

ACL Injuries: Sex Differences and Return to Play Reflections: 50 Years of Title IX



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Clarify Definition Sex vs. Gender

Sex

- Genetic and biologic property
- XX vs XY
- Physiologic and biologic characteristic that define men and women

Gender

- Refers to socially constructed roles, behaviors and attributes that society considers appropriate for men and women
- Masculine and feminine are gender categories

Epidemiology of Injury in Pediatric Athletes

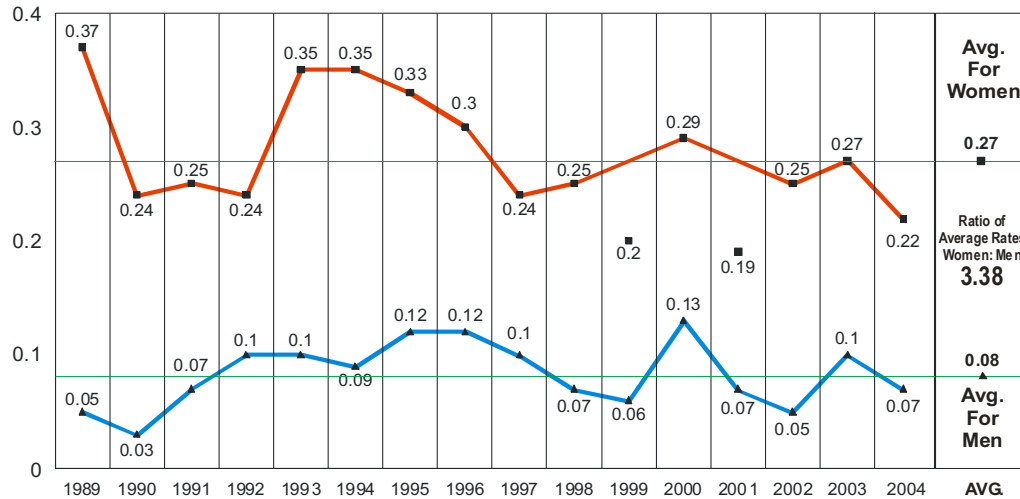
- Cross sectional study performed at Boston Children's Hospital
- Retrospective Chart Review 5% random sampling children age 5-17 (N=2100)
- Females had a high rate of
 - Overuse injury (62.5%) versus traumatic injury (37.5%)
 - Lower extremity and spine injury
- Hip and pelvic injury differed by sex
 - Female: overuse and soft tissue injury
 - Male: traumatic and bony injury
- ACL injury was almost equal
- Sex differences were seen in:
 - Patellofemoral pain 3X greater (F>M)
 - OCD 2X greater (M>F)
 - Fractures (M>F)

**Pediatric Sports Injuries: A Comparison of Males Versus Females
(Stracciolini et al, Am J Sports Med, 2014)**

Slide courtesy of Mary K. Mulcahey, MD

ACL Injury Rates NCAA 1989-2004

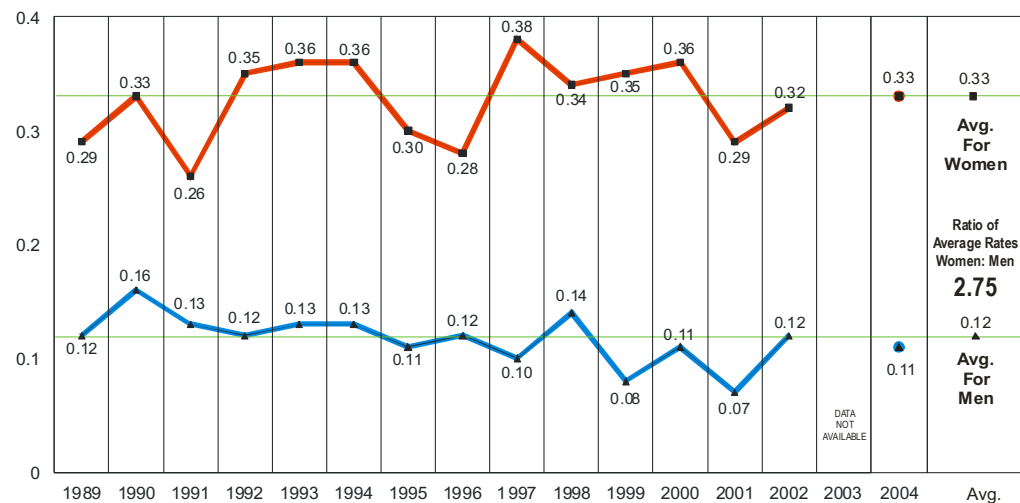
BASKETBALL ACL Injury Rates – NCAA 1989-2004*



*Rates Given are per 1000 Athlete-Exposures.
Data from NCAA Injury Surveillance System, 1989-1990 season through 2004-2005 season.

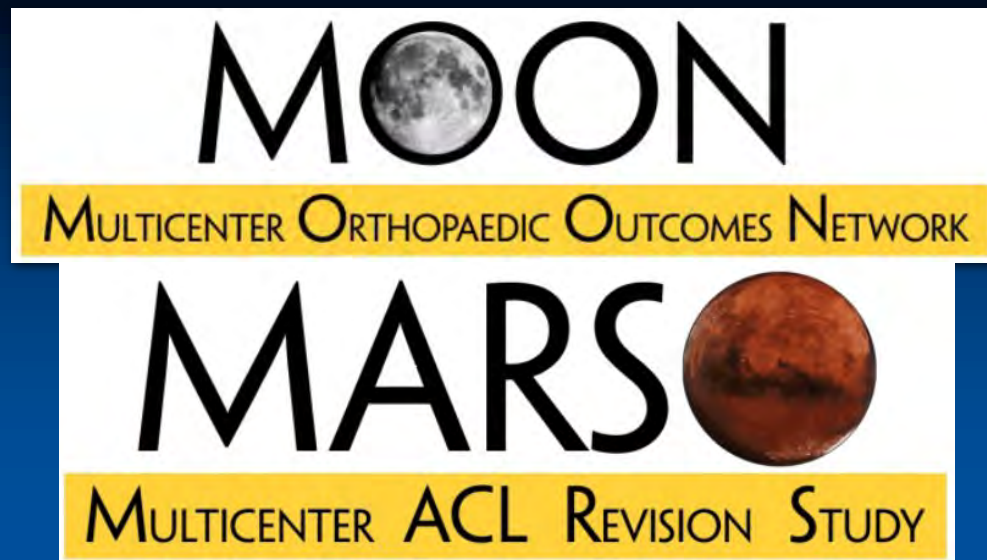
**Basketball
Women:Men
3.38**

SOCCER ACL Injury Rates – NCAA 1989-2004*



*Rates Given are per 1000 Athlete-Exposures.
Data from NCAA Injury Surveillance System, 1989-1990 season through 2004-2005 season.

**Soccer
Women:Men
2.75**



Led by Kurt Spindler, MD

Began 2002

Over 80 articles

Kaiser Permanente Registry

Gregory B Maletis, MD

Analysis of 16,192 Anterior Cruciate Ligament
Reconstructions From a Community-Based
Registry

Joint Specific Sex Differences: Knee

Risk factors associated with revision and contralateral ACL reconstruction

- **Kaiser Registry**

(Maletis, AJSM, 2015)

- 17,436 ACL reconstructions
- Male sex is associated with increased risk of revision
- Female sex is associated with increased incidence of contralateral ACL

- **Swedish National Registry**

(Andernord, AJSM, 2015)

- 9,061 primary ACL reconstructions
- Female sex and contralateral ACL injury

Secondary Injuries After Pediatric Anterior Cruciate Ligament Reconstruction: A Systematic Review With Quantitative Analysis

Results

- 24 Articles
 - 1147 Articles Searched
 - Level 4: 23, Level 3: 1
- 1254 Patients
- 1258 Knees for data Analysis
- Mean age 13.9 years
- 60% Male
- Post Op follow up 25-127 months

Anthony J. Zacharias, MD, John R. Whitaker, MD, Brandon S. Collofello, MD, Benjamin R. Wilson, MD, R. Zackary Unger, MD, Mary Lloyd Ireland, MD, Darren L. Johnson, MD, and Cale A. Jacobs, PhD. Secondary Injuries After Pediatric Anterior Cruciate Ligament Reconstruction: A Systematic Review With Quantitative Analysis. *The American Journal of Sports Medicine* 2021;49(4):1086–1093 DOI: 10.1177/0363546520934774

Secondary Injuries After Pediatric M Anterior Cruciate Ligament Reconstruction: A Systematic Review With Quantitative Analysis

Results – Sex Comparison and Subsequent Injuries

	Entire Group	Males	Females	P-value
Graft Failure	8.3%	7.1%	9.7%	0.14
Contralateral Injury	13.9%	8.7%	22.3%	0.0005
Total Secondary Injury	23.4%	18.0%	33.1%	0.002

