Editorial

Because Women's Lives Matter, We Need to Eliminate Gender Bias

The Institute of Medicine's landmark publication *Unequal Treatment*[1] describes gender bias as unequal access or treatment that is not justified on the basis of an underlying health condition. In a health care setting, bias against women may be manifested when women are diagnosed, counseled, treated, or otherwise managed not just differently, but to a lesser degree of adherence to established standards of care than men with comparable health status. Potential effects of this bias include worse health outcomes for women, marked by higher complication, morbidity, and mortality rates.[2] This expression of prejudice is believed to be implicit, operating at an unconscious level on the basis of situational cues.[3] When a nearly invisible impediment to equitable quality health care can potentially undermine roughly half of the world's population, it should warrant our attention. In the United States, our 309 million residents comprise 50.8% or 156.5 million females[4] who may receive substandard health care.

My personal interest in the topic was piqued after returning home from my granddaughter's funeral following an automobile crash and reading study findings that female trauma victims with life-threatening injuries comparable to males were less often triaged by emergency medical service personnel to trauma facilities and less often transferred by nontrauma physicians to trauma centers.[5] Because both initial transport[6] and secondary transfer to a trauma center[7] correlate with more favorable clinical outcomes, whereas initial triage to a nontrauma facility is associated with a 30% higher mortality rate,[8] the potentially lethal implications of both of those findings hit home immediately and personally.

I found it hard to reconcile that a practice arena heavily accustomed to following protocols and procedures based on valid research delivered a lower standard of care to women. In pursuit of answers and facts, I examined the literature surrounding this issue, hoping to locate evidence that my concern was unfounded. What I found was that this detriment to women's health does not exist as a rare, isolated occurrence limited to third world countries, but has flourished as a pervasive, largely unrecognized phenomenon in the United States and throughout the world.[9] I shared my findings in a 2012 editorial titled "Is there gender bias in critical care?"[10]

In the 5 years since that report, research continues to describe and affirm the nature, extent, and effects of gender bias with some awakening of awareness to its existence and potential for harm. The Table provides a sampling of the literature findings related to gender bias, with an emphasis on studies relevant to critical care. Please refer to it to become acquainted with or to refresh your own recognition of this problem and, I hope, to ignite your interest in contributing to its eradication. To support you in this effort, we can consider some of the approaches suggested for reducing or managing gender bias and then highlight a possibly promising breakthrough discovered serendipitously.

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Table Sampling of reports related to gender bias against women in health care

