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Executive Vice President and Chief Executive Officer
American Medical Association
515 N. State Street
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Dear Dr. Maves:

The American Society of Health-System Pharmacists (ASHP) provides these comments on the recently published *AMA Scope of Practice Data Series, Compendium on Pharmacists*. We are chagrined that the AMA would attempt to define, describe, and prescribe the scope of practice of pharmacists. Furthermore, we believe that the inaccuracies, false statements, errors of fact, and mischaracterizations in the document could not go unanswered. The attached comments are intended to correct key points in the AMA Scope of Practice document.

Of particular concern was the repeated characterization of pharmacists as having inadequate education and training, suggesting that their patient care roles should be limited. While the pharmacy workforce varies with respect to degrees and level of residency training, one fact that should not be in dispute is the level of basic sciences (pharmaceutical and biomedical), pharmacology and therapeutics training that pharmacists receive as compared to physicians. Most physicians are not substantially educated about the use of medications until they are well into their residency training. In fact, pharmacists in academic health science centers and elsewhere often play a key role in assuring that resident physicians learn to prescribe appropriately and safely.

At a minimum, AMA should send a substantial correction to recipients of the pharmacist data series or consider retracting the document altogether. There is a great deal of data in the periodical literature and other credible sources supporting the benefits to patients when pharmacists are involved in team based care. We would hope that there will be continued opportunities to collaborate with physician colleagues on developing models of care that result in improved drug, biological, vaccine and contrast media outcomes and safety for patients.

Sincerely,

Henri R. Manasse, Jr., Ph.D., Sc.D.
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American Society of Health-System Pharmacists

xc: ASHP Board of Directors
Academy of Managed Care Pharmacy
Accreditation Council for Pharmacy Education
American Association of Colleges of Pharmacy
American College of Apothecaries
American College of Clinical Pharmacy
American Pharmacists Association
American Society of Consultant Pharmacists
National Community Pharmacists Association
International Pharmaceutical Federation

Comments by the American Society of Health-System Pharmacists (ASHP) on the American Medical Association's (AMA) Scope of Practice Data Series document about pharmacists, released in September 2009:

ASHP is the national professional association representing over 35,000 pharmacists who practice in hospitals, interdisciplinary clinics of hospitals and health maintenance organizations, home care, and long-term-care settings. ASHP's membership also includes pharmacy students and pharmacy technicians. Common to all these settings are organizational oversight and management of all the health professionals providing care to the organization's patients, collaborative and interdisciplinary patient care, credentialing of health professionals, adherence to external quality standards, and institutional and individual accountability. For brevity in this communication, we will refer to these environments as health systems. ASHP has authoritative expertise about medication use in health systems and can speak with an undiluted focus on those matters.

ASHP recognizes that the AMA document dealt mostly with evolving scopes of practice (SOPs) in community pharmacy. It is not ASHP's purview or expertise to comment in detail on SOPs in the community pharmacy arena. We will leave that commentary to those organizations whose focus is on community pharmacy practice. AMA should be aware, however, that in community pharmacy there are evolving circumstances and instances in which collaborative modifications of traditional SOPs are logical and do lead to improvements in patient care.

Who determines scopes of practice for health professionals?

SOPs are determined on the basis of patients' needs and the qualifications and accountabilities of the health professionals who can best meet those needs. Four primary avenues exist for determining SOPs for health professionals. First, SOPs in the health professions are ultimately a creation of the citizens, speaking through their elected representatives, who enact *laws and related regulations and administrative procedures* about what health care practitioners are allowed or not allowed to do.

Second, regulatory bodies allow *institutions such as hospitals and other health systems to implement modified SOPs* within limits for the health professionals that collaboratively care for patients as long as adequate internal safeguards and accountability are ensured. AMA's document lightly acknowledged the collaborative successes of physicians and pharmacists in hospitals. An important purpose of this letter is to bring further emphasis to that and to urge medical groups and public policy makers to preserve that important avenue for determining SOPs in hospitals and other health systems.

Third, as the AMA document acknowledged, the citizens (through laws and regulations) permit individual physicians and pharmacists to *forge modified, collaborative SOPs among themselves*, when they believe this will best serve patients' needs, for example through collaborative practice

agreements (CPAs). The AMA document focused primarily on this third process for modifying SOPs in community pharmacy.

And fourth, the self-determined knowledge, skills and behavioral traits (e.g. values, attitudes, perspectives) of the profession rooted in their respective sciences and *secundum artem*.

AMA's expression of concern about community pharmacy could lead medical groups and policy makers to make uninformed decisions with respect to the SOPs of health-system pharmacists. ASHP therefore finds it necessary to provide better information about this matter. ASHP will be sharing this information with medical and pharmacy groups and with public policy makers.

The AMA document ignores increasing medication-use problems and unmet patient needs.

The AMA document failed to acknowledge the extent of and hazards of medication misuse* in the United States and the valuable contributions that pharmacists already make toward mitigating those problems. Most importantly it failed to acknowledge that given the increasing potency, hazards, and complexity of medication therapy, medication misuse will likely get worse unless qualified health professionals collaborate on ways to make medication use safer and more effective for patients. ASHP believes that the dimensions of this problem justify it as a major public health issue.^{1,2}

The AMA document failed to acknowledge that physicians alone cannot adequately prevent or resolve all medication-use problems. It failed to acknowledge that pharmacists are the only health professionals with the depth of education, training, experience, and interest to apply their full-time collaborative efforts to preventing and resolving the problems. A simple comparison of the curricular requirements of pharmacists as compared to physicians exemplifies this point. The AMA document only lightly acknowledged that the evidence is already well established that expansions in pharmacists' SOPs in health systems have led to positive patient outcomes and not to patient harm.

The document failed to acknowledge that unmet patient needs with respect to medication use have been and continue to be the ultimate driving force behind changes in the SOPs of pharmacists. Rather, the document depicted evolving SOP changes (at least in community pharmacy) as worrisome incursions into the domain of more highly educated and trained physicians. Fashioned as a communication to state medical associations, national medical specialty societies, and policymakers, it seemed intended to rally them to preserve the status quo and to label pharmacists as incapable of preventing and resolving medication-use problems. The document inadequately acknowledged that many health-system pharmacists, by virtue of their education, training, experience, and supportive organizational settings, are especially well qualified to assist. The document had a defensive tone and did not call upon medical groups to take a positive collaborative approach with qualified pharmacists to address the unmet needs of patients. Nor did it call for the groups' support of evidence-based SOP changes with respect to pharmacists in any setting.

* Includes drugs, biologicals, vaccines and chemical agents in contrast media and diagnostic agents.

Distinct attributes of health systems and health-system pharmacy practice.

In health systems, patient need has consistently been the driver of SOP changes for pharmacists. There is an established history of successful collaborative and expanded SOP activities of health-system pharmacists working with physicians, nurses, and others in the patient care process. Hospital pharmacy has a long history, beginning with organized medication acquisition and distribution in hospitals up through the 1930s. However, by the 1940s it was apparent that the drug-related needs of patients in hospitals demanded pharmacists with more advanced drug knowledge and institutional competence. ASHP was founded in 1942 with a focus on efforts to establish standards of care and ensure the competence of hospital pharmacists. Hospital pharmacists launched postgraduate, post-licensure residencies to cultivate pharmacists capable of meeting the needs of hospitalized patients in the 1960s. Medication-use safety was a high priority for hospital pharmacists. In the 1960s, with federal research funding, hospital pharmacists, pharmacy academics, and ASHP quantified and publicized the safety hazards in hospital drug distribution processes and developed and researched fundamental reforms to improve safety.³ Patient safety was the primary driver for the changes.

In the 1970s hospital pharmacists began expanding their focus from drug product preparation and distribution to clinical monitoring and collaborative interventions to ensure safe and effect medication use. Postgraduate Doctor of Pharmacy degrees were created to better prepare pharmacists for clinical practice. Increasingly, medication therapy in hospitals (and now extending into all other health-system settings) has become immensely more potent, inherently more hazardous, and more complex. Health-system pharmacists have met those challenges by increasing the educational requirements for both the pharmacists and pharmacy technicians employed, expanding postgraduate, post-licensure residencies, establishing formal credentialing processes for staff, and increasing collaboration and team work with physicians and nurses.

By the millennium, pharmacy made the decision to reform its education and to require doctorate-level education with intense clinical content for all pharmacy graduates. Pharmacy also created formal board certifications in several specialty areas.⁴ Health-system pharmacists have embraced the pursuit of such training and certification as ways to improve and sustain their knowledge and competence. More recent developments in health-system pharmacy have included a vigorous system-wide focus on medication-use safety, intensifying the development of health-system pharmacy practice leaders, and the integration of technology to improve medication-use processes.⁵

Unmet patient needs drove all of these changes. Importantly, SOP expansions for pharmacists in health systems have not been motivated by desires for more power or greater professional autonomy. Health-system pharmacists have never sought independent prescribing authority. Nor were the expansions motivated by personal compensation. Health-system pharmacists are virtually all employees of their health systems and do not gain financially by expansions in SOPs, even though these expansions serve to enhance the fiscal integrity of the health system.

Health system pharmacy's pursuit of federal provider status enabling federal reimbursement to health systems is motivated by pharmacists' desire to administer health-system services that will meet patient needs. As is well documented in the health literature, many services (e.g., anticoagulation monitoring and dosing clinics) can be administered by pharmacists using

interdisciplinary teams including pharmacists, physicians, and nurses. Most physicians are probably unaware that a bureaucratic lack of a federal “provider status” designation for pharmacists perversely requires the health system to place a non-pharmacist with a “provider status” in charge of the service, even if the primary focus of the service is to manage patients’ medication therapy. Otherwise, the health system cannot receive Medicare reimbursement for the service. This impedes pharmacist involvement and the development of badly needed services. In the absence of the services, patients’ needs are not adequately met.

