

MedEd SYMPOSIUM SIWF/ISFM 2019
Diversität in der ärztlichen Weiterbildung

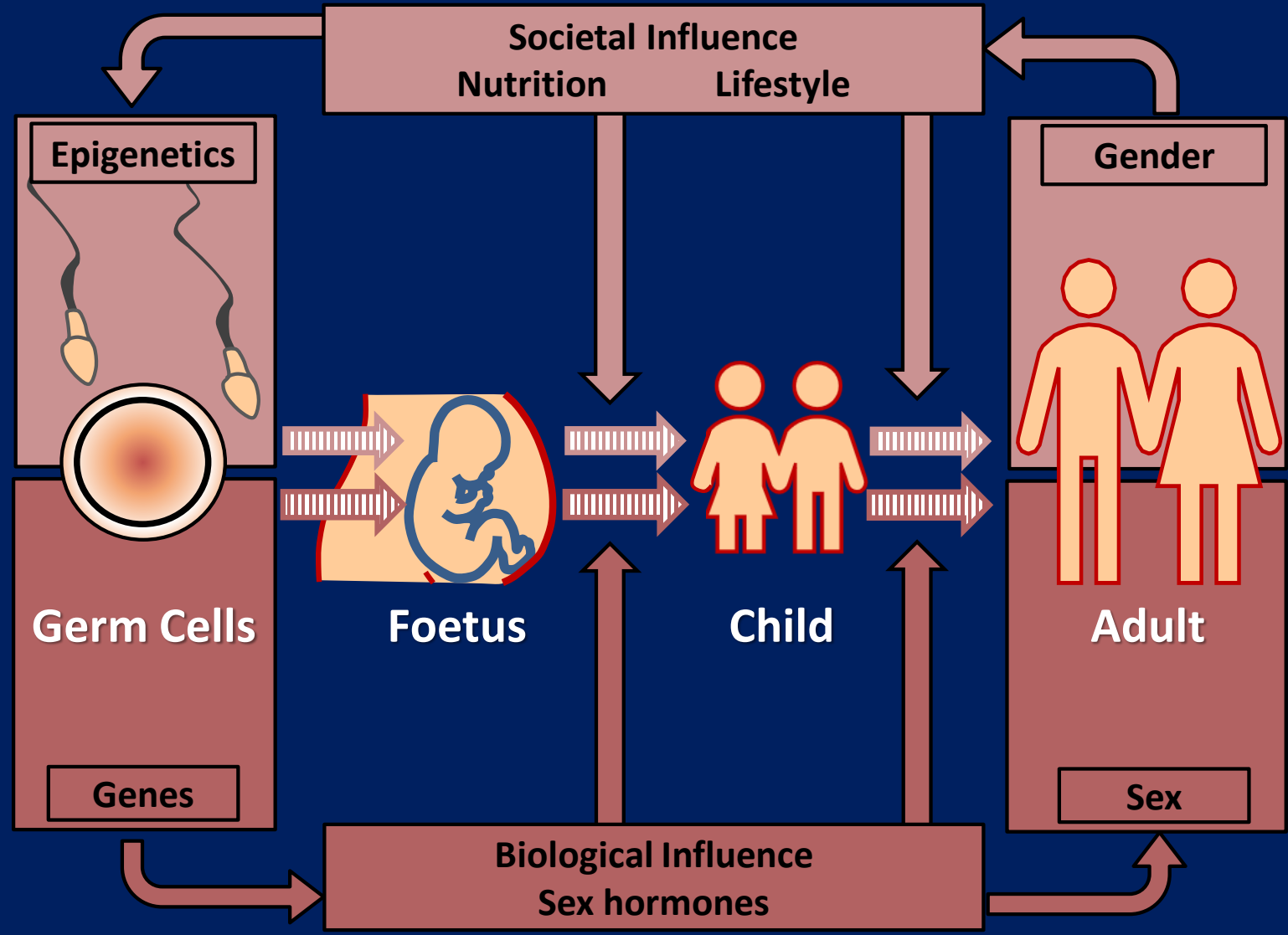
Sex und Gender in der Medizin: Konsequenzen für die Weiterbildung

11. September 2019

Prof. Catherine Gebhard
Klinik für Nuklearmedizin, UniversitätsSpital Zürich
Center for Molecular Cardiology, Universität Zürich

Gender: Socially constructed characteristics of women and men

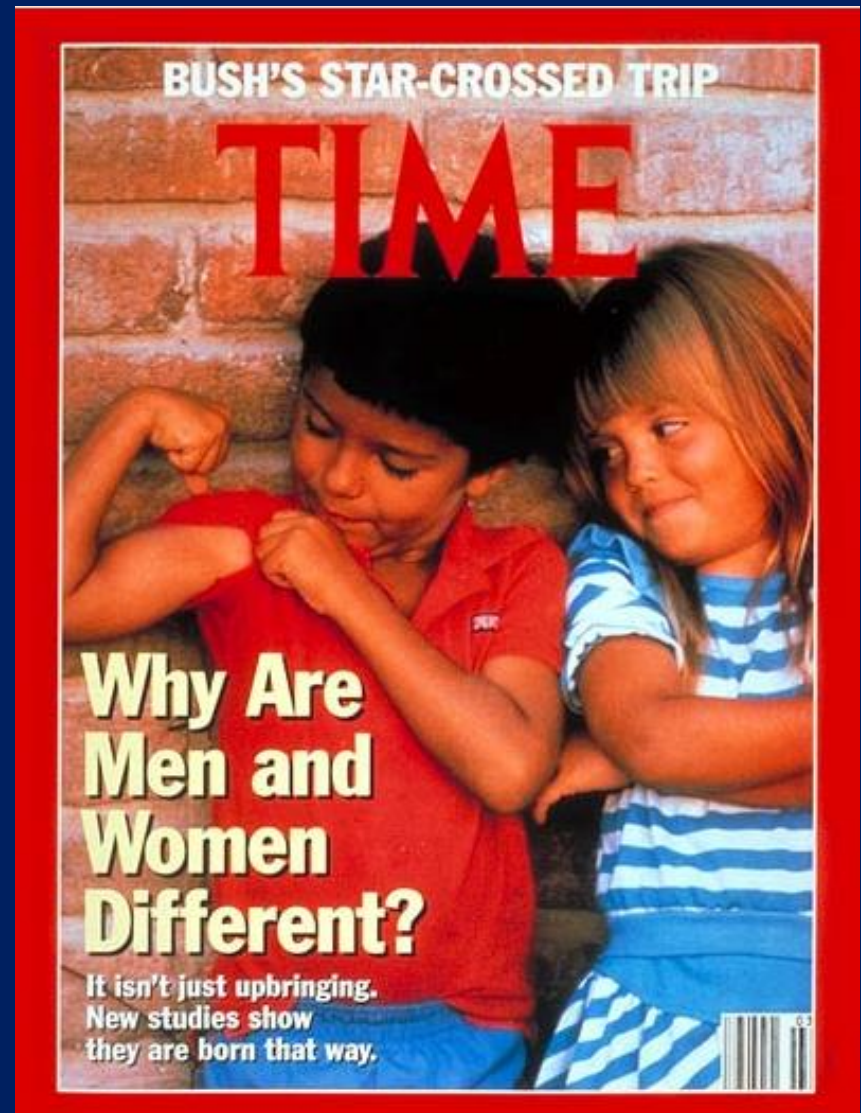
Sex: Biological differences such as genes, sex hormones, anatomy, physiology



Gender-specific Medicine

Study of how diseases differ between men and women in terms of prevention, clinical signs, therapeutic approach, prognosis, and social impact.