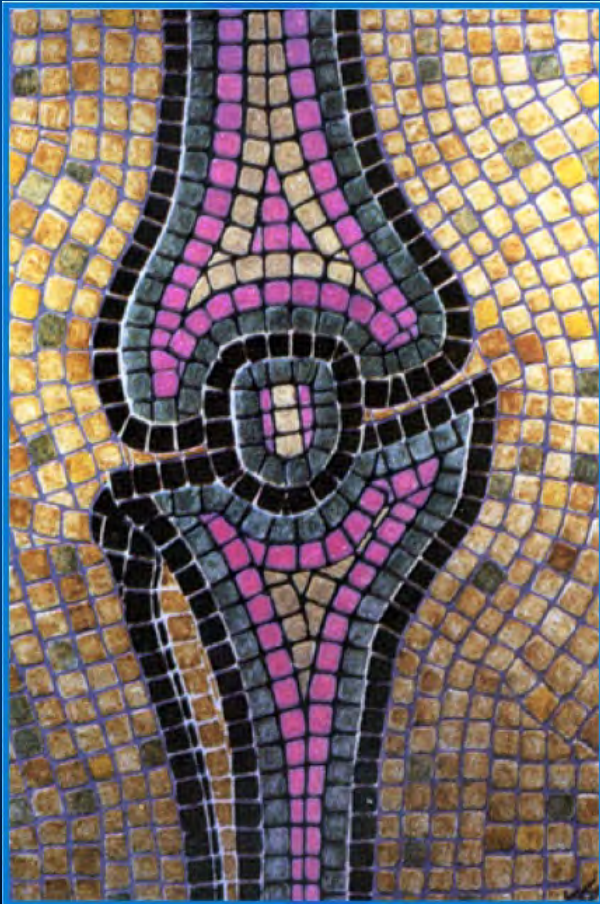
IF WE KNOW

- Young Females are at higher risk for injury/exposure and reinjury
- What do WE SURGEONS do?
- Inform Patients and Families of the Risk of Reinjury and PTOA..
 - Change Surgical Treatment
 - Add Extraarticular +/- Osteotomy
 - Change rehab
 - Delay or don't allow return to high risk sports

We must be the patient Advocate

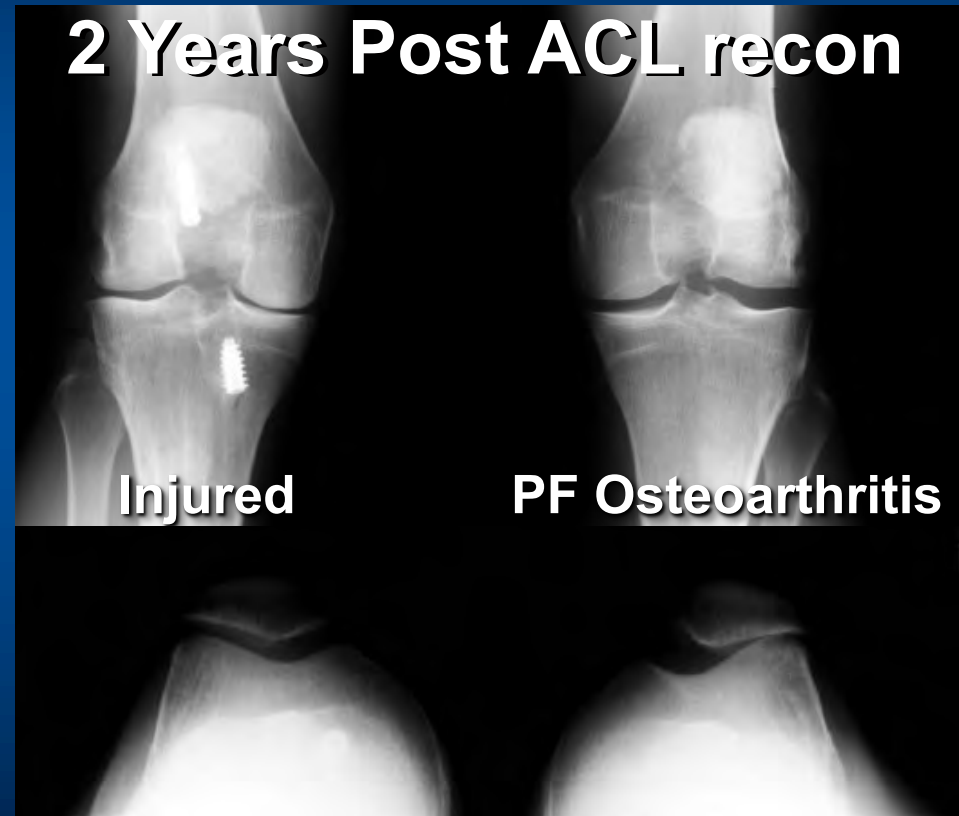
Antony J. Zacharias, MD, John R. Whitaker, MD, Brandon S. Collofello, MD, Benjamin R. Wilson, MD, R. Zackary Unger, MD, Mary Lloyd Ireland, MD, Darren L. Johnson, MD, and Cale A. Jacobs, PhD. Secondary Injuries After Pediatric M Anterior Cruciate Ligament Reconstruction: A Systematic Review With Quantitative Analysis. The American Journal of Sports Medicine 2021;49(4):1086–1093 DOI: 10.1177/0363546520934774

Can we Establish the Former Mosaic of Joint Normality and Homeostasis? NO!



Development of Osteoarthritis

Longer term Registry follow up needed

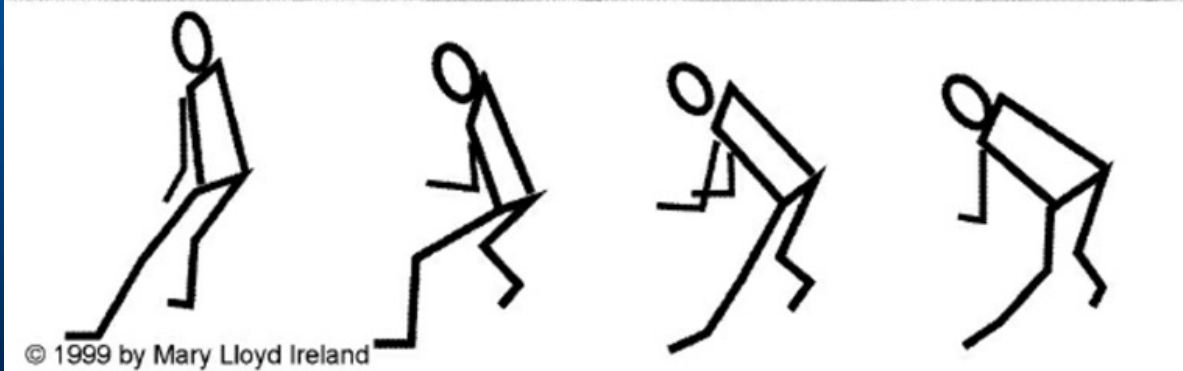


O'Connor M. Sex Differences in Osteoarthritis of the Hip and Knee.
Journal of the American Academy of Orthopaedic Surgeons. 2007 15:22-25

35 Years After Reporting Non-contact ACL higher rates in basketball, what progress have we made? 1988 Olympic Trials



How do we teach athletes to land in a safe position?



© 1999 by Mary Lloyd Ireland

POSITION OF SAFETY		POSITION OF NO RETURN	
MUSCLE ACTIVITY	BODY ALIGNMENT	BODY ALIGNMENT	MUSCLE ACTIVITY
BACK	Normal lordosis	Forward flexed, rotated opposite side	
HIPS	Flexed Neutral Abduction/Adduction Neutral Rotation	Adduction Internal Rotation	FLEXORS ADDUCTORS ILIOPSOAS
KNEE	Flexed	Less flexed, valgus	EXTENSORS QUAD RICEPS
TIBIAL ROTATION	Neutral	External	DORSI FLEXORS
LANDING PATTERN	Both Feet Control	One foot Out of Control	PERONEALS
	Balanced	Unbalanced	TIBIALIS ANTERIOR

© 2000 Mary Lloyd Ireland, M.D.

Position of No Return

- Is it really knee valgus?
 - Seen from frontal plane, YES, but NOT from sagittal plane
 - Injury – Landing Pivot Shift
 - Knee: Anterior subluxation of tibia
 - Hip: Internal Rotation and Adduction
- Femoral rotation
 - first internal, then external
- Anterior tibial translation = “**valgus collapse**”

VROOM . . .

