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HEALTH-CARE-ASSOCIATED INFECTIONS IN HOSPITALS

Continuing Leadership Needed from HHS to Prioritize Prevention Practices and Improve Data on These Infections

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Health Care

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Highlights

Highlights of GAO-09-516T, a testimony before the Subcommittee on Health Care, Committee on Finance, U.S. Senate

Why GAO Did This Study

According to the Centers for Disease Control and Prevention (CDC), health-care-associated infections (HAI)—infections that patients acquire while receiving treatment for other conditions—are estimated to be 1 of the top 10 causes of death in the nation. The statement GAO is issuing today summarizes a March 2008 report, *Health-Care-Associated Infections in Hospitals: Leadership Needed from HHS to Prioritize Prevention Practices and Improve Data on These Infections* (GAO-08-283). In this report, GAO examined (1) CDC's guidelines for hospitals to reduce or prevent HAIs and what HHS does to promote their implementation, (2) Centers for Medicare & Medicaid Services' (CMS) and hospital accrediting organizations' required standards for hospitals to reduce or prevent HAIs, and (3) HHS programs that collect data related to HAIs and integration of the data across HHS. To conduct the work, GAO reviewed documents and interviewed HHS and accrediting organization officials. To update certain information for this statement, GAO reviewed relevant HHS documents released after GAO's March 2008 report.

What GAO Recommends

In its report, GAO recommended that the Secretary of HHS identify priorities among the recommended practices in CDC's guidelines and establish greater consistency and compatibility of the data collected across HHS on HAIs. HHS generally agreed with GAO's recommendations.

View GAO-09-516T or key components.
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What GAO Found

In its March 2008 report, which is summarized in this statement, GAO found the following:

- CDC has 13 guidelines for hospitals on infection control and prevention, which contain almost 1,200 recommended practices, but activities across HHS to promote implementation of these practices are not guided by a prioritization of the practices. Although most of the practices have been sorted into categories primarily on the basis of the strength of the scientific evidence for the practice, other factors to consider in prioritizing, such as costs or organizational obstacles, have not been taken into account.

- While CDC's guidelines describe specific clinical practices recommended to reduce HAIs, the infection control standards that CMS and the accrediting organizations require describe the fundamental components of a hospital's infection control program. The standards are far fewer in number than CDC's recommended practices and generally do not require that hospitals implement all recommended practices in CDC's guidelines.

- Multiple HHS programs have databases that collect data on HAIs, but limitations in the scope of information collected and a lack of integration across the databases constrain the utility of the data.

GAO concluded that the lack of department-level prioritization of CDC's large number of recommended practices had hindered efforts to promote their implementation. GAO noted that a few of CDC's strongly recommended practices were required by CMS or the accrediting organizations but that it was not reasonable to expect CMS or the accrediting organizations to require additional practices without prioritization. GAO also concluded that HHS had not effectively used the HAI-related data it had collected through multiple databases across the department to provide a complete picture of the extent of the problem.

Subsequent to GAO's report, HHS established a steering committee, with senior-level representation of HHS offices and operating divisions, to develop the *HHS Action Plan to Prevent Healthcare-Associated Infections*. This plan includes strategies that are intended to address some of the reasons for the lack of effective actions to control HAIs, including some identification of priorities from among the 1,200 recommended practices, and plans to coordinate HAI-related data collection activities across HHS. HHS released the Action Plan for comment in early January 2009, with the intent of revising it based on the public input it received. Following the transition to the new presidential administration, HHS has continued to solicit public comments. Consequently, it remains uncertain when or if the new administration will choose to implement this plan, and if so, with what modifications, to address GAO's recommendations and reduce the serious problem of HAIs.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss our work on federal government efforts to address the problem of health-care-associated infections (HAI) in hospitals and to provide a summary of our March 2008 report entitled *Health-Care-Associated Infections in Hospitals: Leadership Needed from HHS to Prioritize Prevention Practices and Improve Data on These Infections*.[1] According to the Centers for Disease Control and Prevention (CDC), HAIs are infections that patients acquire while receiving treatment for other conditions[2] and are estimated to be 1 of the top 10 causes of death in the United States. HAIs can be acquired in several ways, such as from bacteria on a needle or tube used to deliver medicine, fluids, or blood to a patient. According to CDC, the most common HAIs are urinary tract infections, surgical site infections, pneumonia, and bloodstream infections. A reduction in the prevalence of HAIs through implementation of practices that are based on the best available scientific evidence would represent a substantial improvement in health care quality.

