

**AMERICAN COLLEGE OF ENDOCRINOLOGY AND
AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS
POSITION STATEMENT ON PATIENT SAFETY AND
MEDICAL SYSTEM ERRORS IN DIABETES AND ENDOCRINOLOGY**

*Writing Committee on Patient Safety and Medical System Errors
in Diabetes and Endocrinology**

*See Appendix for complete list of Writing Committee members.



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Abbreviations:

AACE = American Association of Clinical Endocrinologists; ACE = American College of Endocrinology; CPOE = computerized physician order entry

INTRODUCTION

Innovations in health-care treatment and technology have led to considerable improvement in both quality and longevity of life. Nevertheless, these innovations have also made medical care much more complex and have resulted in more potential hazards for patients as well as greater challenges for health-care professionals, who now must deal with newer, less intuitive, but more powerful diagnostic tools and treatments.

On January 9, 2005, the American College of Endocrinology (ACE) and the American Association of Clinical Endocrinologists (AACE) convened a 2-day consensus conference to discuss patient safety, with a focus on patients with diabetes and other endocrine diseases. The objectives were to emphasize the importance of patient safety and propose methods for achieving safer medical care—care that is free of injurious errors of omission or commission. The conference brought together experts from several fields, including diabetes and endocrinology, general internal medicine, anesthesiology, surgery, pediatrics, and nursing, as well as governmental and regulatory agencies and other national and international organizations, all with a strong interest in health-care quality and safety (see Appendix for list of participants and attendees). This report presents a summary of the findings and recommendations of the conferees.

SCOPE OF THE PROBLEM

Although this conference focused primarily on patient safety issues in the area of diabetes and endocrinology, issues regarding inadequate levels of overall patient safety have long been a major concern to the entire realm of health care. One recent report estimated that more than 195,000 avoidable deaths occur annually in hospitals in the United States (1). In a recent study, nearly 1 of 3 persons overall, and 50% of those with a chronic medical condition, said that they or a family member had experienced a medical error at some time during their life. Nearly half (48%) of all residents of the United States said that they are concerned about the safety of the medical care that they and their families receive (2). The issue of patient safety is not limited to the United States. Studies from Canada, New Zealand, Denmark, Australia, and the United Kingdom show that approximately 10% of all patients in acute care settings experience a substantial injury from medical care (3).

Patients with diabetes have a 2.2- to 4-fold increase in hospitalization rate versus the nondiabetic population (4,5). In 2001, more than 4.6 million hospitalizations were associated with diabetes, accounting for nearly 17 million hospital days at a cost in excess of \$40 billion (6). Patients with diabetes often have several other associated medical conditions (such as heart disease, obesity, high blood pressure, and kidney disease). In addition to insulin, which the Joint Commission on Accreditation of Healthcare Organizations considers a “high-alert” drug (7), patients frequently take numerous medications, a situation that increases the risk for medication-related errors.

A recent study of errors in diabetes care during a 14-year period showed that 20% of the patients studied who died during this period had a major provider-committed error at some time during the course of their care (8). Moreover, for every patient who died within 24 hours as a direct result of an avoidable medical error, many more patients sustained less catastrophic but still significant events. In that study, the results showed that the number of patients with excessive morbidity due to a medical error was 6.5 times as high as the number of patients who died as a direct result of a medical error. The relative number

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Based on a consensus conference held in Washington, DC, January 9 and 10, 2005.
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of those with a permanent complication attributable to a medical error was 4.2 times as high, and the number of those with a permanent disability ascribed to a medical error was 1.3 times as high.

SPECIFIC AREAS OF CONCERN

Diabetes

All hypoglycemic drugs are associated with some risk, but insulin is especially risky (9). Many deaths related to insulin have occurred in the inpatient setting. The causes are widely varied, but a common error occurs when a nurse mistakenly uses a bottle of another medication and confuses it with a bottle of insulin. Heparin, which is also often available in vial form at a nursing station, has long been a common source of confusion (10). Recent data suggest that stricter control of blood glucose levels in hospitalized patients can result in better outcomes, particularly in the intensive care unit and after cardiac surgical procedures. As the protocols for tight glucose control are implemented in more settings, however, it will be essential to implement safeguards to minimize the risk of hypoglycemia, which can be especially pronounced in patients who are sedated. Typical "sliding scale" insulin is not effective and may be dangerous in the manner in which it is typically used (11), yet it remains part of common medical practice (12). Some of the approaches for decreasing insulin-associated risk in the hospital include minimizing the use of sliding scales, implementing backup assessments in critical areas, using computerized physician order entry (CPOE), and bar coding. In the outpatient setting, both patient education and improved communication between providers and patients are essential in order to improve the safety of insulin use.