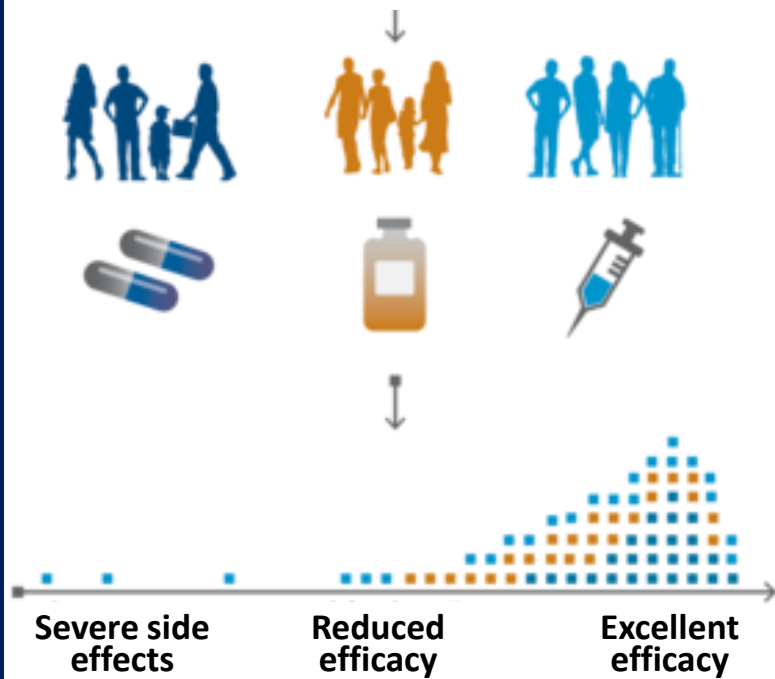
Gender-specific Medicine is a neglected dimension of medicine



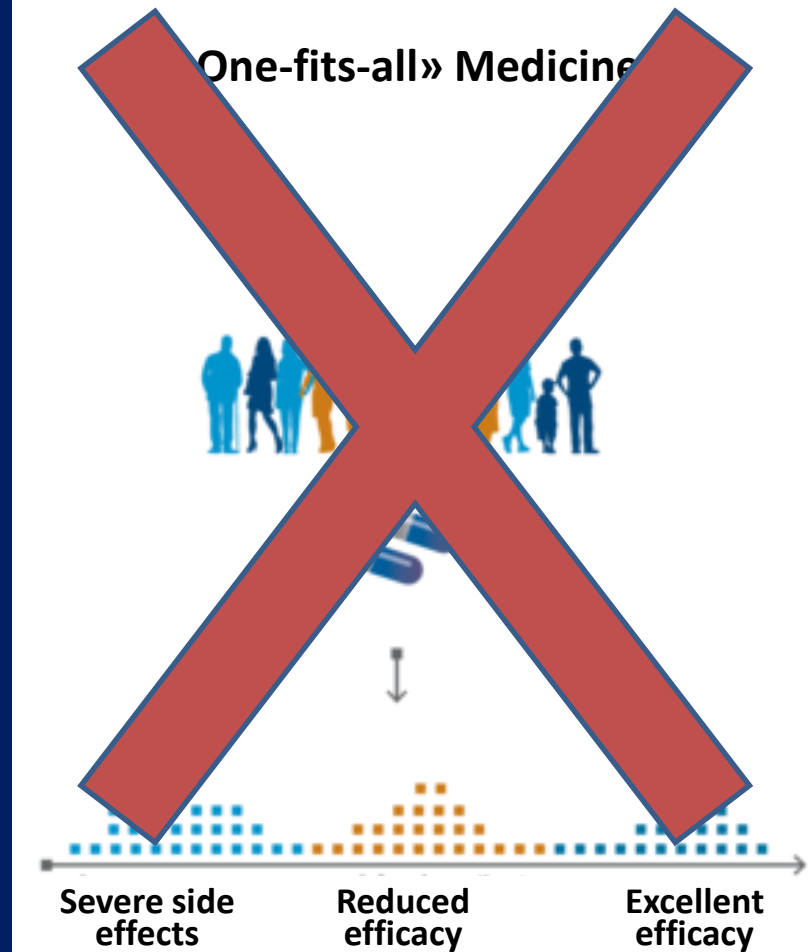
Why is sex and gender an important subject in medicine?

Personalized Medicine

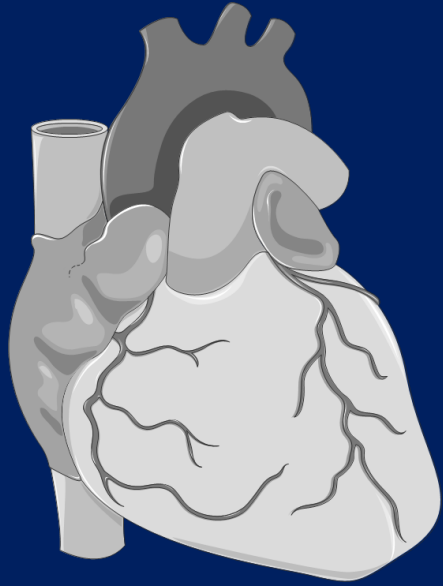
Molecular diagnosis and biomarker-based stratification



One-fits-all» Medicine



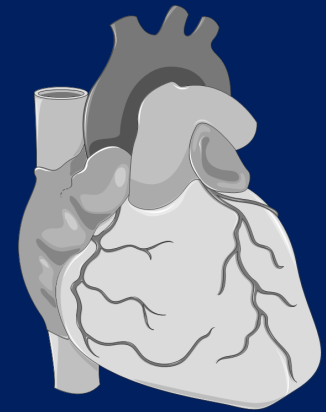
The differences.....