HAIs can be expensive. In 2005 the average payment for a hospitalization in Pennsylvania was over six times higher for patients who contracted a hospital-acquired infection than for patients who did not acquire infections.[3] A 2007 study of 1.69 million patients who were discharged from 77 hospitals found that the additional cost of treating a patient with an HAI averaged $8,832.[4] The costs of HAIs are borne not only by the patients who suffer infections, but also by those who pay for care, such as the Centers for Medicare & Medicaid Services (CMS). According to the

[1]GAO, *Health-Care-Associated Infections in Hospitals: Leadership Needed from HHS to Prioritize Prevention Practices and Improve Data on These Infections*, GAO-08-283 (Washington, D.C.: Mar. 31, 2008).

[2]In general, HAIs are distinct from community-acquired infections, that is, infections that patients may have acquired before entering the hospital.

[3]See Pennsylvania Health Care Cost Containment Council, *Hospital-Acquired Infections in Pennsylvania* (Harrisburg, Pa., November 2006).

[4]See D. Murphy et al., *Dispelling the Myths: The True Cost of Healthcare-Associated Infections* (Washington, D.C.: Association for Professionals in Infection Control and Epidemiology, February 2007).

American Hospital Association, Medicare paid for over one-third of all hospital costs in 2007.[5]

Although not all HAIs are preventable, the federal government and private organizations have established standards and other activities aimed at controlling and preventing them. CMS has established health and safety standards—known as conditions of participation (COP)—with which hospitals must comply in order to be eligible for payment by Medicare and Medicaid and which include the COP for infection control.[6] Hospitals may choose one of two ways to show that they have met these or equivalent standards: they may be certified by a state agency under agreement with CMS to survey the hospital's compliance with the COPs or they may be accredited by a CMS-approved private organization, including the Joint Commission or the Healthcare Facilities Accreditation Program of the American Osteopathic Association (AOA).[7] Most hospitals are accredited by the Joint Commission.[8] Other activities within the Department of Health and Human Services (HHS) aimed at addressing the problem of HAIs in hospitals include CDC's development of guidelines, which contain recommended practices that hospitals may adopt, and the management of several databases in different parts of HHS that contain information about HAIs in hospitals. According to the Institute of Medicine, prevention of HAIs through implementation of evidence-based guidelines can lead to improvements in quality of care.[9] Furthermore, the collection of national data on these infections can provide a benchmark for individual hospitals to gauge their performance and design targeted interventions. In addition to these activities, in January 2009 HHS released for public comment the

[5]Medicare is a federal health insurance program that serves over 42 million elderly and certain disabled beneficiaries and pays for health care needs, such as inpatient hospital stays and physician visits.

[6]See 42 C.F.R. § 482.1 (2007).

[7]Section 1865(b)(1) of the Social Security Act also provides that any other national accreditation body that meets certain requirements as determined by the Department of Health and Human Services may accredit hospitals. CMS approved Det Norske Veritas Healthcare as a hospital accrediting organization in September 2008.

[8]In fiscal year 2008, 81 percent of hospitals were accredited by the Joint Commission, state survey agencies certified approximately 16 percent of hospitals, less than 2 percent were accredited by AOA, and 1 percent of hospitals were accredited by both the Joint Commission and AOA.

[9]See K. Adams et al., *Priority Areas for National Action: Transforming Health Care Quality*, Institute of Medicine of the National Academies (Washington, D.C.: The National Academies Press, 2003).

Action Plan to Prevent Healthcare-Associated Infections.[10] This document is designed as a road map for how the department plans to address HAIs.

