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ADDITIONS TO TVH'S THERAPEUTIC INTERCHANGE POLICY

The Pharmacy and Therapeutics Committee and the Medical Board have recently approved the following cardiologic and ophthalmologic therapeutic interchanges. These interchanges allow pharmacists to automatically substitute medication orders for selected medications without requiring a prescriber co-signature, thus improving the quality of patient drug treatment and safety while minimizing the costs of equivalent drug regimens.

Prostaglandin Analogs

Prostaglandin Analog	Formulary Substitution
Bimatoprost (Lumigan)	Latanoprost (**Xalatan**)
Travoprost (Travatan)	
Latanoprostene bunod (Vyzulta)	

**Do NOT substitute preservative-free formulations such as Zioptan, Lyuzeh, Tafluprost, or Xelpros for Latanoprost

Alpha2 Agonists

Alpha$_2$ Agonist	Strength	Formulary Substitution
Brimonidine (Alphagan)	0.1%	Brimonidine **(Alphagan)** 0.2%
Brimonidine (Alphagan)	0.15%	

**Do NOT substitute Alphagan-P (contains Purite) for Alphagan (contains BAK).

Fibrates

Fibrate Strengths	Formulary Substitution
Fibrate formulations 43 mg – 48 mg	Fenofibrate 48 mg
Fibrate formulations 120 mg - 160 mg	Fenofibrate 145 mg

Therapeutic interchanges continued on page 8.

IN THIS ISSUE

PROTECTING YOUR SKIN WHILE HAVING FUN IN THE SUN: SUNSCREEN ESSENTIALS

Victoria Massella, PharmDc 2025, Krissia S. Melgar, PharmD, BCPS

According to the Skin Cancer Foundation, 1 in 5 Americans will develop skin cancer by the age of 70. Excess exposure to ultraviolet (UV) radiation from sunlight increases the risk for all skin cancer types. Sunscreen serves as a frontline defense against the effects of the sun's UV rays, serving as an essential factor of any sun protection regimen. Sunscreen products play a crucial role in protecting our skin from these detrimental effects, with sun protection factor (SPF) being a key indicator of their efficacy.

SPF quantifies a sunscreen's ability to prevent sunburn by blocking UVB (ultraviolet B) rays, which are primarily responsible for causing sunburn and increasing the risk of skin cancer. The SPF number correlates with the level of protection offered: SPF 15 blocks approximately 93% of UVB rays, SPF 30 blocks about 96.7%, and SPF 40 blocks around 97.5%. Yet, SPF only tells part of the story. Sunscreens labeled as "broad spectrum" offer protection against both UVB and UVA (ultraviolet A) rays. UVA rays penetrate deeper into the skin and are associated with premature aging and skin cancer. Therefore, a broad-spectrum sunscreen, coupled with an SPF of 30 or higher, is vital for reducing the risk of skin cancer and early skin aging.

Drug-Induced Photosensitivity

To make an appropriate recommendation for a sun protection regimen, it's essential to obtain an accurate medication history. Several medications can increase sensitivity to sunlight, which is known as photosensitivity. Drug-induced photosensitivity consists of phototoxicity and photoallergy. Phototoxicity occurs when topical and systemic drugs or their metabolites absorb light and cause direct cellular damage. On the other hand, photoallergy happens when drugs interact with ultraviolet radiation and trigger an immune response in the skin. Some of the most common classes of medications and examples associated with photosensitivity are:

Antibiotics	Doxycycline, ciprofloxacin, levofloxacin, ofloxacin, tetracycline, and trimethoprim
NSAIDs	Ibuprofen, naproxen, especially piroxicam and ketoprofen
Diuretics	Thiazide diuretics: hydrochlorothiazide, chlorthalidone, chlorothiazide; other diuretics: furosemide and triamterene
Retinoids	Topical and oral
Antidepressants	Amitriptyline, fluoxetine
Antipsychotics	Chlorpromazine
Antifungals	Griseofulvin, voriconazole
Sulfonamides	Acetazolamide, sulfadiazine, sulfamethizole, sulfamethoxazole, sulfapyridine, sulfasalazine, sulfasoxazole
Herbal supplement	St. John's Wart
Chemotherapy drugs	Methotrexate

Patients taking these medications should be aware of the possibility of increased sun sensitivity. They should take extra precautions, such as wearing protective clothing, seeking shade, avoiding direct sun exposure during peak hours (usually between 10 a.m. and 4 p.m.), and using broad-spectrum sunscreen with an SPF of 50 or higher. These measures are crucial for protecting these patients who are at a higher risk of developing drug-induced photosensitivity.

