Pharmacotherapy Update

FALL 2011 LEBANON VAMC PHARMACY

SPECIAL POINTS OF INTEREST:

- **Drug Review: Dabigatan, Replacing Warfarin?**
- **Patient Safety Notice: New Simvastatin Restrictions**
- **Literature Review: Pegloticase for Refractory Gout**

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Editor Notes

By Dina Norris, Pharm.D, BCPS/ co-editor; Emily Davies, Pharm.D/ co-editor

The *Pharmacotherapy Update* Fall newsletter comes with the beautiful change of seasons in Central PA. We all hope that everyone has safely made it through the unusual weather maladies this summer has brought to Central PA. You will find that this addition of the newsletter includes a eulogy to the loss of an exceptional man, Young Man Cho, who passed away this Fall. Our pharmacy department will never be the same without him; and he is and always will be an inspiration to all he came in contact with. You will be in our memories always Young Man.

This edition of the newsletter includes several clinically important articles including the Formulary Highlights section with a breakdown of recent changes to the National VA formulary that have occurred since May 2011; a Patient Safety notice on the recent FDA changes for simvastatin dosing and how to handle those changes clinically; the Drug review section on the new agent Dabigatran and what it could mean to warfarin therapy; and the Literature Review section gives insight into the use of pegloticase for refractory gout. Be sure to check out the Pharmacy Phun Phacts section for interesting and fun facts you may not be familiar with; as well as the Highlight section on one of the Pharmacy's technicians. Please help in welcoming the pharmacy's three new PGY1 and two PGY2 residents, their brief bios are located in the Pharmacist Corner.

I hope you enjoy this newsletter issue and stay flu-free this Fall by getting a flu shot!

In Remembrance of Young Man Cho

(1936-2011) Eulogy by Director of Pharmacy, Paul Carnes

Benjamin Franklin is quoted as saying: *"Who is wise? He that learns from everyone. Who is powerful? He that governs his passions. Who is rich? He who is content. Who is that? Nobody."* As many in this room can attest, humility is not necessarily my strong suit. However, I would normally NOT be one to argue with someone as great as Benjamin Franklin. In this quote, though, I believe there is at least one exception. That is Young Man.

Young Man Cho first contacted me in 2001 about a pharmacist job at the Lebanon VA. At the time he was working as a VA pharmacist in California. I don't remember the details, but the timing wasn't exactly right. A year later, though, the planets aligned and Young Man moved himself and his wife across the country to work in our pharmacy. He quickly became a member of the family we were building within the pharmacy.

Over the nine years that he worked with us, he touched all of us with his friendliness, generosity, caring, and, perhaps most of all, his example of living life to the fullest. How does Young Man's example lead me to disagree with Benjamin Franklin? By Franklin's definition, Young Man was all three: wise, powerful, and rich. He learned from each of us but also taught us all something. Not always the same thing but I haven't talked with anyone in the pharmacy or outside of it that didn't learn something from Young Man. His demeanor was always appropriate. A few have commented since meeting 2 of his daughters Tuesday that they were surprised to hear he was a strict father. This disbelief is example of how he portrayed himself to each of us. Always friendly; never fierce. Lastly, I can count on one hand the number of people I've known that seemed as content as Young Man. So, Mr. Franklin, now that you're meeting Young Man, you know that this quote, at least, was unfinished. It should read: *"Who is wise? He that learns from everyone. Who is powerful? He that governs his passions. Who is rich? He who is content. Who is that? Young Man Cho."*

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Young Man Cho

It has only been 9 days since I broke the news of Young Man's death to the rest of the pharmacy. In that time, as I suppose is natural, I have learned much more about Young Man than I knew. Every member of our team has very fond memories of Young Man and every story I've heard over the last week has ended with a smile. The photographic poster on display is a small testament to a man that has left a much more indelible mark on each of us. As stated on the poster, he will be missed!

Since Young Man spent so many of his professional years with the Veterans Health Administration, I think it fitting to end with a quote from President Lincoln. President Lincoln is famously quoted within the VA as being our founder when in his second inaugural address in 1865 he ended by saying:

"With malice toward none, with charity for all, with firmness in the right as God gives us to see the right, let us strive on to finish the work we are in, to bind up the nation's wounds, to care for him who shall have borne the battle and for his widow and his orphan, to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations."

