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Pharmacists Optimizing Cancer Care

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The Future Has Arrived: Gene Therapy for Sickle Cell Disease

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FEATURE

The Future Has Arrived: Gene Therapy for Sickle Cell Disease

Alexis Kuhn, PharmD, BCOP
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December 8, 2023 ushered in what is truly a 'December to remember' in non-malignant hematology with the historic approval of two unique—and theoretically curative—gene therapy products for the treatment of patients with sickle cell disease: lovotibeglogene autotemcel (lovo-cel; Lyfgenia™) and exagamglogene autotemcel (exa-cel; Casgevy™).[1] Prior to the emergence of these therapies, allogeneic hematopoietic stem cell transplantation (HCT) was the only curative option for patients with sickle cell disease. However, its widespread application is hampered by limited availability of donors and the risks of severe/potentially life-threatening HCT complications (e.g. graft versus host disease (GVHD), graft failure, short- and long-term toxicities of conditioning agents, etc.).[2] Negating some of these limitations, lovo-cel and exa-cel offer significant promise to patients with sickle cell disease.

"These agents offer distinct advantages over allogeneic HCT in that a donor is not required, and GVHD is not a risk; however, lovo-cel and exa-cel still require myeloablative conditioning and an extensive treatment timeline, have a relatively unknown long-term safety and efficacy profile, and come with a multimillion-dollar price tag."

What are lovo-cel and exa-cel?

Though both are gene therapies intended to treat patients with sickle cell disease, lovo-cel and exa-cel represent two very distinct approaches to address hemoglobin production. Hemoglobin A (HbA) is a tetrameric structure comprised of two α globin chains paired with two β globin chains.[3] β globin is encoded on the *HBB* gene, which is the nidus of pathogenesis for sickle cell disease: a point mutation on *HBB* results in a dysfunctional β globin variant, β^S, that forms hemoglobin S (HbS) when paired with two α globin chains.[4] The aberrant HbS polymerizes when deoxygenated, resulting in sickling of the red blood cell and resultant clinical sequelae (e.g. vaso-occlusive crises (VOCs), acute chest syndrome, stroke, chronic anemia, end organ damage, etc.).[4]

Lovo-cel relies on gene addition via a lentiviral vector (BB305) that delivers a modified *HBB* gene encoding an anti-sickling β globin protein (β^{AT87Q}).[5,6] The patient's own hematopoietic stem and progenitor cells (HSPCs) are first transduced with the BB305 vector encoding β^{AT87Q} and then reinfused to the patient. Once engrafted, the modified HSPCs begin to produce a new hemoglobin (HbA^{T87Q}), which, when added to baseline HbA production, results in a net increase in total hemoglobin.[5-7] In recently reported results from the phase 1/2 HGB-206 and the phase 3 HGB-210 studies of lovo-cel, median total hemoglobin post-infusion was 11.8 g/dL, up from baseline 8.7 g/dL, with a median HbA^{T87Q} ≥4.5 g/dL.[7] Consequently, VOCs are markedly reduced and/or fully ablated, with 97% of evaluable patients in HGB-206/HGB-210 reporting resolution of severe VOCs and 90% reporting complete resolution of VOCs altogether.[7] Of note, a sister product of lovo-cel which also employs BB305 encoding β^{AT87Q}, betibeglogene autotemcel (beti-cel; Zynteglo™), was FDA-approved for patients with transfusion-dependent β thalassemia in 2022.[8]

Alternatively, exa-cel relies on gene editing. Exa-cel employs CRISPR/cas9 to disrupt the erythroid enhancer region of *BCL11A*.[9] *BCL11A* is a transcription factor responsible for repressing γ-globin synthesis; γ-globin, when paired in a tetramer with α-globin, constitutes fetal hemoglobin (HbF).[1,9] High concentrations of HbF have long been recognized as beneficial for mitigating symptoms of sickle cell disease, making it an attractive target for therapeutic manipulation.[10] As with lovo-cel, the patient's HSPCs are first edited *ex vivo* with exa-cel and then reinfused to the patient.[9] Once engrafted, the edited HSPCs produce HbF with resultant improvement in total hemoglobin and clinical sequelae of sickle cell disease, as evidenced in the phase 3 CLIMB SCD-121 trial.[9,11] In CLIMB SCD-121, mean HbF levels were maintained at ~40% through follow-up, with a mean total hemoglobin ≥11g/dL.[9,11] As a result, 94% of participants experienced no severe VOCs and no patients required hospitalization for severe VOC in ≥12 months post-infusion.[9,11] In January 2024, exa-cel obtained an additional FDA approval for transfusion-dependent β thalassemia.[12]

How are these agents administered?

Unlike gene therapies for other conditions, such as those for hemophilia A and B, which are infused directly to the patient, lovo-cel and exa-cel are functionally akin to autologous transplants with *ex vivo* genetic manipulation. As such, administration of lovo-cel and exa-cel are multi-step, months-long processes.

Step One: Transfusion Run-In Period[5,6,8,9,12,13]

Prior to mobilization of HSPCs, it is first recommended to routinely transfuse patients to decrease hematopoietic stress on the bone marrow and optimize HSPC yield. For both agents, a transfusion regimen is recommended for at least 2 months prior to mobilization/apheresis with a goal of maintaining HbS <30% and product-specific hemoglobin thresholds. During this two-month transfusion run-in period, it is also recommended to withhold

hydroxyurea, voxelotor, crizanlizumab, glutamine (for lovo-cel only), and erythropoietin (for lovo-cel only). Because lovo-cel is a lentiviral-based product, HIV antiretrovirals should also be held for at least a month prior to mobilization to allow adequate washout. Similarly, it is recommended to withhold iron chelators for at least 7 days prior to mobilization for lovo-cel.

Step Two: Mobilization/Apheresis[5,6,8,9,12,13]

Given concern for significant toxicities associated with filgrastim in patients with sickle cell disease, mobilization of HSPCs should be accomplished with plerixafor monotherapy.[14,15] Goal $CD34^+$ harvest targets differ for the two agents, but a backup collection is required for each agent in the event of engraftment failure. After successful collection, manufacturing time for lovo-cel is currently anticipated to take ~10-15 weeks, with ~5-6 months estimated for exa-cel.

Step Three: Conditioning[5,6,8,9,12,13]

Conditioning is required prior to product infusion for both agents, and to date, all published data with lovo-cel and exa-cel are with myeloablative busulfan monotherapy. As with the run-in period prior to apheresis, it is recommended to maintain product-specific hemoglobin thresholds and withhold certain sickle cell disease (SCD)-directed therapies (e.g. crizanlizumab, voxelotor, glutamine [lovo-cel onl], and hydroxyurea [exa-cel only]) for two months prior to conditioning. Furthermore, because of the potential for interaction between busulfan and deferasirox, if a patient is using deferasirox for iron chelation, consider switching to an alternate chelator at least 25 days prior to busulfan.[16] All iron chelators should be discontinued at least 7 days prior to busulfan. Prophylaxis against seizures and sinusoidal obstruction syndrome should be initiated prior to busulfan, and pharmacokinetic monitoring should be performed to ensure appropriate busulfan exposure.

Step Four: Product Infusion/Engraftment[5,6,8,9,12,13]

After at least a 48-hour washout from busulfan, the product can be infused. Because of the preceding myeloablation, the patient will be neutropenic and thrombocytopenic until engraftment of the modified HSPCs. The patient will remain at significant opportunistic infectious risk until immune reconstitution; thus, appropriate bacterial, viral, and fungal prophylaxis should be administered in the post-infusion period. Of note, both products contain an FDA label warning for delayed platelet engraftment and risk for neutrophil engraftment failure.

What else should I know?

In their respective clinical trials, toxicities of lovo-cel and exa-cel were largely consistent with those seen with myeloablative busulfan transplants.[5-8,9,11] Alarmingly, two patients treated with lovo-cel on HGB-206 developed acute myeloid leukemia several years after infusion, raising concern for the possibility of insertional oncogenesis from the lentiviral vector.[17,18] However, after extensive evaluation of the leukemic blasts, lovo-cel was not implicated as the cause of leukemogenesis in either case.[17,18] Nonetheless, FDA labeling for lovo-cel does include a box warning for hematologic malignancy, and providers and patients alike should be aware of the possibility.[13] Notably, exa-cel does not employ a lentiviral vector and thus does not share the same concern for insertional oncogenesis.

Published experience with gene therapy in patients with a history of stroke is currently limited and only exists for lovo-cel. HGB-206 (lovo-cel) did enroll two patients with prior history of stroke, and no patients experienced stroke after infusion.[6] CLIMB SCD-121 (exa-cel) excluded patients with history of central nervous system disease, and the phase 3 trial of lovo-cel (HGB-210; NCT04293185), as listed on its current clinicaltrials.gov record, is also excluding patients with history of ischemic or hemorrhagic stroke.[9,23]

Both agents are currently only approved in patients aged 12 years and older.[12,13] CLIMB-151 (NCT05329649) is a phase 3 trial evaluating exa-cel in children aged 2-11 years old, and is currently recruiting.[22] Similarly, HGB-210 is currently enrolling patients 2-50 years of age to receive lovo-cel.[23]

These groundbreaking therapies carry a groundbreaking price tag, with both agents priced >$2 million—well over the ~$300-400,000 cost of an allogeneic HCT.[19] Prior to their FDA approval, the Institute for Clinical and Economic Review (ICER) published an evidence report on gene therapies for SCD in which they gave lovo-cel a B+ rating and exa-cel a C++ rating as compared to standard of care.[20,21] At time of this writing, the report has not yet been updated to incorporate post-approval pricing data.

