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Your Guide to the Latest Cancer Research and Treatments

Highlights from the 2012 Annual Meeting of the American Society of Clinical Oncology

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This special edition of the Cancer*Care* Connect® Booklet Series highlights cutting-edge research presented at the 2012 Annual Meeting of the American Society of Clinical Oncology, which took place June 1–5 in Chicago, Illinois.

Some of the treatments discussed in this booklet are still in the very early stages of research and may not be available to the general public outside of a clinical trial.

The information contained in this booklet is intended for discussion with your doctor. He or she can tell you whether these advances in the treatment of cancer affect your treatment plan and whether a clinical trial is right for you.

The Cancer*Care* Connect® Booklet Series offers up-to-date, easy-to-read information on the latest treatments, managing side effects, and coping with cancer.

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Cancer*Care* helps individuals and families better cope with and manage the emotional and practical challenges arising from cancer. Our services—for patients, survivors, loved ones, caregivers, and the bereaved—include counseling and support groups, educational publications and workshops, and financial assistance. All of our services are provided by professional oncology social workers and are offered completely free of charge. Cancer*Care* is a national nonprofit organization founded in 1944.

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Your Guide to the Latest Cancer Research and Treatments

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Foreword

A cancer diagnosis affects the entire family, and since 1944, Cancer*Care* has worked tirelessly to provide free services to anyone who has been touched by cancer. Through our dedicated staff of professional oncology social workers, Cancer*Care* helps individuals, families, caregivers, and the bereaved to cope with and manage the emotional and practical challenges arising from cancer. Our services include counseling and support groups, educational publications and workshops, and financial assistance.

Last year, we were able to help more than 110,000 people with our direct services. We distributed $5.1 million in financial assistance to 32,100 individuals to aid in transportation, child care, and other miscellaneous costs and needs. We also offered 53 Connect Education Workshops, which were listened to by more than 51,000 people, and distributed 1.2 million publications nationwide.

As the demand for our services continues to grow each year, Cancer*Care* is committed more than ever to fulfilling our mission of offering help and hope to people affected by cancer. Learning of a cancer diagnosis can be devastating, but no one should have to face the journey alone. Our professional oncology social workers can help. Call Cancer*Care* at 800-813-HOPE (4673) or visit our website at www.cancercare.org.

Helen H. Miller, LCSW, ACSW
Chief Executive Officer, Cancer*Care*

About the Editors

Each year, Cancer*Care* publishes a special edition of the Cancer*Care* Connect® Booklet Series that presents research highlights from the Annual Meeting of the American Society of Clinical Oncology (ASCO). For this 2012 report, we are indebted to the following medical experts, who ensured the accuracy of the information discussed in this publication.

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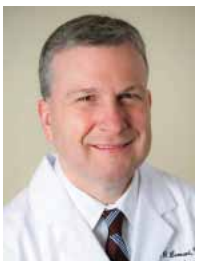

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The Importance of Clinical Trials

The advances in cancer treatment discussed in this booklet were all made possible through clinical trials. Proceeding in phases, clinical trials study new drugs, treatments, or other interventions to improve the survival and quality of life of people with cancer.

Keith D. Eaton, MD, PhD
Fred Hutchinson Cancer Research Center

Phase I trials find a safe dose of a drug and determine how the drug should be given. Researchers also assess whether the drug is harmful in any way (referred to as toxicity). Often, those who take part in phase I trials are "unselected," meaning the people in the study have different types of cancer.

Phase II studies try to determine whether the treatment is effective against a specific cancer. Potential toxicities are studied further. Phase II results are usually compared to historical controls—people treated in the past who serve as a comparison group.

Phase III trials compare a new treatment with the standard treatment—that is, the treatment considered at the time to be the best way to combat the cancer. Phase III trials are often "double blinded," meaning that neither the patient nor the treating physician knows who is getting which treatment. When phase III trials are successful, they can result in approval of a new treatment by the U.S. Food and Drug Administration (FDA).

Phase IV trials take place after drugs and other types of treatments have been approved by the FDA and made

available to the public. These studies help doctors understand how safe and useful the treatment will be over the long term.

Strict guidelines protect the safety of people enrolled in clinical trials. Institutional Review Boards monitor toxicity and potential differences between the treatment arms. In some cases, if it becomes clear that a new treatment is beneficial, a trial may be stopped early.

Before you enroll in a clinical trial, your doctor will give you a clear written description of what the study involves and answer any questions. You can choose to stop taking part in a clinical trial at any time for any reason. You are always in control of your voluntary participation.

Communicating with members of your health care team is an important part of the clinical trials process. Don't be afraid to ask questions, including whether you will need to do any long-term follow-up as part of the study.

Brain Cancer

Although there were no big blockbuster findings in brain cancer reported at the 2012 ASCO Annual Meeting, it is encouraging that there is still a great deal of work being done in this area. Most of the clinical trials discussed are looking at new chemotherapy treatment plans—in some cases, up to three or four drugs given together or in sequence. Researchers are trying to find the right combination of drugs that are safe and have a significant effect on brain tumors. Studies are also exploring ways to target brain cancer cell growth mechanisms as a way to destroy tumors. Many of these clinical trials are in their early stages. For most people with brain cancer, clinical trials are an excellent way to continue to get good care. These studies can benefit those who take part as well as future patients.

Jeffrey N. Bruce, MD
Columbia University College
of Physicians and Surgeons

Chemotherapy Plus Radiation for Brain Cancer

Updated results of a recent clinical trial suggest that chemotherapy combined with radiation is an effective treatment of a rare, slow-growing brain cancer called anaplastic oligodendroglioma. In this study, nearly 300 patients with brain cancer received chemotherapy plus radiation or radiation alone. Chemotherapy was composed of PCV: procarbazine (Matulane and others), lomustine

(CeeNU), and vincristine (Oncovin and others). It took longer for the cancer to grow in those who were treated with PCV plus radiation than in those who were treated with radiation alone (2.5 months versus 1.7 months). PCV plus radiation also helped patients who had a certain gene mutation, or change, known as 1p/19q to live much longer than did radiation alone (14.7 years versus 7.3 years).

What Patients Need to Know

Researchers are studying combinations of different drugs and treatments in people with brain cancer. The belief is that brain tumors may resist a single drug, and so not all of the tumor cells would be killed by that drug. Therefore, these tumors may be treated more effectively with more than one drug or type of treatment. This updated clinical trial also showed that testing patients with cancer for certain genetic mutations may be a good way to select the best treatment for their particular

type of tumor. In this way, people for whom a drug would not work can avoid taking it and risking side effects.

Combination Treatment With Temozolomide for Newly Diagnosed Glioblastoma

According to an early clinical trial, the combination of temozolomide (Temodar) and isotretinoin (a form of vitamin A used to treat acne) was not as effective as temozolomide alone in stopping the growth of a fast-growing brain cancer known as glioblastoma. Different combinations of treatments, all containing temozolomide, were studied in 155 people with newly diagnosed glioblastoma. It took longer for the tumor to start growing again with temozolomide alone than with temozolomide plus isotretinoin (10.5 months versus 6.5 months).

However, researchers did learn that three-drug combinations with temozolomide may help these patients live longer than two-drug combinations with temozolomide.

What Patients Need to Know

Temozolomide plus radiation is the current standard of care for people with newly diagnosed glioblastoma. Researchers are testing temozolomide in combination with other drugs in the hope of finding an even better way to treat people with these brain tumors. Although the combination of temozolomide and isotretinoin was not an effective treatment, other combinations of drugs being studied with temozolomide may prove to benefit people with brain cancer in the future. Ongoing clinical trials of temozolomide are focusing on the ideal dose of the drug, how often it should be given, and the best length of treatment.

An Alternative to Chemotherapy for Glioblastoma

A new treatment that delivers electricity to the brain through electrodes temporarily placed on the head may prove to be an effective way to treat newly diagnosed glioblastoma. Known as TTF (tumor treatment fields), this portable, battery-operated alternative to chemotherapy causes less nausea, fatigue, and anemia (low level of red blood cells) but perhaps more headaches. An ongoing clinical trial will test TTF in combination with temozolomide (the standard of care) to see whether it can stop the growth of newly diagnosed brain cancer. So far, 221 patients have joined this study, which is being conducted in 36 centers in the United States and Europe.

What Patients Need to Know

In 2011, TTF was approved by the U.S. Food and Drug Administration to treat glioblastomas that continued to grow after chemotherapy and radiation. Glioblastoma is highly resistant to standard treatments. Therefore, researchers hope that people newly diagnosed with glioblastoma may also benefit from TTF. They await the results of this and other clinical trials with TTF in combination with temozolomide.

Bevacizumab and Rilotumumab for Resistant Brain Cancer

Combining bevacizumab (Avastin) and the new drug rilotumumab seems to be a promising way to treat people who have brain cancer that no longer responds to other treatments. In a small clinical trial, 15 patients with resistant brain cancer were treated with the two drugs. After each six-

week cycle of treatment, patients had a magnetic resonance image (MRI) taken. (An MRI uses radio waves and a powerful magnet linked to a computer to create detailed pictures of inside the body. It can show the difference between healthy cells and tumor cells.) In 11 of these 15 patients, the tumor shrank or did not continue to grow after treatment. Six months after treatment, more than two-thirds of the patients had survived.

What Patients Need to Know

Many people with brain cancer are treated first with radiation and temozolomide. However, sometimes these treatments stop working, and the cancer continues to grow. Researchers are pleased with the early results with bevacizumab and rilotumumab in this clinical trial. Both are targeted treatments that work by attacking the blood vessels in brain tumors,

which help the tumors grow. However, further studies of this combination treatment in more people with resistant brain cancer will help doctors learn how best to use these drugs. They also will find out whether the early benefits seen on MRI scans actually help these people live longer.

Targeting Nuclear Factor Kappa B in Brain Cancer

People with brain cancer who have a marker in their blood for the substance called nuclear factor kappa B (NFKB) do not seem to respond to a number of the usual treatments. This marker seems to play a part in the growth of cancer cells. According to a very early stage of clinical research, new treatments that block NFKB may prove to be a good way to treat brain cancer that resists other treatments.

What Patients Need to Know

Biomarkers such as NFKB are receiving a lot of attention from researchers and doctors in their quest for better ways to treat cancer. They have gotten better at analyzing individual brain tumors and measuring changes in the cells of these tumors. As researchers understand more about the machinery inside the tumor cells and what drives these tumors to continue to grow, they can develop better drugs to treat these tumors more effectively. Then, they can also predict how a person's tumor will respond to a particular treatment and which patients will benefit most from that treatment.

MGMT and IDH1 May Help Doctors Select the Right Treatment

Recent clinical trials suggest that markers such as MGMT and IDH1 may help doctors pick the most effective treatment with the best chance of benefitting patients with different types of brain cancer.

In a study comparing radiation and chemotherapy for older patients with brain cancer, researchers used the MGMT marker to help choose between the two treatments. For example, brain tumors with a mutated (changed) *MGMT* gene responded better to temozolomide than to radiation. On the other hand, tumors that did not have this mutated *MGMT* gene responded better to radiation.

