or hyperlipidemia)

3. **Step 3: Non-invasive testing (NIT) for fibrosis**
   - FIB-4 is a calculated ratio (based on age, AST, ALT, platelet count)
   - FIB-4 < 1.3
   - 1.3 ≤ FIB-4 < 2.67
   - FIB-4 ≥ 2.67

4. **Step 4: Liver stiffness measurement (LSM)**
   - LSM < 8 kPa
   - 8 ≤ LSM < 12 kPa
   - LSM ≥ 12 kPa

#### Risk Stratification

- **Low Risk**
  - LSM ≤ 8 kPa

- **Indeterminate Risk**
  - LSM 8-12 kPa

- **High Risk**
  - LSM ≥ 12 kPa

**Management Strategies**

- **Low Risk**
  - Management by PCP, dietitian, endocrinologist, cardiologist, others

- **Indeterminate Risk**
  - Management by hepatologist or multidisciplinary team (PCP, dietitian, endocrinologist, cardiologist, others)

- **High Risk**
  - Management by hepatologist

**Key Points**

- **Lifestyle intervention**
  - Yes

- **Weight loss recommended if overweight or obese**
  - Yes

- **Pharmacotherapy for NASH**
  - Not recommended

- **CVD risk reduction**
  - Yes

- **Diabetes care**
  - Standard of care

**Further Management**

- **Liver biopsy F2-F4**

---

### Pregnancy In IBD and Neonatal Outcomes (PIANO) Prospective Cohort


**Pregnancy and Neonatal Outcomes after Fetal Exposure To Biologics and Thiopurines among Women with Inflammatory Bowel Disease**

<table>
<thead>
<tr>
<th>Exposure</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biologics</td>
<td>379</td>
</tr>
<tr>
<td>Thiopurines</td>
<td>242</td>
</tr>
<tr>
<td>1490</td>
<td>642</td>
</tr>
<tr>
<td>1431</td>
<td>227</td>
</tr>
</tbody>
</table>

**No increase in:**

- Congenital malformations
- Spontaneous abortions
- Preterm birth
- Low Birth Weight
- Infections in year
  - But with preterm birth

**Spontaneous Abortion**

**No negative impact of drug exposure**
Exposure to Corticosteroids in Pregnancy is Associated with Adverse Perinatal Outcomes (PIANO)

1490 mothers with IBD enrolled, 1431 live births
Steroid use was associated with preterm birth (OR 1.79), LBW (OR 1.76), and NICU admission (OR 1.54)
Late corticosteroid use (2nd and/or 3rd trimester) was associated with serious infections at 9 and 12 months
Emphasizes the importance of controlling disease activity before and during pregnancy with steroid-sparing therapy


IBD Parenthood Clinical Care Pathway

Includes care pathways from preconception to post-partum
Evidence based assessment of medication utilization and optimization of disease state during pregnancy
One of the first care pathways that also included patient advocates in the planning and distribution

GI/Hepatology Female Physician Scientists

Areas of interest across the GI/Hepatology spectrum
Many are experts in women’s health issues in GI/Hepatology
ALL are also experts in other content “niches”
ALL have moved the needle for women in GI/Hepatology through their publications, mentorship of trainees and junior faculty, patient care, leadership (journals, societies)
ALL have continued to give back to the GI community and are role models for the next generation of female physician scientists

What can WE do to enhance the position of women in clinical research in GI?

Sponsor women in GI for roles in committees, leadership, and collaborative publications
Encourage female trainees to complete research training pathways (T-32) for formal training in epidemiology, biostatistics, grant writing
Mentor women in GI; provide career advice, opportunities, invitations for review papers
Invite women as reviewers for our top journals (including as a co-reviewer if you receive an invite)
Invite women to write invited reviews, participate in published conference proceedings
Sponsor female junior faculty/fellows for leadership training programs
Be an ally: advocate for change on behalf of patients and peers
Networking is really critical, and women generally don’t do as good a job of this as men. There should be opportunities on a regular basis throughout the year that you interact with people within your university and your field on a casual as well as more formal level. You can be the smartest person in the room, but if no one knows who you are, you will struggle to get recognized for your work.

Choose your mentor wisely! If you pick someone very junior, you may be seen as a competitor or a hindrance in their own advancement. If you pick someone too senior with too many people, you will only get the rubber stamp mentorship. Pick someone you admire and connect with. Someone with a track record of mentoring people who have developed independent careers.

Words of Advice for Trainees and Junior Faculty in GI on Developing a Research Career

Write every day. Set aside 30 min with no texts, IG, twitter and write without looking anything up. Sending a manuscript doesn’t have a deadline so you must create your own discipline.

Words of Advice for Trainees and Junior Faculty in GI on Developing a Research Career
What does the future hold for women in GI?

Percentage of women will continue to in specialties including GI will increase
Diversity will enhance all aspects of clinical care and research
Women will continue to gain leadership skills and leadership positions
In 2017, all 4 GI societies were led by women, this will occur with more frequency as deserving women are recognized
• Anna Lok (AASLD), Carol Burke (ACG), Sheila Crowe (AGA), and Karen Woods (ASGE)
The future is bright!

