



Sex and Gender Based Medicine in Clinical Education Annotated Bibliography

Publications:

- **Gonzalo JD, Haidet P, Wolpaw DR. Authentic clinical experiences and depth in systems: toward a 21st century curriculum. *Med Educ.* 2014;48(2):104-5.**

This article describes a program that began in 1952 and introduced increased learner responsibility, an organ system-based curriculum, and early student engagement in patient care through a family clinic. This program linked medical students with pregnant women and created a meaningful mini-immersion for these pre-clerkship students. The students followed the women through pregnancy, delivery, and postnatal care, and infants into early childhood. The students attended all appointments, made home visits, and often developed important longitudinal relationships with mother, child, and family, actively contributing to these patients' health care. Over time the program morphed into a more typical preceptorship, in which students gained the opportunity to practice clinical skills and see a greater number of patients, but without the depth afforded by the original program. This article discusses how the changes caused the program to lose the meaningful engagement that promotes learning and professional development. It also emphasizes the importance of systems-based experiences to student development. The author's focus on a new systems-based curriculum sets a foundation within the medical education literature for future study and adaptation of such curricula.

- **Flier SN, Rose S. Is functional dyspepsia of particular concern in women? A review of gender differences in epidemiology, pathophysiologic mechanisms, clinical presentation, and management. *Am J Gastroenterol.* 2006;101:S644-S-653.**

This review article discusses specific gender differences related to the symptom presentation, pathophysiology, and approach to treatment of functional dyspepsia, while noting where differences have not been found and where further investigation is warranted. Dyspepsia is a remarkably common symptom in the general population. Although multiple definitions have been used to describe the symptom, the most common explanation is that of chronic or recurrent pain or discomfort (a subjective negative feeling that may be associated with early satiety, fullness, bloating, or nausea) centered in the upper abdomen. The effect of gender on mechanisms of disease, symptom presentation, and treatment response is an area of increasing interest and study. As with other functional gastrointestinal disorders, there appear to be some gender-specific features of functional dyspepsia. Specifically, gender-related differences have been observed in some studies of both the prevalence of individual dyspepsia symptoms, and in gastric emptying and proximal gastric motor function. There also appear to be gender differences in the psychosocial realm, with dyspeptic women experiencing a lesser sense of well-being than dyspeptic men, as well as an association of an abuse history with functional dyspepsia.

- **Godfrey JR, Rose S. Toward optimal health: Suzanne Rose, M.D., M.S.Ed., discusses management of constipation in women**

In this article, Dr. Suzanne Rose explains how a seemingly straightforward problem, chronic constipation has a wide range of possible causes in women and requires evaluation, diagnosis, management, and at times, referral. Although a specific etiology is not found at least half the time, clinicians need to understand the physiology and underlying causes in order to properly assess and manage the female patient.

- **DeCross AJ (Editor). Digestive Disease Self-Education Program 7. A Core Curriculum and Self-Assessment in Gastroenterology and Hepatology. The American Gastroenterological Association. Bethesda, MD. 2013.**

Chapter 15, Digestive Health and Disease in Women, describes sex differences in gastrointestinal (GI) physiology. The objectives of this study guide are to discuss differences in sex-based biology, review the effects of hormones on the GI tract, recognize the presentation and management of gastrointestinal and hepatobiliary diseases in women, assess the effect of pregnancy on the presentation and/or course of GI and hepatobiliary diseases, and evaluate the overall effect of sex differences in patients with GI and liver conditions.

- **Oertelt-Prigione S, Regitz-Zagrosek V. Sex and Gender Aspects in Clinical Medicine. London: Springer-Verlag London Limited, 2012. Print.**

This book includes tables on sex/gender differences in symptoms and management and a series of suggestions to the novice in the field. Chapters are specialty-specific. The focus is not on women's health, but the presentation of differences in clinical symptoms, management, and outcomes in women and men. Gender medicine strives to employ the knowledge about these differences to improve diagnosis, better understand pathogenesis, and advance patient-oriented therapy.

- **McGregor AJ, Templeton K, Kleinman MR, Jenkins MR. Advancing sex and gender competency in medicine: sex & gender women's health collaborative. *Biol Sex Differ.* 2013;4(1):11.**

This article presents a case for the inclusion of sex and gender focused content into medical curricula and describes a means for students, faculty, and practitioners to access a centralized, interactive repository for these resources. The Sex and Gender Women's Health Collaborative (SGWHC) is supported by the coordinated efforts of the founding partners: the American Medical Women's Association, American College of Women's Health Physicians, and Society for Women's Health Research to address the gaps in medical education with regard to sex and gender competency in the care of women. Research conducted to date has deepened the understanding of sex and gender differences in the etiology, diagnosis, treatment, and outcomes for many conditions that affect both women and men.