- **V**algus
- **R**otation
- **O**ut
- **O**f control
- **M**ovement



It takes 70 milliseconds to tear the ACL

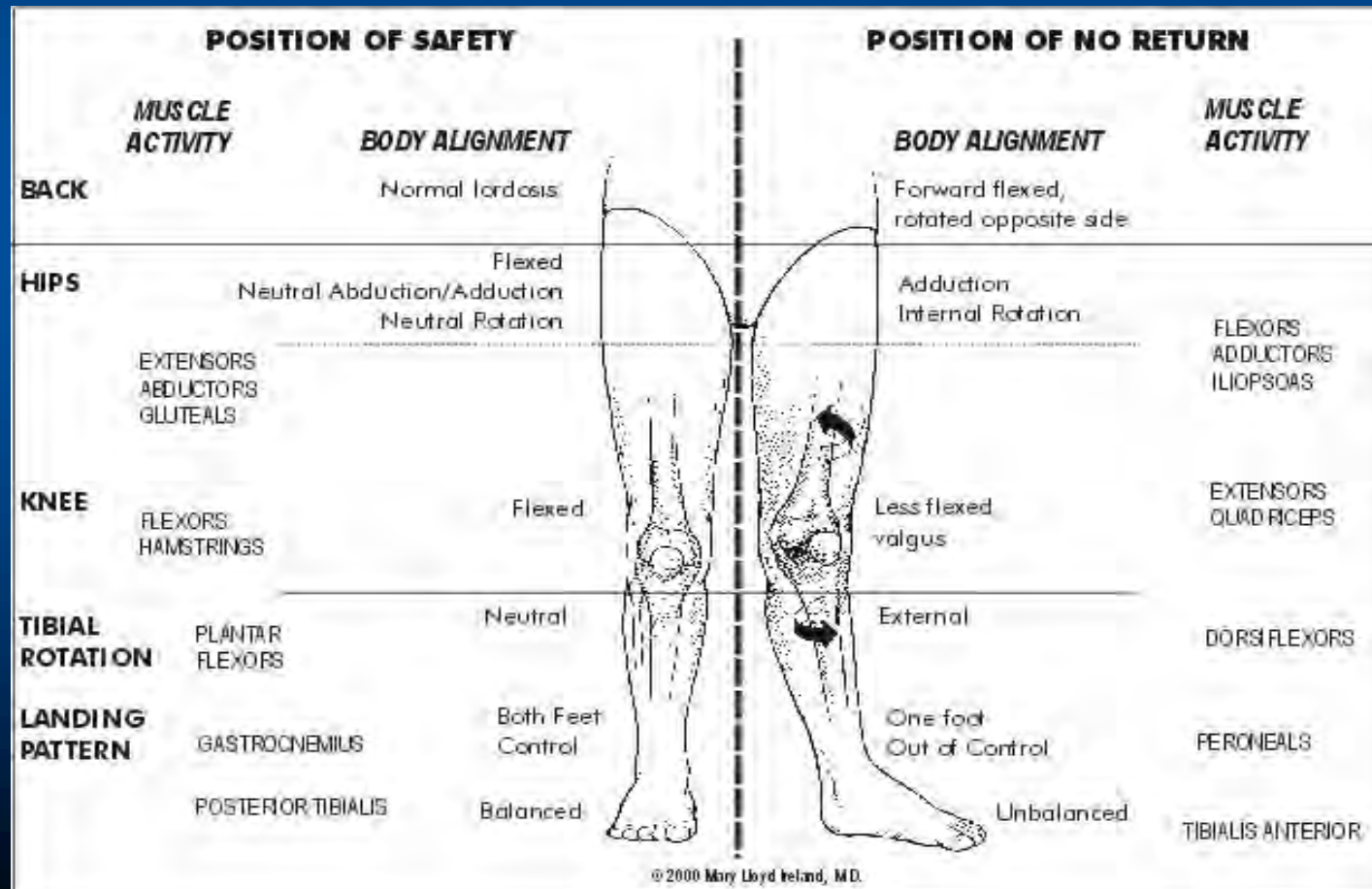
Who remembers the cone of silence?



**Need the cone of stability to prevent knee injury.
Remember the core!**

What I Have Observed

- Mechanism of Injury
 - High risk vs. low risk landing position



	Male	Female
Pelvis	Level	Contralateral Drop
Hip	No Rotation	Internal Rotation and Adduction
Knee	0° Varus/Valgus	Valgus
Tibia	Neutral	External Rotation
Foot	Flat	Pronation
Back	Flat	Lordotic
Pelvis	Neutral	Anterior Tilt



Ireland ML, Durbin T, Bolgia Lori. Gender Differences in Core Strength and Lower Extremity Function During Single Leg Squat. In: ACL Injuries in the Female Athlete: Causes, Impacts, and Conditioning Programs. Noyes FR, Barber-Westin SD Eds, Springer-Verlag, Berlin Heidelberg, 2012.



How Many Step Downs in 60 sec?

SLD Test

- 8 inch Wooden Box
- Single Limb Stance
- Perform a squat contact of heel to scale not to exceed 10% body weight.

ACLR Side	31.8	p=.008
“Normal Side”	36	p=.026
Normal Control	40	

- **Include Kinesiophobia Self Efficacy Scales in pre op and functional assessment before return to play**
- **Athletes at risk for reinjury can be identified by measures like ACL-RSI**

J Rehabil Med 2007; 39: 486–492

ORIGINAL REPORT

DETERMINANTS OF SELF-EFFICACY IN THE REHABILITATION OF PATIENTS WITH ANTERIOR CRUCIATE LIGAMENT INJURY*

Pia Thomeé, RPT, MSc^{1,4}, Peter Währborg, MD, PhD³, Mats Börjesson MD, PhD², Roland Thomeé, RPT, PhD^{1,4}, Bengt I. Eriksson MD, PhD¹ and Jon Karlsson MD, PhD¹

From the ¹Department of Orthopaedics, ²Department of Medicine, Multidisciplinary Pain Centre, Sahlgrenska University Hospital, ³The Sahlgrenska Academy, Göteborg University, ⁴Sportrehab – Physical Therapy & Sports Medicine Clinic, Göteborg, Sweden

McPherson AL, Feller JA, Hewett TE, Webster KE. Psychological Readiness to Return to Sport Is Associated With Second Anterior Cruciate Ligament Injuries. Am J Sports Med. 2019;47(4):857-862. doi:10.1177/0363546518825258

Female Athletes have:

Mental Differences After Injury

- Depression
- Fear of Reinjury (Kinesiophobia)
- Less Likely to Return to Same Level

Uniqueness of sport

- Cheerleading
- Gymnastics

Hip

Femoroacetabular Impingement “FAI”

Females Have higher prevalence

- **Femoral and Acetabular Anteversion**
- **Acetabular dysplasia**
- **Ligamentous laxity**

Males have:

- **Equal prevalence of pincer but greater cam and combined lesions**
- **Higher alpha angles**

Arthroscopic Hip Surgery in the Elite Athlete Comparison of Female and Male Competitive Athletes

Kotaro R. Shibata, MD, PhD, Shuichi Matsuda, MD, PhD, and Marc R. Safran, MD

Investigation performed at the **Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, California, USA**

Comparing Sex:

- **Elite Athletes Return to Competitive Sports Activity at same or higher level after arthroscopy**
 - **84.2% Females**
 - **83.3% Male**
- **Females more Pincer and Instability**
- **Type of Sports**
 - **Females Flexibility and Endurance**
 - **Males Cutting, Contact and Asymmetry**

Anterior Shoulder instability

Males

- 2.6 times more likely to go to ER
- Traumatic dislocations 2X more often
- Higher incidents of recurrent dislocations

Little Information on Sex Based instability or follow up after reconstruction

Sex-based Differences in Common Sports Injuries. Carter, Cordelia W., MD; Ireland, Mary Lloyd, MD; Johnson, Anthony E., MD; Levine, William N., MD; Martin, Scott, MD; Bedi, Asheesh, MD; Matzkin, Elizabeth G., MD. JAAOS: July 1, 2018 - Volume 26 - Issue 13 - p 447–454 doi: 10.5435/JAAOS-D-16-00607

Failed open anterior Bankart MDI



Moon Shoulder Group, Carolyn Hettrich, MD

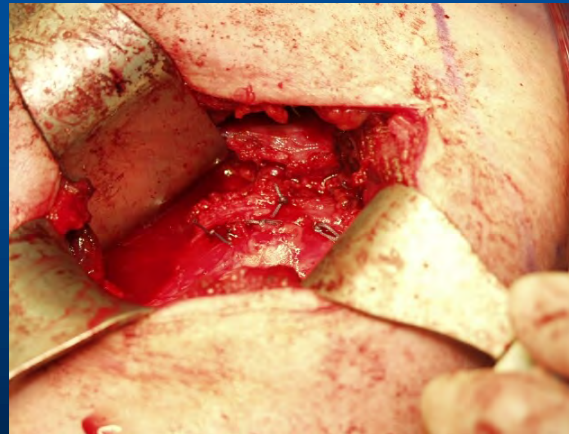
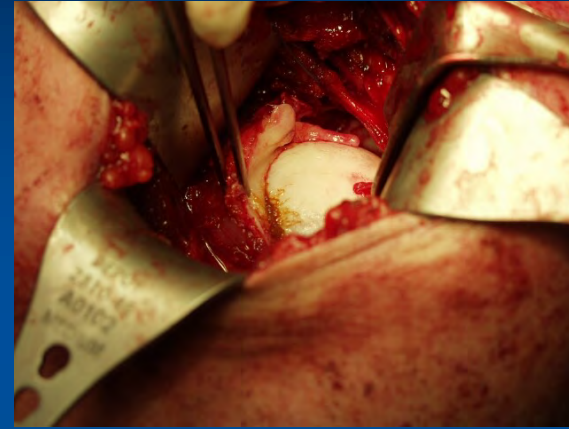
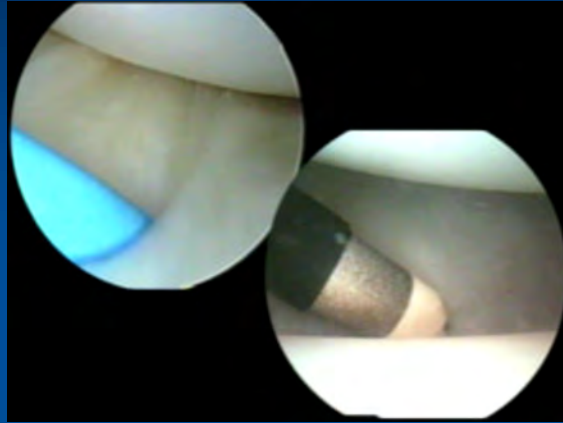
- 1,010 Patients
- Sex Differences in Shoulder Surgery Instability
 - 81% Male - 19% Female
- Males Higher Rate Traumatic and Initial Instability
- Intra OP
 - Males: Higher Rate of Labral Tears Bone Loss
 - Females: Higher Rate of Capsular Laxity
- Females Lower Pre OP
 - ASES
 - WOS Instability Index
 - 36 Item Health Survey
 - SANE Scores

Cheerleader MDI Voluntary Posterior Direction



MDI Surgical Procedures

We have fried, tied, and capulorrhaphied tissue



As surgeons we want to operate...
What is the best treatment? Non OP?

