

Improving Patient Outcomes with Cancer



Prehabilitation is defined as “a process on the cancer continuum of care that occurs between the time of cancer diagnosis and the beginning of acute treatment and includes physical and psychological assessments that establish a baseline functional level, identify impairments, and provide interventions that promote physical and psychological health to reduce the incidence and/or severity of future impairments.”¹ Further, cancer prehabilitation can help improve physical and functional outcomes that often translate to improved quality of life for cancer patients. A growing number of cancer programs offer prehabilitation services, and here’s what some of them had to say about the benefits of adding this service line.

Prehabilitation Delivers Medical Care at Diagnosis

“We need to focus on survivorship care beginning at the time of diagnosis,” says Lillie Shockney, RN, BS, MAS, director of the cancer survivorship programs at the Sidney Kimmel Cancer Center at Johns Hopkins, Baltimore, Md. “For decades, we’ve told our cancer patients to expect fatigue, to expect weakness.” Shockney notes that the historical focus has been on survival as the only benchmark of success, but patient-centered care is changing the landscape. The new goal is now “survival with good quality of life,” Shockney concludes.

While the majority of prehabilitation studies have been conducted on surgical cancer patients with intent to cure, interventions to improve physical and emotional reserve prior to the start of oncology therapy in non-surgical patients, including those with advanced cancer, may be helpful. Shockney explains, “Metastatic breast cancer is one of my specialties and something I am passionate about. Energy conservation is important. Quality of life is important. These patients should be given the same opportunities for reducing side effects and maintaining quality of life.”

B.P. was 74 years old when she was diagnosed with lung cancer at Mary Washington Hospital, Fredericksburg, Va. Because she had already suffered a stroke and was living with chronic obstructive pulmonary disease (COPD), her thoracic surgeon, Timothy Sherwood, MD, informed his patient that she had two possible treatment paths: palliative radiation therapy or potentially curative surgery. B.P. chose surgery. Dr. Sherwood routinely checks his

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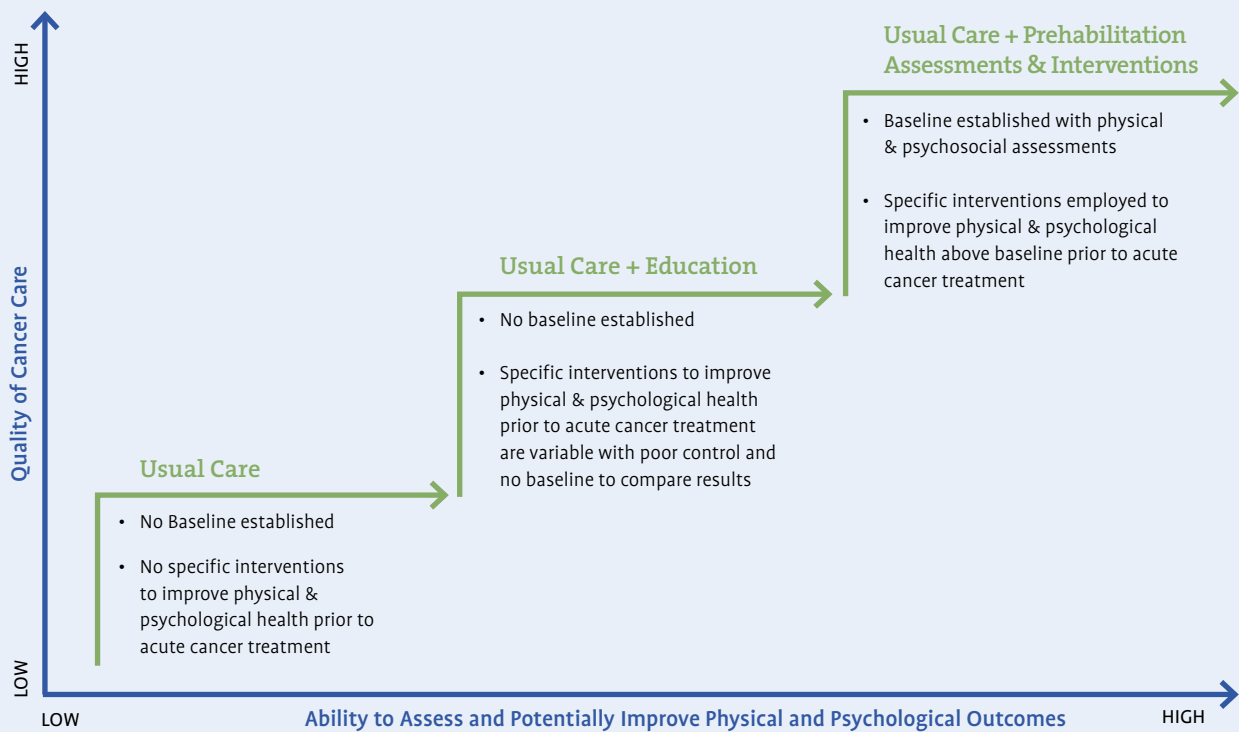
patients’ stamina during office visits by having them climb stairs, and he put B.P. to the test. After the patient walked up two flights of stairs and experienced severe breathing difficulties, Dr. Sherwood referred her for prehabilitation, believing it would help B.P. get through surgery more safely and with a faster recovery time.

