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THE MAGAZINE FOR PHARMACY TECHNICIANS

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CPhT CONNECT™
THE MAGAZINE FOR PHARMACY TECHNICIANS

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PUBLISHER'S NOTE

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Mike Johnston, CPhT-Adv
Founder & CEO, NPTA

Are you ready to take your career and impact as a pharmacy technician to new heights?

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NEWS BRIEFS

DOD GUIDELINES RECOMMEND BUPROPION FOR CHRONIC PAIN

In the ongoing crazy war on opioid use and abuse, it can sometimes be hard to remember that millions of people are in pain and need pain medication to function. Millions of people still rely on opioids, those semi-synthetic or synthetic chemicals that interact with opioid receptors in the body and brain and reduce pain perception. As the regulatory bodies scale back opioid prescribing, many patients who have and continue to suffer may experience difficulty maintaining their treatment. At the same time, providers comply with ever-changing rules due to the opioid fight. In 2019, estimates showed that nearly 23 % of U.S. citizens were prescribed opioids for chronic pain. Over the last decade, many actions have been taken to reduce the prevalence of opioid prescribing, which peaked at around 255 million in 2012 -2013. During the early 2000s, primarily due to oxycontin, reports of prescription pain drugs started increasing significantly. Since then, the FDA and other agencies have provided recommendations, guidelines, and new rules to help better manage pain while also reducing the rapidly increasing cases of opioid use disorder (OUD). There has been no shortage of news regarding OUD, from overdose statistics to oxycontin litigations and increased use of street drugs containing fentanyl. To say the nation is in a national crisis regarding OUD is an understatement.

While attempting to keep opioids out of the hands of those who illegally obtain and sell them, prescribers are held to recommendations that state they must use the lowest dose possible to address the pain and taper down patients who have been on pain medications long-term. All while weighing the benefits and risks. No one denies the legitimate use of opioids to manage pain. Meanwhile, other therapies have been highlighted as part of many pain management programs, such as massage therapy, acupuncture and other holistic healings, pain gels, and non-narcotic pain relievers. It truly is a trial, as each patient may respond differently to alternative treatments. Statistics are few and far between on many of the alternative treatments attempted and often require a wait-and-see for the patient. Some study results offer hope and can lead to recommendations and guidelines helpful to others, like the recent guidelines from the Department of Veterans Affairs (VA). The VA and Department of Defense (DOD) has recently approved a joint clinical practice guideline for opioid use when managing chronic pain. Our nation's Veterans are some of the largest groups of individuals who suffer from pain that needs to be managed the most. They are also the largest group that suffers from other conditions such as behavioral health issues, traumatic injuries, and PTSD. In 2021, about one-third of veterans received pain relief through opioid prescriptions. About one in three suffered from chronic pain, one in five with persistent pain, and one in ten with severe constant pain. As with anyone else who prescribes' s opioids, the VA has seen the incidence of OUD significantly increasing over the years with higher rates of overdose, suicide, and abuse of other illicit drugs such as heroin with Veteran groups. One drug, buprenorphine, has shown much success in helping VA patients with behavioral issues manage their pain at a much lower risk of OUD than full agonist opioids. Before concluding, for the 2022 joint practice clinical guideline, the VA and the DOD relied on data from a systemic evidence review. It evaluated the evidence and recommendations, either strong or weak. This new guideline updates the 2017 VA/DoD Clinical Practice Guideline for Opioid Therapy for Chronic Pain. These updated guidelines have similar recommendations as the recently updated CDC guidelines on opioids, such as prescribing the lowest dose for the shortest time as indicated by patient-specific risks and benefits. The DOD guidelines also recommend screening for catastrophizing and co-occurring behavioral health conditions to identify those at higher risk for adverse outcomes when opioids are considered in patients with acute pain. Updates also include initiating and continuing opioid therapy dose, duration, taper, screening, assessment, evaluation, and risk mitigations. One new recommendation consists of using buprenorphine instead of full agonist opioids, as this drug has a lower risk profile. In addition, clinicians can further reduce risk by screening for underlying mood disorders and a history of traumatic brain injury. Authors of guidelines in the Annal of Internal Medicine also agree that if long-term opioid therapy is decided, consider buprenorphine for its lower risk profile. In addition to the recommendations above, the guidelines suggest all chronic pain patients undergo behavioral health evaluations and receive preoperative education on opioids and pain management. Three one-page algorithms to help guide clinical decision-making are also included.

ANOTHER PERSON CURED OF HIV

Human Immunodeficiency virus (HIV) is a devastating infection that, for many, was a death sentence when it hit the U.S. in 1981. But some research shows HIV presence in the Caribbean which passed into New York and San Francisco about ten years previous without much fanfare. Today, thanks to modern medicines, approximately 38.4 million people worldwide live with HIV. Still, the National Institutes of Health (NIH) estimates that about one million new HIV infections occur each year. Medications allow a better quality of life for HIV-infected patients; however, they do not provide a cure, leaving the person with HIV for life. HIV destroys immune system cells, and continued destruction can lead to acquired immunodeficiency syndrome (AIDS), where patients cannot fight simple infections. HIV infects types of long-lived immune cells that enter a latent state, which leaves a cure out of reach. Antiretroviral treatments attack HIV only when infected cells are actively producing new copies, which collect in the viral reservoir and can be latent for long periods but become active at any time. While medications for HIV have allowed people to live longer, healthier lives, there has been no cure for decades, and there appears to be some progress toward an experimental HIV vaccine. A recent announcement has come out that a fifth person has been cured of HIV since 2009. The first person said to have been cured was Timothy Ray Brown, a Berlin patient, and next was a London patient published in 2019. Two more followed in 2022, and now a patient is known as Dusseldorf, a 53-year-old male from Germany. Dusseldorf's treatment was announced in 2019 but not confirmed as cured until recently, as researchers wanted to be certain that it was not just a long-term remission. Dusseldorf stopped taking HIV medications about four years ago and still has no detectable virus. Treatment for these patients involved a specialized stem cell transplant. Typically reserved for cancer patients, this procedure is extremely high-risk involving stem cells from a donor with specific HIV -resistant abnormalities, which give rise to immune cells naturally resistant to the virus. If successful, it is like giving a patient a whole new immune system.

This same treatment has been performed on many other HIV patients and has not been as successful. Not every patient is a good candidate for a stem cell transplant for blood cancer treatment, and there are no guarantees for those who are. These five cured patients did all have the same HIV-resistant mutation that deletes the protein CCR5 that HIV typically uses to enter the cell. Only one percent of the total population is said to have this genetic mutation. Treatment of patients may have also included various chemotherapy options or stem cells from umbilical cords. Not everyone agrees with using stem cells to treat HIV patients. As you may be aware, considerable debate exists on the ethical aspects of utilizing stem cells. While scientists research the benefits of stem cells in fields of diabetes, Parkinson's, growing new organs, and other debilitating conditions, others are opposed to the need to take these stem cells from human embryos at the earliest stage of development. These human embryonic stem cells (hES) and induced pluripotent stem (iPS) cells can become any cell in the body, and taking these cells from the embryo destroys that embryo. Ethical dilemmas from this type of stem cell taking include religion, human cloning, and many others. Even lawmakers have become involved by passing the Stem Cell Research Enhancement Act of 2007. President Bush limited federal funding of hES cells in 2001, but President Obama overturned Bush's stem cell policy in 2009, increasing the number of stem cell lines available to researchers. While those in support of stem cell research argue that significant advances are at hand, such as curing HIV, opponents argue that deriving the stem cells destroys the blastocyst, an unplanted human embryo, at the sixth to the eighth day of development. Much more research continues on alternate stem cells where embryos are not killed, but each has limitations.

OVER-THE-COUNTER AT-HOME TEST A FIRST

There has been a bombardment of information regarding COIVD and the flu over the last couple of years, so most people know how to obtain a COVID test and even have several at-home test kits on hand. Sometimes people will test, not knowing if it is the flu, but worried it might be COVID.The FDA has issued an emergency use authorization (EUA) for an over-the-counter combined COVID and flu test. This combined test will detect and differentiate influenza A and B, commonly known as the flu, and SARS-CoV-2, which causes COVID-19. The Lucira at-home test kit is the first over-the-counter at-home test for both COIVD and the flu. Lucira can provide testing results in as fast as 30 minutes using self-collected nasal swab samples.

No prescription is needed to obtain the Lucira COVID-19 & Flu Test. Recommendations suggest that anyone with respiratory symptoms 14 years of age or older can self-collect nasal swab samples for testing with Lucira. Adults should collect samples for those younger but older than two. The test works by swirling the sample swab in a vial placed in the test unit. Individuals should report all results obtained to their healthcare provider for public health reporting and to receive appropriate medical care. Most home tests have limited sensitivity, but Lucira's nucleic acid amplification technology allowed the amount of virus in the sample to be magnified, thus increasing the sensitivity of virus detection, similar to a PCR test.

Lucira correctly identified 99.3% of negative and 90.1% of positive Influenza A samples, 100% of negative and 88.3% of positive COVID-19 samples, and 99.9% of negative Influenza B samples. As with any test, there is a risk of false positive and negative results. Those who test positive are encouraged to follow up with their healthcare providers for further confirmation and advice and take appropriate precautions to prevent the spread of either virus, as further testing may be necessary.As of this writing, the makers of Lucira cite the extended time FDA has taken to bring this approval forward as a reason for now filing for bankruptcy.

SECOND ALZHEIMER'S DRUG RECEIVES ACCELERATED APPROVAL

The second drug indicated for treating Alzheimer's disease in a new category has received accelerated approval by the FDA. The Alzheimer's drug trials and research have had difficulty finding treatments that benefit patients, with many not reaching approval. Leqembi (lecanemab-irmb) was approved by the FDA accelerated Approval pathway, which allows a drug of severe conditions that fill an unmet medical need to be approved based on a laboratory measurement, radiographic image, physical sign or other measures that is thought to predict clinical benefit but is not itself a measure of clinical benefit. The intermediate clinical endpoint is a measure of a therapeutic effect that is considered reasonably likely to predict the clinical benefit of a drug.In a double-blind, placebo-controlled, parallel-group, patients given Leqembi were shown to have a significant dose and time-dependent reduction of amyloid beta plaque compared to the placebo arm, which showed no amyloid beta plaque reduction. Patients were given the approved amount of lecanemab, 10 milligrams/kilogram every two weeks. Leqembi package warning includes amyloid-related imaging abnormalities (ARIA), common in this class. It commonly presents as brain swelling, small bleeding spots, headache, dizziness, confusion, vision changes, nausea, and vomiting. Other warnings include infusion-related reactions, with flu-like symptoms and blood pressure changes. Treatment with Leqembi is to be initiated in patients similar to those in the trial, like those with mild cognitive impairment or mild dementia stage of the disease. The recommended dosage is 10mg/kg diluted in 250ml of 0.9% Sodium Chloride Injection, then administered an IV infusion with a 0.2-micron in-line filter over one hour every two weeks. Patients are closely monitored while receiving treatment, including an MRI before initiating and before the fifth, seventh, and fourteenth treatments. There are dosage interruption treatments specific to patients with ARIA-E and ARIA-H. Leqembi vials are for one-time use only and are available as 500mg/5ml in a single dose vial and 200mg/2ml in a single dose vial. This injection should be stored under refrigeration at 2°C to 8°C (36°F to 46°F), stored in the original carton, protected from light, not shaken, or placed in the freezer.

COMMUNITY RX

THE FOCUS ON PATIENT-CENTERED LABELS

How often do you look at a label and think – there is no way I can read or understand this or anyone I know? All the tiny fonts that lend only minuscule instructions to aging eyes, or simple color combinations that make it difficult to decipher? Ask many people how they were instructed to take medication, and most reply with what the 'doctor said in the office.' Prescription labels can contain a lot of important information squeezed onto a small sticker wrapped around a bottle, such as indications, special cautions, and interactions. Additionally, multiple auxiliary stickers, tablet or capsule identification features, pharmacy dispensing information, and a crowded label lends difficulty to even the best set of eyes. Many programs are available for vulnerable patients who receive help from caregivers assisting with their needs, including medication management, which includes reading and understanding medication label instructions. Many pharmacy technicians had interacted with patients who, when asked, 'what do you take this medication for,' replied 'my heart' when that may not accurately reflect the purpose of treatment. Yet the label may actually contain more descriptive language. Researchers point out that medication labels often hinder safe and appropriate medication use with the use of small fonts and vague terminology. They include bar codes, NDC numbers, and QR codes beneficial to pharmacy prescription pharmacy, not the patient. So you can understand why the patient has difficulty finding what they need or avoid reading the label altogether. Past research has shown that nearly half of all patients misunderstand one or more dosing instructions, and more than half misunderstand one or more of any auxiliary warnings related to medication use.

So, what to do? We know that patient information sheets are sent along with the prescription sheet, but like emergency room visit summary sheets, it can seem overwhelming to patients and essentially go unread. Pharmacist counseling is extremely valuable and necessary for any new medications. Still, patients may not catch everything said during this session or elect to forego it for any number of reasons. The United States Pharmacopeia (USP) released voluntary standards to revise medication labels to minimize patient confusion and combat nonadherence in 2013. These standards included emphasizing information important to patients, improved readability, imparting explicit instructions including the purpose for the use, limited auxiliary information, and addressing other issues that patients may have, such as limited English proficiency and visual impairment. This will include prescription basics, such as identification, quantity, strength, name of the manufacturer, packer, or distributor; lot number; and expiration date to fit on the prescription label. Many researchers study how the USP labeling standards have affected medication adherence for multiple classes of drugs. One particular study recently published in the Journal of the American Pharmacists Association indicated that patient-centered prescription medication labels could help increase medication adherence among patients. Study results show that between 30% - 50% of medications taken for chronic illnesses are not used as prescribed. According to researchers, poor medication adherence contributes to 125,000 deaths and up to 10% of hospitalizations. And the cost of medication nonadherence can run between $949 - $44,190.

The study included 1157 men and women who had filled 12,566 prescriptions. The retrospective pre-post cohort study involved prescriptions fill claims data from the Medicaid community health plan and one independent community pharmacy organization with eight retail sites. The study looked at medication possession ratios (MPRs) and the proportion of days covered (PDC) for medications used for contraception, asthma, hypertension, and depression from 15 months before to 13 months after labels were changed.

Overall, these studies showed an increase in medication adherence for asthma control, antihypertensive and contraceptive medications when pharmacies implemented the use of USP patient-centered labeling standards. More research is needed to evaluate the impact of patient-centered labeling with different classes of medications.

MODERNA OFFERS COVID VACCINES FOR FREE

COVID hit; soon after that, a vaccine was developed for this devastating virus. Already in a panic, many people scrambled to determine if they tested positive. Perhaps they were exposed or thought they might have been exposed. Or they were just scared when cold symptoms could now be something other than the flu. Until home tests became widely available, testing often meant visiting a health center or other designated pop up then waiting for several days, hoping symptoms did not worsen. Many people were also sent away from emergency rooms, being told to return if symptoms worsened.

In early 2020 the Health and Human Services (HHS) accelerated authorization for emergency use and availability of COVID-19 tests. Emergency Use Authorizations (EUAs) allow medical countermeasures to be available that are regulated by the U.S. FDA to the public. Most people are aware that EUAs allowed the rapid release of COVID-19 vaccines, but it also allows the release of COVID-19 detection kits for home use and other medical actions. Increased funding dispersed to the states helped millions more people become insured through state programs, especially for COVID during the public health emergency. Access to these home test kits has been free for the past couple of years and has helped thousands of people bring peace of mind, isolate upon finding a positive test, or better prepare and monitor symptoms more closely. Recently, it was announced that the federal government would no longer pay for COVID tests and vaccines as of May 11, 2023, as the Biden administration will end the COVID-19 national emergency and the public health emergency on this date.

This announcement could potentially affect millions of people covered under Medicaid when the public health emergency barred states from removing anyone from the program while the pandemic was at its' peak. Now that these funds are set to end, it could mean that many of those millions are at risk of losing insurance. With the expiration date looming, patients could be left without many options for COVID-related supplies and treatments such as Covid testing, COVID vaccines, and boosters or hospitalization due to COVID. What this means is that patients could now incur costs for COVID testing and treatments and any office visits associated with that treatment. How much is anyone's guess?

