

# The Role of the Advanced Practitioner in Maintaining Adherence in Patients on Oral Oncolytics

KIMBERLY M. HICKS,<sup>1</sup> PharmD, MHA, DIANE COPE,<sup>2</sup> PhD, ARNP-BC, AOCNP®, JOHN NOVAK,<sup>3</sup> CHA, PA-C, and SUSAN SCHERER,<sup>4</sup> RN, BSN, OCN®

From <sup>1</sup>HHCS Health Group of Companies, Orlando, Florida; <sup>2</sup>Florida Cancer Specialists and Research Institute, Ft. Myers, Florida; <sup>3</sup>Rocky Mountain Cancer Centers, University of Colorado School of Medicine, Aurora, Colorado; <sup>4</sup>RN Cancer Guides Solutions, Tampa, Florida

Authors' disclosures of potential conflicts of interest are found at the end of this article.

Correspondence to: Kimberly M. Hicks, PharmD, MHA. E-mail: kmhicks2010@gmail.com

<https://doi.org/10.6004/jadpro.2017.8.722>

© 2017 Harborside™

## Abstract

In past decades, oral formulations of medications used in the treatment of cancer have become increasingly prevalent. This can be a significant benefit for patients, as it eliminates the need for frequent trips to the infusion center and reduces travel and time away from home, work, and family members. However, making cancer treatments available in oral form transfers most of the responsibility for correct administration of the drug to the patient. With this transfer of responsibility comes the need to support patients in their adherence to the directed regimen. Patient education and communication are crucial. Although helping patients by encouraging adherence should be a team effort, the advanced practitioner is perfectly positioned to be sure that patients receive consistent, tailored support.

J Adv Pract Oncol 2017;8:7-21

Cancer is one of the leading causes of morbidity and mortality worldwide. The World Health Organization (WHO) estimates that there were 14 million new cancer cases worldwide in 2012. The number of new cases worldwide is projected to increase by approximately 70% over the next 2 decades (WHO, 2017). Between 2010 and 2020, it is expected that the number of new cancer cases in the United States will increase approximately 24% in men and 21% in women (Weir,

Thompson, Soman, Møller, & Leadbetter, 2015).

Age is one of the greatest risk factors for developing cancer. Approximately 60% of people who have cancer are 65 years or older (Liewer & Huddleston, 2015; Weingart et al., 2008). However, it is very important for patients to understand that age is just one of the risk factors in cancer diagnosis and treatment. A lot will be determined by a patient's overall outlook, general health, and lifestyle for successful navigation through their cancer journey.

## THE AGE OF ORAL ONCOLYTICS

In recent decades, an increasing number of oral anticancer medications have been approved by the US Food and Drug Administration (FDA). See the Appendix starting on page 17 for a list of the majority of the oral oncolytics currently available, and Table 1 for a list of myths (and facts) associated with this form of treatment. As the use of oral oncolytics increases, cancer programs face challenges as they strive to ensure the delivery of high-quality care to their patients. There are significant variations in how cancer programs manage patients on oral oncolytics, and experts are calling on clinicians to extend the quality and safety agenda from parenteral to oral oncolytics (Krzyzanowska & Powis, 2015).

Oral oncolytics offer a host of benefits for both patients and providers, but cancer programs need to be equipped to properly manage and monitor patients who are self-administering their treatments at home. Cancer programs also need to be proactive when providing financial advocacy services for patients who require oral oncolytics, as most of these therapies are associated with high out-of-pocket costs (Sherman, 2014) and other complicated financial implications.

## BENEFITS OF ORAL ONCOLYTICS TO THE ADVANCED PRACTITIONER

As advanced practitioners (APs) become more attentive to patient preferences and quality-of-life issues in clinical care, treatment options that en-

hance flexibility for patients are likely to be used more frequently. However, the more complex the oral treatment regimen, the higher the risk of error and nonadherence. This is true for all oral medication regimens, not just those treating cancer. Medication regimens that require multiple daily doses or complicated administration instructions specific to timing, dietary restrictions, or other factors often result in lower adherence (Haynes et al., 2002).

For the AP, encouraging the use of oral oncolytics may provide some positive development for his or her practice. With patients assuming the responsibility of taking their cancer medications at home, and thus not at the practitioner's site, the patients should not need to schedule visits as frequently, reducing demand on staff time. In addition, patients will be able to spend less time in the clinic receiving IV medications. This is a benefit to both APs and patients, as oral therapy is less invasive and reduces nursing time in infusion suites (Thompson & Christian, 2016).

## BENEFITS OF ORAL ONCOLYTICS TO THE PATIENT

Oral chemotherapy provides certain benefits to patients as well. As noted previously, patients do not need to spend hours in a clinic infusion room receiving therapy. Patient advocates see this as a major quality-of-life improvement because it gives patients more time at home with their families and enables them to continue activities they enjoy.

**Table 1. Myths and Facts About Oral Chemotherapy**

Myth	Fact
Oral chemotherapy is less toxic	Oral chemotherapy can cause just as many dangerous side effects as chemotherapy given by other routes
Oral chemotherapy is less effective	Oral chemotherapy is as effective as parenteral chemotherapy
Oral chemotherapy is more convenient	Oral chemotherapy may be less convenient in some ways; patients (not clinicians) are responsible for taking drugs, which may have complicated schedules or administration instructions
All patients prefer oral therapy	Some patients prefer to go to a healthcare facility on a regular schedule for chemotherapy so they do not have to bother taking it daily
Oral therapy is best for older patients	Older patients may be more forgetful about taking their medications at home and are at greater risk for drug interactions because they typically take multiple drugs in addition to chemotherapy
Oral chemotherapy is less expensive	Oral chemotherapy can be just as expensive as parenteral chemotherapy and may entail more out-of-pocket expenses

*Note.* Information from Thompson and Christian (2016).

In this vein, patients may not need to take as much time off from work during treatment and may have more flexibility to travel during this time.

Oral chemotherapy may eliminate some logistic and financial barriers, such as transportation to and from IV treatment centers, child-care costs, and travel/parking costs. In rural areas, this can be crucial because the closest treatment center may be hours away and weather may complicate travel. In urban areas, parking costs can pose a hardship to families already struggling with high medical costs. However, as discussed later in this supplement, other financial burdens are frequently introduced due to the way oral medications are handled by insurance companies.

### IS THERE AN IDEAL PATIENT FOR ORAL ONCOLYTICS?

Advanced practitioners need to be aware that not every patient with cancer is a good candidate for oral therapy. The likelihood of adherence to an oral regimen can be challenging to assess for both patients and practitioners. The decision to take the route of oral chemotherapy must be based on a collaborative discussion between the patient and the health-care team. The first step is to compile a complete medical history and perform a physical and medical assessment.

Along with patients having the responsibility of administering their own therapy, the issue of adherence must be addressed. Several studies have investigated adherence rates in patients taking oral oncolytics. One found a 37% rate of non-adherence to oral cancer drugs (Osborne, 2012). In another study, rates of adherence to cancer treatment varied from 52% to 100% among older adults (Puts et al., 2014).

It is good practice for APs to ascertain whether patients understand the importance of adhering to their drug regimen. A history of nonadherence may be a warning sign to the AP that similar patterns could be repeated in the future. In patients for whom the likelihood of adhering to a complex oral regimen seems less than optimal, it is critical for the AP to determine whether the patient has a partner or other source of support at home.