Conclusion

Lovo-cel and exa-cel are just the start of the future, with other gene therapy constructs for sickle cell disease on the horizon.[8,24] These agents offer distinct advantages over allogeneic HCT in that a donor is not required, and GVHD is not a risk; however, lovo-cel and exa-cel still require myeloablative conditioning and an extensive treatment timeline, have a relatively unknown long-term safety and efficacy profile, and come with a multimillion dollar price tag. Ultimately, the choice of allogeneic HCT versus gene therapy versus neither will come down to a patient-specific decision. Hematology/oncology pharmacists can support our patients and providers alike by first familiarizing ourselves with these complicated therapies, ensuring patients are receiving the appropriate supportive care and prophylactic medications, and helping to navigate the treatment journey when the time comes. ●●

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The Impacts of Strong Professional Relationships between Clinical Pharmacists and Medical Science Liaisons

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For most of the 11 years I spent in clinical practice, I only superficially understood the purpose of medical science liaisons (MSLs). I knew that this was an industry role focused on clinical data, but never considered that I could, or even should, work with MSLs in my clinical practice. When complicated or new clinical scenarios arose, such as a request from a physician for an off-label use of a therapy, my approach was typically to figure it out myself, or if I were lucky enough to have a student or resident, I would engage them to assist. I would spend precious, patient-care time digging through literature or asking for help on online special interest groups, trying to find justification to support the request. A massive shift occurred late in my practice, when I was tasked with bringing a novel monoclonal antibody to my institution via the pharmacy and therapeutics committee, which included subsequent electronic medical record (EMR) order set development and creation of institutional standard operating procedure. On top of my clinical duties and precepting, this was a heavy lift. The multi-faceted project was time- and labor-intensive, as the agent was riddled with black box warnings and a risk-evaluation and mitigation strategy (REMS) requirement. It was operationally highly burdensome to the pharmacy, the nursing staff, the patient, and the EMR. I spent countless hours researching, emailing, and troubleshooting.

I eventually spoke with the sales representative who offered to connect me with the MSL, who served as the scientific resource to help ensure that the drug was used effectively and could provide relevant clinical data. The MSL proved to be instrumental in the timely implementation of all facets of this project. She was continuously available to address my questions, thoroughly review the associated clinical data, and liaise to connect me with partners at her company, such as access and reimbursement specialists and clinical development teams. Additionally, she was able to connect me with experts at other institutions where the agent was already operationalized to share best practices, reflections on failures, and ideas for optimization. I became the institutional point for this drug, and once our site was comfortable and experienced, I educated our satellite sites as well. The drug company invited me to participate in pharmacist advisory boards, where I was empowered to share my own experiences with experts across the United States. In these forums, the pharmacists were able to vocalize barriers for use, strategies for managing toxicities, and express unmet needs for patients. Personally, I expanded my professional network and learned new strategies to apply to the care of my patients. I learned that clinical pharmacist input to pharmaceutical companies serves as a valuable, if not vital, mechanism to enhance patient care.

> **"I began to see how the MSL could be a particularly useful tool if you know how and when to use him/her".**

When the next clinical challenge arose, I was quick to seek out the associated MSL and request resources, allowing me to implement institutional drug policy and procedures and to develop EMR order sets more efficiently. From this point forward, when an MSL reached out to meet about a relevant drug, I prioritized time for them. The meetings were fruitful for me and my learning, as well as for my entire department, as I was able to share my learnings with the team. Typically, it was difficult for members of our team to travel to and attend live educational conferences, so these meetings were a simple means to review new data, allowed active engagement, and left me with new resources. I learned about up-and-coming therapies, updated data on approved products, and clinical trial opportunities for patients. I grew as a clinical specialist and became a more well-rounded resource for my team and my patients.

Jake Hanlin, PharmD, BCPS, BCOP

When I was a hospital/clinical pharmacist, one of my first meetings with an MSL was planned out several weeks in advance. We agreed to meet in the hospital cafeteria, and I completely forgot about it until I received a reminder email about an hour prior to the meeting. Of course this was right after we had finished rounding and I had two discharging patients to counsel and several other follow up items. I kept the meeting but could not stop thinking about all the tasks I had to get back to as the MSL relayed intricate details of a drug that I had never used, in a disease state that I

Reflection on Personal Impact and Growth

rarely cared for. I gained little from the interaction that went well over the allotted 30 minutes, and it reaffirmed my convictions to decline any future meetings with anyone.

It was not until a few colleagues had left their clinical positions to work in the pharmaceutical industry that I began to better appreciate what the role of medical affairs entailed. With trusted friends working in the pharmaceutical industry, I saw the many advantages to having a strong relationship with an MSL. There were times when a question would arise during rounds that typically would have required post-rounds research; however, because the medication was covered by my MSL friend, I was able to reach out to them during rounds and often have a response quickly.

I began to see how the MSL could be a particularly useful tool if you know how and when to use him/her. As I reflect on my initial negative experience, I realize there were several things that I, as an oncology pharmacist, could have done to make that meeting more productive for me. First, I could have asked more questions long before that meeting. Had I realized that the MSL covered a therapeutic area (or a therapy) that I had little experience or interest in, I could have respectfully declined the meeting. If the MSL covered a therapy that I had been interested in, but perhaps wasn't something that I was familiar with, I should have been open with the MSL (and confident enough to admit that I don't know everything) and asked them to provide more background information to ensure the meeting was beneficial. Next, like most pharmacists, I have a healthy amount of trust issues, so rather than simply trusting the MSL explicitly, I could have requested references or visual materials. Additional data would have allowed me to further digest and interpret the information for myself at my own pace. Lastly, I should have shared with the MSL that I was under a lot of stress and that it would have been beneficial to me to shorten (or even reschedule) the meeting. This is not an uncommon or unreasonable request from front-line healthcare workers. A good MSL will be prepared for this and can condense their message to fit your needs and, if necessary, schedule a follow-up meeting.

Consider these additional tips prior to your next MSL meeting to ensure it is beneficial and can provide value to you and your practice.

Megan and Jake's Tips for Working with MSLs

- **Share your preferences.** You can communicate with MSLs face-to-face (on-site, off-site, at conferences, etc.), via teleconference, over the phone, text, or email at any time. Be open and honest with your time constraints; meetings can be as short or long as you want them to be.
- **Know which drugs (including pipeline) your MSL supports.** Check the company website or simply ask the MSL.
- **Request a focused agenda, communicate your needs, and ask specific questions.** Your time is important, so request efficiency of your MSL. This will allow the MSL to gather resources and bring you the specific information, or additional personnel, that you need.
- **Be honest with your data analysis and feedback.** An MSL's goal is to serve as an unbiased conduit between healthcare providers and their company's Medical Affairs team. By providing your expert opinion, genuine critique, and thoughtful analysis, you are helping patients and helping to identify areas where further research is needed.
- **Invite your teammates, residents, or students to the meeting.** Group meetings allow for enhanced engagement, wider distribution of knowledge, and greater impact on patient care.
- **Designate an industry liaison on your team.** They can take the lead on these meetings and disseminate information to the team.
- **Create a tool that serves as a quick reference for easily contacting the appropriate MSL for your needs.** A suggested format is below: ●●

Company	Drug	Indications	MSL Contact Information	Sales Representative Contact Information	Patient Support Contact Information

Navigating Healthcare Mergers: Strategies for Success in an Ever-Changing Landscape

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The utterance of "we purchased 8 hospitals in other states" evokes a gamut of emotions within me, but it was not the first time the healthcare system I work at had embarked on the acquisition journey. Over the past five years, they had purchased two groups of medical offices which included oncology offices. While the prior acquisitions had minimal impact on my role, I knew the recent acquisition, featuring eight hospitals with infusion centers and a standalone infusion center, would drastically affect my position overseeing system oncology pharmacy. Not only were these mergers happening, but I also learned that these mergers would happen at the same time.

Health system mergers have been occurring for decades, driven primarily by market dynamics and entrepreneurship.[1] Many of these mergers or acquisitions target rural hospitals.[2] With reimbursement rates diminishing and striving to reduce resources, hospitals are attempting to improve outcomes while being efficient, resulting in many hospital mergers.[3] In addition, the American Hospital Association says that acquisitions and mergers help drive quality and improve access to care for patients in rural and underserved communities.[4]

> **"As we have heard before, it is a marathon, not a sprint."**

As the Manager for my healthcare system's Oncology Pharmacy Services, I have been navigating a landscape of continual change and uncertainty since the merger announcements. While I do not have direct reports, my responsibilities encompass policy creation, procedure implementation, formulary management, clinical decision-making, oncology pharmacy alignment, and regimen building in the electronic medical record across a network of 20 hospitals catering to various oncology specialties. The merger announcement triggered concerns about both job stability as well as the daunting prospect of restructuring pharmacy operations. Amidst this once-in-a-lifetime opportunity, I have gained valuable insights that could have eased this transitional phase.

Tip 1: Embrace Constant Change

As pharmacists, we have been able to adapt to change and crisis, especially with pivoting through drug and staffing shortages. However, a merger brings incessant change. I received many announcements of changes within a short time period and got to the point where I was identifying what HADN'T changed in my position. Too much change can lead to burnout quickly as we are consistently adapting to newer processes and structures. But after time, I had to learn to embrace this change. As Maya Angelou says, "If you don't like something, change it. If you can't change it, change your attitude." While much of change lies beyond our control, self-care is paramount. It took me time to gather a toolkit like HOPA's resources on Management/Leadership Wellness.[4] I had to remember to brace myself for the change by taking time off, practicing yoga, getting sleep, exercising, or taking a break during work to walk outside, as recommended in an article on attrition of clinical pharmacists by Rech, et al.[5] Again, the largest practice was asking myself, "Is this in my control?" If it was not, then I knew I had to accept the change. As for employees, I would meet with them during touch bases or team meetings to determine how they were feeling. I was also honest about the upcoming changes and shared what information I knew and didn't know. One great thing our institution has implemented is to have a reflection moment to start meetings and it was here that I would share tips on burnout.

Tip 2: Welcome the Unknown

As with learning to accept constant change, embracing uncertainty is vital. With all of the changes to leadership, philosophy, culture, and previous practices, there is a lot of uncertainty of the future. I learned that worrying about the future is what brings on anxiety and that the anxiety of what will happen is not within my control. I printed and posted a picture above my desk to remind me to embrace the unknown.[6] I also had similar conversations with employees and reminded caregivers to tell themselves they were not alone and that there were strategies to help with these fears. Even though my strategy required me to show my vulnerabilities, I was able to provide them with a practical resource to use.