Clinical Practice Area	Findings
PRIMARY CARE	
Behavioral Health	Using written vignettes of homicides that differed only in sex of perpetrator, forensic psychiatrists and students diagnosed the defendant as legally insane significantly more often when perpetrator was a woman.[11] World Health Organization[12] and US[13] research found most behavioral disorders (depression, anxiety) are diagnosed twice as often in women.
Dermatology	Men receive more intensive treatments than women for common conditions.[14]
Diabetes Mellitus	85% of men vs 55% of women receive oral antihyperglycemics.[15]
Oncology	Despite the UK NICE guideline 27[13,16] (mandates "urgent referral to an oncologist" for painless macroscopic hematuria), 27% of women vs 10% of men had multiple consults before referral. Bladder cancer 5-year survival rate is 57% for men, 44% for women.[17,18] Female gender is independent risk factor for delayed referral and diagnosis of bladder and renal cancer.[19]
Orthopedics	TKA referral in patients with comparable osteoarthritis severity: physicians deny sex influences referral, but referral rate for men is 3 times that for women. Using identical standardized patients, 42% of physicians recommended TKA for the male, but not the female. Odds of primary care physicians recommending TKA for men was twice that for women; for orthopedic physicians, odds for men was 22 times that for women.[20] Patients with osteoarthritis needing hip replacement, women less likely than men to receive 4 of 5 care stages: consult with general practitioner, specialist referral, orthopedic consult, wait listed.[21] Women have more disability before referral.[22]
Organ Transplantation	Women have lower probability of referral to waiting list for kidney transplantation and longer delay between dialysis and waiting list compared to men.[23-25] Women had significantly lower liver transplantation rates than men from 1997 to 2007 and greater deficit to men since.[26]
Pain	Women had pain years longer than men before referral to pain clinic, where women are prescribed minor tranquilizers, sedatives, or antidepressants vs analgesics and opioids for men.[27] After abdominal surgery, physicians prescribed less pain medication for women compared to men; nurses gave less pain medication to women.[28] After CABG, men received narcotics, women given sedatives.[29] First report on gender attributes of pain: physicians minimized women's pain by attributing it to emotional causes.[30] 80 physicians (44 men) and 113 nurses (103 women) more likely to treat male patients with opioids than females. Disparity greater for nurses than physicians.[31]
Peripheral Arterial Disease	Despite ACC/AHA PAD guidelines, at discharge, women are significantly less likely than men to be prescribed 3 recommended therapies: statins, aspirin, and β-blockers.[32,33] Women are offered surgical revascularization less often (36.4%) than men (53.8%) and are offered CEA less often at all ages.[34] When CEA is offered to women, it is often on a very delayed basis. Delays persist after adjusting for age, history, preoperative TIA, ABCD2 score, degree of stenosis, unilateral symptoms, and symptomatic stenosis.[34] Findings most concerning because *female gender* is a *known, negative, independent risk factor* for higher mortality for all major PV extremity surgery (amputation, revascularization).[35] Although PAD has higher prevalence in women,[36] women with PAD incur greater and more rapid functional decline than men.[37] Women with PAD have 2-3 times greater risk of stroke or MI, yet physicians neglect treating this major source of morbidity and mortality.[36]
CRITICAL CARE	
Access to ICU	Fewer women (40%) than men (60%) were admitted to ICUs, especially those ≥50 years, even after control for diagnosis and comorbidity.[38] After transport to ED for chest pain, women less likely than men to be admitted to hospital, sent to cath lab or admitted to ICU. Differences persist after controls for age and ACS diagnosis.[39]
Benchmarks of Care in ED	Mean door-to-ECG time for chest pain (AHA: ≤10 min) delayed for all, but nearly twice longer for women (53 min) than men (34 min); 49% of men had ECG in ≤10 min vs 32% women.[40,41]
Level of Care Received in ICU	In large adult ICU samples in the United States and Canada, despite greater illness severity in women, men received more aggressive care (mechanical ventilation, vasoactive medications, intravenous fluids, central catheters, arterial lines, PA catheters, CABG, thrombolytics, ICP monitoring),[42,43] especially women older than 50; women had higher ICU mortality.[38]
Cardiovascular Risk Factor Management	2-part design compared physicians' attitudes with clinical practice in managing CAD risk factors. **Attitudes** survey of how they would treat 2 hypothetical 58-year-old patients with identical clinical data and mild coronary atherosclerosis. **Actual practice** examined angiographic records of patients with CAD for LDL levels and lipid-lowering medications. **Attitude results**: Despite same findings, physicians prescribed aspirin for 91% of males and 77% of females and lipid-lowering medications for 67% of males and 54% of females. Actual practice (LDL >110 mg/dL): physicians prescribed lipid-lowering medications for 77% of males and 47% females. Clear evidence of gender bias in attitudes and clinical practice.[44]

