A Practical Solution to Reducing Medication-Related Problems in Seniors

October 15, 2008

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Introduction:

While Americans face a world of economic and geopolitical uncertainty, they can ill-afford to endure avoidable and unnecessary costs. One such example is the cost of medication-related problems. In fact, at $177.4 billion[1], more money is spent to treat medication-related problems in the community than the $154 billion spent on outpatient prescription drugs.[2] Moreover, these costs will grow in correlation with the swelling population of individuals aged 65 and older (seniors).

The population of seniors will nearly double from 38 million today to 75 million by 2030.1 The aging population in the United States presents a unique set of challenges for the country, especially when it comes to healthcare. This surging population will translate to increased medical costs and the effect will be far reaching, impacting everyone from patients to payers, from medical providers to taxpayers.

This document aims to look at medication-related problems (MRPs), specifically among seniors, why they are occurring, and what is being done to address/eliminate/reduce these problems. In the following pages, this document will detail potential solutions to these problems along with the advantages and disadvantages. Ultimately, reducing MRPs will lower the cost of health care, whether paid for by private or public health insurance programs, ease the burden on those who fund these programs, and help seniors live safer, healthier and happier lives.

Note to the reader: Several abbreviations, acronyms and terms used throughout this document are explained on the final page of this document (Appendix).

Situation:

At least 1.5 million Americans are sickened, injured or killed each year by errors in prescribing, dispensing and taking medications—and seniors are most susceptible. Medication mismanagement plays a leading role in some of the top issues affecting healthcare today including runaway costs, the increased prevalence of chronic disease and an aging population.

For both payers and consumers, prescription drug therapy is the preferred method of healthcare delivery. Nevertheless, errors from prescription drug therapy cost the U.S. healthcare system in excess of $177.4 billion and that figure is growing.[1] Particularly staggering is the fact that only $154 billion is spent on outpatient prescription drugs.[2]

The costs don't stop there—medication errors cost lives too. More than 200,000 people die each year from medication-related problems,[1] and adverse drug reactions have been estimated as the fourth leading cause of death in the United States.[3] Adverse drug reactions and noncompliance are also responsible for 28 percent of hospitalizations of the elderly.[4]

Also contributing to the growing prevalence of medication errors, most seniors are living with more chronic diseases and multiple conditions. In turn, they are using more medications.

Another pharmacy-industry problem is the issue of polypharmacy in the elderly. Polypharmacy refers to the use of multiple medications and/or the administration of more medications than is clinically indicated. A recent literature review found that polypharmacy continues to increase and is a known risk factor for morbidity and mortality. The review also concluded that health care professionals should be aware of the risks and fully evaluate all medications at each patient visit to prevent polypharmacy from occurring.[5]

Complicating the issue of polypharmacy is the issue of patients using multiple pharmacies to fill multiple prescriptions. When this happens, it's nearly impossible for the pharmacist to recognize potential negative drug interactions and duplication.

Collectively, these issues cause pharmaceutical care to stray far away from a 1975 definition in the *American Journal of Hospital Pharmacy* as "care that a given patient requires and receives which assures safe and rational drug use."[6]

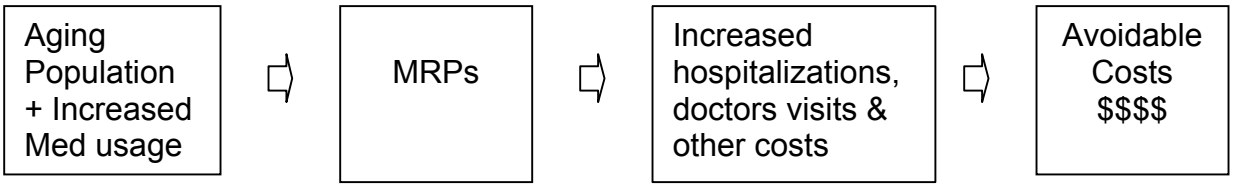
Increased Use of Medication

Each year, payers spend over $1 trillion on healthcare in the United States.[7] For payers, prescription drug therapy is an economical alternative to other cost centers such as costly hospitalization, nursing home stays and visits to the physician. For consumers, prescription drug therapy allows greater freedom, more convenience and improved quality of life. In both cases, prescription drug therapy has emerged as the preferred venue of healthcare delivery.