Tip 3: Have an Open Mind

In addition to uncertainty and change, maintaining an open mind fosters collaboration and innovation. Leadership approaches, including managing differences within cultures and the dynamic between employees, are changing. One of the strategies I used here was having an open mind to all employees at merging institutions. I needed to understand and learn about the site's current process, culture, and structure. I needed to be curious, but I also needed to listen and support any thoughts or concerns related to the merger. By engaging employees and assimilating diverse perspectives, our group could identify best practices and streamline operations. Additionally, learning about the culture and how decisions are made is a key step to moving forward and finding a balance of planning.

Tip 4: Redefine Strategy, Goals, and Metrics

Due to the ongoing reorganization and differing data availability, setting goals and strategies is challenging. I am currently working with sites that have multiple electronic medical records which don't

produce the same data. Additionally, I know we will have to revamp electronic anticancer therapy regimens, but do not know enough of what the process will be to set a goal. While creating other goals for system oncology pharmacy, I had to keep in mind that I would not be measuring this activity, even though I knew it would take up at least 25% of my time. Therefore, I decided to keep the system oncology goals simple. I wrote goals about harmonizing financial, clinical, and pharmacy practices. I collaborated with current pharmacy leaders, oncology leaders, and our oncology pharmacist team to ensure these goals aligned with other system goals. I also had discussions with caregivers about personal goals to identify what would be feasible, knowing some work is unknown or unaccounted for.

Tip 5: Patience is Key

As we have heard before, it is a marathon, not a sprint. There are many times I feel like I should have had these processes approved yesterday, or that I need to have numerous decisions on different issues completed by next week. I have to remember what my strategy is currently and what I need to accomplish this quarter, and that the other harmonization procedures or decisions will have to wait. I am learning to restructure priorities or to see if someone on the oncology team can help solve the problem and that strategic prioritization and delegation are essential. Acknowledging that progress takes time alleviates undue pressure and fosters a sustainable pace.

Tip 6: Cultivating a New Team

Prior to the merger, I was able to create a virtual oncology team across 11 sites with 25 oncology pharmacists. It took years for the team to feel comfortable with each other, but it was carefully planned. Now, my current oncology workforce spans close to 50 oncology pharmacists. I had to adapt to various meeting types and processes in order to make decisions efficiently, such as leveraging current platforms like Microsoft Teams to use polls and chats. A consistent fear of mine is losing the collaboration that we had within previous teams, but tactics such as sharing a slide about yourself or asking random "get to know you questions" in virtual huddles have made a difference. I know we will be able to regain a connection with a larger team but that it will just take time.

Tip 7: Support Your Team

When learning about new information, it is essential to communicate this with team members as being transparent builds trust. Even if there is no news, I communicate that there is none as employees want to know what is happening. I added thrice weekly 15-minute huddles so that we could communicate new information or ask questions. I also communicate in various forms throughout the week using emails, huddles, and chats depending on the information I need to convey. Additionally, I determine what strains the team is having and help them prioritize necessary tasks. Lastly, recognition should not be forgotten even though changes are happening rapidly as employees need validation from leaders.

In conclusion, while some mergers may have minimal impact on your position, others may drastically transform it. Armed with resilience and a managerial toolkit, one can navigate these transitions successfully while being mindful of the tips above. ●●

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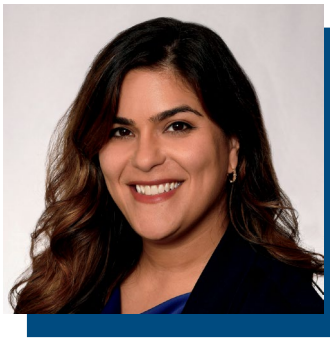

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Quality improvement is an essential part of care delivery due to its pivotal role in improving healthcare processes impacting care quality, safety, coordination, access, and the patient care experience. However, there are many barriers to implementing quality improvement initiatives. Below we highlight three common quality improvement (QI) barriers of resourcing, data, and training, and how each has been overcome by experienced QI pharmacists.

Pharmacy Resources

Often barriers around resources include lack of designated pharmacists to participate in QI projects, competing demands on already stretched pharmacist's time, and lack of support from leadership. Two pharmacy programs recently completing the 6-month American Society of Clinical Oncology (ASCO) Quality Training Program (QTP) share insight and perspective on overcoming resource barriers in completing QI initiatives and their pharmacist-led QI effort.

Dr. Mark Hamm, Director of Pharmacy Oncology of Advocate Aurora Health, explained how the pharmacist-led team at Aurora Health first identified projects that addressed known pain points to not only pharmacists, but also providers and nurses. They recognized the importance of support from leadership outside of the pharmacy department and garnered buy-in and support from their Oncology Quality Director and Oncology Nursing Director very early in the process. This helped to facilitate creation of a multidisciplinary team that would have supported, dedicated time to contribute to a successful initiative. The QI team then agreed upon a realistic time commitment by all project team members. This included the potentially overlooked step of simply adding meeting times to everyone's calendars for the expected duration of the project to ensure all participants had awareness of the commitment. Aurora also set an expectation that all team meetings would be in person meetings. Being able to see each teammate's discomfort, excitement, or other emotions helped bring the team together. This created an environment that the individual teammates looked forward to being a part of, which promoted continued involvement and shared contributions across the team.

Dr. Rose DiMarco, Oncology and Infusion Pharmacy Manager at Thomas Jefferson University Hospital and Pharmacy Quality Lead for the Sidney Kimmel Cancer Center at Jefferson Health, shared that while quality is a part of most pharmacy activities, she holds the only formal quality role within the pharmacy department. She acknowledged how important QI work is, while highlighting how challenging it is to prioritize it with all of the directions in which pharmacists are pulled. Having representation and involvement of all stakeholders is vital to the success of QI efforts and creating multidisciplinary teams is a beneficial approach to distribute work across disciplines, such as involving endocrinology on a QI project to improve processes around hyperglycemia management. While pharmacists can contribute to projects in many ways, having support and team members across disciplines divides the work appropriately. DiMarco shares that staffing QI projects is a careful balance. Dedicating time for her team members to complete their QI obligations must be balanced against the pharmacy workload which can be exacerbated by high patient volumes, staffing shortages, and standard clinical services which fill her pharmacists' plates.

"For pharmacists wanting to expand their skill set in the areas of quality and QI: Find a structured training program and experienced mentor, practice new skills with a project within your scope, then teach others the lessons learned."

Both Drs. DiMarco and Hamm shared experiences demonstrating the importance of having a multidisciplinary QI team to appropriately divide the work while minimizing resourcing strain on one department or individual and garnering senior leadership buy-in to support resourcing. As pharmacist's involvement in QI grows, ensuring appropriate resourcing and support will continue to be a challenge for pharmacy leadership balancing all of the demands on pharmacist's time.

Data and Reports

Data is the backbone of a successful QI project but accessibility, adequacy, accuracy and interpretability of data can be elusive. Two pharmacists working on oral anticancer agent (OAA) assessment initiatives share barriers in data collection and their respective actions to overcome these challenges.

Dr. Britny Brown at the University of Rhode Island School of Pharmacy embarked on a quality project regarding adherence assessment in patients receiving immunomodulatory drugs (IMiDs) (e.g., lenalidomide, pomalidomide, thalidomide). Due to various issues related to IMiD dispensing, patients frequently experienced delays in acquisition between cycles but adherence was not being documented in the electronic medical record (EMR). Initially Dr.

Brown faced difficulties identifying patients newly started on therapy, but she was able to partner with the information technology (IT) team to create a report listing new IMiD starts. Now she can quickly generate an accurate patient list and use a QI team-developed Epic Smart Phrase to capture a timely adherence assessment. Due to the truncated time frame of her project, Dr. Brown faced challenges with data representation to accurately reflect meaningful change. Achieving her data goal required a minimum number of data points showing improvement; however, she ideally needed 8 cycles to assess IMiD adherence which would take longer than the timeframe intended for the project. Dr. Brown's takeaway: "We realized we just needed to be patient! We continued our quality improvement intervention and now have enough data to demonstrate special cause variation."

At UVA Health, Dr. Lia Lynch ran into barriers with data early in her QI project to improve time to first toxicity assessment after initiation of oral anticancer agent (OAA). Her team's ability to evaluate their endpoint successfully was limited by a lack of interoperability between health systems and specialty pharmacies, making it difficult to determine when medication was dispensed and/or received by patients. To overcome the lack of an accurate start date for OAA, the team created patient handouts that educated on the importance of notifying the clinic when they received their OAA shipment. Another data barrier encountered was lack of reports, as only select teams or individuals at their institution had access to reporting tools within the EMR. Due to the reporting group's limited resources and competing priorities, the QI team was unable to obtain baseline data or have custom reports generated to easily collect and measure data. Dr. Lynch's team had to perform time-intensive chart reviews to measure endpoints for the initiative, leading to difficulty in demonstrating project sustainability, a key QI measure. The team pivoted to utilize basic reporting tools available in the EMR to create temporary reports. While not perfect, this allowed the team to be more efficient with data collection.

Education and Training

Dr. Gayle Blouin, Clinical Pharmacy Manager at Dana-Farber Cancer Institute, joined the HOPA Quality Oversight Committee several years ago for a new volunteer experience. Despite 20 years of clinical practice and managerial experience, she had no formal training in quality. She learned about the ASCO QTP program through her work on the Quality Oversight Committee and was fortunate to have Pharmacy leadership and an institutional champion support her interdisciplinary team's enrollment. The training changed her mind set about day-to-day operations and institutional pharmacy initiatives, as well as her role as the current Vice Chair of HOPA's Research & Quality Council. Dr. Blouin reflects: "We are trained in pharmacy school and during residency to solve the problem; unfortunately, we often come up with solutions before we know what the problem truly is." Through quality training, she learned to spend more time focusing on the question rather than focusing on short-term fixes that might not improve the problem. Quality focused teams and training exist at many institutions but rarely focus on smaller scale issues or pharmacy-led initiatives. With her quality training and successful project implementation, Dr. Blouin is now better equipped to lead pharmacy and interdisciplinary teams in institutional initiatives.