But one company has announced that it will continue to offer its' COVID-19 vaccine for free. Moderna, who has been criticized mainly for increasing the price of this vaccine, now announces that they will continue to offer the shot at no cost to consumers even after the May 11 deadline for federal reimbursements. This comes about a month after the price of the COVID-19 vaccine increased to $130 from $26 by Moderna. Moderna, as the sole manufacturer of COVID vaccines, will offer them for free to anyone regardless of ability to pay. This also includes patients that will no longer be covered under the expanded Medicaid testing and treatments provided during the public health emergency. As federal regulation requires, those insured will continue to be covered by their insurance.

STUDY SHOWS NEARLY ONE-FOURTH HOSPITALIZED PATIENTS EXPERIENCE HARMFUL EFFECT

Millions of people have had a hospital stay, for such things as childbirth, surgery, or an overnight observation for a severe medical condition. While most may have received great care, not many willingly look forward to another hospital stay that seems to have none of the comforts of home. As for the hospital, their concerns are keeping a safe, contamination-free environment while patients heal enough to finally end their stay while maintaining high 'customer satisfaction' scores. One main goal in health care is to harm no one, but bad things happen, as it is statistically improbable otherwise. Systems are in place to help limit, reduce, or erase all opportunities for bad things to occur. And patients expect a hospital stay to be problem-free with all its' sterile environments and special care and attention to all the details of keeping it safe. An adverse event can be described as an unintended injury caused by medical management rather than a medical condition that prolongs hospitalization, may produce a disability at discharge, or both. It requires additional monitoring and treatment or may result in death. A preventable adverse event is avoidable by any means currently available unless it is not considered standard care and care that falls below the expected standards of physicians.

So, while no harm is the goal, the reality is that even before the pandemic, there was and is, a one in 300 chance patients worldwide have of experiencing a harmful event according to the World Health Organization as of 2019. A significant portion of these errors are attributed to administrative errors. Across the world, patient harm is the 14th leading cause of morbidity and mortality. Although the goal is a harm-free stay for healthcare and patients, data shows that nearly 25% of hospitalized people have experienced a harmful event during their stay, according to a new study published in the New England Journal of Medicine. Nearly one-fourth of these incidents were found to be preventable. The most common preventable incidents include medication side effects and surgery risk.

As part of a team, Dr. David Bates, chief of general medicine at Brigham and Women's Hospital in Boston analyzed data from sampling 2,800 hospitalized patients in eleven Boston-area hospitals in 2018. Of these patients, 663 were found to have had at least one incident that negatively affected their health. About 7% were admitted to a hospital stay due to an error. Overall, 29 patients experienced adverse events where they were seriously harmed. One preventable death was reported. Falls and bedsores are some examples of those reported as patient-care events totaling approximately 15%, and infections accounted for 12%.

Experts like Dr. Albert Wu, director of the Center for Health Services and Research Outcomes at the Johns Hopkins Bloomberg School of Public Health in Baltimore, expressed that some causes of harm rates have improved or been eliminated. But new harms always appear such as new medications that are highly potent with more dangerous side effects, and new procedures have created new opportunities for all types of harm to exist, adverse or otherwise. Dr. Donald Berwick, president emeritus and senior fellow at the Institute for Healthcare Improvement in Boston, wrote an editorial published along with this new study. Dr. Berwick points out that many medicines today can be more dangerous due to their smaller therapeutic margins. However, this is only one study, as countless others from many years back highlight this issue.

IV HANDLING NOT THAT SIMPLE

Potential pharmacy technicians may view the process of making IVs as a bit terrifying. The potential of poking oneself with a needle can lead some to be wary of this practice. Making IVs can scare a technician from considering inpatient pharmacy or other avenues where a technician would be involved with this process. Other technicians are excited about the challenges of working IVs, and the special techniques required to handle them, especially the hazardous drugs. Training in this aspect includes the many risks of working with hazardous drugs (HDs).

As key personnel in the preparation of drugs for dispensing, technicians typically received training about these hazardous materials through school or education. Many pharmacies also require annual refreshers and periodically update any changes that pharmacy personnel must be aware of that could affect their practice. Not all HDs come in IV form. Extensive lists are available from places like the National Institute for Occupational Safety and Health (NIOSH) which is not a risk assessment; but only a list of hazards. More than 8 million U.S. healthcare workers are estimated to have had more than limited exposure to HDs, especially those in pharmacy and nursing. As the number of people affected by cancer is estimated to be close to 20 million by 2025, there are significant concerns that these and many other healthcare workers are at risk of long-term exposure, which could lead to harmful effects for the routine handler. Harmful effects such as cancer, fertility problems, genetic damage, and organ toxicity may result from handling HDs through compounding aerosolization or surface contamination. These treatments can often involve powders or solutions for injection or intravenous (IV) infusion.Regulations set both at the federal and state level help define the safe manipulation of IVs, including preparation, storage, transportation, and others.

Organizations such as NIOSH publish a list of HDs and promote a classification system depending on the hazard. The Environmental Protection Agency (EPA) describes practice and quality standards for handling HDs. They each expect healthcare organizations to enact a pharmaceutical waste management program under the Resource Conservation and Recovery Act regulations. The United States Pharmacopeia (USP). USP Chapter <800> was developed to minimize the risk of exposure to hazardous agents in the environment, for healthcare personnel, and to patients through engineering controls, personal protective equipment (PPE), and work practices.

Some areas of particular focus include:

USP Chapter <800> - State Boards of Pharmacy incorporate these standards into state regulations. Accrediting agencies and state board inspectors enforce compliance. Because of this, work areas are required to have a staff member overseeing HD lists, policy development and implementation, regulatory compliance, and training.

HD Receipt – The IV HDs receiving process can be a high-risk area of HD exposure. Open or contaminated containers and broken products can significantly increase the risk of exposure. Internal policies and procedures to address potential exposure should be developed, reviewed periodically, and presented to employees as part of any onsite training requirements. Training should also include handling, clean up, proper PPE, ensuring equipment is in good working order, and disposing of an HD spill.

Packaging, Labeling, Storing, and Transporting – Refer to USP <800> when developing policies that ensure safe labeling, manipulation, usage, and transportation. Store IV HD products in a negative pressure area, separate from other locations, and label products clearly with special handling precautions. Keep ample supplies of PPE, spill kits, and other items needed for cleanup nearby. Place products packaged in glass on lower shelves. Store products within manufacturer-appropriate recommended temperatures.

Cleaning, Containing, and Disposing of Spills – Spill kits should contain the correct items to address the HD spills. For example, certain chemicals that will neutralize a substance and specially marked disposal bags. Staff should be trained to handle spills correctly and use the appropriate PPE such as N95 masks if needed.

GERD
DISEASE BRIEF

BY BROOK BEARD, CPhT

GERD (Gastroesophageal reflux disease) is very common. In fact, approximately 60 million Americans and up to 20% of adults have this condition. As a pharmacy technician, you will likely work with GERD patients and the medications that treat them. Therefore, it is important to understand the disease, its symptoms, and commonly prescribed treatments.

Not all people who have GERD are aware of it! Some people experience no symptoms, but others exhibit a range of typical and atypical symptoms. Common symptoms include heartburn, food or liquid rising in the throat toward the mouth, difficulty swallowing, sore throat, tooth enamel erosion, and sinusitis. Atypical symptoms include dry cough, burping, nausea, bloating, dyspepsia, and gastric pain. Without treatment, GERD has several complications, such as esophagitis, and can cause inflamed throats. Stricture can also occur when scar tissue narrows the esophagus. Ulcers, painful sores that feel like a burning pain, can destroy the esophagus and lead to a hole or perforation, which is a medical emergency. Untreated GERD can lead to Barrett's esophagus, a serious condition in which the lining of the esophagus begins to resemble the intestinal lining due to the constant presence of acid. This condition puts a patient at risk for esophageal cancer, which could be fatal. Throat cancer has a five-year survival rate of just 18 percent. With early detection, cancer can be avoided. A stomach typically has a PH of around 2 on a scale from 1 to 14! That kind of powerful acid is not intended to come in contact with the throat's lining. And yet, excess acid production causes GERD. Patients with GERD have a weak lower esophageal sphincter, allowing acid to seep upward. Obesity also contributes to GERD due to increased pressure on the LES (Lower Esophageal Sphincter). Hiatal hernia and pregnancy can also contribute to symptoms. Smoking nicotine relaxes muscles in the body, such as the LES, allowing more acid reflux. People with these conditions are at an increased risk for GERD.

The following drugs are associated with symptoms of GERD:

- Antibiotics
- Anticholinergics
- Antidepressants
- Antihistamines
- Asthma treatments
- Sedatives
- Quinidine
- Potassium
- Iron supplements
- Opioids
- NSAIDs
- Nitrates
- Calcium channel blockers

An endoscopy may be performed to diagnose GERD. During this routine procedure, a scope is inserted through the mouth while under sedative medications. A gastroenterologist can visualize the area and perform a biopsy if needed. An Upper GI, including an x-ray to see the stomach and esophagus after drinking barium, can also help to diagnose GERD. Alternatively, a tiny capsule is attached to the esophagus during an esophageal pH test and measures pH levels. After monitoring for some time, the capsule will naturally pass through the body harmlessly. An esophageal manometry can also be performed to discover how the LES (lower esophageal sphincter) and other muscles work. After diagnosis, treatment can begin.

Medications to treat GERD include PPIs and Proton Pump Inhibitors. Medications from most to least potent include Rabeprazole, Esomeprazole, Omeprazole, Lansoprazole, and Pantoprazole. PPIs block the enzyme involved in producing acid, significantly reducing the acid in the stomach. PPIs allow the body time to heal the esophagus from damage. H2 Blockers can also be prescribed; these medications work by blocking histamine, which plays a role in producing acid. H2 Blockers include Famotidine, Cimetidine, Nizatidine, and Ranitidine. Antacids can also be used, although they are not intended for long-term treatment. They neutralize the acid in the stomach and create temporary relief. Antacids include Tums, Rolaids, Mylanta, Milk of Magnesia, Maalox, and Alka-Seltzer.

The following food and beverages should be avoided to minimize GERD symptoms:

- Alcohol
- Chocolate
- Coffee
- Citrus juices
- Garlic
- Onions
- Mints
- Red meat
- Spicy foods
- Sodas and carbonation
- Tomatoes

Alternatives to medications include lifestyle changes such as avoiding trigger foods, wearing loose-fitting clothes, elevating the head while in bed, stopping smoking, and calming stress. More options include surgery. Of course, a medical provider should evaluate the benefits versus the risks. Gastric bypass surgery may be recommended if a patient's BMI is over 35 and obesity contributes to a patient's GERD. Another surgical intervention is laparoscopic anti-reflux surgery. After discussions with a medical provider, the best decision for the patient should be pursued. Overall, the outcome of GERD patients is very good, and many treatment options can lead to a happy and healthy life.

PSORIASIS
DISEASE BRIEF

BY HANNAH MCSWEENEY, CPhT

Did you know an estimated 7.5 million Americans over the age of 20 have some form of psoriasis? It's more, a 2004 study estimates that up to 3.6 million Americans have undiagnosed cases. This disease is often misdiagnosed because the onset resembles other skin conditions, such as ringworm or eczema. Despite the prevalence of psoriasis, the etiology of this autoimmune disease is still unknown. Current research suggests that psoriasis is an inflammatory response by the immune system that triggers the skin to rapidly turn over cells, causing red and inflamed patches with scales. Researchers believe psoriasis can be caused by a number of triggers and risk factors, including but not limited to infections, cold and dry weather conditions, injuries to the skin such as bug bites or cuts, sunburn, smoking, heavy alcoholism, certain medications, and sudden/rapid withdrawal of corticosteroids. Psoriasis is not selective on race or pre-existing conditions. However, around a third of existing cases start in early childhood. Furthermore, family history seems to play a role, as patients are more likely to develop psoriasis if both parents have this condition.

Several types of psoriasis exist, but approximately 80% of psoriasis patients have plaque psoriasis. Plaque psoriasis is characterized by raised, itchy and inflamed lesions covered in white or silver scales called plaques. In a regular and healthy immune system, old skin cells are shed, and new skin cells replace those in around a month. In comparison, skin with psoriasis goes through this cycle in 4-5 days, causing inflamed skin patches. Plaque psoriasis is most commonly found on the elbows, knees, lower back, and scalp and appears as patches of skin or rashes varying in color from shades of purple with a grayscale to shades of pink with a silver scale. It may also be cyclic, with rashes that come and go and flares that may last several days or even weeks or months.

Another type of psoriasis is nail psoriasis, which "can affect fingernails and toenails, causing pitting, abnormal nail growth, and discoloration. Psoriatic nails might loosen and separate from the nail bed (onycholysis). Severe disease may cause the nail to crumble." Guttate psoriasis is most commonly found in young adults and children and is triggered by bacterial infections such as strep throat. It is characterized by small drop-shaped scales on the buttocks, arms, and/or legs. "Pustular psoriasis, a rare type, causes clearly defined pus-filled blisters. It can occur in widespread patches or on small areas of the palms or soles." And finally, the least common type of psoriasis, erythrodermic psoriasis, can cover the entire body with a peeling rash that can itch or burn intensely. It can be short-lived (acute) or long-term (chronic)." If any of these symptoms begin to concern you, a dermatologist will be able to help further. Going without treatment may, in some cases, turn into additional problems such as psoriatic arthritis, hypopigmentation or hyperpigmentation after a scale has healed, conjunctivitis, blepharitis, uveitis, obesity, type 2 diabetes, hypertension, cardiovascular disease, other autoimmune diseases such as celiac disease, sclerosis, IBD, Crohn's disease, as well as mental conditions like depression.

Due to the large number of patients affected by psoriasis, a growing number of treatment options are available. Conservative treatment is often topical, starting with corticosteroids to treat mild to moderate psoriasis. A mild corticosteroid such as hydrocortisone is usually recommended for more sensitive areas of skin, such as the face. In contrast, stronger corticosteroids, such as triamcinolone or clobetasol, may help harder-to-treat areas such as elbows. If topicals aren't effective enough, a dermatologist may recommend UV phototherapy, where lights that emit UV rays directly onto the plaques may help slow cell growth and reduce inflammation. There are several types of UV treatments, including Goeckerman therapy, which combines UVB treatment with a coal tar regimen; brief daily sun exposure (heliotherapy); UVB narrowband and broadband; taking psoralen combined with UVA light treatment (PUVA); and finally, excimer laser treatment, which uses a more concentrated laser of UVB to target plaques.

The next treatment for psoriasis is oral medication. The standard medications prescribed include steroids such as prednisone, retinoids such as Acitretin, and immunosuppressants like cyclosporine and methotrexate. Alternatives such as hydroxyurea and thioguanine are also available if patients cannot take these other medications. Alternatives to medicines may be recommended in more mild cases, including diet changes, acupuncture, aloe extract topicals, fish oils, and topical barberry.

Finally, injectables, including steroids and biologics, are available for extreme cases of psoriasis or cases in which the previously listed medications prove ineffective. Biologics are powerful immunosuppressants that come with a high risk of catching more severe infections, and they are costly without insurance. If you have insurance, they may or may not cover the medication. Some biologics that are currently approved for psoriasis treatment include Otezla, Enbrel, Remicade, Humira, Stelara, Cosentyx, Taltz, Tremfya, Ilumya, and Cimzia. Enbrel, Stelara, and Taltz are currently approved for pediatric use.

Although there is no current cure for psoriasis, current medication regimens give hope that the disease can go into remission. As more and more cases are being diagnosed, there will continue to be improvements and discoveries in treatment. Still, there is hope that this autoimmune disease, although lifelong, can become manageable for most patients.