In another study on surgery to treat people with brain cancer, researchers used the *IDH1* gene marker to predict which patients would respond best to treatment. People who had an *IDH1* gene mutation had a better chance of living longer after more aggressive surgery than those who did not have this abnormal *IDH1* gene.

What Patients Need to Know

This information on MGMT and IDH1 is very useful for doctors to help them select the right treatment for the right patient. By analyzing these markers, researchers can better predict which new treatments will result in the best outcomes for patients with all types of cancer. Although this is an exciting area of research, it is still in a very early stage, and more studies in lots more patients are needed.

Breast Cancer

There was exciting news at the ASCO 2012 Annual Meeting for women with breast cancer. We have a new and important first-time treatment option for HER2-positive breast cancer. The latest evidence supports results from several years of research. This drug has proved more effective than standard treatment and is well tolerated. In another study, a powerful combination of three drugs has also proved to be very good news for HER2-positive breast cancer. For the first time, we have a way to boost the effectiveness of hormone treatments. It was very heartening to see not only the new studies that were presented but also follow-ups of some major studies that will help us figure out how to use breast cancer drugs more effectively, reduce side effects, and help more people.

Lidia Schapira, MD
Harvard Medical School

Trastuzumab Emtansine for HER2-Positive Locally Advanced or Metastatic Breast Cancer

Trastuzumab emtansine (T-DM1) may help women with locally advanced or metastatic breast cancer (tumors that have spread) to live longer without their cancer growing. According to the results of a large clinical trial, trastuzumab emtansine may even extend their lives.

Of the nearly 1,000 women who took part in the EMILIA trial, half of them were treated with an injection of T-DM1, and the other half were treated with lapatinib (Tykerb)

plus capecitabine (Xeloda). It took longer for the tumor to continue growing in the women who received T-DM1 than in the women who received the lapatinib and capecitabine (9.6 months versus 6.4 months). Two years after treatment, 65 percent of those in the T-DM1 group were alive, compared with 48 percent of those in the lapatinib plus capecitabine group. T-DM1 may improve survival, although it is too early to know for sure.

What Patients Need to Know

The EMILIA study received much attention at the 2012 ASCO Meeting. T-DM1 is often referred to as a "smart bomb," working on two fronts: It blocks the signals that make the cancer grow and enlists the body's immune system to attack the cancer cells. Researchers are pleased with these early results with T-DM1 in women with HER2-positive metastatic breast cancer, which affects between 20 percent and 25 percent of women living with breast cancer. Further studies of T-DM1 will confirm whether it helps these women live longer with their cancer.

Combination Treatment With Pertuzumab for HER2-Positive Metastatic Breast Cancer

Another effective treatment for women with HER2-positive metastatic breast cancer is the combination of the new drug pertuzumab (Perjeta) with trastuzumab (Herceptin) and docetaxel (Taxotere and others).

In a large study called CLEOPATRA, more than 800 women with HER2-positive metastatic breast cancer received pertuzumab plus trastuzumab and docetaxel (PTD) or trastuzumab and docetaxel. Women treated with PTD lived longer without their cancer growing than did women treated

with just trastuzumab and docetaxel (18.5 months versus 12.4 months). Researchers think this new combination of drugs also may help these women live longer with their cancer, but more study is needed; they will continue to follow these women.

What Patients Need to Know

These positive results led to the approval of PTD in June 2012 by the U.S. Food and Drug Administration (FDA) for the first-time treatment of women with HER2-positive metastatic breast cancer. The three-drug treatment did not appear to have a negative effect on the quality of life of these women, which was good news. Researchers believe that the benefits of PTD may be improved by giving pertuzumab and trastuzumab together.

Everolimus for Postmenopausal Women With Advanced Breast Cancer

Updated results of a major clinical trial have shown that the combination of everolimus (Afinitor) and exemestane (Aromasin and others) is an effective way to treat postmenopausal women with advanced breast cancer, even those older than age 70. The study, known as BOLERO-2, compared the two-drug combination with exemestane alone in nearly 725 postmenopausal women with advanced breast cancer. For all of these women, hormonal treatments had been effective at first. But then the cancer no longer seemed to respond to these drugs.

It took more than twice as long for the tumor to continue growing in women treated with everolimus compared with those treated with exemestane alone (about 7.5 months versus 3 months). The benefits of the two-drug combination treatment were also seen in the 161 women older than age 70. The most common side effects of this two-drug treatment were inflamed tissues in the mouth, infections, and skin rash. In addition, researchers found that adding everolimus to exemestane helped protect the bone in women whose breast cancer had spread to the bone.

What Patients Need to Know

In July 2012, the FDA approved everolimus, which comes in pill form, for the treatment of postmenopausal women with advanced breast cancer. Researchers consider the approval of this drug important because it is the first and only treatment that boosts the effectiveness of hormone therapy. The BOLERO-2 study is a good example of how scientific research sometimes takes a long time to make things clear. By continuing to follow these women, doctors should get a

better idea of whether everolimus and exemestane can help patients live longer too.

Cabozantinib for Metastatic Breast Cancer

According to a small clinical trial, cabozantinib appears to be a promising new drug for treating women with metastatic breast cancer. Forty-five women with advanced breast cancer that no longer responded to other treatments received cabozantinib. In nearly three-quarters of these patients, cancer had spread to the bone. Twelve weeks after treatment with cabozantinib, the tumor had shrunk in 14 percent of these women. The bone cancer partially shrank in four women, and bone pain improved in five women.

What Patients Need to Know

Cabozantinib is still in the early phases of research and is not available outside of a clinical trial. But even though the results are preliminary, this drug appears to be an effective option for women with metastatic breast cancer. Cabozantinib also seems to be active against other types of advanced cancer, such as stomach, lung, ovarian, and pancreatic tumors. Some researchers think that this medication may be useful in reducing cancer that spreads to the bone as well as improving related bone pain. Larger studies should help show how best to use this new drug and which patients may benefit most from it.

Colorectal Cancer

The 2012 ASCO Annual Meeting offered new information on colorectal cancer that has spread (is metastatic). From a number of clinical trials, we heard answers to our questions about how best to use the colorectal cancer medicines that are currently approved by the U.S. Food and Drug Administration (FDA). These study results help us gain greater insight into how to manage this disease.

Lowell B. Anthony, MD
Markey Cancer Center
University of Kentucky

Treatment With Bevacizumab and Erlotinib After Chemotherapy

When given to people with metastatic colorectal cancer who have already completed chemotherapy, the combination of bevacizumab (Avastin) and erlotinib (Tarceva) may be a good way to stop the cancer from growing or spreading. In the GERCOR DREAM trial, 446 patients already treated with chemotherapy were given bevacizumab alone or bevacizumab plus erlotinib. The cancer took longer to grow in patients who received the combination treatment than in patients who received bevacizumab alone (5.8 months versus 4.6 months). However, those treated with the combination of bevacizumab and erlotinib had more diarrhea and skin side effects than did those treated with bevacizumab alone.

What Patients Need to Know

Bevacizumab has been used as maintenance therapy in women with ovarian cancer. Maintenance therapy is intended

to help prevent cancer from returning or spreading after the initial treatment has been completed. The results of this clinical trial suggest that the combination of bevacizumab and erlotinib may also be an effective maintenance therapy for people with metastatic colorectal cancer. Bevacizumab works by targeting the vascular epidermal growth factor (VEGF), and erlotinib works by targeting the epidermal growth factor receptor (EGFR). Both VEGF and EGFR help cancer cells to grow, so researchers think that targeting both of them in one combination treatment may prove to be even more effective than targeting just one of them at a time. Further research on this treatment approach is ongoing.

Continuing Treatment With Bevacizumab and Chemotherapy

According to a recent clinical trial known as the TML study, continuing treatment with bevacizumab and chemotherapy is

more effective than continuing treatment with chemotherapy alone for people with metastatic colorectal cancer that has returned after initial treatment. Half of 820 patients received bevacizumab plus chemotherapy (either oxaliplatin [Eloxatin and others] or irinotecan [Camptosar and others]) as a secondary treatment. The others received chemotherapy alone as a secondary treatment. All of the 820 patients had already been treated first with bevacizumab and chemotherapy, and the cancer had returned within three months. The tumor took longer to continue growing in those who received the extra bevacizumab than in those who did not (5.7 months versus 4.1 months). Also, people treated with additional bevacizumab lived longer than those who did not receive it.

What Patients Need to Know

In the past, bevacizumab was used with chemotherapy only as a first-time treatment option. This study showed that there may be a benefit in continuing bevacizumab as a secondary treatment, even though researchers previously believed continuing to give the drug might not be useful. Encouraged by this trial's results, researchers are studying the continued use of bevacizumab in people with other types of tumors.

Regorafenib for Resistant Colorectal Cancer

Researchers reported positive results from the CORRECT clinical trial, which compared regorafenib (Stivarga) with a placebo (a look-alike pill with no active ingredient) in 760 people whose metastatic colorectal cancer no longer responded to standard treatments. Two-thirds of the people taking part in this clinical trial received regorafenib, and the other third received a placebo. Those who were treated with regorafenib lived longer than those who were not

(6.4 months versus 5 months). Skin reactions, such as rash, are the most common side effect of regorafenib.

What Patients Need to Know

In September 2012, regorafenib was approved by the FDA to treat people with resistant metastatic colorectal cancer. In the CORRECT trial, benefits with this drug were seen regardless of the age of the patients and whether or not they had a mutation (change) in the *KRAS* gene, which is involved in the growth of cancer cells. This is good news because people who have the *KRAS* mutation do not seem to benefit from certain combinations of chemotherapy.

Aflibercept and FOLFIRI for Resistant Colorectal Cancer

Adding a new drug called aflibercept (Eylea) to the combination chemotherapy known as FOLFIRI (leucovorin, fluorouracil, and irinotecan) may help people with metastatic colorectal cancer to live longer. Researchers drew on a large clinical trial called VELOUR, which included more than 1,200 patients whose cancer continued to grow after initial treatment with oxaliplatin chemotherapy. The researchers selected a subgroup of 373 patients from VELOUR. Half of the patients received aflibercept plus FOLFIRI, and the other half received FOLFIRI alone. Those treated with aflibercept survived a little over one month longer than those who did not receive this drug.

What Patients Need to Know

Like bevacizumab, aflibercept seems to be another effective drug that targets VEGF in cancer cells. Although aflibercept works somewhat like bevacizumab, the new drug targets several different ways to stop the growth of tumors. Researchers are encouraged by this new targeted approach of treating people with metastatic colorectal cancer that no longer responds to other treatments.

FOLFOX4 Chemotherapy Remains the Standard of Care

Researchers found that giving people with advanced colorectal cancer six cycles of FOLFOX7 chemotherapy followed by six cycles of FOLFIRI before surgery is just as effective as giving 12 cycles of FOLFOX4 (leucovorin, fluorouracil, and oxaliplatin) before surgery. FOLFOX7 included a higher dose of oxaliplatin and was given with less

time in between cycles than was FOLFOX4—what doctors call dose-dense chemotherapy. The MIROX study results, which included more than 280 people with metastatic colorectal cancer, showed there was no benefit to adding FOLFIRI. Therefore, FOLFOX4 remains the standard of care for these patients.