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Table *Continued*

Clinical Practice Area	Findings
CRITICAL CARE	
Cardiovascular Risk Factor Management (*continued*)	Therapies to prevent risk factors are less often ordered for women vs men.[45-49] When women are treated for hypertension[45,47] or high LDL,[47-49] they are less likely to meet recommended goals. In national cohort of patients with CVD, women—despite higher LDL levels than men—were less likely to receive statins or high-intensity statins as guidelines recommend. Female gender was independently associated with a lower likelihood of receiving statins.[50]
Acute Chest Pain	Women who present with chest pain treated much less aggressively than men, who are more likely to be admitted to ICU; have cardiac enzymes drawn; emergency cardiology consult completed; and receive aspirin, heparin, nitroglycerin, and thrombolytics. Women most often receive controlled substances and anxiolytics.[51] Of consecutive transports for chest pain, males significantly more likely than females to receive aspirin and have 12-lead ECGs taken.[52] Women with chest pain receive fewer cardiac diagnostic assessments and less aggressive therapies than men in all settings: primary care,[53] outpatient,[54] inpatient,[55-59] and ED.[60-64] Women have longer prehospital delays in care from symptom onset.[65] Females with acute chest pain were significantly less likely than males to receive aspirin, nitroglycerin, or have intravenous access started during prehospital care.[39] Of ED patients with chest pain, women less likely than men to be told their symptoms could be CHD related or to have cardiovascular testing or catheterization recommended, less likely to receive inpatient cardiac catheterization, referral for stress testing, cardiac catheterization, or cardiology consult. As inpatients, women more likely to be told no further testing needed.[66]
Coronary Artery Disease: Access to Care, Diagnostic Tests, Pharmacologic Management	As outpatients with *positive* stress tests for possible CAD, 62% of women received no further diagnostic testing vs 38% of men.[67] Women presenting to ED with ACS less likely than men to be admitted or to receive coronary revascularization.[68] In management of patients with CHD and type 2 diabetes mellitus: men treated more consistent with guidelines than women. Men were significantly more likely to receive oral combination drugs, ACE inhibitors, calcium channel blockers, and aspirin.[69] Comparable findings in Finland, Italy, UK, and Argentina (despite women's higher risk profiles) and included less aggressive secondary prevention at discharge.[70] In Canada, women less often treated with platelet inhibitors, heparin, and glycoprotein IIb/IIIa inhibitors than men.[71] In 6 Middle East countries: significantly fewer women than men with ACS received ACE inhibitors, aspirin, clopidogrel, β-blockers or statins at discharge.[72] Another study found lower use of antithrombotics for women vs men: clopidogrel, antiplatelet glycoprotein IIb/IIIa inhibitors.[73] In China, only 8.9% of women received all 6 recommended medications.[74] Access to care may account for disparities in mortality between sexes. Canadian study of adults admitted to the hospital for ACS found women less likely than men to receive care within benchmark times for ECGs or fibrinolysis. Women with STEMI were less likely than men to undergo reperfusion therapy (PCI or fibrinolysis) and women with non-STEMI or unstable angina less likely to undergo nonprimary percutaneous coronary intervention.[41]
Coronary Artery Disease: Referrals for Cardiac Catheterization, Cardiology	Fewer women than men sent for cardiac catheterization after MI despite greater functional disability from angina.[75] CABG performed less often for women (5.9%) than men (12.7%) with CAD and angina[75]; same finding for cardiac catheterization 18 years later.[76] Of 9800 adults with CAD or heart failure, women less likely than men to have consults for both conditions and had 15% fewer follow-up consultations.[77] Men given CABG for CAD more than twice as often as women, who are more likely to be prescribed nitroglycerin despite comparable findings.[15] Only 25% of women received reperfusion (PCI or CABG). Of these, 74% received PCI rather than CABG.[15,74,75,78] CABG not likely provided without angiographic evidence[71,72] and significantly fewer women with CAD receive coronary angiography.[79,80] Women with CAD have fewer PCI procedures than men.[72,73,79] Women are less likely to be given reperfusion for STEMI.[41,73,79] Women with non-STEMI or unstable angina are less likely to undergo PCI compared to men.[41]
Acute Coronary Syndrome: Unstable Angina, Non-STEMI, STEMI	In hospitalized patients with chest pain, angina, or acute MI, women less likely than men to have coronary angiography and revascularization, even after controlling for potentially confounding variables.[81] Women with nonobstructive CAD and MI are less likely to be prescribed medications for secondary prevention of MI and have increased rates of readmission, reinfarction, and death in first year after MI.[70,82-84] 10.2% of men vs 3.5% of women had ICD implanted for primary prevention of SCD.[85] After MI, for primary prevention of SCD, women are significantly less likely than men to have an ICD inserted.[85-89] Of Canadians with acute MI, men were 3 times more likely than women to receive an ICD for both primary and secondary prevention. Neither age nor comorbidities accounted for differences.[89]