Similar to Dr. Blouin's journey, Dr. Kathlene DeGregory was a clinical specialist and coordinator in oncology pharmacy for decades at UVA Health without any formal quality training. Seizing on an opportunity for growth, she completed the ASCO QTP as well as the Institute for Healthcare Improvement (IHI) Open School. After successfully completing a project with her postgraduate-year 2 resident, she recognized the lack of QI training in the residency program and embarked on a commitment to develop and implement quality curriculum for the University of Virginia pharmacy residency program. She believes quality education is essential for trainees to enter the oncology pharmacy workforce prepared to improve the quality of care in their own practice. Dr. DeGregory credits the success of the residency program to a few key factors: building quality training as a required component of residency curriculum, providing didactic learning along with experiential application of the tools and methodology, and utilizing external resources to optimize the experience. By aligning resident projects with department and institutional initiatives, the project posters and platform presentations have gained visibility via the UVA Quality Improvement showcase and contributed to the growth of the quality curriculum within the residency program.

Key Takeaways

For pharmacists wanting to expand their skill set in the areas of quality and QI: Find a structured training program and experienced mentor, practice new skills with a project within your scope, then teach others the lessons learned. Check out the HOPA Quality Resources webpage to learn more about quality improvement, metrics, and quality training and education.

Pharmacist's Perspective: Cancer Cachexia ASCO Guideline Rapid Recommendation Update on Olanzapine

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Cancer Cachexia

Cancer-associated cachexia, frequently referred to as cancer cachexia, is common among patients with advanced cancer regardless of active chemotherapy treatment. It presents as a loss of appetite, weight, and muscle tone. Cachexia affects about 50% of patients with newly diagnosed cancer, and it is exacerbated with chemotherapy and the progression of the disease.[1] Nutritional status is an important prognostic factor for survival as it affects patients' performance and outcomes.[2] Cancer cachexia impacts quality of life and is associated with increased treatment-related toxicity and reduced overall survival. In 2020, the American Society of Clinical Oncology (ASCO) published initial guideline recommendations on the management of cancer cachexia, based on a systematic review of nutritional, pharmacologic, and other interventions, like exercise, for cancer cachexia.[2] The panel examined 20 systematic reviews and 13 randomized control trials published between 1966 to 2019. However, they provided a low or intermediate level of evidence quality across all recommendations.[2] Those recommendations have since been updated to recommend the use of olanzapine based on practice-changing clinical evidence in ASCO's 2023 update, "Cancer Cachexia: ASCO Guideline Rapid Recommendation Update".[3]

"On July 12, 2023, ASCO published its Cancer Cachexia: ASCO Guideline Rapid Recommendation Update, recommending olanzapine 2.5 mg daily for treatment of cachexia in patients undergoing active chemotherapy as well as those off of chemotherapy."

The pathophysiology of cachexia is multifactorial. Cancer alters homeostatic control of energy balance, hypothalamic control of appetite, and satiety, resulting in lower food intake and weight loss.[2] The cancer cells produce catabolic proinflammatory cytokines and eicosanoids, and elevated catabolic mediators from tumor overexpression and inflammation can alter metabolism and neurohormonal dysregulation and increase energy wasting. Cancer-related symptoms like pain, depression, nausea, vomiting, constipation, and dysgeusia can also affect food intake. An international 2011 Delphi consensus definition and classification of cancer cachexia defines cancer cachexia as 5% weight loss in the past 6 months or 2%-5% weight loss with either a body mass index (BMI) of 20 kg/m2 or reduced muscle mass.[4]

Olanzapine

Olanzapine is a second-generation (atypical) antipsychotic and antimanic agent which acts on many receptors. It antagonizes serotonin, dopamine, histamine, and alpha 1-adrenergic receptors, moderately antagonizes muscarinic receptors, and weekly binds to GABA-A, benzodiazepine, and beta-adrenergic receptors.[5] Olanzapine's appetite stimulation is attributed to antagonistic effects on histamine, dopamine, and serotonin receptors (H1, D2, 5HT2C, and 5HT2B)[6]. Olanzapine-induced weight gain occurs rapidly upon the initiation of therapy, and the effect slowly flattens over time while patients continue to gain weight while on therapy.[7] Currently, a short course of olanzapine for 1-4 days is a widely used and popular treatment of cancer-associated nausea and vomiting (CINV), being a safe and effective antiemetic option. It was added to the National Comprehensive Cancer Network (NCCN) treatment algorithm for CINV in 2014 based on a phase II study by Navari and colleagues, which established its efficacy for acute, delayed, and breakthrough chemotherapy-induced emesis with moderate or high emetogenic drugs.[8,9] Historically, olanzapine was associated with unwanted weight gain in patients treated for schizophrenia, while the orexigenic effect is attractive in cancer patients dealing with cachexia and failure to thrive.

Sedation associated with olanzapine seems to be transient, and patients can become tolerant to its sedative effects over time.[5] The risk for side effects (predominantly anticholinergic effects like constipation, urinary retention, and dry mouth) is more significant with doses higher than 10 mg daily, which generally would not be used for this indication.[9,10] Olanzapine has a mild to moderate potential for extrapyramidal symptoms.[5] Dyslipidemia and hyperglycemia can develop as early as within three months of therapy and is more common in obese patients and those with schizophrenia.[11,12] Olanzapine causes a mild degree of QTc prolongation which needs to be monitored if patients are on multiple medications that can have additive QTc prolongation effects.[13] Drowsiness is observed across all patients, and older patients are at a higher risk.[14] Cytopenia (less than 1% incidence), hyperprolactinemia, sexual dysfunction, and temperature dysregulation are other significant adverse reactions.[5]

2023 ASCO Guideline Rapid Recommendation Update

On July 12, 2023, ASCO published its "Cancer Cachexia: ASCO Guideline Rapid Recommendation Update," recommending olanzapine 2.5 mg daily for treatment of cachexia in patients undergoing active chemotherapy as well as those off of chemotherapy.[3] Historically, the most commonly used therapies for cancer cachexia have included mirtazapine, corticosteroids, and progesterone analogs (megestrol). However, these agents have generally been unable to show statistically significant differences or clinically meaningful benefits in clinical trials. Thus clinicians have been left to use what they are most comfortable prescribing based on patient-specific factors and risk versus benefit assessment. Many physicians are still hesitant to implement the use of olanzapine into the practice because of adverse events associated with olanzapine.

Though the panel recommends an olanzapine dose of 2.5 mg daily, Dr. Charles Loprinzi, Co-Chair of "Cancer Cachexia: ASCO Guideline Rapid Recommendation Update" recommends increasing the dose to 5 mg and 10 mg if a lower dose is found to be ineffective, which he discussed on the ASCO guideline podcast.[15] This recommendation is based on the results of a 2023 randomized controlled trial published in *Journal of Clinical Oncology*.[16]

This trial was performed at a tertiary care center in South India, randomizing patients to receive either olanzapine 2.5 mg daily for 12 weeks starting cycle 1, day 1 (n=58 evaluable patients) or placebo (n=54 evaluable patients). Median age was 55 years, and the majority of patients had metastatic cancer (80%) and were treated with palliative intent—the most common diagnoses being gastric (55%) and lung (35%). Patients in the olanzapine arm had a more significant weight gain of > 5% (60% versus 9%, p=0.001), improvement in appetite by the visual analog scale (VAS) (43% versus 13%, p=0.001), and by The Functional Assessment of Chronic Illness Therapy system of Quality-of-Life questionnaires Anorexia Cachexia subscale (FAACT ACS) (22% versus 4%, p=0.004). At the same time, patients in the olanzapine group had a better quality of life, nutritional status, and less chemotoxicity, while adverse events of olanzapine reported were low and incidence was similar between the two groups. Grade ≥3 chemotherapy toxicity was less common with olanzapine (12% versus 37%, p=0.002). The authors concluded that low-dose olanzapine is a simple, inexpensive, well-tolerated option for newly diagnosed patients on chemotherapy with cancer cachexia, and it significantly improves appetite and weight gain.

Considerations for the Practicing Hematology/Oncology Pharmacist

Despite many adverse reactions associated with olanzapine, there are a few clinically significant and more commonly observed in practice at doses used for cachexia: sedation, postural hypotension, and QTc prolongation.[13,14,17] Because of its sedating effect, olanzapine should be taken at bedtime, which can also promote better sleep patterns.[17,18] Olanzapine should be started at a lower dose and gradually titrated to patient tolerance to avoid postural hypotension.[17,19] Some patients might metabolize this drug slower; nonsmokers, females, and those aged over 65 are at a higher risk for toxicity, so a lower dose for those patients would be more appropriate.[17] The United State Food and Drug Administration (FDA) labeling for olanzapine contains a warning for elderly patients with dementia-related psychosis, so it should be avoided in this population group.[18] EKGs should be checked regularly for QTc monitoring, as many supportive and oncological therapies, including olanzapine, can prolong QTc.[11]

Barriers to implementation of this guideline recommendation exist as providers may be concerned about the toxicity profile of olanzapine as exhibited in psychiatric trials. In the same manner, patients may refuse to take the medication knowing that it is an antipsychotic agent. As medication experts, pharmacists are essential for educating providers, medical teams, dietitians, and patients about the benefits of olanzapine and its safety profile, while practicing evidence-based medicine. ●●

CLINICAL PEARLS (continued)

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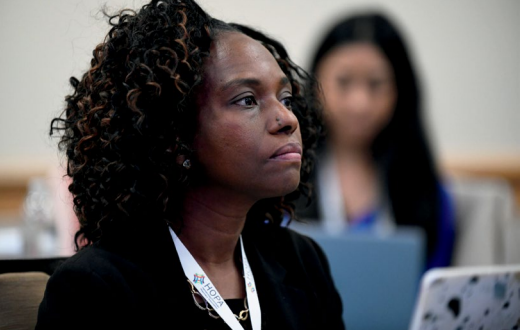

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A Reflection on Transitioning from Resident to Staff Pharmacist at the Same Institution

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Outpatient Pediatric Oncology Pharmacist
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After completion of both my Postgraduate Year One (PGY1) and Postgraduate Year Two (PGY2) residency experiences at Mayo Clinic in Rochester, Minnesota, I was incredibly fortunate to have the opportunity to stay and start my career. While I explored external options for my first "real job", there were many factors that influenced my decision to stay at Mayo Clinic. First, I really enjoyed my years as a resident because of the excellent preceptors and many aspects related to the institution itself. Secondly, I know small towns are not for everyone, but I personally liked the ability to work in a large institution without having to live in a major metropolis. Finally, on a more personal note, having family close to the area also certainly impacted my decision.