What Patients Need to Know

Although researchers are always looking for better ways to treat people with cancer, sometimes they learn a lot from finding out that a new treatment is no better than the standard treatment. That was the case with the MIROX study. Now doctors know that adding FOLFIRI chemotherapy to FOLFOX7 does not improve the outcomes with surgery in people with metastatic colorectal cancer compared with FOLFOX4 chemotherapy. In this way, these patients could avoid the side effects of adding FOLFIRI to their treatment and using dose-dense FOLFOX7.

Head and Neck Cancer

Head and neck cancer has received much attention in recent years because of research linking the human papillomavirus (HPV) to most oropharyngeal cancers (cancers located on the base of the tongue or tonsils). At the 2012 ASCO Annual Meeting, researchers presented studies in which combined treatments resulted in more effective control of head and neck cancer. Other clinical trials evaluated specific ways to target the growth signals of tumor cells in head and neck cancer. Learning more about these growth signals and how to block them will improve customized treatment for people with this disease. By improving cure rates, researchers hope also to improve patients' quality of life.

Marshall R. Posner, MD
Mount Sinai Medical Center

Combination Treatments for Locally Advanced Head and Neck Cancer

Four clinical trials presented at ASCO focused on new treatments being studied for people with locally advanced head and neck cancer. Two of the clinical trials studied newer targeted treatments in the hope of improving outcomes and quality of life for these patients. Targeted drugs are chosen for each person based on specific features of his or her tumor type. They are designed to block the growth and spread of cancer cells and spare healthy cells. There are some side effects from targeted drugs, but they are usually less severe than chemotherapy side effects.

In the first study, known as the DeCIDE trial, some of the participants were given induction therapy—an

initial treatment used to shrink a cancer. The induction chemotherapy was made up of docetaxel (Taxotere and others), cisplatin, and 5-fluorouracil (5-FU). In the DeCIDE trial, induction therapy was followed by additional treatments to destroy any cancer that remained.

Half of the 280 patients in DeCIDE received induction chemotherapy and then chemotherapy plus radiation (called chemoradiotherapy, or CRT). The other half received CRT alone. Two years after treatment, about 75 percent of both groups of patients had survived. However, the cancer spread to other parts of the body in fewer people treated with induction chemotherapy and CRT than with CRT alone.

A second study called the PARADIGM trial took a different approach. In that trial, researchers found that, in terms of extending the lives of people with locally advanced head

and neck cancer, induction therapy followed by CRT was as effective as induction therapy and CRT given at the same time. As in DeCIDE, the PARADIGM induction chemotherapy was made up of docetaxel, cisplatin, and 5-FU, followed by CRT with carboplatin or docetaxel. Of the 145 people in the PARADIGM trial, half received sequential chemotherapy (one drug at a time) followed by CRT. The other half received concurrent CRT (chemotherapy given at the same time as radiation—in this case, the drug was cisplatin). Three years after treatment, approximately three-quarters of patients in both groups had survived. None of these 145 patients had previously received treatment for their head and neck cancer.

A third study, called CONCERT-1, included 150 people with locally advanced head and neck cancer. Adding the targeted drug panitumumab (Vectibix) to CRT did not improve outcomes over CRT alone in these patients. None of the people taking part in the CONCERT-1 clinical trial had previously received treatment for their head and neck cancer. Panitumumab plus CRT with cisplatin was given to 87 patients, and CRT with cisplatin was given to 63 patients. The growth of cancer was stopped at the site of the original tumor in 61 percent to 68 percent of patients in both treatment groups. However, patients treated with panitumumab had more side effects than those not treated with panitumumab. These side effects included inflamed tissues of the mouth, difficulty swallowing, and skin rash.

In the fourth clinical trial, the oral targeted drug erlotinib (Tarceva) in combination with CRT was not significantly better than CRT alone in shrinking locally advanced head and neck cancers. More than 200 patients took part in this study, with some of them receiving the erlotinib combination treatment and others receiving CRT alone. In both groups, the tumor disappeared or shrank in 60 percent to 70 percent of patients.

Although people who received erlotinib experienced more skin rash and stomach side effects than patients who did not receive erlotinib, the number of severe side effects was about the same in both groups.

What Patients Need to Know

The term "locally advanced head and neck cancer" refers to cancer that has grown but not spread beyond the head and neck. The tumor is large enough to need more than one type of treatment in order to be cured. Often the tumor has spread to nearby tissues and lymph nodes. (Lymph nodes are tiny structures that form a linked system throughout the body. Their job is to help filter out and destroy bacteria and other toxic substances such as tumor cells.) People who have locally advanced head and neck cancers may require various combinations or sequences of chemotherapy, radiation therapy, and surgery.

Researchers are always looking for better ways to treat cancer, but sometimes they find out that several treatments are equally effective. That was the case with some of these clinical trials. Induction chemotherapy before CRT, CRT alone, sequential chemotherapy, and concurrent chemotherapy all seem to be effective ways to help people live longer with locally advanced head and neck cancer. Adding panitumumab or erlotinib to CRT does not appear to improve outcomes for these people. However, researchers plan to continue studying the use of such targeted treatments in people with head and neck as well as other types of cancer.

Panitumumab and Chemotherapy for Recurrent or Metastatic Head and Neck Cancer

The combination of panitumumab and chemotherapy (compared with chemotherapy alone) appears to improve survival for people with head and neck cancer whose tumors tested negative for the human papillomavirus (HPV–). However, this new treatment combination offered no similar benefit in patients with head and neck cancer whose tumors tested positive for the human papillomavirus (HPV+). More than 650 people with head and neck cancer that was either recurrent (cancer that has returned) or metastatic (cancer that has spread) took part in the SPECTRUM clinical trial. Of this group, nearly 450 people were tested for HPV: 78 percent tested negative for the virus, and 22 percent tested positive for the virus. Researchers are still analyzing these results to better understand the outcome.

What Patients Need to Know

Researchers are very encouraged by the SPECTRUM trial results with panitumumab and chemotherapy in patients

with HPV– recurrent or metastatic head and neck tumors. Doctors have come to believe that people whose tumors are HPV– may need more aggressive treatment than those whose tumors are HPV+. HPV is a virus that has been linked to several different cancers, including cervical and head and neck cancers. It now seems clear that HPV+ and HPV– are two different diseases requiring different treatment approaches.

Cetuximab, Docetaxel, and Cisplatin for Recurrent or Metastatic Head and Neck Cancer

The combination of cetuximab (Erbitux), docetaxel, and cisplatin (TPEx) may prove to be an effective alternative to standard treatment for people with recurrent or metastatic head and neck cancer. In a small study by a group known as the GORTEC, 48 patients were treated with TPEx. At 12 weeks, the cancer shrank in 23 patients. The cancer neither shrank nor grew in 21 patients. One year after treatment, nearly 60 percent of the patients had survived.

What Patients Need to Know

Cetuximab is a targeted treatment that has been approved by the U.S. Food and Drug Administration for certain types of colorectal and head and neck cancers. These promising results will encourage researchers to continue studying TPEx as a first-time treatment in people who have recurrent or metastatic head and neck cancer. However, additional clinical trials with larger numbers of patients with this type of cancer are needed before TPEx can be considered an effective alternative to other established treatments.

Kidney Cancer

During the past six years, much progress has been made in the treatment of kidney cancer. Seven new drugs have been approved by the U.S. Food and Drug Administration (FDA) for kidney cancer, which at one point had very few therapies. Most of these treatments have focused on stopping the formation of blood vessels that feed the cancer. By preventing those blood vessels from developing, we have been able to slow the growth of kidney tumors and extend the lives of our patients. Although patients are living longer and with improved quality of life, most people on these medications eventually require other treatments. At the 2012 ASCO Annual Meeting, researchers reported on the next wave of progress in treating this challenging disease.

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Tivozanib for Advanced Kidney Cancer

A new targeted drug called tivozanib may be even more effective than the standard targeted treatment sorafenib (Nexavar) in slowing the growth of kidney cancer. This is the finding of a large clinical trial including more than 500 patients with advanced kidney cancer. It took longer for the tumor to start growing again in people who received tivozanib than in those who received sorafenib (11.9 months versus 9.1 months). Patients who had not already been treated for their cancer lived even longer without their tumor growing (12.7 months) when taking tivozanib. The tumor disappeared or shrank in 33 percent of those treated with tivozanib, compared with 23 percent of those treated with sorafenib.

What Patients Need to Know

Researchers are encouraged by these results with tivozanib. It is the first time that a new drug, not yet approved by the FDA, has been shown to be more effective than an approved drug that targets tumor blood vessels in people with advanced kidney cancer. Not only does tivozanib appear to be more effective in controlling cancer than sorafenib, it also may have fewer side effects. Tivozanib may work even better when combined with other treatments.

Axitinib, Anti-PD-1 Antibody for Metastatic Kidney Cancer

Two new treatments—axitinib (Inlyta) and anti-PD-1 antibody—have shown promising results in patients with metastatic kidney cancer (cancer that has spread to other parts of the body). More than 200 people who had not

already been treated for their metastatic kidney cancer first received axitinib. Then they were divided into three groups:

- People who received a higher dose of axitinib,
- Those who did not receive any more axitinib, and
- Those who continued with the same dose of axitinib.

The tumor shrank in 40 percent of those in the first two groups, compared with 56 percent of those in the third group. It took more than a year for the tumor to grow in all of the people taking part in this study.

Anti-PD-1 antibody was given to 240 patients with various tumors. Of these people, 33 had metastatic kidney cancer that no longer responded to other treatments. This very early study showed that anti-PD-1 antibody might be safe and effective against kidney, skin, and lung cancers. Based on these promising results, anti-PD-1 antibody will now be studied more in these three types of cancer.

What Patients Need to Know

Researchers are encouraged by the early results with both axitinib and anti-PD-1 antibody in the treatment of advanced kidney cancer. Approved by the FDA early in 2012 as a secondary treatment of advanced kidney cancer, axitinib may prove to be effective as a first-time treatment as well. More studies with axitinib are ongoing to see whether higher doses of the drug would be of greater benefit in these patients.

Anti-PD-1 is a monoclonal antibody that helps the body's immune system fight cancer. Researchers have found that the immune system response to the tumor may "shut off," allowing the cancer to grow and spread. Using anti-PD-1 antibody to boost the immune system may be an effective way to stop the growth of cancer.

Leukemia

The future is very bright for the treatment of chronic myelogenous leukemia (CML). At the 2012 ASCO Annual Meeting, we learned new ways to get the most effective results from medications. We now have more evidence that both dasatinib (Sprycel) and nilotinib (Tasigna) are superior to imatinib (Gleevec) for first-time treatment of CML. In the past, they had been used mostly for secondary treatment. In addition, clinical trial results on ponatinib are looking strong as well. I'm very optimistic about the fact that we have many options for both initial and secondary treatments for patients with CML. I'm also encouraged by the arrival of newer drugs such as ponatinib to further manage resistant tumors.

