Feature Article

Choosing Wisely in Critical Care: Results of a National Survey From the Critical Care Societies Collaborative*

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Objectives: Over-utilization of tests, treatments, and procedures is common for hospitalized patients in ICU settings. American Board of Internal Medicine Foundation's *Choosing Wisely* campaign tasked professional societies to identify sources of overuse in specialty care practice. The purpose of this study was to assess how critical care clinicians were implementing the Critical Care Societies Collaborative *Choosing Wisely* recommendations in clinical practice.

Design: Descriptive survey methodology with use of Research Electronic Data Capture (https://projectredcap.org/) sent via email newsletter blast or to individual emails of the 150,000 total members of the organizations.

Setting: National survey.

Subjects: ICU physicians, nurses, advanced practice providers including nurse practitioners and physician assistants, and pharmacist members of four national critical care societies in the United States.

Interventions: None.

Measurements and Main Results: A six-question survey assessed what *Choosing Wisely* recommendations had been implemented in ICU settings and if the impact was assessed. A total of 2,520 responses were received from clinicians: nurses (61%; $n = 1538$), physicians (25.9%; $n = 647$), advanced practice providers (10.5%; $n = 263$), and pharmacists (2.1%; $n = 52$), reflecting a 1.6% response rate of the total membership of 150,000 clinicians. Overall, 1,273 respondents (50.6%) reported they were familiar with the *Choosing Wisely* campaign. Respondents reported that *Choosing Wisely* recommendations had been integrated in a number of ways including being implemented in clinical care ($n = 817$; 72.9%), through development of a specific clinical protocol or institutional guideline ($n = 736$; 65.7%), through development of electronic medical record orders ($n = 626$; 55.8%), or with integration of longitudinal tracking using an electronic dashboard ($n = 213$; 19.0%). Some respondents identified that a specific quality improvement initiative was developed related to the *Choosing Wisely* recommendations ($n = 468$; 41.7%), or that a research initiative had been conducted ($n = 156$; 13.9%).

Conclusions: The results provide information on the application of the *Choosing Wisely* recommendations to clinical practice from a small sample of critical care clinicians. However, as only half of the respondents report implementation, additional strategies are needed to promote the *Choosing Wisely* recommendations to make impactful change to improve care in ICU settings. (*Crit Care Med* 2019; 47:331–336)

Key Words: choosing wisely; high-value care; intensive care unit; tests and procedures

Over-utilization of tests, treatments, and procedures is an important example of low-value care that adds to the high cost of healthcare and provides little to no benefit for patients.

A recent systematic review on medical overuse highlighted that the body of empirical work continues to expand, showcasing that medical services continue to be provided for inappropriate or uncertain indications (1).

To combat this problem, the American Board of Internal Medicine (ABIM) Foundation developed the *Choosing Wisely*

***See also p. 469.**

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Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's website (http://journals.lww.com/ccmjournal).

The authors have disclosed that they do not have any potential conflicts of interest.

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DOI: 10.1097/CCM.0000000000003496

campaign, tasking professional societies to develop lists of the top five medical services that patients should question performing. The campaign (http://www.choosingwisely.org/about-us/) was launched by the ABIM Foundation in 2012, and identifies tests and procedures commonly used but whose necessity should be questioned. Tests and interventions should be supported by evidence, not duplicative of other tests or procedures already received, free from harm and truly necessary. More than 80 specialty organizations representing more than 1 million clinicians have published recommendations to improve decision-making and promote appropriate patient-centered care. Each society—or in some cases, multiple societies—has developed a list of five to 10 tests, treatments, or services which are commonly overused by clinicians in that specialty (2). In celebration of the 5-year anniversary of the campaign, the ABIM Foundation issued a special report that highlighted that 525 specialty society recommendations had been identified since the start of the campaign and that 1,330 journal articles referenced *Choosing Wisely* in 2016. In addition, 19 countries have created their own *Choosing Wisely* campaigns (3).

The Critical Care Societies Collaborative (CCSC), which comprises the four major U.S. professional and scientific societies dedicated to the care of critically ill patients, including the American Association of Critical-Care Nurses, the American College of Chest Physicians, the American Thoracic Society, and the Society of Critical Care Medicine, participated by creating a taskforce that addressed practices in critical care medicine (4).