300g
70-72 beats/min



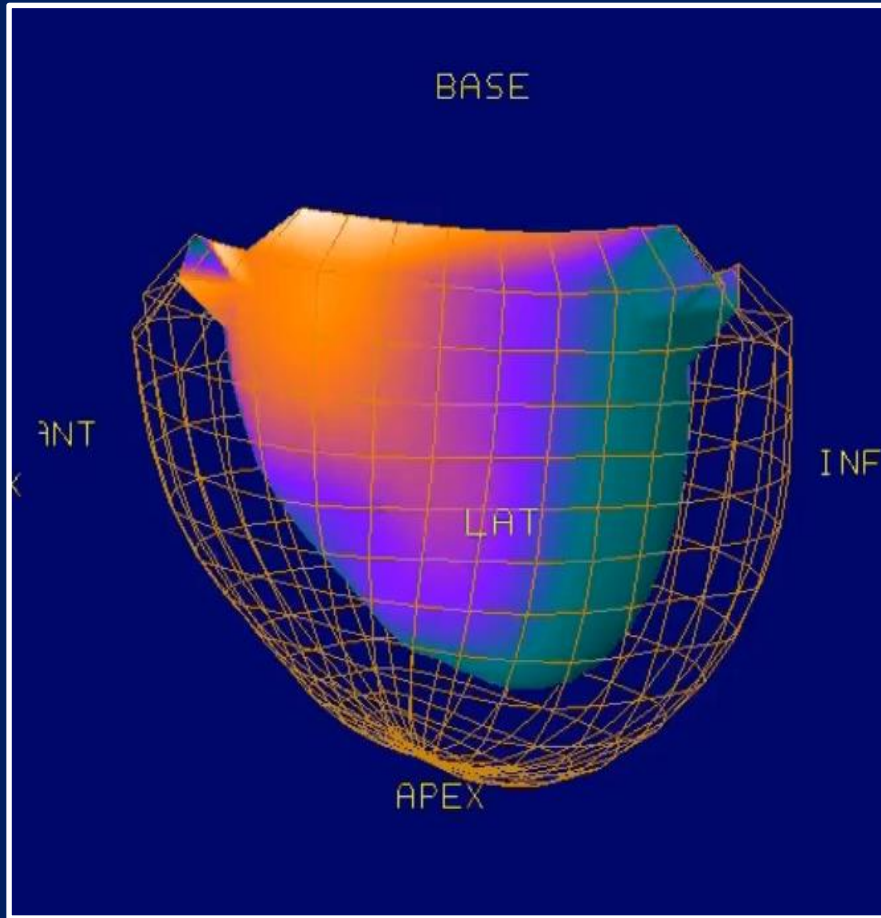
Source: Gettyimages.com



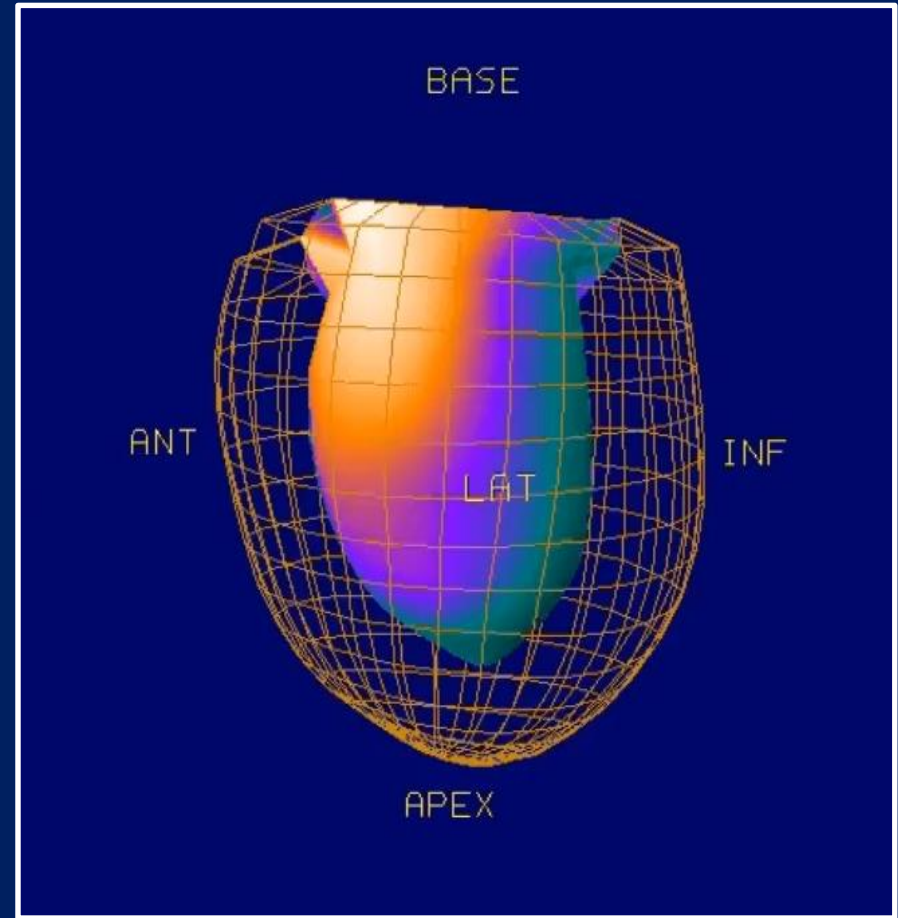
257g
78-82 beats/min

Myocardial perfusion imaging

Male patient, 72 years



Female patient, 68 years



The consequences of gender-unspecific medicine...

Pancreatic cancer: Some blood pressure drugs put women at risk

By [Ana Sandoiu](#) | Published Thursday 19 April 2018



Journal of
Clinical Medicine



Article

Anti-Hypertensive Medication Use, Soluble Receptor for Glycation End Products and Risk of Pancreatic Cancer in the Women's Health Initiative Study

Zhensheng Wang¹, Donna L. White^{2,3,4,6,7,8}, Ron Hoogeveen⁵, Liang Chen^{2,3,4}, Eric A. Whitsel⁹, Peter A. Richardson^{3,4}, Salim S. Virani^{3,4,5}, Jose M. Garcia^{10,11}, Hashem B. El-Serag^{2,3,4,6,7} and Li Jiao^{2,3,4,6,7,8,*}

Example: Pharmacology

Special

The Coronary Drug Project Findings Leading to Discontinuation of the 2.5-mg/day Estrogen

652 JAMA, Nov 5, 1973 • Vol 226, No 6

Conducted solely in men

«...strongly indicates lack of therapeutic efficacy of the 2.5-mg/day mixed conjugated-equine-estrogen regimen [...] also suggest possible adverse effects [...].»

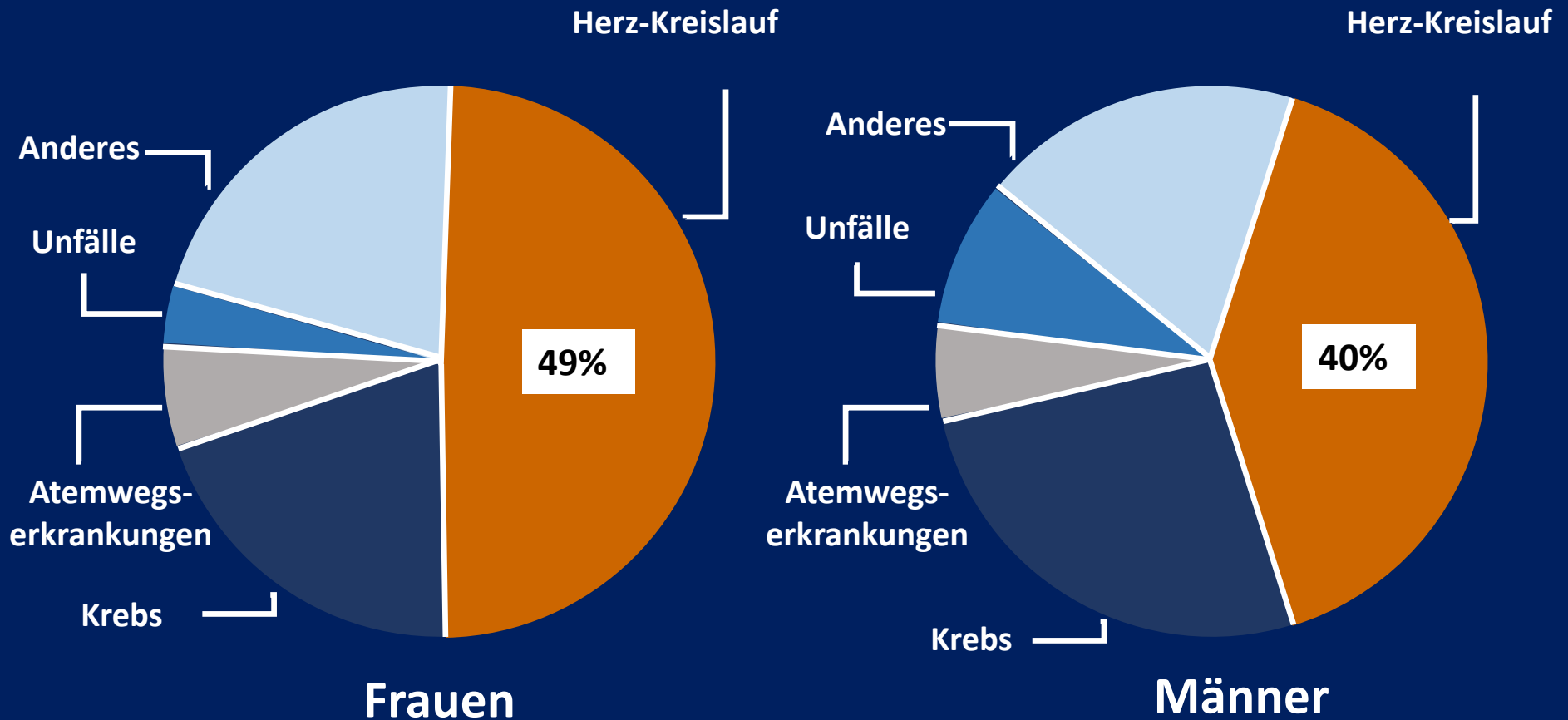
The consequences of gender-unspecific medicine...

- Between 2004 and 2013, women in the United States suffered more than 2 million drug-related adverse events, compared with 1.3 million for men, according to the US Food and Drug Administration (FDA).
- Out of 10 drugs removed from the US market between 1997 and 2000, eight were withdrawn because of side effects that occurred only, or mainly, in women.

