

## **The Evolving Scope of Pharmacy Practice: Perspectives from Future Pharmacists**

***Athena M. Ling, Nicholas J. Panno, Megan E. Shader, Rachel M. Sobinsky,  
Heather N. Whitehead, and Kenneth M. Hale***

The practice of pharmacy has undergone many dynamic changes as American society transitioned through its Agricultural, Industrial, and Information Ages. As we enter the Conceptual Age with its emphasis on “high concept and high touch,”<sup>1</sup> how do contemporary professional students in the field view the evolving scope of pharmacy practice? And how do lay people describe their needs relating to the use of medications in our healthcare system? This article resulted from a consideration of the evolving scope of pharmacy practice in the first pharmacy practice course for entering students in the Doctor of Pharmacy (PharmD) program at the Ohio State University. First-year PharmD students participated in class discussions and readings structured around the following questions:

*What are the most significant current problems relating to the use of medications that we face as a society in our healthcare system?*

*What needs do American patients have relating to their use of medications that are not currently being met?*

*How is the U.S. patient population changing?*

*How would you describe the types of workers, the necessary training, and technology which are involved in providing pharmacy services in the U.S.?*

*How is the work of the pharmacist (the things that pharmacists do) changing?*

Students were encouraged to engage in discussions with lay people on these topics and prepared a brief essay on one of the questions. What follows are exemplary essays from five of these students. They are informative in the sense that they have captured many of the compelling challenges and opportunities in our profession, and they are significant in the sense that they provide a glimpse of the passion and conviction with which pharmacy students view them.

**What are the most significant current problems relating to the use of medications that we face as a society in our healthcare system?**

**By Megan E. Shader**



There are many problems relating to the use of medications in our current healthcare system. Identifying these problems is the first step toward alleviating them and improving patient outcomes. The first issue I will discuss relates to medication safety. Several recently reported statistics are helpful in grasping the significance of this problem. For example, the Centers for Disease Control reports that unintentional drug poisoning is now the second leading cause of death due to unintentional injury in the United States, having claimed the lives of 19,838 individuals in 2004 alone.<sup>2</sup> In 2007, the Institute of Medicine (IOM) reported that "... about one medication error occurs per patient per day in hospital care" (p. 111).<sup>3</sup> They also concluded that at least 1.5 million preventable adverse drug events occur annually in the United States. These numbers are quite staggering, and there have been a number of formal measures proposed to improve them. The Institute of Medicine has proposed the enhancement of decision-support resources, better labeling/packaging of medications, more effective communication between professionals and patients, and higher standards for information technology in the healthcare field. The IOM called on pharmacists to routinely review medications and counsel patients regarding why and how to use them.

Another problem faced by today's society is the abuse of prescription and non-prescription medications, especially among teens. The Substance Abuse and Mental Health Services Administration (SAMHSA) estimated that 2.1 million teens abused prescription drugs in 2005.<sup>4</sup> And in 2007 the Office of National Drug Control Policy reported that, "Next to marijuana, the most common illegal drugs teens are using to get high are prescription medications. Teens are turning away from street drugs and using prescription drugs to get high. Indeed, new users of prescription drugs have caught up with new users of marijuana" (p. 2).<sup>5</sup> Interestingly, approximately 70% of teenagers who abuse prescription pain relievers obtain them from family or friends. Non-prescription drugs are also susceptible to abuse. For example, SAMHSA estimated that 3.1 million young people in the United States, age 12-25, have used non-prescription cough and cold medications to get high at least once in their lifetime.<sup>4</sup> These numbers are alarming, and they suggest the need for enhanced educational efforts geared at young people as well as parents.

Patients also sometimes face difficulties in accessing pharmaceutical care. The cost of prescription drugs was the number one issue brought up by my parents when I asked them about their perceptions of the most significant problems relating to medications. Many individuals in our country are uninsured; 47 million people in 2006 did not have health insurance.<sup>6</sup> Many more individuals are underinsured and have to forgo prescribed therapies or resort to taking lower doses than those prescribed, and others are going out of the country to buy medication in order to save money. This raises regulatory concerns and safety risks with regard to medication authenticity. It is estimated that as much as 10% of the world's pharmaceutical products are counterfeit,<sup>7</sup> and drug importation may ultimately undermine research and development of new medicines, most of which originate in the United States.