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When imatinib was introduced in 2001, it revolutionized the treatment of CML. Now, newer medications such as dasatinib, nilotinib, recently approved bosutinib (Bosulif), and ponatinib may be even more effective than imatinib, changing the way people with newly diagnosed CML are treated in the future. Ponatinib has been submitted for approval to the U.S. Food and Drug Administration (FDA).

Dasatinib for Newly Diagnosed CML

It appears that dasatinib does a better job of treating people with newly diagnosed CML than imatinib, according to updated results from the DASISION clinical trial. More than 500 patients took part in this study, with half receiving dasatinib and

the other half receiving imatinib. Three years after treatment, the cancer was nearly or completely gone in more people treated with dasatinib than with imatinib. Also, fewer people in the dasatinib-treated group had cancer that advanced to a more aggressive stage than in the imatinib-treated group.

What Patients Need to Know

Dasatinib is usually used as a secondary treatment for people whose CML no longer responds to imatinib or who are unable to take imatinib because of side effects they experience. Researchers are very encouraged to see that the benefits of dasatinib also extend to those with newly diagnosed CML. According to these long-term results from the DASISION study, researchers were able to tell as early as three months into treatment with dasatinib whether the drug was effective.

Dasatinib for Resistant CML

For people whose CML does not respond or no longer responds to imatinib, dasatinib is an effective treatment alternative. Approximately 200 patients with resistant CML were treated with dasatinib for six years. More than 70 percent of them are still alive. In addition, six years after treatment, the cancer did not continue to grow in nearly half of the survivors. The cancer advanced to a more aggressive stage in only 6 percent of these patients.

What Patients Need to Know

This study is the longest follow-up of a second-generation drug for treating people with CML that is resistant to imatinib. Researchers are encouraged by these long-term results with dasatinib. They also have discovered that the side effects tend to reduce over time. From people whose treatment has been ongoing for years, researchers are learning important lessons on how best to treat resistant CML.

Nilotinib in Newly Diagnosed CML

According to the three-year follow-up results of a clinical trial known as the ENESTnd study, nilotinib continues to prove more effective than imatinib in treating people with newly diagnosed CML. More than 840 patients took part in this clinical trial. One-third of them received imatinib, and the other two-thirds received one of two doses of nilotinib. Three years after treatment, the cancer disappeared in nearly three-quarters (70 percent to 73 percent) of those who were treated with either dose of nilotinib. Of those treated with imatinib, the cancer disappeared in a little over half (53 percent). In addition, more patients treated with nilotinib than with imatinib were still alive three years later.

The benefits of nilotinib were also seen in a subgroup of patients from the ENESTnd study. This subgroup included people whose cancer had originally responded to treatment with imatinib but who still had few signs of cancer after two years. They then either continued on imatinib or switched to nilotinib. Twelve months later, cancer disappeared in twice as many patients who switched to nilotinib compared with those who received continued imatinib treatment (13 percent versus 6 percent).

What Patients Need to Know

Nilotinib has already been approved by the FDA as a first-time treatment for people with CML. Based on the results of the ENESTnd trial, researchers now think that nilotinib may be superior to imatinib for treating people with CML. A second-generation drug designed to better treat CML, nilotinib and others in its class were developed for resistant cancers. But now they are proving better as first-time treatments. More

research is needed to identify how to use these medications effectively.

Ponatinib in Resistant CML

A new drug called ponatinib is a promising treatment for people with CML and perhaps other types of leukemia that may no longer respond to available medications. In the PACE clinical trial, 350 patients with CML received ponatinib. All of these people had leukemia that had become resistant to available drugs such as imatinib, dasatinib, or nilotinib. In more than half of these patients, the cancer responded to ponatinib. In patients with chronic-phase CML, about half of them had a significant reduction of cancer in the bone marrow. Researchers report that the results seemed to improve over time.

What Patients Need to Know

Ponatinib is a third-generation drug in the same family as the older drugs imatinib, dasatinib, and nilotinib. The promising results seen with ponatinib clearly show how much progress has been made in research on leukemias with the Philadelphia chromosome. (This chromosome is a rearranged piece of DNA [genetic material] that is associated with CML and other forms of leukemia.) It has now become possible to treat leukemia that has been highly resistant to all prior treatments, including those with the T315I mutation. This mutation, or gene change, makes leukemia resist drugs such as imatinib. These advances in treatment for people with CML may mean that a cure for this cancer is within reach.

Lung Cancer

The 2012 ASCO Annual Meeting highlighted the power of genetic information in making better choices for individual lung cancer patients. Many of the reports at the meeting pointed to the importance of testing tumors at the time of diagnosis for the "drivers" of cancer within the tumor cells. Newer medicines are designed to block these drivers to destroy the cancer cell. For example, there have been promising reports on crizotinib (Xalkori) and afatinib for people with specific subtypes of non-small cell lung cancer. Testing tumors for the gene mutations (changes) that define these tumor subtypes has now become a standard of care. Doctors from smaller community-based practices to large hospitals are embracing the need to do this testing. It is a step toward personalized medicine in which we use all of the information available to choose the best treatment for each person.

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Testing Lung Tumors for Sensitivity to *EGFR* Blockers

Recent studies have shown that testing people with lung cancer for the presence of certain genetic mutations, or changes, can help doctors select the right treatment with the best chance of success for the right person. Mutations in the epidermal growth factor receptor gene *(EGFR)* are present in 10 percent to about 25 percent of non-small cell lung cancer (NSCLC) tumors.

In one study, tissue from 1,500 lung cancers was tested for a gene mutation in a spot called *EGFR* exon 20. Of these cancers, 32 had the *EGFR* exon 20 mutation, which seemed to be more common in people who had never smoked. Researchers believe that lung cancer that tests positive for the *EGFR* exon 20 mutation may not respond to targeted drugs such as erlotinib (Tarceva) or gefitinib (Iressa). In such cases, other targeted treatments (or perhaps chemotherapy) may be a better choice. People with more common mutations in exon 19 and exon 21 are much more likely to benefit from erlotinib or gefitinib.

In another study, researchers found that some people with lung cancer who had a different version of the *EGFR* exon 20 mutation may benefit from the targeted treatments erlotinib and gefitinib. They realized that not all lung cancers with *EGFR* exon 20 mutations resist treatment with these targeted medications. The more doctors learn about these different *EGFR* mutations, the better they will become at selecting the right treatment for the right person with lung cancer.

What Patients Need to Know

Testing for genetic mutations (such as those in the *EGFR* gene) and tailoring treatment accordingly has become a standard of care for people with lung cancer. Researchers advise doctors to test their patients for such genetic mutations at the time lung cancer is diagnosed. The information learned from such testing can guide doctors in making the best treatment choices. Sometimes, chemotherapy must be started before the results of these tests are known. If that happens, the test results can be used to guide treatments given later. If the chemotherapy is working, it does not need to be stopped, even if a mutation is identified. Even in the age of personalized medicine, chemotherapy is still an important

part of lung cancer treatment. Currently, there are about eight different targets in lung cancer for which treatments are available, and more are being studied every day. This effective approach to treatment goes by a number of names, including personalized (or individualized) medicine, tailored treatment, and targeted treatment.

Identifying Driver Mutations in Squamous Cell Cancers of the Lung

According to recent studies, several types of genetic mutations were found in more than 60 percent of squamous cell lung cancer (SqCLC) samples. Researchers believe that the more they learn about such genetic mutations in SqCLC, the better they will be able to target them with effective treatments.

In one study of people with advanced-stage lung cancer, testing for genetic mutations was done on SqCLC tumor tissue samples of 40 patients taking part in a clinical trial. Of the 28 patients whose samples have been evaluated so far, an *FGFR1* gene mutation was found in 25 percent, and a *PIK3CA* gene mutation was found in 11 percent. A *PTEN* gene mutation was also noted in 20 percent of 15 patients whose SqCLC samples were studied by a different technique.

As part of the Cancer Genome Atlas project, another study of tumors was conducted from 178 patients with earlier stages of lung cancer. Researchers found *FGFR1* gene mutations or amplifications (extra amounts) in 15 percent, *PIK3CA* gene mutations in 16 percent, and *PTEN* gene mutations in 15 percent. Another gene known as *CDKN2A* was found to be altered in 72 percent of tumors tested.

What Patients Need to Know

After adenocarcinoma, SqCLC is the second most common type of lung cancer, making up about 30 percent of all cases. Researchers now know that testing for genetic mutations in people who have SqCLC will soon be as important as testing in people who have adenocarcinoma of the lung. Some of these identified mutations, also known as driver mutations, may be responsible for the growth of many SqCLCs, making these drivers a target for treatment. Although this type of research is a work in progress, the information being learned through such genetic testing will help doctors better treat people with this type of lung cancer in the future.

Crizotinib for Advanced NSCLC

NSCLC that has the *ROS1* gene change may be more likely than many types of NSCLC to respond to crizotinib. The

ROS1 gene mutation promotes the growth of lung tumors and may play a part in their spread to other organs. In a small clinical trial, 13 people with advanced NSCLC and the *ROS1* gene mutation received crizotinib. The tumor completely disappeared or shrank by more than 50 percent in seven of these people. Most of these responses were seen within about seven to eight weeks of treatment.

What Patients Need to Know

Crizotinib has been approved by the U.S. Food and Drug Administration (FDA) to treat people with advanced NSCLC who have the *ALK* gene mutation. The results of this small study now suggest that crizotinib may also benefit people with advanced NSCLC who have the *ROS1* gene mutation. This is another example of the importance of testing for different mutations in people with lung cancer. However, larger studies with more patients are needed to confirm the promising results with *ROS1*.

Afatinib for Advanced Lung Cancer

The new targeted drug afatinib appears to be a more effective treatment than chemotherapy for people with advanced NSCLC that has *EGFR* gene mutations. A total of 345 people took part in a large clinical trial called the LUX-Lung 3 study. Two-thirds of these patients received afatinib, and one-third received the chemotherapy drugs pemetrexed (Alimta) and cisplatin.

It took longer for the tumor to start growing again in those treated with afatinib than in those treated with pemetrexed and cisplatin (11.1 months versus 6.9 months). The results were even better in people who had common *EGFR* gene mutations in exon 19 and exon 21. In addition, the tumor

significantly shrank in 56 percent of those who received afatinib, compared with 23 percent of those who received chemotherapy. The most common side effects with afatinib were diarrhea (in 95 percent of those treated with the drug), skin rash (62 percent), and skin infection that occurred around the nails (57 percent). The most common side effects with chemotherapy were nausea (66 percent), decreased appetite (53 percent), and vomiting (42 percent).