After completion of my PGY2 residency, my role started on the inpatient adult hematology/oncology team. Since then, I have transitioned into an outpatient pediatric hematology/oncology clinic role within the institution. There are certainly pros and cons to staying at an institution after completion of residency training there, but now almost four years after residency graduation, I am so glad I chose to stay.

"There are certainly pros and cons to staying at an institution after completion of residency training there, but now almost four years after residency graduation, I am so glad I chose to stay."

I found many advantages to staying at Mayo Clinic after training. For lack of a better term, I would lump many of these into "comfortability". Some of the challenges that can come with starting at a new institution came second hand by staying, such as use of the electronic medical record, care team familiarity, and institution specific nuances such as policies and procedures. I knew my pharmacist colleagues well and never felt intimidated to ask for help. Additionally, because I had previously worked with the interdisciplinary teams (including nurses, advanced practice providers, and physicians), I felt my recommendations were often well-received. By being a familiar face within the pharmacy department, I found it natural to become involved in institutional committees, the residency program, and research projects. Some examples of committee involvement within my first couple years after residency include the pharmacy research committee, which helps support departmental research projects, and a medication safety committee. I now hold leadership positions on some of these committees and having an early start was certainly beneficial. During my first year post graduation, I did not precept PGY2 residents, but I did have the opportunity to precept PGY1 residents. I do think it would have been very difficult to serve as primary preceptor that early had I not been so familiar with the institution and practice. I was also able to serve as a supportive mentor for a PGY2 research project, which I found very helpful before eventually acting as a primary mentor later in my career. Because of these experiences and projects early after residency, I have been afforded many opportunities both within my institution and within national organizations. Finally, I had quite a few coresidents who also stayed, and between coworkers and former preceptors, I had a great friend and support group in town. All these pieces made for a very smooth transition from resident to staff pharmacist.

One of the major cons of continuing to practice where I trained was not getting to experience how other institutions operate. I certainly had glimpses of other institutions during pharmacy school, but a vast majority of my operational and clinical knowledge, especially in oncology, came from residency. Fortunately, many of my colleagues had come from outside institutions, so I have learned some aspects of how other hospitals practice, but certainly not to the level I would have had I found a position outside of Mayo Clinic. One difficult aspect I did not necessarily expect was approaching PGY2 residents who had early committed since they were previously my coresidents. For this reason, I was grateful that I did not serve as their primary rotation preceptor. This did put me in a great position to provide informal mentorship for the residents though, as they often felt comfortable asking me questions that may have been difficult to ask other preceptors. Another con I noticed was

some minor difficulty establishing myself as a staff pharmacist and no longer a resident. From my end, I sometimes had to remind myself that my colleagues were now equals and not my preceptors. To a lesser extent, I had to remind former preceptors of this as well, although I do not think any of them meant anything other than to be helpful – and perhaps it is how they approach all pharmacists fresh from residency, regardless of training location. This quickly resolved with time, and from a positive standpoint, I did always have a supportive group around me for the many times I did ask for help as a brand-new oncology pharmacist.

If a resident is in a position to consider staying at their institution of training, I would recommend considering the following questions: Was residency an overall positive experience? How important is it to you to have diverse experiences? What is the staffing model? Does the area meet your needs? Any family considerations? Are you able to practice in your interest area, or is there potential to eventually move to your specific area of interest? Having familiarity with available support and resources, are these adequate to support your non-clinical interests (e.g. quality improvement projects, research, precepting, didactic teaching, etc.)?

Most of these questions can be applied to any job being considered regardless of training location, and there is likely no wrong answer in choosing to stay versus finding a position elsewhere. At the end of the day, a first job does not have to be a forever position. I know many pharmacists who have found success regardless of whether they stayed where they completed residency or not. I personally am grateful I was able to stay at my place of training but recognize that path is not for everyone. ●●

FEATURE

Fertility Preservation in Patients with Cancer

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Fertility preservation is important in both pediatric and adult patients with cancer, and it is recommended by the American Society of Clinical Oncology (ASCO) for providers to address this issue early on in the diagnosis. ASCO first published clinical practice guidelines based on evidence for fertility preservation in 2006, which were then updated in 2013, and again in 2018. The Panel for the ASCO guidelines recommends all healthcare providers for both adult and pediatric patients including oncologists, surgeons, physicians, pharmacists, nurses, and other healthcare providers involved in the care of the patient should emphasize the importance of fertility preservation as early as when the patient discovers the diagnosis. The discussion should begin at diagnosis and continue throughout treatment, including referral to a fertility specialist if needed. This early intervention is key to fertility preservation and has been shown to improve outcomes.[1] Cancer therapy can affect the reproductive organs which leads to many problems such as infertility, hormonal imbalance, decreased sexual function, stunted growth, and diminished quality of life. The impact on reproductive organs depends largely on the cancer type, chemotherapy dose and duration, and individual characteristics. A recent review found that fertility problems, early onset menopause, and the inability to have biological children are associated with poorer outcomes in survivorship and over 100 million women worldwide are at risk for cancer treatment-related fertility issues and may seek preservation by 2025.[2] For this reason, the 2018 ASCO guideline updates emphasize provider discussion of potential impairment to fertility, provider discussion of fertility preservation approaches, all discussions occurring as early as possible prior to beginning treatment, patient referral to reproductive specialists for fertility preservation, documentation of fertility-related discussions, and patient referral to psychosocial services for additional support.[3] In this paper, we will discuss methods for different age groups and recommendations based on cancer types/medications that are widely discussed amongst large organizations based on clinical evidence.

Healthcare providers should initiate the discussion on the chances of infertility and the benefits and risks of procedures to help parents and children make the decision sooner rather than later. All fertility preservation options should be discussed with the parents and children with cancer and should be explained by fertility and reproductive specialists as well, or at least be referred for discussions. It is recognized that patients will primarily be focused on the cancer diagnosis early on, but that healthcare providers should do their best to emphasize the need for fertility preservation discussions. This discussion should be documented, and there should be a read-back method. Sperm, oocyte, and embryo cryopreservation are considered standard practice and should be completed as early as possible. There is conflicting evidence to recommend gonadotropin-releasing hormone agonists (GnRHa) and other means of ovarian suppression for fertility preservation in pediatrics just as is in women. The Panel recognizes that when proven fertility preservation methods are not feasible, and in the setting of young women with breast cancer, GnRHa may be offered to patients in the hope of reducing the likelihood of chemotherapy-induced ovarian insufficiency. However, this should be reserved for when other methods are not possible or available. The area of ovarian tissue cryopreservation is advancing with new research rising rapidly.[1]

"There are several methods available as discussed above for fertility preservation in males, females, and pediatrics. Although the choices are limited, it is the duty of healthcare providers to be well versed in all methods and to educate the patient and/or family on all choices."

Males

For adult males, there are three types of fertility preservation: sperm cryopreservation, hormonal gonadoprotection, and possible testicular cryopreservation.[1] The most established technique for fertility preservation in males is with sperm cryopreservation after masturbation versus freezing sperm via testicular aspiration or extraction. However, this does come with large financial costs of ongoing yearly storage fees and an initial $1,500 fee for three samples to be stored for three years.[1] This method is the best studied, with evidence in the form of large cohort studies as compared to case reports/series for freezing sperm via testicular aspiration or extraction. Hormonal gonadoprotection and testicular cryopreservation have very limited to no evidence to support these methods.[2] If males are unable to ejaculate, then alternative methods such as urine collection after retrograde ejaculation, rectal electroejaculation under anesthesia, or testicular sperm aspiration are utilized. Conditions associated with high risk of infertility, defined as ≥ 80% risk of prolonged azoospermia in men, include radiation >2.5Gy to the testis, chlorambucil (1.4 g/m^2), cyclophosphamide (19 g/m^2), procarbazine (4 g/m^2), melphalan (140 g/m^2), cisplatin (500 mg/m^2), carmustine (BCNU; 1 g/m^2), lomustine (CCNU; 500 mg/m^2), and total body irradiation for bone marrow transplant/stem cell transplant.[2] As mentioned in the

ASCO guidelines, conversation about infertility risks and methods for preservation for patients with cancer should begin within 24 hours of a cancer diagnosis.[3]

Females

For adult females, there are two main types of fertility preservation: embryo cryopreservation and cryopreservation of unfertilized oocytes. Embryo cryopreservation is very well established with a reported live birth rate of 44.4%. This is the most preferred method and involves daily injections of follicle-stimulating hormone (FSH), required to be started within 3 days of the menstrual cycle.[3] Cryopreservation of unfertilized oocytes is a great option for females without a partner or with religious and/or ethical conflicting beliefs with embryo cryopreservation. Oocyte collection has improved, with several methods now available for ovarian stimulation which do not coincide with the menstrual cycle and can therefore be completed more quickly than in the past. Oocyte cryopreservation has a pregnancy rate of 50.2% per cycle or 55.4% per embryo transfer. Combined, both methods have a pregnancy rate of 66% among women with cancer.[1,3,4]

Ovarian transposition, or oophoropexy, can be used when pelvic irradiation is involved during cancer treatment. However, this technique has lower success rates due to radiation affecting the ovaries and should be completed as close as possible to the radiation treatment. GnRHa for fertility preservation has conflicting evidence in females. Another method that has shown some efficacy, but still requires further research, is ovarian tissue cryopreservation and transplantation, which remains an experimental option.[1,5]

Breast and Ovarian Cancer in Women

Women diagnosed with breast cancer have the lowest chance of subsequent pregnancy, approximately 70% less than the general population, which is largely due to the type of chemotherapy and hormonal therapy utilized in endocrine-sensitive disease.[4] Older methods of ovarian stimulation can increase estradiol levels which would be controversial in estrogen receptor-positive (ER+) tumors. Studies show, however, there is not an increased risk of cancer recurrence in women as a result of fertility preservation and pregnancy as previously believed. It is recommended that additional fertility counseling be offered to women with BRCA1 or BRCA2 mutations as they can elect to use preimplantation genetic diagnosis during in vitro fertilization to avoid transmitting the mutation. For ovarian germ cell tumors, cisplatin-based regimens are now preferred as they seem to offer a better fertility outcomes than non-cisplatin-based chemotherapies.[2]

There is conflicting evidence to recommend GnRHa and other methods of ovarian suppression for fertility preservation for these patients. The GBG 37 ZORO Study was a prospective, randomized, multicenter study which showed that premenopausal patients with breast cancer receiving goserelin with chemotherapy, versus those who did not, had no statistically significant menstrual cycles (93.3% with goserelin and 83.3% without goserelin). For this reason, additional studies are required to fully understand the role of GnRHa agents for ovarian suppression.[3] Table 1 summarizes the data from a multi-review analysis of the available guideline recommendations for use of GnRHa.

