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DISTRICT OF COLUMBIA COLLEGE OF CLINICAL PHARMACY

PRESIDENT'S LETTER

The weather is warming, commutes are getting brighter and final grades have been submitted – which means it must be Summer! We held a fun and healthy networking event at Great Falls Park in April. It was great to have the chance to interact with some members that I don't often have the chance to see. We will be scheduling our next networking event at a National's game later this summer. Keep an eye out for our announcement. We would love to see you there!

Summer is also a transitional time in the pharmacy world – with new hires, new residency classes, and new students coming on board. A big CONGRATULATIONS to the graduating students, residents and fellows of DC-CCP! Good luck on next steps in your clinical pharmacy careers. We hope your time with DC-CCP has provided educational and networking experiences that helped you make the most of your training. As you move forward, let us know what additional programming and opportunities would have been helpful so we can develop for future trainees. Stay active with the organization – we are always interested in hearing new voices through CE presentations and newsletter articles. If you are interested in any of these opportunities, contact myself or one of our committee chairs.

The Pharmacist Networking and Education Committee is busy planning the Fall CE. As an organization we pride ourselves in high-quality clinical focused CE programming, and this event should be no exception. Save the date for **September 9th**.

As an organization, we exist to serve our members. If you have any ideas for how DC-CCP can advance your clinical practice, do not hesitate to reach out.

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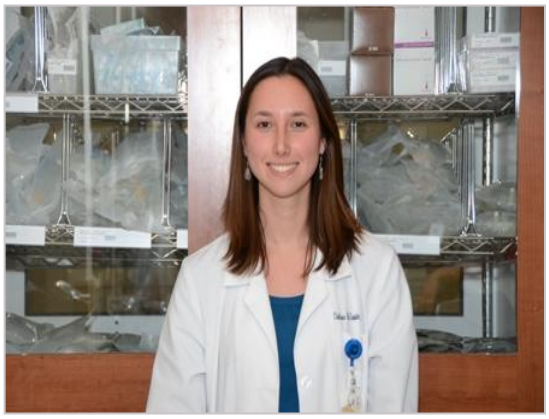
An independent chapter of the American College of Clinical Pharmacy, the DC-CCP is dedicated to improvements in pharmacotherapy practice, education, and research in the District of Columbia, Maryland, and the Commonwealth of Virginia.

DC-CCP MEMBER SPOTLIGHT: CHELSEA MCSWAIN, PHARM.D., BCPS, BCCCP

Bridgette McCauley, 3rd year Student Pharmacist, University of Maryland School of Pharmacy



Dr. Chelsea McSwain is a trail blazer of pharmacy. She currently works at Holy Cross Hospital in Silver Spring, MD as their Emergency Medicine Clinical Pharmacist, a position she created herself during residency. When asked how she determined she wanted to be a pharmacist, she stated it all started during high school. One summer Dr. McSwain decided she wanted to help her grandfather with his medications and managing them. It was during this time that she had a thirst for knowledge to understand why he was on certain medications. She also realized that pharmacy as a career would allow her to understand this and to identify struggles with medication regimens. After high school, she attended the University of Delaware to get her Bachelor's of Science in biology and then continued to the University of Maryland Eastern Shore for an accelerated 3-year pharmacy program. Dr. McSwain was then accepted to a PGY1 Pharmacy Residency Program at Holy Cross Hospital. It was during this time that she and her co-resident realized the need for an Emergency Department Pharmacist and helped implement this new position, which is held by herself and her co-resident. Dr. McSwain has a unique schedule of 7 days on and 7 days off to provide the best care to the patients she sees. On top of Dr. McSwain's PharmD and residency, she is board certified in pharmacotherapy and critical care pharmacy, holds BLS/ACLS/PALS certifications, and she is an active member of her hospital's codes and rapid response teams.

Dr. McSwain has been involved with DC-CCP since 2013 where she served as a member of the communications committee and held the position of co-chair during residency. She continued her involvement past residency, became the pharmacist co-chair, and even helped with the development of the website. She continues peer-reviewing articles for the newsletter. Dr. McSwain's most current role in DC-CCP is as president-elect, and she looks forward to serving as president next year.

DC-CCP ADVOCACY DAY 2017

John Arthur, MS, 2018 Pharm.D. Candidate, University of Maryland School of Pharmacy

DC-CCP held its fourth annual Capitol Hill Advocacy Day on March 30. Pharmacy students from Howard University and Shenandoah University were present and excited to speak with legislators about important issues in the field.