When speaking with my father about these issues, he was concerned about direct-to-consumer (DTC) advertising of pharmaceuticals. He feels that ads for prescription drugs give the average person too much information and cause people to "self diagnose," leading them to demand medications that are often not needed. My mother contends that some physicians may be part of the problem when they indiscriminately prescribe whatever their patients request. DTC advertising also contributes to the rising cost of medications and, among developed countries, only the United States and New Zealand permit it.<sup>8</sup>

Many of our most significant current problems relating to the use of medications ultimately relate to medication safety (including the rising abuse of prescription and non-prescription drugs), patient access to pharmaceutical care, and drug costs. We, as future pharmacists, are preparing ourselves to help our patients solve these problems. In doing so, we can (and will!) improve their health, save lives, and reduce costs in our healthcare system.

**What needs do American patients have relating to their use of medications that are not currently being met?**

**By Nicholas J. Panno**



It is estimated that 81% of American adults take at least one medication per week, and 27% take at least five.<sup>9</sup> Cumulatively, our healthcare system generates nearly four billion prescriptions per year. This substantial medication use comes paired with an inherently high risk for medication errors and other adverse drug events. Ernst and Grizzle estimated that adverse drug events among ambulatory patients alone resulted in a cost of \$177.4 billion to our healthcare system in 2000.<sup>10</sup> Reducing these prevalent and enormously expensive adverse drug events is a major need of our patients that is not being met.

The problem of adverse drug events has two facets, professional errors and patient errors. Professional errors may result from acts of commission or omission by healthcare providers. These include the prescribing of contraindicated medicines as well as not prescribing necessary maintenance medications for patients. In fact, it has been estimated that the prescribing process constitutes the single biggest contributor to medication errors.<sup>11</sup> One solution to the problem of professional errors includes computer-based physician order entry. This technology can be used to reduce errors from illegible handwriting, allergic reactions, incorrect dosage, and drug interactions. Another solution is to improve communication and cooperation between pharmacists and other members of the healthcare team. Leape *et al* found that one pharmacist participating on an intensive care unit team reduced adverse drug events by 66% and saved their hospital over \$270,000 in 1999.<sup>12</sup> This communication and cooperation must also extend beyond the institutional setting to create a continuum of care. Hospital and community practitioners must cooperate to a greater extent in tracking every patient's current conditions and treatments. Our ability to reconcile their medication therapy between different healthcare settings would then be improved.

Patient errors arise mostly from poor adherence and persistence in taking their medications. My father suggests that this could be due to a lack of information provided to patients about their medications and their health in general. He believes that more of us are getting our medications by mail or ordering them from other countries, and this is

separating people from the community pharmacist and the drug information that they need. This dearth of information causes patients to underestimate the importance of adhering to their medication therapy. The obvious solution to this problem would be to increase patient education. An elderly patient at our pharmacy exemplified this when asked what her medication was for and the correct way to take it. She could not remember the name of her antibiotic eardrops and used only one drop per ear instead of three as prescribed. She defended herself by stating, “that’s how the doctor explained it to me.” Clearly there are problems in patient education, because the patient misunderstood what the physician told her and never looked at the prescription bottle to read the directions. Improving health literacy and education could reduce these simple errors in communication and prevent potentially dangerous drug misuse.

Project ImpACT Hyperlipidemia focused on improving patient adherence and persistence through education and frequent patient monitoring by pharmacists. It resulted in a 93.6% rate of medication persistence and a 90.1% rate of adherence, as well as improvements in patients’ achievement of National Cholesterol Education Program lipid recommendations. Overall, patients enrolled in Project ImpACT experienced 2-4 fold improvements in outcomes, showing progressive improvements over time.<sup>13</sup> Clearly, improved patient education and regular monitoring by pharmacists can significantly improve medication therapy outcomes. Keeping this in mind, pharmacists need to routinely monitor their patients and provide accurate, understandable, and easily accessible information about medications. They also must make themselves available to answer any questions that a patient may have.