Federal and state lawmakers are also concerned about HAIs and have taken action to reduce them. With the passage of the Deficit Reduction Act of 2005 (DRA),[11] the Congress took steps to revise the way Medicare pays hospitals so that beginning on October 1, 2008, they would not receive higher payments for patients who acquire certain preventable conditions (including any of three HAIs) during their hospital stays.[12] The HAI-related preventable conditions that CMS identified under subsection 5001(c) of the DRA were urinary tract infections caused by catheters, infections caused by vascular catheters, and surgical site infections following selected types of surgery.[13] In addition, 23 states were designing or had implemented state-mandated public reporting of hospital HAI rates or HAI-related information as of February 2008.[14]

My statement today is based largely on our March 2008 report, and includes some updated information from the HHS Action Plan.[15] In the March 2008 report, we examined (1) CDC's guidelines for hospitals to

[10]See Department of Health and Human Services, *HHS Action Plan to Prevent Healthcare-Associated Infections*, http://www.hhs.gov/ophs/initiatives/hai/index.html (accessed Mar. 14, 2009*)*.

[11]Pub. L. No. 109-171, § 5001(c), 120 Stat. 4, 30.

[12]Under Medicare, hospitals generally receive fixed payments for inpatient stays based on diagnosis-related groups (DRG), a system that classifies stays by patient diagnoses and procedures. Some DRGs take account of certain comorbidities or complications associated with a diagnosis or procedure and pay at a higher rate than would otherwise be paid for the diagnosis or procedure. In a final regulation implementing section 5001(c) of the DRA, CMS identified certain preventable conditions that it would not consider as a comorbidity or complication that would lead to the higher payment. See 72 Fed. Reg. 47130, 47200-217 (Aug. 22, 2007). The DRA also requires hospitals to indicate the diagnoses that were present in patients at the time of admission in order for CMS to determine if a preventable condition developed during a patient's hospital stay.

[13]The selected surgeries are certain orthopedic procedures, bariatric surgery for obesity, and coronary artery bypass graft. Additional preventable conditions that will no longer result in higher payments to hospitals include hospital-acquired injuries, such as fractures, pressure ulcers, objects left in the body during surgery, air embolisms, and blood incompatibility. See 73 Fed. Reg. 48434, 48477-79; 72 Fed. Reg. at 47200-217.

[14]See GAO, *Health-Care-Associated Infections in Hospitals: An Overview of State Reporting Programs and Individual Hospital Initiatives to Reduce Certain Infections*, GAO-08-808 (Washington, D.C.: Sept. 5, 2008).

[15]GAO-08-283.

reduce or prevent HAIs, and what HHS does to promote their implementation; (2) CMS's and the accrediting organizations' required standards for hospitals to reduce or prevent HAIs, and how compliance is assessed; and (3) HHS programs that collect data related to HAIs in hospitals, and the extent to which the data are integrated across HHS.

In carrying out this work for our March 2008 report, we interviewed officials from CDC, CMS, the Agency for Healthcare Research and Quality (AHRQ), the Food and Drug Administration, the Joint Commission, and AOA. We also interviewed selected experts in the field of infection control. In addition, we reviewed and analyzed CDC's infection control and prevention guidelines issued from 1981 through 2007; minutes of HHS's Healthcare Infection Control Practices Advisory Committee (HICPAC); the World Health Organization's guideline on hand hygiene;[16] CMS's COPs for hospitals and interpretive guidelines,[17] which describe the COPs and provide survey procedures used to determine compliance with them; the Joint Commission's 2008 standards for hospitals and its hospital standards manual; and AOA's 2005 standards for hospitals and its hospital standards manual. We refer to the guidance that CMS provides about its COPs in the interpretive guidelines, and that the Joint Commission and AOA provide about their standards in their respective manuals, as "standards interpretations."[18] We also reviewed manuals and other documents that explain the HHS programs that collect HAI-related data, and related publications and data analyses conducted by the agencies based on the data collected. We conducted the performance audit for the March 2008

[16]See World Health Organization, *WHO Guidelines on Hand Hygiene in Healthcare (Advanced Draft)*: *Global Patient Safety Challenge 2005-2006: Clean Care Is Safer Care* (Geneva, Switzerland, 2006).