IBS - IRRITABLE BOWEL SYNDROME

DISEASE BRIEF

BY: HEATHERLYN GRAY, MPH, CEM, CPhT

Remember the book, Everyone Poops? The children's book has been a potty-training mainstay since its first English publication in 1993, normalizing how animals and humans all have to deal with the product of digestion: poop. But for the 10-15% of the adult population in the United States who suffer from irritable bowel syndrome (IBS), pooping may be anything but normal. IBS is a common disorder that affects the stomach and intestines. As a syndrome, IBS refers to a group of symptoms that occur together, including cramping, abdominal pain, bloating, gas, and changes in bowel movements (i.e., diarrhea, constipation, or both). Risk factors for IBS include:

- Family history of IBS
- Emotional stress, tension, or anxiety
- Food intolerance
- Severe digestive tract infection

For those with IBS, common triggers for symptoms include foods, medications, and emotional stress. IBS is a chronic condition, and most people can control their symptoms long-term by managing their diet, lifestyle, and stress.

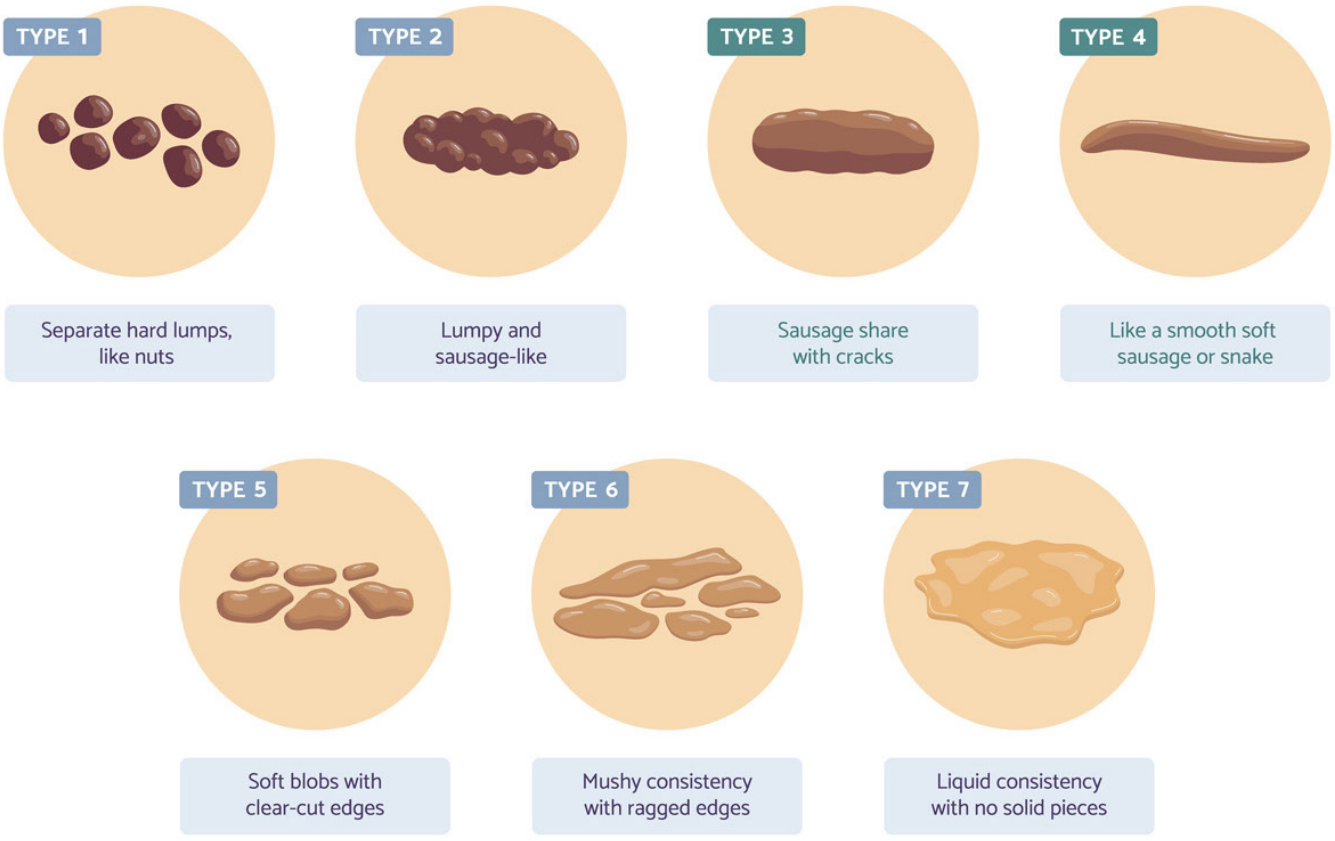
Diagnosis

Unfortunately, definitive testing is not available for IBS. Most testing conducted if IBS is suspected rules out other disorders. In addition to rule-out testing, IBS is usually diagnosed based on a careful review of symptoms and physical examination.

When reviewing symptoms, the Rome IV Diagnostic Criteria are the "gold standards" for IBS diagnosis. Individuals who report recurrent abdominal pain on average at least 1 day per week in the last 3 months may be diagnosed with IBS if their symptom onset occurred at least 6 months before diagnosis and their abdominal pain is associated with two or more of the following criteria:

- Related to defecation
- Associated with a change in the frequency of stool
- Associated with a change in the appearance of stool

The Bristol Stool Form Scale (BSFS) illustrates those changes in appearance (see figure below). Based on the type of bowel movement problems



individuals are having, IBS can be further categorized as:

- IBS with constipation (IBS-C)
- IBS with diarrhea (IBS-D)
- IBS with mixed bowel habits (IBS-M)

Treatment

IBS symptoms may be managed by diet and lifestyle changes. Such diet changes may include eating more fiber, avoiding gluten, and following a low FODMAP diet. Studies suggest that following a low FODMAP diet as part of IBS therapy can reduce symptoms in up to 86% of people.

As an elimination diet, eating low FODMAP is very restrictive and is only recommended as a short-term "discovery process" to better determine which foods trigger IBS symptoms. Lifestyle changes that may help prevent or reduce IBS symptoms include increasing physical activity, reducing stress as much as possible, and getting enough sleep.

Treatment for IBS may also include probiotics. Probiotics are helpful bacteria and yeasts that help digest food, destroy disease-causing cells, or produce vitamins that support a healthy digestive system. Probiotics can readily be found in yogurt, other fermented products, and dietary supplements. Common probiotics that are available as over-the-counter dietary supplements include:

- Florastor
- Culturelle
- Align

Medications used to treat IBS symptoms generally coincide with the individual's IBS diagnosis. For IBS-D, antidiarrheal medications, such as loperamide, reduce the frequency of bowel movements. In comparison, individuals with IBS-C may find relief with laxative use and fiber supplements (see table on the right).

Since stress can be a trigger for IBS symptoms, healthcare providers may also recommend mental health therapies such as cognitive behavioral therapy (CBT), gut-directed hypnotherapy, and relaxation training.

Conclusion

IBS is a common, chronic condition that can negatively impact the quality of life of those who suffer from symptoms. As more is learned about IBS, better treatments and therapies can be recommended to improve health outcomes. Long-term diet and lifestyle changes are necessary for those with IBS to manage their symptoms.

With the proper healthcare team, therapies, and treatments, those with IBS can live a normal life without developing serious health problems.

MEDICATIONS TO TREAT IBS

SYMPTOM	DRUG CLASS	GENERIC NAME	BRAND NAME
Diarrhea	**Antidiarrheals** Slow gut transit	loperamide	Imodium
	Non-absorbable Antibiotics Mechanism of action unknown, but may modify bacterial structure or function in the gut and have anti-inflammatory properties	rifaximin	Xifaxan
	Mu-opioid Receptor Agonist Decreases bowel activity	eluxadoline	Viberzi
	Direct Serotonin Agonists/Antagonists Affects gut secretion, motility, and sensation to relieve diarrhea	alosetron	Lotronex
Constipation	**Laxatives** Increases bowel activity	polyethylene glycol (PEG) 3550	Miralax
		senna cascara	Dulcolax
		bisacodyl	Correctol
		milk of magnesia	
	Secretagogues/ Prosecretory Agents Increase fluid secretion and movement in the GI tract	lubiprostone	Amitiza
		linaclotide	Linzess
		plecanatide	Trulance
	Direct Serotonin Agonists/Antagonists Affects gut secretion, motility, and sensation to relieve constipation	tegaserod	Zelnorm
Abdominal Pain	**Antispasmodics** Suppress smooth muscle contractions in the GI tract	hyoscyamine	Levsin, NuLev, Levbid
		dicyclomine	Bentyl
		coated peppermint oil capsules	IBgard, Pepogest
	Antidepressants/ Neuromodulators Impact nerve signaling between the GI tract and the central nervous system; includes tricyclic antidepressants and selective serotonin reuptake inhibitors (SSRIs)	amitriptyline	Elavil
		nortriptyline	Pamelor
		imipramine	Tofranil
		desipramine	Norpramin
		citalopram	Celexa
		fluoxetine	Prozac
		paroxetine	Paxil
		sertraline	Zoloft

* Adapted from Treatment for Irritable Bowel Syndrome, https://www.niddk.nih.gov/health-information/digestive-diseases/irritable-bowel-syndrome/treatment and Medications for IBS, https://aboutibs.org/treatment/medications-for-ibs

PROBLEM-SOLVING SKILLS IN THE PHARMACY

WRITTEN BY ASHLEIGH SMITH, CPHT

As pharmacy professionals, we are committed to improving patient outcomes, experiences, and safety as pharmacy professionals. Daily duties can often be difficult, especially when medications and healthcare systems become more complicated. We frequently encounter situations that need rapid thinking and problem-solving abilities, whether it be managing inventory, dealing with challenging patients, or resolving technical problems with pharmacy software. Each technique, including Design Thinking, Six Sigma, Root Cause Analysis, Mind Mapping, and Pareto Analysis, has a special way that may be used in a pharmaceutical context to promote a culture of continuous quality improvement. Pharmacy practitioners must comprehend the underlying concepts and available tools in order to successfully implement these strategies in their daily work.

DESIGN THINKING

Design Thinking is a process that promotes innovative thinking and imaginative problem-solving by emphasizing the needs of people.

This indicates that Design Thinking emphasizes understanding the needs and perspectives of the people affected by the problem rather than concentrating on the technical components of a problem. Understanding patient wants and viewpoints is necessary in a pharmaceutical context. Pharmacy staff may create more user-friendly and accessible drug management systems by knowing the needs and viewpoints of patients.

For instance, they may make a medication adherence tool based on patient feedback and preferences using design thinking, which would help patients remember to take their pills on schedule. Pharmacy practitioners can develop patient-centered solutions by utilizing Design Thinking that not only enhances patient outcomes but also raises patient pleasure and involvement in their healthcare.

To apply Design Thinking in a pharmacy setting, pharmacy professionals can follow these steps:

1. Empathize: This involves understanding the needs and perspectives of patients. Pharmacy professionals can conduct interviews, focus groups, or surveys to gather information about patients' medication management experiences.
2. Define: Based on the information gathered in the empathize stage, pharmacy professionals can define the problem they are trying to solve. For example, the problem could be that patients are having difficulty remembering to take their medications on time.
3. Ideate: This involves brainstorming and generating ideas for solutions to the defined problem. Pharmacy professionals can use techniques such as mind mapping or brainstorming sessions to generate a wide range of ideas.
4. Prototype: Once ideas have been generated, pharmacy professionals can create prototypes or mock-ups of potential solutions. This can include designing a medication adherence tool that incorporates patient feedback and preferences.
5. Test: Finally, pharmacy professionals can test the prototypes with patients and gather feedback to refine the solution. This iterative process can lead to a medication management system that is more user-friendly and accessible for patients.

The University of California San Francisco (UCSF) Medical Center is an illustration of how Design Thinking has been used in a pharmacy context. A drug management system for patients with chronic diseases was created by pharmacy experts at UCSF using Design Thinking, according to a study that was published in the American Journal of Health-System Pharmacy. A prescription scheduler, informational resources, and custom care plans based on patient choices and comments were all part of the system. According to the study, patients who used the medication management system had better health outcomes and drug adherence than those who did not.

SIX SIGMA

A data-driven methodology called Six Sigma can assist pharmacists in increasing the precision and caliber of drug delivery, ultimately lowering medication mistakes and enhancing patient safety.

The objective of Six Sigma is to find and remove errors from a process in order to raise the process's overall quality. This entails locating and fixing errors in the medicine dispensing procedure at a pharmacy. Using Six Sigma principles, pharmacy staff may ensure that medication delivery practices are efficient, accurate, and secure. Numerous healthcare facilities have adopted Six Sigma to improve pharmaceutical safety and reduce prescription errors. For instance, a study that was published in the Journal of Patient Safety found that implementing Six Sigma in a hospital pharmacy reduced prescription errors by 95%, enhancing patient safety and results. In order to improve patient care, pharmacists might use Six Sigma to identify and eliminate faults in the medication dispensing procedure.

PARETO ANALYSIS

The use of Pareto Analysis by pharmaceutical professionals may also aid in more efficient resource allocation and effort prioritization.

Pharmacy practitioners can create tailored solutions with a stronger impact on patient outcomes by concentrating on the most important problems. This can be especially helpful in places with little resources, like community pharmacies or underdeveloped nations.

Applying Pareto Analysis in Pharmacy Practice

To apply Pareto Analysis in pharmacy practice, professionals can follow these steps:

1. Define the problem: The first step is to clearly define the problem or issue that needs to be addressed. For example, a pharmacy may be experiencing a high rate of medication errors or adverse drug reactions.

2. Collect data: The next step is to collect data on the frequency and severity of the problem. This can involve reviewing incident reports, conducting observations, or analyzing prescription data.

3. Organize data: Once data is collected, it should be organized in a way that is easy to analyze. This can involve creating a spreadsheet or chart to document the frequency and severity of each type of error or adverse drug reaction.

4. Calculate the 80/20 ratio: The next step is to calculate the 80/20 ratio, which involves identifying the top 20% of issues that are causing 80% of the problems. This can be done by ranking the issues in order of frequency or severity and identifying the cutoff point where 20% of the issues account for 80% of the problems.

5. Prioritize solutions: Finally, pharmacy professionals can prioritize solutions to address the top 20% of issues identified through Pareto Analysis. This may involve developing new policies or procedures, providing additional training for staff, or implementing new technologies or tools to improve medication dispensing processes.

By applying Pareto Analysis in pharmacy practice, professionals can improve patient safety and quality of care by focusing on the most significant factors contributing to medication errors or adverse drug reactions. This can lead to more efficient and effective use of resources, as well as increased patient satisfaction and engagement with their healthcare.

ROOT CAUSE ANALYSIS

Root Cause Analysis (RCA) is a problem-solving methodology that can help pharmacy professionals identify and address the underlying causes of medication errors or other problems in their practice.

By thoroughly investigating and understanding the root causes of an issue, pharmacy professionals can develop effective strategies to prevent similar incidents from occurring in the future.

A pharmacy team can use RCA, for instance, to look into the possibility that a patient's adverse drug reaction was caused by an improper dosage or an incorrectly labeled prescription bottle. The team can create and put into practice measures to prevent such mistakes by figuring out the main cause of the problem, such as introducing doublecheck procedures or enhancing labeling systems. Pharmacy practitioners can enhance patient outcomes and safety by proactively addressing issues with RCA. To apply RCA in a pharmacy setting, the following steps can be taken:

1. Identify the problem: Start by identifying the problem or issue that needs to be addressed. This could be a medication error, a patient complaint, or any other issue that impacts patient care.

2. Gather data: Collect as much data as possible about the problem, including any relevant patient information, medication orders, and pharmacy processes. This may involve reviewing patient charts, speaking with patients and healthcare providers, and reviewing medication orders and dispensing records.

3. Analyze the data: Use tools like flowcharts, diagrams, and statistical analysis to identify patterns and trends in the data. Look for commonalities and connections between different events and processes.

4. Identify root causes: Using the data collected and analyzed, identify the underlying root causes of the problem. These could include issues with medication labeling, communication breakdowns between healthcare providers, or inadequate training or staffing levels.

5. Develop solutions: Once the root causes have been identified, develop and implement targeted solutions to address them. This could include process improvements, additional training for pharmacy staff, or changes to medication labeling or dispensing procedures.