What Patients Need to Know

The LUX-Lung 3 study is one of the first in which people with lung cancer and *EGFR* gene mutations received afatinib. Researchers are encouraged by the fact that afatinib was more effective than the combination of two chemotherapy drugs used most often for this type of cancer. Approximately 38,000 Americans are diagnosed with *EGFR* mutation-positive lung cancer each year. In the near future, afatinib may be an effective treatment alternative for these people. Similar studies have previously been presented with the drugs erlotinib and gefitinib. In all of these trials, the results have been similar: Compared with chemotherapy, the treatments that target *EGFR* gene mutations were more effective in destroying the tumor and increasing the time before the tumor grew again. However, starting with chemotherapy first and then switching to the *EGFR*-targeted drug later is also an effective strategy. If the *EGFR* gene mutation status is not known, it is better to start with chemotherapy.

Continued Treatment With Pemetrexed for Advanced NSCLC

People with advanced NSCLC who were treated with additional pemetrexed after a first treatment with pemetrexed and cisplatin lived an average of three months longer than

those who were not treated with the extra pemetrexed (13.9 months versus 11 months). Nearly 540 patients who had advanced NSCLC that did not continue to grow after initial treatment with pemetrexed and cisplatin took part in the PARAMOUNT study. Two-thirds of these patients then received additional pemetrexed, often referred to as maintenance therapy, and the others did not. Maintenance therapy is treatment that is given, perhaps for a long time, to keep cancer from coming back after it has shrunk or stopped growing following first-time treatment. Pemetrexed has already been approved by the FDA as maintenance therapy for people who have advanced NSCLC.

What Patients Need to Know

Researchers consider the updated results from the PARAMOUNT study good news for people with advanced NSCLC. In 2011, the original results of PARAMOUNT were released. They showed that people with advanced NSCLC who received pemetrexed maintenance therapy after initial

treatment with pemetrexed and cisplatin lived longer without the cancer continuing to grow than those who did not receive maintenance therapy. Now they know that maintenance therapy with pemetrexed can also help these people live longer even after the cancer has started to grow again and patients go on to other therapy. Based on these encouraging results, the way in which people with advanced NSCLC are treated may change to include pemetrexed maintenance therapy.

Erlotinib for Resistant Advanced NSCLC

People with advanced NSCLC that no longer responds to treatment with gefitinib or erlotinib may benefit from re-treatment with one of the same drugs after a break from treatment (averaging 11 months). According to a small study of 19 people with advanced NSCLC, the tumor shrank in nearly 85 percent of them after re-treatment with erlotinib. It took about 10 months before the cancer began to grow again.

What Patients Need to Know

At first, people who have advanced NSCLC and *EGFR* gene mutations may respond to medications such as gefitinib or erlotinib. However, for many of these people, their cancer eventually no longer responds to these drugs. Researchers are encouraged by the benefits of re-treatment with erlotinib or gefitinib after a break from treatment in these patients. This treatment approach will be studied further in people with advanced NSCLC who do not have *EGFR* gene mutations to see whether they may benefit as well. There are also many drugs and drug combinations being studied in patients whose tumors have *EGFR* gene mutations and are no longer responding to erlotinib or gefitinib.

Immunotherapy for Lung and Other Cancers

Immunotherapy that targets the PD-1 pathway may be a promising way to treat several different cancers that no longer respond to other treatments, including NSCLC, kidney cancer, and melanoma (skin cancer). A pathway is a series of actions among molecules in a cell. In the case of the PD-1 pathway, these actions result in the growth of tumors and an ability to resist the immune system. Immunotherapy is treatment that uses the body's immune system to help fight cancer.

Recent studies have tested two related anti-cancer drugs that target the PD-1 pathway—anti-PD-1antibody and anti-PD-1L antibody. In one study, anti-PD-1antibody was given to 240 people with advanced tumors. Seventy-five of the patients had NSCLC. The tumors shrank in about one-fifth of these patients. Many of these responses lasted for at least one year. In another study, anti-PD-1L antibody was given to 162 people with advanced cancer. Fifty of these patients had NSCLC. The tumors shrank in several patients with NSCLC. Again, some of the responses lasted for at least one year.

What Patients Need to Know

Researchers have long sought to harness the immune system in the treatment of cancer. Immunotherapy through the PD-1 pathway is one example of how to do just that. Scientists believe that immunotherapy may be beneficial when used alone or perhaps with chemotherapy and targeted treatments. These promising yet early results with both drugs suggest that further studies in more people with different types of tumors should help doctors learn how best to use immunotherapy to treat cancer in the future.

Lymphoma

At the 2012 ASCO Annual Meeting, the lymphoma studies focused on how to figure out who will benefit the most from each medicine. If we know a particular drug will not work well in people with a certain type of lymphoma, we can spare those patients unnecessary or ineffective treatment. For example, we now know that a more aggressive type of chemotherapy is not better for most people with advanced Hodgkin's lymphoma. For people with follicular lymphoma that has returned, we heard some encouraging results on a combination of drugs that benefits them and may be useful as a first-time treatment of this disease.

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Bendamustine Plus Rituximab for Non-Hodgkin's Lymphoma

The combination of bendamustine (Treanda) and rituximab (Rituxan) appears to be a very effective way to treat people who have non-Hodgkin's lymphoma (NHL), particularly slow-growing (also called indolent) types such as follicular lymphoma. Researchers compared two groups of people with different types of slow-growing NHLs. The first group (261 patients) received bendamustine plus rituximab. The second group (253 patients) received standard chemotherapy plus rituximab. It took more than twice as long for the tumor to start growing again in the first group than in the second group (69.5 months versus 31.2 months). However, there did not seem to be a difference in survival between the two groups.

The standard chemotherapy that patients received in this clinical trial was CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone). None of the people in this study had been treated previously for their lymphoma.

What Patients Need to Know

This was one of the top studies presented at this year's ASCO meeting. In the past, doctors were not exactly sure how best to treat people with slow-growing lymphomas such as NHL. Now they know that bendamustine and rituximab is another treatment option available that is at least equal to and perhaps better than standard chemotherapy and rituximab. Importantly, patients tolerated the new treatment better and generally experienced fewer side effects. For example, patients treated with bendamustine did not lose their hair, as did those treated with CHOP. Many researchers now believe that this new combination of drugs should be the preferred treatment for some people with newly diagnosed NHL to delay the return of their cancer.

Comparing ABVD and BEACOPP Chemotherapy for Hodgkin's Lymphoma

People with advanced Hodgkin's lymphoma (HL) did not appear to benefit from a more aggressive chemotherapy treatment called escalated BEACOPP. Researchers came to this conclusion after comparing people who received escalated BEACOPP with those receiving the standard chemotherapy treatment known as ABVD. Nearly 550 patients with advanced HL took part in a clinical trial to study these two treatments. BEACOPP was no more effective than ABVD in preventing or delaying the complications of advanced HL and did not help patients live longer with their cancer.

BEACOPP is made up of seven chemotherapy drugs: bleomycin, etoposide, doxorubicin, cyclophosphamide, vincristine, procarbazine (Matulane), and prednisone. ABVD is made up of four chemotherapy drugs: doxorubicin, bleomycin, vinblastine, and dacarbazine (DTIC-Dome and others).

What Patients Need to Know

In people who have high-risk HL, previous studies had suggested to researchers that the more intensive chemotherapy of BEACOPP might benefit them more than the standard ABVD chemotherapy. According to the results of this recent trial, patients with advanced high-risk HL could do just as well in the long term with ABVD chemotherapy. And, as a result, there is no clear need to expose these patients to the extra side effects that come with the stronger BEACOPP. Such "negative results" are seen as helpful in guiding decisions about which treatment might be best for a given person with cancer.

Lenalidomide Plus Rituximab for Recurrent Follicular Lymphoma

The combination of lenalidomide (Revlimid) and rituximab seems to be more effective than rituximab alone in treating follicular lymphoma and other slow-growing lymphomas that no longer respond to other treatments. In a clinical trial, 45 patients who received lenalidomide alone were compared with 44 patients who received lenalidomide plus rituximab. The tumor disappeared or shrank in 75 percent of those who received the combination treatment, compared with 49 percent of those who received lenalidomide alone. The two groups experienced similar side effects.

What Patients Need to Know

Based on these early study results, the combination of lenalidomide and rituximab may be a reasonable treatment option for certain people whose follicular lymphoma has returned. These medications work differently than chemotherapy. They belong to a class of drugs referred to as biological therapy. Such treatments boost or restore the ability of the immune system to fight cancer (as well as infections and other diseases). By taking lenalidomide plus rituximab, people with follicular lymphoma that has returned may be able to avoid, or at least delay, using chemotherapy and experiencing its side effects.

Researchers are so encouraged by these results that lenalidomide plus rituximab is also being studied as an initial treatment in people with follicular lymphoma and other types of slow-growing lymphomas. Lenalidomide is a cousin of an older drug called thalidomide (Thalomid). Both of these drugs have been approved by the U.S. Food and Drug Administration for the treatment of multiple myeloma, a type of blood cancer.

Melanoma

The 2012 ASCO Annual Meeting was exciting for melanoma research. For people whose melanoma has advanced and spread, we have promising new treatment tools. We heard reports about our increasing knowledge of the genetic makeup of tumors. Understanding the mutations, or changes, in cancer genes that drive tumors has enabled researchers to find the right drugs to block cancer cell growth. This is opening the door to personalized medicine—that is, tailoring treatment for each patient. In addition, an encouraging report on the use of vaccines showed how we can boost the strength of the body's own immune system to fight cancer.

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Vemurafenib for Melanoma With a *BRAF* Mutation

According to updated results from the BRIM-3 clinical trial, the new targeted treatment vemurafenib (Zelboraf) seems to be more effective in helping people with a certain type of melanoma to live longer than the older drug dacarbazine (DTIC-Dome and others). More than 650 people who have melanoma with the *BRAF*^{V600E} gene mutation were treated with either vemurafenib or dacarbazine. Approximately 12 months after treatment, 55 percent of those who received vemurafenib had survived, compared with 43 percent of those who received dacarbazine. Vemurafenib helped patients live nearly four months longer than treatment with dacarbazine (13.2 months versus 9.6 months).

What Patients Need to Know

BRAF^{V600E} gene mutations are found in approximately half of people with skin melanomas. Researchers are encouraged by these long-term results with vemurafenib in those who have this type of melanoma. The BRIM-3 study shows that understanding the genetics of tumor cells can help doctors choose the right medication, tailored to attack a specific gene mutation in the tumor. Vemurafenib was approved by the U.S. Food and Drug Administration in the summer of 2011. It could become the new standard of care for people who have melanoma with the *BRAF*^{V600E} gene mutation. Future clinical trials will study the use of vemurafenib in combination with other targeted drugs in the hope of improving outcomes even more in people with advanced melanoma.