But more appropriate to this occasion and maybe even more important to us as individuals, Lincoln said:

"And in the end, it's not the years in your life that count. It's the life in your years."

Young Man serves as an example to each of us that we should all strive to emulate. His impact and memory will forever serve as examples to anyone who ever met him that we need to focus on the life in our years. Young Man's death was surprising to us for all of these reasons. But it is for these same reasons that his memory will live on. *September 15th, 2011.*

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Dabigatran, Replacing Wafarin??

By Lindsay Baun, PharmD PGY1 Resident

According to the American Heart Association, atrial fibrillation is a common heart disorder in the United States, which occurs in approximately 2.3 million people.[1] This heart condition is concerning due to the risk of mortality, congestive heart failure, stroke and systemic embolism. In October 2010, dabigatran was introduced as a new anticoagulant, which is FDA approved for the reduction of systemic embolism and stroke in patients with non-valvular atrial fibrillation.[2] An increase in the prescribing of dabigatran is expected, which may be due to interest in utilization of a new drug on the market, increased patient interest due to direct consumer advertising and less monitoring requirements compared with warfarin. Pharmacists are concerned with new prescribing patterns in patients who are stabilized on warfarin therapy, which may be replaced by dabigatran. In addition, there are several concerns with dabigatran therapy which include renal dosing, specific storage instructions, absence of an antidote and lack of long-term safety data.[2] The risk of adverse outcomes with dabigatran may be increased with providers who are unfamiliar with prescribing this medication.

Dabigatran is a new, oral direct thrombin inhibitor indicated for patients with non-valvular atrial fibrillation at risk for stroke.[3] Currently, warfarin is the most common anticoagulant used to prevent the formation of systemic emboli and to help reduce the risk of stroke in patients with atrial fibrillation. Dabigatran provides a therapeutic alternative for patients who are intolerant to warfarin therapy, have a history of poor medication adherence, high risk of bleeding or fluctuating INR levels.

Dabigatran is the active form of dabigatran etexilate, which provides continuous anticoagulation at a stable dose.[3] Frequent monitoring of anticoagulant effects are not necessary, but liver and renal monitoring are required. Continuous monitoring of signs or symptoms of bleeding or stroke are equally important.[4] Dose adjustments are required in patients with renal dysfunction who present with a creatinine clearance (CrCl) < 30 ml/min.[3,4] This medication was not studied in patients with a CrCl < 15 ml/min, therefore it is not recommended in this patient population.[3] Dyspepsia is a common adverse effect reported with this medication, due to tartaric acid, an inactive ingredient in the formulation of this drug.[2,3] This medication must be kept in the original container and any leftover medication must be discarded once the bottle has been open for more than 30 days.[3]

Patients switched from warfarin to dabigatran are recommended to start dabigatran once their INR is < 2.0, after stopping warfarin.[3] The conversion of dabigatran to warfarin is based on the patient's CrCl.[3] It is recommended to start warfarin three days before stopping dabigatran in patients with a CrCl > 50 ml/min, starting warfarin two days prior to stopping dabigatran in patients with a CrCl 31-50 ml/min, and starting warfarin one day prior to stopping dabigatran in patients with a CrCl 15-30 ml/min. There are no recommendations in patients with a CrCl <15 ml/min.[3]

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Recent Formulary Changes

Emily Davies, PharmD, PGY1 Resident

Changes made to the national formulary since May 2011:

Deletions:

GnRH Analog: Goserelin acetate injection, implant

Additions:

Local Anesthetic: Articaine/ epinephrine injection

Transdermal Contraceptives: Estradiol/norethindrone patch, estradiol/ levonorgestrel patch

Hormone Modifier: Lanreotide SA injection

Ophthalmic prostaglandin: Latanoprost opth solution

GnRH Analog: Leuprolide LA injection/ suspension

PPI: Pantoprazole tablet

ICS/ LABA Inhaler: Budesonide/ formoterol fumerate

Ophthalmic antiinflammatory: Cyclosporine opth emulsion (restricted to ophthalmology/ optometry)

Hormone replacement: Estrogens esterified tab

Bladder antispasmodic: Oxybutynin

MOA-B Inhibitor (PD): Rasagiline tab (Restricted to neurology)

Protease Inhibitors for Hepatitis C : Boceprevir

New Drug Monographs and Criteria For Use:

Protease Inhibitors for Hepatitis C : Telaprevir

Direct Thrombin Inhibitor: Dabigatran

Phosphodiesterase 4 (PDE-4) Inhibitor: Roflumilast

Antiarrhythmic: Dronedarone

Monoclonal Antibody– Bone Resorption Inhibitor: Denosumab

Oral Calcimimetic: Cinacalcet

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Dabigatran, Replacing Wafarin??