Table 1: Guideline Recommendations Based on a Multi-Review Analysis[1]

Guideline	Recommendation
NCCN Breast Cancer 2017	Randomized trials have shown that ovarian suppression with GnRHa therapy administered during adjuvant chemotherapy in premenopausal women with ER-negative tumors may preserve ovarian function and diminish the likelihood of chemotherapy-induced amenorrhea. Smaller historical experiences in patients with ER-positive disease have reported conflicting results with regard to the protective effect of GnRH agonist therapy on fertility.
NCCN AYA Oncology 2017	Some data suggest that menstrual suppression with GnRHa may protect ovarian function. However, evidence that menstrual suppression with GnRHa protects ovarian function is insufficient, so this procedure is not currently recommended as an option for fertility preservation.
AIOM 2016	Temporary ovarian suppression with LHRHa during chemotherapy should be recommended to all premenopausal patients with breast cancer undergoing chemotherapy who are interested in ovarian function and/or fertility preservation.
SEOM 2016	The use of GnRHa could be an option to discuss with patients with early-stage receptor-negative breast cancer if embryo or oocyte cryopreservation is not feasible. The use of GnRHa to preserve fertility in women with other cancers should not be recommended.
BCY2 2016	The most recent data suggested a protective ovarian effect of LHRHa in both patients with hormone receptor–positive and –negative disease with no signal for harm from a breast cancer recurrence standpoint. The BCY2 Panel therefore agreed this strategy can be discussed with patients interested in potentially preserving fertility and/or ovarian function.
St Gallen 2015	LHRH agonist therapy during chemotherapy proved effective to protect against premature ovarian failure and preserve fertility in young women with ER-negative breast cancer undergoing chemotherapy.
ESMO 2013	The use of GnRH analogs concomitantly with chemotherapy should not be regarded as a reliable means of preserving fertility. Data on long-term ovarian function and pregnancy rates in these cohorts are warranted.

Abbreviations: AIOM, Italian Association of Medicine; AYA, Adolescent and Young Adult; BCY2, International Consensus Conference for Breast Cancer in Young Women; ER, estrogen receptor; ESMO, European Society for Medical Oncology; GnRHa, gonadotropin-releasing hormone agonist; LHRH, luteinizing hormone-releasing hormone; LHRHa, luteinizing hormone-releasing hormone agonist; NCCN, National Comprehensive Cancer Network; SEOM, Sociedad Española de Oncolog´ıa Medica

Pediatrics and Young Adults

While more studies need to be completed in pediatric and young adult patients, more data is being collected, especially in those who have undergone radiation. Therefore, all available approaches in pediatrics are experimental. For female pediatric patients, the recommendation is to utilize cryopreservation, radiation shielding, or ovarian transposition. For males, active spermatogenesis only begins from puberty onwards. As such, prepubescent males cannot benefit from sperm cryopreservation. Testicular stem cell banking is being introduced and is investigational in clinical practice.[2]

Summary and Recommendations (Cost)

There are several methods available as discussed above for fertility preservation in males, females, and pediatrics. Although the choices are limited, it is the duty of healthcare providers to be well versed in all methods and to educate the patient and/or family on all choices. It is also the duty of healthcare providers to intervene as quickly as possible as early intervention and education is key. However, there are other complications and considerations for the patient and/or family to think about.

In general, patients with cancer have increased costs and have higher out-of-pocket costs versus what is covered by insurance. Out-of-pocket costs are going to vary depending on the insurance the patient has and what needs to be covered. Patients should be aware that different insurance companies may have different recommendations and some options may not be allowed, even if guideline-recommended. Even with the same insurance plan, the price may vary between different healthcare facilities, different practices, and pharmacies. When discussing financial issues and concerns, patients should be made aware of any financial counseling services available and different assistance programs that can be applied.[1]

Per the ASCO guidelines, the perspective of the patient is of central importance defining value. It is aligned with the efficacy and toxicity of an intervention, is dynamic throughout the course of the disease process, and is dependent on variables such as age, comorbidities, life circumstances, insurance coverage, personal finances, individual goals, religious beliefs, and values. It is crucial for anyone who is involved in the patient's care to be well-versed on all of the costs for the patient and to be completely transparent. The patient's perspective and family are of top priority, and all decisions should be respected.[6] ●●

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Toxic Positivity: A Positively Troubling Contradiction

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Overview

Toxic positivity is a relatively new psychological phenomenon that has been described in recent literature as, "encouraging statements that are expected to minimize or eliminate painful emotions, but create pressures to be unrealistically optimistic without considering the circumstances of the situation".[1] This article conveys two patients', Sandra Zori, PharmD, MSBME, and Karen Fancher, PharmD, BCOP, perspectives on toxic positivity: how it can feel to the patient, how it impacts relationships, and how we as pharmacists can best mitigate potentially harmful situations.

"Toxic positivity can result in a dismissal or invalidation of true emotions and provide false reassurances rather than much needed empathy."

Common Phrases That May Contribute to Toxic Positivity:

- *It could be worse*
- *The grass is always greener on the other side*
- *Look on the bright side*
- *Everything will be fine*
- *God has a plan for everyone*
- *Everything happens for a reason*
- Any phrase that starts with "*At least…*"

Through Sandra's experience, she states, "Toxic positivity is a tablecloth you throw over a mess. It means that no one needs to see this. It's purely for appearance's sake." Toxic positivity can be insidious and difficult to recognize in day-to-day practice. Many of us have probably succumbed to using similar statements at some point in our careers. However well-intentioned these vaguely positive statements may seem, they can contribute to real patient harm and additional emotional burden.

Patient Impact

Toxic positivity can result in a dismissal or invalidation of true emotions and provide false reassurances rather than much needed empathy. It can also result in patients feeling that their illness is minimized and adds unwanted pressure to maintain a positive attitude.[2] Karen commented: "It's frustrating not being able to express my true feelings. I might be trying to tell you I'm scared or angry or I'm trying to express some other complex emotion." Sandra added, "People don't realize how hard it was to form a response to some of the comments that were made to me. It makes it difficult to have honest conversations."

Toxic positivity can have a contradictory effect and patients may feel that they are not allowed to be honest about their diagnosis. Karen felt that hearing statements such as, "at least we caught the cancer early" or "at least you still have your family for support" often made her feel like she was "making a bigger deal" about her current situation. Sandra added: "When you are going through cancer treatment, it often feels like you are having to do the heavy emotional lifting for the other person in the conversation."

It was previously suggested that by adopting a "fighting spirit" or having a better attitude, patients with cancer could positively benefit survival and disease recurrence. This has been a vigorously debated topic within recent literature that has yet to come to a full conclusion. A systematic review of 26 studies examined the effect of psychological coping styles (including fighting spirit) on cancer recurrence and survival outcomes and concluded that coping styles do not play an important role in disease recurrence or survival; therefore, cancer patients should not feel pressured into adopting a particular coping style to improve disease outcomes.[3] This opinion

is also endorsed by the American Cancer Society.[4] Many of the studies arguing in favor of adopting a particular coping style are small, lack appropriate statistical control, are subject to publication bias, or are methodologically flawed.[5] Nevertheless, these unconfirmed claims continue to persist in the literature.

How Can We Address Toxic Positivity as Healthcare Providers?

Undergoing cancer treatment is a tumultuous time for patients. They are filled with a wide range of emotions that are fluctuating from the initial diagnosis and throughout the course of their treatment. Each patient reacts differently and should be permitted time and a safe space to process their emotions. Karen states, "The best way to support someone is to let them express how they are feeling in that moment."

As oncology pharmacists, we should strive to avoid words and phrases that imply an unrealistic expectation of how we expect or want the patient to feel. Instead, we should focus on the patients' well-being and how they are feeling at that moment. By being more aware of our language, we can create a more empathetic and supportive environment that allows patients to feel the full depth of their complex emotions.

In asking for advice for patients who may be experiencing toxic positivity, Karen states, "It's okay to feel less than brave. Encourage patients that it is okay to set boundaries. It's okay to consider that everything might not always go smoothly. If you are worried, it's totally valid to talk about the bad things. You are allowed to bring those topics up." Sandra adds, "If you do find someone who is supportive, lean on them. If there are people that are less supportive, but you still want to include them in your life, you don't have to use them to fill your emotional needs. There are other roles in your supportive circle they can fill."

It's also important to remember that no one intends harm with these positive comments. Karen reiterated: "It's important to understand that everyone's comments are coming from a good place. I appreciate that people are trying to help." Karen also notes: "'*I don't know what to say*' was the best response I received. That meant a lot more to me than trying to say something nice." As healthcare providers, we must actively engage by listening to our patients, validating their emotions, and supporting their needs from an emotional and medical standpoint.

