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## **Is There Gender Bias in Critical Care?**

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## IS THERE GENDER BIAS IN CRITICAL CARE?

When patients enter the health care system, particularly when they are experiencing a life-threatening health problem, we implicitly assume that the care they receive is dictated by sound clinical judgment and objective, evidence-based practice parameters derived from reliable research. Nowhere in that scenario do we anticipate that clinical decision making will be influenced by patient attributes such as religion, nationality, or socioeconomic class or any other feature not relevant to their specific clinical situation. Especially in the United States, where citizens often express pride in our democratic form of government and equal opportunity for all, we may tend to take for granted that our health care system offers equal quality care to all. But what if it doesn't? What if some aspects of health care services are tilted to favor one segment of the population while disfavoring another? What if that tilt left virtually half of the adult population—adult women—in the disfavored category? And what if evidence of the disfavoring of women in health care services was found not only within the United States, but internationally as well? Understanding this issue requires clarification of a few related terms.

### Definitions

*Gender bias* is defined as “prejudice in action or treatment against a person on the basis of their sex”<sup>1</sup> and as “discrimination on the basis of gender.”<sup>2</sup> The US federal government’s Equal Employment Opportunity Commission defines *sex-based discrimination* as treating someone less favorably or unfavorably because of that person’s

gender.<sup>3</sup> In a legal context, *gender discrimination* may also be defined as unequal treatment of persons for reasons that have nothing to do with their legal rights or ability.<sup>4</sup>

In health care, the literature related to gender bias primarily refers to instances in which female patients are assessed, diagnosed, referred, and treated not only differently but at a lower level of quality or to a lesser degree of adherence to established standards of care than men with comparable health problems. This inequality can lead to comparatively worse outcomes for women, marked by higher complication rates, higher morbidity, and higher mortality. Gender bias can arise from either assuming sameness and/or equity between the genders where genuine differences in anatomic physiology, pathophysiology, course, or response to treatment actually exist or from assuming differences exist when they do not.<sup>5</sup> Either instance may evoke erroneous, stereotypical views about men or women that may influence how health care professionals practice and provide care. An example is minimizing a woman’s complaints of symptoms such as pain, attributing them to emotional rather than physical causes.<sup>6</sup>

To be clear, we are not equating the problematic issue of gender *bias* with the entirely legitimate issue of gender *disparity*, wherein innate differences between the sexes in anatomic and physiologic attributes result in unique exposures, risks, or benefits specific to each gender and where recognition of these differences is necessary to effect appropriate treatment adaptations and outcomes for each gender. For example, several clinically significant differences exist between men and women related to prevalence,

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clinical presentation, therapeutic management, and outcomes of cardiovascular disease.<sup>7</sup> There are also disparities between genders in aspects of health care that to date have not been ascribed to any particular cause or reason. An example is that women with numerous cardiovascular risk factors including diabetes are less likely to be taking lipid-lowering agents than men.<sup>8</sup> Differences between the genders are quite common and merit recognition, but when differences in care are due to bias, a more overriding concern demands our attention owing to the potential for harm.

Not everyone subscribes to the notion that gender bias exists in health care.<sup>9</sup> One physician said that although “it is commonly believed that American health-care delivery and research benefit men at the expense of women, the truth appears to be exactly the opposite”<sup>10(p66)</sup> and closed his argument by citing the longer life expectancy of women as evidence that “women receive more medical care and benefit more from medical research. The net result is the most important gap of all: seven years, 10 percent of life.”<sup>10(p70)</sup>

Its opponents notwithstanding, a number of recent reviews continue to affirm research evidence of gender bias in health care both within the United States<sup>5,11-14</sup> and abroad,<sup>15-17</sup> which cuts across a wide spectrum of clinical practice areas ranging from management of cardiovascular risk factors, surgery, and orthopedics to behavioral health, as well as a broad swath of acute and critical care. This editorial will briefly overview that literature, cite findings targeted to critical care, and consider some implications of this information for our readers.

