Bupivacaine liposomal injection suspension (Exparel®)
This product is an amide local anesthetic containing bupivacaine in multivesicular liposomes. It is indicated for postsurgical analgesia and administered as a single-dose into the surgical site. Bupivacaine liposomal injection should be injected slowly into soft tissues of the surgical site where bupivacaine will be released from the multivesicular liposomes over a period of time. Concomitant administration with other agents, including bupivacaine HCl, should be used with caution as it may disrupt the liposomal particles or cause an immediate release of bupivacaine from this liposomal suspension. Bupivacaine liposomal injection suspension is restricted at TVH to hemorrhoidectomy, bunionectomy, breast reconstruction, and hernia repair.

Tranexamic acid (TXA; Cyklokapron®)
Additional off-label uses of tranexamic acid have been approved at TVH for epistaxis and acute traumatic injury. TXA is an antifibrinolytic agent that inhibits plasmin and plasminogen activation to reduce bleeding. Inserting a cotton pledget, soaked in TXA IV solution, into the nostrils for epistaxis treatment resulted in shorter time to stop bleeding, shorter hospital stay, and fewer rebleeding cases compared to usual nasal packing. Intravenous TXA has also shown to safely reduce mortality in acute traumatic injury with bleeding when administered as early as possible and within three hours of injury.
Antibiotic length of therapy for patients with a primary diagnosis of pneumonia: utilization before and after computerized prescriber order entry system modification

Michael Gabriele, PharmD, PGY-1 Community Pharmacy Resident

A recent study published in Clinical Infectious Diseases found that, when summing inpatient and discharge lengths of therapy (LOT), over 70% of patients likely receive an excessive overall antibiotic LOT for their community-acquired pneumonia. Previously at The Valley Hospital, discharge antibiotic prescriptions were generated with a 7-day supply by default. In April 2017, the computerized prescriber order entry system was modified to remove these default “days supply” values, thus requiring prescribers to choose a patient-specific length of outpatient antibiotic therapy. This project evaluated the impact of changing the hospital’s order entry system on antibiotic LOT in patients with a primary diagnosis of pneumonia.

The data indicated a downward trend in mean outpatient and total LOT (-10.2% and -9.5%, respectively), but the results were not statistically significant (p = 0.48 and 0.17, respectively). A decrease in the proportion of patients receiving 7-day outpatient prescriptions, and increases in patients receiving 3- and 5-day prescriptions was also noted, but this shift was also not statistically significant (p = 0.30).

We concluded that removing the computerized default number “days supply” for discharge prescriptions may help reduce overall antibiotic length of therapy, but we may need to consider further interventions such as greater involvement of the Infectious Disease specialists or Antimicrobial Stewardship team at the discharge transition of care.

Evaluation of dosing prophylactic enoxaparin in high risk patients in a large community hospital

Brianne Traub, PharmD, PGY-1 Pharmacy Resident

Subcutaneous enoxaparin is a mainstay of prophylaxis in VTE prophylaxis. Dose adjustments in high risk patients, such as those with obesity or poor renal function, are recommended. The purpose of this study was to evaluate the appropriateness of prophylactic dosing in high risk patients at TVH receiving enoxaparin.

A retrospective chart review evaluated sixty adult inpatients who received enoxaparin on critical care, post-surgical, and geriatric units. Overall, 73% of patients were dosed appropriately. Most of the patients with inappropos doses received subtherapeutic dosing with enoxaparin 30 mg daily instead of 40 mg daily. A majority of suboptimal doses were based on age and serum creatinine. The results were presented to P&T, which resulted in Medical Board approval for pharmacist dose adjustment of enoxaparin for renal function.

Dosing adjustment evaluation of oseltamivir in a community hospital

Mark Levy, PharmD, PGY-1 Pharmacy Resident

Oseltamivir is an antiviral agent used for both treatment and prophylaxis against the influenza virus. When given within forty eight hours of symptom onset, oseltamivir is recommended to shorten the duration of the illness and prevent further health complications. Dosing of oseltamivir is based on renal function for adults, and weight for pediatrics.

A retrospective chart review evaluated sixty adult inpatients who received oseltamivir during the influenza season. Overall, sixty three percent were dosed appropriately after considering after dose adjustments. Presentation of these findings to the Pharmacy and Therapeutics Committee resulted in Medical Board approval for automatic renal dose adjustment by the pharmacist per protocol.

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Pharmacy Residents present at American Society of Health-System Pharmacists Midyear Clinical Meeting in Orlando, Florida

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Michael Gabriele, PharmD

Brianne Traub, PharmD

Mark Levy, PharmD
Management of Chronic Obstructive Pulmonary Disease (COPD) using prescription inhalers goes beyond medication selection. Apart from the right drug at the right dose at the right time, a crucial piece of prescription inhaler therapy is the right technique. The body of available literature surrounding this topic suggests that when patients are trained to properly utilize their inhaler devices, they tend to have improved clinical outcomes.

One such study published in the *International Journal of Chronic Obstructive Pulmonary Disease* in 2017 compared clinical outcomes between patients who used devices requiring similar inhalation techniques and patients prescribed devices with different techniques. Patients were placed in the similar-devices cohort if they used two or more inhalers that were either all aerosols or all dry powder inhalers, and were placed in the mixed-devices cohort if they had at least one inhaler from each category. The results included 8,225 patients in each group and showed that patients in the mixed-devices cohort had a greater overall rate of exacerbations and a higher average daily dose of short acting beta agonists (SABAs). The similar-device cohort had a greater percentage of patients with zero exacerbations per outcome-year (58.5% versus 53.4%) and a greater percentage of patients who had an average daily SABA dose of 0 micrograms (17.5% versus 6.4%). After controlling for likely confounding factors, the authors concluded that their results suggested that when patients need to learn proper techniques for different types of inhalers for concurrent use, it can lead to incorrect inhaler use, reduced patient adherence, and a reduction in favorable clinical outcomes.¹

Another study published in the *British Journal of Clinical Pharmacology* was conducted on the effectiveness of a community pharmacist education program for patients receiving inhaled medication prescriptions for COPD. Patients in the intervention group (n = 371) received two protocol-based pharmacist counseling sessions on their medications, while patients in the control group (n = 363) were given standard, nonprotocol pharmacist care. The results showed that on average, the patients who received the interventional inhaler training scored significantly higher on an inhalation technique scoring checklist at one and three months post-randomization. Additionally, 68.5% of patients in the intervention group scored 100% on their technique checklists, while only 32.9% of the control group did. The clinical consequences of these differences were examined in the secondary endpoints of the study. Thirty-three patients in the control group experienced a combined total of 53 severe exacerbations over the course of the study, compared to a combined total of 24 severe exacerbations across 19 patients in the intervention group. These exacerbations led to 35 hospitalizations totaling 307 hospital days in the control group, and 9 hospitalizations totaling 76 days in the intervention group. The authors concluded that pragmatic patient education programs, such as the pharmacist-based one they studied, can improve pharmacotherapeutic regimens and may reduce hospitalization rates in patients with COPD.²

Therefore, when patients are prescribed less-complicated inhaler regimens and are provided with extra personalized training, they experience better clinical outcomes. Educating patients on how they can improve their inhaler technique can be a critical intervention to improve patient health at any transition of care.