MIND-MAPPING

Pharmacists and pharmacy technicians can organize and brainstorm ideas for new pharmacy services and programs using the mind-mapping technique. Professionals can better comprehend how ideas and concepts are connected and pinpoint opportunities for development by visually mapping them out. For instance, a pharmacy team could utilize mind mapping to create a program for patients with chronic diseases to stick to their prescription regimens.

The main focus may be medication adherence, and from there they could explore other methods and tactics, like patient education, reminders, and individualized care plans. his technique can assist in generating original and imaginative ideas that enhance patient happiness and outcomes.

To apply mind mapping in a pharmacy setting, the following steps can be taken:

1. Identify the problem or opportunity: Start by identifying the problem or opportunity you want to explore. This could be anything from improving medication adherence to developing new clinical services.

2. Write down your central idea: Write down your central idea or theme in the center of a piece of paper or whiteboard. This could be a single word or phrase that captures the essence of your problem or opportunity.

3. Brainstorm: Begin brainstorming ideas related to your central theme, and write them down as branches extending from your central idea. Don't worry about organizing them at this stage, just focus on generating as many ideas as possible.

4. Organize: Once you have a list of ideas, start organizing them into categories or sub-themes. Look for connections and relationships between different ideas, and group them accordingly.

5. Refine and develop: Once you have organized your ideas, refine and develop them further. Identify the most promising ideas and begin fleshing them out in more detail. This could involve conducting research, gathering input from other stakeholders, or developing prototypes or pilot programs.

The use of pharmacy staff members' skills and abilities to develop novel strategies to enhance patient outcomes and experiences can be quite beneficial.

Pharmacy professionals may design better user-friendly and accessible medication management systems by knowing the needs and perspectives of patients.

Moreover, pharmacists can learn more about patients' medical conditions and histories by collaborating with other healthcare professionals like doctors and nurses.

They are able to offer more specialized pharmaceutical guidance and deliver more specialized care as a result. To remain at the forefront of their profession and provide the best care possible, pharmacy practitioners must stay up-to-date with the latest pharmacological research and trends.

In conclusion, using these skills and techniques is essential for enhancing patient care and outcomes.

CAREER LADDERS:

ADVANCEMENT FOR PHARMACY TECHNICIANS IN HOME INFUSION

BY: DAN KYES, CPhT, BCSCPT

The rewards are endless for those who are working as pharmacy technicians. Opportunities for furthering education, growth, and advancement are available for those who work within the home infusion setting and many others. Pharmacy technicians work very closely with pharmacists to provide a variety of therapies that p¬rovides the perfect pathway for knowledge and skill building to help achieve a high level¬ of success within the home infusion setting. From personal experience, developing as a pharmacy technician and demonstrating competency and proficiency in many aspects of the job role allows technicians to advance personally and professionally within their organization.

A defined career ladder with expectations within your organization benefits both parties involved. The career ladder provides the outline and structure needed for pharmacy technicians to advance professionally. Organizations will also be able to retain quality employees while increasing the knowledge and experience level of the pharmacy technicians performing sterile compounding or any other task within the organization. This article will provide pharmacy technicians, and others, with the understanding as to why they should consider creating and implementing or updating a current career ladder to help current and future pharmacy technicians grow.

FIRST THINGS FIRST

What is a career ladder? A Career ladder is a progression of defined goals that begin at the base level and move up to high-level positions within the specific organization. As a pharmacy technician climbs the career ladder, one can expect added responsibilities. Along with advancement comes the benefit of wage increases, education, and the potential of added authority depending on the organization's structure.

EXHIBIT A (Page 23) overviews a sample career ladder. Job titles, expectations, and potential incentives break up the career ladder. The career ladder shows that a pharmacy technician that is performing at the top of their license and meeting all expectations could expect to become a lead pharmacy technician within their organization in roughly 5 years of employment. Keep in mind that a pharmacy technician who can excel can be moved up the career ladder even if time has not been met. For example, a pharmacy technician is ready to move from entry-level to senior pharmacy technician, but it has only been 14 months. It is up to the discretion of the designated person(s) to assist in the advancement of the pharmacy technicians.

A career ladder will help provide structure for organizations to invest in the current and new employees looking to grow within their organization. Personal and professional success will be achieved if organizations begin to implement career ladders.

Pharmacy technicians have a wide range of job opportunities that include, but are not limited to, pharmacy technician roles in home infusion, retail, hospital, and even in the nuclear setting. With each unique path that could be explored, specialty licenses and certifications will typically be required.

The Board of Pharmacy Technician Specialties (BPTS) and The National Health Career Association (NHA) offer a variety of certifications. The most common certification received by pharmacy technicians is the Certified Pharmacy Technician (CPhT). With this certification, pharmacy technicians have many opportunities to continue advancement.

One could become certified in sterile compounding as a Certified Compounded Sterile Preparation Technician (BCSCPT or CSPT), Advanced Certified Pharmacy Technician (CPhT-Adv), and many other certificates in many unique topics, including hazardous drugs, billing and reimbursement, and immunizations. Pharmacy technicians must take continuing education (CE) courses to continuously renew each certificate.

NPTA and the National Home Infusion Association (NHIA) offer CE opportunities in many different formats.

WHY ADD A CAREER LADDER TO AN ORGANIZATION?

Implementing a career ladder within an organization helps promote personal and professional growth, develop leadership skills, and build a better work culture. Having a clearly defined career ladder allows the pharmacy technician to prioritize goals and tools needed to drive their success within the organization. Pharmacy technicians who excel in their role and move up the career ladder demonstrate the characteristics needed to produce safe and quality work daily.Accountability is an important part of pharmacy technicians' daily role in the organization. With each designated job role, there is a set of clearly defined expectations that allows for managers and/or supervisors to hold pharmacy technicians accountable for the work they are producing. Both parties involved can visually see and understand the expectations and work together to promote success.

A career ladder will also empower pharmacy technicians to continue pursuing their careers with the organization and prevent the employee from looking for opportunities elsewhere. Promoting a culture of inclusivity comes with adding a career ladder to your organization. Pharmacy technicians are more than capable of completing and contributing to multiple factors that create a successful team. Including the pharmacy technicians in the initial foundation building of a career ladder allows the needs of both entities to be met.

Pharmacy technicians are doing the job from start to fin-

ish, day in and day out, which allows more accurate information to represent each step the pharmacy technician will take to advance in the organization's career ladder. Lastly, the addition of a career ladder can be beneficial in improving succession planning. Having a defined structure of the different levels and titles of the organization, along with the skills, experience, and other requirements for each role, will allow organizations to better plan for the future needs of the leadership team. This will help facilitate a smooth transition when directors and/or leaders move on to other opportunities or retire from the organization.

WHAT INCENTIVES CAN ORGANIZATIONS PROVIDE?

Added incentives and an employment benefit structure for pharmacy technicians can help to motivate individuals within the organization. Organizations should motivate individuals to participate in career development as it benefits the pharmacy technician and the organization the employee works for. The best way to motivate, is to add incentives! The employee benefit structure, incentives, and other factors will vary depending on the organization (i.e., locations and employee count). Still, employers look at many common factors when building a career ladder for advancement. Some of these different incentives include, but are not limited to:

Paid time off (PTO): Who doesn't enjoy time off? While this does carry some potential financial implications for organizations, PTO has a low "retail" price. Organizations that include additional PTO days into the career ladder as an incentive for achievements give pharmacy technicians the time needed to focus on expanding their knowledge base, networking, reinforcing work-life balance, and rewarding success and offering an additional day or 2 off benefits both parties.

Stipends: Adding a set dollar amount that pharmacy technicians will be provided upon successful advancement for continuing education (CE) is a must. In most cases, CE credits are a requirement for renewing an active professional license. Organizations that openly share this financial burden help provide assistance and model ideal learning behaviors.

License Renewal Fees: Keeping a professional license(s) up to date can become expensive depending on the license(s) obtained by the individual. Organizations can offer to cover all or part of the costs that are associated with maintaining an active license(s). Absorbing some, if not all, of these renewal costs demonstrate a commitment to the employee and professionalism.

Merit Pay Increase: Based on performance and successful completion of the requirements to advance, merit increases can be effective for reaching specific goals. These would be in addition to the salary adjustments that occur due to the result of an annual performance review.

Cash Bonus: Who doesn't love cash? Including a discretionary cash bonus for individuals who have demonstrated commitment and dedication to their job performance and will continue to excel, year after year, within the organization.

PERSONAL SUCCESS STORY

"If you had asked me 10 years ago, I would never have guessed I would be sitting where I am today in my career. Being a pharmacy technician is more than filling a prescription, running insurance claims, and compounding sterile products. It is about compassion for the job, coworkers, the patient. Starting as a retail pharmacy technician at a locally owned pharmacy in Central Maine, I began to build my knowledge base of medications, customer service, and processing insurance claims.

Over time, faces become familiar in and out of the pharmacy, and a relationship begins to build. I have a passion for helping people, and I wanted more. When the opportunity to relocate was on the horizon, I began to search for a new job within the pharmacy realm. I found my current employer, a home infusion pharmacy. I had no idea what home infusion was, let alone what a pharmacy technician did in this capacity. I had the interview and was offered the job, which I quickly accepted. Entering the organization, I was a staff pharmacy technician, and the company did not have a career ladder or any room for advancement at that time.

I became certified by PTCB as a Certified Pharmacy Technician and obtained my pharmacy technician license in 2 other states where we have pharmacies in, along with my home state. Quickly excelling in all aspects of the pharmacy technician role compounding sterile preparations, I wanted more.

The opportunity for the Lead Pharmacy Technician job was opened, and I quickly applied for this role. Once offered the Lead position this is where things began to change. In this role, it was identified that pharmacy technicians didn't have room for growth within our organization unless an individual left a position of a higher caliber, etc., which would then require an application for the position, etc. Working with a core group of coworkers from my organization, we created and implemented a career ladder for pharmacy technicians across the 4 pharmacies we have in 3 states.

Now, almost 10 years later I have since moved on from the Lead Pharmacy Technician role to Regional Pharmacy Training and Quality Specialist within my organization overseeing the facility's ongoing compliance, standard-

ization, training and regulatory aspects. I have also had many opportunities, such as teaching at the annual National Home Infusion Association's Sterile Compounding Clinic, and I currently sit as an inaugural member of the NHIA Sterile Compounding Practice Committee. Each day I continuously see pharmacy technicians within our organization advancing further and further within their career, and this has made a positive impact not only on the organization but the individual achieving the accomplishments."

WHEN IS THE TIME TO IMPLEMENT A CAREER LADDER

Many are wondering when the right time is to implement a career ladder. The time is now. With the impending changes that will soon be enforced via USP<797> 2023 Chapter, organizations can hone in and create a career ladder that will increase efficiency, promote well-being, and offer the ability for pharmacy technicians to help continue to build and drive a successful organization. Developing a core team of individuals to build and continuously update an organization's career ladder is important. Staying current with the changes, needs of the company and the employee, and what is needed for continuing education is important as this is constantly changing. Remember, organizations must have a designated person(s), which makes for a great opportunity to add this as a top-tier task for pharmacy technicians to strive to achieve.

It is a great time to start thinking about your organization and how a career ladder would benefit you, your team, and your company. Pharmacy technicians are some of the most dedicated, hardworking, indispensable individuals in the industry, and accompanying these individuals through their success is mutually beneficial. Pharmacy technicians are at the forefront of the constantly evolving standards and regulations implemented by the state board and accreditation agencies, and something such as a career ladder with opportunities for growth can help seek out and retain quality employees.

But it is not enough to provide proper training and to expect more of them. We also must compensate properly, leading me to the second part of advocating for our technicians: pay. Up to recently, the average pay for a technician was not more than $16. With the pressure put on employers and the massive exodus, we have seen a significant pay increase for technicians. However, it is not as much as it should be, and the process of gradual pay is too weak and slow. I am not advocating for new technicians to make as much as seasoned technicians. Let's be clear on that. However, across the board, better pay is not just about money. It also brings value to how technicians feel about their role in pharmacy. To be paid so little for all their work, rightfully so, significantly

diminishes their confidence and desire to become valuable members of our profession. Please do not quote; money is not everything, and do this for the good of the community. If that is the case, we should all be doing our jobs for free. But we have societal, personal, and familial obligations that require us to have income, not just any income but livable wages. Technicians on a national level do not make enough money to cover their needs and those of the families who depend on them. We accuse technicians of not investing in their professional lives. However, how can they justify paying for expensive CEs, and association memberships when they can't afford gas to get to work? Better pay goes along with job satisfaction and retention! While job expansion, better training, and better pay sound enough, it is not. I know what you are about to say: What more can we do? What more do technicians want besides those two? Protection! They want protection just like you and I want. What do I mean by that? How many technicians approach their managers and speak of the issues they might face at the workplace?

How many of them stand before the board of pharmacy and bring safety concerns? How many do you see as public advocates? The fear of retaliation and intimidation does not just apply to Pharmacists. In fact, I dare to argue that technicians feel it more because we have made them believe that they are easily replaceable. Therefore, I think any type of policies or legislation involving Pharmacy rights to advocate should include technicians in the language. APhA and NASPA put together the Pharmacist fundamentals rights and responsibilities which many other associations, including NABP endorsed. While I support and promote the document, I dearly wish it included technicians. Because while we are constantly reminding them of their responsibilities through the company code of ethics and board of pharmacy regulations, we rarely discuss the rights of technicians. In many instances, that include the right to advocate for themselves and their patients without fearing being fired the next day. I sincerely believe that too often, we exclude technicians from the critical roles they can play in fighting against issues Pharmacy faces. That being said, I also believe in personal responsibility, and that's my last call. It is time for Technicians also to take more ownership in advocating for themselves, patients, and our profession overall. Technicians cannot expect anyone else to fight their battles. While I love technicians dearly and what they are worth fighting for, they can no longer fold their hands and leave their destiny at the mercy of others. As a technician, you have immense power, and maybe you have yet to recognize it, or you have been made to believe otherwise! But you do, and that power is not to bully other technicians or pharmacists. Leverage that to become a fierce leader in our profession. It is true when they say, "Technicians can make you or break you." Don't take pride in the fact that you can break others. But instead, be a builder of bridges! Be a builder of opportunities! Be a builder for a better tomorrow for yourselves, your profession, and your patients. Above all, be the person who inspires changes! Because I did not tell you everything about that conversation with that technician. Perhaps you did not know that #PizzaIsNotWorking was birthed that night. That discussion with my technician awoke me from my slumber and made me participate in this fight! This technician inspired me more than he would realize. I hope that today, he can look back and recognize that his cries and his voice changed the course of my life and, undeniably pharmacy overall. While #PizzaIsNotWorking has not revolutionized pharmacy in a deep and impactful way, it has caused the light to be shown on issues that were not wildly spoken for too long! It has brought light to a system of greed, profit, and abuse! It has given voices to others and encouraged them to become their own advocates. #PizzaIsNotWorking will surely be remembered for its contribution to our profession, and it will all be because one technician decided to share his concerns with me. While I had and still have no power, I was encouraged to seek changes and stand up. Today, you are also called to raise your voice! Whether you are a pharmacist, technician, or student, you have the power to bring changes. Specifically, for you, Technicians, do not underestimate your influence and importance. You are indispensable to our profession, and while you might still hide behind the shadows, a brighter tunnel is being built! Do not remain an observant! Start leading the journey towards it now.