Consequently, the retail pharmacy environment continues to enjoy robust growth. According to the National Association of Chain Drug Stores and IMS Health, 2006 total retail prescription sales were $259.8 billion, up a monumental 42 percent from 2002. This sales growth is a direct result of an aging population, a "graying" population (baby boomers turning

65), new medications introduced to the market and finally, natural price increases within the sector.

Diagram: Breaking down the occurrence and effect of MRPs



Increased medication-related problems (MRPs)

On all bottles of medication, prescription or OTC, there is always a list of potential side effects. Sometimes, those side effects are mild, but other times the side effects can be intimidating. The unfortunate side effect for the growing population of seniors on multiple medications is an increase in MRPs or medication mismanagement. This troubling scenario is fast becoming a problem of epidemic proportion.

Traditionally, most consumers obtain their medications through retail pharmacies. Although complicated by a backdrop of public and private payer programs, the consumer simply visits the local pharmacy to have a prescription filled. In most cases, the prescription is provided in a vial, with little or no pharmacist consultation. In this process, retail pharmacies have created a price-sensitive commodity business. For the most part, margins within the sector have stabilized with successful pharmacies operating on mass, efficiencies and points of differentiation. As a by-product of high-volume pharmacy chains, consumers unfortunately receive little guidance with their medications and subsequently, MRPs emerge.

According to a 2001 article from the health policy journal *Health Affairs*, experts estimate that nearly 50 percent of all prescriptions dispensed in the United States are not taken correctly.[8] Additionally, it's estimated that 15-20 percent of prescriptions are unnecessary or otherwise inappropriate.

In the first year of the Minnesota MTM Care Program, pharmacists identified and resolved 789 MRPs in 259 recipients (3.1 drug therapy problems per recipient) after the first year of medication therapy management (MTM). Inadequate therapy (e.g. dose too low for effectiveness, needs additional preventive therapy, and noncompliance) represented 73% of resolved MRPs.[9] In a national sample of over 2,985 patients who received pharmaceutical care services between the years 2000 and 2003, pharmacists found and resolved 9,845 MRPs (or 3.3 MRPs per patient over the four-year period).[10]

Seniors are particularly at risk for MRPs. Moreover, the implications are more severe. Despite the implementation of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, authorizing prescription drug benefits under Medicare Part D, many seniors remain under-treated for diseases. In 2000, The White House estimated more than three in

five Medicare beneficiaries lack access to an outpatient drug benefit and often must risk the health consequences of not receiving potentially beneficial therapies because they cannot afford their medication. In other cases, cost isn't the issue at all.

The American Society of Consultant Pharmacists (ASCP) is among a group of not-for-profit organizations attempting to reign in the increase of MRPs. In its report, *Seniors At Risk*, ASCP defines a MRP as "an event or situation involving drug therapy that actually or potentially interferes with an optimum outcome for a specific patient." ASCP breaks down these problems into eight categories.

Table 1: Categories of Medication-Related Problems

Category	**Definition**
Untreated Indications	The patient has a medical problem that requires drug therapy but is not receiving a drug for that problem.
Subtherapeutic dosage	The patient has a medical problem that is being treated with too little of the correct medication.
Drug use without indication	The patient is taking a medication for no medically valid indication.
Overdosage	The patient has a medical problem that is being treated with too much of the correct medication.
Improper drug selection	The patient has a drug indication but is taking the wrong drug, or is taking a drug that is not the most appropriate for the special needs of the patient.
Adverse drug reactions (ADRs)	The patient has a medical problem that is the result of an adverse drug reaction or adverse effect.
Drug interactions	The patient has a medical problem that is the result of a drug interacting negatively with another drug, a food, or a laboratory test.
Patient noncompliance	The patient has a medical problem that is the result of not receiving a medication due to economic, psychological, sociological or pharmaceutical reasons.

Adapted from: *Seniors At Risk*, American Society of Consultant Pharmacists.