## Evidence of Gender Bias in Health Care

### *Peripheral Arterial Disease*

As in many cardiovascular disorders, aggressive risk-factor modification is essential in peripheral arterial disease (PAD) to minimize the risk of untoward events. Despite the American College of Cardiology/American Heart Association peripheral vascular disease guidelines<sup>18</sup> that specify use of aspirin, statins, and angiotensin-converting enzyme (ACE) inhibitors upon discharge for patients hospitalized for peripheral arterial surgery, those therapies are infrequently prescribed for both men and women<sup>19</sup> but especially for women, who are less likely to receive antiplatelet,  $\beta$ -blocker, or lipid-lowering therapies for either PAD or cardiovascular disease.<sup>20,21</sup> Similarly, although treatments for PAD are similar for both sexes, women are less often offered the option of surgical

revascularization. Reasons for this finding include women’s older age at disease onset, smaller vascular size, worse surgical outcomes, as well as psychosocial factors. However, a recent finding that women are offered surgery less often in every age group studied for carotid endarterectomy suggests that factors beyond age and surgical risk may influence whether physicians offer this surgical option to women.<sup>22</sup> The findings are more concerning, given that the female gender is itself a known and negative risk factor for vascular interventions in peripheral arterial disorders.<sup>23</sup>

### *Behavioral Health*

A study that aimed to detect gender-sensitive indicators of mental health in economically diverse locations used data from national databases in Peru, Columbia, and Canada in a multidisciplinary framework proposed by the World Health Organization. The indicators demonstrating the greatest inequities for women were depression, anxiety, suicide attempts, use of mental health services, and alcohol dependence, and female-to-male prevalence ratios for mental illness ranged from 0.1 to 2.3. The authors hope to reduce gender inequities in all 3 nations.<sup>15</sup>

### *Stroke*

Following upon studies in Europe and North America that found gender-related differences in the management of stroke and suggested that women with stroke were less likely than men to receive appropriate diagnostic imaging, antithrombotic therapy, or carotid revascularization, researchers in Glasgow sought to determine whether evidence of potential gender bias in stroke management existed there as well. Their sample of 3261 patients, 1706 female (52.3%), demonstrated that at patient discharge, although anticoagulant use was comparable, women with stroke were significantly less likely than men to be prescribed statins or ACE inhibitors and were significantly less likely to be discharged receiving combination antiplatelet therapy (aspirin and dipyridamole), concluding that evidence consistent with gender bias in stroke survivor prescriptions also existed in the United Kingdom.<sup>24</sup> A more recent study found no significant differences in stroke care or management in Canada.<sup>25</sup>

In the inpatient setting, women with stroke have longer waiting times after they arrive in the emergency department and receive less aggressive treatment and

therapeutic workup following their admission.<sup>24,26,27</sup> One recent study found that women had 11% longer door-to-doctor times and 15% longer door-to-image times as men.<sup>27</sup> These differences have potentially enormous consequences because the primary therapy for treating acute ischemic stroke, tissue plasminogen activator, has a very short therapeutic window, so even brief delays could make patients ineligible.

### *Osteoarthritis*

In an attempt to explain why total joint arthroplasty (TJA) is underused by more than 3 times as many women as men with qualifying knee osteoarthritis, researchers noted a published survey that reported that primary care physicians indicated that a patient's gender had no effect on their decision to refer a patient for TJA<sup>28</sup> and then designed a study using standardized patients, one man and one woman with moderate knee osteoarthritis and otherwise identical clinical backgrounds to visit 71 physicians (38 family care and 33 orthopedic surgeons) blinded to their comparability on all attributes except gender. Results showed that 42% of physicians recommended TJA to the male but not the female patient, whereas 8% of physicians recommended TJA for the female but not the male patient (odds ratio [OR] 4.2, 95% confidence interval [CI] 2.4-7.3,  $P < .001$ ; risk ratio [RR] 2.1, 95% CI 1.5-2.8,  $P < .001$ ).