The Education and training of health-system pharmacists is more advanced. The AMA document focused attention on pharmacy’s entry-level Doctor of Pharmacy degree and asserted that pharmacy students are not sufficiently educated or trained to engage in expanded SOP activities. ASHP does not accept that AMA assertion. The accreditation standards for Doctor of Pharmacy degree programs are consistent with the core competencies in the Institute of Medicine’s report *Health Professions Education: A Bridge to Quality* (2003).^{6,7} They are to produce graduates able to provide patient-centered care, work in interdisciplinary teams, employ evidence-based practice, apply quality improvement, and utilize informatics. A careful and objective analysis of the pharmacy curriculum will demonstrate this position.

The AMA document lightly acknowledged that some pharmacists do participate in postgraduate residencies. What the document did not acknowledge is that the proportion of residency-trained and specialty-certified pharmacists in the health-system work force is higher than in other pharmacy practice settings. This contributes to the competence of health-system pharmacists and fosters collaborative respect and trust among physicians, pharmacists, nurses, and others in health systems. This has fostered successful expansions of SOPs in health systems. In its vision about the pharmacy work force in hospitals and health systems ASHP has stated unequivocally that eventually *every* pharmacist in health systems will have to have advanced training and credentials.⁸ ASHP is the sole accrediting body in the United States for pharmacy residencies and is recognized by the Centers for Medicare & Medicaid Services.⁹ ASHP is a member of the Association of Specialized and Professional Accreditors.¹⁰ There are more than 1,100 accredited pharmacy residency programs in the United States that graduate about 2,200 residents per year, most of whom practice in hospitals and other health systems.

A related factor is the competence of pharmacy technicians in health systems. It was health-system pharmacists who pioneered formal training of pharmacy technicians and championed the establishment of formal certification requirements for pharmacy technicians.¹¹ ASHP is the sole accrediting body for formal pharmacy technician training programs in the United States.¹² The reason for this support by health-system pharmacists was simple and was based on patient need.

The finite resources available to health-system pharmacy departments make it impossible for health-system pharmacists to attend to all of the medication-related clinical needs of patients and to collaborate with other caregivers to address medication-use issues when pharmacists must apply their time to medication-distribution tasks. Yet, to assign the distribution tasks to pharmacy technicians makes sense only if the pharmacy technicians are adequately qualified and credentialed. Health-system pharmacy has a long history and tradition of supporting the expansion of pharmacy technicians’ roles as long as their education, training, credentials, and experience qualify them. Moreover, a strong and effective supervisory and accountability model must be in place.

There is a fitting parallel in this to AMA's view that expanding the SOPs of pharmacists is dependent on similar criteria about pharmacists. In contrast, however, health-system pharmacy is not resisting SOP expansions for pharmacy technicians. Health-system pharmacy is working with pharmacy technicians to make their roles collaborative, effective, and safe. We believe there is a valuable collaborative blueprint in that approach that AMA should consider with respect to the expansion of pharmacists' SOPs: In order to meet patients' needs, embrace collaborative SOP changes for pharmacists, and construct a future together that will best meet those needs. The dimensions of medication misuse simply are too great to believe that they can be adequately addressed by physicians alone.

Evidence of benefits exists. As the AMA document noted, "The pharmacy literature is replete with clinical studies and economic analyses demonstrating the benefits of pharmacist participation in patient care." The document also noted that most of that literature pertains to institutional and inpatient care. Importantly, there is virtually no evidence of negative patient outcomes from both traditional and expanded SOPs of health-system pharmacists. This warrants some emphasis, and AMA should acknowledge the proven effectiveness of health-system pharmacists. As laws and regulations evolve with respect to SOPs for pharmacists, appropriate allowance and recognition must occur for the proven benefits of health-system pharmacists' roles. A "one size fits all" approach to regulating SOPs for all of pharmacy - particularly to the extent that poorly crafted provisions might interfere with collaboratively meeting the needs of patients in health systems - would be extremely unwise public policy.

Although the AMA document did acknowledge that there is literature evidence of patient benefits from expanded involvements by health-system pharmacists, medical groups and public policy makers might find the attached bibliography especially helpful. The chosen literature (only a portion of what is available) deals mostly with patient outcomes. There is substantial other literature (also not included) that deals with economic benefits.

In addition to evidence in the literature, there are major quality groups and other organizations that have either called explicitly for the involvement of pharmacists or called for improved collaboration among caregivers.

- a. The 2009 update of the National Quality Forum's consensus report, *Safe Practices for Better Healthcare* said, "Pharmacy leaders should have an active role on the administrative leadership team that reflects their authority and accountability for medication management systems performance across the organization."¹³
- b. The Institute of Medicine's report, *Crossing the Quality Chasm: A New Health System for the 21st Century* highlights the importance of effective teams in delivering care to patients and populations.¹⁴
- c. A joint statement of ASHP and the Society for Hospital Medicine in 2007 said,¹⁵ "Pharmacists should be involved in the care of hospitalized patients and can collaborate with hospitalists in numerous ways, including
 - Providing consultative services that foster appropriate, evidence-based medication selection (e.g., during rounds),

- Providing drug information consultation to physicians, nurses, and other clinicians,
 - Managing medication protocols under collaborative practice agreements,
 - Assisting in the development of treatment protocols,
 - Monitoring patient therapeutic responses (including laboratory values),
 - Continuously assessing for and managing adverse drug reactions,
 - Gathering medication histories,
 - Reconciling patients' medications as patients move across the continuum of hospital care, and
 - Providing patient and caretaker education, including discharge counseling and follow-up.
- d. In a 2000 position paper¹⁶, the Society of Critical Care Medicine said that to provide the best care to patients,
- The pharmacist's time is dedicated to critical care patients, with few commitments outside the ICU area.
 - The pharmacist prospectively evaluates all drug therapy for appropriate indications, dosage, drug interactions, and drug allergies, monitors the patient's pharmacotherapeutic regimen for effectiveness and ADEs [adverse drug events]; and intervenes as needed.
 - In conjunction with the clinical dietitian, the pharmacist evaluates all orders for parenteral nutrition and recommends modifications as indicated to optimize the nutritional regimen.
 - The pharmacist identifies ADEs and assists in their management and prevention, and develops process improvements to reduce drug errors and preventable ADEs.
 - The pharmacist uses the medical record as one means to communicate with other health care professionals and to document specific pharmacotherapeutic recommendations.
 - The pharmacist provides pharmacokinetic monitoring when a targeted drug is prescribed.
 - The pharmacist provides drug information and intravenous compatibility information to the ICU team.
 - The pharmacist documents clinical activities that include, but are not limited to, disease state management, general pharmacotherapeutic monitoring, pharmacokinetic monitoring, ADEs, education, and other patient care activities.
 - The pharmacist acts as a liaison between pharmacy, nursing, and the medical staff to educate health professionals regarding current drug-related procedures, policies, guidelines, and pathways.
- e. The 2007 Accreditation Council for Graduate Medical Education's *Common Program Requirements: General Competencies* require that medical residents be able to work in interprofessional teams to enhance patient safety and improve patient care quality.¹⁷
- f. The 1998 Pew Health Professions Commission's fourth report, *Recreating Health Professional Practice for a New Century*, specified working in interdisciplinary teams as a key desired competency and noted that the coordinated efforts of practitioners from

many disciplines provide the best outcomes for the sickest patients. The report noted that the future of medicine will call on all health professions - doctors, dentists, nurses, pharmacists, allied professionals, and public health and social workers - to work together in more focused ways. To assure effective and efficient coordination of care, health professionals must work interdependently in carrying out their roles and responsibilities, conveying mutual respect, trust, support, and appreciation of each discipline's unique contributions to health care.¹⁸

- g. The 2010 *Guidelines for Essential Services, Personnel, and Facilities in Specialized Epilepsy Centers*, issued by the National Association of Epilepsy Centers, lists a "Pharmacologist or Pharm.D. with interest and training in epilepsy" among the essential personnel in specialized epilepsy centers.¹⁹
- h. The 2008 criteria of the United Network for Organ Sharing require that "All transplant programs should identify one or more pharmacists who will be responsible for providing pharmaceutical care to solid organ transplant recipients."²⁰
- i. The Association of American Medical Colleges's 2000 *Graduate Medical Education Core Curriculum* includes the objective that medical residents should demonstrate the ability to work in team settings.²¹
- j. In 2007 the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America released guidelines for developing an institutional program to enhance antimicrobial stewardship. The guidelines recommend that "Core members of the multidisciplinary team include ... a clinical pharmacist with infectious disease training."²²
- k. The Bureau of Health Professions, Health Resources and Services Administration report, *Family Medicine. Report on Undergraduate Medical Education for the 21st Century (UME-21): A National Medical Education Project (Supplement - January 2004, Volume 36)* identified curriculum domains and included a learning objective to "promote effective working relationships with other healthcare professionals to foster teamwork and organization change."²³
- l. In 2007, the Committee on the Future of Emergency Care in the United States Health System, in *Hospital-Based Emergency Care: At the Breaking Point*, advocated more active pharmacist involvement.²⁴

Regulatory mechanisms are in place. Fortunately, state pharmacy regulatory boards have been supportive of expansions in SOPs for health-system pharmacists. At the same time, however, they maintain strict regulatory scrutiny and enforcement authority to act (via licensure suspension and revocations) when SOP transgressions occur. Further, most BOPs are organized within larger umbrella health regulatory board structures within state governments, enabling their coordination of regulatory interventions and prosecutions among pharmacy, medical, and nursing licensing boards whenever needed.