I recently caught up with Dr. Lisa Peters about this year's event. Dr. Peters was a founding member of the DC-CCP Advocacy Day visits, and is also a former President of DC-CCP. Now a DC area pharmacy clinician, she still finds time to be involved in pharmacy advocacy and pay it forward for emerging pharmacists.

The objective of the visit was to continue to build relationships with legislators. "We thought this was a good time to talk about health care delivery, whereas in the past [the country] has been talking about how to pay for it and insurance reform." Advocacy members promoted team-based care, and various bills in Congress have focused on this. Specifically, Comprehensive Medication Management (CMM) is a key issue that pharmacy advocacy groups such as DC-CCP have advocated for in the past. Schools of pharmacy already focus on CMM. Pharmacists learn to order medications, recommend dose adjustments, and order lab tests. "We know pharmacists are well-equipped to do it." However, reimbursement of such services has been lacking. There are currently no bills on the floor waiting to be voted on, and that is where advocacy comes into play. We as pharmacists and pharmacy students need to keep talking to legislators about CMM and other pharmacy services we bring to the table, building relationships as we go so that services will someday become incorporated into a larger healthcare bill.

DC-CCP's Advocacy Day visit came on the heels of Dr. C. Edwin Webb's testimony in front of the House Committee on Appropriations. Dr. Webb, the Associate Executive Director of ACCP, addressed the Committee on the critical need for CMM and its coverage through Medicare. To read Dr. Webb's testimony, as well as the ACCP Medicare Coverage Initiative, visit https://www.accp.com/govt/medicare.aspx.

Going forward, advocacy efforts will continue to promote pharmacist clinical skills in various settings. This year's Advocacy Day pushed for pharmacist reimbursement for Medicare patients, and in Minnesota, legislation has already passed for fee-for-service reimbursement of pharmacist services for Medicaid patients. The private insurance sector will be a large focus moving forward as we as a profession attempt to have pharmacy services embedded into private insurance plans and work with insurances to identify patients with poly-pharmacy and medication management problems so we can get patients the services they need.

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"And getting pharmacists involved in policy making, too. We can provide lots of good input."

When asked about the best part of this year's visit, Dr. Peters replied: "It was the biggest group ever, and with more schools than before, too! They were engaged with the issue and were more involved with the [legislative] aids, building their confidence and skills in advocacy."

Our fourth annual Advocacy Day was another great success, and we hope to see even more students on Capitol Hill next year.

BEZLOTOXUMAB (ZINPLAVA™) [MERCK]: A MONOCLONAL ANTIBODY FOR THE PREVENTION OF RECURRENT *CLOSTRIDIUM DIFFICILE* INFECTION

Hannah Lee, Pharm.D., 2017 graduate of University of Maryland School of Pharmacy

Clostridium difficile (C. difficile) is a significant problem for hospitalized patients, leading to an increased rate of hospital admissions, health complications, and a reported 35% recurrence rate.[1-4] *C. difficile* releases toxins A and B; antibodies against toxins A and B are correlated with protection against primary and recurrent *C. difficile* infections in healthy human subjects.[5-7] Two fully human monoclonal antibodies against *C. difficile* toxins have been developed. Actoxumab neutralizes toxin A and bezlotoxumab (Zinplava, Merck & Co, Inc) subsequently neutralizes toxin B.[8] A previous study compared treatment with actoxumab-bezlotoxumab or placebo in combination with either metronidazole or vancomycin; there were lower rates of recurrent infection in the treatment group compared to placebo.[9] However, a separate study found that adjunctive treatment of metronidazole or vancomycin with actoxumab alone did not reduce rates of recurrent *C. difficile* infections.[7] The study by Wilcox and colleagues examined the rate of recurrence of *C. difficile* infection with combination and single monoclonal antibodies (actoxumab and bezlotoxumab) in addition to oral standard-of-care antibiotics (metronidazole, vancomycin and fidaxomicin).

The investigators conducted a double-blind, randomized, placebo-controlled phase three trial in 322 sites and 30 countries from November 1, 2011 to May 22, 2015. The first trial, MODIFY I, had four treatment arms: actoxumab-bezlotoxumab, bezlotoxumab alone, actoxumab alone, and placebo. During a planned interim analysis, the investigators discontinued the actoxumab alone arm due to increased mortality in this treatment group[11]. Therefore, the second trial MODIFY II included 2,655 patients who were randomized to 3 treatment arms (1:1:1): actoxumab-bezlotoxumab, bezlotoxumab alone, and placebo. Recruited patients had a history of primary or recurrent *C. difficile* infection and were also receiving oral standard of care antibiotic therapy for 10-14 days. The primary endpoint was any recurrent infection within 12 weeks of infusion after initial clinical cure (no diarrhea for two consecutive days after completing standard-of-care antibiotic therapy). The secondary endpoint looked at global or sustained clinical cure response, which was defined as initial cure of the baseline episode of *C. difficile*

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infection and no recurrent infection through 12 weeks.