The AP must also take into consideration that many patients may be on multiple medica-

### Highlights From the Panel Discussion



**Dr. Cope:** Motivation is important, and that's something you can assess. Are they really motivated to live and sustain their life? You know the patient is motivated if they say, "I have to have my medication. This is my lifeline with trying to treat my cancer." With a motivated patient, you're fairly sure they're going to adhere to the medication.



**Dr. Hicks:** Some patients don't have the mindset to follow through with their instructions. This can be problematic.



**Mr. Novak:** I agree. Being committed to taking the medication appropriately and having a willingness to enter into a partnership with your health-care providers in order to take an active role in your own care is a good indicator of success with oral oncolytics.

tions. The potential drug interactions with their oral oncology medications and current medication profile can result in confusion and misunderstandings, hindering their ability to obtain optimal results. This is a pivotal area of care management for the AP and team to assist with the success of the patient's cancer journey.

### EDUCATION AND SUPPORT

Although education is crucial in improving adherence, the best time to teach patients about oral medications is generally not the time of diagnosis, when a patient's focus is understandably on learning that they have cancer. At a follow-up visit before starting the oral oncolytic, patients should be taught how to properly store their medications at home, including the fact that they should be kept away from children and pets.

Patients also need to know how to handle their medication safely, including washing their hands after taking the medication. As tablets and capsules should be swallowed whole, patients should be instructed not to break, crush, or chew the medication. They should avoid handling crushed or broken tablets or capsules. Patients must be advised to call their AP or a member of their clinical team for further instructions if they vomit or regurgitate their medication. Caregivers should wear disposable gloves when handling oral agents. He or she must always wear gloves when disposing of urinal or commode waste, and

the same precautions should be used if handling linen or clothing that has been soiled.

It is interesting to note that a 2008 survey of 1,115 oncology nurses from 15 countries found that only slightly more than half (52%) of the respondents had guidelines for administering oral medications in place in their practices, yet 47% had had no formal education about the procedures (Kav et al., 2008). However, a total of 64% reported that they had been involved in some sort of patient education regarding these therapies.

One crucial aspect of prescribing oral oncolytics is knowing what other medications and complementary/alternative medicine (CAM) agents the patient is taking. It is important for the AP to know that hundreds of medications and CAM agents may interact with oral oncolytics, potentially decreasing their efficacy or increasing their toxicity. Oncology practices are often unaware that their patient's primary care physician has prescribed a potentially interacting medication. In a study by Osborne et al. (2012), this was reported to have happened between 34% and 51% of the time. Therefore, accurate medication reconciliation is essential. Patients must be educated to inform all health-care professionals that they are on these oral oncolytics. They need to also inform their oncology office if they have any medication changes, particularly the addition of herbals, vitamins, and other supplements.

Both younger and older patients, as well as their caregivers, require detailed education about their oral medications. For older patients who have been prescribed oral oncolytic agents, an unexpected decline in physical function is an important signal for both oncology APs and primary care clinicians. Is the oral agent having a direct effect on the neuromuscular system and threatening cognition, balance, coordination, motor skills, or gait?

For some patients who have been prescribed oral oncolytics, an unexpected array of side effects may occur. For example, toxicities such as hand-foot syndrome and severe rashes have developed with some of the oral therapies. Patients should be made aware that the side-effect profile of the newer oral agents may differ from traditional IV therapies, but still require the same amount of clinical management from their AP. In addition, side effects that arise from advanced

disease and oral agent treatment that affect physical function may include anemia, overall weakness, arthralgia, extremity edema, and fatigue (Luciani et al., 2008).

## BARRIERS TO ADHERENCE

Oral cancer therapies present a unique set of clinical management challenges for APs. As patients may take these medications at home unsupervised, patient education becomes more critical to ensure that medications are being taken appropriately. Timely follow-up contact with patients should occur on a regular basis to monitor adherence and mitigate potential toxicities. The health-care staff should regularly assess whether affordability is negatively impacting access to appropriate care (Egerton, 2016).

Advanced practitioners should never assume that someone else in the practice is taking care of educating patients about the importance of proper adherence. Supporting patients as they work on adherence should be a team effort. Anyone who has patient contact, from the front desk staff to the physician, can reinforce adherence and the importance of taking oral oncolytics consistently and properly (see Table 2).

A notable fact regarding medication affordability is that patients with Medicare coverage and lower incomes had higher rates of abandonment of oral oncolytics. In reality, Medicare beneficiaries abandoned their oral prescriptions almost twice as frequently as commercially insured beneficiaries due to high copays (American Cancer Society, 2010; Tangka et al., 2010).

Poor adherence can severely impede the efficacy of an oral oncolytic, and should a prescriber be unaware that a patient is nonadherent, disease

**Table 2. Key Recommendations to Successful Implementation of Oral Oncolytics**

- Take a multidisciplinary team approach
- Assign responsibilities to specific individuals and build in accountability
- Collaborate with specialty pharmacy
- Provide financial advocacy services
- Develop a robust patient education program
- Put effective processes for monitoring for adherence and toxicity in place
- Maximize the use of technology

progression may be attributed to a lack of drug efficacy and may result in an unnecessary regimen change (SanSoucie, 2013).

The causes of nonadherence are multifactorial and include a lack of understanding of proper treatment administration, complex dosing regimens, interactions with other medications, the challenge of timing doses in relation to food intake, cost, and side effects (Wood, 2012).

Existing research often delineates between nonadherence being intentional vs. nonintentional. For example, patients who choose not to take their medication because it makes them sick are displaying intentional nonadherence. In contrast, a patient who simply forgets is displaying nonintentional nonadherence. Intentional nonadherence is the result of three factors (in addition to side-effect avoidance, as illustrated in the example): (1) lack of information about the advantages and disadvantages of treatment; (2) the fact that the benefits of treatment may not be obvious; and (3) the psychological adaptation required to see oneself as in need of treatment (Atkins & Fallowfield, 2006).

It would be helpful for APs to communicate with patients and their caregivers to determine whether the nonadherence is intentional or nonintentional and then to provide supportive education. Nonadherence in itself can produce negative treatment outcomes. For example, Partridge and colleagues reported that adherence rates dropped from 87% in the first year to 50% by year 4 for breast cancer patients treated with tamoxifen for 5 years (Partridge, Wang, Winer, & Avorn, 2003).

It is evident that more current research on adherence needs to be conducted now that many new oral oncolytics are available to APs. Researchers and practitioners need to determine whether the reasons for nonadherence in the oncology setting are similar to those in the chronic disease setting and what interventions oncology patients may find most helpful. Ruddy and colleagues suggested that studies should investigate which diseases and which therapies are significantly impaired by missed doses, so interventions to optimize adherence can be targeted to the patients who are most in need (Ruddy, Mayer, & Partridge, 2009).

For the older adult, challenges revolve around adherence and persistence to remain on the drug, managing numerous side effects, difficulties posed

by the dosing complexity of the regimen, and the polypharmacy associated with other medications to manage ongoing comorbid conditions. Cardiovascular, gastrointestinal, dermatologic, and hematologic side effects may pose problems for the elderly.