For many seniors, significant medication mismanagement stems from difficulties with organizing and administering necessary medication on a daily bases. As many as 70 percent of seniors use pillboxes or a calendar system to organize their medications.[11]

In a study published in *The Consultant Pharmacist* medical journal, researchers discovered that just over 47 percent of patients who had not been previously diagnosed with dementia or documented with cognitive impairment were unable to pass a test assessing their ability to properly fill a pillbox.[12] The results of this study are alarming considering the crucial step pillbox organization plays in medication adherence for millions of seniors.

All MRPs take a human toll on seniors, potentially causing, aggravating or contributing to common and costly geriatric problems including: confusion, delirium/hallucinations, depression, dizziness, drowsiness, falls, incontinence, insomnia, loss or coordination, malnutrition/dehydration, memory loss and other psychiatric problems.

Looking at the issue in total, multiple publics are affected by MRPs in addition to the patient. The other stakeholders include the patient's family and other caregivers (whether for hire, as a volunteer, part-time or full-time).

Physicians and nurses are affected because the patient isn't improving. Medical staffs are trained to understand diseases and conditions, their impact and how to treat them; however, they are not necessarily trained to understand the chemistry of interacting medications. Pharmacists are obviously affected and represent an audience that desperately wants to fix these issues.

Insurance companies, medical plans, and other payers are affected by the costs not only of the medications, but the MRPs as well. In turn, these costs are turned onto employers, the federal government or state government. The general public ultimately pays for this public health issue in the form of increased taxes, increased premiums, and other increased medical costs such as co-pays.

An aging population

The global population has grown exponentially since the Second World War, particularly in developed countries. The situation in the United States closely mirrors the global trend. Since 1950, increased fertility rates, reduced infant mortality rates and a reduction in death rates have helped create what the U.S. Census' report *An Aging World: 2001* described as the "human success story."

Further developing the plot of this success story are continuous improvements in health services, education status and economic development. Life expectancy for American males grew from 66.0 in 1950 to 74.2 by 2000. Female life expectancy increased from 71.7 to 79.9 over the same period.

Because of the massive size of the baby boomer generation, the percentage of seniors among the population will continue to grow.

Table 2: Projected Growth of the U.S. Population and Percentage of Seniors

Year	Total Population	Percentage 65+	Percentage 80+
1975	220,165,000	10.5	2.1
2000	275,563,000	12.6	3.3
2015	312,524,000	14.7	3.8
2030	351,326,000	20.0	5.3

While representing just over 13 percent of the population (38 million), seniors consume a whopping 40 percent of all prescription drugs and 35 percent of all OTC drugs. More than 77 percent of seniors between the ages of 65 and 79 suffer from one or more chronic diseases. The number rises to 85% for those over age 80.[7]

With this aging population living with more chronic diseases and multiple conditions, they are naturally using a disproportionate amount of prescription drugs, as well as OTC medications. The average senior takes 4-6 different prescriptions each day and refills the prescription 12-17 times per year.

Because of these medications and other health service improvements, seniors are *living* longer lives with chronic illnesses. Moreover, they are doing so in the comfort of their own homes. In 1990, 94 percent of males and 93 percent of females were expected to live their senior lives without a major disability and were expected to continue with a least one major activity of daily living such as walking or cooking.

Caring for the elderly

As the health status of an elderly person declines, their living situations also shift. Many seniors live alone and without the helpful oversight to monitor a drug therapy regimen. During the 1990s, 15.1 percent of senior males and 36.8 of senior females lived alone; 5.7 percent of the elderly lived in a residential care facility. Those living alone are sometimes unable to immediately respond to an adverse drug reaction, perhaps not even noticing the problem before the damage has been done. Those living alone are also at a greater risk to getting help after a fall.

Seniors are also moving in with their children in increasing numbers. The so-called "sandwich generation" is finding itself caring for both their parents and their children simultaneously. With hectic schedules, medication management is yet another task item for the sandwich generation.

Increased hospitalization, doctor visits and other costs

While MRPs complicate the existing health issues for seniors, the increased costs due to hospitalizations, physician visits, emergency room visits, nursing facility placement and even death affect us all, particularly costs to fund programs such as Medicare.

