Compounding medications is a vital component of a pharmacist’s profession. Pharmacists in the past had to select, extract, prepare and compound medicines from vegetables, animal and mineral substances. The art of pharmacy compounding is as old as man, and the history of pharmacy parallels the history of civilization. Presently, pharmacists compound medications that are not commercially available, or for patients with specific requirements. In the future, compounding has a large potential for growth and utilization. Compounding allows for an individualized approach to medicine, as each compounded prescription is unique to the patient’s specific needs. Patients form an exclusive relationship with their compounding pharmacist, as they learn how specialized this pharmacist is.

Compounding pharmacists, I feel, have the most auspicious profession, as their entire career is driven by a passion to ensure the best care for their patients. Since compounding pharmacy is vital to a patient’s well being; I believe that it should be taught to all pharmacy students as part of the standardized curriculum, should have an advanced elective course, and most importantly should be part of continuing education requirements.

At Butler University, compounding both sterile and non-sterile preparations was the cornerstone of our Pharmaceutical Care and Dosage Forms courses. During laboratory time, we learned the guidelines of compounding sterile and non-sterile preparations, and prepared prescriptions weekly that were vital to patient’s health and well being. Our curriculum trained us how to prepare everything from creams to chemotherapy. We prepared capsules, suppositories, PLO gel, and even total parenteral nutrition in groups under the supervision of our professors. Since it was a required class, I felt prepared not only to exercise this skill in a retail setting, where patients frequently bring in prescriptions for suspensions and creams; but rather in a hospital setting as well, where antibiotics, total parenteral nutrition and intravenous medications will be compounded.

Since Butler pharmacy students are fortunate enough to become skilled with utilizing the fundamentals of compounding, it never occurred to me that other pharmacy students were not being educated on this important skill as well. Becoming proficient with the methods of compounding medications should be a core value taught in every US pharmacy school, since pharmacists never know when they will be called upon to use it. More importantly, students need to learn the impact that compounding pharmacists can have on their patient’s health care needs. Patients should never be told that they can not have their medication, simply because the pharmacist does not possess the skills required to compound it.

Furthermore, I believe that an advanced compounding class should be offered as an elective course for those students who have the passion to become compounding pharmacists. An elective course would allow for more intricate and complex preparations to be compounded. Compounding large volumes or large batches could be executed during this time, in order to prepare the students for real-world execution. Constructing compounding monographs for newly compounded routes of administration can also be taught at this level. If pharmacy students have the passion and drive to
become compounding pharmacists, they should have the opportunity to learn more about this aspect of pharmacy.

Most importantly, compounding training should not end at the graduate level. Today, pharmacists are called upon to help prepare medications in times of drug shortages, excipient allergies, and times of need to compound medications. Therefore, post-graduation continuing education should be provided by pharmacy schools or through various pharmacy organizations. Just these past few years, pharmacists have been paramount in the compounding of vital medications due to various drug shortages. Tamiflu® suspensions had to be compounded by pharmacists in 2009 due to the overwhelming H1N1 pandemic. The compounded suspension was crucial for children when the commercially manufactured product was unavailable due to the significant need of the medication. Pharmacists had to rise to the challenge of compounding this drug, many without any training in years on compounding guidelines and procedures. The CDC even called upon pharmacists to compound the suspension from the capsules in emergency situations. Pharmacists were instructed on how to properly prepare the oral suspension, and what the correct dosing of the newly prepared medication would be.

Currently, pharmacists are compounding various medications due to the large number of national drug shortages. According to the FDA’s website, currently there are more than sixty drug shortages. The reasons for the drug shortage are reported as manufacturing and quality problems, delays and discontinuations. What is not reported is how pharmacists are supposed to respond to this

---


growing problem. Compounding pharmacists, however, have risen to the challenge by formulating these medications at the same concentration needed for the same desired effect.\textsuperscript{5} Compounding pharmacists in Billings, Montana have compounded prescriptions specifically for their patients who are unable to find their diabetes, thyroid and pain medications at other drug stores. Most patients ended up being happier receiving a specialized formula than a massed-produce drug, which speaks volumes about the compounding pharmacists.\textsuperscript{5}

Currently, there is an increase in patients with gluten allergies. Currently, about one in every 133 Americans has celiac disease.\textsuperscript{6} Gluten is used as an excipient in many medications, and this poses a problem for patients with gluten allergies.\textsuperscript{6} Compounding pharmacists can come to the rescue in this population of patients, by compounding medications that will be gluten free.

Lastly, oral liquids, suspensions and solutions make up the largest amount of dosage forms that are prepared by compounding pharmacists. Children are the recipients of the majority of these compounds, due to their inability to swallow the commercially manufactured capsules and tablets. Compounding pharmacists play a huge role in this population, because they have the knowledge of a drug’s stability, palatability and most importantly the formula of record for the liquid formulation. Without the knowledge of compounding, children would be unable to acquire the medications that they need to alleviate their ailments.

Compounding is a fundamental component of pharmacy, being that it is how this profession began. Pharmacy schools should implement curriculums that have a foundation of compounding fundamentals and skills. By learning the art of compounding, future pharmacists will be able to not only


\textsuperscript{6} What is Celiac Disease? American Society of Health-System Pharmacists Web site. \url{http://www.ashp.org/DocLibrary/Policy/PatientSafety/CeliacFlyer.pdf}
help patients with individual needs, such as gluten allergies, or ones that require liquid formulations of the drug, but also can assist fellow colleagues during times of drug shortages and emergency situations. Additionally, the art of compounding should be a life-long learning process through continuing education requirements, since pharmacy is constantly changing and evolving. Compounding should not only be a specialized aspect of pharmacy, but rather a competency that every pharmacist is able to proficiently perform in order to ensure our patient’s are receiving the best care possible.