According to an editorial in the *Journal of the American Medical Association* by Dr. William Tierney, adverse drug events are everybody’s problem.<sup>14</sup> They represent a substantial drain on our healthcare resources and negatively impact patient’s lives. Stemming adverse drug events would not only save money and lives, but would improve the overall health of Americans. Fortunately, stronger pharmacist involvement in this area has shown dramatic results. Direct pharmacist involvement in a variety of settings is saving hospitals money and also drastically improving medication therapy outcomes for ambulatory patients as well. While there is no easy answer to eliminating adverse drug events, it is clear that pharmacists hold an extremely important role in reducing them. Perhaps stronger pharmacist involvement, along with improved education and communication among healthcare professionals as well as with patients will help solve the problem of adverse drug events and fulfill the safety need of our patients.

## **How is the U.S. patient population changing?**

**By Athena M. Ling**



As pharmacists, we must make it a priority to serve our patients to the best of our abilities. Even so, this is becoming more and more difficult, because the U.S. patient population is becoming more diverse in terms of age, race, ethnicity, socioeconomic status, religion, sexual orientation, and health beliefs. These changes present multiple challenges to the provision of optimal care. As noted by O'Connell *et al*, "The commonality of our ethical and moral values concerning healthcare is being questioned as we enhance our understanding and practice in a multicultural and especially multifaith country" (p. 1071).<sup>15</sup> As people hold on to their own beliefs about disease and medication, pharmacists must constantly adjust therapeutic treatments that will succeed in conjunction with these beliefs.

The United States has always been a mosaic of different cultures, practices, and belief systems, but this generalization has never been more evident than it is today. The 2000 Census reported that there are 321 different languages spoken in the United States. Furthermore, it was projected that by the year 2050, current racial and ethnic minorities will constitute 50% of the total population.<sup>16</sup> Health disparities among these populations are of particular concern. For instance, the infant mortality rate is twice as high for African Americans, Native Americans, and some Asian-American Pacific Islander groups as compared to whites. Minorities also have a greater incidence of chronic disease.<sup>15</sup> Although these statistics are well documented, there is a lack of awareness of this inequality among the majority population. For example, according to the Harvard Forums on Health, 20% and 65% of whites and African Americans, respectively, believe that minorities receive lower quality healthcare than do whites. And 41% of Hispanics believe minorities receive poorer quality care. Overall, they found that 54% of Americans believe that healthcare professionals treat minority and white patients differently.<sup>17</sup> From these data we see that pharmacists must take extra care to provide quality healthcare to all individuals.

Anne Fadiman's highly acclaimed book, *The Spirit Catches You and You Fall Down*, describes the impact of cultural incompetence in healthcare.<sup>18</sup> She tells the story of Lia Lee, a Hmong child who was diagnosed with a severe case of epilepsy. There were many cultural barriers that hindered Lia's treatment. Her parents spoke no English, and the doctors spoke no Hmong. Even though the doctors had identified Lia's disease; her parents believed her seizures to be the result of the departure of the spirit – "the spirit catches you and you fall down." The parents and doctors were from two cultures and had two very different approaches to treating her condition. The parents called in shamen and made animal sacrifices to appease the spirit. In contrast, the doctors prescribed medication for Lia. Because of misunderstandings and miscommunication, Lia was not medicated properly, her condition worsened, and her health suffered greatly.

In Lia Lee's case, there were clear problems with communication. This is a growing concern in an increasingly multicultural society, in which many of our patients do not know English as their first language. This will require pharmacies to use translation services and other methods of enhancing communication. Also the Lee family, in Anne Fadiman's book held a different health belief system. They did not identify with the "culture of biomedicine." As healthcare professionals, we have a strong belief in medical procedures in general, and the use of medicines in particular. We even use specialized language and terminology when we talk about disease and treatments. We assert that we have the ability to overcome disease solely in biomedical terms. As the U.S. patient population becomes more diverse, they bring many different opinions about traditional medicine. Some may reject Western therapies just like Lia's family, because they simply don't understand or agree with them.

When I discussed this question with my brother and mother, they both pointed out that the percentage of seniors in the U.S. patient population is also on the rise. This

speculation is confirmed by the statistic that over the next 50 years there will be a projected increase of 114% in the number of persons aged 65-84, and a 389% increase of those 85 and older.<sup>16</sup> The ACCP white paper relating to cultural competence notes that ageism is a problem when treating seniors. Preference for treatment may be given to those who are younger and have the longest life expectancy after intervention. Also there is an assumption that helping younger individuals results in more productive “working” citizens.<sup>15</sup>

Increasing diversity encompasses differences in socioeconomic status as well. Currently 24% of blacks, 20% of Hispanics, 10% of Asians, and 8% of whites live below the poverty line.<sup>6</sup> With poverty, comes limited access to healthcare. Another correlate of lower socioeconomic status is that patients may have a harder time understanding basic healthcare instructions.