This public health issue is adding up to be a $200 billion problem. In the community population alone, MRPs cost $177.4 billion a year and continue to grow.[1] An additional $24 billion is spent to treat MRPs in other settings such as acute care facilities and nursing homes.[13]

Table 3: Breakdown of Costs Associated with MRPs in the community population[1]

Type	Cost	Percentage
Hospital admissions	$121.5 billion	69%
Long-term care admissions	$32.8 billion	18%
Physician visits	$13.8 billion	8%
Emergency department visits	$5.8 billion	3%
Additional treatment	$3.5 billion	2%

Unfortunately, the costs associated with MRPs are higher than the cost to provide the medications in the first place ($154 billion/year).[2] In other words, it's as if we are doing more harm than good.

Among the most troubling costs often due to MRPs is a fall. One of every three seniors will fall this year and suffer the livelihood cost. Seniors who fall are susceptible to serious injuries such as hip fractures or head injuries. These injuries often precipitate a rapid decline in overall health. About 20 percent of hip fracture patients will die within five years of the fracture. Medication therapy management is an effective fall prevention measure.[14]

Reducing MRPs:

Several associations and other not-for-profit groups, members of academia, the government and businesses are looking at means to increased medication compliance and reduce MRPs. Groups such as the American Society of Consultant Pharmacists advocate for a mandatory consultation while the National Association of Chain Drug Stores attempts to foster a community pharmacy model based in a retail setting.

Maintaining the current situation is always a consideration, but typically not a popular one. On the positive side, patients and other stakeholders can continue with the existing pharmacy model with few new costs. However, the downside has already been detailed in this document. As the population continues to age, the financial costs could become crippling. Maintaining the status quo also ignores the standard goal in the healthcare industry to consistently improve care, procedures, quality and outcomes.

To ultimately solve the epidemic of MRPs in the elderly, several alternatives or a combination should be considered.

Increased Education

One option is to increase education among patients, caregivers and medical staff. Increased education effectively becomes a marketing effort on the part of pharmaceutical manufacturers, advocacy groups, pharmacists and medical professionals targeted to patients, caregivers and even back to medical professionals.

The widespread consensus among the pharmacists participating in the Minnesota MTM Care Program is that awareness needs to increase within the provider community.

Measurable and effective marketing efforts can affect considerable change, consider the decreased rate of smoking in America due to the educational/marketing efforts of various groups and individuals. However, these campaigns come with a major cost and can take a considerable period of time. The various target audiences must go through the diffusion process beginning with awareness through adoption.

Increased patient education however ignores some of the dynamics at play, particularly the fact that as seniors age, their cognitive abilities diminish. Patient noncompliance for various social, economic and psychological reasons remain. For example, properly filling a pillbox, taking medications at the right time, etc., remain at issue. With increased education, hopefully this would eliminate many of the issues of overmedication and subtherapeutic dosages, etc.

Licensing/Accreditation

Another option is to require licensure and accreditation for geriatric pharmacists. This option would require pharmacists to specialize in geriatric pharmacy, perhaps a barrier especially considering the prevalence of the retail pharmacy model that requires pharmacists to serve patients of all ages and conditions.

Licensing and accreditation would likely increase the knowledge among pharmacists about MRPs and how to reduce/eliminate them. Moreover, with a licensed geriatric or senior care pharmacist, patients would be afforded the peace of mind that comes from using a certified professional. This would be similar to the peace of mind an individual can take from hiring a certified financial planner, certified public accountant, certified home inspector, etc. However, the key distinction between those types of professions and the pharmacist is that a pharmacist cannot simply hang their name on a shingle and start dispensing medications. There is the required schooling and access to medication supply.

Another issue is the administration and cost of such an accreditation. What entity or organization is best equipped to require such a distinction, manage it, etc? What would prohibit other organizations from creating their own licensing standards? Would different states require different licensing?

Medication Therapy Management (Mandatory consultation)

The next option is to require a consultation with a pharmacist, perhaps the most trusted profession in healthcare.[15] This option incorporates the concept of the community pharmacy and/or the senior care pharmacy models.

Within a community pharmacy, pharmacists would provide value-added MTM services. While such a service highly indicates it would help eliminate many MRPs, staffing is a concern, as is the workload for a typical retail pharmacist. Additionally, the quality of service would likely vary considerably from one location to another.