Many patients may face substantial out-of-pocket costs associated with the high copayments for these very expensive medications (Molina-Garrido, Mora-Rufete, & Guillen-Ponce, 2014). Financial assistance programs offered to patients with cancer adds the peace of mind that patients often require for them to begin medications that could generally be cost prohibitive. If patients do not feel supported and do not trust that their health care team will provide the necessary resources, then cost alone may lead some patients to forego cancer treatment altogether.

## THE PATIENT EXPERIENCE

Oral oncolytics now make up more than 25% of the oncology market, and their use is continually expanding (Weingart et al., 2008). However, the current insurance system is not efficiently equipped to handle their rapid entry into the market. Due to the increase in multi-tier formularies, the growth in outpatient medication spending decreased in recent years, whereas the demand for specialty drugs, including oral oncolytics, has continued to accelerate (Goldman, Joyce, Lawless, Crown, & Willey, 2006).

Additionally, patients are willing to accept oral therapy as long as side effects are not worse than those expected with IV treatment, and the greater sense of control over their therapy is viewed as a benefit of oral vs. IV therapy (Foulon, Schöffski, & Wolter, 2011). The benefits of oral oncolytics will generally only be realized if the patient is on an exclusively oral regimen. Patients on combination regimens will still need to make office infusion visits; for these patients, it may actually be more convenient to receive the entire regimen parenterally.

A patient's cardiac history may be aggravated by certain oral agents as well. Myocardial infarction, congestive heart failure, and atrial fibrillation may be exacerbated by oral agents (e.g., dabrafenib, dasatinib, erlotinib, and lenalidomide), whereas other drugs may alter blood pressure and necessitate careful monitoring (e.g., abiraterone acetate, axitinib, and enzalutamide; Given & Given, 2016).

It is important to carefully assess patient expectations and preferences as treatment with oral agents starts. Providers need to explain the goals of care for the patient, especially those with advanced disease who are on their second, third, or fourth line of treatment. This enables the patient to be engaged in making decisions about their treatment based on its effectiveness weighed against the treatment toxicities and costs he or she is likely to incur. Patients with advanced disease are at increased risk for cancer- and treatment-related problems brought on by their potential comorbidities and other treatments.

The patient's experience with oral oncolytics and adherence must evolve from a clear understanding of the importance of communicating with their healthcare team. The patient must have a strong desire to correctly administer their oncology medications and also have a clear understanding of how and when to communicate negative experiences regarding side effects.

### ACCESS TO ORAL ONCOLYTICS

The “financial toxicity of cancer” is a term frequently used to describe the increased financial burden faced by patients with cancer due to multiple factors, including out-of-pocket expenses for copayments and deductibles for prescription drugs and medical care, lost income for patients and caregivers while undergoing treatment, and indirect costs experienced by caregivers. Insurance companies struggling to cover the rising expenses associated with cancer drugs may shift more of the cost burden to patients (Egerton, 2016).

There is a large range in the cost of individual chemotherapy treatment, as drugs differ significantly in their cost and length of treatment. The cost of 8 weeks of chemotherapy can range from \$100 to \$30,000 or more. While a patient's oral oncolytic can be the largest part of the cost, we discussed earlier in the supplement that other expenses such as travel and loss of work can factor into financial burden as well.

Medicare and other insurers have distinct medical and pharmacy benefits. The medical benefit in Medicare ensures that physician services, including physician-administered drugs, and hospital services are covered (Henderson, 2009). Meanwhile, the pharmacy benefit usually covers self-administered drugs including oral medications and some

### Highlights From the Panel Discussion



**Mr. Novak:** In addition to the prescribers, I think the pharmacist plays a very important role. We have a dispensing pharmacy with a pharmacist on site who we send the prescription to directly. He then determines the patient's insurance coverage, what resources are available, what the patient's out-of-pocket cost is going to be and whether financial assistance is available. Once the medication is dispensed, we have an oral medication oncology nurse call the patient to get a sense of how things are going and address any issues.



**Dr. Hicks:** It definitely takes a collaborative approach from all of our professions. From a pharmacy perspective, you find non-fulfillment, where the patient doesn't start the medication the doctor prescribed. You also might have non-persistence, where the patient stops taking the therapy, or non-conforming, where they take the medication however they like. From the perspective of the busy oncology practice, there's often a lack of dedicated resources to devote to following up with patients about their patterns of sticking with oral treatment plans. And oncology practices are not reimbursed for this extra effort.

subcutaneous injectables (Henderson, 2009). This bifurcated insurance setting can create artificial enticements for physicians to prescribe IV medications and may hinder the use of oral oncolytics.

In addition, differences in cost-sharing among patients may cause financial difficulties by making the prescription drug benefit inaccessible for those who only have medical benefit coverage. One study found that one in four patients who filled their prescriptions and incurred over \$500 in out-of-pocket expenses did not return to pick them up or follow up with a new oncology medication within 90 days (Streeter, Schwartzberg, Husain, & Johnsrud, 2011). Medicare patients are not eligible to take advantage of patient assistance and/or copayment programs that have been established by pharmaceutical companies. Foundations such as the Patient Access Network Foundation have been established to provide assistance to Medicare patients (Egerton, 2016).

Overall, more of the cost burden of cancer care is being shifted to patients. Simply coping with the

physical and emotional burden of a cancer diagnosis can be overwhelming for patients, even before the financial ramifications are taken into consideration. There are numerous reports of patients and families going into debt or declaring bankruptcy to cover the costs of their cancer medications, as well as examples of patients cutting back on drug doses and groceries and utilizing less heat in their homes (Zafar et al., 2013). In the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment, researchers found that approximately 33% of families lost most or all of their savings after a cancer diagnosis (Covinsky et al., 1994). In another study, researchers stressed the need for clinical staff to identify patients who qualify for financial assistance and to communicate pertinent information about obtaining this assistance (Niccolaï, Roman, Julius, & Nadour, 2017).

Normally, patients pay between 20% and 30% of out-of-pocket expenses for their treatment, which can translate to about \$24,000 to \$36,000 over a year. Those numbers do not factor in the cost of health insurance premiums (Glover, 2015). Due to the cost burden placed upon patients for oral oncolytics, some APs may be reluctant to prescribe them. In fact, 84% of oncologists reported in a survey that patients' out-of-pocket spending influenced their treatment recommendations (Neumann, Palmer, Nadler, Fang, & Ubel, 2010).

Whereas financial hurdles pose a barrier to medication access, patient access to oral therapies can also be affected by how and when the medication is dispensed. Some prescription benefit programs mandate the use of a mail order pharmacy for specific refills, which restricts patients' options in terms of where and how they receive their medication. Additionally, patients may have to wait as long as 2 weeks at the onset of their therapy to receive their oral cancer prescriptions from a mail order pharmacy, according to the results of a 2016 case study from the National Community Oncology Dispensing Association (Egerton, 2016). Other reasons patients may be restricted as to how and when they receive their medications may be the need for a prior authorization and insurance formulary stipulations. With the evolution of the specialty pharmacy, however, most patients can receive their medications overnight once the verification and prior authorization process is com-

pleted. Specialty pharmacies are now a catalyst to helping patients receive their medications in a timely fashion, incorporated with a successful compliance and adherence program. These programs provide support to the AP as well, through a collaborative approach to monitoring and managing their patients on oral oncology medications.

Over the course of treatment, many cancer patients will transition back and forth between acute and chronic symptoms and treatment plans. It is important to set appropriate treatment expectations, recognizing that patients will need individualized support based on where they are along their cancer journey.