It's Time to Break Another Glass Ceiling: Women and Interventional Endoscopy

Allison R. Schulman, MD MPH
Associate Professor of Medicine & Surgery
Director of Bariatric Endoscopy
Interventional Endoscopy
Michigan Medicine
• Background

• Despite an increasing number of women matriculating into medical school, many challenges persist

### Table. Total and Percentage of Women Internal Medicine Subspecialty Residents and Fellows in 1991 and 2016*

<table>
<thead>
<tr>
<th>Internal Medicine Subspecialty</th>
<th>1991 Total Residents or Fellows</th>
<th>Women, No. (%)</th>
<th>2016 Total Residents or Fellows</th>
<th>Women, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>1925</td>
<td>195 (10.1)</td>
<td>2616</td>
<td>557 (21.3)</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>342</td>
<td>139 (40.6)</td>
<td>637</td>
<td>454 (71.3)</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>803</td>
<td>86 (10.7)</td>
<td>1505</td>
<td>512 (34.0)</td>
</tr>
<tr>
<td>Geriatric medicine</td>
<td>181</td>
<td>84 (46.4)</td>
<td>221</td>
<td>150 (67.9)</td>
</tr>
<tr>
<td>Hematology and oncology</td>
<td>1080b</td>
<td>281 (26.0)b</td>
<td>1657</td>
<td>711 (42.9)</td>
</tr>
<tr>
<td>Infectious disease</td>
<td>595</td>
<td>234 (39.3)</td>
<td>727</td>
<td>395 (54.6)</td>
</tr>
<tr>
<td>Nephrology</td>
<td>482</td>
<td>130 (23.9)</td>
<td>848</td>
<td>292 (34.4)</td>
</tr>
<tr>
<td>Pulmonary disease and critical care</td>
<td>1133b</td>
<td>183 (16.2)b</td>
<td>1621</td>
<td>528 (32.6)</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>337</td>
<td>135 (40.1)</td>
<td>457</td>
<td>275 (60.2)</td>
</tr>
</tbody>
</table>
• Status of diversity in leadership

Gender disparities in gastroenterology fellowship director positions in the United States

Zibing Woodward, MD,1,2 Zaida Rodriguez, MD,1,3 Janice H. Jou, MD,1,4 Kian Keyashian, MD,1,5 Yiyi Chen, PhD,1 Charles R. Thomas, Jr, MD,1 Grace H. Etta, MD,6 Sharlene L. D’Souza, MD1,5
Portland, Oregon, USA

**TABLE 1. Female representation in gastroenterology leadership positions**

<table>
<thead>
<tr>
<th>Role</th>
<th>No. of women (%)</th>
<th>No. of men (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program director</td>
<td>29 (17.8%)</td>
<td>134 (82.2%)</td>
<td>163</td>
</tr>
<tr>
<td>Associate program director</td>
<td>30 (28%)</td>
<td>77 (72%)</td>
<td>107</td>
</tr>
<tr>
<td>Division chief</td>
<td>11 (7.3%)</td>
<td>139 (92.7%)</td>
<td>150</td>
</tr>
</tbody>
</table>

Nat Rev Gastro Hep 2020
• Status of diversity in leadership

**TABLE 1. Female representation in positions**

<table>
<thead>
<tr>
<th>Role</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program director</td>
<td>25</td>
</tr>
<tr>
<td>Associate program director</td>
<td>30 (28%)</td>
</tr>
<tr>
<td>Division chief</td>
<td>11 (7.3%)</td>
</tr>
</tbody>
</table>

<0.7% of U.S. medical school faculty full professors are Black women

Sophie Balzora
• Interventional endoscopy training
  
  • Advanced endoscopy (AE) has become a popular career choice with a growing number of applicants
  • Dedicated AE fellowships (AEF) originated in the 1980s, focused on ERCP
  • Field has grown tremendously
  • Technically demanding, require a special skill set
  • Dedicated year in AE has become apparent

<table>
<thead>
<tr>
<th>Fellowship</th>
<th>No. of applicants</th>
<th>No. of positions</th>
<th>No. of applicants per position</th>
<th>Applicant match rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General gastroenterology</td>
<td>908</td>
<td>577</td>
<td>1.6</td>
<td>62.7</td>
</tr>
<tr>
<td>Advanced endoscopy fellowship</td>
<td>104</td>
<td>71</td>
<td>1.5</td>
<td>60.6</td>
</tr>
<tr>
<td>Interventional cardiology</td>
<td>310</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Advanced heart failure and transplant cardiology</td>
<td>84</td>
<td>115</td>
<td>.7</td>
<td>95.2</td>
</tr>
<tr>
<td>Clinical cardiac electrophysiology</td>
<td>126</td>
<td>135</td>
<td>9</td>
<td>91.2</td>
</tr>
<tr>
<td>Interventional pulmonology</td>
<td>42</td>
<td>38</td>
<td>1.1</td>
<td>85.7</td>
</tr>
</tbody>
</table>