Trametinib for Advanced or Metastatic Melanoma With a *BRAF* Mutation

Trametinib is a new type of treatment that seems to be more effective than standard chemotherapy for people who have advanced or metastatic melanoma and the *BRAF*$^{V600E/K}$ gene mutation. (Both advanced and metastatic cancers have spread to other parts in the body from their original site.) More than 320 people with this type of melanoma took part in the METRIC clinical trial; 275 of the patients tested positive for the *BRAF*$^{V600E/K}$ gene mutation. Two-thirds of all the patients received trametinib, and the other third received the chemotherapy drugs dacarbazine and paclitaxel. It took longer for the cancer to continue growing with trametinib than with chemotherapy (4.8 months versus 1.4 months). The tumor shrank in 24 percent of those on trametinib, compared with 7 percent of those on chemotherapy.

What Patients Need to Know

In addition to vemurafenib, trametinib is another targeted treatment aimed at advanced melanoma. Trametinib is the first in a new class of drugs that target MEK, which is a substance found in melanoma cells. Blocking MEK with a drug like trametinib may stop the growth of melanoma cells. Trametinib can be given as a pill taken once a day, which makes it a convenient treatment option.

Dabrafenib Plus Trametinib for Metastatic Melanoma With a *BRAF* Mutation

According to the results of an early clinical trial, the combination of two targeted treatments—dabrafenib and trametinib—appears to be a promising way to treat people who have metastatic melanoma and the *BRAF*^{V600} gene mutation. Researchers studied several different doses of these drugs and found them to be safe. They also found that more than half of the 77 people with melanoma who were treated with dabrafenib and trametinib benefited from the treatment. The tumor completely disappeared in four patients and shrank in 39 patients. It took more than seven months before the tumor started to grow again.

What Patients Need to Know

Researchers found that the combination of dabrafenib and trametinib may prove to be a more effective treatment than either drug alone for people with metastatic melanoma and the *BRAF*^{V600} gene mutation. Also, it seems that patients who received the combination had fewer skin rashes and other skin complications than did those who received either drug separately. Dabrafenib targets the *BRAF*^{V600} gene mutation

and trametinib targets the MEK pathway, both of which contribute to the growth of melanoma. Based on these encouraging early results, this combination treatment will be studied further in more people with metastatic melanoma to find out the most effective dose for both drugs.

MEK162 for Advanced or Metastatic Melanoma

A new oral treatment called MEK162 appears to benefit people who have locally advanced or metastatic melanoma and either a *BRAF* or *NRAS* gene mutation.

Sixty-six people with locally advanced or metastatic melanoma took part in a clinical trial testing MEK162. Forty-two patients have been evaluated so far, including 29 who have the *BRAF* gene mutation and 13 who have the *NRAS* gene mutation. Of those with the *BRAF* gene mutation, the tumor shrank by more than 50 percent in seven of them. Of those with the *NRAS* gene mutation, the tumor shrank by more than 50 percent in three people. The benefit of MEK162 appeared to last for months.

What Patients Need to Know

MEK162 is the first targeted treatment to benefit people who have melanoma and the *NRAS* gene mutation. Of people with melanoma, *NRAS* gene mutations occur in 15 percent to 20 percent; *BRAF* gene mutations occur in 50 percent to 60 percent. Researchers are encouraged by these early results with MEK162 and the hope of having another drug to treat people with locally advanced or metastatic melanoma. Further studies in larger numbers of people will confirm how best to use this drug to target the genetic mutations found in

melanoma cells. Researchers hope that ultimately this type of approach will improve outcomes for people with melanoma.

Immunotherapy for Advanced Melanoma

A promising way to treat several different cancers, including melanoma, that no longer respond to other treatments is immunotherapy that targets the PD-1 pathway. Immunotherapy is treatment that uses the body's own immune system to help fight cancer. The PD-1 pathway is involved in the growth of tumor cells and their ability to resist other treatments.

Recently, early clinical trials have studied two anti-cancer vaccines that target the PD-1 pathway—BMS-936558 and MK-3475. In one clinical trial, BMS-936558 was given to 240 people with different types of cancer, 95 of whom

had advanced melanoma. The tumor shrank by more than 50 percent in nearly one-third of the patients with melanoma. Similar benefits were seen in many of the people with kidney and lung cancers as well.

In another smaller, ongoing study, different doses of MK-3475 have been given so far to nine patients (two with advanced melanoma). In one of the people with melanoma, the tumor shrank by more than 50 percent for more than six months. Similar tumor shrinkage was seen in several other people with advanced cancer.

What Patients Need to Know

Researchers have long sought to harness the immune system in the treatment of cancer. According to the early results of these studies, immunotherapy through the PD-1 pathway is a promising way to boost the immune system so that it can fight tumor cells. Researchers believe that testing people with melanoma to see whether the PD1-pathway is active in their tumors may help doctors predict whether treatments targeting this pathway will be effective for them. These promising early results with both BMS-936558 and MK-3475 suggest that further studies in more people with different types of cancer should help doctors learn how best to use immunotherapy in the future.

Ovarian Cancer

At the 2012 ASCO Annual Meeting, we heard about drugs that are being developed for ovarian cancer. For women with ovarian cancer that returns, who cannot have surgery to remove their tumor, there were several clinical trials discussing treatments, including the use of medications that "starve" the tumor by cutting off its blood supply, which might work better. We are beginning to learn how best to use these drugs. The rate at which ovarian cancer comes back has been a source of frustration for patients and doctors, but there are a number of new medications on the horizon that may increase the time before a tumor returns. The studies are still very early, but we are seeing some promise. Another report identified the most common gene mutation in ovarian cancer. Understanding more about the inner workings of these tumor cells may lead to better treatments.

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Paclitaxel and Carboplatin for Advanced Ovarian Cancer

Putting patients on a weekly schedule of paclitaxel and carboplatin seems to be more effective than giving the same drugs every three weeks. This new treatment is known as dose-dense chemotherapy.

More than 630 women with different types of advanced ovarian cancer were treated with either dose-dense or

standard chemotherapy. More than six years after treatment, the time it took for the cancer to continue growing was longer in those who received dose-dense chemotherapy than in those who received standard treatment (28.1 months versus 17.5 months). Five years after treatment, more women in the dose-dense group were alive than in the standard group.

What Patients Need to Know

Years ago, the early results with this new treatment were promising. Now, researchers are encouraged to see a continued benefit over time with dose-dense chemotherapy. Not only does dose-dense chemotherapy with paclitaxel and carboplatin stop the growth of cancer, it also helped these women live longer.

Combination Treatment With Bevacizumab for Resistant Ovarian Cancer

Two different clinical trials have shown that using bevacizumab (Avastin) in combination with chemotherapy drugs may be an effective way to treat women with different types of ovarian cancer that no longer respond to other treatments.

In the larger of the two trials—the AURELIA study—more than 350 women were treated with chemotherapy alone or bevacizumab plus chemotherapy. (The chemotherapy drugs were a type of doxorubicin [Doxil], topotecan [Hycamtin], and weekly paclitaxel.) It took longer for the tumor to grow in those treated with bevacizumab than in those who were not (6.7 months versus 3.4 months). Also, the tumor responded in more women who received bevacizumab than in those who did not (31 percent versus 13 percent).

In the smaller of the two trials, 66 women were treated with

bevacizumab and "metronomic" cyclophosphamide. The word metronomic refers to the fact that cyclophosphamide is given in low doses frequently or continuously every day—like the constant ticking of a metronome. This treatment was given to patients who had already received treatments that no longer seemed to work. The tumor disappeared or shrank in more than 40 percent of the women who received the combination of drugs. The tumor neither grew nor shrank in nearly one-quarter of the women treated. Eight women experienced side effects (such as high blood pressure and fatigue) that required they stop taking bevacizumab.

What Patients Need to Know

For many women with advanced ovarian cancer, eventually the cancer no longer responds to standard chemotherapy drugs. So researchers continue to search for better ways to treat these women. They were pleased to learn that adding bevacizumab to chemotherapy reduced by half the risk of the cancer growing in these women.

Bevacizumab is the first targeted treatment to show such a benefit in women with advanced ovarian cancer. (Targeted treatments are drugs that block certain cell activities thought to be important for the growth of cancer cells. They work differently from traditional chemotherapy.) Researchers are beginning to learn how best to use bevacizumab for women with ovarian cancer.

Ramucirumab and Lenalidomide for Resistant Ovarian Cancer

Two newer anti-cancer drugs, ramucirumab and lenalidomide (Revlimid), are showing promise as treatments for women who have different types of ovarian cancer that no longer respond to other medications. In one recent clinical trial, 60 women with resistant types of ovarian cancer received ramucirumab after receiving an average of three previous

chemotherapy treatments. In another recent study, 45 women with ovarian cancer that had returned after other treatments received lenalidomide. Women in both studies were in their early 60s.

In those whose tumors responded to ramucirumab, the time it took before their tumors began to grow or spread was six months. In the women who received lenalidomide and whose tumors responded, it took 3.8 months before the tumor continued to grow or spread. However, it took 6.4 months for the tumor to continue to grow or spread in a small group of women treated with lenalidomide whose cancer had previously responded to platinum chemotherapy.

What Patients Need to Know

Although researchers are encouraged with these results with ramucirumab and lenalidomide, it is important to remember that these studies are in a very early stage of research. The benefits for women with resistant ovarian cancer need to be confirmed in larger studies. Researchers are planning to combine lenalidomide with chemotherapy that contains a platinum drug to see whether the combination is even more effective than lenalidomide alone in these women.

Olaparib and Alisertib for Recurrent Ovarian Cancer

Olaparib and alisertib are two promising drugs showing early benefits for women with different types of ovarian cancer that no longer respond to other treatments.

More than 160 women took part in a recent study of olaparib. Approximately half of them were treated first with the combination of olaparib and standard chemotherapy drugs (paclitaxel and carboplatin). Then they received

additional olaparib. The other half was treated first with paclitaxel and carboplatin and then no additional treatment. It took longer for the tumor to return in the group that received olaparib than in the group that did not (12.2 months versus 9.6 months).

In the smaller alisertib study, different doses of the new drug were studied in 28 women with ovarian or breast cancer, who also received paclitaxel. This is a very early clinical trial, but so far, alisertib has shrunk the tumor in eight women (nearly 30 percent). In three patients, the tumor did not grow or shrink. An ongoing study is aimed at finding the most effective dose of this drug for women with ovarian or breast cancer.

What Patients Need to Know

Although researchers are at a very early stage of study, they are pleased with the results on olaparib and alisertib in combination treatments for ovarian cancer. Olaparib belongs to a promising class of targeted treatments called PARP inhibitors, which block a cancer cell's ability to repair itself when damaged by radiation or chemotherapy. Alisertib belongs to an even newer class of drugs called aurora A kinase (AAK) inhibitors. These drugs target enzymes that help cancer cells to grow.

The alisertib study is the first clinical trial to test an AAK inhibitor in combination with paclitaxel. Both types of drugs are also being studied in women with breast cancer. So far, it seems that both olaparib and alisertib may improve the effectiveness of other treatments. But more studies in larger groups of women with ovarian cancer are needed to confirm these results and to find out whether the drugs can help these women live longer.