An excellent guidance document titled *Changes in Healthcare Professions' Scope of Practice Legislative Considerations* was developed in 2006 and revised in 2009 by the Association of Social Work Boards, the Federation of State Boards of Physical Therapy, the Federation of State Medical Boards, the National Board for Certification in Occupational Therapy, the National Council of State Boards of Nursing, and the National Association of Boards of Pharmacy.²⁵ That guidance outlined four criteria for legislatively enabling SOP changes when they are needed: (1) an established history of the practice scope within a profession, (2) education and training to support the changes, (3) supporting evidence for the changes, and (4) an appropriate regulatory environment. As explained above, in the case of health-system pharmacy, all four of those criteria are well met.

Comments about specific parts of the AMA document.

1. The tables in the document clearly represented a snap shot in time. It would be helpful to add a date to each table with a footnote to caution readers to anticipate the inevitable obsolescence of the information.
2. In Table 4, the document said that in several states collaborative practice agreements are patient specific. However, that typically is not the case (and it does not need to be so) for health-system patients. Health systems are, by their very design, collaborative practice environments.
3. The document said
 - “The health and safety of patients are threatened ...when [non-physician providers] are permitted to perform services that are not commensurate with their education or training.”
 - “... limitations in the education and/or training of non-physician health care providers that may result in the substandard or potentially harmful care of patients ...
 - “... solutions to actual or perceived work force shortages simply cannot justify practice expansions that expose patients to unnecessary health risk.”
 - “... 10 distinct non-physician professions that are currently seeking scope of practice expansions that may be potentially harmful to the public.”
 - “... advocacy campaigns where the health and safety of patients may be threatened as a result of unwarranted scope of practice expansions sought by non-physician health care providers.”

All of these warnings appeared on the very first Overview page that introduced the document. They seemed intended to provoke fear and alarm, and they establish a negative tone for the rest of the document. The rest of the document, however, provided no evidence at all that any scope expansions for pharmacists (in any setting) have actually led to patient harm. The documented evidence is clear, in fact, that every SOP modification for pharmacists has led to positive patient outcomes. Further, we assert that the admonitions stated are relevant to physicians as well.

4. The Overview said that the document would provide information “... on the qualifications physicians possess that prepare them to accept the responsibility for full, unrestricted licensure to practice medicine in all its branches.” That information was not provided in the document. It would be useful to consider whether it remains good public policy to allow all physicians to prescribe all available prescription drugs in the U.S.

5. The document made clear in the Introduction that its main focus was on collaborative drug therapy management (CDTM) and depicted it as a scope expansion. Primarily, the document focused concern about the qualifications of community pharmacists to perform CDTM.
6. In contrast, in the first complete paragraph on page 6, the document acknowledged the benefits of pharmacist participation in patient care in institutions. The document attributed this to institutional oversight. ASHP agrees with that observation but encourages a much deeper understanding and acknowledgement of the factors that contribute to the benefits, including advanced education and training of health-system pharmacists and pharmacy technicians, certification of pharmacy technicians, formal board certification for pharmacists, adherence to external quality standards, direct access to patients and their health records, and the collegial and interdisciplinary nature of health-system care. Importantly, the document failed to call upon medical groups and policy makers to preserve and sustain that kind of care by health-system pharmacists. Instead, the overall tenor of the document seemed to be a call for resisting any scope expansions by any pharmacists.
7. At the end of the second complete paragraph on page 6, the document said, "... there are no accreditation standards or other evidence that the [pharmacy] profession has modified the quality or manner in which pharmacy students are trained to provide direct care to patients." Actually, the 2007 accreditation standards for Doctor of Pharmacy degree programs require that 30 percent of the curriculum be in the form of pharmacy experience.⁴ Hence, the statement is patently false.
8. On page 8, the document began a discussion of formal specialties in pharmacy. It omitted one specialty: Ambulatory Care.
9. On pages 9 and 10, the document included 5 paragraphs about the history of pharmacy. Understandably, the document could not devote more space to this subject. The material presented was rudimentary and marginally useful as far as it went. However, it depicted pharmacy's changes as mostly the result of things like soldiers returning from war and consumer movements. The material seriously failed to explain the immense expansion in the number of more potent, more hazardous, and more complex medications and the resulting need for managing the medication therapy of patients as being the primary stimuli for the changes in the pharmacy profession. It neglected extensive advancements in the sciences related to drug discovery and dosage form development.
10. It is unclear why, on page 11, pharmacists' salaries were discussed (another snap shot in time). The data were irrelevant to the matter of SOPs.
11. A lengthy discussion of the Asheville Project was included, but the document failed to note whether AMA regarded this as a scope expansion for pharmacists. If it does not represent an expansion, why was it in the document? AMA was silent about whether it regarded the described roles of pharmacists in the Asheville Project as positive or negative.
12. Section IV of the document was titled "Billing for Services," but it actually was a discussion of medication therapy management (MTM) services. The document did not make clear whether AMA viewed MTM as a scope expansion.
13. In section V about pharmacy education, a table about the content of pharmacy school curriculums was presented. Interestingly, there was no corresponding table about the content of medical school curriculums. Nor was there any acknowledgement that, in their education, pharmacists receive far more didactic education about medication

therapy than do physicians. Nor was there any acknowledgement that the greatest proportion of the learning of physicians about drugs occurs during residencies through a Socratic method. For pharmacists who complete residencies, they receive both the more intense didactic education of pharmacy students *and* they experience the same type of practical, “application” learning about medication use during their residencies. Further, they receive more of it than medical residents, since the entire focus of pharmacy residencies is on medication use.

14. In section V about pharmacy education, on pages 23 and 24, the document said, “Neither [the Accreditation Council for Pharmacy Education] ACPE nor state licensing requirements mandate direct patient contact as a requirement for student practice experience.” Actually, both require actual experience in pharmacy, which inherently is a direct patient contact profession.⁽⁴⁾ Again, the AMA statement is patently false.
15. Section V of the document discussed the entry-level education of pharmacists and postgraduate residency training, noting that 10% of students enter pharmacy school having completed a bachelor’s degree. In health system pharmacy, we believe the proportion of pharmacists with degrees (in addition to the entry-level degree) is higher. Some of the additional degrees are earned before entry to pharmacy school, and some after graduating.
16. On page 7 of the document, AMA said, “Physicians are encouraged to thoroughly consider a pharmacist’s education, training, and experience when evaluating his or her competence to assist the physician’s patients with their medication regimen(s).” Unsaid is the reality that pharmacists will, similarly, evaluate the competence of physicians to be appropriate partners in collaborative practice agreements. Regrettably, in section VI about CDTM, the document pejoratively said on page 27, “It is imperative that a physician entering into a CPA with a pharmacist be cognizant of the limited training pharmacists receive in comparison to their own.” We assert that physicians be more transparent as to how they select and prescribe drug therapy via their scientific and clinical evidence base.
17. Page 24. ASHP is the sole accrediting body for all pharmacy residencies and promulgates the related standards.⁷
18. Page 28 of the document badly misled readers in suggesting that pharmacists seek to provide clinical laboratory services. However, *ordering* clinical laboratory *tests* in order to appropriately monitor patients’ medication therapy (e.g., ordering an INR test for a patient receiving an anticoagulant) or determining their pharmacokinetic course is a logical thing for a pharmacist to be authorized to do.
19. Pages 31-33 listed selected pharmacy organizations. An important organization was omitted: The American Association of Colleges of Pharmacy, located in Alexandria, VA.²⁶ Although the section was titled “Professional Organization,” it would have been more accurate to title it “Pharmacy-Related Organizations” and to further subdivide these into professional associations, trade associations, and regulatory bodies. It would be instructive to examine the extent to which all of these truly function as associations and the extent to which their operating margins are applied to efforts to benefit members.
20. On page 38 began a list of state pharmacist associations. Missing from the document was a list of state societies of health-system pharmacists, which could be valuable sources of information and collaboration with state medical groups and state legislators and regulators as they contemplate appropriate SOPs for health-system pharmacists.²⁷

Summary

Medication misuse in the United States is a major public health problem, and patients in all settings need the engagement of competent health practitioners practicing collaboratively to prevent and resolve medication-use problems on their behalf. Physicians alone cannot prevent or resolve all of the problems. Scopes of practice for pharmacists in general and for pharmacists in health systems will likely evolve over time commensurate with patient needs, pharmacists' qualifications, and characterization of the entire drug armamentarium and scientific developments in drug discovery. Expanded collaborative SOPs for pharmacists in health systems are already common, and there is abundant professional and scientific literature evidence that this produces positive patient outcomes. As statutory and regulatory SOP changes occur, ASHP urges all medical groups and public policy makers to recognize those benefits to hospital and health-system patients and to preserve the freedom of hospitals and other health systems to establish and manage the SOPs of all staff. True patient-centered practice requires this.