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Table *Continued*

Clinical Practice Area	Findings
CRITICAL CARE	
Acute Coronary Syndrome: Unstable Angina, Non-STEMI, STEMI (*continued*)	Women with nonobstructive CAD and MI are less likely to be prescribed medications for secondary prevention (antiplatelet agents, statins),[84] yet have higher rates of readmission, reinfarction, and death first year after MI.[70,82,83] Women had longer prehospital delay from onset of symptoms than men.[65] Formal reports summarize research about women with CAD/ACS in Europe and Asia experiencing substandard levels of care, more complications, and worse outcomes compared to men.[90] Comparable reports relate to women in India,[79] China,[74] and Western Asia.[91] Women much less likely to participate in or be prescribed CR after AMI. Although referral to CR is a performance measure of quality care,[92,93] CR has failed to reach >80% of eligible women in the last 3 decades.[92,94-98] A primary predictor of dismal attendance is lack of physician endorsement of CR.[99,100] Female STEMI patients ≤45 years had significantly poorer quality of care with longer delays in door-to-thrombolytic time,[101] and significantly longer prehospital scene time, transport time, and total scene-to-hospital time compared to men.[102] Upon arrival at the hospital, women with STEMI experienced more delays than men in door-to-code and code-to-balloon times. Female sex is independent determinant of delays.[103] Women have lower rates of hospitalization for AMI and lower rates of PCI to treat AMI compared to men.[104] Women with in-hospital STEMI were less likely to have cardiac catheterization or PCI than men.[105] After AMI, women are less likely than men to receive ACE inhibitors, angiotensin receptor blockers, and β-blockers after discharge.[106] Women are less likely to receive primary PCI or CABG,[107] have longer symptom-onset-to-balloon time, more likely to receive only medical management, less likely to receive β-blockers or statins at discharge.[108] AHA's first Scientific Statement on Acute MI in Women,[109] notes that "despite dramatic declines in cardiovascular deaths among women over the past decade . . . women still fare worse than men." Compared to men, women tend to be underdiagnosed, undertreated, and less likely to receive guideline-recommended medications.[57,71,110]
Cardiac Arrest Management	Women presenting with cardiac arrest less likely to undergo therapeutic procedures (coronary angiography, PCI, TTM) for ventricular tachycardia/fibrillation, pulseless electrical activity/asystole. Women were 25% less likely to undergo angiography or angioplasty and 19% less likely to undergo TTM.[111]
Acute Stroke	Numerous quality indicators (resembling those for management of chest pain, CAD, ACS, MI) for women receiving a significantly lower level of care across all settings than men: delays in provision of care, less likely to receive recommended treatments and medications, less likely to meet established quality benchmarks: - Prehospital recognition of stroke significantly lower in women.[112] - Prehospital delay in studies finding differences, women arrived later in all.[113-117] - In-hospital delay "door-to-doctor" time: women had longer delays.[113,118,119] - In-hospital delay "door-to-scan/image" time: women had longer delays.[119-123] - In-hospital use of intravenous thrombolytics (alteplase) in eligible patients. Women with stroke less likely to receive alteplase.[124-129] - Performance on all "Get With the Guidelines" measures significantly lower for females, even after controlling for age, risk factors, comorbidities.[130]
Trauma	Lack of access to optimal care: Undertriage of patients >65 years. Males significantly more likely to be transported[131] or admitted[132] to a trauma center than females. Male trauma patients more often given priority 1, transported straight to trauma center, and allocated highest level of prehospital competence than females. Differences by sex remained after adjusting for age, type and mechanism of injury, and prehospital cardiac arrest.[133] **Prehospital pain management**: Women less likely than men to receive prehospital analgesia for extremity injuries.[134] **Prehospital opioids for pain**: Among Australian adults with trauma and GCS >12 with pain, males significantly more likely to receive morphine than females even after controls for age, type, and severity of pain.[135] Five years later, study repeated for 2 years with sample 10 times larger: males still had significantly greater odds than females of receiving opioid (morphine or fentanyl).[136] **Triage of Severely-Injured Trauma Patients**: Despite guidelines to ensure triage based on patients' physiologic and injury status, of severely injured (ISS >15) trauma patients (35% women), study had 3 findings[5]: 1) EMS personnel less likely to transport severely injured women from field to trauma center compared to comparably injured men 2) Of patients transported to nontrauma facilities, physicians less likely to transfer injured females to trauma centers compared to males 3) Among comparably injured trauma patients, significantly fewer women than men are triaged to a trauma center by either EMS in the field or physicians in nontrauma facilities. Outcomes persisted after controlling for potentially confounding variables and despite evidence-based guidelines for triage and transfer.