Concussion

Females have:

- 2X incidence of concussions in soccer, basketball, lacrosse.
- More severe and prolonged symptoms

Why?

- Reduced neck musculature
- Hormonal reporting bias
- Males don't report



Carter, Cordelia W., MD; Ireland, Mary Lloyd, MD; Johnson, Anthony E., MD; Levine, William N., MD; Martin, Scott, MD; Bedi, Asheesh, MD; Matzkin, Elizabeth G., MD. Sex-based Differences in Common Sports Injuries. *JAAOS*: July 1, 2018 - Volume 26 - Issue 13 - p 447–454 doi: 10.5435/JAAOS-D-16-00607

Zuckerman SL, Kerr ZY, Yengo-Kahn A, Wasserman E, Covassin T, Solomon GS: Epidemiology of sports-related concussion in NCAA athletes from 2009-2010 to 2013-2014: Incidence, recurrence, and mechanisms. *Am J Sports Med* 2015;43:2654–2662.

Concussion

- **Females sustain double the number of concussions than Males**
- **Sports include:**
 - **Basketball**
 - **Soccer**
 - **Volleyball**
 - **Lacrosse**
- **Higher Rates of Severe Concussions and Cognitive Deficits**

Carter, Cordelia W., MD; Ireland, Mary Lloyd, MD; Johnson, Anthony E., MD; Levine, William N., MD; Martin, Scott, MD; Bedi, Asheesh, MD; Matzkin, Elizabeth G., MD. Sex-based Differences in Common Sports Injuries. JAAOS: July 1, 2018 - Volume 26 - Issue 13 - p 447-454 doi: 10.5435/JAAOS-D-16-00607

FAT Now Renamed Relative Energy Deficiency in Sport RED-S

- **Low Bone Mineral Density**
- **Decreased Energy Availability**
- **Menstrual Dysfunction**
- **16% of Female Athletes Have RED-S**



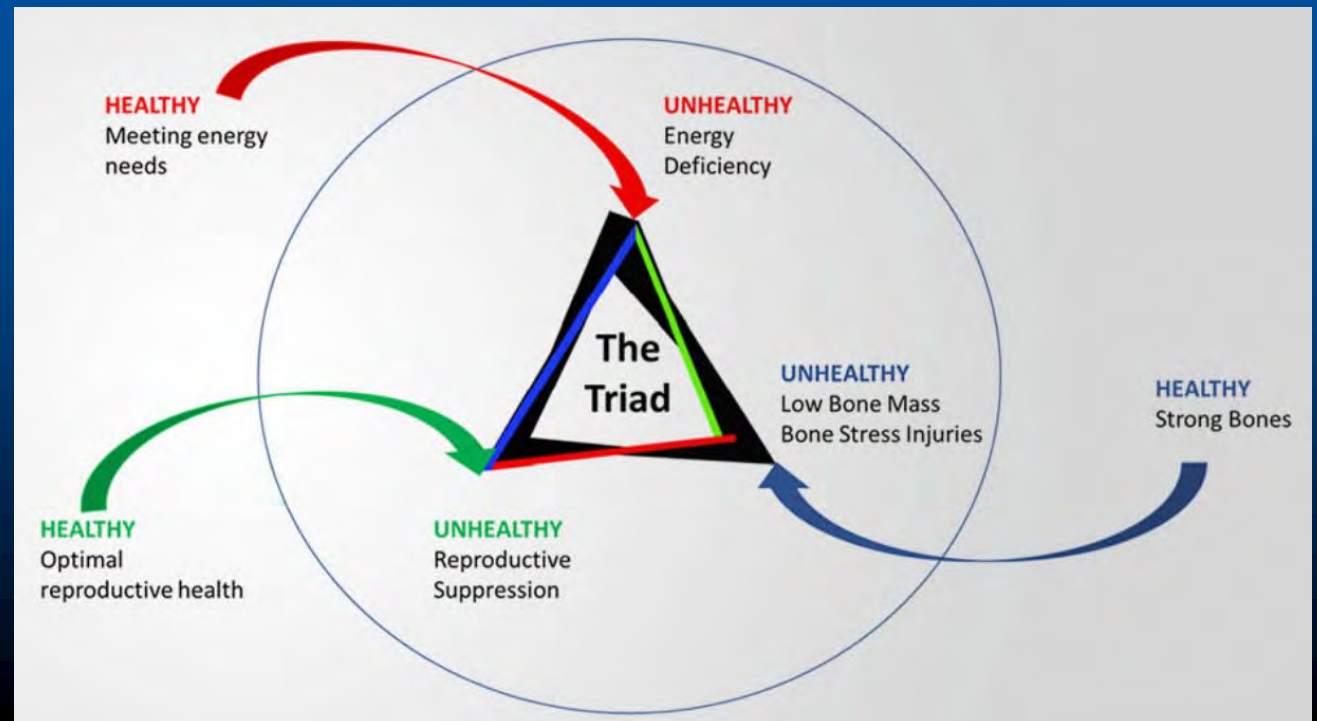
The Female Athlete Triad

www.FemaleAndMaleAthleteTriad.org

What is the Female and Male Athlete Triad?

Syndrome of three interrelated conditions Exist on a continuum of severity.

- Nutrition
- Bone
- Reproduction



The Following Excerpts
Courtesy of

American College
of Sports Medicine

"The Female Athlete Triad"

THE
MAKING
AND
BREAKING
OF
ELITE
GYMNASTS
AND
FIGURE
SKATERS



LITTLE GIRLS
IN PRETTY BOXES

"STUNNING AND FRIGHTENING... THIS
IS THE BOOK THAT MUST BE READ BY ANYONE
CONSIDERING A CAREER IN EITHER SPORT."
—JOHN TRINSTEIN, AUTHOR OF HARD COURTS

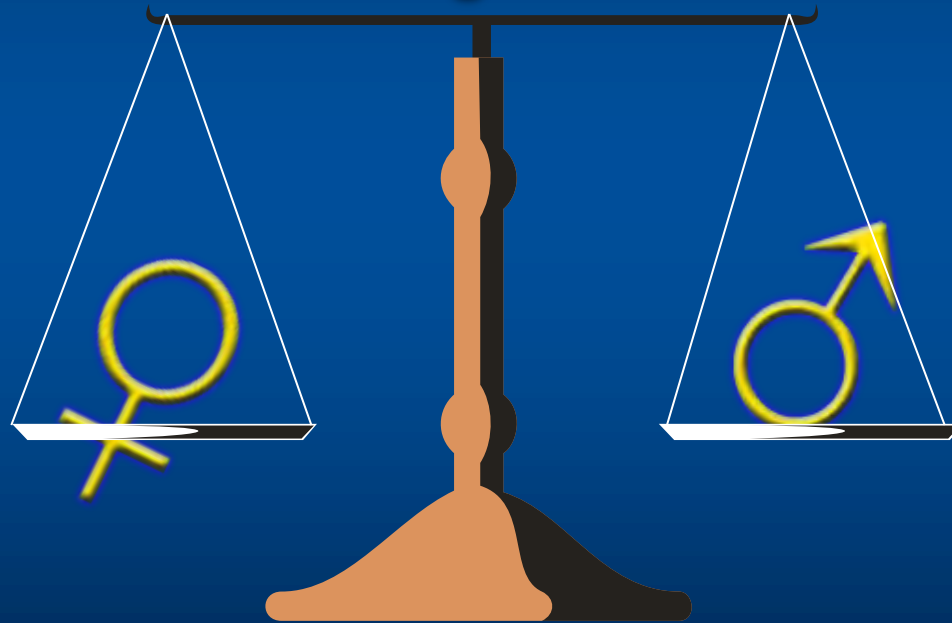


JOAN RYAN

Joan Ryan,
Little Girls in
Pretty Boxes
Warner Books
(New York),
© 1995

Title IX

**Federally-Funded Schools
Do Not Discriminate on the Basis of Gender in the
Provision of Any Educational Activity
Including Athletics**



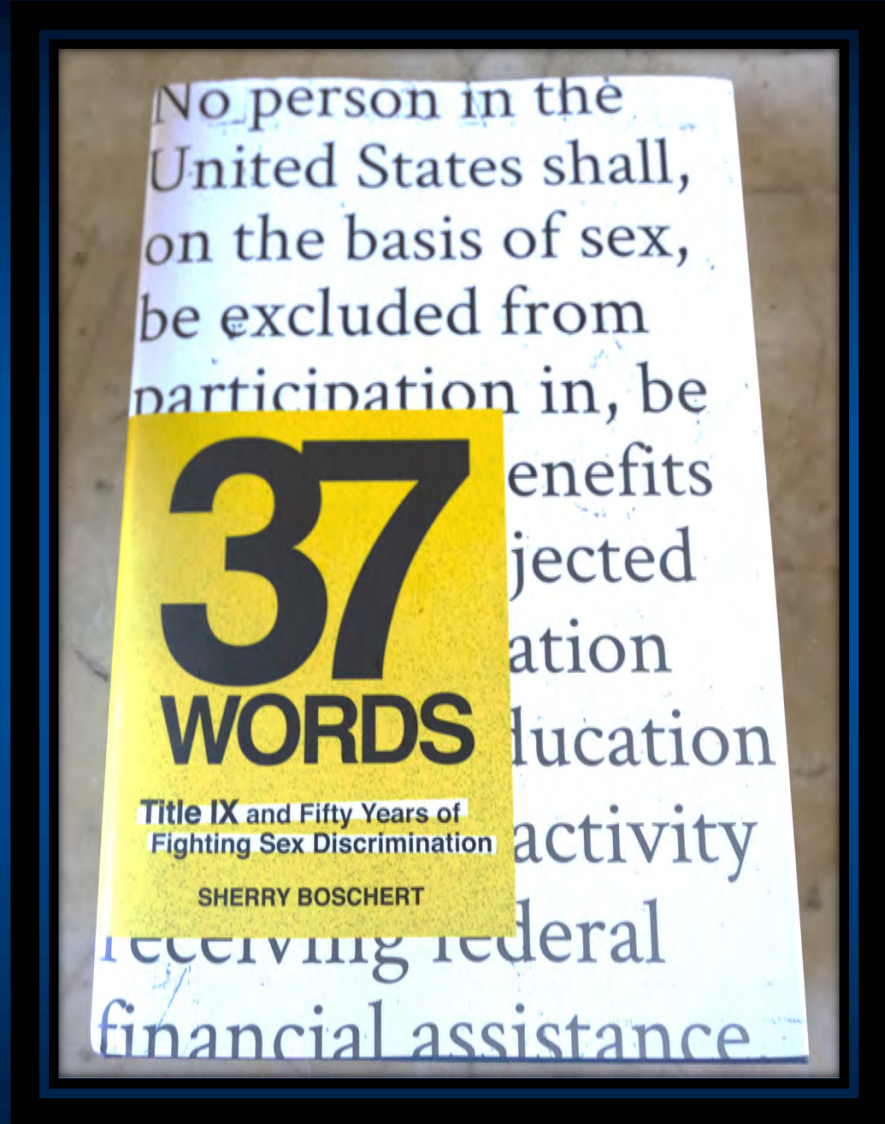
**75% of teenagers and 60% of parents say they know
nothing about Title IX
- University of Maryland Poll**