It is clear that there is a problem with our healthcare system. As future pharmacists, we need to become educators and counselors for all of our patients. We need to improve our quality of care to underserved populations, and we need to ensure that patients are informed and counseled on their medications. As health educators we have the power to help our patients use their medications correctly, so that they can take full advantage of the healthcare system. The lack of cultural competency is increasingly becoming a problem in terms of our ability to reach these goals. All health professionals need to improve the quality of service to individuals from different backgrounds, and pharmacists need to help all patients achieve better medication therapy management. Ongoing changes in the U.S. patient population call for pharmacists to help reduce health disparities by providing culturally competent and proficient care. Pharmacists will need to adjust their services accordingly to better serve this changing patient population.

**How would you describe the types of workers, the necessary training, and technology which are involved in providing pharmacy services in the U.S.?**

**By Rachel M. Sobinsky**



I will never forget my first day of work at the Veterans Affairs Hospital when my new boss introduced me to a very special pharmacist. He began to tell me that his distinguished colleague was able to dispense more medications than any other pharmacist or technician. He also described him as the highest paid pharmacist at around 1.2 million dollars! Much to my surprise, I was being introduced to “Mr. Roberto,” the pharmacy robot. Mr. Roberto comes to mind when I think of the technology which is involved in the provision of pharmacy services today. Other factors of significance to the evolving scope of pharmacy services include the use of supportive personnel, pharmacist specialization, and workforce shortages.

The technology involved in providing pharmacy services has evolved dramatically in recent years. Automated dispensers, computerized physician order entry systems, and pharmacy information systems have all become much more commonly used in pharmacies throughout the United States. The first community pharmacy in which I worked did not have a pharmacy information system or an automatic dispensing machine. Only five years later, it is unusual when a pharmacy does not have a computer system that checks NDC's, shows pictures of medicines, or alerts pharmacists of allergies and drug interactions. It is also becoming more common to utilize e-prescribing software as a way of decreasing medication errors. The perspectives of my parents are very interesting in this regard. Both believe that in the next five years, pharmacists will never have to count another pill due to increased automation. These changes will allow pharmacists to assume a more active role in optimizing the outcomes for medication therapies by providing more sophisticated levels of pharmaceutical care.

The training necessary to provide pharmacy services in the U.S. encompasses changes in the education of pharmacists as well as pharmacy technicians. Recent tragedies due to medication dispensing errors have raised questions concerning the functions which technicians should be allowed to perform and the rigor of their training. In fact, Ohio Senate Bill 203, if passed, would require pharmacy technicians to be appropriately trained and certified. Residency programs are increasingly becoming an important part of the training completed by pharmacists in preparation for providing pharmacy services. There are now two levels of pharmacy residency programs: pharmacy practice residencies (postgraduate year one, PGY1) and specialty residencies (postgraduate year two, PGY2). The American College of Clinical Pharmacy (ACCP) has recommended that, "By 2020, residency training should become a prerequisite for entry into pharmacy practice."<sup>19</sup> My family members were not aware that pharmacists participated in residency programs. My grandma thought that the extra training that a pharmacy resident would gain could be used to improve patient care, decrease adverse effects in patients, and give doctors and pharmacists more of an opportunity to work together. She even thought that pharmacists should complete a residency before going into practice so they can have more experience. There are currently approximately 1,000 accredited pharmacy residency programs in the United States, with PGY1 residency positions accounting for 64% and specialized PGY2 residency positions accounting for 36% of these, respectively.<sup>20</sup> This compares to 770 programs in 2005.<sup>19</sup> These statistics show that the number of residency programs is increasing, and they will need to continue to increase in order to ensure that pharmacists are getting the needed specialized training to provide the best possible care.

Another critical issue of concern in providing pharmacy services relates to the workforce. Pharmacists are in high demand, and a continuing shortage is predicted for the future. Pharmacists rank third behind nurses and physicians in terms of numbers of practitioners. According to the *2008 NABP Survey of Pharmacy Law*, there are 264,960 pharmacists in the U.S.<sup>21</sup> Knapp *et al* predicted that by 2020 this number will approximate 417,000, which is still expected to be significantly below demand.<sup>22</sup> The greatest need for pharmacists in the future is expected to be in primary, secondary and tertiary patient care. Our challenge as a profession is to responsibly employ technology and supportive personnel in order to best utilize the talents of our limited pharmacist workforce to optimize medication therapy outcomes.

