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Choosing Wisely in Healthcare Epidemiology and Antimicrobial Stewardship

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Abstract

OBJECTIVE—To identify Choosing Wisely items for the American Board of Internal Medicine Foundation.

METHODS—The Society for Healthcare Epidemiology of America (SHEA) elicited potential items from a hospital epidemiology listserv, SHEA committee members, and a SHEA–Infectious Diseases Society of America compendium with SHEA Research Network members ranking items by Delphi method voting. The SHEA Guidelines Committee reviewed the top 10 items for appropriateness for Choosing Wisely. Five final recommendations were approved via individual member vote by committees and the SHEA Board.

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Disclaimer. The views expressed in this paper are those of the authors and may not reflect the views of the Centers for Disease Control and Prevention.

RESULTS—Ninety-six items were proposed by 87 listserv members and 99 SHEA committee members. Top 40 items were ranked by 24 committee members and 64 of 226 SHEA Research Network members. The 5 final recommendations follow: 1. Don't continue antibiotics beyond 72 hours in hospitalized patients unless patient has clear evidence of infection. 2. Avoid invasive devices (including central venous catheters, endotracheal tubes, and urinary catheters) and, if required, use no longer than necessary. They pose a major risk for infections. 3. Don't perform urinalysis, urine culture, blood culture, or *Clostridium difficile* testing unless patients have signs or symptoms of infection. Tests can be falsely positive leading to overdiagnosis and overtreatment. 4. Do not use antibiotics in patients with recent *C. difficile* without convincing evidence of need. Antibiotics pose a high risk of *C. difficile* recurrence. 5. Don't continue surgical prophylactic antibiotics after the patient has left the operating room. Five runner-up recommendations are included.

CONCLUSIONS—These 5 SHEA Choosing Wisely and 5 runner-up items limit medical overuse.

Overuse of medical services is common, occurring in an estimated 30% of provided services in the United States.¹ Medical overuse has been associated with significant negative impacts on patient safety and the quality of care received, and worse patient outcomes, including death.¹ As a result, there has been increasing attention directed toward understanding and reducing medical overuse in recent years.²⁻⁴

To address this issue, the American Board of Internal Medicine Foundation created the Choosing Wisely Campaign in 2012.⁵ This Campaign is intended to create dialogue on increasing the use of evidence-based medicine while decreasing use of unnecessary tests and treatments that can result in patient harm. The American Board of Internal Medicine Foundation invites specialty societies to generate lists of tests and or treatments that providers and patients should question. To date, 73 professional societies and 34 consumer group partners have participated, in addition to the US Department of Veterans Affairs launching a Choosing Wisely Hypoglycemic Safety Initiative and several states using Choosing Wisely items to measure patient care quality and overuse, to design interventions, and to monitor progress.⁵ Medical centers and health systems that have implemented Choosing Wisely-based interventions have decreased inappropriate blood transfusions by 20%-60%⁶ and inappropriate cardiac biomarker test orders by 66%⁷ as well as significantly decreased inappropriate outpatient medication use, Pap testing overuse, and telemetry overuse.⁶ There are 22 recommendations referencing “antibiotics” or “antimicrobials” and most of these recommendations are discipline specific.⁵ There was a need for recommendations addressing antimicrobial stewardship and healthcare epidemiology items relevant across multiple disciplines.

In 2015, the American Board of Internal Medicine Foundation invited the Society for Healthcare Epidemiology of America (SHEA) to identify 5 Choosing Wisely items within healthcare epidemiology. The mission of SHEA is to prevent and control healthcare-associated infections, improve the use of antibiotics in healthcare settings, and advance the field of healthcare epidemiology. SHEA represents physicians and healthcare professionals

around the world with expertise in healthcare epidemiology, infection prevention, and antimicrobial stewardship.