EXHIBIT A - SAMPLE PHARMACY TECHNICIAN CAREER LADDER

- Tenure – years with reliable attendance and punctuality
- Job Performance – meets or exceeds expectations in all areas; no history of performance improvement in the period
- Leadership – demonstrates continuous improvement in leadership attributes
- Values – demonstrates adherence to employer's mission, vision and values
- Continuing Education – completes defined continuing education program for the appropriate period
- Department Leadership – assumes responsibility for duties beyond base job requirements as a condition for advancement to a subsequent tier

TITLE	EXPECTATIONS	INCENTIVES
Pharmacy Technician (0-2 years)	• Maintain a good record of attendance and punctuality • No performance management deficiencies in the period • Obtain National Certification (CPhT) within 12 months of hire • Demonstrate independence/competence in picking, mixing, labeling, and staging of the final patient product (Non-Hazardous) • Demonstrate independence/competence in TEACHING: picking, mixing, labeling, and staging of the final patient product (Non-Hazardous) • Complete four continuing education programs in the period specific to the department, professional development, etc.	• Building skills to help with future advancement • Growth opportunities provided by the organization to help promote advancement within the organization
Senior Pharmacy Technician (3-5 years)	• Obtain a license in another state and work at least 1 day per year in that facility • Demonstrate independence/competence in answering/triaging calls from physicians and others on the outside line • Complete six continuing education programs in the period-specific to the department, professional development, etc. • Be involved in at least one branch team (i.e., Inventory Team) • Demonstrate independence/competence in preparing and teaching all hazardous medication compounding	• $500/year toward continuing education in sterile compounding • 2 additional days of paid time off (PTO)/year • Coverage of license fees • 2% salary increase – IN ADDITION to annual merit adjustment
Lead Pharmacy Technician (5+ years)	• Obtain a license in another state and work at least 5 days per year in that facility • Obtain CSPT or BCSCPT • Responsible for department scheduling • Responsible for conducting clean room competency evaluations and maintaining records • Serve as the lead/go-to for a branch team (i.e. Inventory Team) • Serve as designated person(s)	• Up to $1,000/year towards continuing education in sterile compounding • 3 additional days of paid time off (PTO)/year • Pay for all initial/renewal of licenses and certifications • 2.5% salary increase – IN ADDITION to annual merit adjustment • Discretionary bonus of $1,000/year

CE: WEIGHT LOSS FOR PHARMACY TECHNICIANS

Author: Jim Mizner, RPh

This author has no conflict of interest to declare in conjunction with this continuing education activity.

LEARNING OBJECTIVES:

At the completion of this activity, the participant will be able to:

1. Describe the etiology of obesity.
2. Explain the effect of obesity on the body's systems.
3. Identify the medications used in the treatment of obesity.
4. Recognize non-pharmacological treatments for obesity.

Faculty: Jim Mizner, RPh

Contact Hour(s): 2.0
Activity Type: Knowledge-Based Home Study
Instructional Methods: Independent Self-Study + Post-Test
Target Audience: Pharmacists and Pharmacy Technicians
Cost: NPTA Elite/CE+ Members: FREE; NPTA Insiders/Non-Members: $10
Disclosures: The CE faculty, reviewers and planning committee members have all reported no actual or potential conflict of interest in relation to this program. This program received no commercial support and has been peer-reviewed to ensure non-commercialization.
ACPE UANs: 0384-0000-23-009-H01-P, 0384-0000-23-009-H01-T
Release Date: 03/13/2023 Expiration Date: 03/13/2026

Completion of the post-test with minimum passing score of 70% is required to be awarded CPE contact hours.
Participants are allowed a total of two attempts to pass the post-test.

Please allow up to 10 business days for the credit to appear in your NABP CPE Monitor account.

NPTA is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

Disclaimers:
The faculty has reported no actual or potential conflict of interest in relation to this program. This program received no commercial support and has been peer-reviewed to ensure non-commercialization.

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DID YOU KNOW?

- In 1999-2000, the rate of obesity in the United States was 30.5%, but it increased to 41.9% from 2017 to March 2020.
- In the United States, the estimated annual medical cost associated with obesity was almost $173 billion in 2019 dollars.
- The medical costs associated with adults diagnosed with obesity were $1,861 higher than those associated with a healthy weight.
- Healthcare costs linked to inpatient treatment, outpatient treatment, and prescription drugs are approximately $260.6 billion annually in the United States.
- Non-Hispanic Black adults (49.9%) had the highest age-adjusted incidence of obesity, followed by Hispanic adults (45.6%), non-Hispanic White adults (41.4%), and non-Hispanic Asian adults (16.1%).
- The occurrence of obesity was 39.8% among adults aged 20 to 39 years, 44.3% among adults aged 40 to 59 years, and 41.5% among adults aged 60 and older.
- According to the CDC, U.S. adults living in rural areas are more likely to show a propensity to obesity than adults living in urban areas.
- According to the National Survey of Children's Health, one in six youth in the U.S. are obese.

INTRODUCTION

In 1998, the National Institutes of Health(NIH) acknowledged obesity as a disease, followed by the American Obesity Society in 2008. Furthermore, the American Medical Association (AMA) recognized obesity as a disease state in 2013. The AMA's announcement was expected to have a major impact on health policy, leading to research into the origins of obesity, identifying novel treatments for treating this condition and advancing patient health and outcomes. According to the Centers for Disease Control and Prevention (CDC), a weight higher than what is considered healthy for a given height is designated as overweight or obese.Obesity is the disproportionate or abnormal buildup of fat or adipose tissue in the body that injures an individual's health due to its link to the risk of developing diabetes mellitus, cardiovascular disease, hypertension, and hyperlipidemia. Body Mass Index (BMI) is a screening tool for diagnosing overweight individuals and obesity. BMI is calculated by dividing a person's weight in kilograms by the square of the individual's height in meters. BMI is used as a means to identify individuals identified as obese because it associates the amount of body fat an individual has.

If an individual's BMI is less than 18.5, it falls within the underweight range.

- If an individual's BMI is 18.5 to 24.9, it falls within the healthy weight range.
- If an individual's BMI is 25.0 to 29.9, it falls within the overweight range.
- If an individual's BMI is 30.0 to 34.9, the patient is classified as obese: Class I.
- If an individual's BMI is 35.0 to 39.9, the patient is classified as obese: Class II.
- If an individual's BMI is 40.0 or higher, the patient is classified as obese: Class III (severe obesity).

BMI is correlated with more direct measures of body fat acquired from skinfold thickness measurements, bioelectrical impedance, underwater weighing, dual-energy x-ray absorptiometry (DXA), and other methods. BMI and various adverse health outcomes are strongly related.

ABDOMINAL OBESITY BY WAIST CIRCUMFERENCE MEASUREMENTS FOR ETHNIC GROUPS		
COUNTRY/ETHNICITY	WAIST CIRCUMFERENCE IN CM (IN)	
	Males	Females
United States (for those of European descent)	≥102 (40)	≥88 (35)
European	≥94 (37)	≥80 (31.5)
South Asian, Chinese, and Japanese	≥94 (37)	≥80 (31.5)
South and Central Americans	Use South Asian recommendations until more data are available	
Sub-Saharan African	Use South Asian recommendations until more data are available	
Mediterranean and Middle Eastern	Use European recommendations until more data are available	

Waist circumference (WC) measurements can be used to screen for abdominal obesity or accumulation of visceral body fat. People with larger waists, even those with normal body weight, have an increased risk of heart disease, cancer, and all-cause mortality.

OBESITY

Obesity occurs as an imbalance between calories consumed by the human body and calories utilized by the body resulting in weight gain. The body uses calories to sustain basic metabolic processes and for physical activity. If an individual consumes more calories than the body uses, then an individual puts on weight.

Meanwhile, if an individual uses more calories than the body consumes, then the individual loses weight. A variety of factors affect an individual's predisposition to obesity. These factors include behavior and lifestyle habits, environment, economic factors, family history and genetics, and an individual's metabolism.

RISK FACTORS OF OBESITY

GENETICS

Genetic factors may influence the signaling molecules and receptors used by parts of the hypothalamus and gastrointestinal tract to control food intake. Signals from the gastrointestinal tract and changes in plasma nutrient levels provide short- and long-term feedback to regulate food intake:

- Gastrointestinal hormones such as glucagon-like peptide-1 (GLP-1) reduce food intake.
- Ghrelin, secreted predominantly by the stomach, increases food intake.
- Leptin, secreted from adipose tissue, notifies the brain how much fat is stored. Leptin suppresses appetite in normal-weight people, but high leptin levels are associated with increased body fat. Leptin levels can decrease when weight is lost and send a hunger signal to the brain.

Several rare forms of obesity result from spontaneous mutations in single genes. These mutations appear in genes that play an important role in appetite control and energy homeostasis in genes responsible for coding leptin. Individuals diagnosed with genetic syndromes such as Prader–Willi and Bardet-Biedl exhibit obesity.

FOOD AND DIET

There is conflicting information regarding the weight-loss benefit associated with dairy products. According to some-term studies, dairy or calcium-containing products are believed to produce weight loss. However, most long-term studies have not found evidence that dairy or calcium products do not prevent weight gain. It has been demonstrated that sugary drinks increase the possibility of weight gain, obesity, and the development of diabetes.

Furthermore, studies have concluded that there is a connection between soft drink consumption with increased caloric consumption and body weight. Similar to refined grains and potatoes, sugary beverages are high in rapidly digested carbohydrates.It has been shown that liquid carbohydrates are not as satiating as in solid form, and individuals don't eat less to counterbalance the extra calories. "Western-style" dietary patterns containing red meat, sugared drinks, refined carbohydrates, or potatoes have been linked to obesity. The Western-style dietary pattern is also linked to an increased risk of heart disease, diabetes, and other chronic conditions.

ENVIRONMENT

Changes in today's environment have greatly promoted obesity in our society. Consider the following:

- The arrivals of highly processed foods, fast food, and sugar-sweetened beverages and the continuous marketing of these products in multiple media formats;
- The availability of food at all hours of the day and in places that once did not sell food, such as pharmacies;
- A dramatic decrease in physical activity during work and leisure time, especially among children;
- Increased time spent watching television, using computers, playing video games, and engaging in other sedentary activities.

PHYSICAL ACTIVITY

Physical activity refers to any body movement that burns calories, whether for work play, daily household activities, or the daily commute. Exercise is a subcategory of physical activity and refers to planned, structured, and repetitive activities that aim to improve an individual's physical fitness and health. Physical activity is measured in metabolic equivalents (METs). One MET refers to the number of calories expended while a person sits quietly for one minute, about one calorie per every 2.2 pounds of body weight per hour. Moderate-intensity physical activity refers to activities that are strenuous enough to burn three to six times as much energy per minute as an individual would burn when sitting quietly or 3 to 6 METs.

Vigorous-intensity activities burn more than 6 METs. Today, people are less active compared to decades ago. In the United States, individuals driving their cars to work increased from 67% in 1960 to 88% in 2000, and utilizing public transportation to work decreased, too. Fewer children rode their bikes to school in 2000 (13%) compared to 1969 (40%). As a result of decreased physical activity, sedentary activities such as watching television and playing video games have increased.

The increase in sedentary activities has increased the weight of the average American.

SLEEP

Studies have demonstrated that a reduced amount of sleep individuals experience nightly may result in weight gain. A decrease in sleep may increase the amount of food an individual consumes and decrease the amount of energy they expend. Sleep deprivation can increase energy intake due to

altering the hormones that regulate hunger. A study showed men deprived of sleep experienced higher levels of ghrelin, an appetite-stimulating hormone, and lower levels of the hormone leptin. Low levels of leptin results in an increase in an individual's hunger and desire for carbohydrates. It has been shown that individuals who sleep less at night are more likely to eat more than those who acquire a whole night's sleep because of the additional time they are awake. Sleep deprivation can decrease an individual's physical activity level during the day since many of these individuals are more tired and engage in less physical activity. In addition, it has been shown that individuals who do not receive a full night's sleep endure a drop in their body temperature, resulting in less energy being used by the body during this time.

DISEASES AND MEDICATIONS

Diseases such as Cushing's disease, hypothyroidism, and Prader-Willis syndrome may cause obesity in individuals. Other individuals may have developed sedentary lifestyles due to disease states, such as congestive heart, edema, arthritis, and insomnia, which may cause obesity. Many drug classes have the potential to cause a patient to gain weight.

MEDICATIONS COMMONLY ASSOCIATED WITH CHANGES IN BODY WEIGHT

MEDICATION CLASSES	MEDICATIONS THAT INCREASE WEIGHT GAIN	MEDICATIONS THAT ARE WEIGHT NEUTRAL (LONG-TERM THERAPY)	MEDICATIONS THAT INCREASE WEIGHT LOSS
Antidepressants	Lithium, mirtazapine, monoamine oxidase inhibitors, paroxetine, amitriptyline	Bupropion, citalopram, escitalopram, fluoxetine, sertraline	-
Antihistamines	Cetirizine, chlorpheniramine, diphenhydramine, fexofenadine, hydroxyzine, levocetirizine	Loratadine	-
Antipsychotic agents	Clozapine, olanzapine, quetiapine, risperidone	Aripiprazole, lurasidone, ziprasidone	-
Antiseizure agents	Carbamazepine, gabapentin, pregabalin, valproic acid	Lamotrigine, levetiracetam, phenytoin	Topiramate, zonisamide
Cardiovascular agents	Alpha-blockers, beta-blockers (except nebivolol and carvedilol), calcium channel blockers	-	-
Antidiabetic agents	Insulin, meglitinides, sulfonylureas, thiazolidinediones	Alpha-glucosidase inhibitors, bromocriptine colesevelam, dipeptidyl peptidase inhibitors	Glucagon-like peptide-1 receptor agonists, metformin, pramlintide, sodium glucose cotransporter-2 inhibitors
Contraceptives	Some estrogen-based oral contraceptives, progesterone-based subcutaneous implants	-	-
Corticosteroids	Prednisone, prednisolone, and methylprednisolone	-	-
Antiretroviral agents	Protease inhibitors	-	-

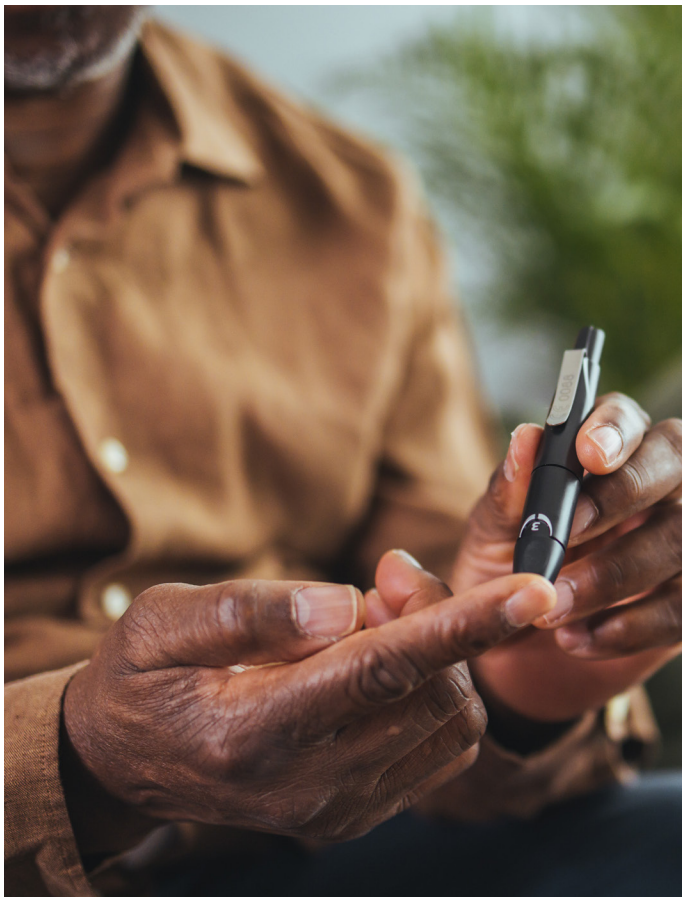
HEALTH RISKS ASSOCIATED WITH OBESITY

Excess weight, especially obesity, affects how the body functions. Obesity increases the possibility of developing weakening and deadly diseases, including diabetes, heart disease, kidney disease, respiratory disease, depression, reproduction, cognitive function, musculoskeletal disorders, and some cancers. It does this through various pathways, such as carrying extra pounds or involving complex changes in hormones and metabolism.