Prehabilitation should be incorporated into an existing high-quality cancer rehabilitation service line and clearly defined as being distinct from “usual care,” including pre-operative testing and patient education (see Figure 1, page 40).

High-quality prehabilitation services are designed to improve physical and emotional health outcomes for a specific patient population and should work synergistically with other best practice protocols, such as peri-operative “fast track” or “early recovery” interventions developed by the Enhanced Recovery after Surgery (ERAS) Society for Perioperative Care. (Learn more at: www.erassociety.org/index.php/eras-guidelines.) Understanding what drives morbidity, decreased functional status, disability, and reduced quality of life in a given patient population is a critical part of being able to develop and deliver prehabilitation services that improve on the current level of care. So, prehabilitation is outcomes focused and data driven, but also time-based—typically occurring between diagnosis and the start of acute cancer treatments, such as surgery. Often the interventions, such as therapeutic exercise, are continued after cancer treatment begins.

The field of cancer prehabilitation is evolving rapidly, and new studies, as well as reviews and meta-analyses, have generally reported positive results. For example, one trimodal randomized control trial demonstrated that prehabilitation had a significant impact on function in colorectal cancer patients.² The study

Figure 1. Defining Prehabilitation Services as “Distinct” from Usual Patient Care



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compared two groups—one that received prehabilitation and post-operative rehabilitation and the other that received only post-operative rehabilitation. While awaiting elective colorectal surgery, patients were divided into two groups—a prehabilitation group that received a trimodal intervention before surgery and a rehabilitation group that received an identical intervention after surgery. All patients were tested using the 6-Minute Walk Test and, prior to surgery, the patients who received prehabilitation for four weeks significantly improved walking distance by an average of +25.2 meters, while patients who did not receive the trimodal intervention declined by an average of -16.4 meters. Eight weeks post-operatively, a much higher proportion of the prehabilitation group was at or above their initial 6-Minute Walk Test baseline (84 percent) compared to the rehabilitation only group (62 percent).²

Prehabilitation May Increase Cancer Treatment Options

While research demonstrates that prehabilitation can help improve physical and functional outcomes, it may also potentially increase a newly diagnosed patient’s treatment options—making curative treatment available and safe. Although Dr. Sherwood was not convinced initially that B.P. would be a good surgical candidate, he believed that if she underwent prehabilitation she likely would improve enough to safely undergo an operation to remove the cancer. To motivate her, he set the surgery date for a couple of months out and informed her that he would proceed if she improved her physical status. B.P. went to physical therapy (PT) twice a week for about a month and then three times a week for a few more weeks. She also followed the physical therapist’s recommendation for a complementary

home exercise program that included walking on the treadmill and other exercises targeted at improving her strength and respiratory muscles. B.P. had her surgery as scheduled and two days later, she was discharged to home.

Dr. Sherwood has been working closely with the Mary Washington Hospital rehabilitation team, implementing prehabilitation lung cancer protocols. He sends all of his “mid-risk” and “high-risk” patients through prehabilitation for approximately four to eight weeks, depending on their physical status at baseline. When asked about treatment delays, he says, “I would rather have my patients get through surgery safely than have a horrific post-operative outcome.” Dr. Sherwood says that as a thoracic surgeon, he’s been trained to be concerned with performance status. During the time that the patient is having prehabilitation, he says, “I am doing the staging, and I see them for several visits and monitor their progress. I have them climb two flights of stairs every time I see them, and I assess their progress.”