METHODS

In spring 2015, the American Board of Internal Medicine Foundation invited SHEA to identify 5 Choosing Wisely recommendations that related to tests, treatments, or other medical care that is overused or misused that should be targeted for wiser use. SHEA accepted the invitation to create the Choosing Wisely list and the SHEA Guidelines Committee utilized the Delphi method^{8–10} to identify the 5 final Choosing Wisely recommendations. The standard format for Choosing Wisely recommendations includes a 1- to 2-sentence evidence-based recommendation and a succinct 2- to 5-sentence explanation of the recommendation.¹¹ This is followed by provision of the key existing literature that formed the evidence base for the recommendation, usually listed as references.

A 9-member subgroup of the SHEA Guidelines Committee (including the authors D.J.M., K.J.P., C.C., A.S., N.O.F., K.B., S.C., S.L.) generated a preliminary list of potential recommendations through survey of a hospital epidemiology listserv (87 members), review of the SHEA–Infectious Diseases Society of America Compendium of Strategies to Prevent Healthcare-Associated Infections,¹² and survey of the SHEA Guidelines, Public Policy and Government Affairs, Antibiotic Stewardship, Education, and Publications committees. Collectively, these groups included 99 SHEA members although demographic characteristics and degree of overlap are not available. The SHEA Guidelines Committee subgroup members are hospital epidemiologists or infection preventionists with 5 to 40 years of experience in healthcare epidemiology. This combined approach of expert panel, survey of society members, and consensus-building for selecting Choosing Wisely recommendations is the standard approach for professional societies participating in the Choosing Wisely campaign.^{13–17}

The SHEA Guidelines Committee subgroup reviewed the list of potential recommendations and removed duplicate suggestions. The committee subgroup then anonymously scored each recommendation from 1 (least important/least appropriate for the Campaign) to 5 (most important/most appropriate for the Campaign). Recommendation importance and appropriateness for the campaign included both potential impact if the recommendation was implemented and the strength of the current evidence base for the item, overlap, format compatibility, and novelty. To limit time burden required for survey completion, a predetermined cut-off of 15 recommendations achieving the highest total scores by the committee subgroup were then sent to the SHEA Research Network, a consortium of more than 200 hospitals collaborating on multicenter research projects in healthcare epidemiology,^{18,19} for similar scoring via a web-based survey. Using Real Magnet Surveys (Real Magnet), an invitation to complete the survey was emailed to all SHEA Research Network members on June 25, 2015, which included hospital epidemiologists, infection preventionists, infectious disease physicians, and hospital quality and leadership personnel. A reminder email was sent July 1, 2015. In addition to the 15 highest-scoring items, the survey included an open-response comment section where additional items could be mentioned by respondents. Again by cut-off predetermined by the SHEA Guidelines Committee subgroup,

the 10 recommendations that received the highest average ratings from SHEA Research Network voting were reviewed by the SHEA Guidelines Committee for overlap and format compatibility with the Choosing Wisely guidelines, as well as novelty of recommendations from lists created by other societies. From these, consensus was achieved by email discussion between Guidelines Committee members on the 5 recommendations considered most evidence-based, relevant to the society's mission, most likely to impact patient care, and appropriate for the Choosing Wisely Campaign. Once the final 5 recommendations were determined, each member of the SHEA Guidelines Committee voted to formally approve the list as the SHEA Choosing Wisely recommendations, followed by individual member vote by the SHEA Board of Trustees.

RESULTS

Surveys of the SHEA leadership, committees, and a Guidelines Committee subgroup review of the SHEA Compendia and healthcare epidemiology listserv initially received 96 items, of which 40 unique items matched the Choosing Wisely format, with some common themes (see Figure 1 for sequence of methods by which items were chosen). The most frequent recommendations centered on not performing diagnostic tests for urinary tract infection, bloodstream infection, or *Clostridium difficile* infection without appropriate clinical syndromes, and not using antibiotics to treat clinical syndromes resulting from likely viral infection. The top 15 ranked suggestions were sent to the SHEA Research Network. Sixty-four (28.3%) of 226 SHEA Research Network members ranked the potential recommendations. Forty-four respondents (68.8%) were at US hospitals, 16 (25.0%) were international respondents, and the location of 4 respondents was unknown. Of the 64 institutions represented, 28 (43.8%) were tertiary care hospitals, and the median bed size of all institutions was 355 beds (interquartile range, 230-546 beds).