Type 2 diabetes mellitus is a condition that is affected by excess weight. Fat cells, especially around the waist, produce hormones and other substances that can initiate an inflammatory response. Inflammation is a vital element of the immune system and part of the healing process; inappropriate inflammation can produce a variety of health problems, though. Inflammation can make the body less responsive to insulin and change how it metabolizes fats and carbohydrates, resulting in higher blood sugar levels and, ultimately, diabetes and its many complications. The Nurses' Health Study tracked 114,000 middle-aged women for 14 years and observed the risk of developing diabetes was 93 times higher among women who had a body mass index (BMI) of 35 or higher at the start of the study compared with women with BMIs lower than 22. Weight gain during adulthood increases diabetes risk, even among women with BMIs in the healthy range. The follow-up to this study found a similar pattern in men. A similar study revealed men and women in the normal weight range (BMI lower than 25), men with BMIs of 30 or higher had a sevenfold higher risk of developing type 2 diabetes, and women with BMIs of 30 or higher had a 12-fold higher risk.

Body weight is directly associated with various cardiovascular risk factors. As BMI increases, so do blood pressure, low-density lipoprotein (LDL, or "bad") cholesterol, and triglycerides. According to the Framingham Study, overweight men and women experience an increase in blood pressure. Individuals with the highest body mass index demonstrated a 16mm HG higher systolic blood pressure and a 9mm HGH higher diastolic blood pressure than those in the lowest body mass index quartile. The study also indicated that each 4.5 kg of increased weight resulted in an increased systolic blood pressure of 4mm Hg.

Irregularities in lipid metabolism are commonly detected in patients who are diagnosed as obese. Lipid abnormalities in obese patients include elevated serum triglyceride, VLDL, apolipoprotein B, and non-HDL-C levels. The increases in serum triglycerides are due to increased hepatic production of VLDL particles and a decrease in the clearance of triglyceride-rich lipoproteins. Weight loss will decrease serum triglyceride and LDL-C levels and increase HDL-C levels. Treatment of a patient's dyslipidemia is warranted to prevent the development of cardiovascular disease.



WEIGHT LOSS

Obesity-related factors are anticipated to produce 11% of heart failure cases in men and 14% in women. Obesity may result in heart failure by inducing hemodynamic and myocardial changes that lead to cardiac dysfunction due to an increased predisposition to other heart failure risk factors.

Many studies have established a direct relationship between excess body weight and coronary artery disease (CAD). A study involving more than 300,000 individuals over 16 years demonstrated that individuals who were overweight had a 32 percent higher risk of developing CAD compared with participants who were at a normal weight; those who were obese had an 81 percent higher risk. The researchers projected that excess weight on blood pressure and blood cholesterol accounts for only about half of the obesity-related increased risk of coronary heart disease. Ischemic stroke and coronary artery disease possess many of the same disease risk factors.

A meta-analysis of 25 cohort studies involving 2.3 million participants revealed a direct connection between excess weight and stroke risk. Being overweight increased the risk of ischemic stroke by 22 percent, and obesity increased it by 64 percent. There was no substantial relationship between being overweight or obese and hemorrhagic stroke.

Obesity increases sodium reabsorption in the kidneys and impairs renal pressure by stimulating the renin-angiotensin and sympathetic nervous systems. An obese individual experiences structural changes in their kidneys, resulting in a loss of nephron function, which increases the likelihood of kidney disease. Excess weight weakens respiratory function through both mechanical and metabolic pathways. The abdominal fat buildup may constrain the diaphragm's descent and lung expansion. Meanwhile, additional visceral fat can decrease the elasticity of the chest wall, drain respiratory muscle strength, and constrict the airways in the lungs.

A review of 17 studies indicated that people who were obese were more likely to experience depression than individuals maintaining a healthy weight. While a biological link between obesity and depression has not yet been conclusively found, possible mechanisms include inflammation initiation, hypothalamic-pituitary-adrenal axis transformation, insulin resistance, and social or cultural agents. Obesity can impact various aspects of reproduction, especially ovulatory infertility. According to the Nurses' Health Study, infertility was lowest in women with BMIs between 20 and 24. It increased with lower and higher BMI, suggesting that ovulatory infertility in the United States may be associated with obesity. During pregnancy, obesity increases the

likelihood of early and late miscarriage, gestational diabetes, and difficulties during labor and delivery. Obesity has been shown to slightly increase the probability of bearing a child with congenital abnormalities. One study indicated that modest weight loss improves fertility in obese women. Studies are not conclusive about male obesity and reproduction.

In the United States, Alzheimer's disease and dementia affect more than 7.5 million people, most over age 65. Body weight is a possible adjustable risk factor for Alzheimer's disease and dementia. A review of 10 prospective cohort studies established a U-shaped association between BMI and Alzheimer's disease. Compared with being in the normal weight range, being underweight was associated with a 36 percent higher risk of developing Alzheimer's disease, while being obese was associated with a 42 percent higher risk. Excess weight places strains on the bones, muscles, and joints. Osteoarthritis of the knee and hip are both positively related to obesity. One-third of all joint replacement operations are conducted on obese patients. Obesity also increases the risk of back pain, lower limb pain, and disability due to musculoskeletal conditions.

TREATING OBESITY

Obesity is a disease. Managing obesity is a multifaceted and long-term process. Modest weight loss enhances an individual's overall health, comorbidities, glycemic control, and cardiometabolic risk factors. For overweight individuals classified as having Class I obesity, a permanent weight loss of 5% to 10% of baseline body weight is important for reducing obesity-related morbidity, disease-specific mortality, and all-cause mortality. Individuals diagnosed with Class II and Class III obesity necessitate a 10% to 20% drop in body weight. An individual diagnosed as severely obese requires a 30% or more reduction in body weight to address weight complications and comorbidities.

Treatment should include diet, exercise, and behavioral therapy plans. A registered nutritionist should prescribe a diet considering a patient's weight loss goals, comorbidities, and personal preferences. Daily caloric intake should be decreased by 500 to 1000 kcal during the initial weight loss phase to affect the body's adaptive response for weight preservation. Research has been conducted and demonstrates that specific foods can protect an individual against developing heart disease, stroke, diabetes, and other chronic conditions. Many foods, such as whole grains, vegetables, fruits, and nuts that help prevent disease can help an individual maintain a healthy weight.

The Dietary Guidelines for Americans 2020–2025 recommends that diets consist of the following;

- Fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products
- A variety of protein foods such as seafood, lean meats and poultry, eggs, legumes (beans and peas), soy products, nuts, and seeds
- Low amounts of added sugars, sodium, saturated fats, trans fats, and cholesterol

Evidence indicates that whole grains such as whole wheat and brown rice are digested more slowly than refined grains. Whole grains have a milder effect on blood sugar and insulin, which may diminish an individual's hunger desires. It has been shown that vegetables and fruits can help prevent disease and

maintain a healthy weight. Studies show that individuals who have increased their consumption of whole grains, fresh fruits, and vegetables gained less weight over twenty years than people with poor diets. Even though nuts have a high fat content, they are rich in protein and fiber, making individuals feel fuller. In addition, an individual who consumes nuts is less likely to have a heart attack or die from cardiac disease.

Two dietary programs, the Dietary Approaches to Stop Hypertension (DASH diet) and the Mediterranean diet, have demonstrated promise against chronic disease and controlling weight. Low-carbohydrate diets improve insulin resistance and reduce reward responses to food consumption. Low-fat diets may lower resting energy expenditure but are slower than low-carbohydrate diets for weight loss. Evidence does not support "crash diets" or "fad" diets for weight loss and long-term weight maintenance.

Intermittent fasting is a diet regimen that sequences between brief periods of fasting with either no food or significant calorie reduction and periods of unrestricted eating. Its purpose is to alter body composition by losing fat mass and weight and improve specific disease markers. There are three methods utilized with intermittent fasting:

- Alternate day fasting, which alternates between days of no food restriction, consists of one meal that provides 25% of daily calorie needs.
- Whole-day fasting consists of 1-2 days per week of complete fasting or up to 25% of daily caloric needs, and no dietary restrictions for the remaining days.
- Time-restricted feeding follows a meal plan each day with a specified period for fasting.

Regular exercise is necessary when losing weight and maintaining a healthy weight. Exercise should comprise at least 150 minutes/week of accumulated moderate-intensity aerobic activity or at least 75 minutes/week of vigorous aerobic activity.

CALORIES USED PER HOUR IN COMMON PHYSICAL ACTIVITIES

MODERATE PHYSICAL ACTIVITY	APPROXIMATE CALORIES/30 MINUTES FOR A154 LB PERSON
Hiking	185
Light gardening/yard work	165
Dancing	165
Golf (walking and carrying clubs)	165
Bicycling (<10 mph)	145
Walking (3.5 mph)	140
Weight lifting (general light workout)	110
Stretching	90
VIGOROUS PHYSICAL ACTIVITY	**APPROXIMATE CALORIES/30 MINUTES FOR A 154 LB PERSON**
Running/jogging (5 mph)	295
Bicycling (>10 mph)	295
Swimming (slow freestyle laps)	255
Aerobics	240
Walking (4.5 mph)	230
Weight lifting (vigorous effort)	220

Exercise should include resistance training, too. Exercise has been shown to reduce the risks associated with cardiovascular disease and diabetes. Other benefits associated with cardiovascular disease include maintaining weight; reducing high blood pressure; lowering the risk for type 2 diabetes, heart attack, stroke, and several forms of cancer; reducing arthritic pain and disability; lowering the risk for osteoporosis and falling; and reducing the symptoms associated with depression and anxiety.

MEDICATIONS

Pharmacotherapy is indicated for individuals with BMIs exceeding 30 kg/m2. Individuals with BMIs of 27 kg/m2 or more with at least one comorbid obesity-related comorbidity, such as hypertension, dyslipidemia, or diabetes mellitus type 2, should be prescribed medications. Finally, patients with BMIs of 27 kg/m2 or more without obesity-related comorbidities where lifestyle management practices fail to prevent continuing weight gain should receive medications. Pharmacotherapy should be considered when one or more comorbid conditions, such as osteoarthritis or prediabetes, require weight loss. Patients should be monitored for drug efficacy and safety at least monthly for 3 months and then at least every 3 months after that for the duration of drug treatment. Pharmacotherapy that achieves 5% or greater weight loss at 12 weeks should be continued. If weight loss at this time is less than 5%, medication adherence should be appraised, and any adverse effects the patient is experiencing should be addressed.

Various medications have been approved by the Food and Drug Administration (FDA) for chronic weight management. They may be taken on a long-term basis as long as the patient benefits from their use and is not experiencing side effects. Approved medications include orlistat (Xenical® and Alli®), phentermine-topiramate (Qsymia®), naltrexone-bupropion (Contrave®), liraglutide (Saxenda®), and semaglutide (Wegovy). Setmelanotide (Imcivree®) is indicated for POMC deficiency-associated obesity, PCSK1 deficiency obesity, LEPR deficiency-associated obesity, and Bardet-Beidl syndrome-associated obesity. Phentermine (Adipex-P®), diethylpropion, and phendimetrazine are meant for short-term weight management.

GLUCAGON-LIKE-PEPTIDE-1 (GLP-1) RECEPTOR AGONISTS

GLP-1 receptor agonists have pharmacologic actions similar to the effects of human GLP-1. Modifications in the agents' chemical sequencing provide resistance to degradation by DPP-4 and a prolonged drug half-life. They stimulate insulin secretion, inhibit glucagon secretion, delay gastric emptying, lower fasting and postprandial blood glucose, and reduce body weight.

LIRAGLUTIDE (SAXENDA®)

- Indication: Chronic weight management for adults and children 12 or older.
- Drug Classification: Glucagon-like peptides (GLP-1) agonists
- Mechanism of Action: Liraglutide mimics glucagon-like peptide-1 (GLP-1) hormone that focuses on brain areas responsible for controlling appetite and food intake.
- Dosage: Adults and pediatric patients (12 years of age and weighing more than 60 kg): The patient should start by injecting 0.6 mg subcutaneously daily for one week and then increasing by 0.6 mg daily each week to a target of 3 mg subcutaneously daily. A dose of 3 mg/day is the maximum dose for liraglutide.
- Common drug interactions: Insulin and sulfonylureas (hypoglycemia); may impair the

absorption of oral medications.

- Common side effects:
  Nausea, diarrhea, constipation, abdominal pain, headache, and increased heart rate
- Patient information:
  - With concurrent oral medications requiring a rapid onset, caution is advised since liraglutide delays gastric emptying.
  - May increase the likelihood of developing pancreatitis.
  - It has been found to cause a rare thyroid tumor in animals.
  - It should not be used by patients with multiple endocrine neoplasia type 2 tumors in their glands or a personal or family history of medullary thyroid cancer.
  - If the patient observes the signs of a swelling or a lump in their neck, experience trouble swallowing, a hoarse voice, or shortness of breath, they should contact their physician.
- Controlled substance: No

SEMAGLUTIDE (WEGOVY®)

- Indication: Chronic weight management for adults and adolescents 12 years or older with at least one weight-related medical condition such as type-2 diabetes, hypertension, or hyperlipidemia.
- Drug Classification: Glucagon-like peptide-1 (GLP-1) agonists
- Mechanism of Action: Mimics a glucagon-like peptide-1 (GLP-1) hormone that focuses on brain areas responsible for controlling appetite and food intake.
- Dosage: Adults and pediatric dosing (12 years or older): The patient should start by injecting 0.25 mg subcutaneously per week for weeks, then 0.5 mg subcutaneously per week for 4 weeks, then 1.7 mg subcutaneously per week for weeks, then 2.4 mg subcutaneously per week.
- Common drug interactions: Insulin and sulfonylureas (hypoglycemia) may impair the absorption of oral medications
- Common side effects: Hypoglycemia, nausea, diarrhea, vomiting, constipation, abdominal (stomach pain), headache, and fatigue
- Patient information:
  - It should not be used with other semaglutide-containing products, other GLP-1 receptor agonists, or other products intended for weight loss, including prescription, over-the-counter, or herbal products.
  - It may increase the possibility of developing pancreatitis.
  - Has been shown to cause a rare type of thyroid tumor in animals.
  - It should be discontinued two months before a woman plans to become pregnant.
  - It should not be used by a patient who has multiple endocrine neoplasia type 2 tumors in their glands or a personal or family history of medullary thyroid cancer.
  - If the patient observes the signs of a swelling or a lump in their neck, experience trouble swallowing, a hoarse voice, or shortness of breath, they should contact their physician.
- Controlled substance: No

Two other medications that contain the active ingredient semaglutide (Wegovy ®) are Ozempic® and Rybelsius®. Wegovy® is available as a 2.4 mg injection and has been approved by the FDA for weight management only. Ozempic® and Rybelsius® are indicated for diabetes mellitus type 2 and cardiovascular event risk reduction in diabetes mellitus type 2 patients with established cardiovascular disease. Ozempic® is available as 2mg per 1.5 mL, 2 mg per 3 mL, 4 mg per 3 mL, and 8mg per 3 mL injectable dosage forms, while Rybelsius® is available in 3 mg, 7mg, and 14 mg dosage forms.

However, all three medications containing semaglutide, Ozempic®, and Rybelsius® have not been approved by the FDA for weight management. Patients being prescribed Ozempic® or Rybelsius® who maintain a healthy diet and exercise routine have shown weight loss.

OTHER MEDICATIONS

ORLISTAT (XENICAL®)

- Indication: Chronic weight management for adults and children ages 12 and older
- Drug Classification: Gastrointestinal lipase inhibitor
- Mechanism of Action: Inhibits pancreatic lipase and reduces the intestinal absorption of dietary fats when administered within 1 hour of consuming a fat-containing meal.
- Dosage:
  - Adults: 120 mg orally every 8 hours with each fat-containing meal (during or up to 1 hour after the meal).
  - Doses greater than 120 mg three times a day have not been shown to provide any additional benefit to the patient.
  - Pediatric (12 years and older): 120 mg by mouth three times a day. Patients should dose during or less than one hour after a meal containing fat if the meal does not contain fat.
- Common drug interactions: Fat-soluble vitamins (decreased absorption); cyclosporine (reduced levels); levothyroxine (decreased serum concentrations); warfarin (increased anticoagulant effect); amiodarone (decreased serum concentrations); antiseizure therapy (increased risk of convulsions); antiretroviral therapy (loss of virological control)
- Common side effects: Oily or fatty stools, orange or brown colored oil in the stools, diarrhea, stomach pain, and nausea.
- Patient information:
  - Avoid taking orlistat with cyclosporine.
  - It should not be taken if the patient is pregnant since weight loss is not recommended during pregnancy.
  - It should not be used if the patient has a digestive disorder involving the absorption of food.
  - Should not use the medication if they have undergone an organ transplant.
  - Fat-soluble vitamin supplements are recommended.
- Controlled substance: No
- Special Note: Orlistat (Alli®) is available as 60 mg over-the-counter medication taken every 8 hours with each meal.