Abbreviations: ACC/AHA, American College of Cardiology/American Heart Association; ACE, angiotensin-converting enzyme; ACS, acute coronary syndrome; AMI, acute myocardial infarction; CABG, coronary artery bypass graft; CAD, coronary artery disease; CEA, carotid endarterectomy; CHD, congenital heart defect; CR, cardiac rehabilitation; CVD, cardiovascular disease; ECG, electrocardiogram; ED, emergency department; EMS, emergency medical service; GCS, Glasgow Coma Scale; ICD, implantable cardioverter defibrillator; ICP, intracranial pressure; ICU, intensive care unit; ISS, Injury Severity Score; LDL, low-density lipoprotein; MI, myocardial infarction; PA, pulmonary artery; PAD, peripheral arterial disease; PCI, percutaneous coronary intervention; PV, peripheral vascular; SCD, sudden cardiac death; STEMI, ST-segment elevation myocardial infarction; TIA, transient ischemic attack; TKA, total knee arthroplasty; TTM, targeted temperature management.

Strategies to Mitigate Gender Bias in Health Care

A number of approaches have been employed to help prevent or reduce implicit bias in health care. A frequent starting place is to help health care professionals gain some awareness of their own vulnerability to this form of prejudice. This step is often accomplished using the Implicit Association Test (IAT)—software that measures automatic associations evoked by rapid reactions in response to specific visually presented features representing various races, genders, ages, and sexual orientations. As different features are presented, the computer-based program tracks changes in response latency that reveal implicit bias. The IAT has been used in hundreds of studies across many disciplines and can be previewed at Harvard's Project Implicit website.[137]

Merely exposing health care workers to the IAT may not alter attitudes or beliefs, however, so multiple strategies are often used, including combinations of education about implicit bias, prejudice, and stereotyping; peer discussions and focus groups; self-reflection; reading about implicit bias; and practicing skills aimed at countering stereotypical responses. To date, none of these has produced any blockbuster success. According to Zestcott et al,[138] more research is needed to determine which of these interventions are effective, to understand how provider bias affects care, and how to motivate providers to control implicit bias.

One window into understanding these dynamics may have opened recently and surreptitiously, while shining a plausible and promising path to success.