References

1. Johnson JA, Bootman JL. Drug-related morbidity and mortality. A cost-of-illness model. *Arch Intern Med*, 1995; 155 (18):1949-56.526.
2. Ernst FR, Grizzle AJ. Drug-related morbidity and mortality: updating the cost-of-illness model. *J Am Pharm Assoc*, 2001; 41(2):156-7.
3. Francke, DE. *Mirror to hospital pharmacy. A report of the audit of pharmaceutical service in hospitals*. 1964. American Society of Hospital Pharmacists, Washington DC.
4. American Pharmacists Association. Board of Pharmaceutical Specialties. <http://www.bpsweb.org/specialties/specialties.cfm> (accessed 2010 February 26)
5. American Society of Health-System Pharmacists Research and Education Foundation. Center for Health-System Pharmacy Leadership. <http://www.ashpfoundation.org/MainMenuCategories/CenterforPharmacyLeadership/AbouttheCenter.aspx> (accessed 2010 February 27)
6. Accreditation Council for Pharmacy Education. Accreditation Standards and Guidelines for the Professional Program Leading to the Doctor of Pharmacy Degree (2007). <http://www.acpe-accredit.org/standards/default.asp> (accessed 2010 February 26)
7. Institute of Medicine. Health Professions Education: A Bridge to Quality. 2003. <http://www.iom.edu/Reports/2003/Health-Professions-Education-A-Bridge-to-Quality.aspx> (accessed 2010 February 26)
8. American Society of Health-System Pharmacists. ASHP Long-Range Vision for the Pharmacy Work Force in Hospitals and Health Systems: Ensuring the Best Use of Medicines in Hospitals and Health Systems. *Am J Health Syst Pharm* 2007;64:1320-1330.
9. American Society of Health-System Pharmacists. Residency Accreditation. <http://www.ashp.org/Import/ACCREDITATION/ResidencyAccreditation.aspx> (accessed 2010 February 26)
10. American Association of Specialized and Professional Accreditors. http://www.aspa-usa.org/principles_aspa.asp (accessed 2010 February 28)
11. Pharmacy Technician Certification Board. <https://www.ptcb.org/AM/Template.cfm?Section=About> (accessed 2010 February 26)
12. American Society of Health-System Pharmacists. Pharmacy Technician Accreditation. <http://www.ashp.org/accreditation-technician> (accessed 2010 February 26)
13. National Quality Forum. Safe Practices for Better Healthcare–2009 Update. http://www.qualityforum.org/Publications/2009/03/Safe_Practices_for_Better_Healthcare%e2%80%9c2009_Update.aspx (accessed 2010 February 26)
14. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. 2001. <http://www.iom.edu/Reports/2001/Crossing-the-Quality-Chasm-A-New-Health-System-for-the-21st-Century.aspx> (accessed 2010 February 26)
15. The American Society of Health-System Pharmacists and the Society for Hospital Medicine. ASHP-SHM Joint Statement on Hospitalist-Pharmacist Collaboration. *Am J Health Syst Pharm* 2008;65:260-263.
16. Society of Critical Care Medicine and the American College of Clinical Pharmacy. Position Paper on Critical Care Pharmacy Services. *Pharmacotherapy*. 2000; 20(11): 1400-1406.

17. Accreditation Council for Graduate Medical Education. Common Program Requirements: General Competencies. http://www.acgme.org/acWebsite/dutyHours/dh_dutyhoursCommonPR07012007.pdf (accessed 2010 February 26)
18. Pew Health Professions Commission .[Recreating Health Professional Practice for a New Century: The Fourth Report. 1998. San Francisco, CA.](#) The executive summary is available at <http://www.soundrock.com/sop/pdf/Recreating%20Health%20Professional%20Practice%20for%20a%20New%20Century.pdf> (accessed 2010 February 26)
19. National Association of Epilepsy Centers. Guidelines for Essential Services, Personnel, and Facilities in Specialized Epilepsy Centers. 2010. http://www.naacc-epilepsy.org/spec_care/documents/FinalGuidelines.pdf (accessed 2010 February 26)
20. United Network for Organ Sharing .Application for Institutional Membership as a Clinical Transplant Program. 2008. http://www.unos.org/ContentDocuments/A_New_Transplant_Center_Applications.pdf
21. Association of American Medical Colleges. *Graduate Medical Education Core Curriculum. 2000.*https://services.aamc.org/publications/index.cfm?fuseaction=Product.displayForm&prd_id=37&prv_id=26&cfid=1&cftoken=0C2B928F-B3E4-5090-6BC369E640091C8D (Source for purchase. Accessed 2010 February 26)
22. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. Guidelines for developing an institutional program to enhance antimicrobial stewardship. 2007. http://www.guideline.gov/summary/summary.aspx?doc_id=10482&nbr=5505&ss=15 (accessed 2010 February 26)
23. The Bureau of Health Professions, Health Resources and Services Administration. *Family Medicine. Report on Undergraduate Medical Education for the 21st Century (UME-21): A National Medical Education Project (Supplement - January 2004, Volume 36).* Available at http://ask.hrsa.gov/detail_materials.cfm?ProdID=533 (accessed 2010 February 26)
24. Committee on the Future of Emergency Care in the United States Health System. *Hospital-Based Emergency Care: At the Breaking Point. 2007.* http://books.nap.edu/catalog.php?record_id=11621#toc (accessed 2010 February 26)
25. Association of Social Work Boards, the Federation of State Boards of Physical Therapy , the Federation of State Medical Boards, the National Board for Certification in Occupational Therapy, the National Council of State Boards of Nursing , and the National Association of Boards of Pharmacy. 2009. *Changes in Healthcare Professions' Scope of Practice Legislative Considerations.* <http://74.125.93.132/search?q=cache%3AexR6bZz6cWYJ%3Ahttps%3A%2F%2Fwww.ncsbn.org%2FScopeofPractice.pdf+Changes+in+Healthcare+Professions%E2%80%99+Scope+of+Practice+Legislative+Considerations&hl=en&gl=us> (accessed 2010 February 26)
26. American Association of Colleges of Pharmacy. <http://www.aacp.org/Pages/Default.aspx> (accessed 2010 February 26)
27. American Society of Health-System Pharmacists. State Affiliates (Enter name of state for contact information) <http://www.ashp.org/Import/ABOUTUS/WhoWeAre/StateAffiliates.aspx> (accessed 2010 February 26)

Bibliography

Inpatient/ Institutional

Anticoagulation

1. Bond CA, Raehl CL. Pharmacist-provided anticoagulation management in United States hospitals: death rates, length of stay, Medicare charges, bleeding complications, and transfusions. *Pharmacotherapy*, 2004; 24 (8): 953-963.
2. Dobesh PP, Lakamp JE. Educational program to reduce major bleeding in patients undergoing percutaneous coronary interventions and receiving abciximab. *Am.J.Health Syst.Pharm.*, 2002; 59 (16): 1539-1542.

Coronary Artery Disease

3. ODell,KM.;Kucukarslan,S. N. Impact of the clinical pharmacist on readmission in patients with acute coronary syndrome. *Ann.Pharmacother.*, 2005; 39 (9): 1423-1427.
4. Bailey TC, Noiro LA, Blickensderfer A, et al. An intervention to improve secondary prevention of coronary heart disease. *Arch.Intern.Med.*, 2007; 167 (6): 586-590.

Critical Care

5. Leape LL, Cullen DJ, Clapp MD, et al. Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. *JAMA*, 1999; 282 (3): 267-270. [comment:erratum appears in JAMA 2000 Mar 8;283(10):1293]
6. Ng TM, Bell AM, Hong C, et al. Pharmacist monitoring of QTc interval-prolonging medications in critically ill medical patients: a pilot study. *Ann.Pharmacother.*, 2008; 42 (4): 475-482.
7. Pell LJ, Martin BS, Shirk MB. Epoetin alfa protocol and multidisciplinary blood-conservation program for critically ill patients. *Am.J.Health Syst.Pharm.*, 2005; 62 (4): 400-405.
8. Brophy GM, Tesoro EP, Schrote GL, Garnett WR. Pharmacist impact on posttraumatic seizure prophylaxis in patients with head injury. *Pharmacotherapy*, 2002; 22 (2): 251-255.

Cardiology

9. Rainville EC. Impact of pharmacist interventions on hospital readmissions for heart failure. *Am.J.Health Syst.Pharm.*, 1999; 56 (13): 1339-1342.

Infection

10. Gums JG, Yancey RW, Hamilton CA, Kubilis PS. Randomized, prospective study measuring outcomes after antibiotic therapy intervention by a multidisciplinary consult team. *Pharmacotherapy*, 1999; 19 (12): 1369-1377.
11. Gentry CA, Greenfield RA, Slater LN, et al. Outcomes of an antimicrobial control program in a teaching hospital. *Am.J.Health Syst.Pharm.*, 2000; 57 (Feb 1): 268-274.
12. Welty TE, Copa AK. Impact of vancomycin therapeutic drug monitoring on patient care. *Ann.Pharmacother.*, 1994; 28 (12): 1335-1339.
13. Bond CA, Raehl CL. Clinical and economic outcomes of pharmacist-managed aminoglycoside or vancomycin therapy. *Am.J.Health Syst.Pharm.*, 2005; 62 (15): 1596-1605.
14. Dranitsaris G, Spizzirri D,Pitre M, McGeer A. A randomized trial to measure the optimal role of the pharmacist in promoting evidence-based antibiotic use in acute care hospitals. *Int.J.Techmol.Assess.Health Care*, 2001; 17 (2): 171-180.

Internal Medicine

15. Terceros Y, Chahine-Chakhtoura C, Malinowski JE, Rickley WF. Impact of a pharmacy resident on hospital length of stay and drug-related costs. *Ann.Pharmacother.*, 2007; 41 (5): 742-748.