PHENTERMINE-TOPIRAMATE (QSYMIA®)

- Indication: Chronic weight management for adults and adolescents 12 or older.
- Drug Classification: Phentermine-topiramate Is a combination medication consisting of phentermine hydrochloride, a sympathomimetic amine anorectic, and topiramate, a fructose antiepileptic.
- Mechanism of Action: Phentermine works by decreasing an individual's appetite. Topiramate is an anticonvulsant that can decrease an individual's appetite by causing an individual to experience a sensation of being full.
- Dosage:
  - Adult: A patient will start by taking 3.75 mg/23 mg orally every morning for 14 days, then increasing to 7.5 mg/46 mg daily. The maximum dosage is 15mg/92 mg.
  - If a patient's BMI changes less than 3% after taking the 7.5 mg/46 mg, then the dose should be increased to 11.25 mg/46 mg by mouth in the morning for 14 days, then increase to 15 mg/92 mg by mouth in the morning.
  - Pediatric (12 years of age and older): A pediatric patient will start by taking 3.75 mg/23 mg by mouth every morning for 14 days, then increasing to 7.5 mg/ 46 mg daily. the maximum dose is 15 mg/92 mg.

- Common drug interactions: Antidiabetic medications (hypoglycemia); antihypertensive medications (hypotension); ethanol (CNS depression); thiazide or loop diuretics (hypokalemia); monoamine oxidase inhibitors (hypertensive crisis); carbonic anhydrase inhibitors (additive effect); CNS depressants (additive effect)
- Common side effects: Constipation, dizziness, dry mouth, taste changes, especially if taken with carbonated beverages, the tinkling of hands and feet, and difficulty sleeping
- Patient information:
  - It should not be used if the patient has glaucoma or hyperthyroidism.
  - It should not be used if the patient is pregnant or becomes pregnant since there is a risk of a birth defect of a cleft lip and palate in a newborn.
  - It should not be used when breastfeeding an infant.
  - Both phentermine and topiramate can increase a patient's heart rate.
  - Topiramate may cause a patient to experience a sudden decrease in their vision.
  - If a patient experiences sudden mood changes or suicide ideation, they should contact their physician.
- Controlled substance: Schedule IV controlled substance
- Restricted distribution in the United States

NALTREXONE-BUPROPION (CONTRAVE®)

- Indication: Chronic weight management for adults
- Drug Classification: Naltrexone-bupropion is a combination medication consisting of naltrexone, an opioid antagonist, and bupropion, an atypical antidepressant.
- Mechanism of Action: Naltrexone is an opioid antagonist, and bupropion is a weak inhibitor of the neuronal reuptake of dopamine and norepinephrine.
- Both naltrexone and bupropion affect the hypothalamus, which regulates an individual's appetite, and the mesolimbic dopamine circuit, which acts as a reward system for the body.
- Dosage: Take one tablet by mouth every morning for one week, then increase to one tablet by mouth twice a day for one week, then increase to two tablets by mouth in the morning and one tablet in the evening for one week, a maximum of four tablets a day.
- Common drug interactions: Alcohol (enhanced alcohol effects, lower alcohol tolerance, increased toxic effects of bupropion); chronic opioids (diminished agonist effects); bupropion-containing drugs, benzodiazepines, barbiturates, antiseizure medications (avoid excessive use or abrupt discontinuation); monoamine oxidase inhibitors (hypertensive crisis); CYD2D6 substrates; CYP2B6 inhibitors and inducers; drugs that lower seizure threshold; antidiabetic medications (hypoglycemia); digoxin (decreased digoxin levels); levodopa and amantadine (CNS toxicity)
- Common side effects: Constipation, diarrhea, dizziness, dry mouth, headache, increased blood pressure, increased heart rate, insomnia, liver damage, nausea, and vomiting
- Patient information:
  - They should not take this medication if they have uncontrolled hypertension, seizures, an eating disorder or are addicted to opioids, are pregnant, or are taking an opioid or bupropion.
  - They should not take naltrexone/bupropion if they have suddenly stopped consuming alcohol or take seizure medications or sedatives.
  - The patient should be aware of changes in their mood or develop suicide ideation.
  - Avoid taking the medication with a high-fat meal.
  - Do not cut, crush or chew the tablet.
- Controlled substance: No

SETMELANOTIDE (IMCIVREE®)

- Indications: POMC deficiency-associated obesity, PCSK1 deficiency obesity, LEPR deficiency-associated obesity, and Bardet-Beidl syndrome-associated obesity.
- Drug Classification: Melanocortin 4 receptor agonist
- Mechanism of Action: Works by triggering pathways to the brain to promote weight loss by decreasing appetite and caloric intake and increasing usage.
- Dosage: For POMC deficiency-associated obesity, PCSK1 deficiency obesity, LEPR deficiency-associated obesity, and Bardet-Beidl syndrome-associated obesity, the patient starts by injecting 2 mg subcutaneously daily for 2 weeks and increasing to 3 mg subcutaneously daily as tolerated. The dosage may be decreased to 1 mg if the patient does not tolerate the 2 mg dosage.
- Common drug interactions: No significant interactions for this medication have been reported.
- Common side effects: Injection site reaction, skin darkening, nausea, disturbance in sexual arousal, depression, and suicide ideation, and risk of serious adverse reactions in neonates and infants with low birth weight due to benzyl alcohol preservatives.
- Patient information:
  - Indicated only for patients diagnosed with POMC deficiency-associated obesity, PCSK1 deficiency obesity, LEPR deficiency-associated obesity, and Bardet-Beidl syndrome-associated obesity and confirmed by testing.
  - Not to be used while pregnant or breastfeeding.
- Controlled substance: No

PHENTERMINE (ADIPEX-P®)

- Indication: Short-term weight management treatment management for adults and adolescents 16 years or older.
- Drug Classification: Sympathomimetic amine anorectic
- Mechanism of Action: Phentermine increases the level of norepinephrine, serotonin, and dopamine transmitters in the brain, decreasing an individual's hunger sensation.
- Dosage: Adults and adolescents (16 years and older) receive 15-37.5 mg by mouth daily before or 1-2 hours after breakfast. The patient may divide the dose so that it is taken twice daily.
- Common drug interactions: Albuterol, amlodipine, bupropion, carvedilol, ibuprofen, naproxen, phenelzine, prednisone, and tranylcypromine
- Common side effects: Hypertension, itching, dizziness, headache, dry mouth, diarrhea, constipation, and change in libido
- Patient information:
  - Patients should not take phentermine if they are agitated or have glaucoma, an overactive thyroid, uncontrolled hypertension, advanced coronary disease, or a history of drug abuse.
  - It should not be taken if the patient has used an MAO inhibitor such as phenelzine or tranylcypromine within the past 14 days.
  - The patient should avoid driving or engaging in hazardous activities while taking phentermine.
  - Consuming alcohol while taking phentermine may precipitate side effects.
  - It may be habit-forming.
- Controlled substance: Schedule IV

DIETHYLPROPION

- Indication: Short-term treatment for weight management for adults and adolescents 16 years of age and older.
- Drug Classification: Sympathomimetic amine anorectic
- Mechanism of Action: Diethylpropion stimulates neurons to release or maintain high catecholamines, dopamine, and norepinephrine levels.

- Dopamine and norepinephrine tend to suppress an individual's hunger signals and appetite.
- Dosage: Take 25 mg by mouth three times a day before meals.
- Common drug interactions: Albuterol, amlodipine, carvedilol, furosemide, ibuprofen, lisinopril, losartan, metoprolol, prednisone, and valsartan
- Common side effects: Tachycardia, hypertension, seizures, arrhythmia, and insomnia
- Patient information:
  - It should not be taken by a patient who has taken an MAO inhibitor, such as phenelzine or tranylcypromine, within the past 14 days.
  - Patients should not take diethylpropion if a patient is agitated or has pulmonary hypertension, severe hypertension, coronary artery disease, hyperthyroidism, glaucoma, or a history of drug abuse.
  - It may be habit-forming.
- Controlled substance: Schedule IV controlled substance

PHENDIMETRAZINE

- Indication: Short-term treatment for weight management for adults and adolescents 17 years of age and older.
- Drug Classification: Sympathomimetic amine anorectic
- Mechanism of Action: Phendimetrazine activates the alpha-adrenergic system to induce an appetite-suppressive and metabolic increase effect.
- Dosage: Take 17-35 mg by mouth three times a day.
- Common drug interactions: Albuterol, amlodipine, bupropion, carvedilol, ibuprofen, naproxen, phenelzine, prednisone, and tranylcypromine
- Common side effects: Tachycardia, hypertension, pulmonary hypertension, restlessness, insomnia, and dizziness
- Patient information:
  - Phendimetrazine should not be taken by a patient who has taken an MAO inhibitor, such as phenelzine or tranylcypromine, within the past 14 days.
  - Patients should not take phendimetrazine if diagnosed with severe heart problems, coronary artery disease, hypertension, hyperthyroidism, glaucoma, signs of agitation or nervousness, or a history of drug abuse.
  - It may be habit-forming.
- Controlled substance: Schedule III

Several other medications promote weight loss but are not approved by the FDA for this indication. They include metformin, topiramate, bupropion, naltrexone, zonisamide, dulaglutide, exenatide, pramlintide, canagliflozin, dapagliflozin, and empagliflozin.

CONCLUSION

Obesity is a disease that can be treated through medications, diet, exercise, and behavioral modification. Healthcare professionals must screen and identify at-risk individuals by evaluating patient-specific medical histories and stress obesity prevention much earlier. Aggressive treatment, close monitoring, and long-term commitment are necessary for treating obesity.

TEST

Post Test Instructions: Completion of an online post-test with minimum passing score of 70% is required to be awarded CPE contact hours. To access the online post-test for this program, go to: www.pharmacytechnician.org, select "CE" from the navigation menu and then click on "Online CE"

1. How should a patient with a BMI of 35.2 be classified?

a. Overweight
b. Obese class I
c. Obese class II
d. Obese class III

2. Which hormone is responsible for reducing food intake?

a. Estrogen
b. Glucagon-like peptide-1 (GLP-1)
c. Ghrelin
d. Leptin

3. How many metabolic equivalents are burned per minute when engaging in moderate-intensity activities?

a. 1 MET
b. 3-6 METs
c. 6-9 METS
d. 9-12 METS

4. Which medication may cause weight gain in a patient?

a. Bupropion
b. Carbamazepine
c. Metformin
d. Phenytoin

5. Which of the following individuals should receive pharmacotherapy with no other conditions?

a. An individual with a BMI of 20
b. An individual with a BMI of 25
c. An individual with a BMI of 27
d. An individual with a BMI of 30

6. Which medication mimics glucagon-like peptide-1 (GLP-1), focusing on brain areas responsible for controlling appetite and food intake?

a. Liraglutide
b. Naltrexone-bupropion
c. Orlistat
d. Phentermine-topiramate

7. Which medication indicated for chronic weight management is available as an over-the-counter medication?

a. Naltrexone-bupropion
b. Orlistat
c. Phentermine-topiramate
d. Semaglutide

8. Which medication is indicated for Bardet-Beidl syndrome-associated obesity?

a. Naltrexone-bupropion (Contrave®)
b. Phentermine (Adipex-P®)
c. Semaglutide (Wegovy®)
d. Setmelanotide (Imcivree®)

9. Which medication indicated for obesity is a schedule IV-controlled substance?

a. Diethylpropion
b. Naltrexone-bupropion
c. Phendimetrazine
d. Setmelanotide

10. Which medication indicated for chronic weight management is administered subcutaneously?

a. Liraglutide
b. Naltrexone-bupropion
c. Orlistat
d. Phentermine-topiramate

KEY STAKEHOLDERS AND EVOLVING ROLE OF THE PHARMACY TECHNICIAN

Managed Care in the Pharmacy

Mitul Patel, Student Pharmacist
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Health care in the United States is a constantly evolving, complex, interconnected system of patients, providers, and payers.Often referred to as managed care organizations, payers consist of a mix of private and government-financed entities that provide coverage for health care services, including medical and pharmacy benefits. This managed care approach to delivering health care is intended to provide access to quality and affordable services while improving patient outcomes. Both pharmacists and pharmacy technicians contribute to the value of managed care by ensuring and enhancing appropriate medication utilization.

"Help[ing] patients get the medications they need at a cost they can afford."

As per the Academy of Managed Care Pharmacy (AMCP), managed care pharmacy is the practice of applying evidence-based medicine to support the appropriate use of medications to enhance patient and population health outcomes while optimizing health care resources. Managed care pharmacy allows the patient as well as the population access to evidence-based medication therapy in a cost-effective manner.

The role of managed care pharmacy can vary depending on the type of managed care organization. However, common activities can include administering pharmacy benefits, assisting with proper medication utilization, and medication therapy management (MTM).

Managed Care Pharmacy Tools

In managed care, various tools such as formulary management, pharmacy benefit design, population health management, and specialty pharmacy are critical to improving patient health outcomes, enhancing access to care, and maintaining care affordability. Formulary management is an integrated patient care process that enables physicians, pharmacists, and other health professionals to work together to promote clinically sound, cost-effective medication therapy and enhance health outcomes.

Pharmacy & Therapeutics Committees, consisting of physicians, pharmacists, and other health care professionals, are instrumental in developing and managing formularies and further work to place drugs into a multiple-tiered system while considering

different factors. The factors to consider are clinical efficacy or effectiveness, safety, the standard of care or clinical guidelines, value assessment, therapeutic need, and cost or cost-effectiveness of medications (Table 1). Medications on higher tiers are typically associated with higher copays and may require prior authorization before the medication is approved for dispensing and coverage.

Furthermore, formularies may utilize quantity restrictions or step therapy requirements for certain drugs as an added safety measure or to promote standards of care or clinical guidelines.

Population health management is an approach that aims to improve the health of an entire population by promoting preventative health measures, facilitating clinical programs to manage chronic conditions, and addressing other population health needs.4 Payers work to ensure that medication therapies and services enhance their members' health outcomes. Hence, to provide added benefits to medication therapies, health plans may reach out to members to help increase adherence rates or perform MTM to ensure safe and efficacious utilization of medications.

Specialty pharmacy is a unique type of pharmacy that largely provides medications for people living with serious conditions requiring complex medication therapy. A pharmacy is considered a specialty pharmacy when it dispenses clinically complex or sophisticated medication therapies for treating severe or rare diseases such as cancer, neurological conditions, and many more.

Managed Care Stakeholders

Several types of managed care organizations, such as health plans, government-funded (e.g., Medicare/Medicaid), integrated delivery system (IDS) or network (IDN), and pharmacy benefit managers (PBMs), are considered key stakeholders in managed care. Pharmaceutical manufacturers also frequently interact with all types of managed care organizations. Patient, provider, and pharmacy interactions with managed care organizations depend on the type of care, location of care, and coverage benefit. A health plan is a broad term that

Formulary Evaluation	• Clinical efficacy / effectiveness • Safety • FDA indication / labeling • Clinical guidelines • Standards of medical practice • Therapeutic need • Other treatment options • Value assessment • Cost / cost-effectiveness • Administration / storage / prescribing requirements
Additional Coverage Considerations	• Formulary status (e.g., preferred, non-preferred, tier placement) • Specialty drug • Medical or pharmacy benefit • Utilization management strategies (e.g., quantity limits, prior authorization, step therapy)

Table 1. Managed Care Formulary Management Considerations

consists of public and private health insurance companies that provide health care coverage for their respective members or beneficiaries. According to the American Hospital Association (AHA), health insurance aims to facilitate access to care and is associated with lower death rates, better health outcomes, and improved productivity.