## How is the work of the pharmacist (the things that pharmacists do) changing?

By Heather N. Whitehead



"I have found it is much more effective to call a pharmacist with questions about a drug or possible side effect than to call the physician. The physician or nurse cannot possibly keep up with all of the details of each medication and potential for drug interactions, especially when multiple doctors and multiple medications from each doctor are involved. The pharmacist is the patient's last line of defense in preventing interactions." The previous thought was articulated by my uncle in response to the question, "How is the work of the pharmacist changing?" His idea largely coincides with the goals of progressive pharmacy practices such as medication therapy management and disease state management.

The Joint Commission of Pharmacy Practitioners has promulgated a "Future Vision of Pharmacy Practice," which includes the input of eleven national pharmacy organizations. They project that by the year 2015, "Pharmacists will be the health care professionals responsible for providing patient care that ensures optimal medication therapy outcomes."<sup>23</sup> Services such as medication therapy management (MTM) will facilitate the achievement of this vision. MTM services are designed to improve care, enhance communication among patients and providers, improve collaboration among providers, and optimize medication use for improved patient outcomes.<sup>24</sup>

The MTM model achieves these goals through five core components: medication therapy review, a personal medication record, a medication action plan, intervention and referral, and documentation and follow-up. The medication therapy review (MTR) serves as the foundation of the MTM model. MTRs are conducted annually, and they involve the patient and the pharmacist. The MTR can be comprehensive or targeted to a specific medication problem. In a comprehensive MTR, the patient presents all prescription and non-prescription medications that they are taking. The pharmacist then reviews them for appropriateness and works with the patient and prescriber to improve the patient's self-management of their medication therapies. Targeted MTRs address new medication problems which may arise due to changes in a patient's health status (e.g., new conditions, surgeries, etc.). The MTR allows for the generation of a portable record of the patient's medications that includes: their name, medication and intended use, directions for use, and the name of the pharmacist and prescriber. This document is referred to as the Personal Medication Record (PMR). The PMR can be used personally by the patient or can enhance continuity of care if it is voluntarily shared with other healthcare professionals. One final important component of the patient care process is the Medication Action Plan or MAP. After the MTR is completed, the patient receives a MAP created in collaboration with the patient, pharmacist, and other healthcare providers that contains information the patient can utilize to improve medication self-management. Use of the MAP supports uniformity and consistency

among caregivers. In order for the MTM service to be completely effective, follow-up appointments with the patient are made according to individual patient needs.

In addition to involvement in MTM, disease state management allows pharmacists to be actively involved in a process that works to identify and treat, as well as prevent diseases in patient populations. The Academy of Managed Care Pharmacy defines disease state management as, “a continuous, coordinated, evolutionary process that seeks to manage and improve the health status of a carefully defined patient population over the entire course of a disease.”<sup>25</sup> Diseases deemed appropriate for this type of program include highly prevalent chronic diseases, diseases with a high risk of treatment failure, or those with expensive treatments or multiple treatment options. Specific actions pharmacists can take in disease state management include evaluating the use and need for medications, recommending appropriate dosages, monitoring the length of therapy, re-evaluating selected medications, and monitoring patient adherence. Pharmacists may also take on the role of educator by teaching patients about a particular disease, related coping strategies, and techniques of monitoring the progress of their disease. As the trained medication management specialist, the pharmacist will be able to hold a leadership role in the development, implementation, and improvement of these types of programs.

Aside from assisting in the management of disease and use of medication, pharmacists also have the opportunity to participate in disease prevention. By participating in a training program, Ohio pharmacists are able to provide adult immunizations for diphtheria, hepatitis A and hepatitis B, influenza, meningococcal, pneumococcal, and tetanus. Because pharmacists are accessible and have frequent interactions with patients, utilizing them as immunizers is very sensible as well as effective. In addition to having the ability to provide immunizations, pharmacists can also act as vaccine advocates by motivating their patients to be immunized.