## STRATEGIES TO MONITOR AND ENHANCE ADHERENCE

Some patients may not understand the disease process and conclude that if their symptoms subside, they can stop taking their medication. Adverse effects of medication, inadequate follow-up or discharge planning, poor provider-patient relationships, regimen complexity, and medication costs may all also be a hindrance. Today's cancer patients and their caregivers are now responsible for adhering to complex dosing regimens, monitoring symptoms, managing side effects, coordi-

### Highlights From the Panel Discussion



**Ms. Scherer:** In our practice, we use telehealth. We also encourage smart devices, such as Siri from your cell phone and other automated home assistants like Alexa and Google Home. And there are tons of apps out there. We're using one that really incorporates the family, so there's this continuity of talking to the family and talking to the patient and having access to their nurse. I think things are getting better for patients.



**Dr. Cope:** But dealing with the older adult, a lot of them are not computer savvy, not really using the apps that we encourage them to sign up for to message us. We're really dealing with the standard type of communication patterns of e-mail and calling us on the phone with any questions.



**Dr. Hicks:** You bring up a good point. Of course there are exceptions, but technology could be a challenge with seniors. We definitely have to address that patient differently than we address a younger patient.

nating drug delivery, and making dosing adjustments (Spoelstra et al., 2013).

An understanding of both the barriers to adherence and the strategies that can be used to effectively manage patients may equip APs with the tools needed to improve adherence (Wood, 2012). Taking the time to speak with a patient and illuminate the real reason he or she is having trouble keeping on track can be invaluable. Once you pinpoint the trouble area, you can suggest strategies to change the nonadherent behavior: patient financial assistance programs, electronic pill boxes, medication reminder apps, etc. (see Table 3). See page 773 of the November/December issue of JADPRO for a patient education handout that can help start the conversation about adherence.

One strategy to enhance adherence is the use of behavioral coaching, a process in which a patient is taught, trained, and guided toward learning a new behavior. This is often utilized to support patients moving from an end-of-life diagnosis to living with a chronic disease. Changing behavior can have a substantial impact on human dynamics.

Another strategy is motivational interviewing. This technique enables APs to promote adherence to patients who previously had negative experiences with oral oncolytics (or knew someone who did), particularly with respect to side effects (Ratliff, 2016). Motivational interviewing focuses on the patient's perception of the problem and encourages the patient, not the AP, to find a solution. Motivational interviewing is a method of counseling that is directive and patient-centered. It encourages APs to explore a patient's understanding and concerns and deter-

mine his or her readiness for change (Levensky, Forcehimes, O'Donohue, & Beitz, 2007).

The unique characteristics of cancer patients present complex challenges that impact the best approach to help patients achieve positive outcomes with emerging, specialty pharmacy treatments. According to WHO, if we are able to increase the effectiveness of adherence interventions, it may have a far greater impact on the health of the population than any improvement in specific medical treatments (WHO, 2003).

### HOW TECHNOLOGY PLAYS A ROLE IN ADHERENCE

Given that technology can either be a hindrance or an enabler to providing better health care, APs should strive to implement available technology to enhance patient adherence. Advanced technology may lead to improved communications and patient outcomes (Collins & Elsaid, 2011; Meisenberg, Wright, & Brady-Copertino, 2014).

However, some APs may still be struggling with the use of health-care-related technology. The role of medical scribes in community oncology settings may be worth considering, given that one recent study found the use of medical scribes led to increased productivity and improvements in the quality of clinical documentation (Lerner et al., 2016).

It is incumbent on APs to find ways to reduce redundancies and to leverage data for continuous quality improvement. If patients are still filling out paper-based forms that are then scanned into their chart, consider ways to digitize the entire process. If staff members are sending repeat faxes to outside specialty pharmacies, consider the use of secure electronic fax servers, which may reduce clerical tasks. Technology solutions can also bolster patient education, as programs provide patients with access to online resources, such as disease state education, and may connect them to on-call nurses and pharmacists. Capturing the appropriate data is critical to successfully leverage the technology. According to a pilot study of 30 ambulatory oncology patients using nonhormonal oral chemotherapeutic agents, it was found they had an adherence rate of 78% with the use of an automated voice-response system and nurse follow-up phone calls (Decker et al., 2009).

**Table 3. Selected Medication Apps for Smartphones and Electronic Pill Dispensers**

Smartphone apps	Pill dispensers/Reminder technology
<ul style="list-style-type: none"> <li>• Care4Today</li> <li>• MediSafe</li> <li>• MyMedSchedule</li> <li>• MyMeds</li> <li>• My PillBox Pro</li> <li>• MyTherapy</li> <li>• Pillboxie</li> <li>• Pill Reminder</li> <li>• RxmindMe</li> <li>• RX2</li> </ul>	<ul style="list-style-type: none"> <li>• E-pill Once-a-Day Reminder</li> <li>• LiveFine Automatic Pill Dispenser</li> <li>• MedFolio</li> <li>• Med Minder</li> <li>• Med-Q Digital Pill Box Organizer</li> <li>• Tabtime Vibe Vibrating Pill Timer Reminder</li> </ul>

## Case Study



**Dr. Hicks:** LR is a 61-year-old female. She's postmenopausal and self-employed. She travels internationally for work. She is divorced, and she has four adult children. She was initially diagnosed with stage 2A, HER2-positive, left-sided breast cancer. She was otherwise relatively healthy until her cancer diagnosis. She had mild hypertension, which was treated with lisinopril 20 mg every day, and she had GERD, which was treated with omeprazole 40 mg every day. She had no other comorbid conditions.

If we fast forward to LR's first relapse, a CT scan revealed a 7.3 x 6-cm mass in the right lobe of the liver. She had no evidence of metastasis elsewhere. On her second relapse, approximately 24 months later, her CT scan showed liver lesions that had increased in size and number and were bilateral, and there were pulmonary lesions.

LR was fast-forwarded on a second-line metastatic treatment. Her doctor ordered capecitabine at 2,000 mg in two divided doses along with lapatinib at 1,250 mg in a single daily dose. She was instructed to take her oral therapies as follows: (1) Two 500-mg capecitabine tablets (taken with food) twice daily for 14 days followed by a 7-day rest period; (2) five 250-mg lapatinib tablets once daily continuously (taken on an empty stomach).

So we're starting to see some possible nonadherence issues. When she was told to take her capecitabine within 30 minutes after a meal and approximately 10 to 12 hours apart with breakfast and dinner, and to take her lapatinib on an empty stomach 30 minutes before or 1 hour after eating, the nurse suggested she take the lapatinib at bedtime because she doesn't like to snack in the evening.

Whose responsibility would it be to educate LR about the importance of precise adherence?



**Ms. Scherer:** It just takes a village. It's everybody. I mean, everybody, even her family practitioner. She still has GERD, and she's taking things on an empty stomach. There could be some situations there that might arise where she's feeling chest pain, and the next thing you know, she ends up in the ER for no apparent reason. So it's important to have everybody on board.

If we're truly going to expect LR to be compliant, hopefully she has somebody with her when she comes to the appointment in which she learns how to take her medications. It's the nurses, it's the advanced practitioners, it's the physician, it's the pharmacy—it's everybody. This needs to be said over and over and over again. She's going to go home and have 20 million questions, and so is her family, especially once they get on the internet. You just have to keep reiterating everything that you're trying to get across about this treatment and the side effects and what to expect.