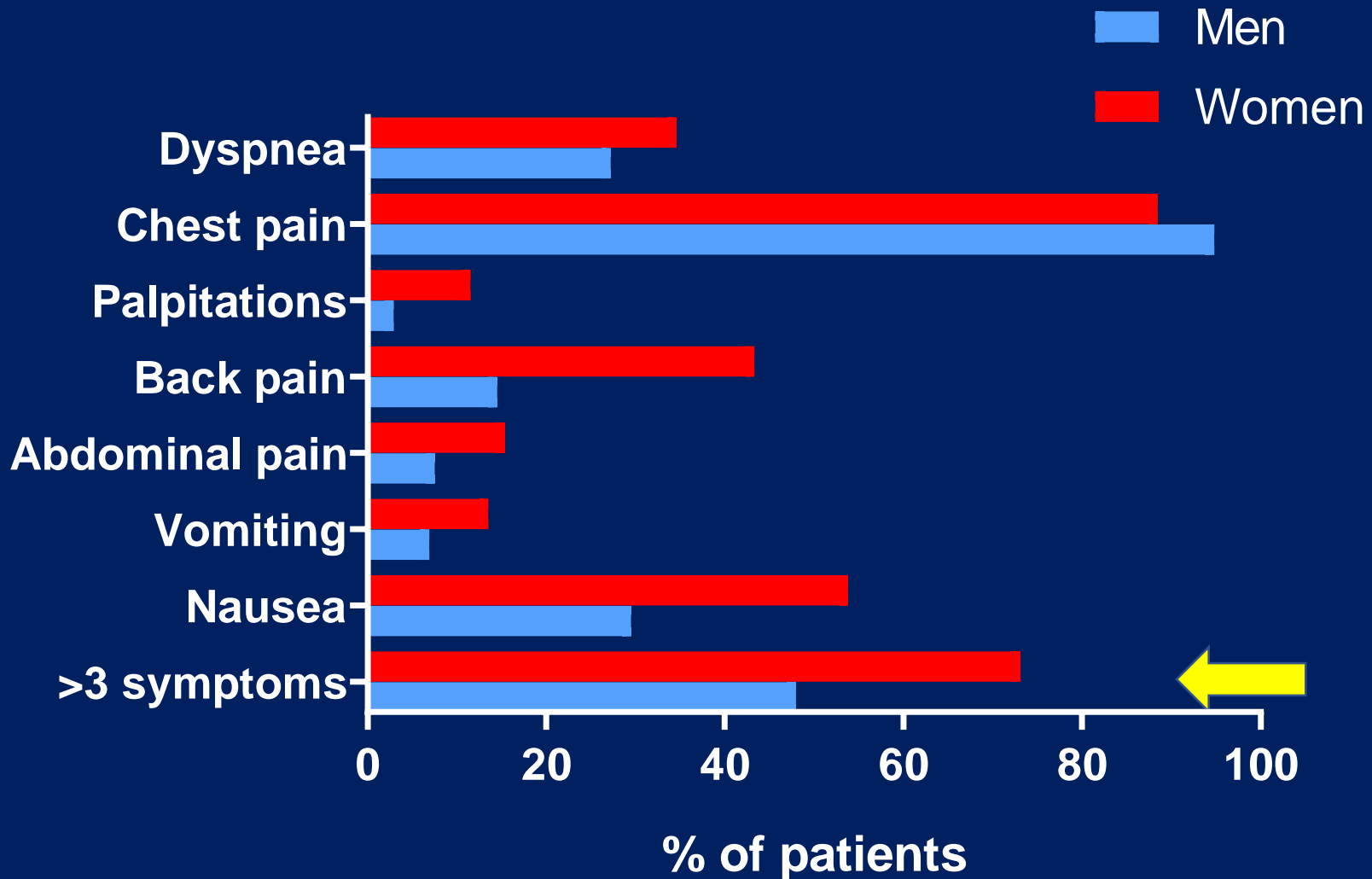


Example: Cardiology

Cardiovascular disease is the most common cause of death in women



The symptoms of a myocardial infarction differ between women and men





Stadt Zürich
Stadtspital Waid und Triemli

Stadt Zürich
Stadtspital Waid
Tièchestrasse 99
8037 Zürich

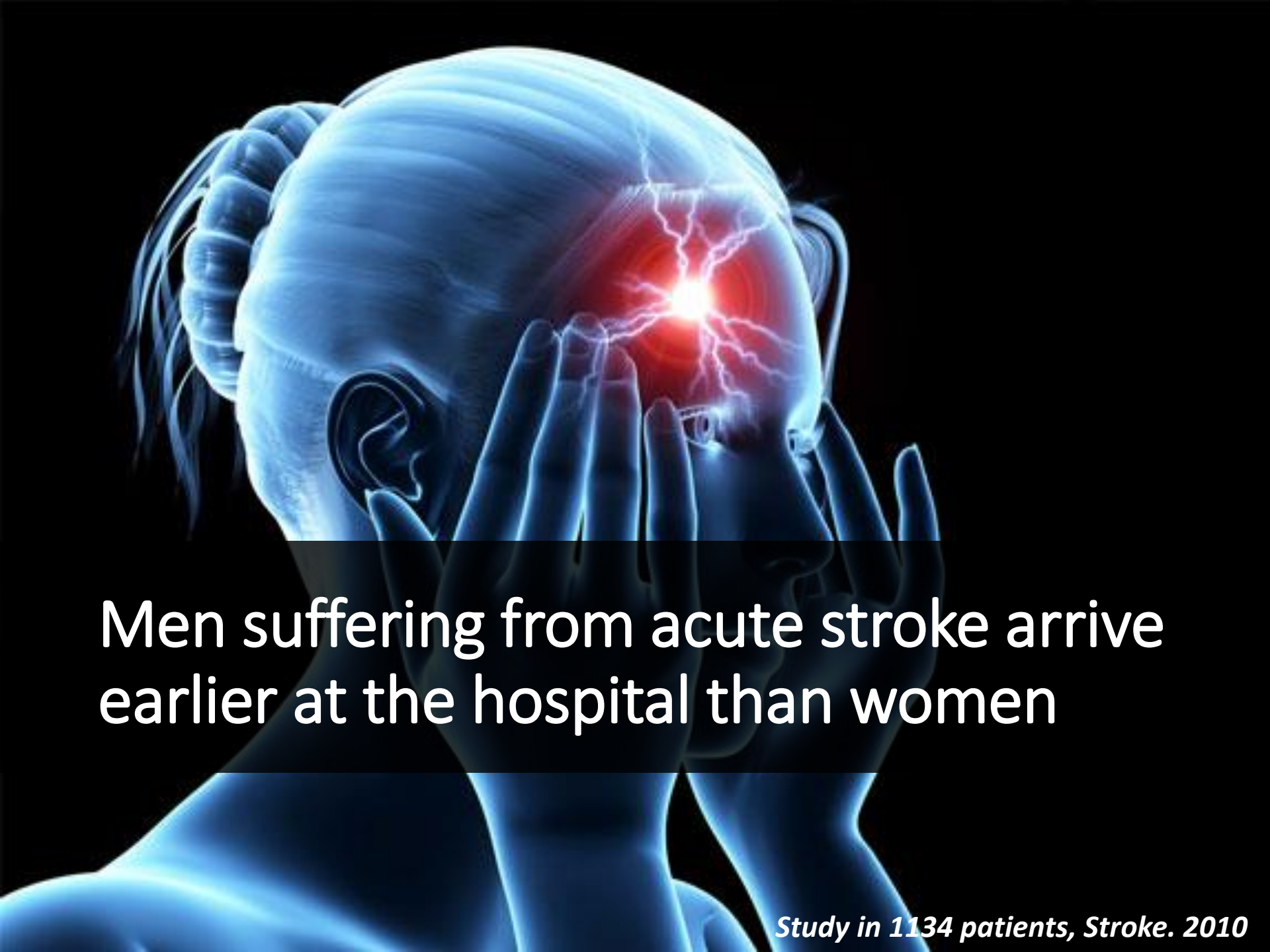
Stadt Zürich
Stadtspital Triemli
Birmensdorferstrasse 497
8063 Zürich

Zürich, 10. Januar 2019

Medienmitteilung

Frauen mit Herzinfarkt sollten schneller medizinische Hilfe beanspruchen

Gemäss einer kürzlich veröffentlichten Studie des Stadtspitals Triemli zögern Frauen bei einem Herzinfarkt länger als Männer, bis sie medizinische Hilfe in Anspruch nehmen. Einerseits da Herzinfarkte fälschlicherweise als typische Männerkrankheit betrachtet werden, andererseits weil bei Frauen häufig andere Symptome auftreten als bei Männern.