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Development and Validation of a Model to Predict Acute Kidney Injury following High-Dose Methotrexate in Patients with Lymphoma

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Introduction

High-dose methotrexate (≥1 gram/meter^2 [g/m^2]; HDMTX) is a cornerstone of treatment for lymphoma with central nervous system (CNS) involvement because it is one of the few agents that reliably crosses the blood brain barrier.[1-3] It has also been integrated into the management of systemic lymphoma as prophylaxis for patients who are at high-risk of disease relapse in the CNS.[4,5] Rates of acute kidney injury (AKI) after HDMTX exposure remain significant despite employing supportive interventions including intravenous hydration, urine alkalinization, and post-methotrexate leucovorin rescue.[6] HDMTX-associated AKI may lead to significant downstream consequences, including prolonged hospitalization, chemotherapy dose reductions, treatment delays, diminished remission rates, and shorter survival.[6,7]

"Factors significantly associated with AKI after HDMTX in the multivariate analysis included age ≥ 55 years, male sex, and lower HDMTX dose number."

There are several factors that have been associated with an increased risk for AKI following HDMTX delivery.[6,8,9] However, our ability to estimate the risk for AKI is limited, especially when more than one risk factor is present. A prediction model would have the potential to quantify a patient's risk for AKI and identify patients that would benefit from measures designed to prevent HDMTX-associated AKI. Therefore, we sought to derive and validate a model that would reliably predict AKI within the 7 days following HDMTX administration.

Methods

This retrospective, multi-site study included patients ≥ 18 years with lymphoma who were admitted to Mayo Clinic hospitals throughout Minnesota and Wisconsin for HDMTX therapy as a short infusion (~4 hours). Patients undergoing hemodialysis, pregnant women, incarcerated patients, individuals who denied research authorization, and patients without baseline serum creatinine prior to HDMTX administration were excluded. The primary endpoint was any AKI within 7 days following HDMTX administration. AKI was defined and staged according to Kidney Disease Improving Global Outcomes (KDIGO) guidelines using serum creatinine alone.[10]

The derivation cohort included any HDMTX doses that were administered between October 2009 and December 2019. The validation cohort included any HDMTX doses administered between January 2020 and December 2020. Patients received sequential doses of HDMTX as part of standard treatment regimens and multiple doses per patient were included in each cohort; however, each dose was considered independently. Patients were followed from HDMTX dose until an AKI event, 7 days after the HDMTX administration, or the next HDMTX dose, whichever came first.

Patient demographics and clinical characteristics were summarized with descriptive statistics. Generalized estimating equations were used to compare the baseline characteristics between cohorts. Logistic regression using the Least Absolute Shrinkage and Selection Operator (LASSO) method created a regression equation to predict AKI. Fit models utilized generalized estimating equations to consider the correlation between multiple doses per patient. Spline plots and cut-point analysis were used to determine whether continuous variables should be kept continuous or converted into categorical variables at the appropriate threshold. An assessment of interactions between dose number and other variables determined whether separate models would be required for each HDMTX dose. Discrimination power of the model was assessed via the c-statistic, and calibration was assessed graphically with the Hosmer-Lemeshow goodness of fit test. The final equation was then applied to a second, independent cohort for validation. A sensitivity analysis was conducted to assess the model performance at specific HDMTX doses.

Result

The derivation cohort included 435 patients who received 1,642 HDMTX doses. The validation cohort included 55 patients who received 247 HDMTX doses. Clinical characteristics for both cohorts were similar at baseline; however, patients in the validation cohort had a higher baseline serum creatinine, a lower baseline estimated glomerular filtration rate when adjusted for body surface area, a higher rate of chronic kidney disease, and a higher rate of AKI during a previous dose of HDMTX therapy. Additionally, the median g/m^2 of HDMTX administered was significantly higher in the derivation cohort. Lastly, the derivation cohort contained a higher percentage of first doses while the validation cohort was primarily subsequent doses.

The incidence of AKI within 7 days of HDMTX administration was 22% and 16% in the derivation cohort and validation cohort, respectively. Of the 181 patients who developed AKI, 109 went on to receive more HDMTX, though the majority had the subsequent

dose delayed to allow for kidney function recovery. Fifty (46%) patients who received additional doses experienced a second AKI event at some point. AKI was predominantly stage 1 in both cohorts; however, 27% in the derivation cohort and 30% in the validation cohort experienced more severe injury.

The variables that were significantly associated with AKI on univariate analysis included age ≥ 55 years, male sex, BSA ≥ 1.9 m^2, lower MTX dose number, AKI following a previous dose, higher absolute neutrophil cell count, and lower albumin**.** Factors significantly associated with AKI after HDMTX in the multivariate analysis included age ≥ 55 years, male sex, and lower HDMTX dose number. Two-way assessment demonstrated no statistically significant interactions between any of the variables. A regression equation was derived based on the multivariable model with inclusion of BSA, eGFR, and Charlson Comorbidity Index based on previous literature and is provided in **Figure 1**.

Figure 1. Regression equation score created from the derivation cohort.

AKI Risk Score=21+6.01·(Age·55)+5.51·(Male)+2.36·(BSA·1.9)+0.65·(Charlson Comorbidity Index)-0.06·(eGFR)-5.92·(Dose # is 2)-8.47·(Dose # is 3 or 4)-14.73·(Dose # is 5 or more)

The c-statistic was 0.72 (95% CI 0.69-0.75) and 0.72 (95% CI 0.60-0.84) in the derivation and validation cohorts, respectively. Sensitivity analyses were performed to determine model performance in several subgroups (**Table 1**). The observed frequency of AKI was highest in patients with a regression equation score >30 in both cohorts. The predicted probability of AKI at scores of 10, 20, 30, and 40 were 0.052 (95% CI 0.038-0.067), 0.143 (95% CI 0.124-0.161), 0.334 (95% CI 0.291-0.377), and 0.602 (95% CI 0.515-0.688), respectively (**Figure 2**). A higher score also reflected a greater likelihood of developing AKI stage 3. A separate analysis evaluated the performance of a model that only utilized factors that were statistically significant on multivariable analysis. The performance of this model was poorer than our model that included BSA, eGFR, and Charlson Comorbidity Index.

Discussion

This study of 490 patients with lymphoma receiving 1,889 HDMTX doses identified a clinically significant incidence of AKI after HDMTX consistent with previously reported rates (10%-40%).[5,7] The longstanding association between increased age and the development of AKI in patients receiving HDMTX is likely attributable to an increased prevalence of comorbid illnesses or diminished kidney function.[6,8] Patients with lymphoma at advanced age or that have comorbidities necessitate a thorough kidney function assessment prior to HDMTX and vigilant monitoring immediately after HDMTX administration.

Using regularly available patient data, the prediction model demonstrated good discrimination and calibration in the derivation and validation cohorts. We did not observe statistical differences in rates of AKI when comparing doses of 8 g/m^2 to lower doses. Mayo Clinic prefers methotrexate, rituximab, and temozolomide (MRT)

Table 1. Model performance according to cohort and subgroup

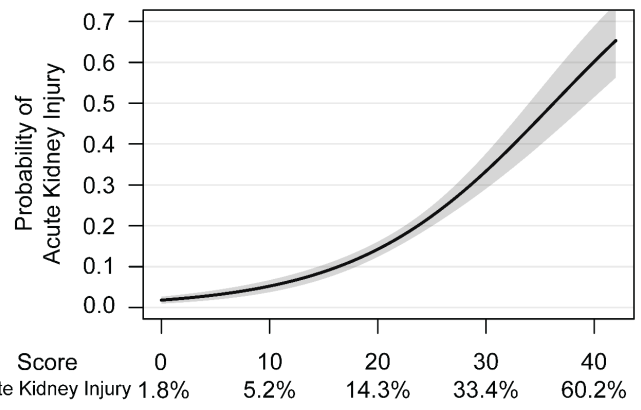
Group analyzed	C-statistic	95% confidence interval
Derivation cohort		
Overall	0.72	0.69 - 0.75
Subset receiving HDMTX 3.5 g/m^2	0.67	0.60 - 0.73
Subset receiving HDMTX 8 g/m^2	0.74	0.70 - 0.77
Subset with primary CNS lymphoma	0.68	0.63 - 0.73
Subset with systemic DLBCL	0.73	0.69 - 0.78
Subset with severe AKI	0.71	0.64 - 0.77
Validation cohort		
Overall	0.72	0.60 - 0.84
Subset receiving HDMTX 3.5 g/m^2	0.74	0.49 - 1.00
Subset receiving HDMTX 8 g/m^2	0.72	0.58 - 0.86
Subset with primary CNS lymphoma	0.71	0.57 - 0.86
Subset with systemic DLBCL	0.83	0.58 - 1.00
Subset with severe AKI	0.75	0.52 - 0.99

Interpretation of c-statistic: value of 0.5 indicates model performs no better than chance, value over 0.7 indicates good model, value over 0.8 indicates strong model.

when treating primary CNS lymphoma, which provides HDMTX at 8 g/m^2 adjusted based on estimated creatinine clearance. The optimal dose of HDMTX has not been established; however, guidelines recommend at least 3 g/m^2 to maximize CNS penetration.[2,3] The utilization of 3.5 g/m^2 in multiagent HDMTX-inclusive chemotherapy regimens compelled a sensitivity analysis to determine performance of our regression equation in patients receiving HDMTX at 3.5 g/m^2. Discrimination was fair in the derivation cohort and good in the validation cohort, making our model generalizable to different patient populations and different dose levels of HDMTX.

There were notable differences in baseline kidney function between the derivation and validation cohorts, and there was a lower incidence of AKI in the validation cohort. As this cohort represents a more current and recently managed patient population, it is likely

Figure 2. Predicted probability of developing AKI after HDMTX exposure based on the regression equation score.



that our providers have made conscious or subconscious adjustments in clinical assessment and pre-chemotherapy supportive care that were learned over time in an attempt to improve the overall safety of HDMTX administration. However, the ability of our model to perform well in this more current cohort demonstrates the robustness of our model as well as applicability to more current patient populations and clinician practices.

The need to abrogate AKI development following HDMTX is clear, as AKI and delayed clearance of methotrexate contributes to dose-limiting and life-threatening toxicities. A prediction model that identifies patients at high-risk for AKI can provide clinicians an opportunity to proactively intervene. Conversely, interventions for low-risk patients could include a transition to a hospital-based outpatient setting for chemotherapy delivery and monitoring with oral, take-home prescriptions.[11] Additional research is required to determine the most appropriate way HDMTX-related care may be escalated or de-escalated for patients with lymphoma across the different categories of estimated risk for AKI. Any change to the current management of HDMTX would require thorough investigation to confirm comparable efficacy and safety.