In both cases, the physicians' professed attitudes related to the role of gender in these decisions were contradicted by their actual practice. Between the 2 categories of physicians, the odds of a family practice physician recommending total knee arthroplasty to a male patient was 2 times (95% CI 1.04-4.71,  $P = .04$ ) that for a female patient, while the odds of an orthopedic surgeon recommending total knee arthroplasty to a male patient was 22 times (95% CI 6.4-76.0,  $P < .001$ ) that for a female patient.<sup>29</sup> In addition, the gender of the physician had no relationship to his/her recommendation for TJAs. Researchers concluded that both male and female physicians were more likely to recommend TJA to a male patient, suggesting that gender bias may contribute to the sex-based disparity in the utilization rates of TJA.

## **Evidence of Gender Bias in Critical Care**

### *Coronary Artery Disease*

As Beery noted nearly 20 years ago,<sup>30</sup> aspects of gender bias have long been recognized in referrals of women

with coronary artery disease (CAD) for diagnostic and therapeutic procedures such as angioplasty,<sup>31</sup> coronary revascularization, implantable cardioverter defibrillators (ICDs), and heart transplants, at least partially explaining why women are older, sicker, and suffer from more comorbidities by the time they receive these therapies and why their outcomes are worse than men's. When the European Institute of Women's Health<sup>32</sup> issues a comparable summary regarding women with heart disease being older when first hospitalized, more prone to risk, receiving inferior treatments, and having more complications and worse outcomes than men in India, China, and western Asia, it is clear that the issue of women not receiving equitable medical services for heart disease has not progressed in 2 decades, but may be more widely recognized today.

Although some of the gender differences in the treatment of CAD may be due to women being older and having more comorbidities than men, an unequivocal gender bias was not clearly established in Israel until 2005, when Abufel et al<sup>33</sup> designed a 2-part study to compare physicians' attitudes with their clinical practice in preventive therapy for CAD. The "attitude study" surveyed the attitudes of 172 physicians toward treatment of 2 hypothetical patients (58-year-old male, postmenopausal female) with identical clinical and laboratory data and mild coronary atherosclerosis on angiography. In the "actual clinical practice study," they examined lipoprotein levels and prescriptions for lipid-lowering medications from the medical records of 344 patients with angiographic evidence of CAD. The "attitude study" revealed that despite the exact same clinical patient data except for gender in both hypothetical cases, physicians generally considered the male patient to be at higher risk and prescribed aspirin (91% for the male vs 77% for female,  $P < .01$ ) and lipid-lowering medications (67% for male vs 54% for female,  $P < .07$ ) more often for the male patient. In the "actual clinical practice study," chart reviews of CAD patients showed that for patients with low-density lipoprotein cholesterol values  $>110$  mg/dL, 77% of males were prescribed a lipid-lowering medication compared to only 47% of females ( $P < .001$ ). The researchers concluded that they found clear evidence of gender bias in both the attitude as well as in the actual clinical practice of secondary prevention therapies for patients with CAD.<sup>33</sup>

### *Acute Coronary Syndrome*

Gender bias has also been reported in the management of patients with acute coronary syndrome (ACS).

Bugiardini and colleagues<sup>34</sup> examined treatments administered for patients with coronary angiographic evidence of coronary artery lumen obstruction from ACS registries in Finland, Italy, the United Kingdom, and Argentina. Despite presenting with higher risk profiles and demonstrating higher in-hospital and 6-month mortality rates, women with ACS and obstructive CAD received less aggressive evidence-based drug therapies for secondary prevention than men, with women less likely to receive aspirin, statins, and  $\beta$ -blockers at discharge.

### *Acute Myocardial Infarction*

Following an acute myocardial infarction (MI), gender disparities for women include a significantly worse prognosis, higher reinfarction rate, heart failure, cardiogenic shock, and myocardial rupture, as well as higher in-hospital and later mortality rates.<sup>35</sup> Despite these ominous circumstances, women with acute MI less frequently undergo reperfusion and revascularization<sup>31</sup> and, when they do receive revascularization, their outcomes are significantly worse compared to men, an event not fully accounted for by the smaller size of their coronary vessels. As a result, although age and detrimental cardiovascular profiles in women with CAD may contribute to these findings, some studies conclude that the female gender itself constitutes an independent predictor of morbidity and mortality.<sup>31,36,37</sup>

Some aspects of patient management for acute MI vary with gender. Nguyen<sup>38</sup> found that although there was no evidence of gender bias in either the pharmacologic therapies (aspirin,  $\beta$ -blockers, ACE inhibitors, angiotensin-receptor blockers) administered or in the use of coronary revascularization once patients were diagnosed with acute MI, there was evidence of gender bias in the referral of patients for coronary angiography, where women were 46% less likely than men to undergo investigative coronary angiography and that for revascularization, women were more likely to receive percutaneous intervention (PCI), whereas men were more likely to have coronary artery bypass grafting.