Men suffering from acute stroke arrive earlier at the hospital than women

Study in 1134 patients, Stroke. 2010

Only 18-24% of study participants in cardiovascular clinical trials are female.

The percentage of female cardiovascular patients amounts to 53%.

Bikini-Medicine

Women's health research focuses on breasts and the reproductive system



Pilote L et al. J Am Coll Cardiol. 2018
Scott PE et al. J Am Coll Cardiol. 2018
Metaanalyse, Circ Cardiovasc Qual Outcomes. 2011

Example: Psychiatry

Eating Disorders, 20:346–355, 2012
Copyright © Taylor & Francis Group, LLC
ISSN: 1064-0266 print/1532-530X online
DOI: 10.1080/10640266.2012.715512



Eating Disorders in Men: Underdiagnosed, Undertreated, and Misunderstood

«Stereotypes of eating disorders inhibit the availability of evidence-based treatment for males and falls short of the successful management of gender specific problems.[...]»

«Resources are limited as treatment paradigms have been geared towards females.»

Example: Psychiatry

Depression is undergdiagnosed
in men.....

Alzheimer's disease disproportionately affects women, but is often diagnosed late in women



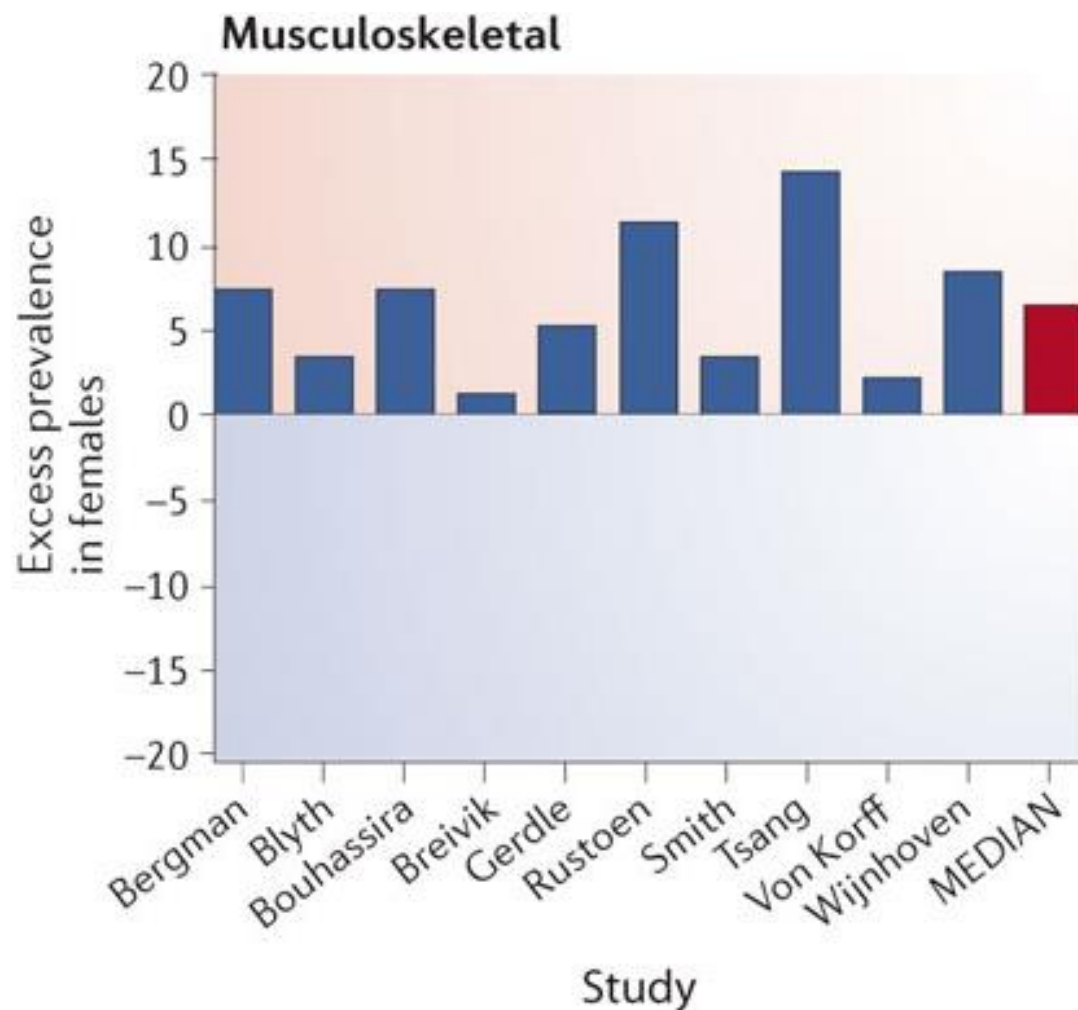
News | Science

🏠 > News > Science

Women's Alzheimer's going undiagnosed because of better memory for words, study indicates

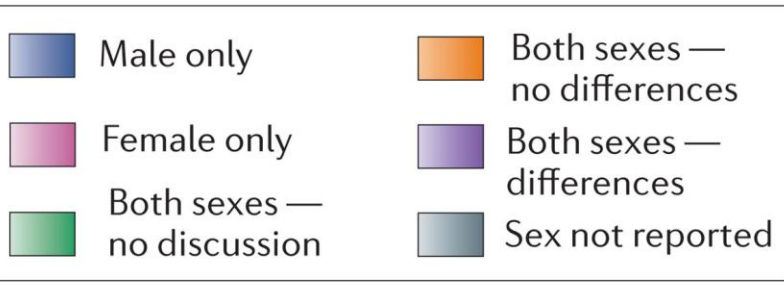
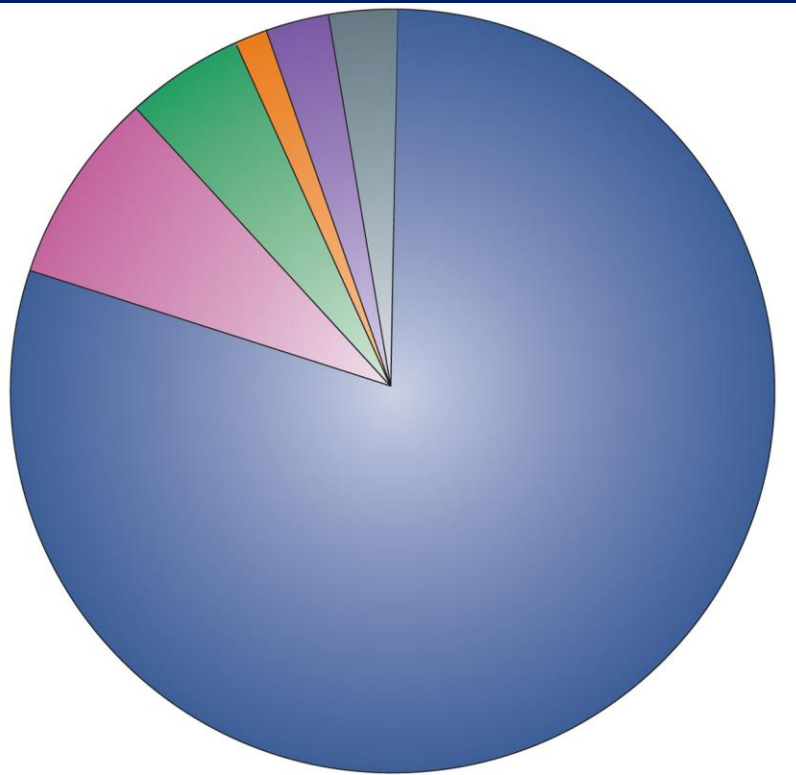


