Errors Resulting From Standard Order Sets

To the Editor Dr Gupta and colleagues[1] identified 2 workflow errors that led to their patient mistakenly receiving a β-blocker while he had complete heart block, but they also missed at least 2 other opportunities. They concluded that poor physician judgment and poor handoffs between the interventional and inpatient cardiology teams were responsible. Their solution for these problems was to insert a hard stop in the order set to ensure that clinicians were aware of the patient's vital signs and an extra box to certify that they were not aware of any contraindications to therapy. This approach is both burdensome and inadequate. No one likes extra clicks, and the absence of any *current* contraindications does not ensure that none will be present in the future.

I propose that the authors consider introducing hold orders appropriate to the medications. If the order for the carvedilol had allowed nursing staff to hold the medication for a pulse below 55/min or for a rhythm other than sinus or atrial fibrillation, the mistaken medication administration might have been prevented.

The authors made no mention of call orders (ie, call the physician if ...), such as for bradycardia, heart block, or hypotension. The presence of these orders may have given the residents a moment to reconsider the admission orders.

It is possible that prior to electronic order sets, physicians were guiltier of sins of omission and now have more sins of commission. However, medical care is more than ever a team enterprise. Entrusting the care of patients to nursing staff and enabling them to exercise good nursing judgment given the opportunity by including hold and call orders, will enhance the care of patients.

I concur with the editorialists[2] who listed numerous questions that must be answered to have the best clinical decision support available. They also emphasized the importance of "maintaining rigorous evidence and usability standards" to have optimal clinical decision support. A research letter[3] in the same issue outlined pertinent usability concerns that may contribute to patient harm. In the case presented, the imperfect clinical decision support included elements of poor or absent alerting, inadequate workflow support, insufficient order placement guidance, and deficient medication administration guidance. All clinicians, informaticists, programmers, developers, and vendors must be vigilant in the complex environment of patient care.

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Conflict of Interest Disclosures: The author has completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

1. Gupta A, Das SR, Pandey A. β-Blockers in myocardial infarction: issues with standard admission order sets. *JAMA*. 2018;319(12):1269-1270. doi:10.1001/jama.2018.0845

2. Shah SD, Cifu AS. From guideline to order set to patient harm. *JAMA*. 2018;319(12):1207-1208. doi:10.1001/jama.2018.1666

3. Howe JL, Adams KT, Hettinger AZ, Ratwani RM. Electronic health record usability issues and potential contribution to patient harm. *JAMA*. 2018;319(12):1276-1278. doi:10.1001/jama.2018.1171

In Reply We agree with Dr Schreiber that poor physician judgment and a suboptimal handoff process were the proximal causes of an inappropriate β-blocker prescription to a patient in acute heart failure and that there are additional opportunities other than the ones discussed to improve patient safety. Schreiber's suggestion that we use hold orders and call orders is well taken. These types of orders are routinely used at our institution and, we suspect, at most others. They were not specifically mentioned in our initial report because of space limitations.

In this case, the hold/notify orders instruct nurses to "hold medications for systolic blood pressure less than 100 mm Hg, diastolic blood pressure less than 50 mm Hg, or heart rate less than 50 beats/minute, and to notify MD for the abnormal vital signs." Unfortunately, the patient we described did not meet any of these criteria for holding β-blockers prior to carvedilol administration, thus bypassing this safeguard. It is possible that higher thresholds would have caught this specific error. However, higher thresholds increase the risk of appropriate β-blocker therapy being withheld; for example, in acute coronary syndrome or aortic dissection. Any specific thresholds require balancing these risks, and we think there is no single right answer. We agree that other reasons to withhold β-blockers, including complete heart block and acute heart failure, existed in this case and should have led to the medication being withheld. We do not think that institution of this specific hard stop was a comprehensive solution and appreciate the opportunity to clarify. Our point was to recognize that seemingly small differences within order sets (eg, prechecking vs not prechecking a specific order) may affect delivered care and need to be carefully considered. We also wanted to make the point that quality metrics, and the order sets intended to facilitate compliance, are a better remedy for sins of omission, which historically were more common, but do less to address sins of commission, which we expect to be more prevalent going forward.

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Comparing Spending on Medical Care in the United States and Other Countries

To the Editor The study by Dr Papanicolas and colleagues[1] examined health care and social spending in the United States and other high-income countries in the Organisation for Economic Co-operation and Development (OECD). They concluded that US social spending and health care utilization were similar to these countries and that underinvestment in social spending did not appear to be a driver of increased US health care spending. One way this could be interpreted by policy makers is that health

care and social spending should not be adjusted. We believe this interpretation would be unfortunate for 3 reasons.

First, the study questions the effect of social spending on reducing health care spending, reinforcing the dominance of cost and remaining silent on health. Although total US social spending was not an outlier compared with the 10 OECD countries, it was still below the average (16.7% vs 19.4% of gross domestic product). However, the United States *was* an outlier on total health care spending (17.8% vs 11.5%), making it the only country with a ratio of social spending to health care spending below 1. What does it mean that the United States had both the lowest social spending to health care spending ratio and the highest rates of poverty, obesity, unmet need, and neonatal and infant mortality and the lowest life expectancy? It means that patients may access quality health care but go home to no food, no electricity, or unsafe housing, making that care less effective and contributing to poor health.[2]

Second, the authors noted that since the United States was not an outlier on utilization, it is unlikely that a lack of social spending results in higher health care spending. However, the link among social spending (and social determinants of health), utilization, and total cost of care is only now being studied systematically. Two new federal pilots (Accountable Health Communities[3] and Comprehensive Primary Care Plus[4]) that include social needs in payment and care delivery models will shed light on these issues. Likewise, commercial payers are now recognizing that investing in social programs may positively affect cost *and* health.[5] Country-level analyses of social spending are not granular enough to understand poverty's effect in the communities where physicians deliver care.