Medication-Use Safety

16. Weiner BK, Venarske J, Yu M, Mathis K. Towards the reduction of medication errors in orthopedics and spinal surgery: outcomes using a pharmacist-led approach. *Spine*, 2008; 33 (1): 104-107.

Nutrition Support

17. Modi BP, Langer M, Ching YA, et al. Improved survival in a multidisciplinary short bowel syndrome program. *J.Pediatr.Surg.*, 2008; 43 (1): 20-24.

Oncology

18. Bernstein BJ, Blanchard LM. Economic and clinical impact of a pharmacy-based filgrastim protocol in oncology patients. *Am.J.Health Syst.Pharm.*, 1999; 56 (13): 1330-1333.

Alternative Locations

Emergency Department/Urgent Care

19. Brown JN, Barnes CL, Beasley B, et al. Effect of pharmacists on medication errors in an emergency department. *Am.J.Health Syst.Pharm.*, 2008; 65 (4): 330-333.
20. Rodis JL, Green CG, Cook SC, Pedersen CA. Effects of a pharmacist-initiated educational intervention on patient knowledge about the appropriate use of antibiotics. *Am.J.Health Syst.Pharm.*, 2004; 61 (13): 1385-1389.

Health Maintenance Organizations

21. Hoffman L, Enders J, Luo J, et al. Impact of an antidepressant management program on medication adherence. *Am.J.Manag.Care*, 2003;9(1):70-80.

Long-term Care

22. Trygstad TK, Christensen D, Garmise J, Sullivan R, Wegner SE. Pharmacist response to alerts generated from medicaid pharmacy claims in a long-term care setting: Results from the North Carolina polypharmacy initiative. *J. Manag. Care Phar.*, 2005; 11 (7):575-583.
23. Christensen D, Trygstad T, Sullivan R, Garmise J, Wegner SE. A pharmacy management intervention for optimizing drug therapy for nursing home patients. *Am.J.Geriatr.Pharmacother.*,2004; 2 (4): 248-256.

Ambulatory Care

Ambulatory Care

24. Sauvageot J, Kirkpatrick MA, Spray JW. Pharmacist-implemented pharmaceutical manufacturers' assistance programs: effects on health outcomes for seniors. *Consult.Pharm.*,2008; 23 (10): 809-812.
25. Taylor CT, Byrd DC, Krueger K. Improving primary care in rural Alabama with a pharmacy initiative. *Am.J.Health Syst Pharm.*, 2003;60911):1123-1129.
26. Lloyd KB, Thrower MR, Walters NB, et al. Implementation of a weight management pharmaceutical care service. *Ann.Pharmacother.*,2007; 41 (2): 185-192.
27. Christensen DB, Roth M, Trygstad T, Byrd J. Evaluation of a pilot medication therapy management project within the North Carolina State Health Plan. *J.Am.Pharm.Assoc.*,2007; 47 (4): 471-483.
28. Yuan Y, Hay JW, McCombs JS. Effects of ambulatory-care pharmacist consultation on mortality and hospitalization. *Am.J.Manag.Care*,2003; 9 (1): 45-56.
29. Malone DC, Carter BL, Billups SJ, et al. Can clinical pharmacists affect SF-36 scores in veterans at high risk for medication-related problems? *Med.Care*,2001; 39 (2): 113-122.
30. Schnipper JL, Kirwin JL, Cotugno MC, et al. Role of pharmacist counseling in preventing adverse drug events after hospitalization. *Arch.Intern.Med.*,2006; 166 (5): 565-571.
31. Delate T, Chester EA, Stubbings TW, Barnes CA. Clinical outcomes of a home-based medication reconciliation program after discharge from a skilled nursing facility. *Pharmacotherapy*, 2008; 28 (4): 444-452.

Anticoagulation

32. Ernst ME, Brandt KB. Evaluation of 4 years of clinical pharmacist anticoagulation case management in a rural, private physician office. *J.Am.Pharm.Assoc.*,2003; 43 (5): 630-636.
33. Witt DM, Humphries TL. A retrospective evaluation of the management of excessive anticoagulation in an established clinical pharmacy anticoagulation service compared to traditional care. *J.Thromb.Thrombolysis*,2003; 15 (2): 113-118. Asthma/Chronic Obstructive Pulmonary Disease
34. Bunting BA, Cranor CW. The Asheville Project: long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. *J.Am.Pharm.Assoc.*, 2006; 46 (2): 133-147.
35. Odegard PS, Lam A, Chun A, et al. Pharmacist provision of language-appropriate education for Asian patients with asthma. *J.Am.Pharm.Assoc.*, 2004; 44 (4): 472-477.
36. Kradjan WA, Schulz R, Christensen DB, et al. Patients' perceived benefit from and satisfaction with asthma-related pharmacy services. *J.Am.Pharm.Assoc.*,1999 39 (5): 658-666.
37. Weinberger M, Murray MD, Marrero DG, et al. Effectiveness of pharmacist care for patients with reactive airways disease: a randomized controlled trial. *JAMA*,2002; 288 (13): 1594-1602.
38. Sterne SC, Gundersen BP, Shrivastava D. Development and evaluation of a pharmacist-managed asthma education clinic. *Hosp.Pharm.*,1999;34:699-706.
39. Bynum A, Hopkins D, Thomas A, Copeland N, Irwin C. The effect of telepharmacy counseling on metered-dose inhaler technique among adolescents with asthma in rural Arkansas. *Telemed.J.E.Health.*,2001; 7 (3): 207-217.

Diabetes

40. Shane-McWhorter L, Oderda GM. Providing diabetes education and care to underserved patients in a collaborative practice at a utah community health center. *Pharmacotherapy*,2005; 25 (1): 96-109.

41. Rothman R, Malone R, Bryant B, et al. Pharmacist-led, primary care-based disease management improves hemoglobin A1c in high-risk patients with diabetes. *Am.J.Med.Qual.*,2003; 18 (2): 51-58.
42. Garrett DG, Bluml BM. Patient self-management program for diabetes: first-year clinical, humanistic, and economic outcomes. *J.Am.Pharm.Assoc.*, 2005;45(2):130-137.
43. Scott DM, Boyd ST, Stephan M, et al. Outcomes of pharmacist-managed diabetes care services in a community health center. *Am.J.Health Syst. Pharm.*,2006;63(21): 2116-2122.
44. Leal S, Glover JJ, Herrier RN, Felix A. Improving quality of care in diabetes through a comprehensive pharmacist-based disease management program. *Diabetes Care*,2004; 27(12): 2983-2984.
45. Baran RW, Crumlish K, Patterson H, et al. Improving outcomes of community-dwelling older patients with diabetes through pharmacist counseling. *Am.J.Health Syst. Pharm.*, 1999;56 (15):1535-1539.
46. Grant RW, Devita NG, Singer DE, Meigs JB. Improving adherence and reducing medication discrepancies in patients with diabetes. *Ann.Pharmacother.*,2003; 37 (7-8):962-969.
47. Nau DP, Pacholski AM. Impact of pharmacy care services on patients' perceptions of health care quality for diabetes. *J.Am.Pharm.Assoc.*,2007; 47 (3): 358-365.
48. Cioffi ST, Caron MF, Kalus JS, et al. Glycosylated hemoglobin, cardiovascular, and renal outcomes in a pharmacist-managed clinic. *Ann.Pharmacother.*,2004; 38 (5): 771-775.
49. Powell MF, Burkhart VD, Lamy PP. Diabetic patient compliance as a function of patient counseling. *Ann.Pharmacother.*,2006; 40 (4): 747-752.
50. Horswell RL, Wascom CK, Cerise FP, Besse JA, Johnson JK. Diabetes mellitus medication assistance program: relationship of effectiveness to adherence. *J.Health Care Poor Underserved*,2008; 19 (3): 677-686.
51. Morello CM, Zadvorny EB, Cording MA, et al. Development and clinical outcomes of pharmacist-managed diabetes care clinics. *Am.J.Health Syst Pharm.*, 2006;63(14):1325-1331.
52. Odegard PS, Goo A, Hummel J, Williams KL, Gray SL. Caring for poorly controlled diabetes mellitus: a randomized pharmacist intervention. *Ann.Pharmacother.*,2005; 39(3): 433-440.
53. Brooks AD, Rihani RS, Derus CL. Pharmacist membership in a medical group's diabetes health management program. *Am.J.Health Syst. Pharm.* 2007; 64 (6): 617-621.
54. Kiel PJ, McCord AD. Pharmacist impact on clinical outcomes in a diabetes disease management program via collaborative practice. *Ann.Pharmacother.*, 2005; 39 (11): 1828-1832.
55. Davidson MB, Karlan VJ, Hair TL. Effect of a pharmacist-managed diabetes care program in a free medical clinic. *Am.J.Med.Qual.*,2000; 15 (4): 137-142.

Geriatrics

56. Stebbins MR, Kaufman DJ, Lipton HL. The PRICE clinic for low-income elderly: a managed care model for implementing pharmacist-directed services. *J.Manag.Care.Pharm.*,2005; 11 (4): 333-341.
57. Smith SR, Catellier DJ, Conlisk EA, Upchurch GA. Effect on health outcomes of a community-based medication therapy management program for seniors with limited incomes. *Am.J.Health Syst Pharm.*, 2006; 63 (4): 372-379.