Gender also appears to influence the insertion of implantable ICDs in patients with acute MI.<sup>39-42</sup> MacFadden's study<sup>43</sup> of ICD insertions in acute MI patients in Ontario between 1998 and 2007 distinguished between use of ICDs in primary prevention (for patients in heart failure) and in secondary prevention (after cardiac arrest) and found that men with acute MI were significantly more likely to receive an ICD than women for both

primary and secondary prevention and that neither age nor comorbidities accounted for these differences. Men were 3 times more likely than women to receive an ICD.

In a study of 1162 patients (552 women) with previous MI who experienced angina in the United Kingdom, researchers<sup>44</sup> found that all aspects of received care were higher for men than for women: risk factor recording was 8% higher, secondary prevention 9% higher, cardiac investigation 10% higher, and revascularization 13% higher in men, leading the authors to conclude that a gender-based hierarchy appears to operate in the clinical management of angina pectoris in primary care.

### *Chest Pain*

In Germany, a prospective study of 1212 consecutive chest pain patients from 74 primary care sites examined physicians' initial assessment and management over 6 months and found that they tended to assume that coronary heart disease is the cause of chest pain more often in male patients and referred more men for an exercise test (women 4.1%, men 7.3%,  $P=.02$ ) and to the hospital (women 2.9%, men 6.6%,  $P<.01$ ). These gender-related differences persisted after adjusting for age, coronary heart disease prevalence, and cardiac risk factors, but ceased after adjusting for the typical nature of chest pain, suggesting that gender discrepancies exist and influence management and that the atypical chest pain that some women experience may contribute to those differences.<sup>45</sup>

### *Organ Donation and Transplantation*

A recent editorial by Gordon<sup>46</sup> decried the gender inequities that persist throughout the field of organ donation and transplantation. In that same issue of *Transplantation*, Couchoud et al<sup>47</sup> studied 9497 men and 5386 women in France who started dialysis and found that women had both a lower probability of being registered on the waiting list (OR, 0.69; 95% CI, 0.62-0.78) and a longer duration between starting dialysis and being registered (OR, 0.89; 95% CI, 0.84-0.95) than men.

### *Trauma Patient Triage*

A recently published study provides evidence that gender bias also affects how seriously injured trauma patients are triaged. In a study designed to determine whether gender is a determinant of access to trauma center care, particularly in settings where trauma triage guidelines are in place to ensure that access is determined



by physiologic status and injury characteristics, Gomez et al<sup>48</sup> found that significantly fewer women who were severely injured (Injury Severity Score >15) were directed to a trauma center by either emergency medical service (EMS) personnel or by physicians working in nontrauma facilities compared to men with comparable injury severity. Of the total of 26 861 severely injured patients (35% women), a significantly smaller proportion of severely injured women were transferred to a trauma center compared to men (49% of women sent vs 62% of men;  $P < .0001$ ; OR, 0.88; 95% CI, 0.81-0.97), an association that persisted even after adjustments for age, comorbidities, mechanism of injury, Injury Severity Score, and body region of injury.

EMS staff were less likely to transport severely injured women than men from the field to a trauma center (33% of women vs 41% of men;  $P < .0001$ ; adjusted OR, 0.88; 95% CI, 0.81-0.97). Similarly, when severely injured patients were taken to nontrauma facilities, physicians there were less likely to transfer severely injured women to trauma centers compared with men (24% of females vs 36% of males; OR, 0.85; 95% CI, 0.73-0.99;  $P < .0001$ ). The researchers concluded that despite widely disseminated and evidence-based guidelines for field triage and interfacility transfer of severely injured patients, severely injured women are less likely than men to be directed to a trauma center by either EMS personnel or referring physicians.