[17]In addition to reviewing CMS's interpretive guidelines that can be found in CMS's *State Operations Manual*, we reviewed CMS's revised interpretive guidelines for the infection control COP, which were published in November 2007. Throughout this report, where we refer to the interpretive guidelines for infection control we are referring to the November 2007 revision.

[18]Standards interpretations are given by CMS primarily in its *State Operations Manual*, which is arranged by COP (Appendix A of the State Operations Manual contains the COPs for hospitals); by the Joint Commission in its *Comprehensive Accreditation Manual for Hospitals: The Official Handbook*, which identifies rationales and performance expectations that are used to measure each standard and is organized into 11 chapters of safety and quality standards, such as "Medication Management" and "Leadership"; and by AOA's standards manual, *Accreditation Requirements for Healthcare Facilities*, which provides explanations for surveyors and the scoring procedures along with its standards and is organized into 32 chapters.

report from January 2007 to March 2008, and updated certain information from the report for this testimony in March 2009 by reviewing the HHS Action Plan and other relevant HHS documents, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. A detailed explanation of our methodology is included in our March 2008 report.

In brief, we found that federal authorities and private organizations had undertaken a number of activities to address the problem of HAIs. We reported that CDC had 13 guidelines for hospitals on infection control and prevention, which contained almost 1,200 recommended practices. However, activities across HHS to promote implementation of these practices were not guided by a prioritization of the practices. Although most of the practices have been sorted into categories primarily on the basis of the strength of the scientific evidence for the practice, there were other factors to consider in prioritizing, such as costs or organizational obstacles. We concluded that a lack of department-level prioritization of CDC's large number of recommended practices had hindered efforts to promote their implementation. While CDC's guidelines describe specific clinical practices recommended to reduce HAIs, the infection control standards that CMS and the accrediting organizations require of hospitals describe the fundamental components of a hospital's infection control program. We found that the standards were far fewer in number than CDC's recommended practices and generally did not require that hospitals implement all recommended practices in CDC's guidelines. We noted that a few of CDC's strongly recommended practices were required by CMS or the accrediting organizations but that it was not reasonable to expect CMS or the accrediting organizations to require additional practices without prioritization. Other HAI-related federal efforts included multiple HHS programs that collect data on HAIs, but we found that limitations in the scope of information collected and a lack of integration across the programs' databases constrained the utility of the data. We concluded that HHS had not effectively used the HAI-related data it had collected through multiple databases across the department to provide a complete picture of the extent of the problem and make progress in reducing HAIs.

In order to help reduce HAIs in hospitals, we recommended that the Secretary of HHS take the following two actions: (1) identify priorities among CDC's recommended practices and determine how to promote implementation of the prioritized practices, including whether to incorporate selected practices into CMS's conditions of participation (COP) for hospitals, and (2) establish greater consistency and compatibility of the data collected across HHS on HAIs to increase information available about HAIs, including reliable national estimates of the major types of HAIs. In commenting on a draft of our report, HHS generally agreed with our recommendations. HHS's Action Plan includes a number of strategies, some of which are intended to address our recommendations. HHS released the Action Plan for comment in early January 2009, with the intent of revising it based on the public input it received. Following the transition to the new presidential administration, HHS has continued to solicit public comments on the plan with no designated deadline for submissions. Consequently, it remains uncertain when or if the new administration will choose to implement this plan, and if so, with what modifications.

CDC Had 13 Infection Control and Prevention Guidelines Containing Almost 1,200 Recommended Practices, and HHS's Action Plan Includes Some Prioritized Practices to Promote Implementation

In March 2008, we reported that CDC had 13 guidelines for hospitals on infection control and prevention, and in these guidelines CDC recommended almost 1,200 practices for implementation to prevent HAIs and related adverse events.[19] (See table 1.) CDC's infection control and prevention guidelines set forth recommended practices, summarize the applicable scientific evidence and research, and contain contextual information and citations for relevant studies and literature. Most of CDC's infection control and prevention guidelines are developed in conjunction with HICPAC, an advisory body created in 1992 by the Secretary of HHS. CDC publishes the final guidelines in its *Morbidity and Mortality Weekly Report*, on its Web site, or through a professional journal.