The 5 final recommendations, formally approved via individual member vote by the SHEA Guidelines Committee, followed by unanimous approval via the SHEA Board of Trustees, are listed below with an evidentiary statement, as well as in Table 1. An additional 5 runner-up recommendations are included in Table 1.

Recommendations

1. *Don't continue antibiotics beyond 72 hours in hospitalized patients unless patient has clear evidence of infection.* Antibiotics are often started when a patient is possibly infected. After 3 days, laboratory and radiology information is available and antibiotics should either be de-escalated to a narrow-spectrum antibiotic based on culture results or discontinued if evidence of infection is no longer present. Lessening antibiotic use decreases risk of infections with *Clostridium difficile* or antibiotic-resistant bacteria.²⁰⁻²²
2. *Avoid invasive devices (including central venous catheters, endotracheal tubes, and urinary catheters) and, if required, use no longer than necessary. They pose a major risk for infections.* Invasive devices are often necessary for patient support; however, they are the major risk for healthcare-associated infections. We are learning they can often be avoided and, if used, can be quickly removed with the

help of clinical reminders and protocols. They should never be used for convenience.^{23–25}

3. *Don't perform urinalysis, urine culture, blood culture, or C. difficile testing unless patients have signs or symptoms of infection. Tests can be falsely positive leading to overdiagnosis and overtreatment.* Although important for diagnosing disease when used in patients with appropriate signs or symptoms, these tests often are positive when an infection is not present. For example, in the absence of signs or symptoms, a positive blood culture may represent contamination, a positive urine culture could represent asymptomatic bacteriuria, and a positive test for *C. difficile* could reflect colonization. There are no perfect tests for these or most infections. If these tests are used in patients with low likelihood of infection, they will result in more false positives than true positive results, which will lead to treating patients without infection and exposing them to risks of antibiotics without benefits of treating an infection.^{24,26–28}
4. *Do not use antibiotics in patients with recent C. difficile without convincing evidence of need. Antibiotics pose a high risk of C. difficile recurrence.* *C. difficile* can be a life-threatening illness and is generally caused by antibiotics killing normal bacteria in the intestine. Patients recovering from *C. difficile* are 3 times as likely to have a recurrence if they receive an antibiotic in the following month.²⁹ However, unnecessary antibiotics are often used in this population—primarily for misdiagnosed urinary tract infection or pneumonia.^{27,29,30}
5. Don't continue surgical prophylactic antibiotics after the patient has left the operating room.

Prophylactic antibiotics during surgery can significantly decrease the risk of surgical site infections; however, they only have benefit if used immediately around the time of surgery. When antibiotics are used for longer than necessary, they increase the risk of infection with antibiotic-resistant bacteria and *C. difficile*.^{31,32}

DISCUSSION

A broad list of practices that providers and patients should question were identified by SHEA leadership. The top 5 items were then selected by Delphi panel voting of the SHEA Research Network with an additional 5 runner-up items. These practices were believed to be both common and harmful to patients.

Much of hospital epidemiology's scope of practice is not the individual patient but interventions focused on the healthcare worker or patient care environments to prevent infections or transmission of antibiotic-resistant bacteria. However, more patient-centered aspects of hospital epidemiology are the use of invasive devices as well as antimicrobial use. This perspective is likely why invasive devices and antimicrobial usage emerged so prominently in the Choosing Wisely panel voting.

