SEPTEMBER 2025 VOL. XIII, ISSUE 3

PHARMFACTS BULLETIN

The latest news and updates from The Christ Hospital Pharmacy Department

IN THIS ISSUE

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P&T Updates *Anna Madding, PharmD, PGY1 Pharmacy Resident*

Formulary Updates as of August 31st, 2025

- **Retifanlimab-dlwr (ZYNYZ)** was added to formulary for outpatient use. Retifanlimab-dlwr is an anti-PD-1 monoclonal antibody used for Merkel cell carcinoma and squamous cell carcinoma anal cancer.
- **Anakinra (Kineret)** was added to formulary restricted to hematology/oncology attending use for treatment of hemophagocytic lymphohistiocytosis (HLH). Anakinra is an interleukin-1 receptor antagonist with labeled indications for IL-1 receptor antagonist deficiency, neonatal-onset multisystem inflammatory disease, and rheumatoid arthritis.
- **Denosumab Biosimilars Wyost and Jubbonti** were added to formulary with the same restrictions as Prolia and Xgeva, respectively. The biosimilars will be the preferred formulary agents unless the branded products are payer preferred. Denosumab interacts with RANKL and has a variety of indications including hypercalcemia of malignancy that is refractory to bisphosphonates.
- **Terlipressin** was reviewed and not added to formulary due to lack of evidence, effectiveness, and benefit over other agents, safety concerns, and cost. Terlipressin is an antidiuretic hormone (ADH) analog that is indicated for use in hepatorenal syndrome.
- **Dexmedetomidine** was added to the list of medications approved for end of life/comfort care on any unit. For this use, it is non-titratable and can only be ordered by the palliative care service.

*****Attention Providers*****

Reading the PharmFacts Bulletin can be used to earn CME! Just complete the CME quiz on the last page of the issue, submit the quiz as directed, and score a passing grade to earn CME.

Spotlight: Infectious Diseases

Management and Treatment of Complicated Urinary Tract Infections Guideline Update

Grace Paustian, PharmD; Angela Haskell, PharmD, BCPS, BCIDP

Updated clinical guidance for the treatment and management of complicated urinary tract infections (cUTIs) was released in July 2025 by the Infectious Diseases Society of America (IDSA).[1] The most notable change is the reclassification of the definition of a complicated UTI. An uncomplicated UTI is now defined as an infection confined to the bladder in afebrile women or men (men were previously classified under the cUTI definition). All other UTIs fall under the cUTI definition such as pyelonephritis, febrile or bacteremic UTI, catheter-associated UTI (CAUTI), and prostatitis.

The guideline provides recommendations regarding selection of empiric antibiotic therapy for complicated urinary tract infections through utilization of a four-step approach. The four steps include assessing severity of illness, risk factors for drug resistance, using patient-specific considerations for therapy, and utilizing local antibiograms. Table 1 below guides empiric therapy based on severity of illness. When assessing for resistant pathogens (step #2), the guideline suggests avoiding antibiotics to which the patient has had a resistant pathogen isolated from the urine in the last 3-6 months.

Table 1. Potential Empiric Antibiotics for cUTI

Patient Condition	Preferred	Alternative
Sepsis with or without shock	Third or fourth generation cephalosporins*, piperacillin-tazobactam, carbapenems†, fluoroquinolones‡	Novel beta lactam-beta lactamase inhibitors§, cefiderocol, plazomicin, or older aminoglycosides¶
Without sepsis, IV route of therapy	Third or fourth generation cephalosporins*, piperacillin-tazobactam, fluoroquinolones‡	Carbapenems†, newer agents (novel beta lactam-beta lactamase inhibitors§, cefiderocol, plazomicin), or older aminoglycosides%
Without sepsis, oral route of therapy	Fluoroquinolones‡ or trimethoprim-sulfamethoxazole	Amoxicillin-clavulanate or oral cephalosporins