The CCSC *Choosing Wisely* in Critical Care taskforce included 10 members representing all four societies and the disciplines of internal medicine, surgery, anesthesiology, emergency medicine, and critical care nursing. Taskforce members initially proposed 58 items for consideration, ranging broadly from diagnostic tests, therapeutics and procedures to ICU structure and end-of-life care. The taskforce evaluated each item on five criteria (strength of evidence, prevalence, cost, relevance, and innovation) and in several steps narrowed the list to nine items. The taskforce debated the conceptual merits of these items and pursued in-depth evidence reviews and consultations with external content experts, and independently scored each item using the five criteria as well as a rating for global "overall impact." The five items with the best mean overall scores were approved by the executive committees of the four CCSC professional societies after thorough vetting that included feedback from additional experts in the field.

The five CCSC *Choosing Wisely* in Critical Care recommendations were formulated as outlined in **Figure 1.** Detailed discussion as to the rationale, evidence, and implications for each recommendation was provided in the published article (4) and the recommendations along with brief summaries were published on the CCSC *Choosing Wisely* website (http://www.choosingwisely.org/societies/critical-care-societies-collaborative-critical-care/). Of note, among the *Choosing Wisely* recommendations published through 2014, the CCSC recommendations were unique by having the largest number of collaborating professional societies and the first to include a nursing professional society. In 2016 and again in 2017, the original authors were surveyed as to their confidence that each of the five original recommendations remained valid despite publication of new research findings since 2014. All authors completed both surveys and responded that they agreed or strongly agreed that each of the five recommendations remain valid. Despite widespread agreement that the concept of the *Choosing Wisely* campaign is sound, concerns have been raised about the limited awareness of *Choosing Wisely* recommendations among clinicians and their actual impact on clinical practice through implementation (5). These questions were echoed in discussion by executive leadership members of each CCSC organization, identifying the need for outcome data.

In 2016, at the annual meeting of the CCSC, consensus was achieved to launch a survey of CCSC members in order to assess the knowledge and use of the five CCSC *Choosing Wisely* recommendations, to determine continued relevancy of the evidence base for the recommendations, and to guide the further work of the CCSC.

METHODS

In order to track the use and implementation of the CCSC *Choosing Wisely* recommendations, a descriptive survey was sent via a newsletter e-blast or to individual emails of the 150,000 total members of the CCSC organizations using an anonymous survey link. Research Electronic Data Capture (project-redcap.org) was used to collect the data. The survey received exempt status review at Rush University Medical Center's Institutional Review Board.

The survey consisted of six questions assessing if the respondent was familiar with the *Choosing Wisely* initiative and if so, which of the five domains of the CCSC recommendations had been addressed. The type of implementation was assessed including integration into clinical care, implementation of a specific quality improvement or research initiative, the overall focus of the initiative, and whether a publication or presentation had resulted from the institutional project.

RESULTS

The survey was open for a 7-month period from November 2016 through June 2017. A total of 2,520 responses were received (1.6% response rate of the total membership of 150,000 clinicians). Physicians represented 25.9% of the respondents (n = 647), nurses represented 61.6% of respondents (n = 1538), advanced practice providers, including nurse practitioners and physician assistants represented 10.5% of respondents (n = 263), and pharmacists represented 2.1% of respondents (n = 52) Twenty-one respondents selected the "other" option and reported being a nurse educator, clinical nurse leader, nursing administrators, or advanced practice registered nurse student, among others (**Fig. 2**).

Overall a total of 1,273 respondents (50.6%) reported they were familiar with the *Choosing Wisely* campaign while 1,244