37 words Title IX

**"No person in the United States shall,
on the basis of sex,
be excluded from participation in,
be denied the benefits of,
or be subjected to discrimination under
any educational program or activity
receiving Federal financial assistance."**

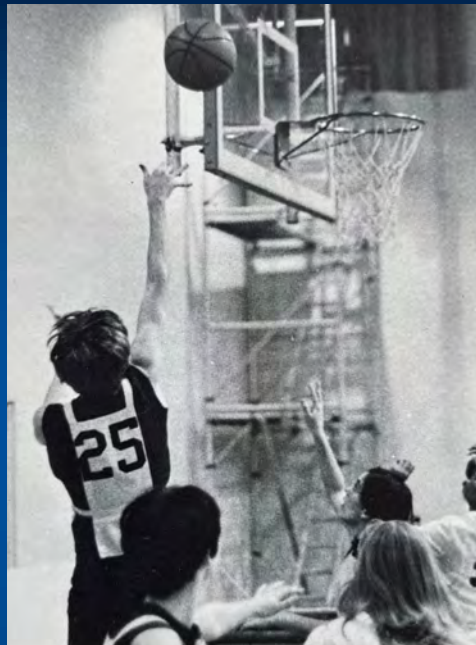
37 words Title IX

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any educational program or **ACTIVITY**
receiving Federal financial assistance."



Boschert, 37 Words: Title IX and Fifty Years of Fighting Sex Discrimination Hardcover. The New Press (April 12, 2022)

High School Sports: I did them all!



1999 World Cup Victory – Rose Bowl

Sold out Attendance 90,185

US Wins!

Brandi Chastain's
Penalty Kick



U.S. Women's Soccer Team Members Filed Federal Equal-Pay Complaint in 2016 Finally!



U.S. Soccer and Top Players Agree to Guarantee Equal Pay By Andrew Das

Landmark labor agreements with members of the men's and women's national teams will include higher paychecks and shared World Cup prize money. **The New York Times**

[nytimes.com/2022/05/18/sports/soccer/us-soccer-equal-pay-deal.html](https://www.nytimes.com/2022/05/18/sports/soccer/us-soccer-equal-pay-deal.html) May 18, 2022

The United States women won a World Cup championship and an Olympic bronze medal during their six-year fight for equal pay. Doug Mills/The New York Times

Unacceptable. World Cup 2023



Spain's Top Soccer Official Resigns Over Unwanted World Cup Kiss



Luis Rubiales, Spain's top soccer official, with members of the country's World Cup team in Madrid last month. Juan Medina/Reuters

Definition of Physician Advocacy

**Role as an advocate is integral to competency
In Canada**

LeeAnne M. Luft, The essential role of physician as advocate: how and why we pass it on. Can Med Educ J. 2017 Jun; 8(3): e109–e116,

Action by a physician to promote those social, economic, educational, and political changes that ameliorate the suffering and threats to human health and well-being that he or she identifies through his or her professional work and expertise.

Earnest MA, Wong SL, Federico SG. Perspective: Physician advocacy: what is it and how do we do it? Acad Med. 2010 Jan;85(1):63–7.

ADVOCATE (noun)

A person who publicly supports or recommend a particular cause or policy

Synonyms

- **Champion**
- **Supporter**
- **Backer**
- **Promoter**
- **Proponent**
- **Protector**
- **Patron**
- **Booster**

ADVOCATE (verb)

To Support or argue for...

To plead in favor of...

Synonyms

- Prescribe
- Recommend
- Comment
- Advise
- Support
- Back
- Uphold
- Urge
- Promote
- Endorse
- Sanction

Educate coaches and parents

The screenshot shows the homepage of safesport.org. At the top, there is a browser window with the URL <https://safesport.org>. The main header features a large image of a young child with a text overlay that reads "MAKE YOUR SPORT SAFE" and "Promote a national sport culture built on respect". Below this is a navigation bar with four icons: a lightbulb for "Training", a speech bubble with an exclamation mark for "Report a concern", a magnifying glass for "Disciplinary records", and a heart for "Donate". Each icon is accompanied by a short description: "Technical Support Helpdesk: (720) 676-6417", "Submit our reporting form or call (720) 531-0340", "Locate past decisions", and "Help every athlete thrive". At the bottom, a "SUPPORTERS" section displays logos for the U.S. Olympic and Paralympic Committees, NBC Sports Group, the NBA, and ESPN.

<https://safesport.org/>

www.congress.gov/bill/115th-congress/senate-bill/534/text

S.534 - Protecting Young Victims from Sexual Abuse and Safe Sport Authorization Act of 2017

115th Congress (2017-2018)

LAW

Sponsor: [Sen. Feinstein, Dianne \[D-CA\]](#) (Introduced 03/06/2017)

Committees: Senate - Judiciary

Latest Action: 02/14/2018 Became Public Law No: 115-126. ([TXT](#) | [PDF](#)) ([All Actions](#))

Roll Call Votes: There has been [1 roll call vote](#)

Tracker:

Introduced > Passed Senate > Passed House > Resolving Differences > To President > **Became Law**

To prevent the sexual abuse of minors and amateur athletes by requiring the prompt reporting of sexual abuse to law enforcement authorities, and for other purposes.



names of physicians who have abused athletes



News

Images

Shopping

Videos

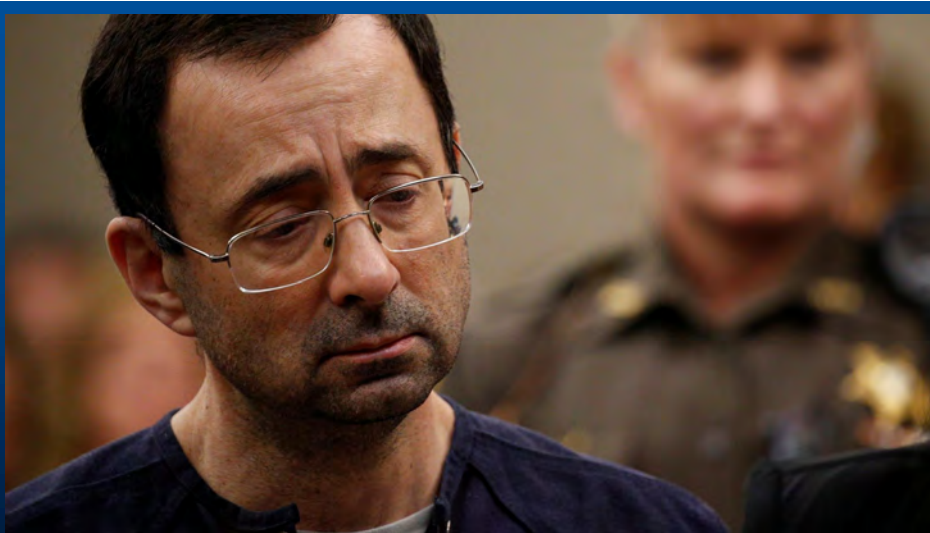
More

About 64,300,000 results (0.42 seconds)

<https://www.freep.com> › news › education › 2020/03/05

Larry Nassar, other doctors who abuse athletes use their ...

Mar 5, 2020 — Campus doctors who **abuse athletes** use their access and power ... Tyndall — two letters in front of their **names** and a potential trail of hundreds of victims. ... They also **have** the implicit trust ... that my **doctor** will do no harm."