* Third and fourth generation IV cephalosporins include: **ceftriaxone**, **ceftazidime**, cefotaxime, and **cefepime**
‡ The fluoroquinolones approved for UTI are currently ciprofloxacin and **levofloxacin**
† The carbapenems currently include imipenem-cilastatin, doripenem, **meropenem**, and **ertapenem**
§ The novel beta lactam-beta lactamase inhibitors currently include **ceftolozane-tazobactam, ceftazidime-avibactam**, meropenem-vaborbactam, and imipenem-cilastatin-relebactam.
% The older aminoglycosides include **gentamicin, amikacin,** and **tobramycin**
BOLDED agents on TCH formulary

In patients receiving parenteral therapy, who are clinically improving and can take oral medications, it is recommended to transition to oral antibiotics as soon as possible if an effective oral option is available. This guideline highlights the following oral options for cUTI: **amoxicillin-clavulanate**, cefixime, **cefpodoxime**, ceftibuten, **cefuroxime, cephalexin**, ciprofloxacin**, levofloxacin**, and **trimethoprim-sulfamethoxazole**. The bolded agents are on TCH inpatient formulary. Of note, amoxicillin, cefadroxil, cefaclor, and cefdinir should not be used unless alternatives are not available due to high rates of resistance (amoxicillin) and lower urinary concentrations (cephalosporins). When using an oral cephalosporin, susceptibility should be confirmed using the cefazolin result from the susceptibility report.[2]

Finally, the recommended duration of therapy is a 5–7-day course for fluoroquinolones or a 7-day course with a non-fluoroquinolone agent. This length of therapy is recommended for patients presenting with a cUTI who are improving clinically on effective treatment, including patients with gram-negative bacteremia secondary to cUTI. However, some patients—such as those with urinary obstruction, indwelling catheters, prostatitis, immunosuppression, or severe sepsis—may require longer durations based on individual clinical factors. Consultation with Infectious Diseases is recommended in patients who have resistant organisms or risk factors that may need longer lengths of therapy.

References: 1. Tamma PD, Schuetz AN, Abbo LM, et al. Complicated Urinary Tract Infections (cUTI): Clinical Practice Guideline by the Infectious Diseases Society of America (IDSA). *Clin Infect Dis.* Published July 17, 2025. doi:10.1093/cid/ciae134. 2. U.S. Food and Drug Administration. Rationale for FDA's Position on the Use of Cefazolin Breakpoints as a Surrogate for Determining Breakpoints for Oral Cephalosporins for the Treatment of Uncomplicated Urinary Tract Infections. FDA. Published October 24, 2022.

CME

Ambulatory Care: GLP-1 Compounding: Updated Guidance

Sean Clark, PharmD, BCACP

Glucagon-like peptide-1 (GLP-1) receptor agonist therapies have become cornerstone treatments for diabetes and weight management. The evolution, indications, and effectiveness of GLP-1 therapy have significantly increased prescribing and demand, which previously outpaced the available supply. This led to long lasting shortages. The FDA recognized the importance of continuing these therapies and allowed for compounded versions to be supplied to patients, per their guidance regarding drug shortages.[1]

Since that time, many of the GLP-1 shortages have ended. The FDA has continued to monitor GLP-1 supplies and has released updates regarding availability and policies addressing compounded alternatives. As of April 2025, the FDA has officially ended the period of enforcement discretion for both compounded semaglutide and tirzepatide. This includes all compounding under sections 503A and 503B of the Federal Food, Drug and Cosmetic Act.[2]

The Ohio and Kentucky Boards of Pharmacy have also provided updates on compounded GLP-1 therapies, which fall in line with the FDA.[3,4] These documents explain how commercial availability prevents the continued compounding of these products, outside of certain narrow circumstances.[5] The continued compounding, selling, ordering, administering, or otherwise facilitating the distribution of these unapproved drugs may make licensees subject to disciplinary action from the Boards of Pharmacy or FDA.

In summary, the use and prescribing of compounded GLP-1 therapy is not advisable unless a commercial product is unavailable, or they meet specific criteria requiring alteration of a product as determined by a prescriber (allergy to a component of the medication, etc.). It is essential for prescribers to explain to patients the importance of purchasing their GLP-1s from a reputable pharmacy that sells the manufactured product instead of an online compounded product. This keeps patients safe as they invest in their weight loss and cardiac health journeys.