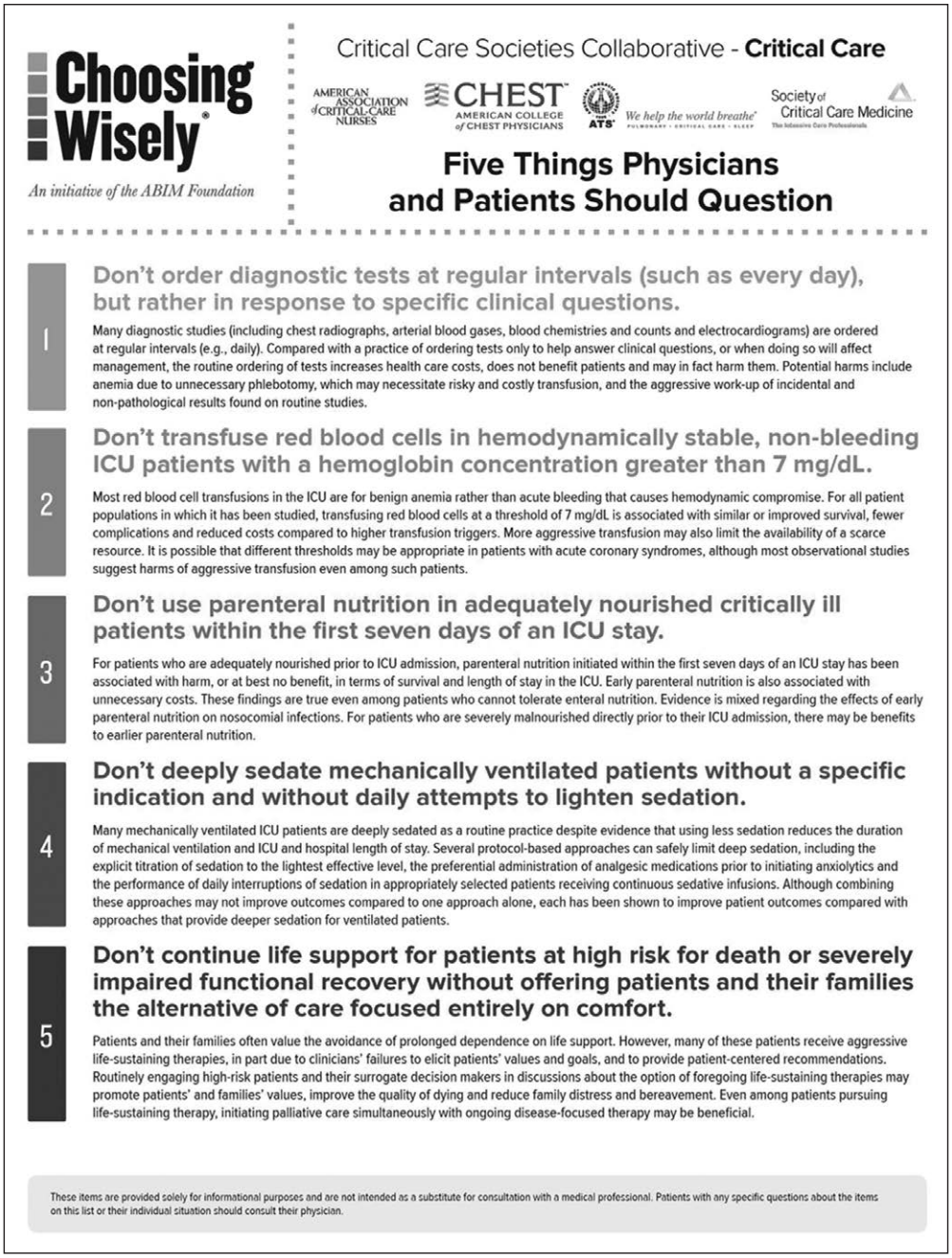

Figure 1. The Critical Care Societies Collaborative *Choosing Wisely* recommendations for critical care (http://www.choosingwisely.org/societies/critical-care-societies-collaborative-critical-care/). ABIM = American Board of Internal Medicine, ATS = American Thoracic Society, CHEST = American College of Chest Physicians.

(49.4%) reported they were not familiar with the campaign (**Fig. 3**). Physicians made up one-quarter of respondents (647), and 520 were aware (87%), whereas nurses made up 61% of respondents (1,538); only 551 were aware (38%). Respondents familiar with the *Choosing Wisely* recommendations reported varying degrees of implementation of the five CCSC recommendations at their organization (**Fig. 4**). Interventions designed to reduce RBC transfusions were reported by 1075 respondents (87.1%), followed by reporting that their practice site did not use parenteral nutrition in adequately nourished patients in the first 7 days of an ICU stay. A total of 994 respondents (80.6%) identified not using deep sedation in mechanically ventilated patients, whereas 901 respondents (73.0%) reported that offering comfort care for patients at high risk for death was provided, and 670 (54.3%) reported reduction of diagnostic tests at regular intervals.