The results revealed that there was no additional benefit in reducing recurrent *C. difficile* infection when patients received the combination treatment (actoxumab + bezlotoxumab) compared to bezlotoxumab alone. However, bezlotoxumab reduced rates of recurrent *C. difficile* infection compared to placebo during the 12 weeks after infusion (in MODIFY I an adjusted difference of -10.1% compared to placebo (P< 0.001) and in MODIFY II an adjusted difference of -9.9 % compared to placebo (P< 0.001)).[11] Only MODIFY II demonstrated a statistically significant adjusted difference in sustained clinical response between bezlotoxumab versus placebo (14.6%; 95%, CI 7.7 to 21.4), while MODIFY I demonstrated a smaller adjusted difference in sustained clinical response between bezlotoxumab versus placebo (4.8%; 95%, CI -2.1 to 11.7).[11] The number needed to treat was 10 for the general adult population, and 6 for patients 65 years and older[11].

In conclusion, a single dose of IV bezlotoxumab in addition to standard-of-care antibiotics protected against recurrent *C. difficile* infections for up to 12 weeks compared to standard-of-care antibiotics alone. Despite the low numbers needed to treat, the role of bezlotoxumab in clinical practice is not yet well defined given the high cost of treatment. A 40 mL vial of bezlotoxumab 1000 mg/40mL is $4560.00.[10] However, there may be a role for elderly patients and those with increased risk of *C. difficile* recurrence due to concurrent complications or comorbidities. Bezlotoxumab is dosed as a single IV infusion of 10 mg/kg and does not require any hepatic or renal adjustments.[8] In addition, common adverse events include infusion type reactions such as nausea, headache, and dizziness.[8] It will be interesting to examine the results from phase 4 clinical trials, and usage data following approval of this agent to better characterize the place in therapy for bezlotoxumab.

References

1. Rupnik M, Wilcox MH, Gerding DN. Clostridium difficile infection: new developments in epidemiology and pathogenesis. Nat Rev Microbiol 2009;7:526-36.
2. Magill SS, Edwards JR, Bamberg W, et al. Multistate point-prevalence survey of health care–associated infections. N Engl J Med 2014;370:1198-208.
3. Cornely OA, Miller MA, Louie TJ, Crook DW, Gorbach SL. Treatment of first recurrence of Clostridium difficile infection: fidaxomicin versus vancomycin. Clin Infect Dis 2012;55:Suppl 2:S154-S161.
4. Kelly CP, LaMont JT. Clostridium difficile — more difficult than ever. N Engl J Med 2008;359:1932-40.
5. Kyne L, Warny M, Qamar A, Kelly CP. Association between antibody response to toxin A and protection against recurrent Clostridium difficile diarrhoea. Lancet 2001; 357:189-93.
6. Kyne L, Warny M, Qamar A, Kelly CP. Asymptomatic carriage of Clostridium difficile and serum levels of IgG antibody against toxin A. N Engl J Med 2000;342:390-7.
7. Leav BA, Blair B, Leney M, et al. Serum anti-toxin B antibody correlates with protection from recurrent Clostridium difficile infection (CDI). Vaccine 2010;28:965-9.
8. Bezlotoxumab. DRUGDEX System [Internet]. Greenwood Village, Colorado: Thomson Reuters (Healthcare) Inc. 1974 - [cited 2017 Jan 31].
9. Lowy I, Molrine DC, Leav BA, et al. Treatment with monoclonal antibodies against Clostridium difficile toxins. N Engl J Med 2010;362:197-205.
10. Bezlotoxumab, Lexi-Drug ID Online [Internet]. Hudson, Ohio: Lexi-Comp, Inc. 1978 – [2016 May 12].
11. Wilcox MH, Gerding DN, Poxton IR, et.al. Bezlotoxumab for prevention of recurrent *Clostridium difficile* infection. *NEJM* 2017; 376(4): 305-17. DOI: 10.1056/NEJMoa1602615.