References: 1. U.S. Food and Drug Administration. (2024, October 11). Compounding when Drugs are on FDA's Drug Shortages List [Webpage]. 2. U.S. Food and Drug Administration. (2025, April 28). FDA clarifies policies for compounders as national GLP-1 supply begins to stabilize [Webpage]. 3. Ohio Board of Pharmacy. (2025, July 17). Compounding of Glucagon-like Peptide-1 Drug Products (GLP-1) in Ohio [Webpage]. 4. Kentucky Board of Pharmacy. (2025, June) Newsletter to Promote Pharmacy and Drug Law Compliance [Webpage]. 5. U.S. Food and Drug Administration. (2018, January) Compounded Drug Products That Are Essentially Copies of a Commercially Available Drug Product Under Section 503A of the Federal Food, Drug, and Cosmetic Act: Guidance for Industry [Webpage].

Pop Quiz!

How long should a patient with a cUTI, who is clinically improving, be treated if using a non-fluoroquinolone agent?

A. 5 days
B. 7 days
C. 10 days
D. 14 days

Answer: B

REMINDER
Flu shots now available!

Who: YOU!
What: Annual flu vaccine
When: Now through 12/5/2025
Where: Various locations, see link below
Why: Protect yourself, coworkers, and the patients we serve!
How: Get vaccinated on site by scheduling an appointment or get vaccinated elsewhere and send required documentation outlined in the link below
Link:
https://mytch.thechristhospital.com/Departments/HR/emphlth/Announcements/Pages/flu-

CME

Oncology: Cancer-Associated Thrombosis

Madison Sayatovic, PharmD Candidate 2026; Shelby Moore, PharmD, BCOP

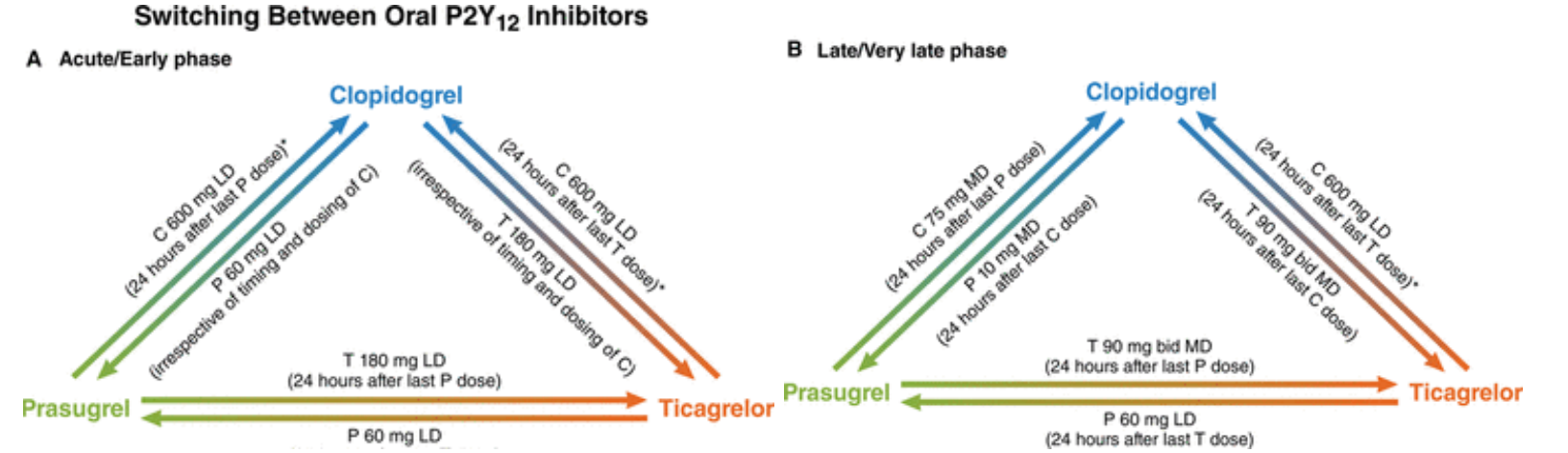
Venous thromboembolism (VTE) is a leading cause of morbidity and mortality in patients with cancer, responsible for roughly 20 percent of all VTE events and ranking as the second most common cause of death in this population. [1,2] Anticoagulation strategies must be tailored to individual risk factors, including tumor characteristics, treatment exposure, and comorbid conditions.[3,4] When cancer-associated thrombosis occurs, anticoagulation is indicated for a minimum of three to six months, with longer durations for those with active cancer.[5] Low molecular weight heparin (LMWH) has historically been preferred, but several recent trials have demonstrated efficacy and safety of direct oral anticoagulants (DOACs). In the SELECT-D, Hokusai VTE, and CARAVAGGIO clinical trials, DOACs demonstrated similar or lower VTE recurrence compared to dalteparin.[6,7,8] Apixaban, in particular, has shown a more favorable bleeding profile and may be preferred in patients with gastrointestinal (GI) malignancies.[9] Agent selection should account for renal and hepatic function, bleeding risk, adherence, and route of administration. LMWH remains the agent of choice in patients with GI or genitourinary (GU) tumors, liver disease, thrombocytopenia, or impaired oral intake. Pharmacists are uniquely positioned to evaluate patient-specific risks, interpret emerging evidence, and guide optimal anticoagulant use in cancer-associated thrombosis.