Conclusion

There was a significant amount of HDMTX-associated AKI observed in this study. Our model, which utilized readily available sociodemographic and clinical factors, demonstrated good discrimination for predicting AKI following HDMTX administration in adult patients with lymphoma. It also performed adequately across different HDMTX dose levels. There is much more work to be accomplished to demonstrate the full clinical utility of our prediction model. However, we fully believe that the impact of our model on clinical decision making is potentially immense and that this model is capable of providing many patient-centered benefits now that it has been developed and validated. ●●

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Breast Cancer Screening Recommendations for Average Risk Women

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Introduction

It is estimated that nearly 2 million people will be diagnosed with cancer in the United States in 2023. Of those, breast, lung, prostate, and colorectal cancers account for approximately 50% of all new cancer cases.[1] Of particular concern is the rising incidence of female breast cancer, which has increased by about 0.5% per year since the mid-2000s. This slow increase is thought to be in part due to diagnoses of localized stage and hormone receptor positive cancers.[1,2] In contrast to incidence rates, mortality rates for female breast cancer have slowly declined since its peak in 1989.[2] The death rate dropped by 43% from 1989 to 2020, which equates to 460,000 fewer deaths during this period. Despite this decrease, female breast cancer was still expected to account for over 43,000 deaths in 2023.[1,2]

Screening Techniques

Due to the substantial incidence and mortality associated with breast cancer, screening is of utmost priority for early detection. The self or clinical breast exam is the least invasive technique, however breast exams have not been shown to decrease the chance of dying from breast cancer.[3] Mammography, which uses x-rays to obtain a visual image inside of the breast, is the most common type of screening modality. Mammography screening prevalence increased drastically from 29% in 1987 to 70% in 2000.[2] This correlated with an increase in incidence of breast cancer due to detection of early and asymptomatic disease. Breast magnetic resonance imaging (MRI) is another screening method in which a magnet, radio waves, and a computer take a series of detailed pictures of the inside of the breast. MRI is typically used in women at higher risk for breast cancer.[3]

"Despite breast cancer screening with mammography being standard of care, there is still variation in the recommendations for the frequency at which to screen average risk women. Additionally, there is no general consensus for the age at which to stop screening for breast cancer."

Who Decides How We Should Screen?

As with most components of oncology care, cancer screening recommendations are constantly changing as new screening technologies and data becomes available. There are also slight differences in recommendations based on the organization providing the recommendation. This is by no means an all-inclusive list, but there are three main organizations/networks that release guidance on breast cancer screening: the National Comprehensive Cancer Network (NCCN), United States Preventive Services Task Force (USPSTF), and the American Cancer Society (ACS). NCCN is a not-for-profit alliance of 33 cancer centers who update their guidelines in real time and are an expert opinion.[4] The USPSTF is an independent, volunteer panel of national experts in disease prevention and evidence-based medicine.[5] Lastly, the ACS has issued cancer screening guidelines since 1980 and has a guideline development panel of individuals with appropriate expertise, a patient advocate, and an independent systematic review of evidence.[6]

Screening Recommendations for Average Risk Women

Mammogram screening recommendations for women at average risk of breast cancer vary from those at higher risk and based on age. For average risk women ages 40-44 years, NCCN recommends a yearly mammogram.[7] The USPSTF recommends screening occur every other year. This recommendation was updated in 2024, in that women should start screening at 40 years old, rather than at age 50 as previously recommended.[8] Lastly, the ACS recommends that women should have the choice to start annual screening if they wish.[9] For women ages 45-54 years old, the NCCN and USPSTF recommendations remain the same.[7,8] However, ACS recommends a yearly screening mammogram for this age group.[9] Finally, for women 55 and older, again, the NCCN and USPSTF recommendations are the same with yearly and every other year mammogram, respectively.[7,8] ACS recommends continuing yearly or switching to every other year.[9] In summary, the general recommendation in the United States is yearly mammograms beginning at 40 years old.[7]

An important consideration in average risk women is the risk versus benefit discussion for when to stop screening. This assessment and recommendation is different based on the organization. NCCN has no established age limit in their guideline. They state that if a patient has comorbid conditions that limit life expectancy and no further intervention would occur based on the screening findings, then the patient should not be screened, regardless of age.[7] USPSTF states there is insufficient evidence to assess the balance of benefit and harm of screening mammography in women 75 years and older.[8] Additionally, ACS also does not provide an age at which to stop screening, but states that it should continue as long as a woman is in good health and is expected to live at least 10 or more years.[9] In general, the age and decision to stop breast cancer screening should be individualized for each patient.

As mentioned previously, these recommendations are for women at average risk. The guidelines also have varying definitions for what constitutes high risk. NCCN has several criteria, including a residual lifetime risk ≥20% as defined by models that are largely dependent on family history, thoracic radiation therapy between ages 10 and 30 years, 5-year risk of invasive breast cancer >1.7% in individuals 35 years or older per the Gail Model, atypical ductal hyperplasia in combination with a ≥20% residual lifetime risk, or a pedigree suggestive of or a known genetic predisposition for breast cancer.[7] The USPSTF states their recommendations previously discussed apply to patients with a family history of breast cancer and those with other risk factors, such as having dense breast tissue. However, they do not apply to patients with a genetic marker or syndrome associated with a high risk of breast cancer, such as BRCA1 or BRCA2 genetic mutations, a history of high-dose radiation therapy to the chest at a young age, or patients with a previous breast cancer or high-risk breast lesion on previous biopsies.[8] ACS defines high-risk as having a personal history, strong family history, genetic mutation known to increase risk of breast cancer, or having chest radiation therapy before the age of 30 years.[9] In general, the screening recommendations for high risk women vary by the risk factor that put them at higher risk.

Conclusion

Despite breast cancer screening with mammography being standard of care, there is still variation in the recommendations for the frequency at which to screen average risk women. Additionally, there is no general consensus for the age at which to stop screening for breast cancer. Similar to cancer screening in general, a patient specific and centered decision should be made based on the age, concomitant conditions, and patient specific goals. However, this may change in the future as breast cancer screening recommendations continue to evolve. ●●

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Board Update

Start with Gratitude and Lead with Courage

Jolynn Sessions, PharmD, BCOP, FHOPA
HOPA President (2024-2025)
Oncology Pharmacy Manager, Charles George VA Medical Center
Oncology Clinical Pharmacist Practitioner, Charles George VA Medical Center
Asheville, NC

I look forward to serving as HOPA President this year and have chosen the theme of "Courage" to help guide the association – and *challenge myself* – over the next several months. I hope you will join me in continuing to face the challenges of optimizing cancer care head-on, while remembering to start each day with gratitude.

First, I want to thank LeAnne Kennedy, Immediate Past President, for her guidance and support. Thank you to the entire HOPA Board and especially outgoing members, Heidi Finnes, Andrea Iannucci, and Amber Lawson, for their years as volunteer leaders.

Last but certainly not least, I want to thank all of you, our HOPA members – whether you serve formally as a volunteer, or informally through the work you do every day, your contributions to the practice of hematology/oncology pharmacy are invaluable. Keep up the great work!

HOPA2024 Recap

Please join me in thanking all of the committees, subcommittees, and staff who worked so hard to make our 20th Annual Conference and Anniversary Celebration a success! Attendance was nearly 1,600, which is in keeping with most recent years.

Attendees enjoyed the sights, sounds, (and weather!) of Tampa. More importantly, we received positive feedback on the sessions and presenters, the number of continuing education credits, and the many opportunities to network. The John G Kuhn Keynote was delivered by Will Flanary, better known to most of us as Dr. Glaucomflecken, who entertained and enlightened us with his unique perspective of being both a physician and patient.

Mark your calendars for April 9-12, 2025 when we will gather in Portland, Oregon for HOPA2025!

HOPA Hill Days

This year, HOPA will again head to Capitol Hill, not just once, but twice to talk to the staff of elected officials about the role of the hematology/oncology pharmacist, and such important initiatives as oral chemo parity. On May 7, 2024, we held our spring Virtual Hill Day where HOPA members, staff, and patient advisory panelists participated in a total of 80 meetings with representatives from 31 states.

If you weren't able to participate in Virtual Hill Day, there are still ways for your voice to be heard. Join the HOPA letter-writing campaign on our website and watch for announcements for Hill Day in Washington, D.C. this September!

Three Initiatives for 2024-2025

I have identified three initiatives that will help us continue to meet our strategic goals and you are invited to participate!

Initiative One: The Big Idea 2.0

The last time HOPA launched a member-driven, innovation-centric contest to identify the next "Big Idea" in oncology pharmacy, the end product was Core Competency, which is now in its second release. The Big Idea 2.0 will also be a call for practice-changing ideas, directly from our members, so please watch for launch announcements and get ready to wow!

Initiative Two: Make HOPA More Accessible to, and the home of, Community Oncology Pharmacists

The goal is to learn from oncology pharmacists in community settings what kind of support they need most. From there, our support for this segment of professionals will grow – and so might our membership as we diversify our offerings to meet the needs of community pharmacists.

Initiative Three: Leadership Development Emphasizing Diversity and Inclusion

We will continue to be intentional with our efforts to diversify the composition of leadership groups in terms of race, ethnicity, religion, ability, gender, sexual orientation, and other social identities, as well as in terms of practice settings and locations, lived experiences, and skills and expertise.

We have already begun the work of evaluating our nominations and elections processes to ensure they are fair and free from bias. More than that, this initiative seeks to create a culture of inclusivity where everyone is given the tools, time, and opportunity to grow as leaders.

2024-2025 Committee Year

By the time you receive this issue of HOPA News, our new committee year will have just begun. Please know that the HOPA Board looks to our committees and task forces to be experts and leaders and we encourage you to dream, be courageous, and help HOPA move forward. I know there is much to do, so let's get started together! ●●

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