**Dr. Cope:** In our practice, the nurses really do not see those patients that are on oral drugs, so it really does fall with the advanced practitioner. The physician sets the regimen, and then we do the bulk of the education. We're also fortunate to have a specialty pharmacy with our practice. Again, we're collaborating with them. They're great as far as getting copay assistance and working on foundation grants. If the grants dry up, or they just can't find a grant that can help them with assistance, then they talk with us and say this is a problem, and we have to figure out how to solve it.



**Mr. Novak:** It is definitely a multidisciplinary approach. The oncologist initially gives a brief overview of what's going to happen. Obviously, they have a lot of time constraints, so that is where the AP comes into play to really just slow things down and explain the process in simpler terms so the patient has a firm understanding of what's going to happen moving forward. We then schedule a formal chemo teaching with our nurse clinician. In our practice, we have a specific clinician for each disease state, who then spends an hour teaching each patient. This is not done at the same time as the patient's initial visit, but rather 2 or 3 days later so the patient has time to digest and process things.



**Dr. Hicks:** So let's look at some more of LR's issues. She's self-employed and pays for her own health insurance. She has a high deductible and limited pharmaceutical benefits, and she's already met her deductible for the current year. She has an unpredictable schedule. She travels extensively, so she often has to reschedule her appointments to meet her work obligations. She often travels abroad, so changing time zones alone can affect her medication schedule. The therapeutic regimen won't accommodate LR's lifestyle unless the AP and the team sit down with her and provide thorough education on some of the challenges that she could face by traveling abroad. She reports that she confused the cycles and dosing schedules of both medications because one drug is twice a day and one drug is once a day because she forgot to keep a dosing calendar. It's not hard to see how a patient who's traveling through different time zones could forget which one is once a day and which is twice a day. Would anyone like to share about regimen complexity?

Continued on next page.

**Case Study (cont.)**

**Ms. Scherer:** There's something called the Hawthorne effect, where a patient will tell you what they think you want to hear. So if you look at a diabetic's diary, everything ends in a zero because they filled it out in the car on the way there. They're going to tell you what you want to hear. In my role, one of the advantages being in the home is that we're able to look at the bottles and say, "OK, what's going on?" It's hard. Because unless you're physically watching somebody take the medication or you're testing their PKU levels or something, how do you know? With LR's travels, I would have concerns about her being neutropenic and flying—we all know everything that you can catch on a plane. There would have been some talk about some short-term disability options. One of the things we do with our patients is we have these client treatment organizers that they keep with them at all times, and we make sure they know how to keep track of their records. Because if they travel out of the state or away from their facility and go to another ER, they may be rescanned for something that might have been done already. It reduces cost and duplication of testing. It's important to educate people who do a lot of traveling on how they keep track of their own situation.



**Dr. Cope:** It's important to approach a patient with good rapport. Don't accusing them of missing a dose. They need to be comfortable so that they're not afraid to call and say, "I missed a dose. What should I do?" I think that's a big thing. Another thing is when they come in for an appointment, we have them reiterate their regimen. "Now, tell me how you're taking your medications..." If they can recall those complex regimens, you can be fairly sure that they understand it. Plus you're giving instructions back to them, so that's very helpful.



**Mr. Novak:** I agree. The patient/provider relationship is crucial because then the patient can be honest with you. But I do think that LR's situation has the potential to be a recipe for disaster: single parent, four kids, travels for work, and a ridiculously complex regimen. She takes two different medications, with two different schedules: one must be taken with food, one without food. In her case it's really important to simplify things up front. Take the time to sit down with her and come up with good individualized strategies to figure out a way for her to take her medications properly in a way that works with her lifestyle.



**Dr. Hicks:** So LR's adherence improved with frequent monitoring and education by an advanced practitioner. She agreed to speak with an advanced practitioner every cycle before refilling her prescription, and they worked out a concrete plan for addressing her irregular travel schedule.



**Dr. Cope:** I think John really highlighted something before. We talk about the ideal patient, but it really comes down to good provider assessment.

**THE FUTURE OF ORAL THERAPY**

Advances in cancer care indicate that cancer is on track to become a chronic condition. Oral oncolytic therapy is an increasingly available and important aspect of this advancement, and adherence to treatment is critical to deriving optimal patient benefit. In order for this to happen, patients need to be better educated, motivated, and organized. Otherwise, the potential compromise in outcomes due to premature drug discontinuations will be significant.

However, adherence is not the only issue: Intertwined with the problem of adherence are the reimbursement considerations associated with oral oncolytics. Advanced practitioners need to assist their patients in identifying resources that may enable them to afford treatment with oral oncolytics.

Oral oncolytics are challenging traditional attitudes toward cancer care, redefining the roles and

responsibilities of APs and patients, and demanding a new model of oncology services for patient education, monitoring, and support. The future of oral oncolytics lies with opportunities for APs to ensure their patients adhere to their drug protocol as closely as possible. ●

**Acknowledgment**

Dr. Hicks would like to dedicate her work on this supplement to JADPRO to her dear friend Lydia, who struggled with cancer and inspired those around her to never give up trying to improve the care and dedication they give to their patients.

**Disclosures**

Dr. Cope, Dr. Hicks, and Ms. Scherer have nothing to disclose. Mr. Novak serves on speakers bureaus for Amgen, Lexicon, and Pfizer, and has acted as a consultant for bioTheranostics.

**Appendix. Oral Agents Used in the Treatment of Cancer**

Generic name	Brand name	Disease	Manufacturer	Mechanism of action
Abemaciclib	Verzenio	Breast cancer	Eli Lilly	Kinase inhibitor, targets CDK4/6
Abiraterone acetate	Zytiga	Prostate cancer	Janssen Biotech	CYP17 inhibitor
Acalabrutinib	Calquence	MCL	Acerta Pharma BV	Kinase inhibitor, targets BTK
Afatinib	Gilotrif	NSCLC	Boehringer Ingelheim	Kinase inhibitor, targets EGFR
Alectinib	Alecensa	NSCLC	Genentech	Kinase inhibitor, targets ALK
Altretamine	Hexalen	Ovarian cancer	Eisai	Alkylating agent
Anastrozole	Anastrozole	Breast cancer	Various	Non-steroidal aromatase inhibitor
Axitinib	Inlyta	RCC	Pfizer	Kinase inhibitor
Bexarotene	Bexarotene	CTCL	Various	Retinoid
Bicalutamide	Bicalutamide	Prostate cancer	Various	Androgen receptor inhibitor
Bosutinib	Bosulif	CML	Pfizer	Kinase inhibitor
Brigatinib	Alunbrig	NSCLC	ARIAD Pharmaceuticals	Kinase inhibitor, targets ALK
Cabozantinib	Cabometyx	RCC	Exelixis	Kinase inhibitor
Capecitabine	Capecitabine	CRC, breast cancer	Various	Nucleoside metabolic inhibitor
Ceritinib	Zykadia	NSCLC	Novartis	Kinase inhibitor, targets ALK
Chlorambucil	Leukeran	Hematologic malignancies	Aspen Global	Bifunctional alkylating agent of the nitrogen mustard type
Cobimetinib fumarate	Cotellic	Melanoma	Genentech	Kinase inhibitor
Crizotinib	Xalkori	NSCLC	Pfizer	Kinase inhibitor, targets ROS1
Cyclophosphamide	Cyclophosphamide	Various	Various	Alkylating agent
Dabrafenib	Tafinlar	Melanoma	Novartis	Kinase inhibitor
Dasatinib	Sprycel	ALL, CML	Bristol-Myers Squibb	Kinase inhibitor, targets BCR-ABL
Eltrombopag olamine	Promacta	Chronic ITP	Novartis	Thrombopoietin receptor agonist
Enasidenib	Idhifa	AML	Celgene	IDH-2 inhibitor
Enzalutamide	Xtandi	Prostate cancer	Astellas Pharma	Androgen receptor inhibitor
Erlotinib	Tarceva	NSCLC, pancreatic cancer	OSI	Kinase inhibitor
Estramustine	Emcyt	Prostate cancer	Pharmacia and Upjohn	Antimicrotubule agent
Etoposide	Etoposide	Various	Various	Topoisomerase inhibitor
Everolimus	Afinitor	Various	Novartis	Kinase inhibitor
Exemestane	Exemestane	Breast cancer	Various	Aromatase inhibitor
Finasteride	Finasteride	Prostate cancer	Various	5-alpha reductase inhibitor
Flutamide	Flutamide	Prostate cancer	Various	Non-steroidal antiandrogen
Gefitinib	Iressa	NSCLC	AstraZeneca	Tyrosine kinase inhibitor
Hydroxyurea	Hydroxyurea	Various	Various	Antimetabolite
Ibrutinib	Imbruvica	MCL, WM, CLL, SLL, MZL, cGVHD	Pharmacyclics/ Janssen Biotech	Bruton's tyrosine kinase inhibitor