*Data for fellowships other than advanced endoscopy fellowships were obtained from the National Resident Matching Program and Electronic Residency Application Service website (Available at: www.nrmp.org).
(Interventional cardiology participates in the Electronic Residency Application Service but not in the National Resident Matching Program.)
• Interventional endoscopy training

  • The allure of an ever-evolving and innovative field is demonstrated by a substantial increase in the number of AEFs in the country
  • In the year 2000, there were about 10 AEFs, and currently there are >100

• Interventional endoscopy training

  • Despite its increasing popularity, women interventionalists have been a glaring absence in this phenomenon
  • For the 2018-2019 academic year, women represented only 12% of incoming AE fellows
  • The percentage of female trainees interested in AE diminishes as general GI fellowship progresses
    • A greater proportion of men (78%) than women (59%) were interested in AE as they began their GI fellowships
    • Interest declined significantly among women as compared with men for ERCP (22% vs 77%)
• What are the barriers?

- Underrepresentation of women
  - Leadership
  - Lack of visible mentors
- Lack of safe and comfortable environment
  - Ergonomics
  - Concerns for radiation exposure
- Gender-based bias in workplace
  - Discrimination
  - Implicit bias
  - Imposter syndrome
- Work-life balance
  - Schedules
  - Family planning/pregnancy
Gender disparities in advanced endoscopy fellowship

Jessica X. Yu,1 Tyler M. Berzin,2 Brintha Enestvedt,1 Michelle A. Anderson,3 Violeta B. Popov,4,5 Christopher C. Thompson,6 and Allison R. Schulman3,7

• Survey of AEF program directors participating in the ASGE match

• Aims:
  • Describe program characteristics
  • Identify contributors to gender disparity including barriers and facilitators influencing women pursuing AEF training

59.3% response rate (38/64)

Women represented
• 15.8% (6/38) of AEF PDs
• 13.2% (5/38) of endoscopy chiefs
• 14.8 ± 17.0% of AEF faculty
• 12.0 ± 11.1% of AEF trainees over the past 10 years

• 47.4% (18/38) programs reported no female AE faculty (!)
• 31.6% (12/38) of programs have never had a female fellow (!)
Gender disparities in advanced endoscopy fellowship

Jessica X. Yu, Tyler M. Berzin, Brinha Eneqvist, Michelle A. Anderson, Violeta B. Popov, Christopher C. Thompson, and Allison R. Schulman

- Percentage of female fellows was strongly associated with percentage of female AEF faculty ($\beta = 0.43$, $P < 0.001$)

- Most important cited barriers to recruitment:
  - Inflexible hours and call (mean rank 3.3 ± 1.1)
  - Exposure to fluoroscopy (2.9 ± 1.1)
  - Lack of women endoscopists at national conferences/courses (2.9 ± 1.1)
  - Lack of female mentorship (2.9 ± 1.0)
• Why does this matter?

• 22-70% women with gender preference for endoscopists
• Patient gender single most predictive factor for same-sex preference
• 34.1-90% delay care until same-gender provider

• Study of 1078 Muslim patients
• 66% indicated gender preference
• 72% would delay care by 7 days for same gender

Anglade P et al. GIE 2021
Kamani L et al. GIE 2021

• Why does this matter?

• In survey, 24.7% women vs 37.5% men (no diff) wanted career in advanced endoscopy
• Major motivating factors (men and women):
  • Strong personal interest
  • Preference for procedures
  • Encouragement from a mentor
  • Wider skill sets for jobs
• No gender difference in career satisfaction for those who went into AE

Increase job satisfaction → improve patient care

David Y et al. Am J Gastro 2021
Courtesy of Amrita Sethi
• Why does this matter?

  • Academic faculty workforce should reflect female medical school matriculants
  • Increasing women in advanced endoscopy brings diversity of thought
  • Serves valuable need for our patients (women prefer women)

• How do we achieve this?

  • System based factors:
    • Evaluation of hiring practices
    • Zero-tolerance policies for harassment
    • Ensuring equitable representation
    • Transparency surrounding parental leave policies
      • Breast pumping time, childcare access, schedule flexibility
    • Avoid pipeline “leaks”
      • Ensure advancement opportunity, parental support, an environment without harassment, sponsorship
    • Avoid pipeline “plugs”
      • Term limits
    • Fair selection processes for leadership
    • Salary compensation and equity
• How do we achieve this?

• **System based factors:**
  
  - Diversify leadership
  - Change the environment
  - Create networks and increase visibility of mentors/role models
  - Seek guidance
  - Provide opportunities
  - Elevate and amplify perspectives and voices of diversity
  - Practice allyship

• How do we achieve this?

• **Individual factors:**

  - Self advocacy
  - Support team of coaches, sponsors, and mentors
  - Combat the “third shift” (household tasks)
  - Allyship
• How do we achieve this?