Larry Nassar is convicted of sexual abuse of more than 265 women and girls

Team Doctors who abused athletes for years



Dr. Robert Anderson
150+ Male Victims



Dr. Larry Nasser
265+ Female Victims

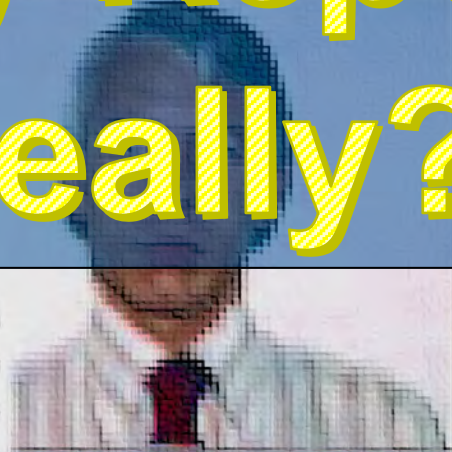
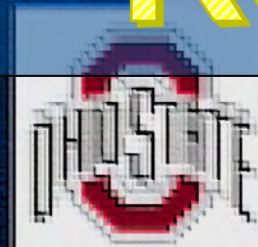


Richard Strauss
177+ Male Victims

Team Doctors who abused athletes for years



**Nobody Knew?
Nobody Reported?
Really?**

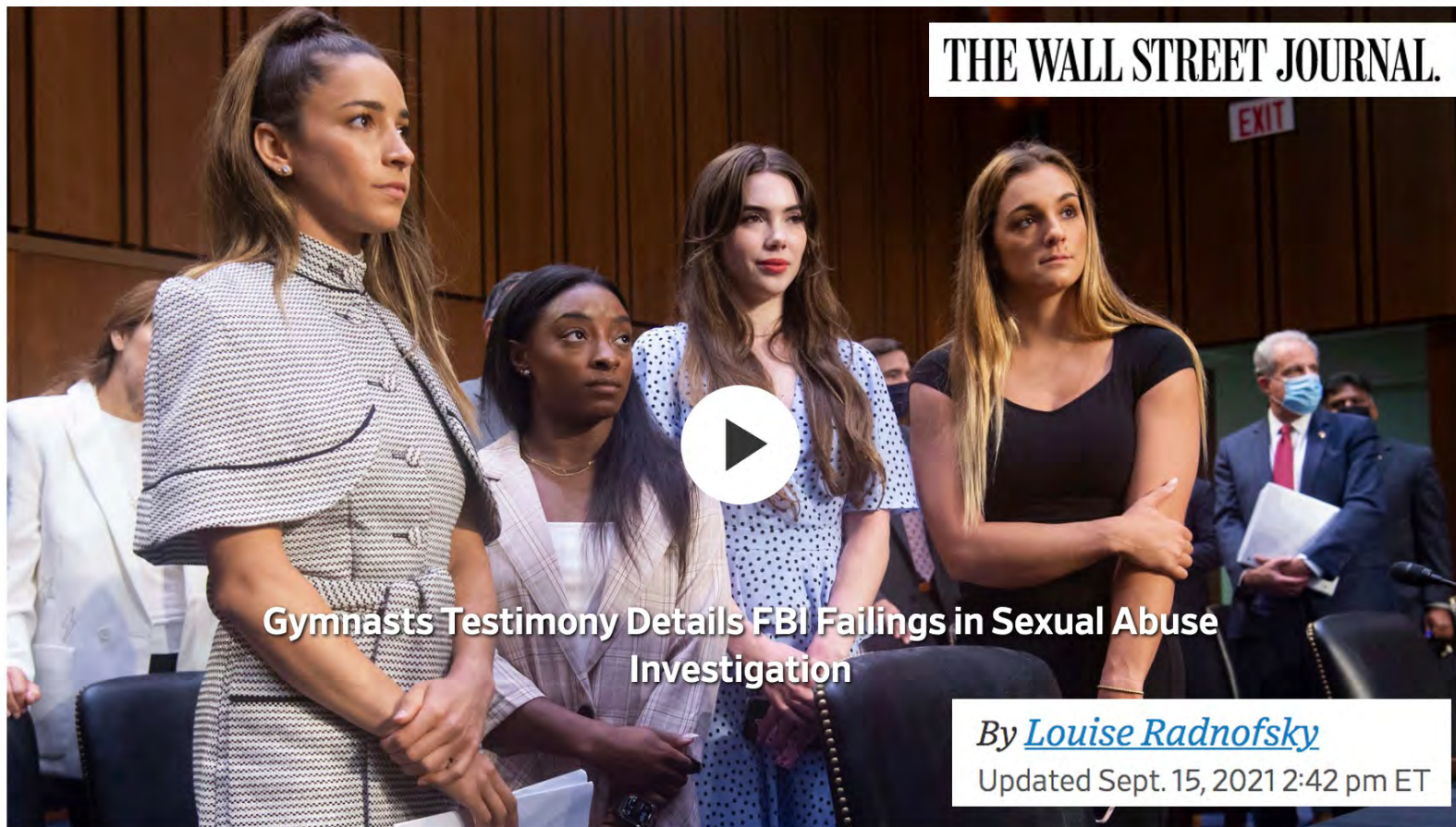


**Richard Strauss
177+ Victims**

265+ Victims

Star Gymnasts Give Senators an Unsparing Account of FBI's Failures in Larry Nassar Investigation

Simone Biles, McKayla Maroney, Maggie Nichols and Aly Raisman appeared before the Senate Judiciary Committee describing their abuse and its aftermath



Gymnasts Testimony Details FBI Failings in Sexual Abuse Investigation

By [Louise Radnofsky](#)

Updated Sept. 15, 2021 2:42 pm ET

Elite gymnasts Simone Biles, McKayla Maroney, Maggie Nichols and Aly Raisman delivered an emotional account of FBI failures in the investigation of former national team doctor Larry Nassar, in testimony before the Senate Judiciary Committee Wednesday. Photo: Saul Loeb/Press Pool

[wsj.com/articles/simone-biles-mckayla-maroney-aly-raisman-senate-fbi-investigation-11631723958](https://www.wsj.com/articles/simone-biles-mckayla-maroney-aly-raisman-senate-fbi-investigation-11631723958)

Will New Olympic Abuse Prevention Policy Make Athletes Safer?

June 03, 2019



[wbur.org/onpoint/2019/06/03/olympic-athletes-sexual-abuse-prevention-policy-safesport](https://www.wbur.org/onpoint/2019/06/03/olympic-athletes-sexual-abuse-prevention-policy-safesport)

U.S. gymnasts, from right, Gabrielle Douglas, Aly Raisman, Lauren Hernandez, Simone Biles and Madison Kocian walk to the next apparatus during the artistic gymnastics women's qualification at the 2016 Summer Olympics in Rio de Janeiro, Brazil, Sunday, Aug. 7, 2016. (Dmitri Lovetsky/AP)

With Meghna Chakrabarti

<https://www.wbur.org/onpoint/2019/06/03/olympic-athletes-sexual-abuse-prevention-policy-safesport>

Sarah G. Clein



A sexual abuse victims attorney and advocate; earliest known victim of former USA Gymnastics national team doctor Larry Nassar's abuse.

Nancy Hogshead-Makar



Lawyer, and title 9 specialist, Olympic Gold Medalist Swimmer, commitment to equality, using sport as a vehicle for social change. Author - Equal Play: Title IX and Social Change

Katie Hanna



Vice President, Education and Public Policy at U.S. Center for SafeSport

<https://www.wbur.org/onpoint/2019/06/03/olympic-athletes-sexual-abuse-prevention-policy-safesport>

AAOS NOW published our position statement on Preventing Sexual Abuse in Sport. (The Forum with Drs. DeMaio, Scerpella and Wolcott)

- **▲ The sports medicine practitioner should recognize potential sexual abuse/harassment and provide an immediate and appropriate response.**
- **▲ The athletic training room should provide a safe haven for athletes, where discriminatory behavior and sexual abuse/harassment are not tolerated and where athlete confidentiality is respected.**

<https://bit.ly/2tabKly>

Academy Endorses The Forum's Position Statement on Sexual Abuse in Sports



<https://bit.ly/2SDdOmY>

Confront. Report. Don't Walk Away... Pay Attention to Warning Signs



1992 Olympics Barcelona, Spain

COMMENTARY

Woke sports organizations are ignoring women's rights in transgender debate

BY MIKE BIANCHI
Orlando Sentinel

They used to call Nancy Hogshead-Makar a leftist liberal, a tolerant Democrat and a fierce feminist who dedicated her life to fighting for the rights of female athletes.

Now she has been labeled a transphobe, a bigot and worse.

All because she has had the audacity to question whether transgender women (male-to-female transition) should be competing against biological women in athletics competition.



DAVID ZALUBOWSKI AP file

Nancy Hogshead-Makar, who won four medals in the Summer Olympics for the United States in 1984, has spent her professional life battling for women's rights.

Orlando Sentinel - April 27, 2022
<https://bit.ly/3NzZ5mj>

What Lia Thomas Could Mean for Women's Elite Sports

Although the number of top transgender athletes is small, the disagreements are profound, cutting to the core of the debate around gender identity and biological sex.



By Michael Powell

The New York Times

Published May 29, 2022 Updated May 30, 2022, 12:58 p.m. ET

ATLANTA — The women on the Princeton University swim team spoke of collective frustration edging into anger. They had watched Lia Thomas, a transgender woman who swam for the University of Pennsylvania, win meet after meet, beating Olympians and breaking records.