Often prehabilitation services can be delivered during the “window of time” between diagnosis and the start of active oncology treatment, to improve outcomes. Delays in surgery or other oncology therapies may be appropriate, especially in patients who are elderly, deconditioned, and/or have co-morbidities. Surgeons and oncologists should carefully consider patients on an individual basis and monitor them during prehabilitation, if delays are anticipated, as Dr. Sherwood described. When considering delays, it is important to do so in the context of all cancer treatment—not just surgery or whichever treatment comes first. For example, if a patient has post-operative complications, then adjuvant chemotherapy may be delayed. Similarly, if the patient has neoadjuvant chemotherapy and becomes very deconditioned, surgery may be delayed. In the end, prehabilitation may be appropriate if the patient’s clinician believes that it will help the patient tolerate all of the recommended cancer treatments with the least risk for side-effects and complications and for optimal physical and emotional outcomes.

Delays are often not necessary or appropriate. Matt LeBlanc, RN, BSN, an oncology rehabilitation nurse navigator at Anne Arundel Medical Center, Annapolis, Md., worked with his team to embed a speech therapist in the radiation department. This improved the time it takes for head and neck cancer patients to receive a consultation by more than two months. The average consultation is now given approximately one week prior to beginning radiation therapy (see Figure 2, page 42). LeBlanc says, “We set a goal that all head and neck patients would see the speech therapist either the week before or the week they started radiation. When we showed the oncologists a strategy, goal, and data, it was easy to get them on board.”

With Prehabilitation, Patients May be Healthier Post-Cancer than Pre-Cancer

Usually the expectation healthcare professionals and patients have is that the patient’s health will be worse after cancer treatment than before. Indeed, the concept of “new normal” has been extensively written about in the oncology literature and almost universally refers to a decline in health and function due to treatments—necessitating an emotional adjustment as well. However, what if directed cancer treatment, including prehabilitation, demonstrated that some patients could actually be healthier after treatment than they were at diagnosis? This is an exciting paradigm shift and one that is important to consider in both research and clinical care.

B.P. is not the only patient of Dr. Sherwood’s who felt stronger and healthier after cancer treatment than at diagnosis. Seventy-five-year-old A.H. had recently undergone a lumbar spinal fusion surgery when she was diagnosed with lung cancer in the fall of 2013. She was referred to Dr. Sherwood, and he raised the possibility of sending A.H. to a sub-acute nursing facility for rehabilitation after surgery. The mere mention of a “nursing home,” temporary or not, motivated the patient to fully participate in prehabilitation.

A.H. went to PT for six weeks (prehabilitation) and improved her physical and functional status significantly. After she underwent lung resection, A.H. had six additional weeks of PT, followed by transition to a community-based exercise program at the YMCA.

Mary Washington Hospital wrote up this patient case study and presented it at the Academy of Oncology Nurse and Patient Navigators Annual Conference in the fall of 2014, and the outcomes were subsequently published.³ Two of the validated performance tools that are frequently used in research studies include the 6-Minute Walk Test and Timed Up and Go (TUG). A.H.’s functional outcomes included a 6-Minute Walk Test baseline score of 992 feet, a score of 1,120 feet after prehabilitation (a 13 percent improvement), and a score of 1,130 feet after surgery and the additional 6 weeks of rehabilitation (a 14 percent improvement). A.H.’s baseline TUG score was 13 seconds; after prehabilitation, surgery, and post-operative rehabilitation her score was 8 seconds, which represented a 38 percent improvement. Further, A.H.’s hospital length of stay (LOS) was three days—two days less than the average five days for patients undergoing a similar surgical procedure.