Antimicrobial stewardship involves coordinated strategies to optimize antimicrobial use to improve patient outcomes, reduce antibiotic resistance, and decrease costs.³³ Antimicrobial

stewardship was an important focus of Choosing Wisely items, and consistent with SHEA's mission of preventing the emergence and spread of antibiotic-resistant bacteria in healthcare facilities. The recommendations of *don't continue antibiotics beyond 72 hours in hospitalized patients unless patient has clear evidence of infection; do not use antibiotics in patients with recent C. difficile without convincing evidence of need; and don't continue surgical prophylactic antibiotics after the patient has left the operating room* related to the judicious use of antibiotics. Additionally, several runner-up items of *don't use antibiotics for apparent viral respiratory illnesses; don't use prophylactic antibiotics for the placement or maintenance of tubes or drains; and don't treat Candida in the respiratory tract specimen* related to appropriate antibiotic use. Although these practices were chosen by members without expressly referring to the literature, strong evidence supported each recommendation (as outlined in the Results section). Appropriate use of antibiotics is a common theme of other Choosing Wisely practice recommendations, with more than 20 current Choosing Wisely items directed at improving antibiotic use.⁵

Appropriate testing and minimizing use of invasive devices were the other 2 Choosing Wisely themes that received the greatest support from SHEA Research Network voting. Appropriate testing—in this case, testing only in the presence of symptoms and signs of infection—is also aligned with other Choosing Wisely recommendations. Although the culturing of vascular catheter tips in the absence of suspected infection was not in the top 5, SHEA committees and SHEA Research Network members believed it is important to question this practice.

Finally, 2 items that scored well but did not fit the standard format for Choosing Wisely were (1) *don't come to work sick* and (2) *don't reuse syringes, needles, medication vials, or intravenous solutions*. The former recommendation was seen as important for preventing the spread of infections (eg, respiratory virus infection) in a healthcare facility from potentially mildly symptomatic healthcare personnel to vulnerable patients who are at high risk of complications. The frequency of sickness “presenteeism” is 70%-86% among physicians³⁴ and 49% among registered nurses³⁵ whereas 76.9% of physicians have continued to work despite having an infectious illness.³⁶ Unsafe injection practices—for example, use of the same needle, syringe, or medication vial for multiple patients—place both patients and healthcare workers at risk of transmission of bloodborne pathogens.³⁷

This process was limited by subjective identification of items by a group in leadership at SHEA, which may not represent the full potential list of practicing hospital epidemiologists. Furthermore, during the survey ranking, response rates were relatively low so it is possible that only those already highly interested in the highest ranked items were respondents. However, a strength of this group is that many members of SHEA leadership were part of the Centers for Disease Control and Prevention Healthcare Infection Control Practices Advisory Committee or the SHEA Guidelines Committee, and are aware of existing literature and standard methods for evaluating evidence.

The top 5 Choosing Wisely items will be incorporated into the campaign, with the list of 5 items being included on the Choosing Wisely website. Further dissemination will occur at the SHEA 2016 Spring Meeting as well as the IDWeek 2016 meeting. *Consumer Reports* is

translating recommendation No. 1 into a patient-oriented guide that will be available on their website to further provider-patient discussion. Five Choosing Wisely and 5 runner-up items were endorsed for general clinicians to improve patient care. It is hoped that through dissemination and understanding of these items, medical practice will be more efficient and safe.