• Paradigm shift
  • Recruitment of new endoscopists
  • Retention of existing providers
  • Sustainability
  • Innovation

Diversity and gender equity in endoscopy

Addressing gender in gastroenterology: opportunities for change
Loren G. Rabinowitz, MD,† Sharmila Anandassabapathy, MD,‡ Amrita Sethi, MD,§ Uzma D. Siddiqui, MD,¶ Michael B. Wallace, MD,** Michelle K. Kim, MD, PhD††

<table>
<thead>
<tr>
<th>TABLE 2. Industry and the endoscopist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Endoscopy leadership, both in practice and hospital settings, must set clear behavioral expectations for equal and appropriate treatment of male and female endoscopists with industry partners.</td>
</tr>
<tr>
<td>2. Unconscious bias training has been demonstrated to be an effective tool in combatting unequal treatment of women in medicine and may be beneficial in the endoscopy setting.27</td>
</tr>
<tr>
<td>3. Female and male endoscopists should have equal representation and purchasing power in negotiations with industry partners. This equality should be made clear to industry representatives throughout the negotiating process.</td>
</tr>
<tr>
<td>4. Female endoscopists should be actively recruited to participate and lead research opportunities.</td>
</tr>
</tbody>
</table>

GIE 2020
Courtesy of Amrita Sethi
• How do we achieve this?

• **Change at a local level (endoscopy unit / division)**
  
  • Increase presence at the table: chief of endo, meetings with unit players (nursing, anesthesia, hospital supply)
  • Amplify thoughts and ideas of others, prevent being overlooked
  • Nominate others for opportunities, help overcome imposter syndrome
  • Recognize good work and elevate to the level that will make a difference (ex. email a supervisor/chief)
  • Embrace failure/complications → learning opportunities
  • Address policies that cause barriers (pregnancy, work hours, meeting times, etc.)

Adams MA, GIE 2021
Courtesy of Amrita Sethi

• How do we achieve this?

• **Changing the environment**
  
  • Set the mission and core values
  • Change the dialogue - definitions of success, qualifications
  • Enhance the skillset - leadership training, professional coaching
  • Bias training - without awareness there can be no change
  • Provide atmosphere of safety (psychologically and physically)
  • Expect excellence but reward the effort

**EDITORIAL**

Don’t fix the women, fix the system: recognizing and addressing implicit gender bias in gastroenterology training and practice

Adams MA, GIE 2021
Courtesy of Amrita Sethi
How do we achieve this?

New platforms

Women In Endoscopy

WIE is the global organization that champions the advancement of women through education, professional growth and leadership development.

How do we achieve this?

Societal involvement

- ASGE Women in Endoscopy SIG
- ACG Women in GI Circle
- UEG Diversity Committee
- Society for Women in Gastroenterology (SWiG)
- Women in Endoscopy (WIE)
- Women in GI Network Asia Pacific Society (WIGNAPS)
- Association of Black Gastroenterologists and Hepatologists of America (ABGH)
If you can’t see it, you can’t be it

- How do we achieve this?
- Increasing visibility

If you can see it, you can do it
• Conclusion

• Despite an increasing number of women matriculating into medical school, many challenges persist
• Gender disparities evident throughout medicine, with few women filling leadership roles and being promoted
• These disparities are exacerbated in procedural fields including interventional endoscopy
• Need to recruit and retain in order to sustain
• Need an inclusive, innovative environment
• Increase mentorship to inspire others, overcome obstructive perceptions
• Diversify leadership to enhance innovation, elevation, & promotion

Thank you
ERGONOMICS IN ENDOSCOPY – WHAT DO WOMEN DO DIFFERENTLY?

Asmeen Bhatt MD PhD
Assistant Professor
Department of Gastroenterology, Hepatology and Nutrition
The University of Texas Health Science Center at Houston

ERGONOMICS

- Ergonomics: Greek words Ergon (work) and Nomos (laws). Term was coined by a Polish scholar in 1857.
- Definition: an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely (Merriam-Webster Dictionary)

er•go•nom•ic
/ˌerɡəˈnəmɪk/
adj
relating to or designed for efficiency and comfort in the working environment

FIVE ASPECTS:
1. Safety
2. Comfort
3. Ease of Use
4. Productivity/Performance
5. Aesthetics
WHY IS IT IMPORTANT IN ENDOSCOPY?

Endoscopy related injury

- Prevalence of musculoskeletal injury ranging from 29%-89% in physicians from performing endoscopy, as summarized in several review articles.

- A 2016 survey revealed that 47% of gastroenterology fellows reported a new musculoskeletal injury related to endoscopy, mostly in the first year of training. Only 25% had ergonomic training and 83% desired such training.


Male : Female Gastroenterologists

- Association of American Medical Colleges (AAMC) data shows that only 17.6% of all practicing gastroenterologists are women.

- American Board of Internal Medicine (ABIM) statistics from academic year 2018-19 shows that 39% of first year gastroenterology trainees are now women!