[19]This total does not include the practices recommended in CDC's *Guideline for Disinfection and Sterilization in Healthcare Facilities*, which was issued in November 2008.

Table 1: CDC's Infection Control and Prevention Guidelines, with Number of Recommended Practices, Issued between 1981 and 2007

	Guideline (issue date)	Total number of recommended practices
1	Guideline for Prevention of Catheter-associated Urinary Tract Infections (1981)	24
2	Guideline for Infection Control in Health Care Personnel (1998)	183
3	Guideline for Prevention of Surgical Site Infection (1999)	63
4	Guidelines for Preventing Opportunistic Infections among Hematopoietic Stem Cell Transplant Recipients (2000)	[a]
5	Guidelines for the Prevention of Intravascular Catheter-Related Infections (2002)	111
6	Guideline for Hand Hygiene in Health-Care Settings (2002)	42
7	Recommendations for Using Smallpox Vaccine in a Pre-Event Vaccination Program (2003)	[b]
8	Guidelines for Environmental Infection Control in Health-Care Facilities (2003)	329
9	Guidelines for Preventing Health-Care-Associated Pneumonia (2003)	208
10	Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health-Care Settings (2005)	[b]
11	Influenza Vaccination of Health-Care Personnel (2006)	6
12	Management of Multidrug-Resistant Organisms in Healthcare Settings (2006)	80
13	Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007)	152
Total		**1,198**

Source: GAO-08-283.

[a]For the purpose of this table, we do not include a count of the recommended practices in this guideline because the guideline is targeted to a specific patient population that not all hospitals treat. However, for the hospitals that do treat such patients, this guideline provides at least another 164 recommended practices.

[b]The practices in these guidelines are not organized in a way that supports counting the total number of practices.

We found that CDC's guidelines covered such topics as prevention of catheter-associated urinary tract infections, prevention of surgical site infections, and hand hygiene. An example of a recommended practice in the hand hygiene guideline is the recommendation that health care workers decontaminate their hands before having direct contact with patients. Most of the practices were sorted into five categories—from strongly recommended for implementation to not recommended—primarily on the basis of the strength of the scientific evidence for each practice. Over 500 practices were strongly recommended.

We also found that CDC and AHRQ had conducted some activities to promote implementation of recommended practices, such as disseminating the guidelines and providing research funds. However, these steps were not guided by a prioritization of recommended practices. Our March 2008 report noted that one factor to consider in prioritization is strength of evidence, as CDC had done. In addition to strength of evidence, an AHRQ study identified other factors to consider in prioritizing recommended practices, such as costs and organizational obstacles. Furthermore, the efforts of the two agencies had not been coordinated. For example, we found that CDC and AHRQ independently examined various aspects of the evidence related to improving hand hygiene compliance, such as the selection of hand hygiene products and health care worker education. This could have been an opportunity for coordination. We found that no one in the HHS Office of the Secretary was responsible for coordinating infection control activities across HHS. The department subsequently established the Steering Committee for the Prevention of Healthcare-Associated Infections, with senior-level representation of HHS offices and operating divisions, to develop the HHS Action Plan. To facilitate implementation of recommended practices among health care organizations, the plan prioritized some recommended practices to address four of its six targeted HAIs.[20]

[20]The Action Plan identified six targeted HAIs: central-line-associated bloodstream infections, catheter-associated urinary tract infections, surgical site infections, ventilator-associated pneumonia, *Clostridium difficile* infections, and methicillin-resistant *Staphylococcus aureus* infections. It identified prioritized recommended practices for all but *Clostridium difficile* infections and methicillin-resistant *Staphylococcus aureus* infections.

