

Kessler Foundation Podcast Transcript: Cancer Related Fatigue

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MICHAEL
STUBBLEFIELD: 00:04

[music] I'm Dr. Michael Stubblefield. I'm the medical director for cancer rehabilitation here at Kessler, and I'm the national medical director for our ReVital Cancer Rehabilitation program. I've gotten the honor of being your MC tonight. This is our third cancer program that we put on here, and we changed it up. I think we did spinal cord, then we did brain, and now we're going to do fatigue. Fatigue is the most common thing that cancer patients complain of. We've got several hours of it for you tonight, which will probably make you fatigued. So I hope you will bear with us, but we have a really nice lineup. My job is just to introduce everybody as best I can and kind of run you through things.

STUBBLEFIELD: 00:49

When I'm not playing doctor, I'm actually a photographer. Those of you who know, I actually shoot birds. I have extended into photographing patients and staff largely because nobody else really does it. So this is one of our inpatients that was up at Saddle Brook, and thank you to all the therapists who helped me get in there to photograph her. And I just wanted to tell you a little about her because this is a typical sort of patient for us and really just to kick off the program. So typical 67-year-old woman, hypertension, hypothyroidism, rheumatoid arthritis, sleep apnea, restless leg syndrome, oh, and advanced non-small-cell lung cancer. So initially diagnosed in 2008, and at that time, she was found to have multiple brain metastases as a result of this. She was treated with carbo, taxol, and whole-brain radiation followed by bevacizumab. So those of you who don't know who are kind of new to the cancer world, metastatic non-small-cell lung cancer was and still is a death sentence. The difference is 5, 10 years ago, these patients, if you looked at 5 years across all of them, your survival rate was like 3, 5 percent. Because of these new biologic agents like bevacizumab, these patients are living much longer, and we're getting up to like a 20% 5-year survival rate with patients who were diagnosed with metastatic lung cancer. And I think I can predict that those numbers will get better and better going forward as we get better and better treatments and understand the biology of these tumors well.

STUBBLEFIELD: 02:27

So this lady, who was effectively metastatic shortly after diagnosis, comes in in June to the urgent care center with a bunch of neuro symptoms. And guess what? She has progression of the disease. She did finally fail the bevacizumab with hemorrhagic lesions. So she comes in to do a low performance status fatigue. She needed to be tuned up before she could continue additional treatment. So this is what I would say is common across almost any cancer patient that comes into the inpatient setting. It's also a huge problem in the outpatient setting, which my colleague Dr. Khanna back here is going to be speaking to next. We'll talk about. And with that, I'm actually going to get off the platform. I'm going to go finish my dessert, and I'm going to turn it over to Dr. Khanna.

ASHISH KHANNA: 03:15

So I'm going to do a brief introduction about cancer-related fatigue. As you know, we've got a jam-packed program here. And a lot of these topics are going to be covered by other people. So I'll just do a little bit of a brief introduction about kind of-

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- or I guess kind of like an overview. So the first thing I'll talk about is the need for cancer rehab.

KHANNA: 03:32 So those of you who don't work with cancer patients directly, I'll give you a brief intro to what is cancer rehab, and why do we need it? Basically, we have a lot of patients who luckily, through advances in science, like Dr. Stubblefield had mentioned, are now living many years after a cancer diagnosis, which is great. The downside of that, of course, is that many people are living with the side effects of cancer and cancer treatments. A lot of the downstream effects of cancer that people frankly never really lived long enough to experience, now we're seeing those for the first time. And we're all kind of in this room on this journey together to try to help them. So it's an exciting field. That's why I went into it. And I'm sure that's the reason a lot of you guys went into it too amongst other reasons.

KHANNA: 04:18 I like to think of cancer kind of like becoming sort of like a chronic disease. If you think about it when you had the AIDS crisis, I guess, in a similar way in the eighties or nineties. If you found out that you were diagnosed with AIDS in 1982, probably the future was pretty bleak in that case. Right? And we lost a lot of great people in that AIDS epidemic.

KHANNA: 04:42 Now if people [inaudible] HIV or AIDS, they live a very long time. Right? AIDS is now kind of a chronic condition. Right? And I hope that cancer will become that way too. Right? And it looks like we're moving in that direction every day, which is great. So what do we manage in cancer rehab? As a team, we manage all of these different things here; pain, fatigue, issues with mobility, range of motion, deconditioning, weakness, trismus, spasticity. So I'm going to take an hour and talk about each one of these. Thank you guys for staying until midnight [laughter]. Just kidding. I'm going to talk about only of these. That's fatigue. All right.

KHANNA: 05:27 So what is fatigue? Everybody here familiar with fatigue? We know what that looks like?

KHANNA: 05:32 Yeah. All right. I just became a dad like two months ago, so I'm familiar with this guy's facial expression. I'm glad we have coffee in the back, everyone. But really, there's an important distinction between what regular fatigue is, which we all experience on a Monday, versus what is cancer-related fatigue. So there's a big difference. And I'll tell you about those differences. So there are a lot of different definitions to fatigue, right? Those of you who work in, say, like lymphedema know that there are many different definitions of lymphedema. And when you have a lot of different definitions, it's hard to kind of unify the science and compare studies, which is too bad. This is one definition that I like from the Journal of Clinical Oncology. They say it's fatigue. It lasts greater than two weeks and occurs every day. So they use two weeks as a cutoff. Some people say six weeks. Some people say a month, six months. It's out of proportion to exertion. So this is a big one, I think. I've had a patient that-- and maybe you guys who deal with fatigue in this room know too. Sometimes people get up, and they turn off the light switch, and they're wiped, right? It's out of proportion to the amount of-- they're just as tired as if they ran around the block, and all they did was get off the couch. Right? So it's out of proportion to exertion. It's associated with distress and functional loss, of course. Naturally, it's associated with a cancer

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diagnosis of chemotherapy. And then lastly, it's not explained by a primary psychiatric diagnosis, so of course, it's not due to depression or any other kind of problem like that. So really, what I would just try to remember is that it's out of proportion to exertion, I think, is a big clue.

KHANNA: 07:14

So we have the NCCN, that's the National Comprehensive Cancer Network. I think we have a talk later also going to be talking a little bit about this, so I won't go too much into it. But these are the kind of guidelines that oncologists and the oncology care team, these are the ones that they use. So here's their definition. So this is from their point of view. That's the only reason I included this. So from their point of view, they see it as a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment, again here not proportional to recent activity. And then of course, it has to interfere with your usual functioning. Right?

KHANNA: 08:53

All right. So Dr. Stubblefield alluded to this, but what is the most common complaint of cancer patients? Fatigue, right? Okay. All right. Fatigue is the most common side effect of cancer and cancer treatments. It occurs in about 60 to 96 percent. That's almost 100% of patients in some studies. And then importantly, it may persist for months or even years after successful treatment completion. Right? So 30% of patients in one study continued to report fatigue 1 to 5 years after diagnosis, and then 63% of them even after 5 years, so from 5 to 10 years they continued to feel fatigued.

KHANNA: 08:34

This is another interesting study I put in this talk just because I think it's kind of illustrative. It's an old one now from 2000. But these guys, they looked at 538 cancer patients. And then let's look at-- and this is a viewpoint study. Right? From the oncologist's point of view, and I would expand this to say all of the doctor community who are here are guilty of this, they thought that pain was more clinically relevant than fatigue. Right? So 61% of the oncologists when you asked them, "What's the most important thing that a cancer patient is dealing with?" would check the box for pain. Only 37% of people said fatigue. Now let's ask the patients. 61% of them said that fatigue affected their life every day much more than pain. And which one do you think in the clinic do we ask about more?

AUDIENCE: 09:24

Pain.

KHANNA: 09:24

Of course. "How are you feeling? How's your pain? Where does it hurt?" Nobody's asking about fatigue. And that's evidenced by this. 52% of the patients who-- 52% of the patients said that they never reported fatigue to their oncologist, I would guess probably because they were never asked, and only 14% had received treatment or advice on how to manage their fatigue. So fatigue is the number one symptom in the patient's point of view, and only 14% of people had been given advice on it. Right? And then 33% of the patients with fatigue had said that they didn't feel like they had received adequate treatment.

KHANNA: 10:03

All right. So what causes fatigue? So we're going to do a fancy Venn diagram with this here. The answer to what causes fatigue is that it's multifactorial. Right? So that means complicated. Here we go. Number one, demographic factors. So age, income,

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and marital status have been linked to fatigue. Let me see if I can get this clicker to work. Here we go. Psychosocial factors also. There's evidence that depression is linked to it. Probably not surprising. And then the catastrophizing coping style. I think most people know what I'm talking about there. Health behaviors are linked to increased fatigue. These are epidemiological studies we're talking about here. Right? Physical activity and cardiopulmonary fitness do contribute. There are the comorbid symptoms; pain, menopausal symptoms, sleep disturbance, comorbid medical conditions; if you have cardiovascular disease, being overweight. And then there are the biological factors, such as anemia. If you're anemic, you're going to be fatigued, right? And then the last one and certainly not least is inflammation. There is evidence that the number one real-- well, there are many causes, like I said. But one of the biggest contributors, they think, is this one, inflammation. So we're going to talk about that for a couple of minutes.

KHANNA: 11:20

All right. So inflammation basically. What is inflammation? It's the body's response to infection or injury. And inflammation is mediated by a bunch of different cytokines. Right? These are IL-1, IL-6, and TNF alpha. Those are the big three. And I'm only mentioning that because I'm going to mention that again later. And there'll be a quiz at the end. And then additionally, there are the local and the systemic effects of inflammation. Right? So when you get a cut, you're going to get inflammation there. It's going to be red. It's going to be swollen. Fine. There's also the systemic effects, particularly in people getting radiation. And even the tumor itself or chemotherapy causes a systemic inflammation. Right? And that can affect your central nervous system, and that's what we're going to talk about.

KHANNA: 12:11

So this is an interesting study here. It talks about the neuroendocrine-immune mechanisms of patients with cancer. So if you look at the left side, here you can see the cancer and its treatments. Right? You've got the tumor. You have the metastases, chemotherapy, stress, surgery, radiation. All these kinds of things result in - it's in the red box here - inflammation. That's due to the pro-inflammatory cytokines, like I mentioned mostly, and we won't get into the other things.

KHANNA: 12:41

What does inflammation do? So this is a cycle here. It causes problems with your sleep/wake cycle, right, so decreased sleep efficiency, more time awake, increased latency to sleep, so more time spent lying in your bed staring at the ceiling counting sheep. So it affects the sleep/wake cycle. Now, that affects your neuroendocrine system, so you have a flattened cortisol response and a bunch of different issues which I won't go into. But those are basically your neuroendocrine system. And this is a cycle here. So they feed into each other. The ultimate endpoint of all of these things are these CNS effects. Oops, sorry. And then all of these CNS sort of depression, dealing with serotonin, a lot of different neurotransmitters, a lot of different stuff, results in depression, fatigue, impaired sleep, cognitive dysfunction. But this is the one we're here to talk about today, which is fatigue. All right.

KHANNA: 13:41

So again, just mentioning it, different picture, same thing. We have cancer, infection, wounds, stress, cancer treatments. Those are going to cause immune cells to release their cytokines, and then that's going to have an effect on your central nervous system, particularly serotonin, dopamine, and cause a decreased appetite, decreased

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energy, those kinds of things, changes in your sleep, and impaired learning and memory. All right.

KHANNA: 14:11

So TNF, actually there's the-- so it's worth mentioning that this is actually a real thing. This is not something that people are sort of feeling, and it's kind of like a wishy-washy sort of topic, which is what a lot of people consider it. So I like to put a lot of the scientific stuff in here. And then you can remind your patients that this is a real thing. What they're feeling is real. We have scientific evidence that this exists. And I'm going to show you a couple of slides for that. The first thing is to establish that patients who have chemotherapy and cancer treatments have increased levels of inflammation in their bodies. So this red line is the patients with no chemotherapy, and those who did get chemotherapy. And this is the amount of inflammation basically, inflammatory markers, that they have in their bloodstream. So you can see it's higher at all time points, at the beginning, at six months, and then again at one year. So we established they have more inflammation in their body.

KHANNA: 15:05

Now, what does it do on your brain? That's a complicated slide. But briefly, we'll look down here first. These are the patients who have low levels of that exact cytokine I was talking about on the previous-- they have low markers. And you can see the activity in the baseline here at the brain is nice and lit up. It's red. It's orange. Compare that to here. So these are the patients who have high levels. Right? And you can see here just even with the picture that the amount of activity happening in their inferior frontal gyrus, the anterior part of the brain, is lower. Do you guys see that here? You can compare those two here. And even at one year later, the patients who had low levels of inflammation had more brain activity even one year later. Okay? So again, this is a real thing. We can even measure it in a scanner. The brain activity is less.

KHANNA: 16:01

This is kind of an interesting thing. It's talking about the genetics. Now we're entering the era of personalized medicine, right, very exciting. It is very exciting. Here, this study is showing that they have these genetic markers that correlate to the severity of fatigue. So they looked at patients who have very bad fatigue and the patients whose fatigue is not as intense, and they found that there is some genetic link between those two. And this is again a more complicated slide here. But it's basically showing that they were able to calculate a score based on the genetics, and that score sort of correlated to how bad the fatigue was. So basically, they showed the patients with more of a high-expression alleles of these certain single-nucleotide polymorphisms, certain genetic components, had more severe fatigue and cognitive complaints than people who didn't have those genetic components. So essentially, they concluded that the genetic risk index is significantly associated with greater fatigue and cognitive changes. So what does that mean? That means we can, even with a genetic test, predict-- before chemotherapy starts, before all the cancer treatment starts, we can even predict who's going to be more affected by fatigue, and then we can send them to rehab earlier, right, and do prohab and things like that like we try to do with ReVital.

KHANNA: 17:23

These are the guidelines that makes your eyes kind of blur over when you see this. And we're going to talk about screening. We have a whole talk about that, which is

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going to be great. So I'm not going to spend too much time on this. But basically, again, those same kind of oncology guidelines state that fatigue should be screened, assessed, and managed. All patients should be screened using age-appropriate measures. The fatigue should be evaluated, monitored, treated promptly, all that. It also says that health care professionals experienced in fatigue evaluation and management should be consulted. Right? That would be us. We're happy to see ourselves in there. Rehab doesn't make it into a lot of these oncology guidelines. It just says we should implement the guidelines. And then look at that. Look who's in the very dead last line of these guidelines here. We made it; physical therapy, occupational therapy, physical medicine, and diagnosis from [inaudible]. Sorry to speech therapists and everybody else who didn't make it in this [laughter], but at least we made it into something. Then the oncologists, well, they're going to read it. We're last, but we made it. All right.

KHANNA: 18:32

Primary evaluation. This is a little bit about how do we treat fatigue? So that's where we kind of-- what I'm transitioning to here. Of course, we're going to do the focus history. We're going to consider the cancer recurrence. We're going to look at what makes the fatigue worse, what makes it better, right, kind of the standard workup that we do. And then there's the management of the symptoms and treatable contributing factors. So that's what I'm going to talk a little bit about next. So like I said, there's a lot of things that cause fatigue. Some of them we can't do anything about, but some of them, like depression and anemia, we can do something about. Yeah. So it would be tragic if somebody was fatigued, and they were anemic the whole time, right, we never even checked. Or they have hypothyroid; that can make you fatigued. Right? So it's worth looking into those treatable causes of fatigue, and that's a step that a lot of people skip. And it's an important one obviously. Because we're treating them. And then if they were hypothyroid the whole time, that's a real tragedy. So first identify, treat underlying factors. This is more for the physicians in the audience, I guess, more of a treating the underlying factors; anemia, depression, sleep disturbances, and pain, different medical conditions.

KHANNA: 19:42

So what do we do about it? Let me do a quick time check to make sure we're not running behind. So there are a couple of different interventions or categories of interventions. The first is the pharmacologic, right, the medications. The biggest medication-- or the class of medications really that we use the most are going to be these psychostimulants, and I'll talk about that. There are also the behavioral and psychological interventions, and we're going to talk a lot more about that. There are the exercise interventions, which, of course, little preview, is a very important aspect of this. And then there's the complementary and alternative medicine. So let me talk a little bit briefly about those just by way of introduction, I guess.

KHANNA: 20:37

So there are the psychostimulants. I'm not going to bore everybody with this because I know it's not of interest to most people. But the two most psychostimulants that have been studied are going to be modafinil, which is Provigil, and then methylphenidate, which is Ritalin. And there are different formulations of all of these, meaning extended-release, short-release, all those kinds of things. So there was a review. One showed that there is improvement using methylphenidate, meaning Ritalin. Another one showed that modafinil works great. And then another trial

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showed that modafinil didn't do anything. So basically, the research is sort of all over the place with this, and we don't have a clear guideline. In my experience - I don't know about Dr. Stubblefield's experience - most patients who have had fatigue, they have so many different things going on. They're really not interested in starting a new medication. I rarely even bring this topic up. These medications have a lot of side effects. But when I do give it to them, I use modafinil 200 milligrams. But anyway.

KHANNA: 21:37

Lastly, so this is the exciting stuff. Here's where we're going in the future as far as the medications go. The strongest evidence it looks like on the horizon for the treatment of cancer-related fatigue are anti-cytokine therapies. So like I said, we had those pro-inflammatory cytokines. Right? Does anybody remember the three cytokines I said? IL-1, TNF alpha. All right. I was going to be impressed if somebody remembered that. So these medications basically block those. Right? And we already have medicines that do that. For example, for rheumatoid arthritis, psoriasis, these rheumatological problems, we already have medications that do that. TNF, remember that was the one from the graph and the one that we saw the brain scan with, we have antagonists to those. We already have drugs that block those. And there they are, infliximab and those etanercept and stuff like that. So those drugs already exist. And they have been found, and some studies are looking into it and are finding that they are effective in reducing fatigue associated with those conditions. So we may have a medication or at least medication to help with fatigue. I don't think it's going to cure it, but every little bit helps. So that's exciting. All right.

KHANNA: 22:46

Next, we'll talk about the psychological interventions. These are primarily designed to provide information to the patients. They reduce stress. They improve coping. And they increase the social support, of course. And we're going to talk-- we're going to have a great talk about this coming up. Oh, sorry. I was looking at the-- you guys can't see that. There you go. Now you can see it. They also have beneficial effects on fatigue.

KHANNA: 23:19

Lastly, there are the complementary and alternative medicines. So as you guys know, a lot of the cancer patients are interested in this kind of thing, which is understandable. Right? So we get a lot of questions and requests about this. Right? There is some evidence of using acupuncture, tai chi, different energy therapies, and yoga as well.

KHANNA: 23:47

So exercise. Exercise, probably it has the best evidence that we have for treating for fatigue. Okay? I hope I'm not giving somebody else's lecture. Sorry, guys who are coming after me. Steal your thunder. Totally stole it. But exercise is the highest level of evidence for this. And they're going to go into a lot more detail about this. So this just kind of introduction. So the exercise interventions, they show beneficial effect on fatigue during and particularly after treatment. There's home-based exercises shown to be not quite as effective. But then the supervised aerobic exercise, right - you guys are happy about that - have show a medium or a significant reduction compared to those who have no exercise. So exercise does make a difference. That doesn't mean convincing a patient who's fatigued to exercise is easy. You guys know that better than me. But there you have it.

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- KHANNA: 24:41 The last thing that we can do is our energy conservation techniques. We're going to talk a little bit more about this later too. And this is something that you guys do a great job with. But one of the barriers to having patients do come to therapy, of course, is that they have so many other appointments. They're doing radiation, they have young children, whatever it is, you guys know there are so many barriers to have people come back. So what I usually tell them is that all of these energy conservation strategies here can really just be educated-- the patients can just be educated only in just a few visits. Right? So just because they're busy, I try to convince them to at least learn some of the strategies. I'm not saying they have to go for six to eight weeks. Right? Of course, that would be the best, but. We can at least encourage them to learn some of the techniques. Right? And these are listed here, and we're going to talk about those. I'm not, but other people are going to. Other people who are much more knowledgeable about this than me are going to talk about this as far as pacing yourself, delegating, doing activities during your busiest-- or your most energetic portion of the day.
- KHANNA: 25:43 So according to the American Cancer Society, what should we be telling our patients? And I try to remember these. You set up a daily routine that lets you be active and when you feel your best. Right? So you do the stuff when you're feeling your best. When you're feeling fatigue, don't try to rearrange the furniture or do whatever you need to do. You get regular light to moderate-intensity exercise. Get fresh air. You need to eat a balanced diet, drink plenty of water, prevent dehydration. Control your symptoms; pain, nausea, depression. Take your medication. See your appropriate physicians to get those kind of conditions under control if they're not already. Keep the things you use often within easy reach to kind of save energy. Enjoy your hobbies and other activities that give you pleasure. Use relaxation-- sorry. Use relaxation and visual techniques to reduce stress. Balance activities with rest so as to not interfere with your nighttime sleep. A lot of people take daytime napping and things like that-- or do daytime napping and things like that, so. Another aspect of cancer-related fatigue is not feeling relieved by rest. Right? So when we feel fatigued, we take a nap, and we wake up refreshed. A lot of patients with cancer-related fatigue will not. And that's because just because you take a nap doesn't mean that your level of inflammation in your body's gone down. Right? So that's an important one. And then lastly, ask for help if you need it.
- KHANNA: 27:14 All right. So in summary, we have the treatment, team members refer to a psychiatrist or supervised rehabilitation program. Exercise, category one recommendation. To make the diagnosis, we need to screen the patients, and we need to treat their underlying medical causes if they are any. We should at least look into them. Those include anemia and hypothyroid. Those are the two most common offenders in addition to depression. And then if there's no underlying cause, the guidelines say that we should refer to knowledgeable people who can treat this effectively. And then lastly, for the doctors in the audience, we're talking about the psychostimulants. There's a reason that one's last on this list.
- KHANNA: 27:46 All right. So cancer-related fatigue, common, persistent, difficult to treat. The causes of cancer-related fatigue not well-known, not well-understood, definitely

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multifactorial. That means complicated. But it's associated with anemia, high body mass index, diabetes. Some different types of cancer are more associated with fatigue than others. Don't really know why. Perhaps it may have to do with the treatment of them, but who knows? The inflammatory cytokines, right, the markers of inflammation. Cortisol dysregulation. And then one of the most effective treatments for cancer-related fatigue is exercise. This is a level one recommendation. Aerobic and resistance exercise are both effective. But I'm going to stay out of it because there are people who know a lot more about that than me, so I'll let them talk about that. And then lastly, there are the cognitive and behavioral therapies. We can recommend those, and those can help mitigate their symptoms, as do those psychostimulants as well if need be. All right. That's all I've got. If you have any questions, let me know. That's how to reach me. [applause]

- STUBBLEFIELD: 29:07 So true to form, Dr. Connor's like five minutes ahead of schedule, so nicely done, which means we do have a little time for questions, and we're going to script the recording. No. Okay. If you don't want to be-- we're recording these. So if you don't want to be on the recording, then whisper in my ear, and I'll say something [laughter]. Fair enough. Are there any questions? I'm going to lead off. I have a question.
- KHANNA: 29:29 Sure. Uh-oh [laughter].
- STUBBLEFIELD: 29:30 So--
- KHANNA: 29:31 Quick, somebody else.
- STUBBLEFIELD: 29:33 Right. So I guess our audience is mostly non-physiatrists, non-physicians.
- STUBBLEFIELD: 29:39 So when they see somebody who comes in with cancer-related fatigue, what red flags would prompt them to try to encourage their patient to go to a physician for a medical workup of the fatigue as opposed to just assuming it's cancer-related?
- KHANNA: 29:45 That's a good question. I would say the number one thing would be if they don't have close physician follow-up. If you have a patient, and they haven't seen their doctor in a while-- some patients, like we saw, cancer-related fatigue can be 5, 10 years later you can still have that problem. And I see that in the office for sure. If you have somebody who's not seeing their doctor regularly, then I think that's definitely a red flag because somebody should be checking and ruling out those medical causes of fatigue. Do you have anything else?
- KHANNA: 30:29 Okay. Sure.
- AUDIENCE: 30:32 My question is, so when the patient comes in for their initial evaluation, and normally, you say, "How do you feel?" how do you ask that question? "Are you fatigued?" or? Do you understand what I'm saying?
- KHANNA: 30:47 Yeah. Right.
- AUDIENCE: 30:47 Normally, the normal question to people are, "How are you feeling?" So now when you want to just focus on fatigue, how do you separate that?
- KHANNA: 30:45 Yeah. So I ask them do they-- I basically ask them do they feel fatigued? This is a great question. I should have put that-- I should make a slide out of that. That's a good

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question. I usually ask them do they feel fatigued? And I ask if they feel fatigued throughout the course of the day. Do they feel fatigued out of proportion to what their normal activity is? And then do they feel refreshed after a nap? And also the amount of daytime napping. I didn't go into that, but there is evidence of daytime napping, a lot of patients who do daytime napping and things like that. So those can all be kind of indicators.

STUBBLEFIELD: 31:32 And our next 20 minutes is going to be all about screening.

KHANNA: 31:35 Yeah. Actually, that's a good point.

STUBBLEFIELD: 31:35 So that'll hopefully answer in-depth. But basically, it's just--

KHANNA: 31:39 [inaudible].

STUBBLEFIELD: 31:40 Yeah. But you're going to see two things again and again through the course of this. One is exercise is the best medicine, and two, you've got to ask. Right? Those are really your takeaway points. You can all go now. Now, we do have just a couple more minutes before we bring on our next speaker if there are any questions. Otherwise, I'll get off the stage again.

AUDIENCE: 31:48 Too early in the game to ask this question, but in reference to the exercise piece, for instance, [inaudible] like yoga or tai chi, are there studies that have indicated those [inaudible]?

STUBBLEFIELD: 32:11 So the question is are there studies on complementary-- like yoga and tai chi? And the answer is yes, absolutely. And I believe the course will be going over that. If not, we'll answer it at the end. [music]

ANNOUNCER: 32:24 For more information about Kessler Foundation, go to [KesslerFoundation.org](https://www.KesslerFoundation.org). Follow us on Facebook, Twitter, and Instagram. Listen to us on Apple Podcasts, Spotify, SoundCloud, or wherever you get your podcasts.