References: 1. Donellan E, Khorana A. Oncologist. 2017;22:199-207. 2. Eichinger S. Thromb Res. 2016;140:S12-S17. 3. Dickson K, Koom-Dadzie K, Brito-Dellan N, Escalante C. Support Care Cancer. 2022;30(10):8539-8545. 4. Moik F, Ay C. Thromb Res. 2022;213:S58-S65. 5. Campello E, Ilich A, Simioni P, et al. Br J Cancer. 2019; 121:359-71. 5. NCCN Clinical Practice Guidelines in Oncology Cancer-Associated Venous Thromboembolic Disease. Version 2.2025. https://www.nccn.org/professionals/physician_gls/pdf/vte.pdf. 6. Young AM, et al. J Clin Oncol. 2018;36(20):2017-23 2 7. Raskob GE, Van Es N, Verhamme P, et al. N Engl J Med. 2018;378(7):615-624. 8. Agnelli G, Becattini C, Meyer G, et al. N Engl J Med. 2020;382(17):1599- 1607. 9. Frere C, Farge D, Schrag D, Prata PH, Connors JM. J Hematol Oncol. 2022;15(1):69.

Cardiology: Antiplatelet Switching

Kathryn Weber, PharmD, BCPS, BCCP

Patients often need to transition between P2Y12 inhibitors for a variety of reasons, including bleeding risk, thrombotic risk, adverse effects, and cost. Due to differences in receptor binding, adverse effects, platelet inhibition potency, and pharmacokinetic factors such as onset of action, the agents are not interchangeable. Prasugrel and clopidogrel are both prodrugs that irreversibly bind to the P2Y12 receptor, while ticagrelor binds reversibly.[1] Ticagrelor and prasugrel have more potent platelet inhibition, leading to a decrease in ischemic events but at the expense of an increased bleeding risk when compared to clopidogrel.[2,3] When considering a switch between P2Y12 inhibitors, timing of event (often stent placement) that warranted initiation of P2Y12 inhibitor therapy must be taken into account. Thrombotic risk is higher in the acute/early phase (less than 30 days from index event) compared to the late phase (>30 days from index event). The diagram below provides direction on timing of next doses as well as need for loading dose for the different switching scenarios, considering the pharmacokinetic and pharmacodynamic differences between the agents.[1] For example, a patient in the late phase being switched from prasugrel to clopidogrel would be started on clopidogrel 75 mg 24 hours after the last prasugrel dose.