Selection of a Product and Application

Sunscreen comes in many formulations, including oils, sprays, and lotions, each formulation offers different characteristics and methods of application. When choosing a sunscreen, consider factors such as skin type and application. Oils have a non-greasy, lightweight feel and usually have moisturizing ingredients. Application only requires a small amount to be evenly spread. Oils are preferred for dry or normal skin types but may not be ideal for oily or acne-prone skin. Sprays offer a quick and convenient way for application, usually preferred to cover large areas of the body like the back. Sprays are prone to uneven coverage, so it is key to rub the spray into the skin to ensure good protection. They can also be easily washed or rubbed off, especially after sweating or swimming, therefore reapplication is crucial. Lotions are the most common form of sunscreen; they have a creamy texture and are tolerated by most skin types. Although they spread easily and provide even coverage, it does require rubbing to get absorbed in the skin.

The duration and frequency of reapplication are critical for maintaining protection, especially after swimming, sweating, or prolonged sun exposure. The frequency of sunscreen reapplication depends on several factors, including the SPF level, activity level, sweating, swimming, and exposure to water or towels. Generally, sunscreen should be reapplied every two hours, or more frequently if you're sweating heavily or swimming.

Regular reapplication helps maintain consistent protection levels and minimizes the risk of sunburn and skin damage.

When to reapply:

Every 2 hours	Regardless of the SPF level, it is recommended to reapply sunscreen every 2 hours, especially when spending extended periods outdoors.
After Swimming or Sweating	Water-resistant sunscreens provide protection for either 80 minutes or 40 minutes when swimming or sweating, as indicated on the product label.
Towel Drying	Towel drying can remove sunscreen and reduce its effectiveness. Reapplying sunscreen after towel drying is recommended, even if it hasn't been two hours since the last application.

Remember that sunscreen is most effective when applied generously and evenly to all exposed skin areas. Additionally, wearing protective clothing, seeking shade, and avoiding direct sun exposure during peak hours (typically between 10 a.m. and 4 p.m.) are essential components of a complete sun protection strategy, particularly for patients who take medications that increase photosensitivity. Additionally, it is important to remember that the sun's rays may be stronger when reflected off water, sand, and snow. By incorporating these strategies into their sun protection regimen, we can assist patients with an increased risk of photosensitivity in better protecting their skin and reducing the chance of sun-related damage.

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DISEASE-MODIFYING THERAPIES, A PIVOTAL CHANGE IN THE TREATMENT OF ALZHEIMER'S DISEASE

Phillip Park, PharmD

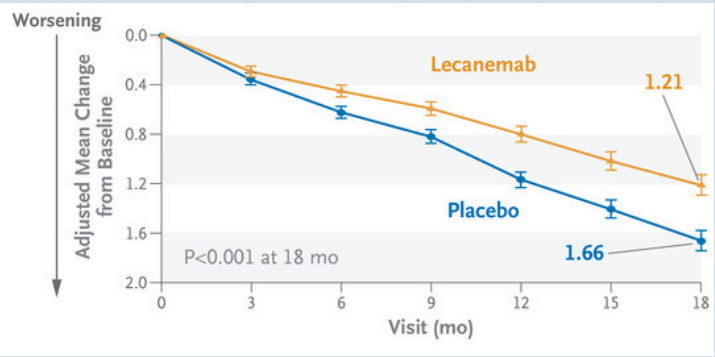
There are multiple types of dementia disease and Alzheimer's is the most common cause of dementia accounting for 60~80% of dementia cases. Alzheimer's is a degenerative brain disease caused by complex brain changes after cell damage and is not a normal part of aging. Finally, Alzheimer's is a progressive disease which means that the disease worsens over time. On average, a person with Alzheimer's lives 4 to 8 years after diagnosis but can live up to 20 years, depending on other factors.