Respondents reported that *Choosing Wisely* recommendations had been integrated in a number of ways including being implemented in clinical care (n = 817; 72.9%), through development of a specific clinical protocol or institutional guideline (n = 736; 65.7%), through development of specific electronic medical record (EMR) orders (n = 626; 55.8%), or with integration of longitudinal tracking using an electronic dashboard (n = 213; 19.0%). Some respondents identified that a specific quality improvement initiative was developed related to the *Choosing Wisely* recommendations (n = 468; 41.7%), or that a research initiative had been conducted (n = 156; 13.9%) (**Supplemental Fig. 1**, Supplemental Digital Content 1, http://links.lww.com/CCM/E138; legend: ways in which the *Choosing Wisely* recommendations have been implemented).

Over 300 open-ended comments revealed a number of ways that the *Choosing Wisely* recommendations have been integrated (**Table 1**). Review of these responses were grouped into broad categories including changes made to order sets, development of specific policies or guidelines, orientation information to new employees; changes in recommendations for transfusions; use of less volume blood draw tubes; use of palliative care triggers; evaluation of nutrition in the ICU; decreasing sedation and reducing delirium initiatives; tracking of utilization by practitioner; EMR order set changes; EMR reminders for transfusion restrictions; development of standard operating procedures concerning transfusions, laboratory orders, sedation, palliative care and nutrition; use of an ICU checklist to reinforce reducing unnecessary

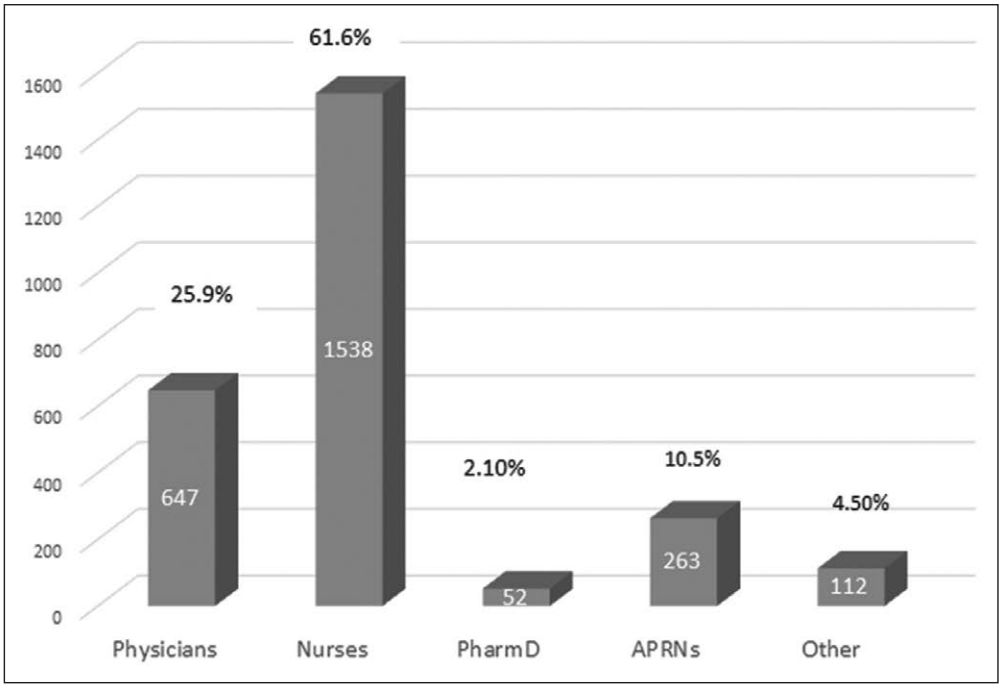

Figure 2. Survey respondents. APRN = advanced practice registered nurse.