As this patient case study shows, there is a subset of cancer patients that will have a “new normal” above their diagnostic baseline. These outcomes are very exciting, and may occur in other cancer populations as well. For example, the Canadian study of colorectal cancer survivors discussed earlier demonstrated improvements in physical function in some of the participants over their baseline status.²

Prehabilitation Can Improve Patient-Centered Care

Sally Luehring, MSL, RHIA, is the executive director of cancer services for the Hospital Sisters Health System—Eastern Wisconsin Division—which includes St. Vincent Hospital, Green Bay, Wisc.; St. Mary’s Hospital Medical Center, Green Bay, Wisc.; and St. Nicholas Hospital. Luehring says, “Enhancing and supporting our patients’ quality of life throughout their cancer journey is one of our service line goals.”

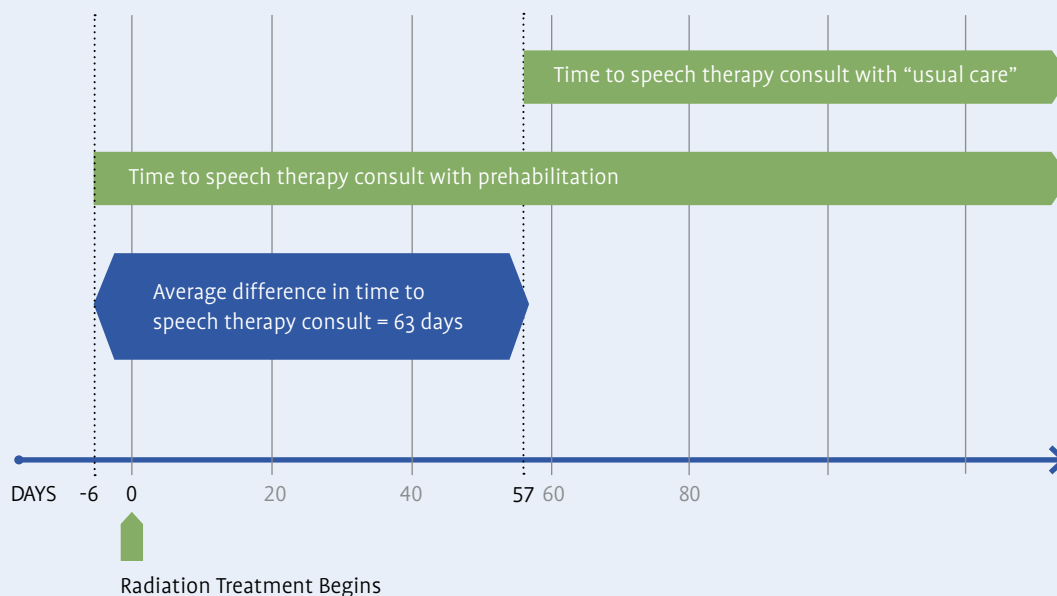
James Leenstra, MD, a radiation oncologist at St. Vincent Regional Cancer Center in Green Bay, Wisc., thinks cancer prehabilitation encourages patient-centered care because, “It helps both providers and patients see where they are functionally and more clearly identify where they want to be.”

To support its initial prehabilitation pilot, St. Vincent received a \$5,000 grant from the American Cancer Society and the Wisconsin Comprehensive Cancer Control Program. The grant supported embedding a “rehabilitation navigator” in the cancer center for a three-month period to assess newly-diagnosed cancer

patients. Megan Pfarr, DPT, CLT, is the rehabilitation navigator and spearheaded the pilot study. Newly-diagnosed patients were offered a prehabilitation assessment and could decide whether they wanted to participate. Because of the pilot grant funding, patients were not charged for this initial visit.

During the three-month period, Pfarr assessed 28 newly-diagnosed cancer patients with various diagnoses. The baseline assessment included, but was not limited to, manual muscle testing, joint range of motion, and balance testing. Examples of the validated tools included in this pilot were the 6-Minute Walk Test, FACIT-F, FACT-Cog, and Tinetti Balance and Gait Assessment Tools. Of the 28 participants, 6 (21 percent) were found to have baseline physical impairments and were referred to PT prior to the start of cancer treatment. Following treatment, reassessments revealed that 10 patients (36 percent) had decreased functional status and were referred for rehabilitation. In this pilot, the six patients who were treated with PT prior to their cancer treatment improved their functional status above baseline. This type of prehabilitation is an

Figure 2. Outcomes after Embedding a Speech Therapist in a Radiation Oncology Department*



* Data from Anne Arundel Medical Center, Annapolis, Md. Reproduced from the STAR Program and used with permission from McKesson Corporation and/or one of its subsidiaries. ©2015. All Rights Reserved.

important component of patient-centered oncology care because it helps people to maintain the highest level of function possible.