- **McGregor AJ, Núñez A, Barron R, et al. Workshop summaries from the 2015 Sex and Gender Medical Education Summit: utilization of sex and gender based medical education resources and creating student competencies. *Biol Sex Differ.* 2016;7(S1):43.**

This article describes the outcomes of two workshops held during the 2015 “Sex and Gender Medical Education Summit: a Roadmap to Curricular Innovation” that sought to lay the framework for an undergraduate medical education curriculum on unified sex- and gender-based medicine (SGBM). Despite overwhelming evidence that sex and gender are critical factors in the delivery and practice of medicine, there is no such curriculum. Attendees to the Summit attended one of two workshops. Workshop A, “Utilization of SGBM Resources in U.S. Medical Schools,” identified gaps in existing curricula as well as strategies for integrating available SGBM content into existing educational activities or curricular threads. Focus was given to the use of advisory committees to nurture collaboration and sharing of resources. Workshop B, “Creating SGBM Student Competencies,” created a framework for national SGBM competencies by adapting existing materials from women’s health curricula such as Brown University’s SGBM Emergency Medicine subspecialty. The importance of student engagement, assessment, and faculty development were stressed as well as engaging the Liaison Committee on Medical Education in awareness of the vital nature of including SGBM content into all medical school curricula. These Workshops provided a forum for national and international institutional representatives to lay a foundation for integration of SGBM into medical school curricula and the development of national SGBM Student Competencies.

- **Kling JM, Rose SH, Kransdorf LN, et al. Evaluation of sex-and gender-based medicine training in post-graduate medical education: a cross-sectional survey study. *Biol Sex Differ.* 2016;7(1):38.**

This article provides information from a survey that was administered to residents across the Mayo Clinic campuses to assess current knowledge of sex and gender medicine in a large program of post-graduate medical education and to identify barriers and preferred teaching methods for addressing sex and gender issues in health and disease. Addressing health care disparities is a national priority for initiatives in precision and individualized medicine, and an essential component of precision medicine is the understanding that sex and gender influence health and disease. The study showed that curriculum gaps exist in post-graduate medical education regarding sex- and gender-based medicine, and residents often do not fully understand how these concepts impact their patients’ care. Reviewing the definition of sex- and gender-based medicine and integrating these concepts into existing curricula can help close these knowledge gaps. The authors concluded that as the practice of medicine becomes more individualized, it will be essential to equip physicians with an understanding of how a patient’s sex and gender impacts their health to provide the highest value care.

- **Pinn VW. Sex and gender factors in medical studies: implications for health and clinical practice. *JAMA.* 2003;289(4):397-400.**

This article discusses how the research agenda for women’s health has expanded from the historical concept that women’s health relates to reproductive hormones and organs. Expectations of health care are increasingly based on an understanding of sex and gender factors. Important issues in research, policy, and health care will include wellness care and prevention of chronic disorders with consideration of sex and gender differences in weight patterns, injuries, and behaviors; more specific and individually tailored drug interventions with considerations of sex differences at the genetic, cellular, and functional levels; caregiving and effects on the caregiver; interdisciplinary and comprehensive approaches to multisystemic diseases, such as autoimmune diseases, and hormone-based conditions; and sex and endocrine differences in manifestations of brain health and disorders

such as epilepsy and Alzheimer disease. The authors concluded that women and men will both benefit from new approaches to health care that are based on education on the role of sex and the gender influences of social, economic, cultural, geographic, and behavioral factors.

- **Verdonk P, Benschop YWM, de Haes HCJM, Lagro-Janssen TLM. From gender bias to gender awareness in medical education. *Adv Health Sci Educ.* 2009;14(1):135-152.**

This article describes how gender is an essential determinant of health and illness. Gender awareness in physicians contributes to equity and equality in health and aims towards better health for men and women. The uptake of gender issues in medical education brings about specific challenges for several reasons. For instance, the political-ideological connotations of gender issues create resistance especially in traditionalists in medical schools. Secondly, it is necessary to clarify which gender issues must be integrated in which domains. Also, some are interdisciplinary issues and as such more difficult to integrate. Finally, schools need assistance with implementation. The integration of psychosocial issues along with biomedical ones in clinical cases, the dissemination of literature and education material, staff education, and efforts towards structural embedding of gender in curricula are determining factors for successful implementation. Gender equity is not a spontaneous process. Medical education provides specific opportunities that may contribute to transformation for medical schools to educate physicians. Consequently, future benefits legitimize the integration of gender as a qualitative investment in medical education.

- **Franconi F, Brunelleschi S, Steardo L, Cuomo V. Gender differences in drug responses. *Pharmacol Res.* 2007;55(2):81-95.**

This review article summarizes gender differences in drug response. Although gender differences have been described both in pharmacodynamics and pharmacokinetics, their role in clinical practice is not yet completely elucidated. The evidence that women have been less enrolled in clinical trials and that a gender-specific analysis usually is not included in the evaluation of results, contributes largely to this uncertainty. Consequently, adverse drug reactions are still higher in females than in males. Since sex is a fundamental biological variable that cannot be discounted, gender differences in pharmacology have to be considered in order to improve drug safety efficacy and to optimize medical therapy both in men and women.

- **Song MM, Jones BG, Casanova RA. Auditing sex- and gender-based medicine (SGBM) content in medical school curriculum: a student scholar model. *Biol Sex Differ.* 2016;7(S1):40.**

This article provides a summary of a qualitative analysis and a post-audit comparative analysis that were completed to assess the level of sex- and gender-based medicine (SGBM) instruction at the Texas Tech University Health Sciences Center School of Medicine. Complete auditing and accounting of SGBM content in the existing medical school curriculum was necessary to determine the baseline status and prepare for integration of SGBM content into that curriculum. The review of syllabi and the Curriculum Management and Information Tool (CurrMIT) data analysis did not generate a meaningful catalogue of SGBM content in the curriculum; most of the content identified specifically targeted women's or men's health topics and not sex- or gender-based differences. The real-time student audit of the existing curriculum at Texas Tech revealed that most of the SGBM material was focused on the physiological/anatomical sex differences or gender differences in disease prevalence, with minimal coverage of sex- or gender-based differences in diagnosis, prognosis, treatment, and

outcomes. The real-time student scholar audit was effective in identifying SGBM content in the existing medical school curriculum that was not possible with a retrospective review of course syllabi and lecture objectives or curriculum databases such as the CurrMIT. The audit results revealed the need for improved efforts to teach SGBM topics in the school's pre-clinical curriculum.

- **Jenkins MR, Herrmann A, Tashjian A, et al. Sex and gender in medical education: a national student survey. *Biol Sex Differ.* 2016;7(1):45.**

This article provides information from a study that examined the role of gender specific medicine in the U.S. medical school curriculum. Gender- and sex-specific medicine is defined as the practice of medicine based on the understanding that biology (dictated by sex chromosomes) and social roles (gender) are important in and have implications for prevention, screening, diagnosis, and treatment in men and women. In light of the many ways that sex and gender influence disease presentation and patient management, there have been various initiatives to improve the integration of these topics into medical education curriculum. The study, which was based on the opinions of U.S. allopathic and osteopathic-enrolled students, showed that medical students recognize the differentiation between sex- and gender-based medicine principles and women's health, and understand the translational value of sex and gender-specific principles in the clinical setting. However, current curricular offerings fall short of providing students with adequate coverage of specific evidence-based health differences.

- **Women's Health Research: Progress, Pitfalls, and Promise. Institute of Medicine. 2010. Women's Health Research: Progress, Pitfalls, and Promise. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12908>.**

This publication provides an overview of the major changes in government support of women's health research—in policies, regulations, and the organization of research efforts—that have occurred during the past two decades. To assess the impact of these changes, Congress directed the Department of Health and Human Services (HHS) to ask the IOM to examine what has been learned from that research and how well it has been put into practice as well as communicated to both providers and women.

Websites:

- **Sex and Gender Specific Health. Laura W. Bush Institute for Women's Health. Texas Tech University Health Sciences Center. Available at: <http://www.laurabushinstitute.org/sex-gender-specific-health/provider.aspx>**

The Laura W. Bush Institute for Women's Health and the Texas Tech University Medical Center Women's Health Committee share the goal of advancing multi-disciplinary science in women's health and promoting the well-being of women through research, education, and patient care. The website provides resources on sex and gender specific health and continuing medical education programs.

- **Sex and Gender Women’s Health Collaborative. Available at: <http://sgwhc.org/>**

The Sex and Gender Women’s Health Collaborative (SGWHC) was established in 2012 with grants from its founding partners: the American Medical Women’s Association, American College of Women’s Health Physicians, and Society for Women’s Health Research, and with support from the Laura Bush Institute for Women’s Health at Texas Tech University Health Sciences Center. It is supported by a growing network of medical and academic institutions, professional organizations, government agencies and individuals who share a vision of women’s health and sex and gender specific medicine. The SGWHC maintains a digital resource library of sex and gender specific materials to be adopted and adapted into medical education and clinical practice.

- **2015 Sex and Gender Medical Education Summit. Available at: <http://www.sgbmeducationsummit.com/>**

The Sex and Gender Medical Education Summit was convened at the Mayo Clinic in Rochester on October 18-19, 2015. At the Summit, US and international leaders of sex and gender based medicine and medical education presented information about the integration landscape at federal agencies and academic health sciences centers. The Summit concluded with working groups where participants developed plans for creating sex and gender based competencies for medical education and for integrating sex and gender knowledge at their medical schools. The website includes presentations and other material related to the Summit.