*Note.* NSCLC = non-small cell lung cancer; RCC = renal cell carcinoma; CTCL = cutaneous T-cell lymphoma; CML = chronic myeloid leukemia; CRC = colorectal cancer; ALL = acute lymphoblastic leukemia; ITP = idiopathic thrombocytopenic purpura; AML = acute myelogenous leukemia; MCL = mantle-cell lymphoma; WM = Waldenström's macroglobulinemia; CLL = chronic lymphocytic leukemia; SLL = small lymphocytic lymphoma; MZL = marginal zone lymphoma; cGVHD = chronic graft-vs.-host disease; FL = follicular lymphoma; GIST = gastrointestinal stromal tumor; HCC = hepatocellular carcinoma; MF = myelofibrosis; PCV = polycythemia vera; pNET = primitive neuroectodermal tumor. Information from FDA.gov.

 Continued on next page.

**Appendix. Oral Agents Used in the Treatment of Cancer (cont.)**

Generic name	Brand name	Disease	Manufacturer	Mechanism of action
Idelalisib	Zydelig	CLL, FL, SLL	Gilead	Kinase inhibitor
Imatinib mesylate	Imatinib mesylate	Various	Various	Tyrosine kinase inhibitor
Ixazomib	Ninlaro	Multiple myeloma	Takeda/Millennium	Proteasome inhibitor
Lapatinib	Tykerb	Breast cancer	Novartis	Kinase inhibitor, targets HER2
Lenalidomide	Revlimid	Multiple myeloma	Celgene	Immunomodulatory drug
Lenvatinib mesylate	Lenvima	Renal cell cancer, differentiated thyroid cancer	Eisai	Kinase inhibitor
Letrozole	Letrozole	Breast cancer	Various	Non-steroidal aromatase inhibitors
Leucovorin	Leucovorin	Various	Various	Folic acid analogue
Lomustine	Gleostine	Various	Corden Pharma	Alkylating agent
Megestrol acetate	Megestrol acetate	Various	Various	Synthetic progestin
Melphalan	Melphalan	Multiple myeloma, epithelial ovarian carcinoma	Various	Nitrogen mustard analogue
Mercaptopurine	Mercaptopurine	ALL	Various	Nucleoside metabolic inhibitor
Mesna	Mesna	Ifosfamide-induced hemorrhagic cystitis (prophylactic)	Various	Cytoprotective agent
Methotrexate	Methotrexate	Various	Various	Antimetabolite
Midostaurin	Rydapt	AML	Novartis	Multitargeted inhibitor of multiple kinases
Neratinib	Nerlynx	Breast cancer	Puma Biotechnology	Kinase inhibitor, targets HER2
Nilotinib	Tasigna	Ph+ CML	Novartis	Kinase inhibitor
Nilutamide	Nilutamide	Prostate cancer	Various	Non-steroidal antiandrogen
Niraparib	Zejula	Gynecologic cancers	Tesaro	PARP inhibitor
Olaparib	Lynparza	Gynecologic cancers	AstraZeneca	PARP inhibitor
Osimertinib	Tagrisso	NSCLC	AstraZeneca	Kinase inhibitor, targets T790M
Palbociclib	Ibrance	Breast	Pfizer	Kinase inhibitor, targets CDK4/6
Panobinostat	Farydak	Multiple myeloma	Novartis	HDAC inhibitor
Pazopanib	Votrient	RCC, soft-tissue sarcoma	GlaxoSmithKline	Kinase inhibitor
Pomalidomide	Pomalyst	Multiple myeloma	Celgene	Thalidomide analogue
Ponatinib	Iclusig	CML, ALL	ARIAD Pharmaceuticals	Kinase inhibitor
Procarbazine	Matulane	Hodgkin lymphoma	Leadiant Biosciences	Alkylating agent
Raloxifene	Evista	Breast cancer, osteoporosis	Eli Lilly	Estrogen agonist/antagonist
Regorafenib	Stivarga	CRC, GIST, HCC	Bayer	Kinase inhibitor
Ribociclib	Kisqali	Breast	Novartis	Kinase inhibitor, targets CDK4/6

*Note.* NSCLC = non-small cell lung cancer; RCC = renal cell carcinoma; CTCL = cutaneous T-cell lymphoma; CML = chronic myeloid leukemia; CRC = colorectal cancer; ALL = acute lymphoblastic leukemia; ITP = idiopathic thrombocytopenic purpura; AML = acute myelogenous leukemia; MCL = mantle-cell lymphoma; WM = Waldenström's macroglobulinemia; CLL = chronic lymphocytic leukemia; SLL = small lymphocytic lymphoma; MZL = marginal zone lymphoma; cGVHD = chronic graft-vs.-host disease; FL = follicular lymphoma; GIST = gastrointestinal stromal tumor; HCC = hepatocellular carcinoma; MF = myelofibrosis; PCV = polycythemia vera; pNET = primitive neuroectodermal tumor. Information from FDA.gov.