...and suffer more often from chronic pain



...but:

79% of animal studies in
Neurology are being
conducted in male
animals



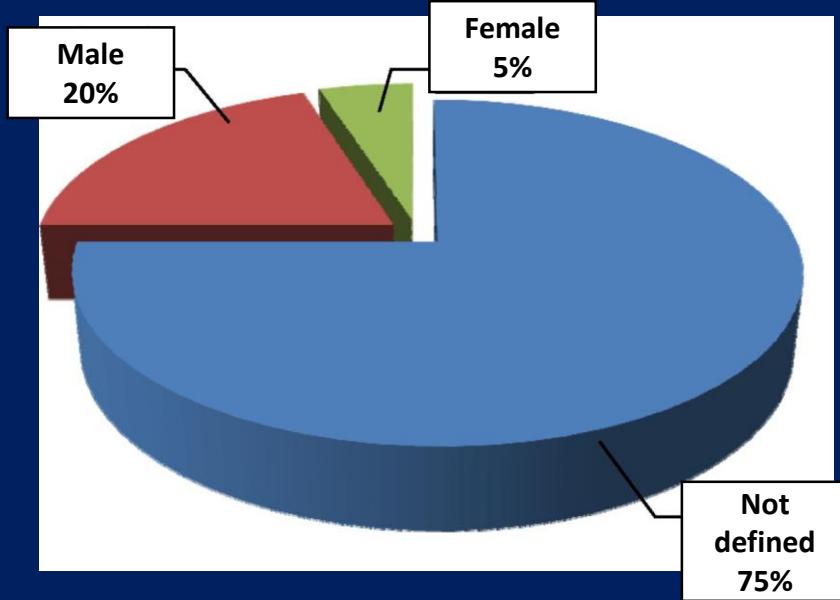
Analysis of all experimental studies focusing on pain perception that were published between 1996 und 2005.

Nature Reviews Neuroscience. 2012

Neuron



Dopamin, a neurotransmitter mediating pain perception, is being ingested twice as fast in female neurons as compared to male neurons



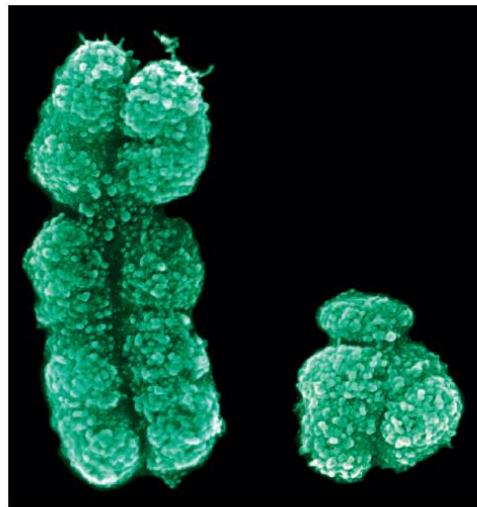
Only 5% of studies are being conducted in female cells

Example: Genetics

nature
medicine

Accounting for sex in the genome

Genetic association studies of the human genome often omit the X chromosome because of the unique analytical challenges it presents. A concerted effort to undo this exclusion could offer medically relevant insights into basic biology that might otherwise be missed.



The X (left) and the Y chromosomes have more influence on cells than first thought.

Growing public awareness of the sex- and gender neglect in medicine

ZEIT  ONLINE

Deutscher Herzbericht

Das schwache Herz der Frauen

Die gute Nachricht: Immer weniger Menschen sterben an Herzinfarkten. Die schlechte: Herzkrankheiten werden generell häufiger. Vor allem Frauen sind betroffen.

17. Januar 2018, 18:31 Uhr / Quelle: ZEIT ONLINE, dpa, AFP, cck / 15 Kommentare



Das menschliche Herz als 3-D-Modell © Science P

TAGBLATT

«Frauen sind anders krank als Männer» – Die Medizin wendet sich den Frauen zu

Eine Hausärztin, die Frauen anders behandelt als Männer – das ist neu. Und überfällig. Denn Studien belegen, dass das Geschlecht Symptome, Auslöser und Verlauf von Erkrankungen beeinflusst.

Inge Staub
10.8.2018, 14:50 Uhr



More Women Dying Of Heart Disease, Yet Men Still Get More Treatment

Disorders in Men: Underdiagnosed, Under-

The influence of sex and gender on immunity, infection and vaccination
Anna Ruggieri¹, Simona Anticoli², Antonella D'Ambrosio³, Luciana Giordani⁴

THE YENTL SYNDROME

BERNADINE HEALY, M.D.

Pharmacologic Research in Pregnant Women — Time to Get It Right
Ahizechukwu C. Eke, M.D., M.P.H., Kelly E. Dooley, M.D., Ph.D., and Jeanne S. Sheffield, M.D.

EDITORIAL

Myocardial Infarction in Young Women: An Unrecognized and Unexplained Epidemic

Viola Vaccarino, M.D.

IN THE JOURNALS

FDA analysis: Women underrepresented in HF, CAD, ACS trials

Pilote L, et al. J Am Coll Cardiol. 2018;71:1057-1064. May 1, 2018

The Feminine Face of Ischemic Heart Disease: Challenges and Opportunities*

... in liver transplantation: Does sex matter?
D. Watt², Norah Terrault¹, Marisa...

FDA Takes Action on Ambien; Concedes Women at Risk

Review
Sex differences in...
Gianpaolo R...
Center for...
January 30, 2015

Osteoporosis Significantly Underdiagnosed, Undertreated in Men

THE PAIN GAP

Sex Differences in Efficacy and Toxicity of Systemic Treatments: An Undervalued Issue in the Era of Precision Oncology

Berna C. Özdemir, Lausanne University Hospital; and International Cancer Prevention Institute, Lausanne, Switzerland
Chantal Csajka, Lausanne University Hospital; and University of Lausanne, Lausanne, Switzerland

Geschlecht in der Medizin:

ein Thema mit vielen Facetten

Carole Clair
nature
medicine

Accounting for sex in the genome
Genetic models in the study of sex differences

Maria Buoncervello^{1,*}, Matteo Marconi^{2,*}, Alessandra Carè³, Paola Piscopo⁴, Walter Malorni^{2,5} and Paola Matarrese^{2,5}

Vulnerability of Female Drivers Involved in Crashes: An Analysis of US Population at Risk

Dipan Bose, PhD, Maria Segui-Gomez, ScD, MD, MPH, and Jeff R. Crandall, PhD

Mental Stress-Induced Myocardial Ischemia Risk After MI Increased in Women

Sex and gender in medicine: vulnerable populations

HIV-positive women less likely to use statins, even though they qualify

Dec 08, 2017 | Anicka Slachta

ann. behav. med. (2018) XX:1-8
DOI: 10.1093/abm/kax007

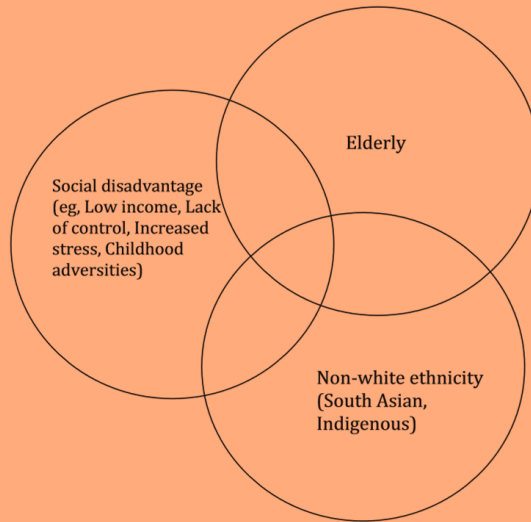
BRIEF REPORT

Worry About Deportation and Cardiovascular Disease Risk Factors Among Adult Women: The Center for the Health Assessment of Mothers and Children of Salinas Study