- Women have smaller hand sizes that do not fit the endoscopes, have smaller muscle mass and high levels of progesterone during pregnancy cause laxity of joints and ligaments, which can all potentially lead to musculoskeletal injury.
**ENDOSCOPY RELATED INJURY**

**Prevalence**

29%-89%

**Mechanisms**
- Overuse Injuries (high pinch force)
- Repetitive Motions
- Awkward and Fixed Positions
- Standing for long periods of time
- Use of lead aprons
- Lack of breaks and less recovery time

**Sites**
- Thumb, Hand, Wrist, Elbow, Shoulder and Carpel Tunnel Syndrome
- Neck and Upper Back
- Lower Back

ENDOSCOPY RELATED INJURY IN FEMALES

- A 2004 survey of 726 laparoscopic surgeons studied the relationship between hand size and difficulty using surgical instruments: found that the percentage of time subjects reported having difficulty using all laparoscopic instruments was greater for the Small glove size group compared to both the Medium and Large groups (p < 0.001)

- A 2008 survey of U.S. gastroenterology fellows showed that respondents felt like hand size affected the ability to learn endoscopy and a significant number of trainees, especially females, perceive that their hands are too small for standard endoscopes

- Korean Study, n=55, Female participants (33%), Severe pain was seen in 47% (26/55), more women than men reported severe pain (61% vs 40%, respectively, p=0.15)

- A study of 171 endoscopists from Portugal with 55% females, found that female gender was related to higher number of musculoskeletal injury (P= 0.03) and severe pain (P=0.02)


ENDOSCOPY RELATED INJURY IN FEMALES

- Survey study of 1698 participants: Rates of Injury-75%. Male Participants – 65.7%; Thumb, neck, hand/finger, lower back, shoulder, and wrist

- No significant difference in the prevalence of ERI between male and female gastroenterologists

- Females reported upper extremity ERI while males reported lower-back pain-related ERI

- Significant gender differences were noted in the reported mechanisms attributed to ERI

- Most respondents did not discuss ergonomic strategies in their current practice (63%)

- ERI was less likely to be reported in GI physicians who took breaks during endoscopy (P = 0.002)

- Approximately 79% of the female participants reported new-onset ERI related to pregnancy

Pawa S et al., Am J Gastroenterol 2021 Mar; 115 (3): 530-538
PREVENTION AND MITIGATION

Ergonomic endoscopy

Hierarch of Controls

Elimination
Substitution
Engineering Controls
Administrative Controls
PPE

Most effective
Prevention through design: ENDOSCOPE/DEVICE COMPANIES
Endoscopy suite: adjustable monitors, beds
Endoscopes: support stands, caps, right/left dial assist
Ergonomic training/safety culture
Ergonomic "Time out"
Endoscopy schedule
Endoscope maintenance
Endoscopy's technique
Microbreaks/stretches
Maintain physical fitness

Least effective

© ASGE / GIE


Endoscopy Unit
- Adjustable Beds
- Adjustable Monitors

Endoscope Related Controls

Distal Attachment Cap
Auxiliary angle (left/right dial) assist knob/adaptor
Aer-O-Scope
Invendo Colonoscope system
Pathfinder endoscope overtube

Colonscope control support device

Shergill A et al. Gastrointest Endosc; 2021;93 (3):704-709
Wei M et al. Gastrointest Endosc; 2021 Mar;93(3):740-749

American College of Gastroenterology
Ergonomics training/ Safety culture:

- A 2021 Core Curriculum article for “Ergonomics in Endoscopy” addresses the training environment, goals of training (cognitive, technical and non-technical skills) and training processes and assessment of training.
- A 2020 study showed that simulation-based Endoscopy Training Curriculum (ETC) is associated with reduced risk of Musculoskeletal Injury during endoscopy.

Khan R et al. Gastrointest Endosc. 2020 Nov;92(5):1070-1080
ADMINISTRATIVE CONTROLS

- Ergonomics “Time Out”: A 2019 Quality Improvement Project aimed at GI faculty, fellows, nurses and technicians used an “Ergonomic Checklist” among other measures to educate and improve Endoscopy Ergonomics.

- Endoscopy Schedule: Incorporating non procedure days for recuperation

- Endoscope Maintenance

Ali MF et al. Tech Gastrointest Endosc. 2019, 21(3): 159-161

PERSONAL PROTECTIVE EQUIPMENT

- Endoscopist’s Technique: “Pinkie Maneuver”, Place Shaft on the Bed

- Microbreaks/Stretches: A 2016 study of 56 surgeons showed that incorporating microbreaks with exercises during surgery resulted in self-reported improvement or no change in their mental focus (88%) and physical performance (100%) and significantly reduced discomfort in the shoulders. 87% of the surgeons wanted to incorporate the microbreaks with exercises into their OR routine

- Maintain Physical Fitness: One 2019 article from the Am J Gastroenterol called on endoscopists to train as “endo-athletes” and adopt the Ergonomic Pentathlon- Equipment (adjusting to appropriate heights), Preparation (optimizing layout), Teamwork (teaching team best ergonomic practices), Recovery (regular exercising and stretching between cases) and Reflection (contemplating how to improve ergonomics), as principles to help reduce risk of injury

Ali MF et al. Tech Gastrointest Endosc. 2019, 21(3): 159-161
Hallbeck M et al. Appl Ergon. 2017 Apr;60:334-341
ERGONOMICS IN ENDOSCOPY

WHAT DO WOMEN DO DIFFERENTLY?