CMS's and Accrediting Organizations' Required Hospital Standards Described Components of Infection Control Programs, and Compliance with These Standards Was Assessed through On-Site Surveys

In March 2008, we reported that while CDC's infection control guidelines described specific clinical practices recommended to reduce HAIs, the infection control standards that CMS and accrediting organizations require as part of the hospital certification and accreditation processes described the fundamental components of a hospital's infection control program. These components included the active prevention, control, and investigation of infections. Examples of standards and corresponding standards interpretations that hospitals must follow included educating hospital personnel about infection control and having infection control policies in place. The standards were far fewer in number than the recommended practices in CDC's guidelines—for example, CMS's infection control COP contained two standards.

We also found that as a whole, the CMS, Joint Commission, and AOA standards and their interpretations described similar required elements of hospital infection programs. For example, all required that the hospital designate a person or persons to be responsible for the infection control program. However, there were differences, including the extent to which the standards and their interpretations required implementation of practices recommended in CDC's infection control guidelines. Although CMS and the accrediting organizations generally did not require that hospitals implement all recommended practices in CDC's infection control and prevention guidelines, we reported that the Joint Commission and AOA had standards that required the implementation of certain practices recommended in CDC's infection control guidelines. For example, we reported that the Joint Commission and AOA required hospitals to annually offer influenza vaccinations to health care workers, whereas CMS's interpretive guidelines, or standards interpretations, were more general, stating that hospitals should adopt policies and procedures based as much as possible on national guidelines that address hospital-staff-related issues, such as evaluating hospital staff immunization status for designated infectious diseases. In our March 2008 report, we proposed that HHS determine how to promote implementation of prioritized practices, including whether to incorporate selected practices into CMS's hospital standards. In its Action Plan, HHS indicates its preference not to include specific infection control practices in its hospital standards in order to keep its standards flexible and broad.

In our March 2008 report, we also discussed how compliance with hospital standards is assessed. CMS, the Joint Commission, and AOA assessed compliance with their infection control standards during on-site surveys through direct observation of hospital activities and review of hospital policy documents. Among the surveys conducted in the first quarter of

2007, 12.6 percent of CMS-surveyed hospitals, 17.6 percent of Joint Commission–surveyed hospitals, and 22.2 percent of AOA-surveyed hospitals were cited as noncompliant with one of the respective organizations' standards on infection control.

Multiple HHS Programs Collected Data on HAIs, but Lack of Integration of Available Data and Other Problems Limited Utility of the Data

In March 2008, we reported that multiple HHS programs collected data on HAIs but that limitations in the scope of information they collected and the lack of integration across the databases maintained by these separate programs constrained the utility of the data. Three agencies within HHS—CDC, CMS, and AHRQ—collect HAI-related data for a variety of purposes in databases maintained by four separate programs: CDC's National Healthcare Safety Network (NHSN) program, CMS's Medicare Patient Safety Monitoring System (MPSMS), CMS's Annual Payment Update (APU) program, and AHRQ's Healthcare Cost and Utilization Project (HCUP). (See table 2.) We found that the most detailed source of information on HAIs in HHS was the NHSN database. It began as a voluntary program in the 1970s to assist hospitals that wanted to monitor their HAI rates. CDC has drawn on these data to publicly report aggregate trends in selected HAIs, and we found that it was working with a number of states that were implementing mandatory programs for hospitals to submit HAI-related data through NHSN. We reported that the MPSMS database provided CMS with information on national trends in the incidence of selected adverse events among hospitalized Medicare beneficiaries, including a number of different types of HAIs. These data were collected from medical records selected for annual random samples of approximately 25,000 Medicare inpatients. We also reported that the APU program implemented a financial incentive for hospitals to submit to CMS data that were used to calculate hospital performance on measures of quality of care. The program received quality-related data quarterly for a range of medical conditions, including data on three surgical infection prevention measures. We noted that CMS reported the results of its analyses of these data on its Hospital Compare Web site. Finally, we reported that AHRQ sponsored the development of the HCUP databases to create a national information resource of patient-level health care data. Two of the 20 Patient Safety Indicators that AHRQ derived from these data were related to HAIs, one involving infections caused by intravenous lines and catheters, and the other postoperative sepsis.