Prostate Cancer

There is much progress patients have to look forward to in prostate cancer treatment. Many of the drugs that have been approved by the U.S. Food and Drug Administration (FDA) are intended for use once the disease has progressed beyond the control of hormonal therapy. However, as we saw at the 2012 ASCO Annual Meeting, some of these new drugs may be used much earlier in the course of the disease to improve treatment. For many people, there will be a pill to take that enables them to go on with their lives and live fully with fewer side effects. Also discussed at the meeting was an effective pain treatment for prostate tumors that spread to the bone, which is very important for men with advanced disease.

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Abiraterone as Initial Treatment in Metastatic Prostate Cancer

According to the results of a large clinical trial, combining the new drug abiraterone (Zytiga) and an older drug, the steroid prednisone, appears to be an effective way to treat men with prostate cancer that has spread (is metastatic) and has resisted castration. (Because the male hormone testosterone drives prostate tumors, treatment can include castration—that is, either the surgical removal of the testicles or the use of medicines to suppress the function of the testicles.)

More than 1,000 men took part in this study, which compared abiraterone plus prednisone with a placebo

plus prednisone. (A placebo is a look-alike medication with no active ingredient.) All of these patients had no or few symptoms and had not already received chemotherapy for their advanced prostate cancer. The use of abiraterone delayed the time before patients needed to start chemotherapy (25 months with abiraterone versus 16.8 months without it). As a result, the abiraterone and prednisone study was stopped so that all of the men could receive abiraterone plus prednisone.

What Patients Need to Know

In 2011, abiraterone in combination with prednisone was approved by the FDA for the treatment of late-stage metastatic prostate cancer that no longer responded to other treatments, specifically docetaxel (Taxotere and others). For this reason, researchers believed that the combination would also be effective for men with earlier stage prostate cancer. These early study results seem to show they were right. Abiraterone works by helping to prevent the body from making testosterone, which in turn can prevent the cancer from spreading. Researchers plan to follow these patients longer to learn whether the new combination can extend their lives.

Enzalutamide for Metastatic Castration-Resistant Prostate Cancer

According to the results of a clinical trial known as the AFFIRM study, a new hormone-type drug called enzalutamide may be beneficial for men with advanced prostate cancer. Nearly 1,200 men whose cancer had continued to grow after chemotherapy that included docetaxel were treated with enzalutamide or with a placebo. Patients in the enzalutamide group lived longer than did those in the placebo group

(18.4 months versus 13.6 months). As a result, researchers offered the men who had received a placebo the chance to receive enzalutamide.

What Patients Need to Know

Researchers are comparing enzalutamide with bicalutamide (Casodex), another anti-cancer drug used to treat metastatic prostate cancer, in a study called TERRAIN. Like bicalutamide, enzalutamide works by blocking testosterone in the body. These early results show that enzalutamide is a safe way to treat this type of cancer and may prove to be useful at a much earlier stage of the disease. However, further research should shed more light on how best to use enzalutamide for men with prostate cancer.

Radium-223 Chloride for Metastatic Castration-Resistant Prostate Cancer

A new drug called radium-223 chloride (Alpharadin) appears to delay symptoms of cancer that has spread to the bone (such as bone breaks and bone pain). The ALSYMPCA study included more than 920 men with metastatic castration-resistant prostate cancer (mCRPC). Some patients received six injections of radium-223 chloride every four weeks, and others received placebo.

Men who were treated with the new drug lived longer than those who were not (14.9 months versus 11.3 months). In addition, the time it took for bone symptoms to appear in the men who received radium-223 chloride was 15.6 months, compared with 9.8 months in the men who received a placebo.

What Patients Need to Know

Radium-223 chloride is a new type of drug known as an alpha-radiopharmaceutical. This simply means that this radioactive drug works by carrying microscopic amounts of radium—known as alpha particles—directly to cancer that has spread to the bone. Not only does the drug seem to relieve bone pain, it also may effectively treat prostate cancer that no longer responds to hormone treatment. In another ongoing trial, radium-223 chloride is now being looked at in combination with docetaxel in men with mCRPC. Researchers are encouraged by these early results with radium-223 chloride and predict it may become a new standard of care for this type of cancer in the future.

Orteronel for Nonmetastatic Castration-Resistant Prostate Cancer

For men whose castration-resistant prostate cancer has not spread to other parts of the body, orteronel (TAK-700) may become an effective treatment, according to updated results from a small clinical trial. All of the 39 men who were treated with orteronel had castration-resistant prostate cancer and rising prostate-specific antigen (PSA) levels, a sign that often signals the return of cancer. Three months after treatment, PSA levels dropped by at least 50 percent in more than three-quarters of the men. Also, six and 12 months after treatment, the prostate cancer had not spread to other parts of the body in 97 percent of the men. The most common side effects with orteronel were fatigue (62 percent), high blood pressure (38 percent), and diarrhea (38 percent).

What Patients Need to Know

Like the already approved drug abiraterone, orteronel blocks the production of testosterone. The fact that this drug appears to be effective without using a steroid such as prednisone is good news. That's because steroids are often linked with both short- and long-term side effects. Researchers plan to continue studying the use of orteronel without a steroid in men whose resistant prostate cancer has not spread to other parts of the body.

Sarcoma

There was a great deal of interest at the 2012 ASCO Annual Meeting in how doctors can better communicate to patients the potential risks of sarcomas and ways to involve their patients in making treatment decisions. Researchers also discussed ways to predict the effectiveness of treatments for sarcoma.

Although we saw some scientific advances this year, there was no new practice-changing information reported relating to sarcoma or gastrointestinal stromal tumor (GIST), a type of sarcoma. However, researchers gave the first public presentation of a very promising drug called regorafenib (Stivarga, recently approved for resistant colorectal cancer). This medication was shown to manage GIST that is metastatic (spread to other parts of the body) and no longer responds to the currently used targeted treatments imatinib (Gleevec) and sunitinib (Sutent). If approved by the U.S. Food and Drug Administration (FDA), regorafenib would become the third drug available to treat metastatic GIST.

Unlike chemotherapy, targeted treatments like regorafenib are designed to destroy cancer cells selectively, which means they may spare healthy cells, hopefully causing fewer side effects. At the ASCO meeting, we heard about research on a number of new targeted treatments for sarcoma.

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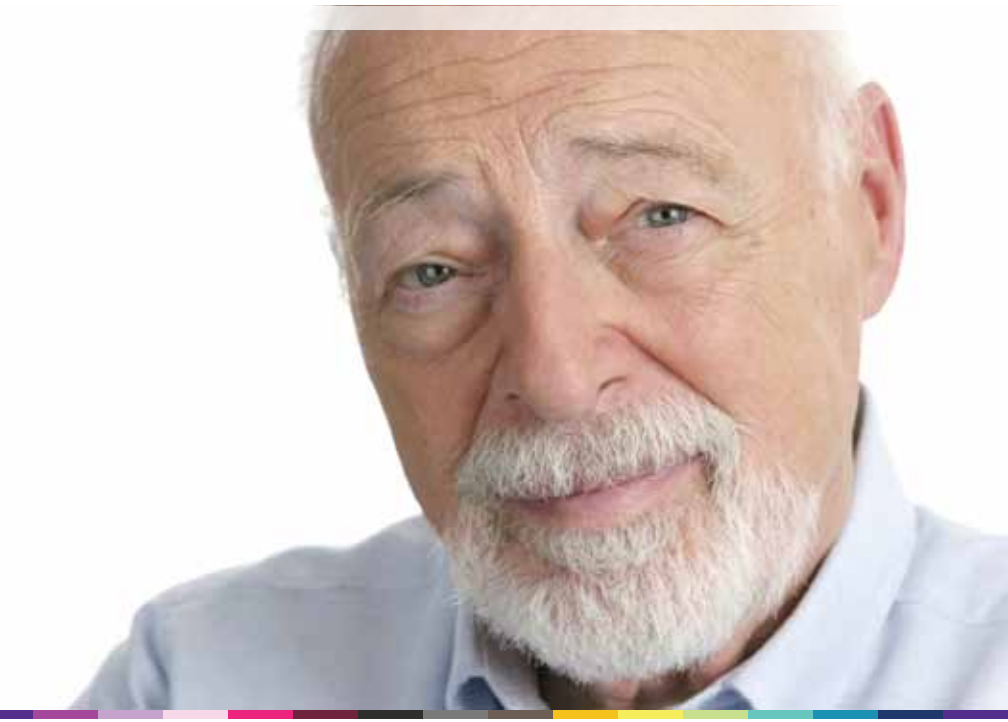
Regorafenib for GIST

A new oral pill called regorafenib appears to be an effective treatment for metastatic GIST. The current standard of treatment for this type of sarcoma is surgery if possible. If surgery is not possible, or if the disease has returned after surgery, then patients usually are treated with oral drugs that keep the cancer cells from growing. The first drug given is usually imatinib, and if the GIST develops resistance to that, then sunitinib is given.

A recent clinical trial compared regorafenib with placebo (a look-alike inactive substance) in more than 230 patients with advanced GIST that had spread or could not be removed with surgery. For all of these patients, imatinib and sunitinib had been given; resistance had developed, and the GIST continued to grow. In people who received regorafenib, the



time it took for the GIST to continue growing was nearly five months. In those who received a placebo, the GIST started growing again much more quickly, in less than one month.

Six months after treatment started, the GIST was still controlled in 38 percent of those who received regorafenib, whereas the tumor grew in every patient who started on a placebo.

What Patients Need to Know

This clinical trial included a safety check: patients who received a placebo and whose GIST got worse were given regorafenib. The results showed that for people whose GIST developed a resistance to imatinib and then sunitinib, regorafenib may offer an effective option. Regorafenib works somewhat differently from imatinib and sunitinib, which may be the reason for these positive results. Although regorafenib was recently approved by the FDA for resistant colorectal cancer that has spread to other organs, doctors hope that the agency will also approve the drug for treatment of GIST.

Cixutumumab and Temsirolimus for Resistant Sarcomas

Combining two targeted treatments—the new drug cixutumumab (also called IMC-A12) and another drug called temsirolimus (Torisel), which is approved for the treatment of kidney cancer—may be an effective way to treat different types of metastatic sarcomas that no longer respond to other medications.

In a recent clinical trial, 170 people with resistant sarcomas received the combination of IMC-A12 plus temsirolimus. The patients were divided into three groups, depending

on whether their sarcoma was in soft tissue or in bone and whether the tumors contained receptors, or "doorways," on the cell surface for a protein called insulin-like growth factor-1 (IGF-1). Tumors with the receptors are called IGF-1R positive (+); tumors without the receptors are called IGF-1R negative (–). Laboratory studies have shown that IGF-1 helps cancer cells to grow, but it has to enter through a receptor to relay the growth message.