Prehabilitation Makes Financial Sense

There are many financial benefits associated with cancer prehabilitation that affect patients and their families, hospitals, and society.⁴ Further, prehabilitation supports the goals of the Institute for Healthcare Improvement's "Triple Aim" to:⁵

1. Improve the patient experience of care (including quality and satisfaction)
2. Improve the health of populations
3. Reduce the per capita cost of healthcare.

Some of the potential financial benefits with prehabilitation are obvious and some are not as intuitive. Clearly, a case can be made that prehabilitation—by reducing pain and increasing physical function—will help employed patients remain productive at work.⁶

Daniel Santa Mina, PhD, is a scientist studying the effects of prehabilitation at the Princess Margaret Cancer Centre in Canada. Recently, he and his colleagues published a systematic review and meta-analysis on whole-body prehabilitation and its impact on post-operative outcomes.⁷ Dr. Santa Mina summarized his findings in this way: "At the time of publication, we retrieved 21 trials that met our inclusion criteria and found that, compared to no prehabilitation, a majority of the studies demonstrated improved pain, length of stay, and physical function for patients that underwent prehabilitation."

Reducing hospital length of stay is an important goal in the U.S. and other countries. According to Dr. Santa Mina, "Our meta-analysis indicated that post-operative length of stay was reduced by approximately half a day."

At Mary Washington Hospital Center, Kathy Duval, SLP, and Messina Corder, RN, work closely to coordinate the prehabilitation services and track the team's outcomes. Currently, prehabilitation is demonstrating a downward trend in length of stay for surgical lung cancer patients—from approximately five days to three days.

At Johns Hopkins, Lillie Shockney experienced a similar decline saying, "I know from our own experience at Hopkins that by referring patients having DIEP flap reconstruction to prehab to learn the correct technique for core strengthening, we were able to reduce length of stay by one day and patients recovered faster. I personally had this procedure done and was back to work at four weeks post-op. I credit my prehab combined with excellent surgical care for making that possible," she said.

The Evolving Field of Cancer Prehabilitation

Many of the early cancer prehabilitation studies focused only on general exercise to improve overall fitness;¹ however, there are two important new trends in the scientific literature. The first is targeted exercises, in addition to general conditioning. For exam-

ple, in lung cancer patients, targeted exercises focus on the muscles of respiration to improve breathing and help prevent post-operative complications and hospital readmissions. In the lung cancer surgical population, pneumonia is a frequent cause of post-operative morbidity and mortality. Dr. Sherwood explains, "Patients will have pain due to their incision and if they cough, they will have more pain. This means they may take very shallow breaths and get atelectasis and are at risk for pneumonia. Targeted exercises are really important to help prevent complications."

In prostate cancer survivors, targeted exercises include pelvic floor strengthening to reduce the likelihood of significant urinary incontinence problems after surgery, and in the head and neck cancer population, the focus is on swallowing exercises.

The second trend is to include more than one modality—going beyond just general exercise and conditioning. Franco Carli, MD, MPhil, professor of anesthesia, McGill University, Montréal, Canada, has been studying surgical prehabilitation in patients with colorectal cancer. Dr. Carli was one of the researchers on the Gillis et al. study discussed earlier that used a trimodal prehabilitation approach—combining nutritional supplementation, stress reduction, and exercise.

Dr. Carli explains the reasoning behind this study approach. "In our first randomized control trial using intense exercise, we found that many of the participants were unable to sustain such efforts. Also, we found almost 20 percent of patients experienced high anxiety and depression. Finally, we did not control for nutrition, and we believed this was an important component to control together with the other elements."

According to Dr. Carli, when newly-diagnosed cancer patients increase their physical activity levels and undergo surgery, they are naturally in a catabolic state. Therefore, it makes sense to give them protein supplementation—similar to what is done with athletes. "Under-nutrition, before or after surgery, is associated with higher mortality, morbidity, and costs, and delayed recovery after abdominal surgery. This implies that nutrition ought to be considered in the perioperative period."