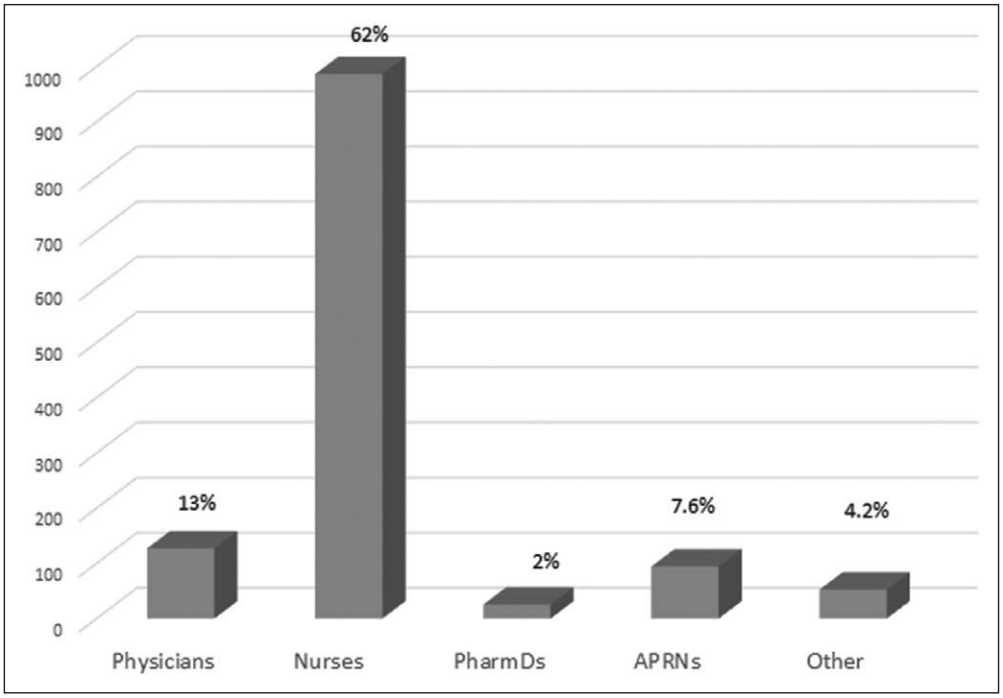

Figure 3. Respondents not familiar with *Choosing Wisely*. APRN = advanced practice registered nurse.

diagnostic testing; educational campaigns initiated, among other initiatives.

One respondent reported "We have a protocol for sedation and spontaneous awakening and spontaneous breathing trials and liberation from mechanical ventilation. We have a protocol and checklist for ordering blood products, and we are working on reducing diagnostic tests. We also created a palliative care team to offer/discuss comfort care." Another shared "We have a robust interdisciplinary Quality Improvement committee that has led efforts for each of the critical care *Choosing Wisely* recommendations. We have done the most work around sedation to integrate into daily work, and we have reports for monitoring our processes and outcomes." Another respondent identified "We have built into the orders the guideline for transfusion only if hemoglobin is less than 7 g/dL. This can be overridden by provider judgment. When this occurs, a chart review is completed, and the appropriateness of ordering is validated. If not, the ordering practice is discussed with provider."

Another respondent highlighted "We have a blood transfusion protocol and if blood transfusions are ordered for patients with a hemoglobin greater than 7 it has to be signed off on by an attending physician. The pharmacists rounds with the critical care team and evaluates orders for total parenteral nutrition (TPN). There is also a protocol for nutrition and TPN is restricted for the first 7 days in the ICU. We have chest radiograph and urinalysis-ordering criteria based on evidence-based practices, and we are tracking and providing feedback on how we are doing to the clinical staff. We have reduced the average monthly urinalysis tests from over 1,500 down to 90. We presented the results of the project at with a poster presentation at a research day within our facility."