UPDATES ON *HELICOBACTER PYLORI* MANAGEMENT

Shannon Haar, Pharm.D. Candidate, Lindsey W. Crist, Pharm.D., BCPS, and Sarah K. Holman, Pharm.D., BCPS

Introduction

Helicobacter pylori (*H. pylori*) is a prevalent chronic bacterial infection which can lead to peptic ulcer disease and gastric cancer. In February 2017, the American College of Gastroenterology (ACG) published the first update to the guidelines for management of *H. pylori* in ten years. Changes to the guidelines include an extended list of indications to test for *H. pylori*, updated first-line treatment regimens for initial therapy, and salvage therapy.[1]

Indications to test for *H. pylori*

Routine testing for the presence of *H. pylori* infection is not recommended. Table 1 summarizes the changes to the indications for screening. Of note, patients with typical symptoms of GERD without a history of peptic ulcer disease (PUD) are not candidates for screening.[1]

Available tests to identify active *H. pylori* infection include a urea breath test, fecal antigen test, and endoscopic biopsy. A serum antibody test is available but cannot differentiate between active and past infections. Choice of test depends on patient factors and availability.

First-Line Treatment Options

An optimal treatment for *H. Pylori* would have high eradication rates, simple administration, high safety, and tolerability. Previously, the guidelines recommended against using regimens not validated in the United States, however, antibiotic resistance and decreasing eradication rates have led to an increased dependence on international studies evaluating unique regimens or dosing strategies.[2] Recommended first-line regimens are summarized in Table 2.[1] The number of first-line treatment options increased since the 2007 guidelines; however, regimens vary in strength of evidence.[1-2] Treatment durations also vary from 10-14 days; however, evidence suggests that 14 day durations have higher rates of treatment success and may be preferred.[1,3] Nonetheless, clinicians have more options to select and pharmacists play a pivotal role in the choice of the optimal therapy.

Treatment decisions should be based on local antibiotic resistance patterns, prior antibiotic exposure, allergy history, simplicity, tolerability, potential drug interactions, and cost.

One of the largest changes in the new guidelines resulted from increasing rates of macrolide resistance due to the prevalent use of these agents. While clarithromycin-triple therapy still remains a first-line option, it should only be considered for use in areas where *H. pylori* clarithromycin resistance is less than 15% and in patients with no previous macrolide exposure. Multiple exposures to macrolide regimens may decrease the likelihood of success.[1] In patients with these risk factors for macrolide failure, bismuth-based regimens or concomitant therapy is preferred. Although the guidelines include fluoroquinolone-based regimens as potential first-line options, caution is warranted due to emerging resistance with these agents for other indications.

Patient allergy history is also an important consideration in treatment choice, with penicillin-allergy being the most common concern. The preferred therapy in patients with penicillin allergy is bismuth-quadruple therapy. An alternative option in patients without risk factors for macrolide failure is clarithromycin, metronidazole, and proton-pump inhibitor.

Other factors to consider are health literacy, ability to follow complicated directions as required in the sequential regimens, and cost. Although sequential therapy offers a unique approach to therapy, it is a complex regimen requiring a change in components of the regimen midway through the course. A bismuth-based regimen is also limited by its complex schedule and side effects which may impact tolerability and adherence. A combination tablet of bismuth subcitrate, metronidazole, and tetracycline (Pylera™) is an option to consider. While the tablet decreases the pill burden, it has significantly higher cost than the individual components.[4] Additionally, the proton pump inhibitor must be taken separately. Pharmacists must be vigilant in ensuring a complete regimen is prescribed and dispensed.

Interactions with drugs, food, and diseases should be evaluated when choosing a regimen. Clarithromycin is a substrate and strong inhibitor of cytochrome P450 3A4 with the potential for numerous interactions with commonly prescribed medications. Clarithromycin and levofloxacin are known to increase risk of arrhythmias due to QTc prolongation. Avoidance of other medications that affect the QTc interval is necessary.[5,6]

Eradication and Salvage Therapy

Several factors predict the likelihood of successful eradication including choice of regimen, adherence, and resistance patterns.[1] To ensure treatment success, it is recommended that all patients receiving treatment undergo eradication testing. With success rates for eradication declining, many patients will still have *H. pylori* after appropriate treatment and will still be at risk for complications from the pathogen. Testing should occur at least 4 weeks after completion of the antibiotic regimen and 1-2 weeks after proton pump inhibitors are discontinued. Non-endoscopic confirmation testing is preferred.[1] In the event of treatment failure, a change in regimen is indicated. It is recommended to avoid antibiotics that have been taken previously due to concern for resistance.

Beyond the first-line regimens, there are additional regimens only indicated for salvage therapy that should also be chosen based on local antibiotic resistance data.[1]

Conclusion

The management of *H. Pylori*-related peptic ulcer disease in the United States is complicated due to increasing antibiotic resistance and limited number of studies assessing newer regimens. Pharmacists can play a role in selection of therapy to mitigate resistance and potential drug interactions. Future studies may help further define the optimal treatment in the U.S.

