The Purdue University College of Pharmacy’s Center for Medication Safety Advancement (CMSA) was established in March 2010 with the purpose of developing systems to reduce medication errors, prevent and manage adverse drug events, and promote safe medication use practices. CMSA is committed to serving the citizens of Indiana, the nation and the world through enhancing the discovery of safe medication use practices and delivering this knowledge to all who may benefit. Innovation and collaboration at the CMSA between faculty, staff and students link actionable discovery to entrepreneurial delivery, ultimately helping achieve a vision of making safe medication use common practice.
maximum dose of COLLABORATION

There are times when individuals or single entities make a significant advancement that improves the human condition. More often, however, the most impactful achievements arise when people join together as partners to accomplish common goals. Making meaningful improvements in our complex health care system is one example of partnerships that are essential.

The Center for Medication Safety Advancement (CMSA) was founded on the understanding that collective efforts are necessary to achieve our goal of improving patient safety in a variety of settings. Throughout its existence, partnerships have been essential to the work we do. In this annual report, we highlight a number of those partnerships that are improving the well-being of the citizens of Indiana and beyond.

Such partnerships are possible because of common goals and shared values. It is incredibly rewarding to join with others who share the goal of making health care delivery the safest system possible. The creation of CMSA increased awareness of just how many other entities are passionate about achieving the same goal. These partners refuse to accept the status quo and energetically embrace the proposition that things can be better. We don’t have to accept the way things are; we can initiate and facilitate change. And working together, we will.

No partnership has been more important to the work of CMSA than that of the Lilly Endowment Inc., which joined with us when the center was first conceived in one person’s mind. The endowment’s financial support turned that bold idea into a reality. Its continuing support has been a catalyst to the maturation of CMSA into a cutting-edge organization that is forging important partnerships across the globe to improve the safe use of medications. We, and the patients impacted, continue to be grateful for the support of the Lilly Endowment.

CRAIG K. SVENSSON
Dean of the College of Pharmacy and Professor of Medicinal Chemistry and Molecular Pharmacology
The primary focus of this annual report is to celebrate the many successes of the Center for Medication Safety Advancement in 2013. It is difficult, however, for me to dwell very long on what we have accomplished in the past year, since the future looks incredibly bright for our organization.

Our optimism about the future is based primarily on the people and partners that surround us daily. We continue to be overwhelmed by how many organizations share our mission of making safe medication use common practice. This shared passion for preventing harm associated with medication use forged many new and exciting partnerships for us in 2013. These relationships have helped us grow as an organization and have expanded our challenge to become even more innovative in our approach to creating safe medication use practices.

It is our hope that as you read this report you are not only moved to accept the challenge of making safe medication use common practice, but also feel compelled to openly challenge others to do the same.

**KYLE E. HULTGREEN**
Director
Center for Medication Safety Advancement
The act of providing a lecture or some form of didactic teaching for safe medication use practices does not automatically instill the learner with a competency in safety. In conjunction with the question “How do we measure safety?” we must also ask, “How do we measure one’s competency in medication safety?”

CMSA has been working in a multidisciplinary partnership to create a tablet-computer-based simulation that will place users in a lifelike situation whereby they must safely dispense and administer medications to patients. Simulation can serve as a tool in creating authentic experiences for individuals to practice their skills in a safe virtual environment in a real-time setting. Virtual environments can also include components of team interactions, stressors and confounding variables that are representative of the fluid work environment in a health care setting.

Ultimately, we aim to link skills learned in the simulation experience to those utilized on a daily basis in the acute-care setting through the development of a common medication safety dashboard. With simulation already showing excellent results in many health care settings, we aim to contribute yet another tool for developing competent professionals in safe medication use practices.

KEVIN D. BARLOW  
Graduate Student  
Center for Medication Safety Advancement
“An agent that provokes or speeds significant change or action.” That’s the definition of “catalyst,” per Merriam-Webster.com.

CMSA has earned its stripes as a catalyst with the U.S. Department of Veterans Affairs (VA).

When 2012 drew to a close, the partnership between CMSA and the VA consisted of nine of the center’s consultant subject-matter experts providing professional services. That was the beginning of a burgeoning partnership.