An Unanticipated Breakthrough in Helping to Eliminate Gender Bias in Health Care

In 2005, after a random chart audit in a few high risk patient areas revealed that only 33% of vulnerable patients had received appropriate venous thromboembolism (VTE) prophylaxis, patient safety staff at Johns Hopkins Hospital launched a collaborative program to maximize adherence to VTE prophylaxis guidelines by means of a checklist.[139] Further examination of these findings revealed that whereas 31% of male trauma patients did not receive VTE prophylaxis, for female trauma patients, that failure rate was 45%, making women nearly 50% more vulnerable to thrombi/emboli.[140] Checklists were used as clinical decision support devices based on their effectiveness in improving compliance with other guidelines related to infection control[141] and reducing postoperative complications.[142] Among the lessons learned with this project was that while many interventions to foster staff buy-in for this effort may have contributed to substantial improvements in VTE prophylaxis compliance observed in successive project reports,[143-145] 2 other aspects were requisite for success: (1) The checklist order sets must be evidence based, user friendly, efficient, smoothly integrated into normal workflow, and enable real-time performance monitoring, and (2) physician participation in completing all checklist requirements needs to be mandatory to achieve consistent compliance.[139] In addition to the checklists, a "culture of safety" should include instruction in safety science, recognition of possible safety problems, design of evidence-based solutions, monitoring for improvements, and empowerment of all caregivers to halt procedures when safety appears to be compromised.[146]

Continued work with these computer-based mandatory checklists as clinical decision support tools has not only expanded their application as effective means for maximizing staff compliance with best practices, but has also afforded an apparent breakthrough into achieving desired clinical practice results while erasing disparities ascribed to race and gender bias. Lau et al[145] describe attainment of significantly improved VTE prophylaxis compliance for hospitalized medical and trauma patients with concurrent elimination of preexisting racial and gender disparities. For medical patients, compliance with prescribed risk-appropriate VTE prophylaxis improved from 70% for black patients and 62%, for white patients ($P = .015$) before protocol implementation to 92% for black patients and 88% for white patients with no differences in compliance between the races ($P = .082$). Similarly, for trauma patients, the proportion of males prescribed VTE prophylaxis before the protocol was significantly higher than for female trauma patients (70% vs 55%, $P = .045$), whereas after protocol implementation, compliance increased for both male (86%) and female (81%) trauma patients ($P = .078$).[145] Although other reports have highlighted the strong association between strict adherence to established guidelines and improved patient outcomes,[147-149] Lau et al rightly underscore their unique findings of mutual and simultaneous benefits in both optimal and equitable patient care: "These findings highlight the potential of health information technology approaches to improve the quality of care for all patients and eradicate healthcare disparities."[145(p6)]

How Critical Care Nurses Can Contribute to Eliminating Gender Bias

Some of the cumulative lessons that critical care nurses can take away from these studies:

- Evidence of gender bias against women in delivery of health care services is pervasive and persistent.
- Acknowledging the existence of gender bias against women is a necessary first step in eliminating it.
- Gaining insight into one's own biases via the IAT can be a valuable personal enlightenment.
- Critical care staff who would like to eliminate gender bias at their facility can learn from the experiences of multidisciplinary teams at Johns Hopkins Hospital as they refined their checklists[141,150] designed the culture of safety,[146] and implemented the VTE prevention program.[139,143]
- Monitoring for gender bias includes observing for errors, omissions, or deviations from established protocols, standing orders, and national guidelines in our own setting as well as upon receipt of patients from emergency medical services or other facilities.
- Just as with security concerns, the culture of safety demands that when you *see something* in a health professional's practice that deviates from expectations, you *say something* so the practice is not permitted to continue or repeat.

If gender bias against women can be reduced by ensuring that all health care providers follow established protocols for practice in their clinical area, then we may not have a panacea but surely a promising means to eradicate a significant proportion of the gender bias that surrounds us. Critical care nurses can make their contributions via their insights and participation as integral members of the collaborative teams tasked with eliminating gender bias while maximizing compliance with best practices. *Critical Care Nurse* looks forward to hearing about your progress against gender bias, so please keep us informed. CCN

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