Implementing High-Quality Prehabilitation Services

Building a high-quality cancer rehabilitation service line is an essential step in offering prehabilitation services, because baseline assessments will undoubtedly uncover physical impairments that need to be addressed by professionals. One resource available to cancer programs is STAR (Survivorship Training and Rehabilitation) Program[®] Certification, which provides hospitals, cancer programs, and group practices with the training, protocols, and clinical support needed to deliver evidence-based and best practices cancer rehabilitation services.

During the implementation phase of a STAR Program, teams initially focus on building the rehabilitation service line, and when that is established, they can turn their efforts to prehabilitation.

For example, Kathleen Michie, PT, MT, CLT, the oncology services program manager for Poudre Valley Hospital, Fort Collins, Colo., (affiliated with the NCI-designated University of Colorado Cancer Center) is embedded in the oncology department. She and the outpatient rehabilitation manager, Kerri Applegate, PT, are leading a four-phase process to implement prehabilitation. The first phase was to establish a pilot multidisciplinary survivorship clinic, including a nurse practitioner, physical therapists, an oncology social worker, and a massage therapist. The pilot began in November 2013 and focused on the subset of survivors with various types of cancer who were treated with curative intent and had completed active therapy. After one year, 102 patients were assessed and given survivorship care plans. Eighty of the 102 participants (78.4 percent) had further physical therapy. Forty patients (39.2 percent) had follow-up mental health services. Patient reported outcomes revealed that the most significant improvements were in activities at home (24 percent), employment (23 percent), feelings of isolation (19 percent), and fatigue (17 percent).

Phase 2 is designed to expand this successful pilot to other sites. Phase 3 will pilot the STAR Program Prehab, and Phase 4 will expand the prehabilitation services. Michie says, “When we ask our patients how we could improve their experience they tell us they wish they had started sooner.” Applegate agrees, “Now that we have integrated rehab into the ongoing management of cancer survivors, we are eager to implement a model of prehabilitation that focuses on improving the outcomes of patients.”

Even with research support, it often takes many years to incorporate new concepts into clinical care. STAR Program Prehab, an evidence-based best practices model for cancer prehabilitation, is designed to quickly translate important new research into its practice model. STAR Program Prehab uses a five-prong multimodal approach: general exercise for conditioning, targeted exercise based on the cancer diagnosis, stress reduction strategies, nutrition, and smoking cessation (see Figure 3, right).

Evaluating what services are already in place and determining whether there are synergies that may be easily incorporated into high quality prehabilitation care is the first step in implementation of STAR Program Prehab. This data informs the entire process, and what many STAR Program teams have learned is that the services that are already in place may not be ideal for oncology patients. For example, many hospitals offer conventional pulmonary rehabilitation; however, this may not be ideal for newly-diagnosed lung cancer patients.

Dr. Sherwood highlights some of the problems associated with using services that are not specifically developed for oncology patients. “Conventional pulmonary rehabilitation was not designed to improve surgical outcomes in lung cancer patients, but rather to treat patients who have serious cardiac and/or pulmonary disease.” Further, with conventional rehab his patients would often have to wait weeks to get into the program, whereas the cancer rehabilitation team was able to see his patients within a day or two.

“STAR Program care is generally covered by my insurers,” Dr. Sherwood said. “But with other services, my patients would have to qualify by having a reduced cardiac ejection fraction or

cardiac valvular disease. Even if I could get patients seen, it wasn’t always covered, because they weren’t sick enough based on cardiac and pulmonary criteria.”