Dissemination of the project results were reported and included posters at a variety of national meetings including the American College of Chest Physicians, American Association of Critical Care Nurses National Teaching Institute, American Thoracic Society, Society of Critical Care Medicine, American Society of Hospital Pharmacy, American Nurses Association Conference, Institute for Healthcare

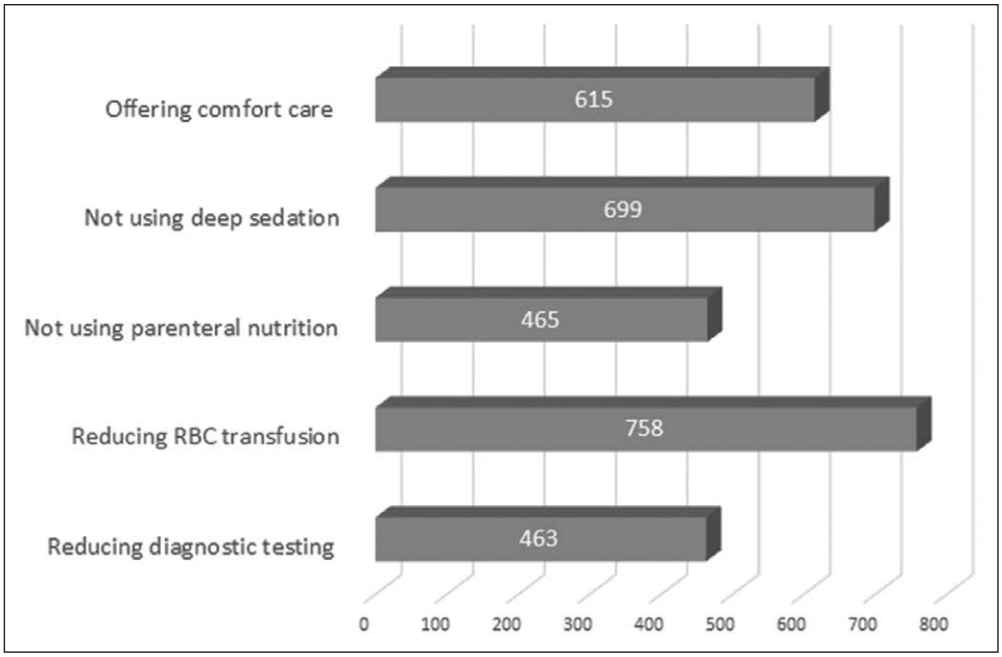

Figure 4. Reported implementation of the five Critical Care Societies Collaborative *Choosing Wisely* recommendations.

Improvement, Society of Hospital Medicine Annual meeting, and publications in journals including *CHEST, Critical Care Medicine, AACN Advanced Critical Care, Annals of Thoracic Surgery, British Medical Journal of Quality & Safety, Dimensions of Critical Care Nursing, Heart & Lung, Journal of Critical Care, Journal of Family Medicine, Journal of Intensive Care Medicine, Journal of Pain and Symptom Management, Journal of Trauma & Acute Care Surgery, Mayo Clinic Reviews, Pediatrics, Pediatric Critical Care Medicine, Sedation & Analgesia, Southern Medical Journal, Transfusion*, as well as in internal organization newsletters and quality improvement reports, and reports at internal critical care department and division meetings.

TABLE 1. Ways *Choosing Wisely* Recommendations Have Been Implemented

Changes made to order sets
Development of specific policies or guidelines
Changes in recommendations for transfusions
Use of less volume blood draw tubes
Use of palliative care triggers
Evaluation of nutrition in the ICU
Decreasing sedation and reducing delirium initiatives
Tracking of utilization by practitioner
Electronic medical record order set changes
Electronic medical record reminders for transfusion restrictions
Development of standard operating procedures concerning transfusions, laboratory orders, sedation, palliative care, and nutrition
Use of ICU checklist to reinforce reducing unnecessary diagnostic testing
Educational campaigns
Orientation information to new employees

DISCUSSION

The results identify the application of the *Choosing Wisely* recommendations to clinical practice for critical care clinicians. Respondents identified a number of ways that the *Choosing Wisely* recommendations have been integrated and processes of care improved. Categories of improvement included:

1) Revision to order sets including in the EMR, EMR reminders for transfusion restrictions, use of checklists to reduce unnecessary diagnostic testing.
2) Development of specific policies or guidelines: blood transfusions, use of less volume blood draws, decreasing sedation, nutrition, palliative care triggers.
3) Team member education/orientation.