Cardiology

58. Bunting BA, Smith BH, Sutherland SE. The Asheville Project: clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia. *J.Am.Pharm.Assoc.*,2008; 48 (1): 23-31.
59. Gattis WA, Hasselblad V, Whellan DJ, Oconnor CM. Reduction in heart failure events by the addition of a clinical pharmacist to the heart failure management team: results of the Pharmacist in Heart Failure Assessment Recommendation and Monitoring (PHARM) Study. *Arch.Intern.Med.*,1999; 159 (16): 1939-1945.
60. Taveira TH, Wu WC, Martin OJ, et al. Pharmacist-led cardiac risk reduction model. *Prev Cardiol.*,2006; 9 (4): 202-208.
61. Murray MD, Young J, Hoke S, et al. Pharmacist intervention to improve medication adherence in heart failure: a randomized trial. *Ann.Intern.Med.*,2007; 146 (10): 714-725.
62. Lee JK, Grace KA, Taylor AJ. Effect of a pharmacy care program on medication adherence and persistence, blood pressure, and low-density lipoprotein cholesterol: a randomized controlled trial. *JAMA*,2006; 296 (21): 2563-2571.

Hyperlipidemia

63. Pineros SL, Sales AE, Li YF, Sharp ND. Improving care to patients with ischemic heart disease: Experiences in a single network of the Veterans Health Administration. *Worldviews Evid Based Nurs.*,2004; 1 (s1): 33-40.

64. Faulkner MA, Wadibia EC, Lucas BD, Hilleman DE. Impact of pharmacy counseling on compliance and effectiveness of combination lipid-lowering therapy in patients undergoing coronary artery revascularization: a randomized, controlled trial. *Pharmacotherapy*,2000; 20 (4): 410-416.
65. Bozovich M, Rubino CM, Edmunds J. Effect of a clinical pharmacist-managed lipid clinic on achieving National Cholesterol Education Program low-density lipoprotein goals. *Pharmacotherapy*,2000; 20 (11): 1375-1383.
66. Cording MA, Engelbrecht-Zadvorny EB, et al. Development of a pharmacist-managed lipid clinic. *Ann.Pharmacother.*,2002; 36 (5): 892-904.
67. Till LT, Voris JC, Horst JB. Assessment of clinical pharmacist management of lipid-lowering therapy in a primary care setting. *J.Manag.Car Pharm.*,2003; 9 (3): 269-273.
68. Straka RJ, Taheri R, Cooper SL, Smith JC. Achieving cholesterol target in a managed care organization (ACTION) trial. *Pharmacotherapy*,2005; 25 (3): 360-371.

Hypertension

69. Parra D, Beckey NP, Colon A. Retrospective evaluation of the conversion of amlodipine to alternative calcium channel blockers. *Pharmacotherapy* 2000; 20 (9): 1072-1078 .
70. Borenstein JE, Graber G, Saltiel E, et al. Physician-pharmacist comanagement of hypertension: a randomized, comparative trial. *Pharmacotherapy*,2003; 23 (2): 209-216.
71. Schneider PJ, Murphy JE, Pedersen CA. Impact of medication packaging on adherence and treatment outcomes in older ambulatory. *J.Am.Pharm.Assoc.*,2008; 48 (1): 58-63.
72. Green BB, Cook AJ, Ralston JD, et al. Effectiveness of home blood pressure monitoring, Web communication, and pharmacist care on hypertension control: a randomized controlled trial. *JAMA*,2008; 299 (24): 2857-2867.
73. Hennessy S, Leonard CE, Yang W, et al. Effectiveness of a two-part educational intervention to improve hypertension control: a cluster-randomized trial. *Pharmacotherapy*,2006; 26 (9): 1342-1347.
74. Mehos BM, Saseen JJ, MacLaughlin EJ. Effect of pharmacist intervention and initiation of home blood pressure monitoring in patients with uncontrolled hypertension.
75. Zillich AJ, Carter BL, Ernst ME, Kelly MW. Effect of a telephone medication renewal service on blood pressure control. *J.Am.Pharm.Assoc.*,2003; 43 (5): 561-565.
76. Lam AY. Assessing medication consultations, hypertension control, awareness, and treatment among elderly Asian community dwellers. *Consult.Pharm.*,2008; 23 (10): 795-803.
77. Kicklighter CE, Nelson KM, Humphries TL, Delate T. An evaluation of a clinical pharmacy-directed intervention on blood pressure control. *Pharmacy Pract.*,2006; 4 (3): 110-116.

Infectious Disease

78. Rathbun RC, Farmer KC, Stephens JR, Lockhart SM. Impact of an adherence clinic on behavioral outcomes and virologic response in treatment of HIV infection: a prospective, randomized, controlled pilot study. *Clin.Ther.*,2005; 27 (2): 199-209.
79. March K, Mak M, Louie SG. Effects of pharmacists' interventions on patient outcomes in an HIV primary care clinic. *Am.J.Health Syst Pharm.*, 2007;64 (24): 2574-2578.
80. Horberg MA, Hurley LB, Silverberg MJ, et al. Effect of clinical pharmacists on utilization of and clinical response to antiretroviral therapy. *J.Acquir.Immune Defic.Syndr.*, 2007;44(5): 531-539.

Informatics and Medication-Use Safety

81. Humphries TL, Carroll N, Chester EA, et al. Evaluation of an electronic critical drug interaction program coupled with active pharmacist intervention. *Ann.Pharmacother.*,2007; 41 (12): 1979-1985.
82. Raebel MA, Carroll NM, Kelleher JA, et al. Randomized trial to improve prescribing safety during pregnancy. *J.Am.Med.Inform.Assoc.*,2008; 14 (4): 440-450.
83. Chrischilles EA, Carter BL, Lund BC, et al. Evaluation of the Iowa Medicaid pharmaceutical case management program. *J.Am.Pharm.Assoc.* 2004; 44 (3): 337-349.

Osteoporosis

84. Stroup JS, Rivers SM, Abu-Baker AM, Kane MP. Two-year changes in bone mineral density and T scores in patients treated at a pharmacist-run teriparatide clinic. *Pharmacotherapy*,2007; 27 (6): 779-788.

Renal

85. To LL, Stoner CP, Stolley SN, et al. Effectiveness of a pharmacist-implemented anemia management protocol in an outpatient hemodialysis unit. *Am. J. Health Syst. Pharm.*,2001; 58 (21): 2061-2065.

Pain/Palliative Care

86. Gammaitoni AR, Gallagher RM, Welz M, et al. Palliative pharmaceutical care: A randomized, prospective study of telephone-based prescription and medication and counseling services for treating chronic pain. *Pain Med.*,2000; 1 (4): 317-331.
87. Winterbottom LM, Fong AM, Benkstein KL, et al. Impact of a clinical pharmacy consult service on guideline adherence and management of gabapentin for neuropathic pain. *J.Manag.Care.Pharm.*,2005; 12 (1): 61-69.

Pharmacotherapy

88. Malone M, Alger-Mayer SA, Anderson DA. The lifestyle challenge program: a multidisciplinary approach to weight management. *Ann.Pharmacother.*,2005; 39 (12): 2015-2020.
89. Zarowitz BJ, Stebelsky LA, Muma BK, et al. Reduction of high-risk polypharmacy drug combinations in patients in a managed care setting. *Pharmacotherapy*,2005; 25 (11): 1636-1645.
90. Malone M, Alger-Mayer SA. Pharmacist intervention enhances adherence to orlistat therapy. *Ann.Pharmacother.*,2003; 37 (11): 1598-1602.
91. Isetts BJ, Schondelmeyer SW, Heaton AH, et al. Effects of collaborative drug therapy management on patients' perceptions of care and health-related quality of life. *Res.Social Adm.Pharm.*,2006; 2 (1): 129-142.
92. Zillich AJ,Ryan M, Adam A, et al. Effectiveness of a pharmacist-based smoking-cessation program and its impact on quality of life. *Pharmacotherapy*,2002; 22 (6): 759-765.

Psychiatry

93. Capoccia KL, Boudreau DM, Blough DK, et al. Randomized trial of pharmacist interventions to improve depression care and outcomes in primary care. *Am.J.Health Syst. Pharm.*, 2004; 61 (4): 364-372.
94. Finley PR, Rens HR, Pont JT, et al. Impact of a collaborative pharmacy practice model on the treatment of depression in primary care. *Am.J.Health Syst Pharm.* 2002; 59 (16): 1518-1526.
95. Finley PR, Rens HR, Pont JT, et al. Impact of a collaborative care model on depression in a primary care setting: a randomized controlled trial. *Pharmacotherapy*,2003; 23 (9): 1175-1185.

Transplant

96. Chisholm MA, Mulloy LL, Jagadeesan M, DiPiro JT. Impact of clinical pharmacy services on renal transplant patients' compliance with immunosuppressive medications. *Clin.Transplant.*,2006; 15 (5): 330-336.
97. Chisholm MA, Spivey CA, Mulloy LL. Effects of a medication assistance program with medication therapy management on the health of renal transplant recipients. *Am.J.Health Syst Pharm.*, 2007; 64 (14): 1506-1512.