Osteoporosis

Despite the high frequency of osteoporosis, the failure to diagnose and treat osteoporosis at all is by far the most serious threat to the safety of the patient with osteoporosis.

Osteoporosis is responsible for more than 1.5 million fractures annually. In 2004, the US Surgeon General's report on osteoporosis showed that about 10 million Americans have osteoporosis and another 34 million have low bone mass (13). A woman beyond age 50 years has about a 50% lifetime risk for fracture. In the United States, approximately 250,000 hip fractures occur each year, and about 20% of senior citizens who sustain a hip fracture will die within 1 year. Because many factors can cause low bone density, appropriate evaluation is necessary. The patient population at highest risk for fracture includes those who have already had an osteoporosis-related fracture.

Established guidelines exist for bone density testing (14) and for prevention and management of postmenopausal osteoporosis (15,16). Nevertheless, only 18% of women 67 years of age or older who sustain a fracture have had either a bone mineral density test or a prescrip-

tion for a drug to prevent or treat osteoporosis during the 6 months after the date of fracture (17). Furthermore, although men constitute approximately 20% of the patient population with osteoporosis, they are even less likely to be evaluated and treated for this condition. A team approach involving the orthopedic surgeon, primary care physician, and endocrinologist is essential in this setting. In addition to appropriate drug therapy, sufficient calcium and vitamin D supplementation is a critical factor.

Pediatric Endocrinology

Delayed diagnosis of congenital hypothyroidism has been identified as a serious problem, inasmuch as delay in diagnosis and treatment can be catastrophic. Meticulous management of congenital hypothyroidism is critical to brain development and achievement of normal intelligence.

Thyroid Disorders

Errors in the diagnosis and management of thyroid disease can be important safety issues. For example, untreated hypothyroidism can masquerade as severe depression that is refractory to treatment. In one recent study of patients taking thyroid replacement medication, only 56% received the recommended minimal monitoring, a situation that increases the risk of preventable adverse drug events (18). Patients who received recommended monitoring had fewer preventable adverse drug events, with a rate of only 1% versus 6% in those who were not appropriately monitored. Minority status and language other than English were also associated with the occurrence of an adverse drug event.

Bariatric Surgical Procedures

The safety of patients undergoing bariatric surgical procedures is likely to vary considerably. The demand and performance of bariatric surgical procedures are increasing dramatically because of the proven efficacy at improving the health and well-being of patients with morbid obesity amidst the current epidemic of obesity. Some questions exist, however, about whether a sufficient number of qualified surgeons are available to manage the increased demand. The centers with the most experience still report 1 to 2% total mortality, but other centers have statistics that are significantly worse. Others do not report their outcome statistics at all. The potential for surgical injury or death is lessened when bariatric operations are performed at centers that have been accredited for safe outcomes. For successful results, a well-trained surgeon with advanced bariatric training in both open and laparoscopic bariatric procedures should serve as the head of a dedicated team. Patient selection, selection of the appropriate technical procedure, preoperative comprehensive patient assessment, and focused intraoperative and postoperative care with technologies tailored to the special needs of the obese patient are critical for optimal operative outcomes.

SYSTEMIC PROBLEMS AND RECOMMENDATIONS

1. Create a culture of safety

Problems within the system of health care, often far removed from the actual point of care, may have much more powerful effects than are generally recognized.

Learning from medical accidents is extremely difficult because it is easier to blame the individual provider of health care rather than to identify the pivotal factors in the working environment. As a result, accidents due to medical error are rarely investigated in sufficient detail to identify their systemic causes. Excessive medical liability litigation has led to higher malpractice premiums and, as a result, may be hampering efforts to improve the quality of care and to address the root causes of medical errors (19).

A culture of safety is one in which a collection of workers cooperatively collaborate to reduce medical errors. Factors contributing to patient safety are timely communication of important clinical information and insertion of "backup" checks in critical settings. We need to move from a "name, blame, and shame" mentality to a culture of safety.