These results compare favorably to prior surveys conducted with clinicians with respect to awareness of *Choosing Wisely*. In a survey of Emergency Medicine department chairs and division chiefs in institutions with Emergency Medicine residency programs, 80% of respondents were aware of *Choosing Wisely* (6). However, a nationwide survey of 600 physicians conducted in 2014 and repeated in 2017 identified no significant changes in awareness of the *Choosing Wisely* campaign, with awareness only increasing from 21% to 25% (5). Like most protocols, guidelines and recommended improvement strategies, the *Choosing Wisely* campaign cannot eliminate the problems of inappropriate decisions and low clinician compliance with clinical care targets/goals. Additionally, although promoting appropriate testing that is beneficial in influencing clinical decision-making, additional efforts are needed to examine how clinical decisions are made, as limited documentation often exists on the specific and detailed reasons why decisions are made.

A significant limitation of the study was the low overall response rate (1.6% response rate of the total membership of 150,000 clinicians), and thus is it reasonable to question generalizability. However, it is important to consider that the primary intent of the survey was to characterize the various types of interventions clinicians are utilizing to address *Choosing Wisely* recommendations, rather than to accurately determine

the actual extent of penetration of these recommendations into clinical practice. The survey did yield new information about approaches to implementation, including important exemplars. When interpreting our results, it is worth recalling that the survey was distributed by the respective organizations either via an email newsletter blast or to the individual emails of the organization's membership. Additionally, the largest number of respondents were nurses, most likely reflecting the large membership of the American Association of Critical Care Nurses (about 115,000) compared with the other CCSC organizations (16,000–20,000).

However, although a larger percentage of nurse respondents reported not being aware of the *Choosing Wisely* recommendations in this survey, the original campaign was initially targeted to physician groups. There is growing awareness of the campaign among other healthcare providers including among nurses and advanced practice nurses (7).

Respondents in the current study also identified variability in the degree to which all clinicians adhere to the *Choosing Wisely* recommendations. Some respondents reported that only some or none of the recommendations have been implemented at their organization. This highlights the need for continued reinforcement of the benefit of the *Choosing Wisely* recommendations in promoting high-value care in critical care. Measures to promote clinician awareness could include sharing the results of institutional or health system initiatives aimed at implementing the *Choosing Wisely* recommendations, sharing "lessons learned" from teams that have successfully implemented a clinical initiative, and showcasing studies that demonstrate the cost implications of reducing unnecessary tests and procedures.

Notably, several respondents identified that a specific quality improvement or research initiative had been implemented related to the *Choosing Wisely* recommendations. One respondent identified that the institution reduced RBC usage by 20% and fresh frozen plasma by 80% through education, changing of order sets, policies, and feedback. Others reported that the results of initiatives had been reported internally at critical care department and division meetings, presented in poster presentations, published in organizational newsletters, or in peer-reviewed journals. This is encouraging and reflects the impact that focused efforts can have at improving care in the ICU as well as in promoting dissemination efforts.

IMPLICATIONS

Respondents familiar with the *Choosing Wisely* recommendations reported varying degrees to which the five recommendations had been implemented at their organization. Although the CCSC has promoted awareness of the critical care recommendations, ongoing dissemination is needed to ensure that all critical care clinicians are familiar with the specific recommendations for critical care. Sharing strategies for successful adoption could also be useful for clinicians. A number of examples of targeted measures for reducing unnecessary testing in the ICU have been published including unit based quality improvement projects, changing order sets, and integrating ordering guidelines into team rounds (8–11). In order to increase the benefits of the *Choosing Wisely* critical care list, efforts need to be deployed to encourage compliance (12). Continued education, sharing of strategies for implementation, and showcasing exemplars in critical care practice may have the greatest impact. In reflecting on the outcomes of the *Choosing Wisely* campaign, Kerr et al (13) outline a road map for increasing the impact of the campaign highlighting dissemination of successful approaches, measuring clinically meaningful outcomes, and continued testing of ways to raise awareness of both clinicians and patients. As collectively the CCSC represents over 150,000 critical care professionals, continuing to identify strategies for promoting the *Choosing Wisely* recommendations can result in impactful change to improve care in the ICU.

ACKNOWLEDGMENTS

This article reports on the work of a Critical Care Societies Collaborative (CCSC) workgroup. The CCSC comprises the four major U.S. professional and scientific societies dedicated to the care of critically ill patients, including the American Association of Critical-Care Nurses, the American College of Chest Physicians, the American Thoracic Society, and the Society of Critical Care Medicine.

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