By the end of 2013, CMSA, with its expanded cadre of 34 consultant subject-matter experts, had become the catalyst for change throughout the VA system. CMSA was the hub that enabled a response within the VA to facilitate the agency’s desired Systems Redesign. The CMSA and VA initiative has utilized all manners of educational interactive spaces: virtual, small group, one-to-one and large group lecture, for everyone — from those in executive leadership positions to those directly responsible for patient care. In short, all levels of the patient care team have been impacted by the VA Systems Redesign partnership efforts.

Safety performance and improvement projects from coast to coast impact the health care of veterans on an ongoing basis. The collaborative endeavor between CMSA and the VA demonstrates the enormous benefit of a partnership between a public academic unit and a government agency.

CATHERINE R. SCOTT
Education Program Manager
Center for Medication Safety Advancement
When CMSA approached In Touch Pharmaceuticals of Valparaiso, Ind., about partnering on an advanced research initiative to analyze our efforts to reduce medication errors, I knew the findings would be vital to the long-term care health care industry. CMSA is pivotal in bringing this study to our industry.

Since In Touch Pharmaceuticals’ inception as a long-term care pharmacy almost 10 years ago, our objective has been to reduce the opportunity for medication errors. Our automated systems focus on the innovative use of bar coding and packaging robots to deliver the most accurate unit dose routine of oral solids. Each resident-specific dose is packaged in cycles of seven days or fewer and sorted by date and time of administration. Our model uniquely delivers the benefits of automation by internally assisting in the dispensing discipline to ensure accuracy and by reducing the opportunity for error during administration of medication.

The CMSA research will help validate for the Centers for Medicare & Medicaid Services, third-party payers and others in the long-term care health care industry that medication errors need to be addressed and prevented. Most important, findings delivered by this partnership will bring attention to the need for improvement in the quality of pharmaceutical health care. By analyzing and making recommendations to further reduce errors that thereby decrease readmission and health care costs, the savings may reinforce safe medication practices by long-term care pharmacies.

**RICK F. RONDINELLI**  
President and Owner  
In Touch Pharmaceuticals
CMSA’s mission to make safe medication use common practice includes an inherent directive to teach safe practices to everyone associated with the medication use process.

In 2013, CMSA launched a second set of seven one-hour continuing education medication safety lectures created to aid physicians, pharmacists and nurses. The program, affectionately known as Medication Safety Essentials 2.0 — or MSE 2.0 — is a follow-up to a program developed in conjunction with the Indiana Hospital Association.

This continuing education program focuses on nuances of medication safety that may be outside of traditional concepts and data analyses typically associated with medication safety. Topics such as the culture of safety, storytelling and communication are integral components of the new series. Medication safety topics such as antihyperglycemics and anticoagulants also have been incorporated.

Educating caregivers about the principles of medication safety is essential to achieving CMSA’s mission of making the safe use of medications common practice. And it will be evident to the caregivers who take advantage of these online, on-demand educational sessions that CMSA delivers on its mission with compassion and dedication.

DANIEL D. DEGNAN
Senior Project Manager
Center for Medication Safety Advancement
After completing my first professional year in Purdue’s PharmD program, I pursued an opportunity to work with CMSA as a summer intern through the Summer Undergraduate Research Fellowship Program, which is part of the Lilly Endowment gift to the College of Pharmacy. I worked with the CMSA team to assess the quantitative findings from an Agency for Healthcare Research and Quality (AHRQ) survey focused on the patient safety culture within hospitals. The project opened my eyes to two overarching realizations: the importance of having all units within a hospital—not just the pharmacy—focused on patient safety and the challenges in actually achieving and maintaining a hospitalwide culture of patient safety.

My work during the summer of 2013 not only furthered my interest in medication and patient safety but also provided on-the-job training in academic research. With tremendous support and guidance from the CMSA leadership team, I had the opportunity to serve as a contributing author on a manuscript summarizing my analysis of the AHRQ survey. This work was accepted by the sixth annual Medication Safety Conference in Abu Dhabi, United Arab Emirates, and by the National Patient Safety Foundation Congress in Orlando, Fla.

Being a CMSA intern gave me firsthand insight into a nontraditional pharmacy practice and provided a challenging professional development experience. I could not have had better mentors than I had with the CMSA team.
Pharmacists serve a vital role by ensuring that the right patient receives the right medication through involvement in every step of the medication use process. That includes the compounding and verification of sterile products. Therefore, providing pharmacists and pharmacy technicians with adequate instruction to prevent medication errors in a sterile environment is critical and must include practice-based training within an intravenous (IV) room setting. However, sterile environments are expensive to build and also require frequent renovation as regulations change.