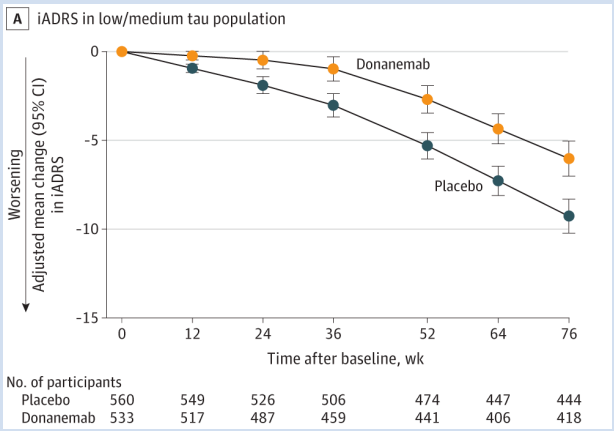
A currently known fact about the pathophysiology of Alzheimer's disease is that amyloid beta plaques and neurofibrillary tangles are always present in Alzheimer's disease and most cases are detectable before clinical symptoms through specific testing. These pathophysiological findings are essential background to the newly researched and developed pharmacologic agents against Alzheimer's disease.

Conventional pharmacological therapies available for Alzheimer's disease include acetylcholinesterase inhibitors and NMDA inhibitors for cognitive symptoms and various symptom management depending on presenting neuropsychiatric symptoms. However, the symptom-based treatment of Alzheimer's disease has changed drastically with the newly approved medications.

Aducanumab (Aduhelm®) marked the first revolution in the treatment of Alzheimer's disease. Aducanumab got accelerated approval from the FDA in June 2021 with a novel mechanism of action of a monoclonal antibody that reduced the amyloid beta plaque. However, in January 2024, the manufacturer of aducanumab announced that they will no longer manufacture and market this drug.

Lecanemab (Leqembi®) is the newly approved humanized IgG1 monoclonal antibody therapy from the aducanumab's company with superior outcomes. Lecanemab got approval from the FDA in January 2023. Lecanemab has a similar mechanism of action to aducanumab where it shows the clinical effect by reducing amyloid beta plaque. The phase 3 clinical trial, CLARITY AD trial, showed clinically significant slowing of disease progression by 27% at month 18 compared to placebo.





Donanemab (Kisunla™)is another humanized IgG1 monoclonal antibody therapy for Alzheimer's disease. Donanemab also has a similar mechanism of action to the previous two medications and as of July 2, the FDA has approved donanemab for adults with early symptomatic Alzheimer's disease, mild cognitive impairment, and mild dementia. The phase 3 clinical trial, TRAILBLAZER 2 trial, showed clinically significant slowing of disease progression by 34% at week 72 compared to placebo.

The only pharmacological modality that we could've offered was symptomatic treatment with at most modest AD-specific treatment. Their MoA did not target the pathogenesis of AD. However, with the introduction of the new drugs, we now can target the pathogenic source of AD and significantly delay the progression of the disease.

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DRUG INFORMATION CORNER

Karen Flores, PharmD, MBA

Question: Can we preserve renal function in a non-diabetic 57-year-old male with a GFR 52 with SGLT-2s?

Response: Maintaining kidney function is essential for life as they're the main filter for our body. It's recommended to preserve kidney function by incorporating a healthy diet, active lifestyle, and maintaining controlled blood pressure. Moderately limiting dietary salt to 1.5–2g a day and avoiding a high protein diet intake is helpful. Sodium Glucose Cotransporter 2 (SGLT2) inhibitors have an important role in slowing the progression of kidney disease. SGLT2s may have a role in patients who have CKD without diabetes. One randomized clinical trial, EMPA-KIDNEY, showed an overwhelming efficacy of these agents in organ protection leading to early termination of the trial. EMPA-KIDNEY which included adults with or without type 2 diabetes with GFR of 20 to < 45 mL/min OR GFR of 45 to <90 mL/min and a urinary albumin to creatine ratio of > 200. The primary outcome was the first occurrence of kidney disease progression or death from cerebrovascular causes in 432 of 3304 patients (13.1%) in the empagliflozin group and in 558 of 3305 patients (16.9%) in the placebo group with a hazard ratio, 0.72; 95% confidence interval [CI], 0.64 to 0.82; P<0.001). Empagliflozin therapy led to a lower risk of progression of kidney disease or death from cardiovascular causes than placebo. SGLT2Is have a relatively low adverse effect profile based on clinical trials, and the risks of acute kidney injury and urinary tract infections have now been demonstrated to be lower than initially expected.