Third, the key question is not whether social spending should be increased or decreased. Rather, it is how should aggregate health care and social resources be deployed to improve health? By addressing health care spending without recognizing the effects of poverty and unmet need, the authors risk providing an important answer to the wrong question.

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1. Papanicolas I, Woskie LR, Jha AK. Health care spending in the United States and other high-income countries. *JAMA*. 2018;319(10):1024-1039. doi:10.1001/jama.2018.1150

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To the Editor Health care in the United States has an undeniable pricing problem, highlighted in the Special Communication by Dr Papanicolas and colleagues.[1] We disagree, however, with statements in the article about whether relatively higher US spending might partially be explained by low primary care to specialist mix.

The study relied on workforce estimates that are outliers relative to other US physician workforce analyses. The Kaiser Family Foundation web source referenced used data from the commercial company Redi Data to count 951 061 licensed physicians in the United States, 456 389 (43%) of them classified as primary care.[2] These numbers deviate substantially from other contemporary estimates. For example, the Association of American Medical Colleges (AAMC), using data from the American Medical Association Physician Masterfile, counted 782 200 physicians in direct patient care in 2016, with 221 2000 (28.3%) in primary care.[3] The Bureau of Labor Statistics counted 713 800 physicians in 2016, 195 220 (27.3%) in primary care.[4] Lack of published methods makes the Kaiser Family Foundation estimates difficult to reproduce, but their estimated 188 277 general internists exceed federal (Health Resources and Services Administration) estimates[5] of 65 600 general internists and 205 000 primary care physicians by enough to suggest inclusion of retirees, administrators, teachers, researchers, and residents, most of whom ultimately specialize.

Using more accurate counts suggests that the United States is actually an outlier in comparison with the peer nations studied, who more centrally coordinate workforce planning. We are concerned that the authors oversimplified the cost differences between countries and paid insufficient attention to other critical drivers, including workforce planning and distribution.

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In Reply Drs Goodman and Valenti raise the important issue that social spending likely affects health outcomes, and we agree. While the somewhat lower-than-average investment in social spending in the United States may not be driving higher health care spending, it is likely a driver of worse health outcomes.[1] As their letter notes, although many poor individuals in the United States may have access to excellent health care, they cannot easily access food or safe housing, factors that have a profound effect on health. Given that the United States has a much higher poverty rate than many of the other countries we studied, its lower-than-average social spending is particularly problematic for population health. Instead of justifying social spending as a way to reduce health care spending, social spending should be invested in for the most important reason of all: it likely improves health and well-being.

Dr Bazemore and colleagues raise important questions about our estimates of the proportion of physicians in the United States who are practicing primary care. They rightly note that our estimates rely on numbers taken from the Kaiser Family Foundation.[2] These estimates differ from other estimates such as those of the Bureau of Labor Statistics or the AAMC. Although each approach has its strengths and weaknesses, our primary motivation was to use an approach that mirrored closely how other countries count primary care physicians. Because the Bureau of Labor Statistics excludes all self-employed physicians or physicians who are owners or partners in unincorporated practices, it likely leaves out a substantial proportion of the US physician workforce.[3] Data from the other countries do not have such exclusions. The AAMC estimates that 34.8% of total active physicians were in primary care in 2015.[4] However, it appears that the AAMC categorizes physicians whose specialty is not listed (n=83 637) as "other specialties."[5] If we remove these unclassified physicians, the AAMC's estimate of primary care physicians is 38.5%. The AAMC recently began excluding hospitalists from its primary care categories, a reasonable decision.[5] However, we chose not to do the same for purposes of comparability between countries. If we had also excluded all hospitalists, our primary care proportion would have dropped to 39%, which is nearly identical to the AAMC estimates. Of course, we then would have had to identify numbers of physicians functioning as hospitalists in other countries and excluded them as well. Those numbers were not generally available.

There is no gold standard for measuring primary care, and each country does it a bit differently. Our approach was to create the most comparable set of numbers to understand how the United States compares with other countries. While the specific numbers for any one nation can be debated, if we were to take a different approach for the United States, we would have to apply the same filters and exclusions for all the other countries. Whatever approach one takes, using the lens of comparable numbers across nations, there is little evidence that the United States is an outlier in its mix of primary care and specialist physicians.

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CORRECTION

Data Misinterpretation: In the Editorial entitled "Digital Media and Symptoms of Attention-Deficit/Hyperactivity Disorders in Adolescents"[1] published in the July 17, 2018, issue of *JAMA*, data from the original article were misinterpreted. The last words in the last sentence of the third paragraph should have read, "this magnitude of increase is clinically significant on an individual and population scale." The last sentence in the seventh paragraph should have read, "Future studies should include effect modification analyses examining whether associations between media use and ADHD symptoms are stronger in adolescents with poorer emotion regulation." The Editorial was corrected online.

1. Radesky J. Digital media and symptoms of attention-deficit/hyperactivity disorder in adolescents. *JAMA*. 2018;320(3):237-239. doi:10.1001/jama.2018.8932

Error in 95% CI Limit: In the Research Letter entitled "Use of Death Counts From Vital Statistics to Calculate Excess Deaths in Puerto Rico Following Hurricane Maria,"[1] published online August 2, 2018, there was an error in an upper limit of a 95% CI reported in the Results section and Table. The number (95% CI) of excess deaths in September 2017 should have been: 459 (95% CI, 425-493). This article was corrected online.

1. Santos-Lozada AR, Howard JT. Use of death counts from vital statistics to calculate excess deaths in Puerto Rico following Hurricane Maria [published online August 2, 2018]. *JAMA*. doi:10.1001/jama.2018.10929