To meet this challenge, the team at CMSA partnered with the Purdue University Envision Center for Data Perceptualization to design, build and implement a virtual pharmacy cleanroom laboratory. This virtual cleanroom offers significant advances in the learning process, including the capability to select and move products (medications, diluents and equipment), extract or insert drug and diluent, and identify potential medication safety risks. A course to accompany this newly created, Web-based virtual cleanroom learning environment was launched during the first quarter of 2014. The initial pilot demonstrated very promising results in learning and comprehension.

Ultimately, this innovative model of teaching affords any health professional the opportunity to access, learn and practice critical cleanroom principles and skills in a safe, virtual environment, thereby minimizing the risk to patients and enhancing skill-focused training and education.

JOHN B. HERTIG  
Associate Director  
Center for Medication Safety Advancement
The Indianapolis Coalition for Patient Safety (ICPS) provides a forum for Indianapolis area hospitals to share information about best practices and work together to solve patient safety issues. The ICPS is comprised of chief executive, medical, nursing, quality/safety, and pharmacy officers from IU Health, Community Health Network, Richard L. Roudebush VA Medical Center, Franciscan St. Francis Health, St. Vincent Health, and Eskenazi Health. Coalition hospitals pool their expert resources to accelerate patient safety improvements through community-wide efforts.

ICPS members share the vision and the challenge of making Indianapolis the safest city for health care. The coalition has historically achieved accelerated outcomes by sharing resources, performance targets, accountability, funding and learning opportunities. ICPS members undertake projects that focus on patient-centered strategies to improve safety and do so by addressing what patients and providers observe as barriers to achieving a standardized approach to patient care.

In addition to relying on content experts from each of the member health systems, ICPS also relies heavily on community partners to bring essential expertise and resources to the conversation. Purdue’s CMSA is a great example of such a partnership. CMSA staff members bring their experience and breadth of knowledge to the table in serving as content experts for our workgroups. That expertise ultimately benefits patients across our community.

JIM H. FULLER
President
Indianapolis Coalition for Patient Safety Inc.
The Medication Safety Fellowship, founded by CMSA, is a two-year post-graduate training program that was started to maintain and enhance a scientific link among the Food and Drug Administration (FDA), academia, and the pharmaceutical industry. As the 2013-15 Fellow, I spend six months at CMSA, nine months at Eli Lilly and Company, and nine months at the FDA. The goal of the program is to enhance pharmacists’ knowledge, expertise and abilities in medication safety while introducing them to many avenues to utilize their skill set.

During my time in this program I have not only learned about improving medication safety and quality, but I have been able to apply the skills and knowledge I have gained from one rotation to another. At CMSA, I have introduced a new pharmaceutical industry elective at Purdue College of Pharmacy, helped propose legislation for improving pharmacy technician training and developed a toolkit for a statewide initiative to reduce harm associated with anticoagulants. Through these projects, I have gained knowledge of improving patient safety and have been asked to share my knowledge in medication safety through various forums. I am grateful for this unique experience and very excited to continue to learn in my next chapter at the FDA.

KATELYN R. BROWN
Medication Safety Fellow
Center for Medication Safety Advancement
**CAPSULE**

dissolving the numbers for 2013-14

- **6** publications
- **1,400** hours training Purdue students
- **1,866** continuing education medication safety hours completed
- **29** states impacted by CMSA
- **5,830** health care professionals trained
- **48** Indiana medication safety alliance members
- **49** performance improvement certifications
- **24** state and national presentations
- **29** countries
- **3** states
- **1,400** hours
- **1,866** completed
- **5,830** impacted
- **48** members
- **49** certifications
- **24** presentations
- **29** countries
- **3** states
- **1,400** hours
- **1,866** completed
- **5,830** impacted
- **48** members
- **49** certifications
- **24** presentations
- **29** countries
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**ONE MISSION**
making safe medication use common practice
We encourage you to explore our CMSA website and bookmark it as a gateway to some of the most up-to-date medication safety information available. The site explains CMSA, details many current projects, and links you to new presentations and publications as they become available. Stay closely tuned to our medication safety blog, a great source of hot topic information.

WWW.PHARMACY.PURDUE.EDU/CMSA

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