**METHODS**

- A survey instrument was designed in REDCap.
- The survey was distributed as a REDCap link via email to participants (practicing gastroenterologists) in 2020 and responses to the survey were stored within REDCap.
- The study protocol was approved by the IRB at the University of Texas Health Science Center at Houston.
- Statistical data analysis was done using the Stata software version 14.2. Majority of the overall data contained categorical variables which were summarized as frequency for analysis and the statistical significance between females and males were determined.

- Equipment
- Endoscopy room orientation
- Use of specific parts of the endoscope
- Styles of performing various techniques
- Sites of injury
- If time was taken off from work?
- Use of corrective lenses
- Preferences to improve ergonomics
## Survey Participant Characteristics

### PHYSICIAN POSITION

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominantly standing</td>
<td>103 (96.3%)</td>
<td>41 (100%)</td>
<td>62 (95.5%)</td>
<td>0.27</td>
</tr>
<tr>
<td>Predominantly sitting</td>
<td>8 (0.8%)</td>
<td>0</td>
<td>0 (0.8%)</td>
<td></td>
</tr>
</tbody>
</table>

### PATIENT BED LEVEL

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At physician hip level</td>
<td>70 (65.4%)</td>
<td>28 (68.3%)</td>
<td>42 (63.6%)</td>
<td>0.79</td>
</tr>
<tr>
<td>Above physician hip level</td>
<td>30 (28%)</td>
<td>10 (24.4%)</td>
<td>20 (30.3%)</td>
<td></td>
</tr>
<tr>
<td>Below physician hip level</td>
<td>7 (6.6%)</td>
<td>3 (7.3%)</td>
<td>4 (6.1%)</td>
<td></td>
</tr>
</tbody>
</table>

### MONITOR HEIGHT

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At physician eye level</td>
<td>63 (58.9%)</td>
<td>22 (53.7%)</td>
<td>41 (62.1%)</td>
<td>0.42</td>
</tr>
<tr>
<td>Above physician eye level</td>
<td>34 (31.8%)</td>
<td>16 (39%)</td>
<td>18 (27.3%)</td>
<td></td>
</tr>
<tr>
<td>Below physician eye level</td>
<td>10 (9.3%)</td>
<td>3 (7.3%)</td>
<td>7 (10.6%)</td>
<td></td>
</tr>
</tbody>
</table>

### ENDOSCOPE TOWER LOCATION

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behind physician</td>
<td>94 (87.8%)</td>
<td>36 (87.8%)</td>
<td>58 (87.9%)</td>
<td>0.73</td>
</tr>
<tr>
<td>In front of physician</td>
<td>6 (5.6%)</td>
<td>3 (7.3%)</td>
<td>3 (4.5%)</td>
<td></td>
</tr>
<tr>
<td>To the left of physician</td>
<td>7 (6.6%)</td>
<td>2 (4.9%)</td>
<td>5 (7.6%)</td>
<td></td>
</tr>
</tbody>
</table>

### ENDOSCOPE CONTROL HOLD TECHNIQUE

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand predominantly used to turn small wheel on endoscope</td>
<td>56 (52.3%)</td>
<td>20 (48.8%)</td>
<td>36 (54.5%)</td>
<td>0.65</td>
</tr>
<tr>
<td>Left</td>
<td>68 (63.7%)</td>
<td>21 (51.2%)</td>
<td>47 (71.2%)</td>
<td>0.05*</td>
</tr>
<tr>
<td>Right</td>
<td>39 (36.3%)</td>
<td>19 (48.8%)</td>
<td>19 (28.8%)</td>
<td></td>
</tr>
</tbody>
</table>

### COLONOSCOPE USED IN PETITE OR LOW BMI PATIENTS

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric colonoscope</td>
<td>58 (54.3%)</td>
<td>24 (58.5%)</td>
<td>34 (51.5%)</td>
<td>0.61*</td>
</tr>
<tr>
<td>Regular colonoscope</td>
<td>49 (45.7%)</td>
<td>17 (41.5%)</td>
<td>32 (48.5%)</td>
<td></td>
</tr>
</tbody>
</table>

### ENDOSCOPY STYLES

**Endoscopy control hold technique**

1. Umbilical cord inside the forearm
2. Umbilical cord outside the forearm
### Preference for Turning the Endoscope Shaft during Procedure

<table>
<thead>
<tr>
<th>Method</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the small (left/right deflection) wheel</td>
<td>23 (56.1%)</td>
<td>26 (39.1%)</td>
<td>0.09</td>
</tr>
<tr>
<td>Torquing or twisting the shaft</td>
<td>46 (92.2%)</td>
<td>61 (92.4%)</td>
<td>0.26</td>
</tr>
<tr>
<td>Turning your left forearm (that is holding the endoscope control)</td>
<td>17 (41.5%)</td>
<td>34 (51.5%)</td>
<td>0.31</td>
</tr>
</tbody>
</table>