By Lindsay Baun, PharmD, PGY1 Resident

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The FDA approved dabigatran based on the results of the RE-LY trial, which is a non-inferiority study comparing the endpoint of stroke or systemic embolism with warfarin.[5] The RE-LY trial was published in the New England Journal of Medicine in 2009, which randomized 18,113 patients with atrial fibrillation.[5] Patients received one of three therapies: adjusted dose warfarin to maintain an INR of 2-3, dabigatran 110 mg twice daily or dabigatran 150 mg twice daily.[5] The primary endpoint of this study was stroke or systemic embolism and the primary safety outcome was major hemorrhage.[5] Results of this study revealed 182 patients in the dabigatran 110 mg group vs. 150 patients in the dabigatran 150 mg group vs. 199 patients in the warfarin group experienced a stroke or systemic embolism.[5] The results of the safety outcome illustrate dabigatran 110mg is non-inferior to warfarin in reducing the incidence of major bleeding.[5] Non-inferiority studies attempt to demonstrate that the treatment group does not have worse outcomes than the control group.

In 2010, an analysis of the RE-LY trial was published which assessed the safety and efficacy of dabigatran compared with warfarin at time in therapeutic range (TTR) based on INR levels.[6] Due to the design of this study, the results indicate both doses of dabigatran are non-inferior to warfarin. However, the advantages of dabigatran were greater in patients with poor INR control compared with patients having optimal INR control.[6] The results of this study were compared to usual care as provided by a physician or a nurse, as opposed to therapy managed by a pharmacist. According to one resource, INR control varies greatly between clinicians.[7] On average, the time in therapeutic range (TTR) managed by the usual care model was 57.4%, nurse-managed model was 71.8% and the pharmacist-managed model was 83.6%.[7]

Based on the VHA/PBM criteria for use document on dabigatran, created in April 2011, patients stabilized on warfarin therapy should continue their therapy rather than switching to dabigatran. However, patients not stabilized on warfarin, have a high risk of intracranial bleeding, difficulty monitoring INRs or multiple interacting medications may consider dabigatran if they meet the inclusion criteria.[4] Patients may only be prescribed this medication if they have the presence of non-valvular AF documented by electrocardiogram and at least one risk factor for stroke (CHF, HTN, age >65 yo, diabetes, history of stroke).[4] The dose of dabigatran is based on renal function. Patients with a CrCl >30 ml/min are recommended to take 150mg twice daily.[4] Contraindications to therapy include a CrCl < 15 ml/min and presence of anemia or thrombocytopenia; therefore this medication should not be used in this patient population.[4]

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New Simvastatin Restrictions

By Dina Norris, PharmD, BCPS

Recently the FDA announced new dosing recommendations concerning simvastatin; based on safety review findings from the SEARCH trial as well as the FDA's adverse event reporting system. In general, the FDA now recommends that the 80mg dose of simvastatin be reserved for patients who have been taking this dosage for 12 months or longer with no evidence of muscle injury. Providers should no longer start new patients on simvastatin 80mg. There have also been updates to the product labeling in regards to the use of concomitant drugs known to inhibit the metabolism of simvastatin.

New Simvastatin Labeling:

DRUGS NOW CONTRAINDICATED	**Itraconazole, Ketoconazole, Posaconazole** **Erythromycin, Clarithromycin, Telithromycin** **HIV Protease Inhibitors** **Nefazodone** **Gemfibrozil** **Cyclosporine** **Danazol**
DO NOT EXCEED 10MG of SIMVASTATIN DAILY	Amiodarone Verapamil, Diltiazem
DO NOT EXCEED 20MG of SIMVASTATIN DAILY	**Amlodipine** **Ranolazine**
Avoid Large Quantities of Grapefruit Juice (>1 quart/day)	

The use of simvastatin with gemfibrozil is now contraindicated!