References: 1. Angiolillo DJ, et al. International expert consensus on switching platelet P2Y12 receptor-inhibiting therapies. Circ. 2017; 136: 1955-1975. 2. Wallentin L, Beck RC, Budaj A, et al. Ticagrelor versus clopidogrel in patients with acute coronary syndromes. N Eng J Med. 2009; 361: 1045-57. 3. Wiviott DS, Braunwald E, McCabe CH, et al. Prasugrel versus clopidogrel in patients with acute coronary syndromes. N Eng J Med. 2007; 357:2001-2015.

CME

Ambulatory Care: Managing Opioid Induced Nausea and Vomiting

Brett Hemmann, PharmD, BCPS, BCGP

One of the most common side effects of treatment with opioids is nausea and vomiting, with approximately 40% of patients experiencing nausea and 15-25% experiencing vomiting.[1] Nausea and vomiting are complex biochemical process, though opioid-induced nausea and vomiting (OINV) are thought to be primarily attributed to stimulation of the chemoreceptor trigger zone (CTZ), increased vestibular sensitivity, and/or altered gastric emptying and motility.[2] Both μ and δ opioid receptors, D_2 dopamine receptors, and 5-HT_3 receptors are thought to activate the CTZ, whereas histamine H1, acetylcholine (ACh), tachykinin NK1, and cannabinoid receptor-1 (CB-1) are implicated in other pathways that contribute to OINV. The D_2 receptor may contribute most to OINV in this context.[3]

Generally, if patients require routine and consistent opioid doses, tolerance and reduction in symptoms can occur within a few days.[4] Constipation should always be managed with use of opioids, as this can worsen OINV. Coadministration of opioids with food has not shown to decrease incidence of OINV.[5] Lowering the opioid dose or rotating opioids can help with symptoms, though use of antiemetics is often warranted, especially in scenarios where opioids will be used short-term. Antidopaminergic agents such as prochlorperazine, haloperidol, and metoclopramide are recommended as initial treatments per NCCN guidelines in cancer pain, though use of metoclopramide as treatment for OINV remains controversial.[3,6] Other atypical antipsychotic agents have shown utility in treating nausea and vomiting of different origins, with agents such as olanzapine blocking dopaminergic, serotonergic, muscarinic, histaminergic, and adrenergic receptors.[3] Promethazine has less specific D_2 antagonism while still remaining anticholinergic and may be effective for OINV.[2] Caution should be used with antidopaminergic agents in patients at risk of extrapyramidal effects those with concomitant QTc prolonging medications.

Agents such as ondansetron are commonly utilized for OINV due to familiarity, tolerability, and relative cost effectiveness. Ondansetron and other 5-HT_3 antagonists may be preferred in patients with Parkinson disease due to the lack of antidopaminergic and anticholinergic activity. Caution should be used with these due to risk of QTc prolongation and the primary side effect of constipation, which may worsen nausea and vomiting.[1,2]

If patients are experiencing nausea secondary to motion sickness because of opioids, agents with more potent anticholinergic and antihistaminergic activity (i.e. diphenhydramine, promethazine, scopolamine) may be effective for symptoms.[7]

In summary, many treatment options are available for treatment of OINV. Patient-specific conditions and detailing associated symptoms with nausea and vomiting can help tailor the initial choice of treatment. Antidopaminergic agents are often an appropriate first line therapy and can provide symptom relief in acute use of opioids.

References: 1. Mallick-Searle T, et al. *J Am Assoc Nurse Pract.* 2017;29(11):704-710. 2. Herndon CM, et al. *Pharmacotherapy*. 2002;22(2):240-50. 3. Smith HS, et al. *Eur J Pharmacol*. 2014:722:67-78. 4. Paice JA, et al. *J Clin Oncol*. 2023;41(4):914-930. 5. Raffa RB, et al. *Postgrad Med.* 2017;129(7):698-708. 6. Swarm RA, et al. *J Natl Compr Canc Netw*. 2025;23(7):e250032. 7. Coluzzi F, et al. *Curr Pharm Des*. 2012;18(37):6043-52.

Pop Quiz!

What characteristics describe ticagrelor?

Select all that apply.