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EASTERN STATES CONFERENCES

In May, the PGY1 pharmacy residents (Karen Flores, Phillip Park, and Likitha Mamillapalli) attended the annual Eastern States Conference in Hershey, Pennsylvania. During this conference, they had the opportunity to formally present and discuss their residency projects and interact and broaden their relationships with other resident colleagues. They were accompanied by Michael Gabriel, recipient of last year's Preceptor of the Year award. Below are the abstracts of their projects.

Emergency nurses' familiarity and confidence in distributing intranasal naloxone upon discharge from the emergency department

Authors: Karen Flores, Michael Gabriele, and Terri Marxen

Background/Objective: New Jersey's Substance Abuse Act was revised in 2021 to expand the authorization for any person or entity to obtain, distribute, and administer opioid antidotes. By encouraging wider distribution of naloxone, it aims to reduce the number of opioid overdose deaths. This study will evaluate nurses' knowledge and comfort with intranasal naloxone upon emergency department discharge before and after education.

Methods: A quasi-experimental design will be used, with both a pre-assessment and post-assessment. These assessments will have ten questions and be administered as part of a mandatory online training program for all emergency room nurses. The assessment questions cover a range of topics, including comfort level (measured on a 5-point Likert scale) and multiple-choice knowledge questions. Importantly, the same set of questions will be used for both the pre and post assessments. Nursing education will be provided via an electronic platform that will include (1) recognizing signs of an opioid overdose, (2) administration of naloxone, and (3) written discharge instructions. Results from completed assessments will be obtained from the online education program. One month of assessments with both completed pre-assessment and post-assessment will be included in the study.

Results: Upon evaluation of nurses' post-assessment scores after naloxone education. Comfort increased in all areas: Process for dispensing naloxone at discharge (28% vs 83%), recognizing clinical signs of an opioid overdose (83% vs 100%), and educating patients and family members on intranasal naloxone (61% vs 89%)/. For Knowledge, the average score increased by 16%.

Safety First: Assessing the Preventability of Reported Adverse Drug Events at an Ambulatory Infusion Center

Authors: Likitha Mamillapalli, David Turberville, Carlo Lupano

Background/Objective: Adverse drug events (ADEs) can be preventable and occur due to improper dosing, administration, or monitoring. This study will utilize a modified Schumock and Thornton Scale to evaluate the preventability of ADEs at an ambulatory infusion center.

Methods: A retrospective chart review was conducted using electronic medical record data at an ambulatory infusion center to assess the preventability of reported adverse drug events using a modified Schumock and Thornton Scale[TD1] . The study population included patients who experienced an adverse drug event between January 1, 2023 to December 31, 2023. The primary endpoint was the percentage of "definitely preventable" adverse drug events. Secondary endpoints included the percentage of "probably preventable" adverse drug events and a ranked list of drugs associated with preventable ADEs. Data collected included patient age, gender, primary disease state, causative agent, infusion rate, reaction, severity of reaction, supportive care, timing of

supportive care, and treatment(s) provided for reaction. The ADEs will be assessed for preventability using a nine-point scale to classify them as “definitely preventable”, “probably preventable”, or “not preventable”. If you are making unique modifications to the scale, then this would just be a modified version rather than The Modified Schumock and Thorton which signifies a standard scale. [TD1]
Results: Out of all the ADEs that occurred in 2023, 60/140 (43%) events were definitely preventable (DP) with 25/60 (42%) events due to a previous allergy or reaction to the causative agent, 1/60 (2%) due to an inappropriate rate of administration, and 37/60 (62%) due to either inappropriately prescribed or administered preventative measure for the reaction. 73/140 (52%) ADEs were probably preventable (PP) with 73/73 (100%) events due to the reaction being listed in the manufacturer’s prescribing information for the suspected drug. The top five causative agents were oxaliplatin (DP, N=10; PP, N=7), ferric derisomaltose (DP, N=15; PP, N=0), and paclitaxel (DP, n=12; PP, n=2), docetaxel (DP, n=6; PP, n =7), and rituximab-abbs (DP, N=7; PP, N=4). Overall, the majority of ADEs that occurred at the institution's ambulatory infusion center in 2023 were preventable
Conclusion: Based on the results, there are opportunities to create a standardized procedure for handling patients with a documented allergy or reaction to a prescribed agent, reevaluate institution-specific standardized premedications for causative agents, and reeducate infusion nurses regarding the appropriate timing of premedications with respect to the causative agent.