Pointers to consider with simvastatin dosing:

Patients on concomitant interacting medications –

Patients on simvastatin AND Strong CYP 450 3A4 inhibitors

- Requiring long-term therapy (>30 days) Such as therapy with HIV protease inhibitors, nefazodone, cyclosporine, etc.- **Provider option is to switch to formulary agent Pravastatin**
- Short-term therapy (<30 days) such as with antibiotics or azole antifungals- **withhold simvastatin until therapy is complete**

1. Gemfibrozil: Option to switch statin to formulary Pravastatin: If patient clinically needs therapy with both a statin and a fibrate:

- The 2004 Update to the 2001 NCEP guidelines offers the following guidelines for treating triglycerides (TG): TG should become the primary target of lipid lowering therapy if levels are ≥500 due to acute risks of developing pancreatitis, otherwise, the target of lipid lowering therapy is getting the LDL to goal.
- In other cases, the treatment of elevated TG should be made on a case by case basis due to lack of health outcomes associated with this treatment as well as potential for risks due to combination therapies in particular statin-fibrate or statin-niacin combinations.

Any patient with TG of > 500 and/or a history of pancreatitis should consider the use of OTC omega-3 fatty acids , with niacin SA as an alternative. OTC Omega-3 fatty acids can now be ordered without placing a non-formulary request

2. Amlodipine : Pravastatin and lovastatin are formulary alternatives

Patients on **ranolazine AND >20mg/day of simvastatin:** Switch to Lovastatin or Pravastatin
Patients on **amiodarone AND simvastatin >10mg/day:** Switch to Pravastatin
Patients on **verapamil or diltiazem AND simvastatin >10mg/day:** Switch to Pravastatin

Statin Dose Conversion Table Based on Approximate LDL Reduction:

Statin (available doses)	**Simvastatin (5-80mg)**	**Pravastatin (10-80mg)**	**Lovastatin (10-80mg)**	**Rosuvastatin (5-40mg)**
Approximate Equivalent Dose	10mg	20mg	20mg	-
	20mg	40mg	40mg	2.5mg
	40mg	80mg	80mg	5mg
	80mg	-	-	10mg
	-	-	-	20mg
	-	-	-	40mg

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2. Simvastatin 80mg: Guidance in Response to FDA's Updated Restrictions, Contraindications and Dose Limitations. VHA Pharmacy Benefits Management Services, Medical Advisory Panel and VISN Pharmacist Executives. (Accessed 9-27-11)

Pharmacist Corner Featuring: The New Residents!

Kendra Vong, PharmD, BCPS

PGY2 Administration Resident

Home Town: Vietnam; Reno, NV

Education: Kendra completed her studies at the Pacific University, Oregon earning her PharmD degree in 2009. Kendra completed her PGY1 Residency in the Las Vegas VA, and became BCPS certified in 2010. Kendra then worked in the Sacramento VA prior to starting here at Lebanon.

Fun Facts:

- Kendra is one of ten kids in her family!
- Kendra has lived in Vietnam, Hong Kong, Nevada, Oregon, Washington, Texas, Wisconsin, California, and Pennsylvania!
- Kendra hiked the Grand Canyon during a thunderstorm!

Heather Spoonhower, PharmD

PGY2 Ambulatory Care Resident

Home Town: Moscow (Scranton), PA

Education: Heather completed her studies at Northeastern University earning her PharmD degree in 2010. Heather completed her PGY1 residency at the Buffalo VA.

Fun Facts:

- Heather lived in Kenya, Africa for six months working as an independent healthcare volunteer. She has also lived in Key West, FL, Boston, MA, Buffalo, NY, Ocean City, Maryland, and Philadelphia, PA.
- Heather loves hiking, camping, and the outdoors and hopes to hike the Appalachian Trail some day.
- Heather was once invited to a Rolling Stones rehearsal and got to hang out with Mick Jagger. She now thinks he's overrated :)

Lindsay Baun, PharmD

PGY1 Pharmacy Practice Resident

Home Town: Indiana, PA

Education: Lindsay completed her studies at Wilkes University earning her PharmD degree in 2011.

Fun Facts:

- Lindsay is a fan of Duke basketball!
- Lindsay was the first resident to get injured in MOVE Ultimate Frisbee this year!
- Lindsay's favorite food is doughnuts!

Sarah Witkowski, PharmD

PGY1 Pharmacy Practice Resident

Home Town: Glen Lion, PA

Education: Sarah completed her studies at Wilkes University earning her PharmD degree in 2011.