Table 2: Selected Characteristics of HHS Databases That Contain HAI-Related Information, 2008

Responsible agency and database	HAI-related data collected	Population for which data are collected
CDC's National Healthcare Safety Network (NHSN)	Infection types • central-line-associated BSI • catheter-associated UTI • VAP • postprocedure pneumonia • SSI • MDRO[a] • other[b]	Most hospitals report on patients in selected critical care units and those undergoing selected procedures such as coronary bypass surgery and colon surgery.
CMS's Medicare Patient Safety Monitoring System (MPSMS)	Infection types[c] • central-line-associated BSI • catheter-associated UTI • postoperative pneumonia • antibiotic-associated *C. difficile* • MRSA • VRE	National sample of hospitalized Medicare patients.
CMS's Annual Payment Update (APU) database	Practices to prevent or reduce SSIs • providing antibiotics within 1 hour of surgery • selecting appropriate antibiotics to prevent surgical infections • stopping the administration of the antibiotics within 24 hours of end of surgery	National inpatient population for selected surgical procedures.[d]
AHRQ's Healthcare Cost and Utilization Project (HCUP) database, Nationwide Inpatient Sample	Infection types • postoperative sepsis[e] • "infection due to medical care" (focused on intravenous and catheter infections)	A sample of inpatients in hospitals in 37 states.

Source: GAO-08-283.

Notes: BSI is bloodstream infection; *C. difficile* is *Clostridium difficile*; MDRO is multidrug-resistant organism; MRSA is methicillin-resistant *Staphylococcus aureus*; SSI is surgical site infection; UTI is urinary tract infection; VAP is ventilator-associated pneumonia; and VRE is vancomycin-resistant enterococci.

[a]For patients whose infections are laboratory-confirmed, NHSN collects data on the pathogens identified, and for specified pathogens (including those responsible for MRSA and VRE), the result of any testing of their resistance to specific antibiotics. Participating hospitals have the option to report separately the number of times in a given month that they tested specimens of any of eight specified organisms for resistance to selected antibiotics, as well as the results of those tests. From these data, NHSN produces rates of antimicrobial resistance relative to the number of nonduplicative specimens tested (i.e., excluding multiple tests for the same organism in the same patient). This part of NHSN does not distinguish between MDRO infections acquired in the hospital and community-acquired infections present at admission.

[b]Hospitals can choose to submit to NHSN data on other types of HAIs, such as skin and soft tissue infections, cardiovascular system infections, and gastrointestinal system infections. CDC does not provide data collection protocols for these types of infections, but they can be entered into NHSN as "custom events" using definitions provided separately by CDC.

[c]In 2007, CMS added catheter-associated UTIs, VAP, MRSA, and VRE to MPSMS and dropped insertion-site infections associated with central vascular catheters, BSIs, and postoperative-associated UTIs.

[d]The three practice measures are assessed for certain categories of surgeries: coronary artery bypass graft; other cardiac surgery; colon surgery; hip arthroplasty; knee arthroplasty; abdominal hysterectomy; vaginal hysterectomy; and vascular surgery.

[e]The rate of postoperative sepsis is computed only for patients undergoing elective surgeries.

We found that each of these databases presented only a partial view of the extent of the HAI problem because each focused its data collection on selected types of HAIs and collected data from a different subset of hospital patients across the country. Although two databases—NHSN and MPSMS—addressed many of the same types of HAIs, the former provided information only from selected units of hospitals that participated in the NHSN program (which did not represent hospitals nationwide), while the latter provided information only on a representative sample of Medicare inpatients (i.e., MPSMS did not provide information on non-Medicare patients). In addition, the data collection methods employed by the NHSN, MPSMS, and HCUP databases ranged from concurrent review of patient care as patients were being treated in the hospital, to retrospective review of patient medical records after patients had been discharged, to analyses of diagnostic codes recorded electronically in patient billing data.