Table 1. Indications for *H. pylori* Testing[1,2]

2007	2017
• Active peptic ulcer disease (PUD) • Confirmed history of PUD without confirmed eradication of prior *H. pylori* infection • Gastric MALT lymphoma • History of endoscopic resection of early gastric cancer	• Active PUD • Confirmed history of PUD without confirmed eradication of prior *H. pylori* infection • Gastric MALT lymphoma • History of endoscopic resection of early gastric cancer • Patients with dyspepsia undergoing endoscopy • Patients initiating chronic NSAID therapy
	Conditional recommendations for select patients:
	• Age <60 years with uninvestigated dyspepsia without alarm symptoms • Patients on long-term low dose aspirin • Patients currently on chronic NSAID therapy • Patients with unexplained iron deficiency anemia • Patients with idiopathic thrombocytopenic purpura

Table 2. First-Line Treatment Options[1]

Regimen	Medication/Duration
Clarithromycin Triple Therapy	PPI + clarithromycin + amoxicillin or metronidazole for 14 days
Bismuth Quadruple Therapy	PPI + bismuth + tetracycline + nitroimidazole for 10 to 14 days
Concomitant Therapy	PPI + clarithromycin + amoxicillin + nitroimidazole for 10 to 14 days
Sequential Therapy	PPI + amoxicillin for 5 to 7 days followed by PPI + clarithromycin + nitroimidazole for 5 to 7 days
Hybrid Therapy	PPI + amoxicillin for 7 days followed by PPI + amoxicillin + clarithromycin + nitroimidazole for 7 days
Levofloxacin Triple Therapy	PPI + levofloxacin + amoxicillin for 10 to 14 days
Fluoroquinolone Sequential Therapy	PPI + amoxicillin for 5 to 7 days followed by PPI + fluoroquinolone + nitroimidazole for 5 to 7 days

*nitroimidazole: tinidazole or metronidazole

References

1. Chey WD, Leontiadis GI, Howden CW et al. ACG Clinical Guideline: Treatment of *Helicobacter pylori* Infection. *Am J Gastroenterol*. 2017; 112:212-38.
2. Chey WD, Wong BCY et al. American College of Gastroenterology Guideline on the Management of *Helicobacter pylori* Infection. *Am J Gastroenterol*. 2007; 102:1808-25.
3. Fallone, CA, Chiba N, van Zanten SV et al. The Toronto Consensus for the Treatment of Helicobacter pylori Infection in Adults. Gastroenterology 2016;151:51–69.
4. Pylera. In: Lexi-Drugs Online [Internet Database]. Hudson, OH: Lexi-Comp, Inc. Updated 2017 Mar 16.
5. Clarithromycin. In: Lexi-Drugs Online [Internet Database]. Hudson, OH: Lexi-Comp, Inc. Updated 2017 Apr 21.
6. Levofloxacin. In: Lexi-Drugs Online [Internet Database]. Hudson, OH: Lexi-Comp, Inc. Updated 2017 Apr 21

Special thanks to our peer reviewers:

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Interested in contributing an article for the DC-CCP Fall newsletter or becoming a peer reviewer?

Please contact **dcccpnewsletter@gmail.com**

Thank you to everyone that came out to our April Networking Event at Great Falls Park! We hope to see you at our next Networking Event!

DC-CCP Upcoming Events!

- **August 2017:** Washington Nationals Baseball Game/Networking Event
- **September 2017:** Fall CE Event
- **October 2017:** 2017 ACCP Annual Meeting

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About DC-CCP

DC-CCP is a non-profit professional association and an independent chapter of the American College of Clinical Pharmacy dedicated to improvements in pharmacotherapy practice, education, and research in the Washington D.C. Capital Region, including the District of Columbia, State of Maryland, and Commonwealth of Virginia. Membership will be open to any licensed or registered health care professional or health care professional student in the Capital Region. Membership in the American College of Clinical Pharmacy is not required to become a member of our organization.

Purpose and Goals of DC-CCP

(A) To promote the rational use of drugs in society
(B) To advance the principles and practice of clinical pharmacy
(C) To promote the full-time, advanced practice of clinical pharmacy
(D) To provide an advanced level of continuing education programs in the area of clinical pharmacy and objectives of ACCP as outlined in its constitution and bylaws
(E) To provide a forum for the expression of opinion on pharmacy practice, education, and research from the perspective of clinical pharmacists
(F)To support, promote, and advance the goals and objectives of ACCP as outlined in its constitution and bylaws
(G) To provide a local recruiting base for ACCP

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