Examples of health insurance companies include Aetna, Anthem, Cigna, Humana, United Health, and many more. Health plans vary in structure, size, and location, ranging from employer-based, regional to national, and are designed to lower the cost of medical care for its members that one would have to otherwise pay in full. The role of pharmacists and pharmacy technicians in health plans is to ensure that the members get access to prescription medications at an affordable cost. More specifically, the claims for reimbursement that retail pharmacies submit to dispense medications to patients are often processed by pharmacy technicians. These transactions require substantial support, also often performed by managed care pharmacy technicians. Additionally, pharmacy technicians often perform prior authorization reviews, explain member pharmacy benefits, process claims/appeals, and communicate with pharmacies.

Medicare is the federally funded health insurance program for individuals aged 65 and older, certain younger individuals with disabilities, and those diagnosed with End-Stage Renal Disease (ESRD). Medicare Part D is an optional coverage that covers the cost of prescription medications, including vaccines. Medicare prescription drug coverage plans are offered by private insurance companies approved by the Centers for Medicare and Medicaid Services (CMS). On the other hand, Medicaid is a federal and state government program that helps with health care costs for qualifying individuals with limited income and resources. It also offers benefits that are typically not covered by Medicare.6 Pharmacists and pharmacy technicians contribute to managing Medicare and Medicaid pharmacy benefits by managing formularies approved by government standards, processing claims, approving special or prior authorization requests, performing drug utilization reviews, and providing quality customer services.

IDSs comprise physicians, hospitals, outpatient clinics, diagnostic centers, nursing homes, pharmacies, and sometimes health insurance. An IDS works in a coordinated manner by providing health care services and benefits to its members within the organized structure, compared to stand-alone entities in the market. Some examples of IDSs include the Cleveland Clinic, Geisinger Health System, Highmark Health, Intermountain Healthcare, Jefferson Health, Kaiser Permanente, University of Pittsburgh Medical Center (UPMC), and many more. The goal of IDSs is to enhance health outcomes, promote quality and reduce healthcare costs. Often pharmacy services are an integral part of the health care team within an IDS, and pharmacy technicians may perform duties such as dispensing medications, supporting direct-patient care clinical pharmacy services, or assisting with the management of the drug formulary.

Another prominent set of stakeholders in managed care is PBMs, which manage prescription drug benefits on behalf of health plans, Medicare/Medicaid, employers, and other payers. PBMs, help health plan sponsors by managing formularies, offering MTM, and providing health and wellness programs. Moreover, PBMs can also improve medication adherence for a plan sponsor's beneficiaries by encouraging relationships between healthcare providers, pharmacies, and patients and partnering with pharmacies that offer automatic refilling of medications. PBMs also assist plan sponsors with placing certain drugs on the formulary. The roles of pharmacy technicians within PBMs are typically very similar to those seen at a health plan.

Role of the Managed Care Pharmacy Technician

Within each type of managed care organization, the role of the pharmacy technician demonstrates the value of the pharmacist-pharmacy technician relationship, medication and pharmacy benefit knowledge, and customer service skills.

While pharmacists contribute to managed care organizations by initiating and managing benefit programs, pharmacy technicians aid with the proper execution of tasks. As outlined earlier, there are a variety of tasks that pharmacy technicians perform within managed care organizations (Table 2). Pharmacy technicians may also be responsible for making outbound calls to members, assisting them with their benefits, processing prior authorization requests, supporting the utilization of medication therapy, managing data, and preparing and reviewing pharmacy reports. Job responsibilities can vary from organization to organization depending on their size, location, population, services, and needs.

"I've seen technicians in all kinds of roles, from individual contributor to management. On my team, pharmacy technicians are embedded in every function: patient-facing clinical support roles, outreach, care coordination, and administrative support."

Justin Bioc, PharmD, BCPS, BCGP, RPh
Clinical Pharmacist, Devoted Health

However, the opportunities for pharmacy technicians within managed care are tremendous and are easily located on managed care organization career opportunity listings, or workforce hiring platforms. For example, at a large PBM, Magellan Rx Management, there is a position titled "clinical pharmacy technician," where one is involved with reviewing and authorizing prior authorization claims. Another position is "initial review pharmacy technician," where one performs utilization management by reviewing patient information and checking appropriateness using clinical criteria.

These positions would be considered entry-level positions. Alternatively, at Blue Cross Blue Shield health plan, there is a position named "pharmacy operations representative," where a technician is assigned tasks related to preparing, reviewing, and submitting pharmacy reports using spreadsheets. This position would be considered a more

Table 2. Roles of Pharmacy Technicians in Managed Care Organizations

Customer Service	• Explaining and assisting members with their benefits • Making outbound calls to members • Assisting providers and pharmacies with formulary, claims processing, appeals inquiries
Data Management	• Formulary coding and maintenance • Processing prior authorization requests • Preparing and reviewing pharmacy reports
Clinical	• Reviewing and authorizing pharmacy claims requests • Support for MTM services • Support for managing utilization of medication therapy • Sending outbound medication refill reminders • Monitoring high-cost or high-risk medications • Coordinating pharmacy benefit or drug information requests

*Many managed care roles prefer or require pharmacy technician experience, licensure, and/ or certification. Scope of practice and pharmacist supervision is defined by organizational and local polices and regulation.

tenured managed care pharmacy technician. It is important to differentiate the skill and utilization of pharmacy technicians in managed care organizations discussed here from how state boards of pharmacy define the scope or licensure of a pharmacy technician. Organizational, local, and national policies and regulations, particularly concerning pharmacist supervision and pharmacy technician autonomy, can differ from region to region.

Managed Care Pharmacy Technician Skills and Training

To perform the job responsibilities of a managed care pharmacy technician efficiently, certain skills are preferred (Figure 1). Many roles at managed care organizations are directly related to interactions with members. Hence, providing quality customer service is critical to perform the job duties successfully. Phone etiquette is an important aspect of customer service, as interactions with members will mostly occur through phone calls. Moreover, one should be willing to work well in a team-based environment, as many managed care operations involve teams of pharmacists, pharmacy technicians, and other non-clinical staff or inter-departmental coordination.

Pharmacy technicians primarily perform non-clinical tasks. However, when clinical decision-making is required, a pharmacy technician should be able to escalate the issue to a pharmacist. Lastly, and like many pharmacy technician positions, time management and attention to detail are important skills required to perform assigned tasks efficiently and accurately. At some managed care organizations, a pharmacy technician certification through The Board of Pharmacy Technician Specialties (BPTS) or National Healthcareer Association (ExCPT) is required beyond obtaining licensure to work as a pharmacy technician. Hence, obtaining certification is encouraged to prepare for these roles. Managed care organizations consider certification as an indication of expansive knowledge of medication names, drug classes, and indications, which helps perform these advanced pharmacy technician tasks. Not all managed care organizations require certification; some provide support in obtaining certification within a specified time frame, like six months from the date of hire.

"Pharmacy technicians are absolutely vital and essential to the work we do and our ability to succeed."

Ryan Swanson, PharmD, Manager of Pharmacy Clinical Review, Blue Cross Blue Shield of North Carolina

Outlook for Pharmacy Technicians in Managed Care

Opportunities to grow when working within some pharmacy sectors may be limited. However, it is expansive when working in a managed care organization. Someone can begin gaining experience at an entry-level position by answering member phone calls, helping members navigate through benefits, or assisting the pharmacy department with daily operations, and eventually gain enough experience to advance to a director or supervisory level position.

Managed care organizations value the skill of the pharmacy technician and intentionally create career paths to encourage the retention of quality employees and utilize this unique skill throughout the organization. Advancement in some organizations is structured based on demonstrated skill and experience, and in other organizations depends on the requirements and needs of the organization.

Managed care organizations also offer flexibility and often create new positions based on company innovation, project demands, and demonstration of delivering positive change. For example, Joseph T. DiBiase, CPhT, Director of Medicare

Figure 1. Key Skills for Pharmacy Technicians in Managed Care Organizations

- Basic drug knowledge
- Communication
- Attention to detail
- Teamwork
- Time management

"It is such a unique skill set that is hard to find, that we value pharmacy technicians and want to continue to grow their career."

Martin Burruano, Vice President, Pharmacy Services, Independent Health

Part D Operations – Call Center and Utilization Management at Magellan Rx Management, joined Magellan in 2015 after working eight years in a retail pharmacy. Within seven years of working at Magellan, he transitioned from an entry-level position as a clinical pharmacy technician, following protocol to approve prior authorizations, to director of call center and utilization, supervising nearly 20 individuals and managing multiple projects and programs.

This is just one example of the opportunities available for pharmacy technicians in managed care to gain responsibilities, advance in a career path, and contribute to the success of managed care organizations. Pharmacy technicians seeking career opportunities in managed care can take advantage of several resources. Networking is key when applying for a job in the pharmacy profession. Attending conferences, such as those offered by AMCP, can be beneficial to network with individuals working in various managed care organizations and learn about managed care and new developments within the practice.

With the continued increase in demand for health care services and the development of new technologies within health care, the roles of pharmacy technicians are shifting from traditional dispensing roles to more advanced roles involving patient interaction, computer database management, and supervisory or program management. This trend is predicted to increase for years to come.

Under the supervision of a licensed pharmacist, highly skilled and knowledgeable pharmacy technicians allow managed care pharmacists to focus on providing optimal pharmaceutical care.

MEMBER SPOTLIGHT

Jamel King, BCSCPT

"I was grateful for NPTA when they implemented the BPTS programs, which are affordable & easy to access. "

ABOUT JAMEL KING

I am an Allied Healthcare Professional with over 25 years of experience working in Pharmacy and more than a decade in education as a Pharmacy Program Director. Teaching has always been a passion of mine ever since grade school, so I am blessed to have had the opportunity to pursue this childhood dream. My healthcare career started when I was around 20 years old when I worked part-time as a Certified Nursing Assistant at a rehabilitation center in West Palm Beach, FL, while putting myself through school.

This was the pivotal point when I knew I wanted to continue helping patients in some capacity, whether directly or behind the scenes. I currently reside in Fort Lauderdale, FL, with my partner and 7-year-old furry King Charles Cavalier, Simba. I enjoy collecting and wearing fragrances, but one would look at my fragrance collection and call me a Fragrance Guru. I love music of all kinds and play the Clarinet and Alto Saxophone whenever time permits.

WHEN DID YOU FIRST BECOME INTERESTED IN BECOMING A PHARMACY TECHNICIAN?

My interest in Pharmacy sparked during a Medical Laboratory Technology course, specifically the pharmacology section. The sight of pharmacists in white lab coats at Walgreens intrigued me as a child, and I desired to wear one myself someday.

However, pursuing Pharmacy never crossed my mind until later in life. Upon completing my medical laboratory technology program in 1997, I stumbled upon a job posting in the Palm Beach Post. Walgreens was seeking a pharmacy technician for one of their local stores, and I saw this as an opportunity to wear the coveted white lab coat. Yet, lacking the necessary education and experience, doubts crept into my mind. Unaware at the time that technicians didn't require formal training, I reached out to one of my teachers for advice.

Fortunately, they encouraged me to apply. I worked with the company for 11 years, gaining experience in hospital and long-term care on a part-time basis. Throughout my pharmacy career, I've given back to the industry by mentoring pharmacy technician students and serving as an Item Writer and Content Developer for PTCB.

TELL US ABOUT YOUR CURRENT POSITION/CAREER.

After 17 years of working in Higher Education and teaching Pharmacy Technicians, I felt the need to get back into the field and practice as a technician again. However, I was uncertain about what area of Pharmacy I wanted to practice. So, I was a bit hesitant before leaving education altogether. In the interim, I worked with an agency that assigned me to different institutional settings. I thought this was the best route to take while deciding what to do.

During my time with the agency, I was presented with a wonderful opportunity as a Lead Pharmacy Technician at Kabafusion. This position allows me to demonstrate my leadership skills, arrange IgG refills to complete patient therapy, conduct monthly assessments on my patients, and keep my sterile compounding skills current.

, BCNCPT, CPhT-ADV

WHAT WAS THE EDUCATIONAL PROCESS YOU TOOK TO GET WHERE YOU ARE TODAY?

Fortunately for me, becoming a Pharmacy Technician in 1997 was not as rigorous a process as it is today. Most of my training took place on the job, but I surrounded myself with great Pharmacy Managers who took me under their wings and taught me the ins and outs of Pharmacy. They suggested that I get PTCB certified to become Sr. Technician, which also came with more responsibility. After studying with fellow coworkers, I was fortunate to pass on the first try.

Moreover, I knew there was more to just doing the day-to-day duties such as resolving insurance claims, processing prescriptions, assisting customers, and counting medication. When I started teaching in Higher Education, I achieved my CHEP certifications in Teaching and Online Teaching by completing an accredited course by CECU.

Additionally, I pursued a degree in Health Science to further advance my clinical discipline. These achievements allowed me to create an environment conducive to learning for my students and instructors that I mentored.

Over the past year, I was fortunate to take and pass the Medication Therapy Management-MTM, Immunizations, Technician Product Verification-TPV, Regulatory Compliance, Medication History, Hazardous Drug Management, Controlled Substance and Diversion, Supply Chain Management, Billing and Reimbursement certificate-based assessments. I also earned the BCSCPT and BCNCPT credentials in Sterile and Non-Sterile Compounding offered through NPTA BPTS ACPE accredited programs.

WHAT ADVICE DO YOU HAVE FOR TECHNICIANS WHO FEEL TRAPPED OR IN A RUT IN THEIR CURRENT POSITION?

I communicate with several technicians on various social media outlets who feel dissatisfied with their employers and want to do something different. However, countless technicians are afraid to transition due to a lack of experience or the fear of not doing well in a different setting. I try to encourage them as much as I can and remind them it is okay to feel this way. After all, we have all gone through it. But it is never okay to stay in an unhappy situation, as it can affect your work.

WHAT ADVICE WOULD YOU GIVE TO A STUDENT OR BRAND NEW TECHNICIAN?

The advice I would give to brand-new Pharmacy Technicians is to learn as much as they can with their current employer. Use the knowledge and skills learned on the job to pursue specialty certificates and/or certifications to make yourself more marketable. Not only will the additional specialty training programs help with career growth, but it broadens your skill set. When you walk into a pharmacy to start your day, you must keep patient care first. This is the same advice I have given my students over the years and the same advice I give my fellow coworkers.

WHAT IMPACT HAS NPTA HAD ON YOUR PROFESSIONAL CAREER?

Throughout my career, it was essential for me to join professional organizations to stay informed of what is changing in the industry. Many professional associations offer continuing education resources and professional growth programs to advance your pharmacy career. NPTA takes pride in advocating for technicians and advancing Pharmacy Technician careers, whether it relates to career education or offering soft-skills techniques. I was grateful for NPTA when they implemented the BPTS programs, which are affordable and easy to access. I was privileged that I had the opportunity to add many of these certificates to my portfolio, which can be beneficial in my current position as Lead Technician.

These opportunities were not around when I started Pharmacy other than becoming a CPhT. Currently, Pharmacy Technicians have more opportunities to help catapult their career. I just wish more people would take advantage of these additional certificates.

IS THERE ANYTHING ELSE YOU WOULD LIKE TO ADD?

Many technicians in the industry feel there is no point in seeking advanced certifications if there is no compensation for doing so. As a fellow technician, I do understand their hesitation. But there are times in our lives and professional careers when we must do things for ourselves and our inner growth. Pharmacy roles are expanding for technicians, and you must have the education and skillset to assist the Pharmacist with patient care—which is the reason we are all in this career.

ARE YOU READY TO ADVANCE YOUR CAREER?

WE'VE GOT ALL THE ESSENTIALS.

NPTA's new initiative, BPTS, is designed to help you advance in your career. The goal with BPTS is to help 1,000 CPhTs earn their CPhT-Adv by the end of 2023! All ten of the essential training certificate programs for the pharmacy technician profession are offered through BPTS.

NPTA National Pharmacy Technician Association

BPTS BOARD OF PHARMACY TECHNICIAN SPECIALTIES

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