**Appendix. Oral Agents Used in the Treatment of Cancer (cont.)**

Generic name	Brand name	Disease	Manufacturer	Mechanism of action
Rucaparib	Rubraca	Ovarian cancer	Clovis Oncology	PARP inhibitor
Ruxolitinib	Jakafi	MF, PCV	Incyte	Kinase inhibitor
Sonidegib	Odomzo	Basal cell carcinoma	Novartis	Hedgehog pathway inhibitor
Sorafenib	Nexavar	Hepatocellular carcinoma, renal cell carcinoma, differentiated thyroid carcinoma	Bayer	Kinase inhibitor
Sunitinib	Sutent	GIST, RCC, pNET	Pfizer	Kinase inhibitor
Tamoxifen	Tamoxifen	Breast cancer	Various	Non-steroidal antiestrogen
Temozolomide	Temozolomide	Glioblastoma multiforme, anaplastic astrocytoma	Various	Alkylating agent
Thalidomide	Thalomid	Multiple myeloma	Celgene	Immunomodulatory agent
Thioguanine	Thioguanine	Acute nonlymphocytic leukemia	Aspen Global	Purine analogue
Topotecan	Hycamtin	Small cell lung cancer	Novartis	Topoisomerase inhibitor
Toremifene citrate	Fareston	Breast cancer	Kyowa Kirin	Estrogen agonist/antagonist
Trametinib	Mekinist	Melanoma	Novartis	Kinase inhibitor, targets MEK
Trifluridine and tipiracil	Lonsurf	CRC	Taiho Oncology	Nucleoside metabolic inhibitor plus thymidine phosphorylase inhibitor combination
Uridine triacetate	Vistogard	Fluorouracil or capecitabine overdose	Wellstat Therapeutics	Pyrimidine analogue
Vandetanib	Caprelsa	Thyroid cancer	Sanofi Genzyme	Kinase inhibitor
Vemurafenib	Zelboraf	Melanoma	Genentech	Kinase inhibitor
Venetoclax	Venclexta	CLL	AbbVie	BCL-2 inhibitor
Vismodegib	Erivedge	Basal cell carcinoma	Genentech	Hedgehog pathway inhibitor
Vorinostat	Zolinza	CTCL	Merck	HDAC inhibitor

*Note.* NSCLC = non-small cell lung cancer; RCC = renal cell carcinoma; CTCL = cutaneous T-cell lymphoma; CML = chronic myeloid leukemia; CRC = colorectal cancer; ALL = acute lymphoblastic leukemia; ITP = idiopathic thrombocytopenic purpura; AML = acute myelogenous leukemia; MCL = mantle-cell lymphoma; WM = Waldenström's macroglobulinemia; CLL = chronic lymphocytic leukemia; SLL = small lymphocytic lymphoma; MZL = marginal zone lymphoma; cGVHD = chronic graft-vs.-host disease; FL = follicular lymphoma; GIST = gastrointestinal stromal tumor; HCC = hepatocellular carcinoma; MF = myelofibrosis; PCV = polycythemia vera; pNET = primitive neuroectodermal tumor. Information from FDA.gov.

**Learn More Online!**

The publishers of JADPRO have created a brand new online resource for advanced practitioners treating patients on oral cancer therapies. In the **Knowledge Center: Adherence to Oral Oncolytics**, you'll find the roundtable discussion that inspired this supplement, links to other helpful articles, a patient education sheet, and more. Visit [advancedpractitioner.com/oralonc](http://advancedpractitioner.com/oralonc) today and continue learning!

## References

- American Cancer Society. (2010). Cancer Facts & Figures, 2010. Retrieved from <https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2010.html>
- Atkins, L., & Fallowfield, L. (2006). Intentional and non-intentional non-adherence to medication amongst breast cancer patients. *European Journal of Cancer*, 42(14), 2271–2276. <https://doi.org/10.1016/j.ejca.2006.03.004>
- Collins, C. M., & Elsaid, K. A. (2011). Using an enhanced oral chemotherapy computerized provider order entry system to reduce prescribing errors and improve safety. *International Journal for Quality Health Care*, 23(1), 36–43. <https://doi.org/10.1093/intqhc/mzq066>
- Covinsky, K. E., Goldman, L., Cook, E. F., Oye, R., Desbiens, N., Reding, D.,...Phillips, R. S. (1994). The impact of serious illness on patients' families: SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment. *Journal of the American Medical Association*, 272(23), 1839–1844. <https://doi.org/10.1001/jama.1994.03520230049037>
- Decker, V., Spoelstra, S., Miezo, E., Bremer, R., You, M., Given, C., & Given, B. (2009). A pilot study of an automated voice response system and nursing intervention to monitor adherence to oral chemotherapy agents. *Cancer Nursing*, 32(6), E20–E29. <https://doi.org/10.1097/NCC.0b013e3181b31114>
- Egerton, N. J. (2016). In-office dispensing of oral oncolytics: A continuity of care and cost mitigation model for cancer patients. *American Journal of Managed Care*, 22(4 suppl), S99–S103.
- Fallowfield, L., Atkins, L., Catt, S., Cox, A., Coxon, C., Langridge, C.,...Price, M. (2006). Patients' preference for administration of endocrine treatments by injection or tablets: Results from a study of women with breast cancer. *Annals of Oncology*, 17(2), 205–210. <https://doi.org/10.1093/annonc/mdj044>
- Foulon, V., Schöffski, P., & Wolter, P. (2011). Patient adherence to oral anticancer drugs: An emerging issue in modern oncology. *Acta Clinica Belgica*, 66(2), 85–96. <https://doi.org/10.2143/ACB.66.2.2062525>
- Given, C. W., & Given, B. A. (2016). Care of the elderly patient on oral oncolytics for advanced disease. *Current Geriatrics Report*, 5(3), 233–239. <https://doi.org/10.1007/s13670-016-0183-8>
- Glover, L. (2015). Oncologists worry about rising costs of cancer treatment. *US News & World Report*. Retrieved from <http://health.usnews.com/health-news/patient-advice/articles/2015/07/01/oncologists-worry-about-rising-costs-of-cancer-treatment>
- Goldman, D. P., Joyce, G. F., Lawless, G., Crown, W. H., & Willey, V. (2006). Benefit design and specialty drug use. *Health Affairs (Project Hope)*, 25(5), 1319–1331. <https://doi.org/10.1377/hlthaff.25.5.1319>
- Haynes, R. B., McDonald, H. P., & Garg, A. X. (2002). Helping patients follow prescribed treatment: Clinical applications. *Journal of the American Medical Association*, 288(22), 2880–2883. <https://doi.org/10.1001/jama.288.22.2880>
- Henderson, L. (2009). Oncologists report declining reimbursement most significant challenge for future practice viability. KJT Group. February 12, 2009.
- Kav, S., Xxxxson, J., Rittenberg, C., Fernandez-Ortega, P., Suomenen, T., Olsen, P. R.,...Clark-Snow, R. (2008). Role of the nurse in patient education and follow-up of people receiving oral chemotherapy treatment: An international survey. *Supportive Care in Cancer*, 16(9), 1075–1083. <https://doi.org/10.1007/s00520-007-0377-x>
- Krzyzanowska, M. K., & Powis, M. (2015). Extending the quality and safety agenda from parenteral to oral chemotherapy. *Journal of Oncology Practice*, 11(3), 198–201. <https://doi.org/10.1200/JOP.2015.004002>
- Lerner, R. E., Shapiro, A. C., Richter, S., Craft, C., Menge, M. R., Zylla, D. M.,...Holasek, L. (2016). Medical scribes in a community oncology clinic. *Journal of Clinical Oncology (ASCO Annual Meeting)*, 34 [Abstract 6585]. Retrieved from <http://meetinglibrary.asco.org/record/135947/abstract>
- Levensky, E. R., Forcehimes, A., O'Donohue, W. T., & Beitz, K. (2007). Motivational interviewing: An evidence-based approach to counseling helps patients follow treatment recommendations. *American Journal of Nursing*, 107(10), 50–59. <https://doi.org/10.1097/01.NAJ.0000292202.06571.24>
- Liewer, S., & Huddleston, A. N. (2015). Oral targeted therapies: Managing drug interactions, enhancing adherence and optimizing medication safety in lymphoma patients. *Expert Review of Anticancer Therapy*, 15(4), 453–464. <https://doi.org/10.1586/14737140.2015.1014807>
- Liu, G., Franssen, E., Fitch, M., & Warner, E. (1997). Patient preferences for oral versus intravenous palliative chemotherapy. *Journal of Clinical Oncology*, 15(1), 110–115. <https://doi.org/10.1200/JCO.1997.15.1.110>
- Luciani, A., Jacobsen, P. B., Extermann, M., Foa, P., Marussi, D., Overcash, J. A., & Balducci, L. (2008). Fatigue and functional dependence in older cancer patients. *American Journal of Clinical Oncology*, 31(5), 424–430. <https://doi.org/10.1097/COC.0b013e31816d915f>
- Meisenberg, B. R., Wright, R. R., & Brady-Copertino, C. J. (2014). Reduction in chemotherapy order errors with computerized physician order entry. *Journal of Oncology Practice*, 10(1), e5–e9. <https://doi.org/10.1200/JOP.2013.000903>
- Molina-Garrido, M. J., Mora-Rufete, A., & Guillen-Ponce, C. (2014). Oral chemotherapy in elderly women with metastatic breast cancer. *Anti-cancer Agents in Medicinal Chemistry*, 14(5), 665–672. <https://doi.org/10.2174/1871520614666140416103440>
- Neumann, P. J., Palmer, J. A., Nadler, E., Fang, C., & Ubel, P. (2010). Cancer therapy costs influence treatment: A national survey of oncologists. *Health Affairs (Project Hope)*, 29(1), 196–202. <https://doi.org/10.1377/hlthaff.2009.0077>
- Niccolai, J. L., Roman, D. L., Julius, J. M., & Nadour, R. W. (2017). Potential obstacles in the acquisition of oral anticancer medications. *Journal of Oncology Practice*, 13(1), e29–e36. <https://doi.org/10.1200/JOP.2016.012302>
- Osborne, R. (2012). Management programs for oral oncolytics drive adherence and brand loyalty. United BioSource Corporation. Retrieved from [www.ubc.com/blog/management-programs-oral-oncolytics-drive-adherence-and-brand-loyalty](http://www.ubc.com/blog/management-programs-oral-oncolytics-drive-adherence-and-brand-loyalty)
- Partridge, A. H., Wang, P. S., Winer, E. P., & Avorn, J. (2003). Nonadherence to adjuvant tamoxifen therapy in women with primary breast cancer. *Journal of Clinical Oncology*, 21(4), 602–606. <https://doi.org/10.1200/JCO.2003.07071>
- Puts, M. T., Tu, H. A., Tourangeau, A., Howell, D., Fitch, M.,