### Reasons for Gender Disparities/Bias

A wide variety of reasons have been proposed to account for disparities in patient management that seem to suggest prejudice related to a patient's gender. Some of the possible reasons include the following:

- Underestimating or misunderstanding a woman's risk for health problems or complications<sup>8</sup>
- Differences in the way women experience (cardiac) symptoms<sup>30</sup>
- Differences in the way women perceive themselves and their illness<sup>30</sup>
- The most likely explanations are at the patient level, the physician level, or both. Patients may have misperceptions of indications, risks, or benefits of surgery. Women are less likely to discuss TJA with physicians. Gender bias may contribute, as physicians were less likely to recommend TJA and offered less shared decision making to women.<sup>49</sup>

- One factor may be the differences in style that women and men use to describe their symptoms or injuries to the physician. Women tend to describe what they experience as a more personal, narrative commentary compared to men, who typically describe symptoms in a more straightforward, factual manner with fewer comments.<sup>49</sup> Women's narrative presentation style reportedly contributed to physicians making more diagnostic errors in their evaluations of chest pain in women.<sup>50</sup>
- Unconscious prejudices among physicians—social stereotyping<sup>29</sup>
- Overt discrimination based on sex. Some physicians take women's symptoms less seriously, attribute symptoms to emotional rather than physical causes, and refer women less often than men for specialty care, even women with a relatively greater degree of disability.<sup>29</sup>
- Cultural biases, especially among older male physicians<sup>51</sup>
- Women thinking of stroke and heart disease as men's diseases<sup>51</sup>
- Perceived differences in injury severity or perceived benefits of trauma center care, or from subconscious gender bias<sup>48</sup>

No one knows for certain which factor or combination of factors lead to situations that appear to be gender bias. Different clinical scenarios may be influenced by different factors. In addition, no one in the health care community has suggested that any of this research evidence or apparent bias against women occurs on an intentional basis. As critical care nurses, however, it is important to keep in mind that gender bias need not be intentional to be detrimental; to the contrary, the more insidious its existence, the more readily gender bias can invade, fester, and infect patient care in subtle and undetected ways.

### What Critical Care Nurses Can Do

The numerous and at times glaring discrepancies between what men and women receive in health care services merit more than mere notice because diagnostic procedures that are not performed, drugs that are not prescribed, referrals that are not made, pain that is ascribed to emotional rather than pathologic causes, and trauma that is not appropriately triaged can cost women their lives. Even a brief review of the range of

possible origins of gender bias mentioned here could well extend so broadly that confirmation of the etiology of gender bias may not be feasible in the course of our lifetime. That said, critical care nurses can instigate an approach to this problem in at least 3 ways: recognition, identification, and mitigation.

Acknowledging that gender bias exists, that it may consciously or subconsciously influence not only physicians' decision making but our own, and monitoring for it in our everyday practice would represent a good starting point toward halting its influence. Some of the tools that can assist in ensuring equal opportunity for equitable patient care are the objective indices contained in various sets of evidence-based protocols and guidelines, and similar tools related to critical care patient management. Deviation from those tools needs to require full a priori justification to ensure each is applied as intended without variances from subjective elements such as gender bias.

When instances of gender bias are confirmed, these need to be identified and communicated to all stewards of patient care so that any necessary investigations can be completed and analyzed to reveal the causes that created the situation and to devise strategies to correct patient care decisions and mitigate recurrence. Those of us who work in academic settings can assist in this effort by reserving time in the curriculum to both inform nursing students at every level of the potential inequities in quality of care posed by gender bias in health care, to sensitize students to this problem and its outcomes, and to teach students how to recognize and minimize gender bias. Clinical nurse specialists, staff development educators, nurse managers, and all staff nurses can monitor their own and their unit's practice to protect women from gender bias. We can accommodate and try to understand differences in care that male and female patients may require, but when disparities in care are discriminatory and detrimental to women, we have a responsibility to make those situations visible so they can be eradicated. **CCN**



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