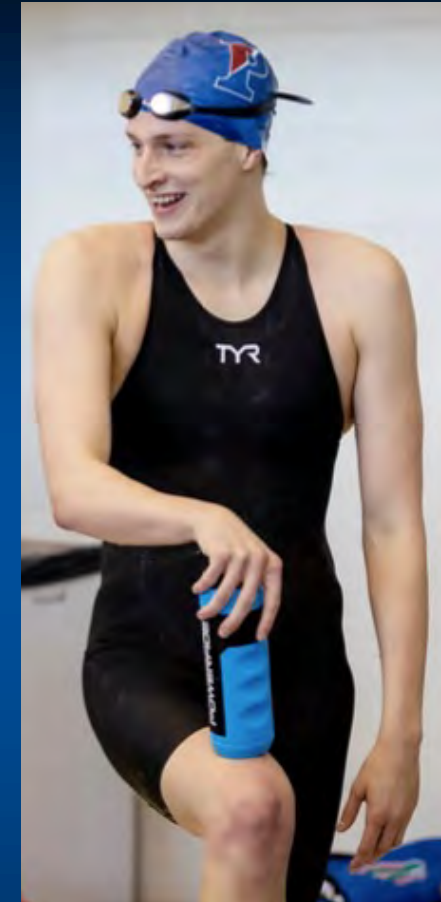
<https://www.nytimes.com/2022/05/29/us/lia-thomas-women-sports.html>



“The Princeton swimmers... “detailed the biological advantages possessed by transgender female athletes. To ignore these, they said, “was to undermine a half-century fight for female equality in sport.”

(TERFs, which stands for trans-exclusionary radical feminists.)

“So I’m a ‘TERF’?” Ms. Navratilova said in response... “If I faced the male equivalent of Lia in tennis, that’s biology. I would have had no shot. And I would have been livid.”



“Actions speak louder than words; let your words teach and your actions speak.”

St Anthony of Padua (1196 to 1231)

“Actions speak louder than words.”

Abraham Lincoln (1809-1865)

Cooper Union Address

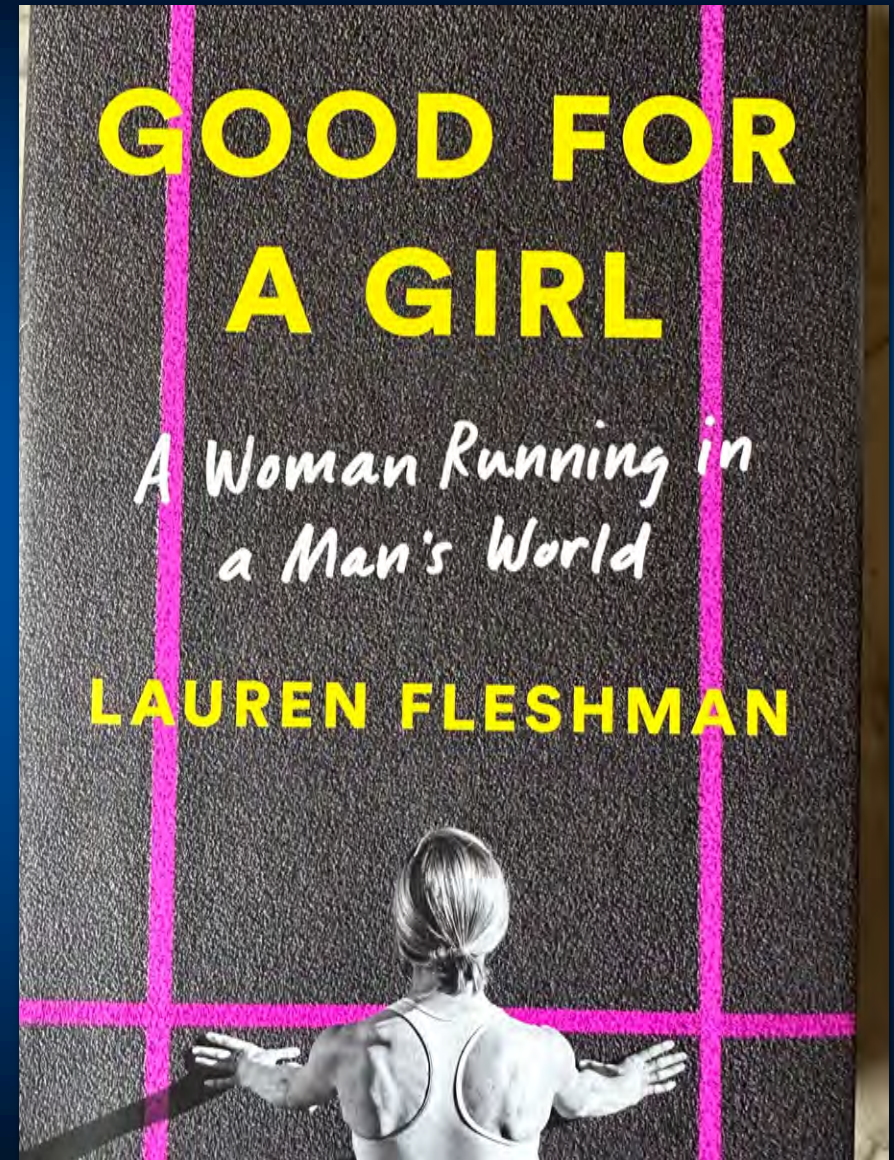
New York, New York

February 27, 1860

We Must Act and Speak!

Lauren Fleshman
(Born 1981)

- Stanford long distance track athlete
- Professional track athlete (Ret)
- Coach author
- Injuries kept her from making the Olympic team
- Strong Father Influence
- Book is a Women's Sports manifesto



**Learn how to land
at a good age**

Encourage physical activity

Make sports fun and exciting

**Sports allowed me to
succeed in a male-
dominated career and stay
active**



MLI, on swing set, real band-aids

**Active
Women's
Health
Initiative**



UK College of
Health Sciences

follow us on  **@UKAWHI**

Vision: Empower Girls and Women To lead Healthy Lifestyles

Mission: To advance girls' and women's Physical activity through research and outreach

Supported By: My Philanthropic Donations and Research Grants

Established: 2019

**GIRLS
CAN...**

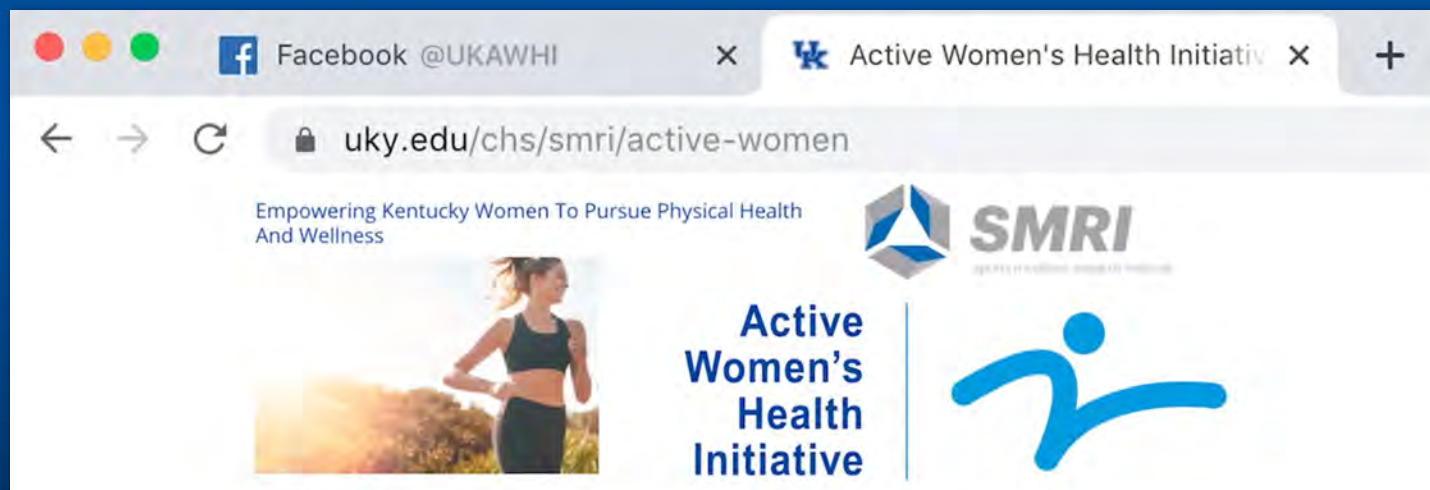


Links to Active Women's Health Initiative

MaryLloydIreland.com - [Girls Can
marylloydireland.com/awhi.html](https://marylloydireland.com/awhi.html)

AWHI

<https://www.uky.edu/chs/smri/active-women>



@UKAWHI



The End...



Thank you for your attention

Suggested Reading

Letha Y. Griffin, Mary Lloyd Ireland, Fred Reifsteck, Matthew H. Blake, Benjamin R. Wilson. DeLee, Drez and Miller's Orthopaedic Sports Medicine: The Female Athlete (294-305). Elsevier, 2019

27 The Female Athlete

Letha Y. Griffin
Mary Lloyd Ireland
Fred Reifsteck
Matthew H. Blake
Benjamin R. Wilson

Abstract

Over the past several decades there has been a rapid development of competitive sporting events for women, and parallel to this, an emergence of increasing numbers of excellent competitive women athletes. Not only have the numbers and recognition of highly competitive female athletes increased over the last 50 years, but also the

Anthony J. Zacharias, MD, John R. Whitaker, MD, Brandon S. Collofello, MD, Benjamin R. Wilson, MD, R. Zackary Unger, MD, Mary Lloyd Ireland, MD, Darren L. Johnson, MD, and Cale A. Jacobs, PhD. Secondary Injuries After Pediatric M Anterior Cruciate Ligament Reconstruction: A Systematic Review With Quantitative Analysis. *The American Journal of Sports Medicine* 2021;49(4):1086–1093 DOI: 10.1177/0363546520934774

Clinical Sports Medicine Update

Secondary Injuries After Pediatric Anterior Cruciate Ligament Reconstruction CME

A Systematic Review With Quantitative Analysis

Anthony J. Zacharias,^{1,2} MD, John R. Whitaker,¹ MD, Brandon S. Collofello,¹ MD, Benjamin R. Wilson,² MD, R. Zackary Unger,² MD, Mary Lloyd Ireland,¹ MD, Darren L. Johnson,¹ MD, and Cale A. Jacobs,¹ PhD
Investigation performed at the University of Kentucky, Lexington, Kentucky, USA

Carter, Cordelia W., MD; Ireland, Mary Lloyd, MD; Johnson, Anthony E., MD; Levine, William N., MD; Martin, Scott, MD; Bedi, Asheesh, MD; Matzkin, Elizabeth G., MD. Sex-based Differences in Common Sports Injuries. *JAAOS*: July 1, 2018 - Volume 26 - Issue 13 - p 447–454 doi: 10.5435/JAAOS-D-16-00607

Review Article

Sex-based Differences in Common Sports Injuries

Abstract

The patient's sex plays an important role in mediating the risk for, and experience of, disease. Injuries of the musculoskeletal system are no exception to this phenomenon. Increasing evidence shows that the incidence, clinical presentation, and treatment outcomes for male and female patients with common sports injuries may vary widely. Stress fracture, which is associated with the female athlete triad, is a sports injury with known sex-based differences. Other common sports-related injuries may also have distinct sex-based differences. Understanding these differences is important to optimize each patient's musculoskeletal care.