Fun Facts:

- Sarah designed a Christmas card that was published to help raise money for a children's hospital.
- Sang backup in an ensemble with Andy Williams.
- Sarah is a PPA all-star!

Emily Davies, PharmD

PGY1 Pharmacy Practice Resident

Home Town: Wadsworth, OH

Education: Emily completed her studies at Ohio Northern University earning her PharmD degree in 2011.

Fun Facts:

- Emily played soccer from age 6 until she retired at 21!
- Emily is a fan of the Cleveland Browns and The Ohio State University football.
- Emily has gone to Dave Matthews Band concerts annually since she was 15.

Pegloticase For Refractory Gout

By Ashley Palkovic, 2012 PharmD Candidate

Gout is a very common disease state in the US with 5 to 6 million patients currently diagnosed. It is a disorder characterized by elevated uric acid levels resulting in accumulation of urate in tissues. This hyperuricemia, or high uric acid level, is caused by an overproduction or under-excretion of urate. Risk factors for gout include being overweight or obese, having hypertension, consuming an increased amount of alcohol, using diuretics, and consuming a diet containing large amounts of meat and seafood.

Current popular therapies that are used in the treatment of gout are allopurinol, colchicine, probenecid, NSAIDs and corticosteroids. Allopurinol, which can be dosed up to 800mg/day, is a xanthine oxidase inhibitor and therefore prevents the formation of uric acid. Colchicine is more often used in the treatment of gout flares. Common flare treatment dose is 1.2mg at the first sign of flare, then 0.6mg 1 hour later. NSAIDs are mainly used for their anti-inflammatory properties and help with the pain associated with gout. These agents are effective, but may not work for all patients, which is why we need to explore other options for those with refractory disease. New therapies have come out recently for gout, including febuxostat (Uloric) and pegloticase (Krystexxa).

Pegloticase is a newly approved agent for use in refractory gout. This agent works by catalyzing the oxidation of uric acid to allantoin, a soluble metabolite, for renal elimination. It is administered by IV infusion every two weeks at a dose of 8mg. In two replicate, randomized, placebo-controlled, 6 month trials, the uric acid lowering ability, clinical efficacy, and tolerability of pegloticase was tested. The study included patients who were 18 years or older, had a baseline serum uric acid level of 8 mg/dL or greater, had a contraindication to allopurinol treatment OR abnormal uric acid level despite ≥ 3months of allopurinol given at the maximum appropriate dose, and at least one of the following:

- 3 or more self-reported gout flares during the previous 18 months
- 1 or more tophi
- Gouty arthropathy

Patients were excluded if they had a G6PD deficiency, had prior treatment with a uricase containing agent, were pregnant, had unstable angina, uncontrolled hypertension, cardiac arrhythmia, or uncompensated congestive heart failure, were undergoing renal dialysis, or had a solid organ transplant.

"The first uric acid specific enzyme for adult patients with chronic gout refractory to conventional therapy."

Treatment included a one week washout period for any patients receiving a urate lowering medication at screening. Gout flare prophylaxis was initiated one week before the first infusion, and continued throughout the study. Infusion related reaction prophylaxis was given to all patients before each infusion and included oral fexofenadine 60mg given the evening prior to, and before the infusion, IV acetaminophen 1000mg immediately before the infusion, and IV hydrocortisone 200mg immediately before the infusion. Treatment groups were as follows:

- Biweekly treatment group: 2 hour IV infusion of 250mL 0.9% sodium chloride containing pegloticase 8 mg at each infusion
- Monthly treatment group: 2 hour IV infusion of 250mL 0.9% sodium chloride containing pegloticase 8 mg alternating with placebo
- Placebo group: 2 hour IV infusion of 250mL 0.9% sodium chloride containing placebo

The primary efficacy endpoint was the proportion of uric acid responders in each pegloticase group compared to placebo. A responder was defined as a patient with a uric acid level <6.0 mg/dL for 80% of the time or longer during both months 3 and 6. Secondary endpoints included tophus resolution, tophus complete response (CR), reductions in the proportion of patients with gout flare, reduction in the number of flares per patient during months 1-3 and 4-6, reductions in tender and swollen joint count, and patient-reported changes in pain, physical function, and quality of life. This study was powered to >80%, and statistics were considered significant if the P value was <0.05. When analyzing the results for the primary efficacy endpoint, it was found that plasma uric acid levels normalized within 24 hours in all patients receiving pegloticase. Also, the number of uric acid responders was significantly greater in each pegloticase group compared to placebo in the pooled analysis (P<0.001).