### Preferences for Stabilizing the Endoscope Shaft during Procedure

<table>
<thead>
<tr>
<th>Method</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stabilize with your body</td>
<td>20 (48.8%)</td>
<td>42 (63.6%)</td>
<td>0.62</td>
</tr>
<tr>
<td>Place shaft on the bed</td>
<td>27 (65.8%)</td>
<td>42 (63.6%)</td>
<td>0.80</td>
</tr>
<tr>
<td>Hold the shaft with your fingers of left hand</td>
<td>20 (48.8%)</td>
<td>34 (51.5%)</td>
<td>0.28</td>
</tr>
<tr>
<td>Ask for assistance from tech/nurse</td>
<td>11 (26.8%)</td>
<td>18 (28.8%)</td>
<td>0.82</td>
</tr>
</tbody>
</table>

### Injury from Performing Endoscopy

<table>
<thead>
<tr>
<th>Injury (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced any pain or tingling numbness associated with performing endoscopy</td>
<td>53 (49.5%)</td>
<td>27 (40.9%)</td>
<td>0.02*</td>
</tr>
<tr>
<td>Pain in wrist</td>
<td>18 (16.8%)</td>
<td>7 (10.6%)</td>
<td>0.02*</td>
</tr>
<tr>
<td>Pain in hand, thumb or fingers</td>
<td>20 (48.8%)</td>
<td>23 (34.8%)</td>
<td>0.15</td>
</tr>
<tr>
<td>Pain in elbow</td>
<td>8 (7.5%)</td>
<td>5 (7.6%)</td>
<td>0.96</td>
</tr>
<tr>
<td>Pain in shoulder</td>
<td>20 (48.8%)</td>
<td>11 (16.7%)</td>
<td>0.95</td>
</tr>
<tr>
<td>Pain in upper back</td>
<td>11 (10.3%)</td>
<td>6 (9.1%)</td>
<td>0.60</td>
</tr>
<tr>
<td>Pain in lower back</td>
<td>15 (14%)</td>
<td>6 (9.1%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Pain in hip</td>
<td>3 (2.8%)</td>
<td>2 (3%)</td>
<td>0.85</td>
</tr>
<tr>
<td>Pain in knee</td>
<td>5 (4.3%)</td>
<td>5 (7.6%)</td>
<td>0.07</td>
</tr>
<tr>
<td>Pain in ankle</td>
<td>1 (0.9%)</td>
<td>1 (1.5%)</td>
<td>0.42</td>
</tr>
<tr>
<td>Pain in foot</td>
<td>3 (3.7%)</td>
<td>1 (1.5%)</td>
<td>0.12</td>
</tr>
<tr>
<td>Taken time off from work to treat pain, tingling or numbness</td>
<td>2 (4.8%)</td>
<td>8 (12.1%)</td>
<td>0.07</td>
</tr>
<tr>
<td>Needed corrective lenses or a change in prescription of lenses due to performing endoscopy</td>
<td>10 (9.3%)</td>
<td>7 (10.6%)</td>
<td>0.57</td>
</tr>
</tbody>
</table>
UNIVARIATE AND MULTIVARIATE ANALYSIS

<table>
<thead>
<tr>
<th>Have you experienced any pain or numbness associated with the procedure?</th>
<th>(n=107)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Female | 26 (63.4%) | 15 (36.6%) | 0.02*  
Male | 27 (42.9%) | 39 (57.1%) |
| Do you work with GI fellows in training? |  
Yes | 33 (24.9%) | 44 (57.1%) | 0.03*  
No | 20 (60.7%) | 10 (33.3%) |
| Weekly endoscopy case volume |  
< 20 cases | 16 (42.1%) | 22 (57.9%) | 0.34  
20 – 40 cases | 28 (57.1%) | 21 (42.9%)  
> 40 cases | 9 (45%) | 11 (55%) |
| Performing fluoroscopic or Advanced endoscopic procedures |  
Yes | 22 (57.9%) | 16 (42.1%) | 0.19  
No | 31 (44.9%) | 38 (55.1%) |
| How do you prefer to hold the endoscope? |  
Outside the forearm | 36 (51.4%) | 34 (48.6%) | 0.59  
Inside the forearm | 17 (45.9%) | 20 (54.1%) |
| At what height is the monitor set for your procedures? |  
Above eye level | 18 (52.9%) | 16 (47.1%) | 0.77  
At eye level | 31 (49.2%) | 32 (50.8%)  
Below eye level | 4 (40%) | 6 (60%) |

Factor | Coefficient | Standard error | p-value |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly endoscopy case volume</td>
<td>0.137</td>
<td>0.313</td>
<td>0.66</td>
</tr>
<tr>
<td>Gender</td>
<td>1.355</td>
<td>0.503</td>
<td>0.00*</td>
</tr>
<tr>
<td>Performing fluoroscopic or advanced endoscopic procedures</td>
<td>0.859</td>
<td>0.489</td>
<td>0.07</td>
</tr>
<tr>
<td>Endoscope hold control</td>
<td>0.029</td>
<td>0.492</td>
<td>0.95</td>
</tr>
<tr>
<td>Monitor height location</td>
<td>-0.031</td>
<td>0.380</td>
<td>0.93</td>
</tr>
<tr>
<td>Working with fellows in training</td>
<td>-1.102</td>
<td>0.488</td>
<td>0.02*</td>
</tr>
</tbody>
</table>