The emerging model of MTM in conjunction with disease state management and pharmacist-provided immunizations largely encompasses the Joint Commission of Pharmacy Practitioners’ (JCPP) vision statement for pharmacy practice in the year 2015.<sup>23</sup> JCPP predicts that, “Pharmacists will have the authority and autonomy to manage medication therapy and will be accountable for patients’ therapeutic outcomes. In doing so, they will communicate and collaborate with patients, care givers, health care professionals, and qualified support personnel.” Pharmacists are the professional healthcare providers that patients turn to as a trusted and accessible source of information and advice regarding the safe, appropriate, and cost-effective use of medications. In order to provide this level of care, we as future pharmacists must be committed to care for, and care about, patients. Instead of merely being a person who stands behind a counter and dispenses medications, pharmacists, through services such as MTM and disease state management, provide patient-centered and population-based care that optimizes medication therapy. Ultimately, our goal as future practitioners should be to enhance the pharmacists’ role in our nation’s healthcare system by providing patient-centered care that optimizes medication therapy, manages disease states, and improves therapeutic outcomes.

## **Conclusion**

The dynamic evolution of pharmacy practice, as seen through the eyes of new professional students, encompasses the need for improvements in medication safety, access to pharmaceutical care, reducing the incidence of adverse drug events, enhancing cultural competence in the deliver of care, incorporating the prudent use of

technology and supportive personnel, the acquisition of advanced training for delivering pharmaceutical care, involvement in disease state management, and the delivery of medication therapy management services.

Michael Manolakis recently wrote in the *American Journal of Pharmaceutical Education*<sup>26</sup> that practitioner and student “followers” will need to “lead up” if we are to realize the JCPP “Future Vision of Pharmacy Practice.”<sup>23</sup> That is, in addition to the efforts of national pharmacy leaders and the demographic and attitudinal impact of the aging baby boomer population, the individual and collective efforts of practitioners are critical for realizing this vision. The essays provided in this article demonstrate that our students clearly see the nature of the problems relating to medication therapy in our healthcare system, but they are excited about the role they will play as future pharmacists to help solve these problems. If we can help them sustain this passion to provide high quality care for their patients, our future is indeed in good hands!