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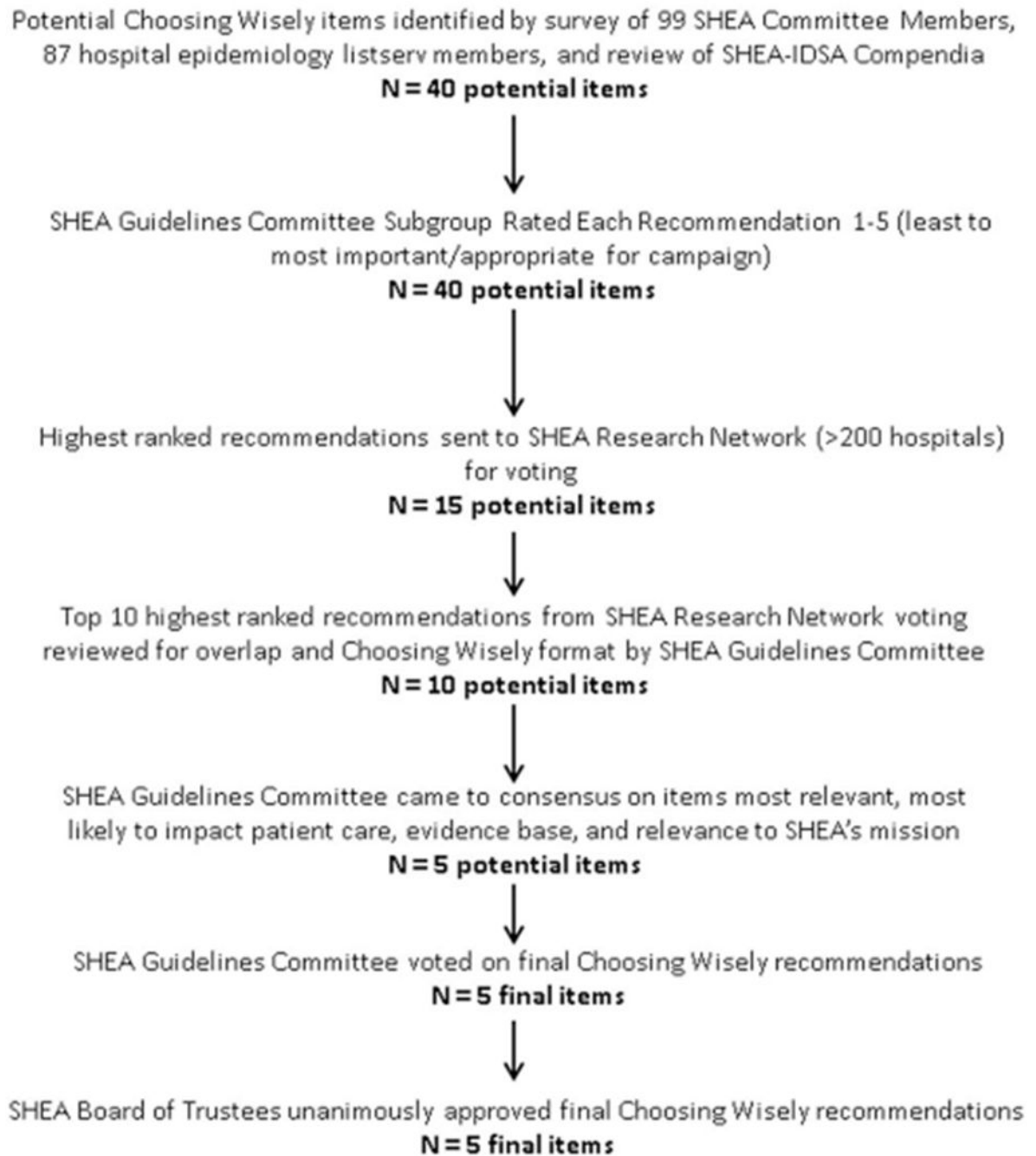


FIGURE 1.

Flowchart of Society for Healthcare Epidemiology of America (SHEA) Choosing Wisely recommendations selection process. IDSA, Infectious Diseases Society of America.

TABLE 1.
Society for Healthcare Epidemiology of America Choosing Wisely Recommendations

Final Choosing Wisely recommendations

1. Don't continue antibiotics beyond 72 hours in hospitalized patients unless patient has clear evidence of infection.
2. Avoid invasive devices (including central venous catheters, endotracheal tubes, and urinary catheters) and, if required, use no longer than necessary. They pose a major risk for infections.
3. Don't perform urinalysis, urine culture, blood culture, or *Clostridium difficile* testing unless patients have signs or symptoms of infection. Tests can be falsely positive leading to overdiagnosis and overtreatment.
4. Do not use antibiotics in patients with recent *C. difficile* without convincing evidence of need. Antibiotics pose a high risk of *C. difficile* recurrence.
5. Don't continue surgical prophylactic antibiotics after the patient has left the operating room.

Choosing Wisely runner-up items

1. Don't use antibiotics for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis, otitis media).
 2. Don't reuse syringes, needles, medication vials, or intravenous solutions.
 3. Don't come to work sick.
 4. Don't treat *Candida* in the respiratory tract specimen.
 5. Don't perform cultures of vascular catheter tips in the absence of suspected infection.
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