- **Putting science to work for the health of women. Office of Research on Women’s Health. National Institutes of Health. Available at: <https://orwh.od.nih.gov/research/cme/>**

The Office of Research on Women’s Health (ORWH) was established in September 1990 in response to congressional, scientific, and advocacy concerns that a lack of systemic and consistent inclusion of women in NIH-supported clinical research could result in clinical decisions being made about health care for women based solely on findings from studies of men—without any evidence that they were applicable to women. ORWH is part of the Office of the Director of NIH, and works in partnership with the 27 NIH Institutes and Centers to ensure that women’s health research is part of the scientific framework at the NIH—and throughout the scientific community. The ORWH website offers a series of courses for researchers, clinicians, and students to provide a foundation for sex and gender accountability in medical research and treatment.

Presentations:

- **Templeton K, Werbinski J, Rojek M, Parikh-Walter G. Moving Past One-Sex Medicine: Developing medical education programs with a sex and gender lens. AMA ChangeMedEd Conference. Chicago. September 16, 2017. Available at: <https://ace.communities.ama-assn.org/pages/233?subsection=saturday-presentations>**

This presentation provided an overview of how the study of sex and gender based medicine (SGBM) can be integrated into medical school curricula. The results of a national study conducted by Texas Tech University Health Center to learn more about student awareness of SGBM were also presented. The study showed that 96 percent of the 1,097 survey respondents consider the study of

sex and gender difference important to their ability to care for patients; there is variable discordance between expressed knowledge and perceived amount of exposure within several topic areas; there is marked inconsistency across topics in regard to the reported inclusion of sex and gender differences within medical education; and future efforts toward uniform integration of sex and gender evidence into medical education are needed. This presentation also provided resources and strategies for closing the sex and gender gaps in medical education.

- **Vanderbilt A, Page R. Implicit Bias in Medicine: How medical education and interprofessional healthcare teams can be a part of the solution. AMA ChangeMedEd Conference. Chicago. September 15, 2017. Available at: <https://ace.communities.ama-assn.org/pages/233?subsection=friday-presentations>**

This presentation provided examples of implicit bias in medicine, including those defined by the Institute of Medicine which impact physician-patient interactions and lead to differential treatment of patients based on race, gender, ethnicity, and other social stereotypes. The presentation also showed how medical education and interprofessional health-care teams can be a part of the solution during undergraduate medical education.

AMA Policies:

- **AMA Policy H-295.890, Medical Education and Training in Women's Health**
Policy H-295.890 (Parts 1, 5, and 6) asks that our AMA encourage the coordination and synthesis of the knowledge, skills, and attitudinal objectives related to women's health/gender-based biology that have been developed for use in the medical school curriculum. Medical schools should include attention to women's health throughout the basic science and clinical phases of the curriculum; encourage the development of a curriculum inventory and database in women's health for use by medical schools and residency programs; encourage physicians to include continuing education in women's health/gender based biology as part of their continuing professional development. (Jt. Rep. CME and CSA, A-99 Reaffirmed: CME Rep. 2, A-09)
- **AMA Policy H-525.976, An Expanded Definition of Women's Health**
Our AMA recognizes the term "women's health" as inclusive of all health conditions for which there is evidence that women's risks, presentations, and/or responses to treatments are different from those of men, and encourages that evidence-based information regarding the impact of sex and gender be incorporated into medical practice, research, and training. (CSAPH Rep. 05, A-16)
- **AMA Policy H-525.988, Sex and Gender Differences in Medical Research**
Our AMA: (1) reaffirms that gender exclusion in broad medical studies questions the validity of the studies' impact on the health care of society at large; (2) affirms the need to include both genders in studies that involve the health of society at large and publicize its policies; (3) supports increased funding into areas of women's health research; (4) supports increased research on women's health and participation of women in clinical trials, the results of which will permit development of evidence-based prevention and treatment strategies for all women from diverse cultural and ethnic groups, geographic locations, and socioeconomic status; and (5) recommends that all medical/scientific journal editors require, where appropriate, a sex-based analysis of data, even if such comparisons are negative. (Res. 80, A-91 Appended: CSA Rep. 4, I-00 Modified: CSAPH Rep. 1, A-10 Reaffirmed: CSAPH Rep. 05, A-16)

- **AMA Policy D-295.310, Sex and Gender Based Medicine in Clinical Education**

Our AMA will collaborate with the Accreditation Council for Graduate Medical Education, Liaison Committee on Medical Education, Commission on Osteopathic College Accreditation, Association of American Medical Colleges, and Accreditation Council for Continuing Medical Education to disseminate the work produced by medical schools participating in the Accelerating Change in Medical Education consortium and distribute pertinent information and a comprehensive bibliography about the influence that sex and gender have upon clinical medicine. (Res. 958, I-17)