## References

- <sup>1</sup> Pink DH. *A Whole New Mind: Why Right-Brainers Will Rule the Future*. New York: Riverhead Books, 2006.
- <sup>2</sup> Paulozzi L and Annett J. “Unintentional Poisoning Deaths – United States, 1999-2004.” *Morbidity and Mortality Weekly Report* 2007;56(05):93-96.
- <sup>3</sup> Aspden P, Wolcott JA, Bootman JL, Cronenwett LR (eds.). *Preventing Medication Errors*. Washington, DC: The National Academies Press, 2007.
- <sup>4</sup> Substance Abuse and Mental Health Services Administration. *Results from the 2006 National Survey on Drug Use and Health: National Findings*. (NSDUH Series H-32, DHHS Publication No. SMA 07-4293). Rockville, MD: Office of Applied Statistics. 2007.
- <sup>5</sup> Office of National Drug Control Policy, Executive Office of the President. *Teens and Prescription Drugs: An Analysis of Recent Trends on the Emerging Drug Threat*. February 2007.
- <sup>6</sup> DeNavas-Walt C, Proctor BD, Smith J. *Income, Poverty, and Health Insurance Coverage in the United States: 2006*. U.S. Census Bureau, Current Population Reports, P60-233. Washington DC: U.S. Government Printing Office, 2007.
- <sup>7</sup> World Health Organization. “Counterfeit Medicines.” <http://www.who.int/mediacentre/factsheets/fs275/en/index.html>. Accessed June 23, 2008.
- <sup>8</sup> Donohue JM, Cevasco M, Rosenthal MB. “A Decade of Direct-to-Consumer Advertising of Prescription Drugs.” *New England Journal of Medicine* 2007;357:673-81.
- <sup>9</sup> Slone Epidemiology Center at Boston University. “Patterns of Medication Use in the United States 2005: A Report from the Slone Survey.” <http://www.bu.edu/slone/SloneSurvey/AnnualRpt/SloneSurveyWebReport2005.pdf>. Accessed June 23, 2008.
- <sup>10</sup> Ernst FR and Grizzle AJ. “Drug-Related Morbidity and Mortality: Updating the Cost-of-Illness Model.” *Journal of the American Pharmacists Association* 2001;41(2):192-99.
- <sup>11</sup> Leape LL, Bates DW, Cullen DJ, Cooper J, Demanaco HJ, Gallivan T, Hallisey R, Ives J, Laird N, Laffel G, Nemeskal R, Peteren LA, Porter K, Servi D, Shea BF, Small SD, Sweitzer BJ, Thompson BT, Vander Vliet M. “Systems Analysis of Adverse Drug Events.” *Journal of the American Medical Association* 1995;274(1):35-43.
- <sup>12</sup> Leape LL, Cullen DJ, Clapp M, Dempsey MS, Burdick E, Demanaco HJ, Erickson JI, Bates DW. “Pharmacist Participation on Physician Rounds and Adverse Drug Events in the Intensive Care Unit.” *Journal of the American Medical Association* 1999;282(3):267-70.
- <sup>13</sup> Bluml BM, McKenney JM, Cziraky MJ. “Pharmaceutical Care Services and Results in Project ImPACT: Hyperlipidemia.” *Journal of the American Pharmacists Association* 2000;40:157-65.
- <sup>14</sup> Tierney WM. “Adverse Outpatient Drug Events – A Problem and an Opportunity.” *The New England Journal of Medicine* 2003;348(16):1587-89.
- <sup>15</sup> O’Connell MB, Korner EJ, Rickles NM, Sias JJ. “Cultural Competence in Health Care and Its Implications for Pharmacy.” *Pharmacotherapy* 2007;27(7):1062-1079.
- <sup>16</sup> U.S. Census Bureau. “Population Projections, U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin: 2000-2050.” <http://www.census.gov/ipc/www/usinterimproj/>. Accessed June 23, 2008.
- <sup>17</sup> The Harvard Forums on Health. “Americans Speak Out on Disparities in Health Care. 2003.” [http://www.phsi.harvard\\_reform/poll\\_media\\_report\\_disparities.pdf](http://www.phsi.harvard_reform/poll_media_report_disparities.pdf). Accessed June 23, 2008.
- <sup>18</sup> Fadiman A. *The Spirit Catches You and You Fall Down: A Hmong Child, Her American Doctors, and the Collision of Two Cultures*. New York: Farrar, Straus and Giroux, 1997.
- <sup>19</sup> Murphy JE, Nappi JM, Bosso JA, Saseen JJ, Hemstreet BA, Halloran MA, Spinler SA, Welty TE, Dobesh PP, Chan L-N, Garvin CG, Grunwald PE, Kamper CA, Sanoski CA, Witkowski PL. “American College of Clinical Pharmacy’s Vision of the Future: Postgraduate Pharmacy Residency Training as a Prerequisite for Direct Patient Care Practice.” *Pharmacotherapy* 2006;26(5):722-33.
- <sup>20</sup> Warner D. (Director, Residency Program Development, American Society of Health-System Pharmacists) (Personal Communication, June 24, 2008).
- <sup>21</sup> National Association of Boards of Pharmacy. *2008 Survey of Pharmacy Law*. Mount Prospect, IL: National Association of Boards of Pharmacy, 2008.
- <sup>22</sup> Knapp DA. “Professionally Determined Need for Pharmacy Services in 2020.” *American Journal of Pharmaceutical Education* 2002;66:421-29.

---

<sup>23</sup> Joint Commission of Pharmacy Practitioners. "JCPP Future Vision of Pharmacy Practice, 2004." <http://www.aacp.org/site/page.asp?TRACKID=&VID=1&CID=1177&DID=6724>. Accessed June 24, 2008.

<sup>24</sup> American Pharmacists Association and the National Association of Chain Drug Stores Foundation. *Medication Therapy Management in Community Pharmacy Practice: Core Elements of an MTM Service*. Washington DC: American Pharmacists Association, 2005.

<sup>25</sup> Academy of Managed Care Pharmacy. "Disease State Management/Health Management." [www.amcp.org/data/legislative/concepts/Disease%20State%20Management.pdf](http://www.amcp.org/data/legislative/concepts/Disease%20State%20Management.pdf). Accessed June 24, 2008.

<sup>26</sup> Manolakis M. "Leading Up: Moving Pharmacy Toward the 2015 Vision." *American Journal of Pharmaceutical Education* 2008;72(3):Article 55.