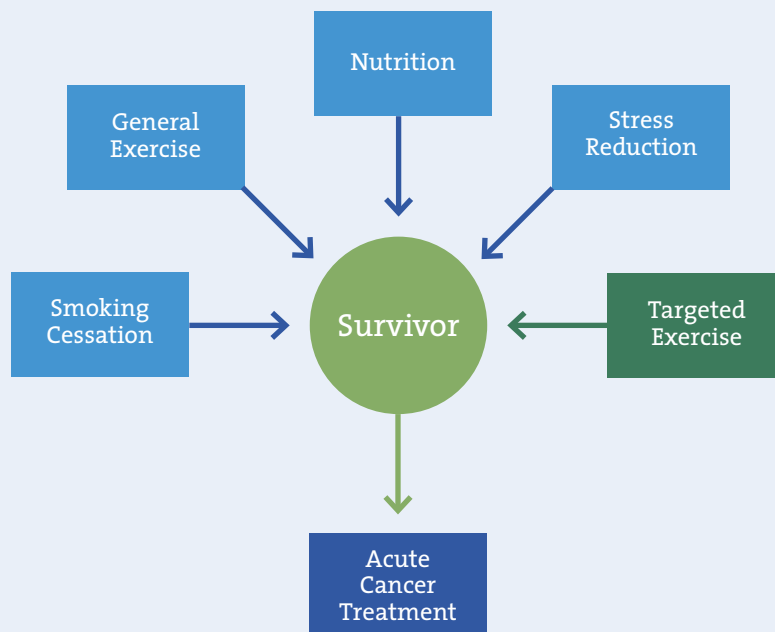
In the March/April 2014 *Oncology Issues*, Lahey Hospital and Medical Center, Burlington, Mass., was featured for its low-dose lung screening service model. Newly STAR Program certified, Lahey is adding multimodal lung cancer prehabilitation services. Radiation oncologist Andrea McKee, MD, is championing this effort and says, “We believe prehab offers an opportunity to enhance patient outcomes by integrating and maximizing evidence-based techniques earlier in the course of our patient’s care continuum.”

Many healthcare professionals believe that because their institution offers services such as pre-operative education, smoking cessation services, and “chemo classes,” they have prehab covered. Although these services may be helpful to newly-diagnosed patients, prehabilitation is aimed at driving specific outcomes that are measurable. Lahey clinicians are learning that lung cancer prehabilitation involves a strategic approach that is different than what they have done in the past. Stacey Pare, a physical therapist and a STAR Program Clinical Consultant, is working with many hospitals throughout the United States on their prehab implementation—including Lahey—and says, “It takes some time for programs to operationalize well-coordinated prehabilitation services, but Lahey will succeed because they have high-level support from their oncologists, administrators, and rehabilitation director.”

Prior to implementing the STAR Program Prehab lung cancer protocol, Lahey, like most hospitals and cancer programs, had some services that might be considered prehabilitation. The first step of the STAR Program Prehab protocol is to evaluate services that are already in place, so that efficiencies and economies of scale can be utilized as the program grows. Currently, Lahey is transitioning to a more strategic and quality prehabilitation approach that will track and improve patient outcomes. Dr. McKee explains, “The elements included in our pulmonary prehab program already existed within our center but had been introduced to patients at various points later in their cancer journeys. By introducing these concepts earlier and as a package, at a minimum our patients will benefit sooner than they had before.” After reviewing the recent research on lung cancer prehabilitation, including a review that highlighted decreased morbidity and hospital lengths of stay, Dr. McKee is very optimistic about their new prehabilitation lung cancer services: “Ultimately, our hope is to demonstrate synergies and improved outcomes over what we have been able to previously offer our patients.”


Ron Ponchak, PT, MBA, was recently hired at Lahey as the director of rehabilitation services. He says, “The barriers are what you might expect—they are related to time and trying to coordinate various individuals and departments—trying to get the human resources collaborating.” Ponchak, who came to Lahey from another hospital that had adopted the STAR Program, insists this is a barrier that can be overcome through effective and consistent communication between departments and the STAR Program and by explaining—repeatedly, if need be—why prehabilitation is so important.

Figure 3. STAR Program Prehab Multimodal Model



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Dr. McKee is excited to oversee the expansion of lung cancer prehabilitation at Lahey. She believes a well-trained team that understands prehabilitation best practices and has the right tools to implement these services will continue to improve the high quality oncology care that her institution is able to deliver. “We are huge fans of the STAR Program. For years we searched for a way to make our rehabilitation, supportive oncology, and psychosocial services more accessible to patients.”

For more information on the STAR Program and/or STAR Program Prehab, go to: www.oncologyrehabpartners.com. 

Julie Silver, MD, is an associate professor at Harvard Medical School and a founder of Oncology Rehab Partners, which developed the STAR Program, a service-line model for high-quality cancer prehabilitation and rehabilitation care that has been adopted by more than 200 hospitals and cancer centers and is now available at hundreds of sites throughout the United States.

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