The biweekly pegloticase treatment produced a response rate of 47% and 38% in the two trials, the monthly pegloticase treatment produced a response rate of 20% and 49% in the two trials, and the placebo groups produced a response rate of 0% in the two trials. In regards to secondary endpoints, the biweekly pegloticase group exhibited the highest percentage of CR in once or more tophi at 40%. Gout flares were reported more frequently in the pegloticase groups during months 1-3 but were then reduced in months 4-6. There was a

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Pharmacy Tech Corner Featuring: Mike Snyder

Mike Snyder is a pharmacy technician who has worked with the Lebanon VA for 20 years . Mike smoked for 20 years, starting halfway through his time in the Navy, around 1985. With the assistance of the patch, lozenges, and the support of friends and family, Mike successfully quit smoking December 17th, 2007, after a few failed attempts. Mike states that his niece, Melissa, was a big influence in his persistence to quit. Mike is hoping to celebrate a 4 year anniversary of his quit date this coming December! In April, Mike started running in order to improve his cholesterol and blood pressure. On September 18th, 2011, Mike ran his first half marathon (13.1 mi), participating Rock 'n' Roll Philadelphia Half Marathon. Mike finished the race in 1 hour and 53 minutes, with an average mile time of 8 min and 38 sec. Mike ran another half marathon in Hershey on October 15th in 1 hour and 45 minutes. Mike plans on running in the Tough Mudder November 13th, and the TCS Annapolis Half Marathon November 19th. Mike has the goal of running in a full marathon by this time next year! For smokers trying to quit, Mike advises to "keep trying! It feels great to be able to do things I wouldn't be able to if I were smoking now." If you see Mike around the Hospital, congratulate him on his great accomplishments!

Pharmacy Phun Phacts!

By Sarah Witkowski, PharmD PGY1 Resident

1. Heroine was invented twice. It was originally synthesized by an English chemist in 1874 whose discovery fell to the wayside. It was later accidentally recreated by the Bayer company in 1897 when trying to find an easier way to produce codeine. It was originally marketed as a cure for the epidemic of morphine addiction following the civil war. When it was found to be metabolized into morphine in the liver and to have a greater addiction potential, it was sold as a component of patent medicines and was used to treat everything from coughs to anxiety.
2. Aspirin is an example of convergent evolution, or when two completely different biological entities evolve to be more similar instead of becoming more different. The botanical origin of asprin is a compound called Spirin (from Rose extract) or Salicin (from Willow extract) depending from which plant family it is derived. Both members of the Willow family, Salicaceae, and the Spiraea genus of the rose family, Rosaceae, independently evolved to make this compound for protection from common wood burrowing pests. The Salicylic acid in these extracts has been used for years to treat headaches. We then isolated and acetylated this compound to make it easier on the stomach. That's how Acetyl-Salicylic Acid, or aspirin, got its name.
3. Warfarin, a synthetic derivative of dicoumarol, was originally discovered in Wisconsin. Dicoumarol is produced when Aspergillus fungi ferments from a compound called coumarin found in sweet clover. Cows who had grazed on this plant were found to have sever hemorrhages from minor cuts from the fences surrounding their pastures. An investigation at the Wisconsin Alumni Research Facility, or WARF, discovered the culprit compound in the animal blood samples. WARF added "-arin" to the end of the facility's name to link the new compound to its botanical origin (coumarin) and the term "warfarin" was born.

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Pegloticase For Refractory Gout

significant difference in tender joint count in patients receiving biweekly and monthly pegloticase (P=0.01 and 0.03, respectively). Commonly reported adverse events included gout flares and infusion related reactions. There were 7 deaths reported, however, they were not caused by the treatment received.

Refractory gout is a painful and bothersome disease for those who suffer from it. While we ultimately want to increase patients' quality of life, we must carefully weigh the risks versus benefits when considering treatment with pegloticase. Pegloticase in patients with refractory gout who have failed on conventional therapy have exhibited sustained reduction in uric acid lowering, and improvement in clinical outcomes. Great care should be taken when selecting patients to receive pegloticase therapy, as to avoid unwanted side effects and optimize patients' quality of life. Please keep in mind that this agent is non- formulary.

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