Although we noted that officials from the various HHS agencies discussed HAI data collection with each other, we found that the agencies were not taking steps to integrate any of the existing data from the four databases. This integration could involve creating linkages across the databases by, for example, creating common patient identifiers so that data from the same individuals in multiple databases could be pulled together. Creating linkages across the HAI-related databases could enhance the availability of information to better understand where and how HAIs occur. For example, data on surgical infection rates and data on surgical processes of care were collected for some of the same patients in two different databases that were not linked. In our March 2008 report, we concluded that, as a consequence, the potential benefit of using the existing data to monitor the extent to which compliance with the recommended surgical care processes led to actual improvements in surgical infection rates had not been realized. In its January 2009 Action Plan, HHS proposes remedying this situation by undertaking a series of short- and longer-term initiatives to coordinate and align its various HAI-related data collection activities, under the guidance of a new interagency working group.

In our March 2008 report, we reported concerns with the use of HAI data for providing a national picture of HAIs. Although none of the databases collected data on the incidence of HAIs for a nationally representative sample of hospital patients, CDC officials had produced national estimates of HAIs. However, those estimates derived from assumptions and extrapolations that raised questions about the reliability of those estimates. In its Action Plan, HHS proposes to draw on some of the same data sources—primarily NHSN—to track progress in reducing the incidence of five of its six targeted HAIs.

Concluding Observations

HAIs in hospitals can cause needless suffering and death. Federal authorities and private organizations have undertaken a number of activities to address this serious problem; however, to date, these activities have not gained sufficient traction to be effective.

In our March 2008 report, we identified two possible reasons for the lack of effective actions to control HAIs. First, although CDC's guidelines are an important source for its recommended practices on how to reduce HAIs, the large number of recommended practices and lack of department-level prioritization hinder efforts to promote their implementation. The guidelines we reviewed contain almost 1,200 recommended practices for hospitals, including over 500 that are strongly recommended—a large number for a hospital trying to implement them. A few of these are required by CMS's or accrediting organizations' standards or their standards interpretations, but it is not reasonable to expect CMS or accrediting organizations to require additional practices without prioritization. Although CDC has categorized the practices on the basis of the strength of the scientific evidence, there are other factors to consider in developing priorities. For example, work by AHRQ suggests factors such as costs or organizational obstacles that could be considered. The lack of coordinated prioritization may have resulted in duplication of effort by CDC and AHRQ in their reviews of scientific evidence on HAI-related practices.

Second, we reported that HHS had not effectively used the HAI-related data it had collected through multiple databases across the department to provide a complete picture of the extent of the problem. Limitations in the databases, such as nonrepresentative samples, hinder HHS's ability to produce reliable national estimates on the frequency of different types of HAIs. In addition, data collected on HAIs are not being combined to maximize their utility. HHS has made efforts to use the currently collected data to understand the extent of the problem of HAIs, but the lack of

linkages across the various databases results in a lost opportunity to gain a better grasp of the problem of HAIs.

HHS has multiple methods to influence hospitals to take more aggressive action to control or prevent HAIs, including issuing guidelines with recommended practices, requiring hospitals to comply with certain standards, releasing data to the public to expand information about the nature of the problem, and using hospital payment methods to encourage the reduction of HAIs. Prioritization of CDC's many recommended practices can help guide their implementation, and better use of currently collected data on HAIs could help HHS—and hospitals themselves—monitor efforts to reduce HAIs. In our March 2008 report, we concluded that leadership from the Secretary of HHS was lacking to do this and that without such leadership, the department would not be able to effectively leverage its various methods to have a significant effect on the suffering and death caused by HAIs.

The recently released HHS Action Plan identifies strategies that are intended to address some of the reasons for the lack of effective actions to control HAIs, including some identification of priorities from among the 1,200 recommended practices, and plans to coordinate HAI-related data collection activities across HHS. HHS released the Action Plan for comment in early January 2009, with the intent of revising it based on the public input it received. Following the transition to the new presidential administration, HHS has continued to solicit public comments on the plan with no designated deadline for submissions. Consequently, it remains uncertain when or if the new administration will choose to implement this plan, and if so, with what modifications, to address our recommendations and reduce the serious problem of HAIs.

Mr. Chairman, this completes my prepared remarks. I would be happy to respond to any questions you or other members of the subcommittee may have at this time.

Contacts and Acknowledgments

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