Jacqueline M. Torres, PhD, MPH¹ • Julianna Deardorff, PhD² • Robert B. Gunier, PhD³ • Abbey Alkon, RN, PhD, CPNP⁴ • Katherine Kogut, MPH, MSc³ • Brenda Eskenazi, PhD⁶

NEWS • INTERVENTIONAL | SCAI 2017

Minority Women Face 50% Increased Risk of Death/MI After PCI Compared With White Men at 1 Year



JAMA Cardiology | Original Investigation

National Trends in Statin Use and Expenditures in the US Adult Population From 2002 to 2013 Insights From the Medical Expenditure Panel Survey

Joseph A. Salami, MD, MPH; Haider Warraich, MD; Javier Valero-Elizondo, MD, MPH; Erica S. Spatz, MD, MHS; Nihar R. Desai, MD, MPH; Jamal S. Rana, MD, PhD; Salim S. Virani, MD, PhD; Ron Blankstein, MD; Amit Khera, MD; Michael J. Blaha, MD, MPH; Roger S. Blumenthal, MD; Donald Lloyd-Jones, MD, ScM; Khurram Nasir, MD, MPH

JAMA Cardiology | Original Investigation

Outcomes in Women and Minorities Compared With White Men 1 Year After Everolimus-Eluting Stent Implantation Insights and Results From the PLATINUM Diversity and PROMUS Element Plus Post-Approval Study Pooled Analysis

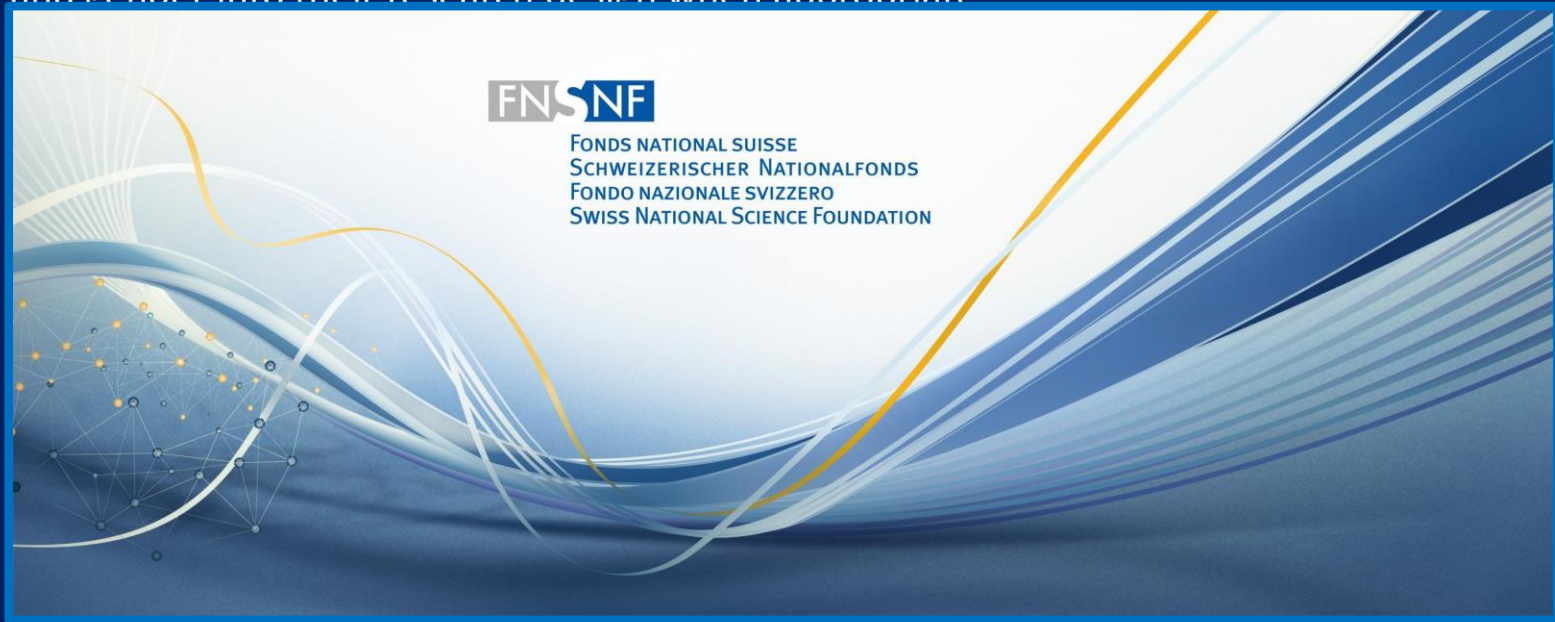
Wayne Batchelor, MD, MHS; David E. Kandzari, MD; Scott Davis, MD; Luis Tami, MD; John C. Wang, MD; Islam Othman, MD; Osvaldo S. Gigliotti, MD; Amir Haghghat, MD; Sarabjeet Singh, MD; Mario Lopez, MD; Gregory Giugliano, MD; Phillip A. Horwitz, MD; Jaya Chandrasekhar, MBBS; Paul Underwood, MD; Craig A. Thompson, MD; Roxana Mehran, MD

Statins' expanding reach falls short among women, minorities

Torres M et al. Ann Behav Med. 2018
Kandasamy S et al. Can J Cardiol. 2018
Salami JA et al. JAMA Cardiol. 2017
Batchelor W et al. JAMA Cardiol. 2017
Todd JV et al. AIDS Patient Care STDS. 2017

New regulations since 2016

- **National Institutes of Health**: issued its mandate for including females in vertebrate studies
- **Canadian Institutes of Health Research**: expects that all research applicants will integrate sex and gender into their research design when appropriate



- **UK National Centre** for the Replacement, Refinement and Reduction of Animals in Research has issued guidelines calling for basic research to always report the sex of lab animals.
- **Horizon 2020**: sex and gender must be integrated into all stages of research and innovation

Sex and gender in medicine: the other side

NFWS

Primary prevention of cardiovascular disease: More patient gender-based differences in risk evaluation among male general practitioners

European Journal of Preventive Cardiology
2016, Vol. 23(17) 1831–1838
© The European Society of Cardiology 2016
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sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/2047487316648476
ejpc.sagepub.com



Raphaëlle Delpech¹, Virginie Ringa², Hector Falcoff^{3,4} and Laurent Rigal^{1,2}

Researchers say about 32,000

JAMA Internal Medicine | Original Investigation

Comparison of Hospital Mortality and Readmission Rates for Medicare Patients Treated by Male vs Female Physicians

Yusuke Tsugawa, MD, MPH, PhD; Anupam B. Jena, MD, PhD; Jose F. Figueroa, MD, MPH; E. John Orav, PhD; Daniel M. Blumenthal, MD, MBA; Ashish K. Jha, MD, MPH

doi:10.1093/eurheartj/ehw486



Canadian Journal of Cardiology
Volume 35, Issue 2, February 2019, Pages 160-168



Association Between Patient and Physician Sex and Physician-Estimated Stroke and Bleeding Risks in Atrial Fibrillation

1 Fam Physician. 2017] 1. 2017]

- Limitations Concerning the Association of Physician Sex and Patient Outcomes. [JAMA Intern Med. 2017]
- Limitations Concerning the Association of Physician Sex and Patient Outcomes. [JAMA Intern Med. 2017]
- Limitations Concerning the Association of Physician Sex and Patient Outcomes. [JAMA Intern Med. 2017]
- Limitations Concerning the Association of Physician Sex and Patient Outcomes. [JAMA Intern Med. 2017]
- Limitations Concerning the Association of Physician Sex and Patient Outcomes. [JAMA Intern Med. 2017]
- Limitations Concerning the Association of Physician Sex and Patient Outcomes-Reply. [JAMA Intern Med. 2017]

liovascular

ol. 2016

Sex and gender in medicine: the other side

39% of men intended to pursue interventional cardiology compared to only 17% of women.