Without a systematic approach to identifying errors when they do occur, followed by a thorough and frank discussion of these problems, we cannot move forward in fully assessing the causes and formulating solutions. In such a setting, our ability to design safer systems of care is limited. A "blame-free" reporting system has the potential to produce more insights about the underlying systemic problems that give rise to medical accidents. Clearly, such a comprehensive assessment would make the system safer.

ACE and AACE strongly support state and national initiatives to develop a medical error reporting system that provides useful information for addressing identified errors and issues.

2. Implement electronic patient records and information-sharing systems

The broad use of electronic patient records and information-sharing systems was universally endorsed by the consensus conference participants. Several presenters discussed benefits as well as resistance to use of this technology, including initial outlay, loss of productivity, lack of financial incentives, and personnel training time; availability of information technology support; standardization of software (ability to interface with other systems); and identification of certified programs.

The consensus of the meeting was that third-party reimbursements must be increased to encourage physicians to adopt this technology.

3. Reduce medication errors through use of CPOE

Medication error rates are high. Adverse drug events are the leading cause of injury to hospitalized patients

(20). These adverse events are caused by several factors, including illegible handwriting, use of ambiguous abbreviations, inappropriate combination of medications, and wrong medications or incorrect dosage. Problem lists should be integrated with medication lists in all care settings.

Another strategy for reducing medication errors is to implement computerization of physician orders. CPOE reduced the serious medication error rate by 55% in hospitalized patients in one study (21) and has reduced the overall medication error rate by more than 80% in other studies (20). Computerized prescribing improves medication safety in a variety of ways. Orders must be complete with appropriate doses or they will not be accepted. Perhaps more important, computerized orders can be checked for various issues such as drug allergies, drug-drug interactions, and drug-laboratory issues.

It has become increasingly clear that medication errors and adverse drug events are common in the outpatient setting (22). In this setting, however, the causes are somewhat different from those in the inpatient setting, and problems with follow-up are especially prominent. Implementation of the electronic health record, including computerization of prescribing, will probably represent the most important strategy for improving outpatient medication safety (22).

4. Improve coordination of care

Coordination of care is an important part of patient safety, particularly in the inpatient setting. Use of communications technology, in combination with a focus on teamwork among health-care professionals and ancillary services, will minimize critical lapses that may result in significant patient injury. Improving coordination of care involves not only better communications but also effective ongoing education among all caregivers.

5. Improve patient self-care through education and communication

More effective strategies to improve communication between patients and health-care professionals are essential. "Medical literacy" in America varies widely. Lower rates of medical literacy occur in many groups and are often a barrier to care. When practitioners do not communicate effectively with patients, serious and even lethal errors may occur. Communication problems can be especially prevalent when medical care is provided for ethnic and cultural minorities.

In addition, more individualized, ongoing evidence-based educational strategies are needed to ensure that patients can safely and effectively follow their treatment plan. Maintaining personal health records will empower patients with diabetes to document their health status and glycemic control and may allow them to interact with their electronic health records.