A. Prodrug

B. Reversible binding

C. Increased bleed risk

D. P2Y12 inhibitor

Answer: B, C, D

Answer: B

CME

Name (Required): Date:

Email:

Submit quiz to Alissa Lee by email (Alissa.Lee@thechristhospital.com) or fax (513-585-3438). Receipt of completed quiz will be confirmed by email. To receive CME credit, one must score at least 80%. Submissions are due by September,30, 2026. If a participant received a score below the minimum requirement, he/she will be contacted and asked to resubmit. Two attempts are the maximum each participant is allowed. Each question is worth 1 point and the quiz is worth a total of 10 points.

1. Which of the following are a part of the four steps recommended by IDSA to select empiric antibiotics in cUTI? Select all that apply.
    a. Utilizing a local antibiogram
    b. Severity of illness
    c. Results of urinalysis
    d. Risk factors for drug resistance
2. Which of the following patients would be considered to have a cUTI is symptoms and labs fulfill the definition of UTI?
    a. Male with suprapubic tenderness and increased urinary frequency
    b. Female with diabetes presenting with dysuria and increased urinary urgency
    c. Male with urinary symptoms who had a UTI 3 months prior
    d. Female presenting with fever and dysuria
3. Who is currently allowed to compound GLP-1s (semaglutide or tirzepitide)?
    a. 503a pharmacies
    b. Drug manufacturer
    c. 503b pharmacies
    d. Independent pharmacies
4. What change led to new guidance on compounded GLP-1s from the FDA (and respective Boards of Pharmacy)?
    a. GLP-1s are no longer deemed safe
    b. GLP-1s are no longer on shortage
    c. GLP-1s are no longer deemed effective
    d. GLP-1s must be made in proprietary packaging
5. Which of the following are factors that differ between the P2Y12 inhibitors that prohibit them from being interchangeable? Select all that apply.
    a. The need for renal adjustment
    b. Receptor binding
    c. Platelet inhibition potency
    d. Onset of action
6. There is a patient who is 19 days out from the index event that needs to be switched from clopidogrel to ticagrelor. What is the timing and dose of ticagrelor you should use for the first dose of ticagrelor?
    a. 90 mg ticagrelor loading dose irrespective of clopidogrel timing
    b. 90 mg ticagrelor maintenance dose 24 hours after clopidogrel dose
    c. 180 mg ticagrelor loading dose irrespective of clopidogrel timing
    d. 60 mg ticagrelor maintenance dose 12 hours after clopidogrel dose
7. What anticoagulant did the CARAVAGGIO trial compare a DOAC (apixaban) to?
    a. Enoxaparin
    b. Dalteparin
    c. Fondaparinux
    d. Heparin
8. What percentage of VTE events are attributed to patients with cancer?
    a. 4%
    b. 15%
    c. 20%
    d. 37%
9. Which of the following decrease the incidence of OINV? Select all that apply.
    a. A lower opioid dose
    b. Rotating opioids
    c. Treating constipation appropriately
    d. Taking the opioid with food
10. Which medication is preferred for OINV in a patient with Parkinson's disease?
    a. Metoclopramide
    b. Prochlorperazine
    c. Ondansetron
    d. Haloperidol

Date originated: September 30, 2025 **CME credit designation expiration: September 30, 2026**

Disclosure Information: The authors, planners, and CME Committee members have indicated no significant financial interest or arrangements with any organization that could be perceived as a real or apparent conflict of interest in the context of this activity's subject matter. There is no commercial support or sponsorship for this activity.

Objectives: At the conclusion of this educational activity, participants should be able to: (1) Explain changes to the formulary, (2) Implement guidelines and best practices relating to the usage of the drugs and topics discussed, and (3) Assist with carrying out of Antimicrobial Stewardship efforts and other Network initiatives.

Accreditation & Credit Designation: The Christ Hospital Health Network is accredited by the Ohio State Medical Association to provide continuing medical education for physicians. The Christ Hospital Health Network designates the enduring-material CME activity for a maximum of 1.0 AMA PRA Category 1 Credit™.

In order to obtain the above credits, physicians and/or allied health members must complete the following steps: