

Kessler Foundation Podcast Transcript: Cancer-Related Fatigue Part 3 of 5: Rehabilitation to Manage Fatigue

Recorded September 2019. [Listen to it here.](#)

- TIFFANY KENDIG: 00:05 [music] It's really exciting that rehabilitation is specifically called out in clinical practice guidelines, medical clinical practice guidelines, as an integral component of management of cancer-related fatigue.
- ANNOUNCER: 00:18 Welcome to the 2019 Third Annual Cancer Conference - Beyond Rest: A Rehabilitative Approach to Managing Cancer-Related Fatigue. Sponsored by Kessler Institute for Rehabilitation and Kessler Foundation.
- ANNOUNCER: 00:34 Cancer-related fatigue is an issue that often develops during treatment, and can last for months or even years. The conference podcasts will focus on the impact, screening and management of the physical, physiological, emotional and cognitive sequelae. Listeners will gain understanding of the various evidence-based therapeutic interventions and the overall benefits of a multi-professional approach. Topics to be discussed will include current research and practice guidelines, as well as the unique role that rehabilitation can play in managing and reducing signs of cancer-related fatigue. This presentation was recorded, produced, and edited by Joan Banks-Smith, Creative Producer for Kessler Foundation on Thursday, August 8, 2019 at the Kessler Institute for Rehabilitation, West Orange Campus, New Jersey. Be sure and check out the conference playlist to listen to all of the other session podcasts. The link to the playlist is in the show notes.
- ANNOUNCER: 01:38 In session three: Tiffany Kendig, physical therapist, Kelly Walloga, senior occupational therapist, and Sara Ilenko, senior speech-language pathologist, all from Kessler Institute for Rehabilitation presented Rehabilitation to Manage Fatigue in Patients with Cancer.
- KENDIG: 01:57 We're really excited to be here tonight to talk to you about rehabilitation management of cancer-related fatigue. And, as Dr. Khanna had mentioned, he thinks he stole my thunder but he did not. It's really exciting that rehabilitation is specifically called out in clinical practice guidelines, medical clinical practice guidelines nonetheless as an integral component of management of cancer-related fatigue. So over the next couple of minutes, we'll be talking about how rehabilitation can be beneficial to individuals with cancer-related fatigue. Our specific goals will be to highlight - and I think there's a clicker up here, thank you - our specific goals will be to highlight the role of physical activity and exercise, and management of cancer-related fatigue, as well as touching upon integration of strategies for energy conservation and pacing, as well as management of cognitive aspects of fatigue. So I just want to take a step back and highlight a couple of the questions that have already been asked, and highlight some of the things that Linda had talked about, too. One of the questions that I thought was a fantastic question was, what do you ask your patients when you're talking to them about cancer-related fatigue? And I think the answer is, we are all fantastic and we all know now that the NCCN wants us to ask at every visit, every time, for them to rate their fatigue on a scale from 0 to 10. But the multidimensional aspect that Linda touched upon, that I think is really important and has a huge role for therapy as well is, how does that fatigue impact your day today? Because as she mentioned, there are things that individuals would like to do, things that they can do,

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and as rehabilitation specialists, we're here to empower them to be able to do those things.

KENDIG: 03:47

So when we're talking about the effects of fatigue, we know that fatigue is negatively associated with functional status. So individuals who experience cancer-related fatigue are significantly more likely to experience functional decline. Those who are particularly at risk, and this is also called out in the NCCN guidelines, are individuals who are already experiencing some components of dependence in activities of daily living. So it's really important that we ask our patients specifically at all points throughout the continuum, from diagnosis through survivorship, "Are you experiencing fatigue?" And it needs to be a pointed question; we need to ask them to rate that. And we need to ask them how that's impacting their day, okay? So it makes perfect sense that very oftentimes if an individual is fatigued, they won't engage in as much activity, and that can lead to functional decline. That functional decline, in turn, can result in less activity, which can fester fatigue. So it's a vicious cycle. How do we, as rehabilitation professionals, help to slow down or stop that cycle? As Dr. Khanna mentioned before, physical activity and exercise is category one supported interventions for cancer-related fatigue. So we know that, and we tell our patients that, and very often when we say, "I want you to exercise," they say, "Are you kidding me? I just told you, I am exhausted. I can hardly get out of bed, and now you're telling me to exercise?" So I want to go back to that question about, what do you ask your patients? Because very often, the next thing I'll ask an individual is, how would you like to feel? Because that can be a very empowering question, right? We can take down a barrier and help to engage someone in physical activity or exercise, simply by changing the way we're phrasing things. How would you like to feel? I'd like to feel energized. I'd like to feel stronger. Fantastic, let's get started on that, okay?

KENDIG: 05:47

So a lot of times what we may hear is, "You must be kidding me," but what we need to be able to do is and empower individuals to be effective self-monitors of their fatigue, and self-managers, through physical activity and exercise. Because we know there is very strong evidence that exercise and physical activity have significant and beneficial impacts on cancer-related fatigue during and after treatment for a number of types of cancers: breast, prostate, colorectal, individuals with blood cancers. You name it, there is some evidence out there. So the question is, how or why? Dr. Khanna talked a lot about the etiology and factors that contribute to cancer-related fatigue, and part of the reason that exercise is so beneficial is because it positively impacts so many of those factors. So we know, within the general population, that there are numerous benefits to exercise. But specifically, when we talk about the impact on cancer-related fatigue - I'm not sure if there's a pointer? Oh, fun, okay - so we know that there are significant impacts on psychological well-being, specifically self-efficacy and confidence, which can empower individuals to be more active. We know that there are benefits in overall physical fitness, increased cardiopulmonary fitness, overall muscular endurance, aerobic capacity. And when you increase those aspects, then the amount of perceived work it takes to perform your day-to-day activities goes down, right? So the more fit you are, the better able you are to perform your day-to-day tasks, the more efficient you are at performing them. That has a positive impact on fatigue. Anti-inflammatory effects: I will defer to Dr. Khanna

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to talk about the cytokines, but we know and there's actually really good evidence in the cancer population, mostly within the breast cancer population, that physical activity and exercise has a strong beneficial effect on decreasing inflammatory cytokines.

KENDIG: 07:48

Autonomic nervous system balance: that's an interesting one, and it has a direct impact on fatigue. An example of how physical activity or exercise can positively impact autonomic nervous system balance would be increasing heart rate variability, for example, which can help to facilitate the balance between the parasympathetic and sympathetic nervous system. And that has positive benefits, as well, that impact fatigue. And then last but not least, a beneficial impact on neurotrophic factors, so things that help to optimize brain function. All of these things, taken together, help contribute to reduction of fatigue in individuals experiencing cancer-related fatigue. So what we need to help our patients start to see and start to say is not, "Are you kidding me?" but, "There are all these benefits, how can I do this? And why?" So for us in this room to kind of get on that train, we need to look at a little bit of the evidence. So if you go to Google scholar, and you put in exercise and cancer-related fatigue - and I did this yesterday - you will get about 274,000 results. So as you can probably deduce from that, it is one of the most commonly studied and most published upon interventions related to fatigue. In the interest of time and having friends after this talk, I'm going to focus on a few of those studies, okay? So a number of meta-analyses that you see here show that exercise has strong efficacy for reducing fatigue. We know that that reduction can occur over time, and there are these changes, positive changes in severity of fatigue after a 12-week intervention. We know that, as compared to controls, so people who don't exercise or perform physical activity, the fatigue is better for individuals who are more active. And we know that there are certain time points where the benefit of exercise may be greater than others. But overall, we do know there's a big benefit across populations from diagnosis through survivorship, and including end-of-life.

KENDIG: 10:05

Again, because of time and friends, two recent studies that I would like to kind of draw our attention to - because they have really important findings and because they are systematic reviews - and this one, in particular, that I'm going to talk about is a systematic review of systematic reviews. Which is great, because that means someone did the work of putting those important things together, and it's a systematic review of systematic reviews, looking at randomized controlled trials, right? So now it's got all of those buzzwords within evidence that makes me say, "Ooh! I'd like to pay attention to this." Okay? So this is a 2017 study that includes 16 studies and had multiple meta-analytic results. A couple of things that are important to note here, the authors were looking at the impact of exercise on cancer-related fatigue in adults. And they looked at mixed cancer types, so again this is going to lend support to the impact of exercise across cancer types. They looked at individuals throughout the cancer continuum, and they looked at exercise interventions that focused on either aerobic components, strength components, or a combination thereof because that's what's most widely supported in the literature, as Dr. Khanna said earlier. One thing that I'd like for us to kind of point out, is having a ton of evidence is a blessing and a curse, right? There's a lot of variability and heterogeneity

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within the evidence. So a little bit of a bubble burst here, we don't know the best dose of exercise, and this systematic review of systematic reviews shed some light as to why. There are so many variations in the components of exercise programs for these fatigue studies, it's important for us to realize that. And that kind of gets us to that universal statement of, "future research is needed," but the length of the exercise interventions ranged from 3 weeks to 52 weeks. That's quite a range, but the nice thing is we know at least at 3 weeks, we can have a benefit. Frequency per week for the interventions ranged from 1 to 10 times per week and duration, 10 minutes to 120 minutes per session. So again, a lot of variety.

KENDIG: 12:11

What did these authors find? A picture is worth a thousand words, right? And it's a very little one, but I hope you can kind of see over here, these are the 55 various meta-analytic results. And in the middle, is the line for the confidence interval. All of the meta-analytic results showed that the standardized mean difference in effect, size was in the positive or beneficial direction for the impact of exercise on cancer-related fatigue. So that's great. More than half of the meta-analytic results were significant for that beneficial effect. But what this study also shows - and this is studies that were included through 2016, so they're relatively recent - is that about half of those results cross the confidence interval. And so, they suggested a beneficial effect, but we have limited conclusions that we can draw from that as to what that beneficial effect is. So it's important that we recognize there's a lot of variation, we need future studies, and because of the way there is variation in how we assess fatigue and how we treat fatigue, we need to kind of bear those things in mind when creating an exercise prescription. The authors concluded that the benefits are likely there, but they are uncertain but very importantly, they concluded that exercise does not increase cancer-related fatigue. So while some people would say, "Oh, this isn't the most compelling study," it actually really is, because this is what we need to show patients who say, "Are you kidding?" We can say, "No, I'm serious. There's really strong evidence and you get all these other benefits, too." Another study, another meta-analysis that I wanted to bring got published in the same year, 2017, and looked at pharmacologic interventions, psychosocial interventions, and exercise interventions and their impact on cancer-related fatigue. Again, various cancer populations throughout the cancer continuum.

KENDIG: 14:04

And what these authors found was a consistently significant benefit of exercise and physical activity interventions across the board. And the weight - ooh, I'm sorry - the weight of the effect was strongest for exercise. So when compared with psychological and pharmacologic interventions, exercise had the most beneficial effect. The authors concluded that studies that intervened with exercise demonstrated the largest overall impact in cancer-related fatigue, demonstrating a moderate impact or effect. The authors also found that there were improvements in cancer-related fatigue in all patients and all survivors across diagnoses and across treatment. The greatest benefit for exercise interventions were for individuals with early-stage, non-metastatic disease - that's not to say that there wasn't benefit in other groups, but this is where there were the strongest effects. Individuals who are post-primary treatment and individuals who participate in group-based and in-person training, which has a huge impact when we're considering if we're going to send an individual home with a home

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exercise program, or if they're better off coming in for a supervised group exercise session, or if there's a skilled need for therapy intervention. Effectiveness: there were improvements as we mentioned, across all categories, aerobic and anaerobic interventions were equally effective, which is great. Exercise: out of those types of interventions, was the most effective for individuals on active treatment. A combination of exercise and psychologic treatment interventions were most effective post-treatment. So the evidence out there is so compelling and so strong, that as you've heard multiple times tonight, multiple clinical practice guidelines have integrated exercise and physical activity recommendations into their standard of care. And I think as rehabilitation professionals too, one thing to think about is it's not only indicated within these clinical practice guidelines, and these clinical practice guidelines not only call for intervention specialists - which I'll talk about briefly in a second here - but the standard of care for the fatigue guidelines also mention, they call for insurance coverage for disability due to the effects of fatigue. That's pretty remarkable when we now are pushing for policy changes and reimbursement because we know how debilitating this can be, but we also know that we are really empowered to help individuals optimize function and hopefully, decrease disability and are pushing for access and coverage for them to do so.

KENDIG: 16:38

So, what are some of these groups that have endorsed physical activity as an intervention for cancer-related fatigue? NCCN, as you've heard before, asked all the American Society of Clinical Oncologists, the Oncologic Nursing Society, and the Children's Oncology Group. So I wanted you to kind of show, this is across the board, all age ranges. So what are these guidelines? The NCCN Guidelines encourage moderate levels of physical activity during and after treatment. For individuals who are newly diagnosed, they encourage them to either maintain physical activity or increase physical activity, if it can be done safely. Refer to exercise specialists as indicated: PT, physical medicine and rehabilitation, or rehabilitation specialist. This is hugely important, given that we know cancer and its treatments have acute effects during treatment, as well as late and lasting effects that can persist over time. So, we're not working with individuals that are having kind of a static insult, but they're dynamically changing and they may have different impairments that present at different times that may change the way they move or change the way they are able to exercise. And we need to intervene and provide tailored, individualized interventions to meet that patient where they are, screen for some of these acute late and lasting effects, and come up with the most appropriate exercise prescription for that individual.

KENDIG: 18:03

They should include, as we know already, aerobic and strength components. We should consider cancer-specific programs, again, take into consideration the unique nuances of where that individual is, where they've been in terms of treatment, and what we can anticipate in terms of their future, to make sure that they're exercising safely and integrating physical activity that is most beneficial. And most importantly, starting low and progressing slow. Meeting the individual where they are, and really helping to modify, as appropriate. So as Linda had mentioned, if I know that my patient with myeloma is coming in, and they just got steroids and I know in two days they're going to crash, I might give them a program for today, and then I'm certainly

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going to give them a program for two days from now, where they're in bed that's going to be much less intense, but still gives them something they can safely do. And that's our job as rehabilitation professionals, is to figure out where to meet that person and how to meet that need. A couple of words of caution in determining activity level, as outlined by the NCCN guidelines: for individuals who are in active treatment or end of life, we need to consider certain aspects of cancer-related disease and/or treatment - bone metastases, blood counts, if the patient has fever or active infection, or limitations due to metastases, other comorbid conditions and safety issues. Again, this is where we, as rehabilitation professionals, can consider all of those things to make a program that is safe for that patient. Because we know they all present a little bit differently and have different needs. Post-treatment, we need to consider late effects of treatment, like cardiomyopathy or peripheral neuropathy, and safety issues to make sure that we are integrating physical activity and exercise, again, in the safest and most beneficial manner. What we just discussed were the NCCN guidelines on fatigue, but I wanted to point out that there are also other clinical practice guidelines, the NCCN Guideline in Survivorship that also says, "Hey! it's really important that we maintain physical activity and exercise."

KENDIG: 19:58

If you're at high risk for injury, refer to a PT or a specialist - we made it, I'm so biased but that's really huge when you make it into the NCCN guidelines - things to consider: cardiomyopathy, neuropathy, lymphedema, long-term effects or comorbidity, things that the therapist may be able to help manage, to then get an individual to more effectively exercise on their own with a program that is safe for them and most beneficial. And then also, they specifically call out that if it's function limiting, they need to see a rehabilitation specialist. ASCO, the American Society of Clinical Oncologists, also has a clinical practice guideline that calls for exercise and physical activity in survivorship. These guidelines again are specific to survivorship, and this group actually went so far as to say, "Hey! We're actually going to give some recommendations in terms of intensity, duration, length, frequency." But they went with were the ACSM Guidelines for Exercise in Cancer Rehabilitation - oh, I'm sorry - for Individuals with Cancer. And they recommend at least 150 minutes of moderate-intensity exercise, 3 to 5 days per week, as well as 2 to 3 days of strength training sessions per week. And they base that again, not necessarily on the evidence, but what is out there in terms of recommendations for general exercise. We need more evidence to help guide our exercise prescriptions. They say walking programs are generally safe, so when in doubt, a patient can generally start walking after they consult with their doctor to make sure there are no contraindications. And if they're at risk for injury, again we hear that, refer to a specialist.

KENDIG: 21:43

So in summary, given all of that evidence in the clinical practice guidelines, we know that physical activity and exercise is feasible, beneficial, and more than highly encouraged but is also spelled out and supported in our clinical practice guidelines. We need to screen for cancer and treatment-related effects, just like we need to screen for fatigue. So if an individual comes to see me with shoulder pain after a mastectomy, I'm going to be asking that person pointedly about fatigue. And when I'm creating my care plan, I'm going to be integrating aspects of exercise that are going to be beneficial not only for that shoulder but to help combat fatigue. The

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exercise prescription again, aerobic exercise component with a resistance exercise component. What has come out from some of the Canadian exercise groups, they do recommend again 150 minutes per week, moderate intensity, so that's 3 to 6 met levels, or a 12 to 14, on a 6 to 20 boric scale, or 50 to 70% heart rate max. Teaching your patient to self-monitor is hugely important there. And then again, 3 to 5 days per week. As far as strengthening or resistance exercise, the general recommendations to address fatigue, two sets of 10, right, reps affecting at least 8 to 10 of the major muscle groups. And then, a group - again, additional research is needed because there is so much variation in terms of what's out there for exercise prescription - and then a group or a supervised setting is preferred. So there are a lot of good studies out there but that helps to empower and optimize compliance with exercise. So the big take-home message is we as therapist understand that fatigue can be debilitating and how it impacts individuals is very different, and what is important to each individual in their day-to-day routine is very different. We are in a unique position to empower them and give them a program that can help them achieve those goals. And with anything in life, with exercise to keep that, "Are you kidding me?" from being the reality, we need to show them the evidence, but we also need to give them ways to balance their activity. So with that, to talk a little bit more about how we will balance activity, energy conservation, and pacing, I'll just hand you over to Kelly.

KELLY WALLOGA: 23:59

Good evening, everybody. I'm Kelly, and I'm one of the occupational therapists at the Chester campus. And Tiffany did a really nice job of explaining and emphasizing exercise, how that benefits fatigue. And I'm going to talk a little bit about rest. So we're going to kind of battle each other a little bit, but again, it's really important that-- she did a nice job of saying that exercise benefits fatigue, okay? So as an OT, I'm going to start an article that talks about cancer-related fatigue and associated disability in post-treatment cancer survivors. And this article talks - oops, sorry. This study was completed to understand the prevalence of cancer-related fatigue and its impact on disability. So as I said, I'm an OT, we look at function, right? So how does fatigue impact disability ability? So this article looks at non-metastatic breast, colon, and prostate cancer survivors. This article describes the occurrence of cancer-related fatigue within three time points - its transitional survivorship, extended survivorship, and permanent survivorship - and this was completed by two self-administered questionnaires, the first being functional assessment of cancer-related cancer therapy fatigue. And that scored from a 0 to 52 scale, 52 being minimum and we also looked at the World Health Organization Disability Assessment Schedule. And that looks at six different areas of function and life tasks that looks at understanding and communicating, self-care, mobility, interpersonal relationships, work and household roles, civic roles - and that ranges from no disability to mild, to moderate, to significant. So the results concluded that 1,294 questionnaires were returned and completed. 29% reported that significant levels of fatigue were reported with high levels of disability. So fatigue levels did not differ between the time cohorts. And significant fatigue had high, as I mentioned, high levels of disability, so burden of care is high.

WALLOGA: 26:20

So what I want you to take away is that cancer-related fatigue is experienced by a vast majority of patients, which we've been doing a nice job of explaining. And in patients,

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it appears to persist in some patients for years post-treatment. It's highly distressing, it interferes with daily activities, and negatively impacts quality of life. So before I dive into energy conservation, what does that mean? Energy conservation refers to the way activities are performed to minimize muscle fatigue, joint stress, and pain by using your body efficiently, and doing activities in a sequential manner, can help you save your energy. Work simplification and energy conservation techniques will allow you to remain independent and be less frustrated by your illness, that way your energy can last throughout the day. So for purposes of this presentation, I'm going to refer to this person as Susan. So Susan is a mom, a wife, full-time worker, a homemaker, a caretaker, and a daughter. So Susan was diagnosed with breast cancer about 4 years ago. She is a 40-year-old female, she had a double mastectomy including 17 lymph nodes that were removed, 4 rounds of chemo, 28 rounds of radiation, and she will be on tamoxifen for 5 to 10 years. And let's talk about her roles. So, her roles as a mother: she has to bathe, take care of her kids, she's a chauffeur, she's an entertainer, event planner, she cleans laundry, cleans up messes, healthcare provider, counselor. How about her roles as a wife? So her role as a wife: she cooks, she cleans, she shops, she puts groceries away, she has date nights, intimacy, right?

WALLOGA: 28:22

How about her roles as a worker? She's a provider of income, she's committed to working full-time schedules of 35 to 40 hours a week, she has to have her ability to concentrate and focus on tasks, she participates in physical labor and scheduling. This next slide, I had took direct quotes from Susan. So she had told me, in talking about her experience with her treatment of radiation and chemo, she had said, "I'm very tired at the end of the day, but I have to keep pushing myself. Going back to work was hard. The thing is, you're not only physically tired, but you're mentally tired. I would have trouble washing my kids and get mad because I was having trouble. You're fatigued from surgery, and then you get better. Then chemo, and you get tired, then you get better. Then radiation happens, and then you're tired for months after. So I mean, it kind of speaks for itself. And as a mom of two, a new mom of two, I cannot fathom adding another layer of fatigue, on top of being a mom." I'm sure you guys, as mothers out there can agree to that. So Susan came into the clinic with her goal being able to bathe her children independently. Understanding the meaningfulness and the time and the relationship spent bathing her kids, we came up with energy conservation techniques from the NCCN guidelines, so she can return to bathing her kids. Having everything ready prior to the bath - the soap, the shampoo, the towel - she's using her stool to sit on, that's her daughter's favorite stool, doing the task in a seated position, teaching her kids to wash certain body parts, incorporating a song, making a game, having them participate, watching both children at the same time, and then having the partner home, just in case it doesn't go as planned, to be able to come in and help with the task. And then, some tips for herself to be able to wash herself: planning ahead to avoid rushing, sitting down to drying off or using adorable medical equipment like a shower chair to sit, use of long-handled sponge or a grab bar in the shower, and using carts or little caddies to avoid bending or reaching.

WALLOGA: 30:49

And what might this look like for somebody who is terminally ill, or who might be experiencing end-of-life kind of treatment? This person may not have the physical

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ability to participate, so maybe having a loved one or spouse help with the task, or having a team alternate: I take a piece of this task, and you take a piece of that task. So clients may come into our clinic without specific goals in mind. Our responsibility is to listen to the challenges that they're experiencing, ask questions about the participation of previously enjoyed activities, and find opportunities to educate those patients on specific energy conservation techniques, in order for them to return to those enjoyed activities. Susan and I were having a conversation about different recipes, and she expressed how she loves to make taco salad for her family. So we came up with different energy conservation techniques, so she could return to making the salad. And her kids are really excited because they can enjoy this meal as well. So having all the ingredients started before starting the task, using shredded cheese and using packaged guacamole before storing items at chest level to minimize bending and reaching, sliding heavy pots across the counter instead of lifting and carrying, having children help - so having her kids help break up the tortilla chips and opening up the packages, or assisting by mixing - using a bag or bowl to mix, and let dishes dry or using a dishwasher instead of drying the dishes yourself.

WALLOGA: 32:40

And again, what might this look like for a patient who has mets or who maybe can't physically participate in the cooking task itself? Maybe having that person delegate the task to somebody, a loved one, how to make the recipe. That way, they're still participating in the task itself. Another area that Susan expressed difficulty in was getting her scrubs on. With the lymphedema and the tightness of the scrubs as many of you all know, it's hard to get on, even without having that added extra component. So we had discussed using a scrub with a zipper or a larger, looser fitting scrub. And if somebody might not have the physical ability to get dressed, you can have that person participate by having them pick out their own clothes from their closet, getting dressed maybe lying down, or using adaptive equipment like a long-handled reacher or a sock aid to get your socks and your shoes on. So these are energy conservation techniques and I'm not going to go through each one of them, these are for your reference for your patients when they come to you. Again, I can't emphasize enough, asking them what they want to do, what is it that they really enjoy doing or what is difficult? So, as I mentioned before, they may not come out and say and verbalize a goal, "I want to be able to wash my kids. I want to be able to cook this meal again." You might have to kind of probe them and ask those questions, what is it that's missing, right? Because some of these standards may seem common sense to us, but it's important that we integrate specific strategies for those specific activities for those patients.

WALLOGA: 34:35

So I want to stress that doing the hardest task when you are the most alert, to maximize concentration, and incorporating rest breaks. Short rest breaks allow your mind to rest while focusing again, that way your mind doesn't have to struggle to focus on those tasks. Balancing activities and rest: so doing an activity and incorporating a rest break and doing another activity, like I said, alternating. Pacing yourself: recognizing that you're going to have good days and bad days, and not overdoing it. Positioning: sitting whenever possible, use of assistive devices, like a walker, a cane, a cart, a scooter, crutches, grab bars, use of adaptive equipment like I mentioned earlier with getting dressed. By allowing yourself to save energy without

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having to bend or reach, avoid heavy lifting. And then, learning to set priorities about necessary stressful situations about some battles that are not worth fighting. And maintaining a pleasant work environment as often as possible: irritation, frustration, worry, and competitive feelings can waste energy. Next, I'm going to jump into work and leisure. So, balancing activity and rest, planning ahead, setting priorities, understanding activity, talent, and work simplification. Work simplification can be divided into concepts of good body mechanics, elimination of unnecessary movements, and efficient use and organization of workspace. And again, taking short rest breaks to allow your mind to rest again, so that way your mind doesn't have to struggle. And, like the quote from Susan, the thing is that you're not only physically tired, but you're mentally tired. So I'm going to have Sarah come up and talk about mental fatigue, which also plays an important role.

SARA ILENKO: 36:32

My name is Sara. I'm an inpatient speech therapist at Kessler and Saddlebrook, and I'll be speaking with you today about cognitive fatigue, and those deficits that patients with cancer undergo. So like we said earlier, according to the National Comprehensive Cancer Network, cognitively is a distressing, persistent, subjective, sense of physical, emotional and/or cognitive tiredness or exhaustion related to cancer, or cancer treatment that is not proportional to recent activity, and it interferes with usual functioning. So as the population grows into the millions, there has been an increasing emphasis, as all of you know and all of you have heard already by now, on how the effects of treatment can affect survivors and their ability to return to work, school, their capacity to function and live independently, and their overall quality of life. Initially, the cognitive impairment due to cancer was thought to be from more of a pharma-toxicology perspective, so more of what you might hear as chemo brain. This perspective has kind of evolved into more of a multidimensional model and its examined multiple cancer treatments, the biology of the cancer itself, and the factors conferring the risk for post-treatment cognitive decline. Today, I will speak with you about cognitive impairment due to fatigue. So here I have a conceptual model, and the figure has multiple factors for what can impact cognitive function amongst cancer survivors. So here we have the tumor, over here on the left the different types of tumor, the genetic factor, sociodemographic, treatment modality, physiological, psychological, allostatic load, and your lifestyle. All of them have an impact on cognitive function.

ILENKO: 38:16

So cognitive impairment due to fatigue, like I said, is a frequent problem. It's difficulties that patients experience with memory, attention, your processing of information, your executive functioning, and your ability to concentrate. Cognitive reserve is that innate undeveloped cognitive capacity which is influenced oftentimes by genetics, your education level, occupation, your lifestyle, and cognitive-simulating activities. Persistent fatigue often reduces disability to refresh that cognitive reserve, so those patients who have that persistent fatigue have difficulty refreshing our cognitive reserve. Similarly, if you or I are working on a project at night, we're dealing with home life or we went out with friends, you have difficulty starting your workday the next day. You need that cup of coffee to really help you kick off and be productive. Patients with cancer who have this chronic fatigue have difficulty refreshing that cognitive reserve, and that cup of coffee really isn't going to do the

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trick for them, so that persistent fatigue that then, in turn, affects their cognitive abilities. So fatigue impacts on cognition, specifically. So executive functioning: so your ability to problem solve, your hierarchical thinking, your ability to execute and plan a project perhaps at work or at home, your ability to schedule events or coordinate different schedules. Your processing speed also takes a hit. So, your ability to process different information that's incoming towards you at work or at home. It affects your attention, your memory, and your problem-solving and sequencing.

ILENKO: 39:52

With regards to work-related function, throughout my day I am constantly multitasking, whether it be working with a patient or listening to what a coworker said about a specific case. So your workload would also suffer as well with these cognitive deficits due to fatigue. Household-related functions: so once you leave work, your other job begins when you get home. So your ability to complete any and all household chores such as laundry, food preparation, cleaning, etc., all of those different things can also be affected. Patients often report that they are easily overwhelmed, they have difficulty being organized and being efficient in their daily activities and it suffers. Oftentimes, those automatic tasks that we do become difficult, as well. Systems strategies as well, compensatory and remedial, include those psychosocial measures such as cognitive therapy, relaxation, social support. All of these can help to decrease fatigue. Cognitive therapy such as training and/or teaching survivors to manage - compensate for their cognitive deficits is something I'll get into shortly - and practicing of skills to restore that attention processing speed, memory and/or executive functioning. Yoga and mindfulness is something as well that helps to reduce those cognitive deficits brought on from fatigue, and also sleep hygiene. So yoga for cancer survivors, also known as yogas: I have done yoga a couple of times, but not often enough to really be able to speak about its benefits from my perspective, however there is a study that I have here that talks about how-- it was designed from the researchers from the University of Rochester, it's a haifa and restorative yoga program. It includes movement, breath, and awareness. The postures consist of seated, standing, transitional, and supine poses with an emphasis on restorative poses. It's modified to meet the experience levels, so from beginner to advanced. And it consisted of eight sessions of about 75 minutes in length, twice a week during the late afternoon or evening hours at yoga studios and community centers.

ILENKO: 41:54

So this study here by Janelson from 2014 focused on using yogas, which is yoga for cancer survivors, and basically the reasoning for it was there are interventions that are needed in order to alleviate the memory difficulty in cancer survivors. The study looked at the effects of yogas on memory and identified relationships between memory and sleep, specifically. Yogas significantly reduced memory difficulty, and it had a positive effect on memory function. There were 328 participants in the study. Sleep quality was measured by the Pittsburgh Sleep Quality Index and self-perceived memory difficulty item of the MD Anderson Symptom Inventory, which for those of you who don't know is a patient-reported clinical assessment tool. It assesses multiple symptom outcomes for research and applies to many different cancer types, as well. So basically the takeaway point from this study, in particular, was that yoga had a significant effect and reduced memory difficulty, while at the same time improving

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memory function and reducing that fatigue. Tai chi was also something that was brought up earlier. In this study that I have talked about how 23 women with a history of cancer, the outcome measure was before and after treatment. Participants completed a neuropsych testing, so that would be testing of memory, executive functioning, language, and attention. There were five tests of balance and self-reported questionnaires of neuropsych complaints, stress, and mood, and also fatigue. These patients participated in 10 weeks of Tai chi. It improved memory, attention, and executive functioning. It also had some other good side effects, as well. It relieved other side effects that patients were experiencing. It improved physical function and overall quality of life, which is exactly what we as rehab professionals, are trying to do.

ILENKO: 43:45

So the takeaway point here was that improvements in memory, attention, and executive functioning, and also like I said, that increase in quality of life and overall fatigue as well. This other study that I found as well deals in more of the cognitive rehabilitation, so what we as speech therapists do with our patients who have cancer. So it specifically looked at patients with gliomas, 140 adults that is with low-grade and anaplastic gliomas. The intervention that they used was computer-based attention, retraining, and compensatory skills training of attention, memory, and executive functioning. The patients completed neuropsych tests and self-reporting questionnaires on cognitive functioning, fatigue, mental health relating to quality of life, and community integration at baseline and after completion of CRP, which is the cognitive rehabilitation program, and again at a six-month follow-up. The results were that CRP or cognitive rehabilitation program had an effect on short-term cognitive frustrations, patient's experience, and on long-term cognitive performance, as well as mental fatigue. Further research however is needed to pinpoint which parts of intervention are in fact most effective. At Kessler, we do have a cognitive rehabilitation program as well, in the outpatient level, and it is definitely something we use a lot with our stroke and brain injury patients. And I would be interested to see if it would be something that we start to use as well with some of our patients with cancer, as well. So like I said, the takeaway point from this study, in particular, was that it improved in overall fatigue, mental health-related quality of life, community integration from baseline to a six-month follow-up. Some helpful reminders to manage cognitive fatigue: so these are the different things you, as a therapist, might try to tell your patients. Keeping a checklist of daily reminders, one task at a time, versus multi-tasking. Pen and paper for reminders, a calendar, sticky notes, rest, physical activity, and brain strengthening mental activities or as I like to call them, mini brain push-ups with my patients.

ILENKO: 45:53

So those would be such as crossword puzzles, painting, playing a musical instrument, or learning a new hobby. The aims of cognitive training overall: so this is again as SLPs, we assist patients with increasing sensory stimulation and performance, which then leads to neural plasticity and improvement of overall cognitive outcomes. Some psychological factors contributing to cognitive impairment include stress, anxiety, and depression. And that study that I have posted on the bottom demonstrates that there was a strong correlation between depression and cognitive impairment, as well. It's a highly acknowledged relationship, understandably so. So our assessment of mental

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fatigue for the healthcare provider. So some questions you might want to ask your patient to see if they are suffering from cognitive deficits due to fatigue would be that does the individual become exhausted from performing his or her normal routine, and find that they are wiped out in the early afternoon or they must take naps? Does it take them more mental effort to perform those usual activities that used to be something that they wouldn't even think about, it would be so automatic? Does also the individual have difficulty with multitasking and become overwhelmed when too much is going on at once? This might even include socializing with several people talking at once or in working environment with multiple distractions. Again, does the individual have difficulty sustaining their attention and concentration for any period of time? A lot of times, the vulnerability to distraction is one of the hallmark difficulties experienced by patients with cancer-related fatigue.

ILENKO: 47:34

And finally, is the individual experiencing generalized slowing of cognitive processes so that he or she misses the point in a conversation or in talking with a coworker or family member, or perhaps they can't take notes or pay attention during a meeting. So those are different things we, as healthcare providers, might want to ask our patients when we suspect them to be having cognitive deficits due to fatigue.

ANNOUNCER: 47:55

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