Links for Female Athlete Information

- ACSM Female athlete Triad Coalition
<https://www.ncbi.nlm.nih.gov/pubmed/17909417>
- 602 Sex and Sports AAOS Symposium 2016
http://marylloydireland.com/female_injuries



Links at www.marylloydireland.com/hughstonsociety

Sex and The ACL – Epidemiology and Risk Factors



RUTH JACKSON ORTHOPEDIC SOCIETY

Sex and The ACL

📅 Jan. 7, 2014, 6 p.m.

Faculty: SHARON HAME, JASON DRAGOO, MARY IRELAND, CONSTANCE CHU

👁 3,453 views 16 👍

📅 December 2013

WEBINAR

<https://www.vumedi.com/video/sex-and-the-acl-epidemiology-and-risk-factors/?list=6f665d73-54f4-4524-b93d-ef111e2c8323>

Links at www.marylloydireland.com/hughstonsociety

AAOS NOW

Sex in your practice?

- From AAOS NOW
August 2012: **Is Sex a Risk Factor for Shoulder Instability?**
Aglan, SM
<http://www.aaos.org/news/aaosnow/aug12/research2.asp>
- June 2012: Cute Shoes Can Lead to Ugly Feet,
Ruth L. Thomas, MD
<http://www.aaos.org/news/aaosnow/jun12/research1.asp>
- April 2012: Scoliosis and Sex, McIntosh AL and Weiss JM April 2012
<http://www.aaos.org/news/aaosnow/apr12/research1.asp>

Links at www.marylloydireland.com/hughstonsociety

Council on Research and Quality(CORD)

- **Approved Unified Research Agenda Including:**
 - **Sex/Gender Clinical and basic research**
 - **Disparities in Health Care Research Based on Sex/Gender and Race**
- **Reported by John Healy, MD**
- **Research Interest Groups**
- **Unknown: Differences in Disease Burden comparing Sexes website**

<http://www.boneandjointburden.org/>

Links at www.marylloydireland.com/hughstonsociety

Stanford: Londa Schiebinger links

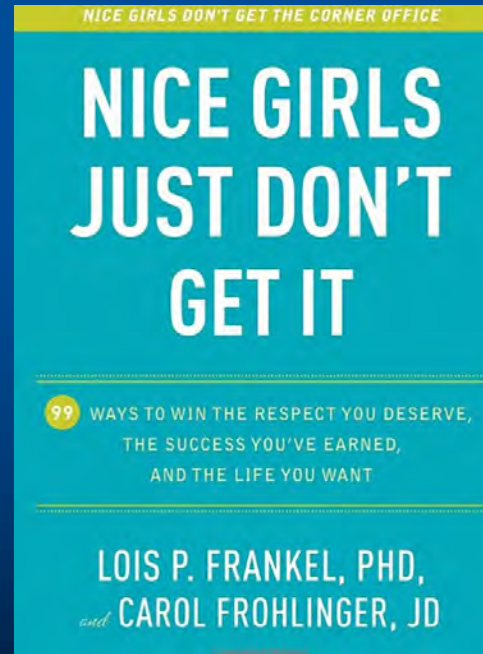
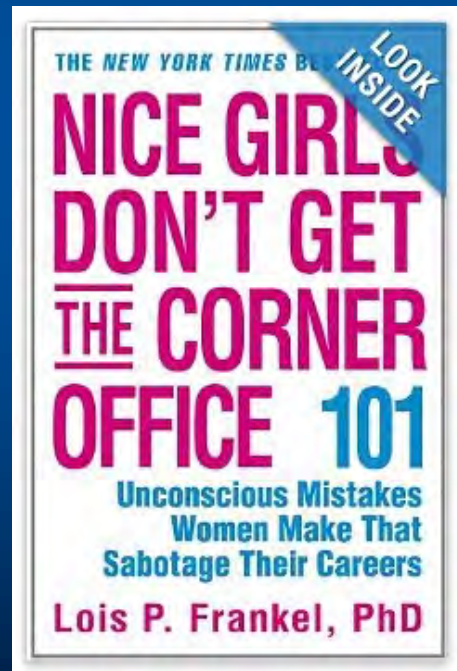
- <http://genderedinnovations.stanford.edu>
- Europe:
http://ec.europa.eu/research/science-society/gendered-innovations/index_en.cfm
<http://genderedinnovations.stanford.edu>
- Europe:
http://ec.europa.eu/research/science-society/gendered-innovations/index_en.cfm

Links at www.marylloydireland.com/hughstonsociety

Lois P Frankel, PhD:

Nice Girls Don't get the Corner Office:

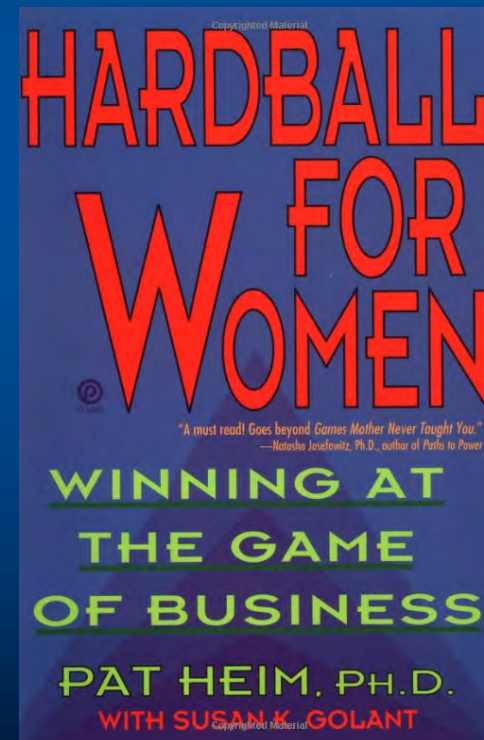
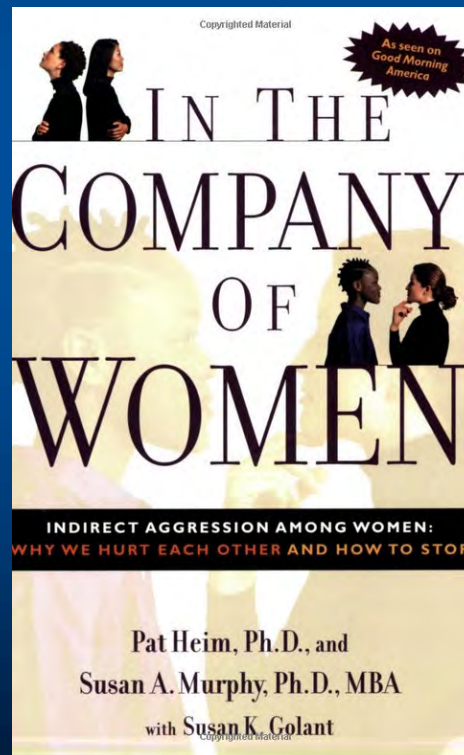
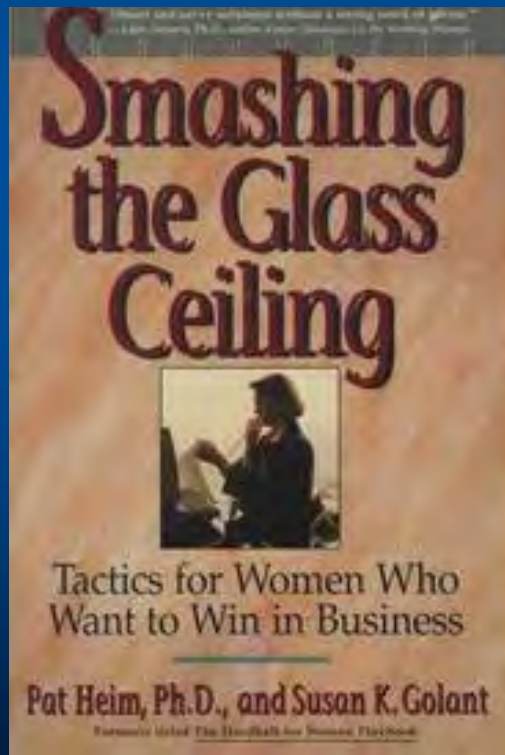
101 Unconscious Mistakes Women Make That Sabotage Their Careers



Pat Heim books

www.heimgroup.com

Why aren't there more Wall Street Business Leaders who are women?



Links at www.marylloydireland.com/hughstonsociety