PREFERENCES TO IMPROVE ENDOSCOPY ERGONOMICS

<table>
<thead>
<tr>
<th>Preferences to improve ergonomics</th>
<th>Yes (n=107)</th>
<th>Female (n=41)</th>
<th>Male (n=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-procedure posture safety check list</td>
<td>70 (65.4%)</td>
<td>32 (78%)</td>
<td>38 (57.6%)</td>
<td>0.03*</td>
</tr>
<tr>
<td>Wear a posture sensor on your back which signals you to stand up straight</td>
<td>35 (32.7%)</td>
<td>20 (48.8%)</td>
<td>15 (22.7%)</td>
<td>0.00*</td>
</tr>
<tr>
<td>Use braces at the site of pain to provide stability</td>
<td>35 (32.7%)</td>
<td>19 (46.3%)</td>
<td>16 (24.2%)</td>
<td>0.01*</td>
</tr>
<tr>
<td>Talk colleagues (techs, nurses) to remind physician of correct posture</td>
<td>41 (38.3%)</td>
<td>18 (43.9%)</td>
<td>23 (34.8%)</td>
<td>0.34</td>
</tr>
<tr>
<td>External items to help with position (chair, anti-fatigue mat, Christmas tree to hold shaft etc.)</td>
<td>43 (40.2%)</td>
<td>19 (46.3%)</td>
<td>24 (36.4%)</td>
<td>0.30</td>
</tr>
<tr>
<td>Change working posture and use pauses during long procedures</td>
<td>49 (45.8%)</td>
<td>20 (48.8%)</td>
<td>29 (43.9%)</td>
<td>0.62</td>
</tr>
<tr>
<td>Re-design endoscopy room (remove unnecessary equipment, install adjustable monitors etc.)</td>
<td>51 (47.7%)</td>
<td>20 (48.8%)</td>
<td>31 (47%)</td>
<td>0.85</td>
</tr>
<tr>
<td>Willing to try new re-designed lighter endoscopes</td>
<td>58 (54.2%)</td>
<td>24 (58.5%)</td>
<td>34 (51.5%)</td>
<td>0.47</td>
</tr>
<tr>
<td>Educate oneself about endoscopy ergonomics (attend conferences, read journal articles etc.)</td>
<td>83 (77.6%)</td>
<td>31 (75.6%)</td>
<td>52 (78.8%)</td>
<td>0.70</td>
</tr>
</tbody>
</table>
PREGNANCY AND ENDOSCOPY ERGONOMICS

- Of the 41 total female participants, 30 performed endoscopy during pregnancy (73.2%)
- Of those 30 participants, 7 (23.3%) performed advanced endoscopy with fluoroscopy during pregnancy. These 30 participants stated that they did not use any special modifications to perform endoscopy or use any special precautions to perform advanced endoscopy with fluoroscopy during pregnancy.
- The two most common comments received from females who performed endoscopy during pregnancy:
  1) Procedure was preferably done sitting and
  2) Fewer/lesser cases were performed each day.

CONCLUSIONS

Survey Participant Characteristics - Females were shorter in height, had smaller hand sizes, performed fewer weekly case volumes and more males than females performed advanced endoscopic procedures.

Endoscopy Styles - Females preferred holding the endoscope with the umbilical cord outside the forearm, using the right hand to turn the small wheel and using a pediatric colonoscope to perform colonoscopy in a petite or low BMI patient.

Technique Preferences - The preferred methods for turning the endoscope shaft and for stabilizing the endoscope shaft during the procedure were not statistically different between the genders.

Our study is the first to highlight these subtle gender differences in endoscopy styles.
CONCLUSIONS

Injury from performing endoscopy - Overwhelming percentage of gastroenterologists suffer work related injury, especially females. Most common site on injury is hand, thumb and fingers. Females suffer from more wrist pain than males.

Univariate and Multivariate Analysis of injury with variables - Gender is an independent risk factor for injury. Working with a GI fellow decreases injury, while higher weekly case volumes and performing advanced endoscopy procedures do not.

Preferences to improve endoscopy ergonomics - Our study proved a willingness to adopt options to improve endoscopy ergonomics; will guide our future studies.

These findings provide insight into the needs for techniques to improve endoscopy ergonomics which will likely prevent future injuries, enhance work efficiency and satisfaction.

We propose that there is a strong need for ergonomic focused specific training for female and male trainees in gastroenterology.

THANK YOU
Questions

Asmeen Bhatt, MD, PhD, FACP

Millie D. Long, MD, MPH, FACP (will not be able to join for Q&A)

Allison R. Schulman, MD, MPH