Researchers found that after 12 weeks, the cancer was not growing in around 32 percent to 43 percent of the patients, depending on which group they were in. The three groups broke out like this:

- Group A: IGF-1R+ soft-tissue sarcoma (32 percent of tumors were not growing)
- Group B: IGF-1R+ bone sarcoma (38 percent)
- Group C: IGF-1R– bone and soft-tissue sarcoma (43 percent)

What Patients Need to Know

Temsirolimus is used to treat people who have advanced kidney cancer. A targeted treatment, it blocks the actions of mTOR, a substance that acts like a master switch, "turning off" different mechanisms that promote cancer growth. IMC-A12 blocks the growth signal from IGF-1R. The combination of temsirolimus and IMC-A12 may slow the growth of tumors. Many researchers have been enthusiastic about drugs that block IGF-1R, and further studies of this combination treatment are needed to confirm these early results.

Pazopanib for Advanced Sarcoma

Based on the updated results of a well-known international clinical trial called the PALETTE study, pazopanib (Votrient) was approved in 2012 as an effective treatment for people with advanced sarcoma after standard chemotherapy no longer worked. However, it is not yet clear which patients or which forms of sarcomas might benefit the most from pazopanib.

In the PALETTE trial, nearly 370 patients with advanced sarcoma whose tumors no longer responded to other treatments received either pazopanib or a placebo. Those who received pazopanib lived slightly longer than those who did not receive the drug (12.5 months versus 10.7 months). Researchers also learned that the number of previous treatments, age, gender, and ethnicity did not appear to predict who among these patients would benefit the most from this drug.

What Patients Need to Know

Pazopanib is the first new drug since 1981 that has been approved for different forms of soft-tissue sarcomas, other than those on the market for GIST. This drug is a targeted treatment that blocks the growth of new blood vessels (which tumors need to survive) and also other key cell growth mechanisms that may contribute to sarcomas. Early in 2012, pazopanib was approved by the FDA for the treatment of advanced kidney cancer. More studies of pazopanib are planned, to find out whether it might be more effective if given earlier in the course of the disease before chemotherapy stops working. Nonetheless, this new drug benefited people with different types of metastatic sarcomas, and that is good news for patients.

Predicting Outcomes in Patients With Sarcoma

Certain factors may help doctors predict how sarcoma may behave or how effective treatments might be. Examples of these factors include a person's age, as well as the tumor's size, the specific type of sarcoma, and the tumor grade (an indication of how "normal" or "abnormal" the cancer cells look under the microscope). Doctors can also use this information to predict how likely it is that the tumor might return after surgery.

In one study of more than 500 people with sarcoma, these factors proved to be important in predicting how much patients would benefit from surgical removal of the sarcoma. Another study collected information on more than 8,500 patients treated for sarcoma. According to this research, there was a greater risk that the sarcoma would return after

a period of treatment and improvement in people who had larger tumors than in those with smaller tumors.

In yet another study of nearly 500 patients with a different type of sarcoma, the likelihood of the tumor returning after surgery depended on the size and location of the tumor, as well as the patient's age.

What Patients Need to Know

There was a great deal of interest in studies like these at ASCO and what the results mean for patients. Doctors can use the results of such studies to help people with sarcoma better understand the likelihood of their tumor returning after treatment, to help choose the best treatment options, and to have the most accurate expectations for the future.

Supportive Care and Quality-of-Life Issues

At the 2012 ASCO Annual Meeting, we heard a number of encouraging reports about ways to manage various side effects that people may experience as a result of their cancer treatment. Nausea and vomiting is certainly of concern to people who receive chemotherapy. A study presented at this year's ASCO meeting described a way to relieve nausea and vomiting that occurs two to four days after chemotherapy. There was also a report on easing cancer-related fatigue with American ginseng. Pain relief is another important area in which there are some hints of progress, especially when it comes to chemotherapy-related pain, numbness, and tingling affecting the hands and feet. Another promising report focused on women with breast cancer who experience pain related to anti-estrogen treatment.

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Mayo Clinic

Olanzapine for Breakthrough Nausea and Vomiting

Results from a recent clinical trial have shown that olanzapine (Zyprexa) may be a promising way to relieve breakthrough nausea and vomiting, which occurs about two to four days after potent chemotherapy is started. Olanzapine was shown to be more effective than metoclopramide. This study included 80 patients who experienced breakthrough nausea and vomiting, with half receiving olanzapine and the other half receiving metoclopramide. Of the patients who received

olanzapine, about 70 percent had no vomiting, compared with about 30 percent who received metoclopramide.

What Patients Need to Know

Breakthrough nausea and vomiting occurs in up to 50 percent of people with cancer receiving potent chemotherapy. It can disrupt the quality of life for many patients and may make it difficult for them to receive effective chemotherapy for their cancer. Olanzapine has now been shown to be of benefit in patients with cancer who have experienced breakthrough nausea and vomiting. In people with psychological conditions, olanzapine has caused side effects when used for at least six months. However, because the drug was used for only up to three days in this study, no major side effects occurred in patients treated for breakthrough nausea and vomiting. More study is needed to learn about the usefulness of this drug for preventing and/or treating nausea and vomiting associated with chemotherapy.

Ginseng and Dexamethasone for Fatigue Related to Cancer Treatment

According to two recent studies, ginseng and dexamethasone may benefit people with cancer who experience fatigue related to their treatment. More than 350 patients took part in the first clinical trial, which compared American ginseng with a placebo (a look-alike substance that has no active ingredient). General and physical cancer-related fatigue was reduced after eight weeks in those treated with American ginseng. In the second clinical trial, dexamethasone also was found to be more effective than a placebo in reducing cancer-related fatigue in more than 80 people with advanced cancer.

What Patients Need to Know

Fatigue can be a major side effect associated with cancer treatment. It often affects newly diagnosed patients who are starting to receive chemotherapy. Fatigue can continue to affect people for a long time after they complete their chemotherapy. So, these recent trials looking at American ginseng and dexamethasone for treating cancer-related fatigue are good news. Ginseng, a product that can be found in health food stores, is not regulated by the U.S. Food and Drug Administration. There are different types of ginseng, and so patients should talk to their doctors for additional information.

Duloxetine for Peripheral Neuropathy Related to Cancer Treatment

According to a recent study, duloxetine (Cymbalta) may reduce treatment-related pain in people with cancer, specifically in the hands and feet, a condition called peripheral neuropathy. In a

trial known as CALGB 170601, more than 180 patients received either duloxetine or a placebo. Of those who were treated with duloxetine, 59 percent reported pain relief, compared with 38 percent of those who received placebo. In both treatment groups, about one-third of patients reported no improvement or worsening in their pain.

What Patients Need to Know

People with cancer who receive treatment with certain chemotherapy drugs such as cisplatin, oxaliplatin, paclitaxel, or docetaxel may experience symptoms in the hands and feet. This condition can affect people for months or years after chemotherapy is finished. This is the first study to demonstrate that a drug can help decrease chemotherapy-related peripheral neuropathy. In the future, duloxetine may prove to be a promising way to reduce such treatment-related pain.

Acetyl-L-Carnitine for Peripheral Neuropathy Related to Cancer Treatment

Researchers are still not sure whether a natural substance called acetyl-L-carnitine benefits people with peripheral neuropathy, according to the results of two separate clinical trials. In the first trial, which was conducted with 240 patients in China, oral acetyl-L-carnitine was reported to be effective in relieving this type of pain from cancer treatment. Nearly 120 people received acetyl-L-carnitine, and the others received a placebo. After 12 weeks, almost 52 percent of patients taking acetyl-L-carnitine were reported to have reduced pain, compared with approximately 23 percent of those taking a placebo.

However, in the second trial, researchers found that acetyl-L-carnitine did not perform as hoped. Patients in this trial, who

were being treated for breast cancer, were receiving paclitaxel or docetaxel. More than 400 patients received either acetyl-L-carnitine or a placebo. After 24 weeks of treatment, patients receiving acetyl-L-carnitine actually experienced an increase in treatment-related pain.

What Patients Need to Know

Acetyl-L-carnitine can be found in health food stores and has been believed to help decrease pain from chemotherapy neuropathy. These two recent clinical trials, however, offer mixed results regarding the usefulness of acetyl-L-carnitine. Further studies are required. Until then, doctors cannot be sure about whether to recommend acetyl-L-carnitine for relieving this type of nerve pain.

Vitamin D and Calcium for Side Effects Related to Treatment of Breast Cancer

Results from a recent clinical trial have shown that large doses of vitamin D_3 may decrease pain in women who are receiving drugs such as anastrozole (Arimidex and others) and letrozole (Femara and others) for their breast cancer. Patients taking these newer drugs often experience joint aches and pains. In the VITAL trial, 160 women were given letrozole plus either vitamin D_3 plus calcium or a placebo. After 24 weeks, fewer women taking the combination of vitamin D_3 and calcium had muscle and joint pain (37 percent) than did those taking a placebo (51 percent).

What Patients Need to Know

Approximately 50 percent of women with breast cancer being treated with drugs such as anastrozole and letrozole experience joint aches and pains. These complications

sometimes bother patients enough to make them unable to continue with their letrozole treatment. The results from the VITAL trial are encouraging for both doctors and their patients being treated for breast cancer. Further studies need to be performed to confirm these early benefits with vitamin D_3 and calcium.

Long-Term Treatment With Zoledronic Acid for Breast Cancer That Has Spread to Bone

Monthly injections of zoledronic acid (Zometa) are commonly given to reduce and delay bone pain and other complications due to the spread of breast cancer to the bone. Now, researchers have found that these same benefits may be obtained when this drug is given less often—every 12 weeks. In a study called the ZOOM trial, zoledronic acid was just as effective when given every 12 weeks as it was when given every four weeks, according to the results seen after one year of treatment.

What Patients Need to Know

For many women with advanced breast cancer, tumors spread to other parts of the body, such as the bone. This can lead to bone fractures (breaks) and pain and a need for radiation treatment. Drugs such as alendronate (Fosamax), ibandronate (Boniva), and zoledronic acid are all common treatments for osteoporosis. (Zoledronic acid is also used to treat cancer that has spread to the bone.) However, zoledronic acid has been associated with side effects, especially after long-term use. Researchers are encouraged by the results of the ZOOM trial, which suggest that the use of zoledronic acid every 12 weeks did not reduce the benefit of the drug. Further studies are needed to confirm these early results.

Resources

Cancer*Care*
800-813-HOPE (4673)
www.cancercare.org

American Cancer Society
800-227-2345
www.cancer.org

Cancer*Care* Co-Payment Assistance Foundation
866-55-COPAY (26729)
www.cancercarecopay.org

Cancer.Net
Patient information from the American Society of Clinical Oncology
www.cancer.net

National Cancer Institute
800-422-6237
www.cancer.gov

National Comprehensive Cancer Network
The patient website of this nonprofit alliance provides free treatment summaries and guidelines for various diagnoses.
www.nccn.com

National Library of Medicine (MedlinePlus)
www.medlineplus.gov

TO FIND OUT ABOUT CLINICAL TRIALS:

Coalition of Cancer Cooperative Groups
www.CancerTrialsHelp.org

National Cancer Institute
800-422-6237
www.cancer.gov/clinicaltrials

CANCERcare®

for Help and Hope, visit or call:

WWW.CANCERCARE.ORG

800-813-HOPE (4673)