Emergency Departments

98. Thomasset KB, Faris R. Survey of pharmacy services provision in the emergency department. *Am J Health Syst Pharm.*, 2003;60:1561-4.
99. Peth HA. Medication errors in the emergency department: a systems approach to minimizing risk. *Emergency Medicine Clinics of North America*, 2003. 21(1): p. 141-58.
100. Schenkel S. Promoting patient safety and preventing medical error in emergency departments. *Academic Emergency Medicine*, 2000;7(11):1204-22.
101. Powell MF, Solomon DK, McEachen RA. Twenty-four hour emergency pharmaceutical services. *Am J Hosp Pharm* 1985;42(4):831-5.
102. Fairbanks RJ, Hays DP, Webster DF, Spillane LL. Clinical Pharmacy Services in an Emergency Department, *Am J Health Syst Pharm*, May 2004; 61:934-7.
103. 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(15):1311-6.
104. Kozer E, Scolnik D, Macpherson A, et al. Variables associated with medication errors in pediatric emergency medicine. *Pediatrics* 2002;110(4):737-42.
105. Tisdale JE. Justifying a pediatric critical-care satellite pharmacy by medication-error reporting. *American Journal of Hospital Pharmacy* 1986;43(2):368-71.
106. Kaushal R, Bates DW, The Clinical Pharmacist's Role in Preventing Adverse Drug Events (chapter). In *Making Health Care Safer: A Critical Analysis of Patient Safety Practices. Evidence Report/Technology Assessment: Number 43. AHRQ Publication No. 01-E058*, July 2001. Agency for Healthcare Research and Quality, Rockville, MD.
107. Risser DT, Rice MM, Salisbury ML, Simon R, Jay GD, Berns SD. The potential for improved teamwork to reduce medical errors in the emergency department. The MedTeams Research Consortium. *Annals of Emergency Medicine* 1999;34(3):373-83.
108. Ammons DK, Roberts N. Frontline pharmacist: prioritizing pharmacy services in the emergency department. *Am J Health Syst Pharm.* 1997; 54:1702-5.
109. Whalen FJ. Cost justification of decentralized pharmaceutical services for the emergency room. *Am J Hosp Pharm.* 1981; 38:684-7.
110. Elenbaas RM, Waeckerle JF, McNabney WK. The clinical pharmacist in emergency medicine. *Am J Hosp Pharm.* 1977; 34:843-6.

111. Berry NS, Folstad JE, Bauman JL, Leikin JB. Follow-up observations on 24-hour pharmacotherapy services in the emergency department. *Ann Pharmacother.* 1992; 26:476–80.
112. Kasuya A, Bauman JL, Curtis RA, Buarte B, Hutchinson RA. Clinical pharmacy on-call program in the emergency department. *Am J Emerg Med.* 1986; 4:464–7.
113. Lada P, Delgado G. Documentation of pharmacists' interventions in an emergency department and associated cost avoidance. *Am J Health-Syst Pharm-Vol 64 Jan 1, 2007*
114. Fairbanks RJ, Hildebrand JM, Kolstee KE, Schneider SM, Shah MN. Medical and nursing staff value and utilize clinical pharmacists in the emergency department. *Emergency Medicine Journal* Oct 2007; 24:716-719

Other

115. Carter BL, Rogers M, Daly J, et al. The potency of team-based care interventions for hypertension a meta-analysis. *Arch Intern Med.*, 2009;169(19):1748-1755.
116. Koshman SL, Charrois TL, Simpson SH, et al. Pharmacist care of patients with heart failure a systematic review of randomized trials. *Arch Intern Med.*, 2008;168(7):687-694.
117. Pedersen CA, Schneider PJ, Scheckelhoff DJ. ASHP national survey of pharmacy practice in hospital settings:dispensing and administration—2005. *Am JHealth-Syst Pharm.*, 2006; 63:327–45.
118. Kaboli PJ, Hoth AB, McClimon BJ et al. Clinical pharmacists and inpatient medical care: a systematic review. *Arch Intern Med.* 2006; 166:955–64.
119. Bond CA, Raehl CL, Franke T. Interrelationships among mortality rates, drug costs, total cost of care, and length of stay in United States hospitals: Summary and recommendations for clinical pharmacy services and staffing. *Pharmacotherapy*, 2001; 21:129–41.
120. Bond CA, Raehl CL, Franke T. Clinical pharmacy services, hospital pharmacy staffing, and medication errors in United States hospitals. *Pharmacotherapy*, 2002; 22:134–47.
121. Bond CA, Raehl CL. Clinical pharmacy services, pharmacy staffing, and adverse drug reactions in United States hospitals. *Pharmacotherapy*. 2006; 26:735–47.
122. Kucukarslan SN, Peters M, Mlynarek M et al. Pharmacists on rounding teams reduce preventable adverse drug events in hospital general medicine units. *Arch Intern Med.*, 2003; 163:2014–8.
123. Cooper H, Carlisle C, Gibbs T et al. Developing an evidence base for interdisciplinary learning: a systematic review. *J Adv Nurs.*, 2001; 31:228–37.
124. Crawford GB, Price SD. Team working: Palliative care as a model of interdisciplinary practice. *Med J Aust.*, 2003; 179:S32–4.
125. Holland R, Battersby J, Harvey I, Lenaghan E, Smith J, Hay L. Systematic review of multidisciplinary interventions in heart failure. *Heart*, 2005;91(7):899-906.
126. Varma S, McElnay JC, Hughes CM, et al. Pharmaceutical care of patients with congestive heart failure:interventions and outcomes. *Pharmacotherapy*, 1999;19(7):860-869.
127. Bouvy ML, Heerdink ER, Urquhart J, et al. Effect of a pharmacist-led intervention on diuretic compliance in heart failure patients: a randomized controlled trial. *J Card Fail.* 2003; 9 (5):404-411.
128. Tsuyuki RT, Fradette M, Johnson JA, et al. A multicenter disease management program for hospitalized patients with heart failure. *J Card Fail.*, 2004;10(6):473-480.
129. Sadik A, Yousif M, McElnay JC. Pharmaceutical care of patients with heart failure. *Br J Clin Pharmacol.*, 2005;60(2):183-193.
130. López CC, Falces SC, Cubi QD, et al. Randomized clinical trial of a postdischarge pharmaceutical care program vs regular follow-up in patients with heart failure. *Farm Hosp.*, 2006;30(6):328-342.
131. Stewart S, Pearson S, Horowitz JD. Effects of a home-based intervention among patients with congestive heart failure discharged from acute hospital care. *Arch Intern Med.*, 1998;158(10):1067-1072.
132. Gwadry-Sridhar FH, Arnold JM, Zhang Y, et al. Pilot study to determine the impact of a multidisciplinary educational intervention in patients hospitalized with heart failure. *Am Heart J.*, 2005;150(5):982.
133. Triller DM, Hamilton RA. Effect of pharmaceutical care on outcomes for patients with heart failure. *Am J Health Syst Pharm.*, 2007;64(21):2244-2249.
134. Witsil et al. Strategies for implementing emergency department pharmacy services: Results from the 2007 ASHP Patient Care Impact Program. *Am J Health Syst Pharm* , 2010;67:375-379.
135. Lipton. Home is where the health is: Advancing team-based care in chronic disease management. *Arch Intern Med*, 2009;169:1945-1948.
136. Walker et al. Impact of a pharmacist-facilitated hospital discharge program: A quasi-experimental study. *Arch Intern Med*, 2009;169:2003-2010.
137. Setter et al. Effectiveness of a pharmacist-nurse intervention on resolving medication discrepancies for patients transitioning from hospital to home health care. *Am J Health Syst Pharm*, 2009;66:2027-2031.