REFERENCES

1. **Collier S.** Patient Safety in American Hospitals: The Consumer Has the Right to Know. Article reprinted from Patient Safety & Quality Healthcare, January/February 2005. Available at: <http://www.healthgrades.com/media/DMS/pdf/PSQHCollierPSinAmerHosp022005.pdf>. Accessed for verification May 5, 2005.
2. **The Henry J. Kaiser Family Foundation.** Five years after IOM report on medical errors, nearly half of all consumers worry about the safety of their health care [news release]. Washington, DC, November 17, 2004. Available at: <http://www.kff.org/kaiserpolls/pomr111704nr.cfm>. Accessed for verification May 5, 2005.
3. **Reason J.** Safety. Presented at: Patient Safety and Medical System Errors in Diabetes and Endocrinology Consensus Conference, January 9-10, 2005, Washington, DC.
4. **Rushakoff RJ.** Management of the hospitalized diabetic patient. Endotext.com. March 1, 2002: chapter 23. Available at: <http://endotext.com/diabetes/diabetes22/diabetes22.htm>. Accessed for verification May 5, 2005.
5. **Hogan P, Dall T, Nikolov P (American Diabetes Association).** Economic costs of diabetes in the US in 2002. *Diabetes Care.* 2003;26:917-932.
6. **Centers for Disease Control and Prevention.** National diabetes fact sheet: general information and national estimates on diabetes in the United States. 2003. Revised edition. Atlanta, GA: U.S. Department of Health and Human Services. Centers for Disease Control and Prevention, 2004. Available at: http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2003.pdf. Accessed for verification May 5, 2005.
7. "High-alert" medications and patient safety. *Int J Qual Health Care.* 2001;13:339-340.
8. **Hellman R, Hellman J, Rosen H.** Provider error is an important cause of poor outcomes in diabetes care [abstract]. *Diabetes.* 1999;48(Suppl 1):A67.
9. **Hellman R.** A systems approach to reducing errors in insulin therapy in the inpatient setting. *Endocr Pract.* 2004; 10(Suppl 2):100-108.
10. **Bates DW.** Unexpected hypoglycemia in a critically ill patient. *Ann Intern Med.* 2002;137:110-116.
11. **Queale WS, Seidler AJ, Brancati FL.** Glycemic control and sliding scale insulin use in medical inpatients with diabetes mellitus. *Arch Intern Med.* 1997;157:545-552.
12. **Hirsch IB, Farkas-Hirsch R.** Sliding scale or sliding scare: it's all sliding nonsense. *Diabetes Spectrum.* 2001; 14:79-81.
13. **United States Department of Health & Human Services.** Bone Health and Osteoporosis: A Report of the Surgeon General. Washington, DC: U.S. Department of Health and Human Services, October 14, 2004. Available at: www.hhs.gov/surgeongeneral/library/bonehealth. Accessed for verification May 5, 2005.
14. **Lewiecki EM, Watts NB, McClung MR, et al (International Society for Clinical Densitometry).** Official positions of the International Society of Clinical Densitometry. *J Clin Endocrinol Metab.* 2004;89:3651-3655.
15. **American Association of Clinical Endocrinologists Osteoporosis Task Force.** American Association of Clinical Endocrinologists medical guidelines for clinical practice for the prevention and treatment of postmenopausal osteoporosis: 2001 edition, with selected updates for 2003 [erratum in *Endocr Pract.* 2004;10:90]. *Endocr Pract.* 2003;9:544-564.
16. **National Osteoporosis Foundation.** Physician's guide to prevention and treatment of osteoporosis. Washington, DC: National Osteoporosis Foundation, 2003. Summary available at: http://www.guidelines.gov/summary/summary.aspx?doc_id=3862&nbr=3073. Accessed for verification May 5, 2005.
17. **The National Committee for Quality Assurance.** Osteoporosis management in women who had a fracture. In: The State of Health Care Quality. Washington, DC, 2004: 39. Available at: <http://www.ncqa.org/communications/SOMC/SOHC2004.pdf>. Accessed for verification May 5, 2005.
18. **Stelfox HT, Ahmed SB, Fiskio J, Bates DW.** An evaluation of the adequacy of outpatient monitoring of thyroid replacement therapy. *J Eval Clin Pract.* 2004;10:525-530.
19. **Sage W.** Medical liability and patient safety. *Health Aff (Millwood).* 2003;22:26-36.
20. **Bates DW, Teich JM, Lee J, et al.** The impact of computerized physician order entry on medication error prevention. *J Am Med Inform Assoc.* 1999;6:313-321.
21. **Bates DW, Leape LL, Cullen DJ, et al.** Effect of computerized physician order entry and a team intervention on prevention of serious medication errors. *JAMA.* 1998;280:1311-1316.
22. **Gandhi TK, Weingart SN, Borus J, et al.** Adverse drug events in ambulatory care. *N Engl J Med.* 2003;348:1556-1564.

APPENDIX

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Organizations Participating in the Consensus Conference

Agency for Healthcare Research and Quality

American Association of Clinical Endocrinologists

American Association of Diabetes Educators

American College of Endocrinology

American College of Surgeons

American Diabetes Association

American Medical Association

American Society of Anesthesiologists

Endocrine Nurses Society

International Society of Clinical Densitometry

Joint Commission on Accreditation of Healthcare Organizations

National Committee for Quality Assurance

Organizations Attending the Consensus Conference

American Association of Endocrine Surgeons

American Association of Retired Persons, Public Policy Committee

American College of Cardiology

American Dietetic Association

Centers for Medicare and Medicaid, Quality Improvement Group

Maryland Health Care Commission

National Alliance for Hispanic Health

National Quality Forum

Ohio Patient Safety

Society of Hospital Medicine

Society of Thoracic Surgeons

US Department of Health and Human Services, Health Information Technology

US Food and Drug Administration, Division of Endocrine and Metabolic Drugs

Veterans Health Administration

World Medical Association