JACC: CARDIOVASCULAR INTERVENTIONS
© 2019 PUBLISHED BY ELSEVIER ON BEHALF OF THE
AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION

VOL. 12, NO. 3, 2019

Sex Differences in the Pursuit of Interventional Cardiology as a Subspecialty Among Cardiovascular Fellows-in-Training



Clinical



Celina M. Yong, MD, MBA, MSc,^{a,b} Freddy Abnoui, MD, MBA, MSc,^{b,c} Anne K. Rzeszut, MA,^d
Pamela S. Douglas, MD,^e Robert A. Harrington, MD,^b Roxana Mehran, MD,^f Cindy Grines, MD,^g S. Elissa Altin, MD,^c
Claire S. Duvernoy, MD,^h for the American College of Cardiology Women in Cardiology Leadership Council (ACC WIC)
and the Society for Cardiovascular Angiography and Interventions Women in Innovations (SCAI WIN)

RESULTS Of 574 respondents, 33% anticipated specializing in IC. Men were more likely to choose IC than women (39% men, 17% women, odds ratio: 3.98 [95% confidence interval: 2.38 to 6.68]; $p < 0.001$). Men were more likely to be married ($p = 0.005$) and have children ($p = 0.002$). Among married FITs, male IC FITs were more likely to have spouses who do not work ($p = 0.003$). Although men were more likely to be influenced by positive attributes to pursue IC, women were significantly more likely to be influenced negatively against pursuing the field by attributes including greater interest in another field ($p = 0.001$), little job flexibility ($p = 0.02$), physically demanding nature of job ($p = 0.004$), radiation during childbearing ($p < 0.001$), "old boys' club" culture ($p < 0.001$), lack of female role models ($p < 0.001$), and sex discrimination ($p < 0.001$).

50%

Sex and gender in medicine: the other side

Science faculty *vs* students *vs* female students

 Women
 Men



Summary

Limited knowledge and lack of awareness.....

-that sex- and gender-differences exist in pathogenesis, diagnosis, therapy and prevention of disease
-that sex and gender impacts the physician-patient relationship
-that gender impacts the training, mentoring, and career-decisions of residents

What can we do?

**Gendered
Innovations**

in Science,
Health & Medicine,
Engineering, and
Environment



Fix the knowledge

Research

Teaching/Education

Patient Care



How to implement this into clinical practice?



Fix the knowledge: patient care

- Be aware that disease development, manifestation, and course are different in men and women
- Know about the demographic groups that currently have insufficient or suboptimal medical care
- Develop and implement gender-sensitive diagnostic tools and gender-sensitive treatments



Fix the knowledge: patient care

ISOGEM

International Society of Gender Medicine



[IGM >](#) [News >](#) [Event](#) [Member Societies](#)

[Usefull Links](#)

[Contact >](#) [Our Team](#)



Usefull links

[News](#)

<http://www.isogem.eu>

Institute for gender-specific medicine



Fix the knowledge: teaching



Integration
into
assessment

Integration of sex and gender
medicine in all teaching formats
throughout the curriculum

Integration of sex and gender
medicine in multiple teaching courses

Multiple stand alone courses on sex and gender medicine

Single courses involving sex and gender medicine aspects

Fix the knowledge: medical education

- Provide information on gender sensitive disease manifestation and gender disparities in disease management
- Detect gender-specific problems in medical training and mentoring of residents
- Take measures to eliminate these problems:
 - Be aware of unconscious bias
 - Address a lack of support in the workplace
 - Specific mentoring needs of women and men
 - Flexible working hours and opportunities to align work and family
 - Support for returners after career breaks



**„Der Patient darf nicht als
Neutrum mit männlichen
Zügen behandelt werden“**

Vera Regitz-Zagrosek

**Direktorin Institut für Gender-Medizin
Charité Berlin**





Medizinische Fakultät

News

Über die Fakultät

Dekanat / Geschäftsstelle Direktorium
UMZH

Institute und Kliniken

Sitzungstermine

Formulare und Richtlinien

Stiftungen und Preise / Grants

Informationen zum Studium

Informationen zur Promotion

Habilitation

Umhabilitation

Umhabilitation kombiniert mit
Titularprofessur

Titularprofessur

**Chancengleichheit und
Nachwuchsförderung**

Filling the Gap

**Gastprofessur Anna-Fischer
Dückelmann 2019
"Sex and Gender in Medicine"**

Mentoring

Veranstaltungen

Interprofessionalität

Doktoratsprogramme

Alumni

Veranstaltungen

Offene Stellen

Der Dekan gratuliert

Veranstaltungen

Kick-off Symposium "Sex and Gender in Medicine"

Datum: 15.11.2019

Zeit: 13:30 – 18:45 Uhr, anschliessend Apéro

Ort: Aula UZH

Mit: Prof. Regitz-Zagrosek (Berlin), Prof. Kautzky-Willer (Wien)
Prof. Beck Schimmer, Prof. Buch, Dr. Ferretti, Prof. Gebhard,
Prof. Jäncke, Prof. Nadal (UZH)

Workshop Laufbahnplanung für Nachwuchswissenschaftlerinnen: "Wie plant Frau ihre Karriere?"

Datum: 09. Oktober 2019

Zeit: 17:00 - 18:30

Ort: Careum 2, Raum 286

Mit: Prof. Dr. med. Dr. h.c. Vera Regitz-Zagrosek,

↓ [Flyer_Wie plant Frau ihre Karriere? \(PDF, 250 KB\)](#)

Impulsreferat "Medizin und Chancengleichheit – Fiktion oder Wirklichkeit?"

Datum: 31. Oktober 2019

Zeit: 17:00 - 18:00, anschliessend Apéro riche

Ort: Restaurant UniTurm
Universität Zürich, Hauptgebäude

Mit: Prof. Dr. med. Dr. h.c. Vera Regitz-Zagrosek,
Prof. Dr. Beatrice Beck Schimmer, Prof. Dr. med. Klara Landau

[↑ top](#)

Kontakt

Für Anfragen zu Vorträgen oder Treffen während der Gastprofessur:

→ miriam.buchmann2@uzh.ch

[↑ top](#)

Agenda

- 25.09.2019, Seminar CMC - "Sex differences in the molecular mechanisms of cardiac hypertrophy"
- 04.10.2019, Vortrag am Zentrum für Experimentelle Rheumatologie, Schlieren
- 08.10.2019, ETH Medizin Bachelor: Vorlesung "Sex differences, und wie untersucht man geschlechtsspezifische Unterschiede?" Modul "Translationale Tiermodelle"
- 09.10.2019, Workshop Laufbahnplanung für Nachwuchswissenschaftlerinnen: "Wie plant Frau ihre Karriere?"
- 10.10.2019, Workshop: Input Gender Medizin
- 15.10.2019, ZIHP Veranstaltung "Warum brauchen wir Gendermedizin?"
- 28.10.2019, Einführungsvorlesung Medizin 3./4./6. SJ
- 31.10.2019, Vortrag: "Sex differences in cardiovascular cells"
- 31.10.2019, Impulsreferat: Medizin und Chancengleichheit – Fiktion oder Wirklichkeit? Executive MBA
- 05.11.2019, Interne Dienstagsweiterbildung: "Sex and Gender in Medicine"
- 06.11.2019, Einführungsvorlesung in Medicine "Gender in Medicine" 2. SJ
- 15.11.2019, Kick-off Symposium "Sex and Gender in Medicine"
- 18.11.2019, Workshop: Implementierung von Gender Medicine in Curriculum für



Vielen Dank!

MIND THE GAP