Utilization of Proportion of Days Covered Versus Medication Possession Ratio in the Absence of a Gold Standard of Practice to Measure Adherence

Authors: Phillip Park, Sonya Kremenchugsky, and Raymond Hawash
Background/Objective: Medication adherence analysis is important in the specialty pharmacy field. This study aims to evaluate whether the PDC or MPR calculation will be more applicable and practical to analyze the adherence rate at a health-system specialty pharmacy.
Methods: A retrospective chart review was conducted using two electronic medical records, TherigySTM and EnterpriseRx, to assess the applicability and practicality of utilizing PDC calculation versus MPR to report medication adherence rates. The study population included patients who used the Valley Health Pharmacy’s Specialty Services in the year 2023. The study excluded patients who voluntarily declined specialty services and never refilled prescriptions from the specialty services. The primary endpoint was the yearly medication adherence rate in percentage calculated by PDC versus MPR. The secondary endpoint included the difference in the number of patients calculated to be nonadherent with PDC versus MPR, and the average time needed to calculate PDC compared to MPR. Data collected included specialty medication prescribed, insurance claim dates, day supply of each prescription, documented pharmacist interventions, and time needed to calculate PDC and MPR for five patients.
Results: A total of 247 patients utilized the Valley Health Pharmacy’s Specialty Services in the year 2023, and 212 patients’ data were retrospectively reviewed based on eligibility criteria. The adherence rate result from the PDC calculation is 92.2%, while the MPR method calculates 86.2%. The PDC calculation and MPR calculation identified 21 and 63 patients to be non-adherent based on an 80% threshold respectively. The PDC and MPR calculation required 1.3 minutes and 1 minute to set up data in an Excel sheet and an average of 4.8 minutes and 1.25 minutes to calculate 5 patients’ data respectively. This translates to about 3.33 hours for PDC and 0.88 hours for MPR to calculate the entire year’s adherence data.
Conclusion: The higher average adherence rate and the lower number of non-adherent patients reported by the PDC calculation may justify utilization of PDC. However, the application of the PDC calculation may not be practical as it takes three times longer to finalize an adherence report. While MPR may underestimate adherence when compared to PDC, our MPR still shows an average adherence rate above the 80% threshold.

ADDITIONS TO TVH'S THERAPEUTIC INTERCHANGE POLICY (CONTINUED)

Angiotensin Converting Enzyme (ACE) Inhibitors

ACE Inhibitors	Therapeutic Interchange
Benazepril 5 mg	Lisinopril 5 mg
Captopril 25 mg	
Enalapril 2.5 mg	
Fosinopril 5 mg	
Moexipril 3.75 mg	
Perindopril 2 mg	
Quinapril 5 mg	
Ramipril 1.25 mg	
Trandopril 1 mg	
Benazepril 10 mg	Lisinopril 10 mg
Captopril 50 mg	
Enalapril 5 mg	
Fosinopril 10 mg	
Moexipril 7.5 mg	
Perindopril 4 mg	
Quinapril 10 mg	
Ramipril 2.5 mg	
Trandopril 2 mg	
Fosinopril 20 mg	Lisinopril 20 mg
Benazepril 20 mg	
Quinapril 20 mg	
Fosinopril 40 mg	Lisinopril 40 mg
Benazepril 40 mg	
Quinapril 40 mg	

HMG-CoA Reductase Inhibitor (Statins)

Statin	Formulary Substitution
Pitavastatin 1 mg	Pravastatin 10 mg
Simvastatin 10 mg	
Lovastatin 20 mg	
Fluvastatin 40 mg	
Pitavastatin 2 mg	Pravastatin 20 mg
Pitavastatin 4 mg	Pravastatin 40 mg
Simvastatin 20 mg	Atorvastatin 10 mg
Lovastatin 40 mg	
Fluvastatin 80mg	
Simvastatin 40 mg	Atorvastatin 20 mg
Lovastatin 80 mg	

*Pravastatin: preferred statin for low-intensity and low myalgia risk due to hydrophilicity
**Atorvastatin: preferred statin for moderate/high intensity
***Rosuvastatin will remain on formulary and will be excluded from therapeutic interchange