This option may annoy customers under the age of 65 who are not getting a consultation. Furthermore, what happens when a caregiver picks up the prescription on behalf of the patient? The consultation may not be as effective without the patient present.

This option would transition the pharmacy from a commodity/product-based retail industry into a healthcare service provider. However, its not clear if the industry as a whole is ready to make this change. Varying agendas among the subtypes of retail pharmacies are a serious challenge to success.

The ASCP advocates for a senior care pharmacy model in which it would deliver pharmaceutical care to at-risk seniors at home and other community settings. These experts would be uniquely qualified to identify individuals who are at high risk for MRPs that interfere with the goals of therapy. By applying expert knowledge to seniors where they reside, these pharmacists can identify, resolve, and prevent more MRPs.

This model is already required for nursing homes under federal legislation. However, this in-road unveils an obvious hurdle. The nursing home consultant pharmacists are on location. The senior care pharmacist would be a traveling road service. This model does not take the logistical factors into consideration such as the price of fuel, the time to travel, and auto insurance for traveling pharmacists. However, MTM services provided by a pharmacist from a call center could eliminate the logistical concerns.

In the Minnesota MTM Care Program, the ten most productive pharmacists in the first year of the program were those with established collaborative practices relationships with physicians and other primary care providers and were also part of an integrated health delivery system.

The value of a consultant pharmacist cannot be understated.

Improved packaging/services

The final option is for improvements in packaging and services. This option is already underway and represents some momentum. For seniors who take multiple medications, they are used to using alarm clocks, calendars and pillboxes to help them adhere with their drug therapy.

The market has produced a wealth of products to improve medication compliance. There are electronic pillboxes with built-in alarms, vials that have an audible alarm, vials that light up, color-coded vial tops, event vials that talk. There are also all-in-one products that dispense medications, remind and record. However, all of these options assume the products have been properly loaded. Studies have proven that even individuals with no history of cognitive impairment are likely to improperly fill their pillboxes, in some cases as much as 50 percent of the time. Even one improper dosage can produce a catastrophic effect.

Another packaging solution is a mail-order product in which the patient's medications come organized in "single-serving" packets. This option ensures the patient is taking the right dosage of the right medication. Some services even include written instructions as to the time to take these medications and other reminders such as food or drink indications.

There are also reminder services similar to a wake-up call at a hotel. A company will make an automated call, scheduled email or send a text message. These options obviously require additional subscription services and patients must have the computer and/or phone by their side at all times.

Conclusion:

Seniors are some of our nation's most precious assets. They helped shape the United States into the grand nation that it is today. They deserve all the help in their elder years we can provide. The increased rate of MRPs demands a solution.

This document has outlined the problems and costs associated with MRPs and potential means to address this issue. However, no one method will solve this "disease." It is recommended that today's leaders seek out businesses that will provide a hybrid of the solutions that have been outlined. In particular, a revolutionary packaging system coupled with a thorough and reoccurring pharmaceutical consultation by a geriatric specialist or MTM-certified pharmacist should be used. Groups should continue to increase awareness of the issues at play through educational, marketing and advocacy efforts.

One such company looking to combine these solutions is Arcadia Healthcare and its DailyMed pharmacy solution. DailyMed is a revolutionary pharmacy dispensing system that provides a safe, effective solution to the dangers of medication mismanagement. DailyMed makes it easier to comply with prescriptions, better manage health conditions and improve patient outcomes.

DailyMed transfers prescriptions, OTC medications and vitamins and organizes them into pre-sorted packets clearly marked with the date and time they should be taken. The streamlined dispensing system involves a thorough consultation by an MTM-certified pharmacist and reviews with patients, their caregivers and medical providers. This process allows DailyMed pharmacists to examine a patient's entire drug profile, check that prescription combinations are safe and make recommendations to improve drug effectiveness. The entire 30-day supply is delivered to the patient or caregiver's home in a convenient dispensing box that works similar to a box of facial tissues.

Additionally, Arcadia is committed elevating the issue of MRPs into the public's conscience. Efforts such as this document help present this issue to many who may not even be aware such a problem exists.

America's seniors need this service if they are to going to reap the benefits of modern medicine and live safer, happier and healthier lives. Additionally, this type of service will ultimately reduce unnecessary costs, hospital and physician visits and even death.

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