138. Hassan et al. Impact of a renal drug dosing service on dose adjustment in hospitalized patients with chronic kidney disease. *The Annals of Pharmacotherapy*, 2009;43:1598-1605.
139. Cohen et al. Effect of clinical pharmacists on care in the emergency department: A systematic review. *Am J Health Syst Pharm*, 2009;66:1353-1361.
140. Bates. Role of pharmacists in the medical home. *Am J Health Syst Pharm*, 2009;66:1116-1118.
141. Murray MD, Ritchey ME, Wu J, et al. Effect of a pharmacist on adverse drug events and medication errors in outpatients with cardiovascular disease. *Arch Intern Med*, 2009;169:757-763.
142. Erickson et al. Implementation of clinical pharmacy services in a dialysis unit. *Am J Health Syst Pharm*, 2008;65:2011-2013.
143. Pharmacist interventions in an inpatient geriatric psychiatry unit Dolder et al. *Am J Health Syst Pharm* 2008;65:1795-1796.
144. Anaya et al. Evaluation of pharmacist-managed diabetes mellitus under a collaborative drug therapy agreement. *Am J Health Syst Pharm*, 2008;65:1841-1845.
145. Mahmood et al. Relationship between pharmaceutical services characteristics and exposure rates to drug-drug interactions in Veterans Affairs medical centers. *Am J Health Syst Pharm*, 2008;65:1744-1749.
146. Blair et al. Pharmacist privileging in a health system: Report of the Qualified Provider Model Ad Hoc Committee. *Am J Health Syst Pharm*, 2007;64:2373-2381.
147. Phillips, Wittowsky. Survey of pharmacist-managed inpatient anticoagulation services. *Am J Health Syst Pharm*, 2007;64:2275-2278.
148. Heelon et al. Effect of a clinical pharmacist's interventions on duration of antiretroviral-related errors in hospitalized patients. *Am J Health Syst Pharm*, 2007;64:2064-2068.
149. Woods. An essential ingredient. *Am J Health Syst Pharm*, 2007;64:1911-1911.
150. Mahoney et al. Effects of an integrated clinical information system on medication safety in a multi-hospital setting. *Am J Health Syst Pharm*, 2007;64:1969-1977.
151. Thompson et al. Patient care interventions by pharmacy students in the intensive care unit. *Am J Health Syst Pharm*, 2007;64:1788-1789.
152. Phansalkar et al. Pharmacists versus nonpharmacists in adverse drug event detection: A meta-analysis and systematic review. *Am J Health Syst Pharm*, 2007;64:842-849.
153. Peterson. Improving adherence in patients with alcohol dependence: A new role for pharmacists. *Am J Health Syst Pharm*, 2007;64:S23-S29.
154. Murray et al. Effect of a pharmacist on adverse drug events and medication errors in outpatients with cardiovascular disease. *Arch Intern Med*, 2009; 169: 757-63.
155. Adler D, Bungay K, Wilson I, et al. The impact of a pharmacist intervention on 6-month outcomes in depressed primary care patients. *Gen.Hosp.Psychiatry*, 2004; 26 (3): 199-209.
156. Bogden P, Koontz L, Williamson P, et al. The physician and pharmacist team. An effective approach to cholesterol reduction. *J.Gen.Intern.Med.*,1997; 12 (3): 158-164.
157. Bond C, Salinger R. Fluphenazine outpatient clinics: a pharmacist's role. *J.Clin.Psychiatry*, 1979; 40 (12): 501-503.
158. Cohen I, Hutchison T, Kirking D, et al. Evaluation of a pharmacist-managed anticoagulation clinic. *J.Clin.Hosp.Pharm.*, 1985; 10 (2): 167-175.
159. Destache CJ. Clinical and economic benefits of a clinical pharmacokinetic service: 1987 versus 1992 data. *Med.Interface*, 1994; 7 (11): 84-90.
160. Dudas V, Bookwalter T, Kerr K, et al. The impact of follow-up telephone calls to patients after hospitalization. *Am.J.Med.*, 2001; 111 (9B): 26S-30S.
161. Kucukarslan S, Peters M, Mlynarek M, et al. Pharmacists on rounding teams reduce preventable adverse drug events in hospital general medicine units. *Arch.Intern.Med.*, 2003; 163 (17): 2014-2018.
162. Lipton H, Bird J. The impact of clinical pharmacists' consultations on geriatric patients' compliance and medical care use: a randomized controlled trial. *Gerontologist*, 1994; 34 (3): 307-315.
163. Marshall J, Finn C, Theodore. Impact of a clinical pharmacist-enforced intensive care unit sedation protocol on duration of mechanical ventilation and hospital stay. *Crit.Care Med.*, 2008; 36 (2): 427-433.
164. McGhan W, Stimmel G, Hall T, et al. A comparison of pharmacists and physicians on the quality of prescribing for ambulatory hypertensive patients. *Med.Care*, 1983; 21 (4): 435-444.
165. Monson R, Bond CA, Schuna A. Role of the clinical pharmacist in improving drug therapy. Clinical pharmacists in outpatient therapy. *Arch.Intern.Med.*, 1981; 141 (11): 1441-1444.
166. Olson K, Rasmussen J, Sandhoff B, et al. Clinical Pharmacy Cardiac Risk Service Study Group. Lipid management in patients with coronary artery disease by a clinical pharmacy service in a group model health maintenance organization. *Arch.Intern.Med.*, 2005; 165 (1): 49-54.

167. Rehring T, Stolcpart R, Sandhoff B, et al. Effect of a clinical pharmacy service on lipid control in patients with peripheral arterial disease. *J.Vasc.Surg.*, 2006; 43 (6): 1205-1210.
168. Rosen C, Copp W, Holmes S. Effectiveness of a specially trained pharmacist in a rural community mental health center. *Public Health Rep.*, 1978; 93 (5): 464-467.
169. Thompson J, McGhan W, Ruffalo R, et al. Clinical pharmacists prescribing drug therapy in a geriatric setting: outcome of a trial. *J.Am.Geriatr.Soc.*, 1984; 32 (2): 154-159.
170. Vernon D, Furnival R, Hansen K, et al. Effect of a pediatric trauma response team on emergency department treatment time and mortality of pediatric trauma victims. *Pediatrics*, 1999; 103 (1): 20-24.
171. Zillich A, Sutherland J, Kumbara P, et al. Hypertension outcomes through blood pressure monitoring and evaluation by pharmacists (HOME study). *J.Gen.Intern.Med.*, 2005; 20 (12): 1091-1096.
172. Chiquette E, Amato M, Bussey H. Comparison of an anticoagulation clinic with usual medical care: anticoagulation control, patient outcomes, and health care costs. *Arch.Intern.Med.*, 1998; 158 (15): 1641-1647.
173. Jameson J, VanNoord G, Vanderwoud K. The Impact of a pharmacotherapy consultation on the cost and outcome of medical therapy. *J.Fam.Pract.*, 1995; 41 (5): 469-472.
174. Rothman R, Malone R, Bryant B, et al. A randomized trial of a primary care-based disease management program to improve cardiovascular risk factors and glycated hemoglobin levels in patients with diabetes. *Am.J.Med.*, 2005; 118 (3): 276-284.
175. Chisholm M, Jagadeesan M, Martin B, et al. Effect of clinical pharmacy services on the blood pressure of African-American renal transplant patients. *Ethn.Dis.*, 2002; 12 (3): 392-397.
176. Irons B, Seifert C, Horton N. Quality of care of a pharmacist-managed diabetes service compared to usual care in an indigent clinic. *Diabetes Tech & Therapeutics*, 2008; 10 (3): 220-226.
177. Perkins L, Hussein G, Leung B. Anemia and erythropoietin (rHuEPO) management program for optimal therapeutics and patient care. *Clin.Res.Regul.Aff.*, 2003; 20 (3): 331-339.
178. Bogden P, Abbott R, Williamson P, et al. Comparing standard care with a physician and pharmacist team approach for uncontrolled hypertension. *J.Gen.Intern.Med.*, 1998; 13 (11): 740-745.
179. Bond C, Monson R. Sustained improvement in drug documentation, compliance, and disease control. A four-year analysis of an ambulatory care model. *Arch.Intern.Med.*, 1984; 144 (6): 1159-1162.
180. Carter B, Bergus G, Dawson J, et al. A cluster randomized trial to evaluate physician/pharmacist collaboration to improve blood pressure control. *J.Clin.Hypertens.(Greenwich)*, 2008; 10 (4): 260-271.
181. Chamberlain M, Sageser N, Ruiz D. Comparison of anticoagulation clinic patient outcomes with outcomes from traditional care in a family medicine clinic. *J.Am.Board Fam.Pract.*, 2001; 14 (1): 16-21.
182. Cohen S. A pharmacy-based antibiotic UR program. *QRB Qual.Rev.Bull.*, 1984; 10 (1): 22-25.
183. D'Angio R, Stevenson J, Lively B, et al. Therapeutic drug monitoring: improved performance through educational intervention. *Ther.Drug Monit.*, 1990; 12 (2): 173-181.
184. Destache C, Meyer S, Bittner M, et al. Impact of a clinical pharmacokinetic service on patients treated with aminoglycosides: cost-benefit analysis. *Ther.Drug Monit.*, 1990; 12 (5): 419-426.
185. Hanlon J, Weinberger M, Samsa J, et al. A randomized, controlled trial of a clinical pharmacist intervention to improve inappropriate prescribing in elderly outpatients with polypharmacy. *Am.J.Med.*, 1996; 100 (4): 428-437.
186. Hunter K, Bryant B. Pharmacist provided education and counseling for managing pediatric asthma. *Patient Educ.Couns.*, 1994; 24 (2): 127-134.
187. Kelso T, Abou-Shala N, Heilker G. Comprehensive long-term management program for asthma: effect on outcomes in adult African-Americans. *Am.J.Med.Sci.*, 1996; 311 (6): 272-280.
188. Kelso T, Self T, Rumbak M, et al. Educational and long-term therapeutic intervention in the ED: effect on outcomes in adult indigent minority asthmatics. *Am.J.Emerg.Med.*, 1995; 13 (6): 632-637.
189. Kershaw B, White R, Mungall D, et al. Computer-assisted dosing of heparin. Management with a pharmacy-based anticoagulation service. *Arch.Intern.Med.*, 1994; 154 (9): 1005-1011.
190. Kotapati S, Kuti J, Nicolau D. Role of a clinical pharmacist on drotrecogin alfa (activated) outcomes in a large community teaching hospital. *J.Infect.Dis.Pharmacother.*, 2003; 6 (3): 55-68.
191. Rosen C, Copp W, Holmes S. The psychiatric pharmacist in community mental health. *Can.J.Public Health*, 1978; 69 (2): 139-142.
192. Rothman R, Malone R, Bryant B, et al. The relationship between literacy and glycemic control in a diabetes disease-management program. *Diabetes Educ.*, 2004; 30 (2): 263-273.
193. Self T, Brooks J, Lieberman P, et al. The value of demonstration and role of the pharmacist in teaching the correct use of pressurized bronchodilators. *Can.Med.Assoc.J.*, 1983; 128 (2): 129-131.
194. Van Veldhuizen-Scott M, Widmer L, Stacey S, et al. Developing and implementing a pharmaceutical care model in an ambulatory care setting for patients with diabetes. *Diabetes Educ.*, 1995; 21 (2): 117-123.

195. Viola R, Abbott K, Welch P, et al. A multidisciplinary program for achieving lipid goals in chronic hemodialysis patients. *BMC Nephrol.*, 2002; 3: 9.
196. Witt D, Sadler M, Shanahan R, et al. Effect of a centralized clinical pharmacy anticoagulation service on the outcomes of anticoagulation therapy. *Chest*, 2005;127 (5): 1515-1522.
197. Yam F, Akers W, Ferraris , et al. Interventions to improve guideline compliance following coronary artery bypass grafting. *Surgery*, 2006; 140 (4): 541-552.