- Springall, E., & Alibhai, S. M. (2014). Factors influencing adherence to cancer treatment in older adults with cancer: A systematic review. *Annals of Oncology*, 25(3), 564–577. <https://doi.org/10.1093/annonc/mdt433>
- Ratliff, K. (2016). Adherence to oral oncolytics requires a clinically integrated approach to specialty pharmacy. *Specialty Pharmacy Times*. Retrieved from [www.specialtypharmacytimes.com/publications/specialty-pharmacy-times/2016/june-2016/adherence-to-oral-oncolytics-requires-a-clinically-integrated-approach-to-specialty-pharmacy](http://www.specialtypharmacytimes.com/publications/specialty-pharmacy-times/2016/june-2016/adherence-to-oral-oncolytics-requires-a-clinically-integrated-approach-to-specialty-pharmacy)
- Ruddy, K., Mayer, E., & Partridge, A. (2009). Patient adherence and persistence with oral anticancer treatment. *CA: A Cancer Journal for Clinicians*, 59(1), 56–66. <https://doi.org/10.3322/caac.20004>
- SanSoucie, H. (2013). Patient adherence to oral oncolytics. Walden University. Retrieved from <https://search.proquest.com/openview/fe6a6e0d6cfc843d33800c26619ffb31/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Sherman, D. (2014). Oncology financial navigators: Integral members of the multidisciplinary cancer care team. The NaVectis Group. Retrieved from <http://navectis.com/oncology-financial-navigators-integral-members-multidisciplinary-cancer-care-team>
- Spoelstra, S., Given, B. A., Given, C. W., Grant, M., Sikorskii, A., You, M., & Decker, V. (2013). An intervention to improve adherence and management of symptoms for patients prescribed oral chemotherapy agents: An exploratory study. *Cancer Nursing*, 36(1), 18–28. <https://doi.org/10.1097/NCC.0b013e3182551587>
- Streeter, S. B., Schwartzberg, L., Husain, N., & Johnsrud, M. (2011). Patient and plan characteristics affecting abandonment of oral oncolytic prescriptions. *Journal of Oncology Practice*, 7(3 suppl), 46s–51s. <https://doi.org/10.1200/JOP.2011.000316>
- Tangka, F. K., Trogdon, J. G., Richardson, L. C., Howard, D., Sabatino, S. A., & Finkelstein, E. A. (2010). Cancer treatment cost in the United States: Has the burden shifted over time? *Cancer*, 116(14), 3477–3484. <https://doi.org/10.1002/cncr.25150>
- Thompson, N., & Christian, A. (2016). Oral chemotherapy: Not just an ordinary pill. *American Nurse Today*, 11(9), 16–20.
- Weingart, S. N., Brown, E., Bach, P. B., Eng, K., Johnson, S. A., Kuzel, T. M.,...Walters, R. S. (2008). NCCN Task Force Report: Oral chemotherapy. *Journal of the National Comprehensive Cancer Network*, 6(suppl 3), S1–S14.
- Weir, H. K., Thompson, T. D., Soman, A., Møller, B., & Leadbetter, S. (2015). The past, present, and future of cancer incidence in the United States: 1975 through 2020. *Cancer*, 121(11), 1827–1837. <https://doi.org/10.1002/cncr.29258>
- Wood, L. (2012). A review on adherence management in patients on oral cancer therapies. *European Journal of Oncology Nursing*, 16(4), 432–438. <https://doi.org/10.1016/j.ejon.2011.10.002>
- World Health Organization. (2003). Adherence to long-term therapies: Evidence for action. Retrieved from <http://www.who.int/chp/knowledge/publications/adherence-report/en>
- World Health Organization. (2017). Cancer Fact Sheet. <http://www.who.int/mediacentre/factsheets/fs297/en/>
- Zafar, S. Y., Peppercorn, J. M., Schrag, D., Taylor, D. H., Goetzinger, A. M., Zhong, X., & Abernethy, A. P. (2013). The financial toxicity of cancer treatment: A pilot study assessing out-of-pocket expenses and the insured cancer patient's experience. *Oncologist*, 18(4), 381–390. <https://doi.org/10.1634/theoncologist.2012-0279>

### How to Earn Credit

To access the learning assessment and evaluation form online, visit <http://surveys.edmeasures.com/s3/Oral-Oncolytics>

**Statement of Credit:** Participants who successfully complete this activity (including scoring of a minimum of 70% on the learning assessment) and complete and submit the evaluation form will be able to download a statement of credit.