



Meet Our Presenters:



Eugene Lee: Dr. Lee is an associate professor of urology at the University of Kansas Healthcare System. He serves as director of urologic oncology and program director for the fellowship. Additionally, he leads clinical research programs and Dr. Lee is a surgeon scientist who focuses on urologic cancers. As a scientist, his main area of interest is on improving outcomes in patients undergoing radical cystectomy for bladder cancer. It's a pleasure to have you here, Dr. Lee.



Jill Hamilton-Reeves: Dr. Hamilton-Reeves, who is an associate professor, a dietician, and a certified oncology nutritionist at the University of Kansas. Dr. Hamilton-Reeves works with urologists and medical oncologists to foster the discovery of better diet and exercise approaches to benefit patients with cancer. Her nationally-funded research program is focused on nutrition and cancer prevention, management and survivorship, with specific attention on bladder cancer.




Muger Geana: Dr. Geana is a PhD physician and he's associate professor of strategic communications at the William Allen White School of Journalism and Mass Communications at the University of Kansas. He's also the director of KU's Center for Excellence in Health Communications to Underserved Populations. As a physician, Dr. Geana also has his PhD, as I mentioned, in journalism and health. He conducts research into the identification and development of health communications channels and messages to address health disparities, and barriers and facilitators for communication about cancer and cancer clinical trials.

Dr. Lee: This is such a wonderful opportunity for not only myself but I think I can speak on behalf of the team, that what a great opportunity to sit down and talk about bladder cancer and specifically nutrition with all the participants today. So, thank you all for joining.


This is going to be a very brief overview of what we've worked on. And really, obviously the point of this is to allow people to ask questions and have a dialogue.

Dr. Lee: Because I don't know all of the folks who are participating in this, I don't know at what stages of bladder cancer you have been diagnosed with, you or your loved ones or family members, but I'm going to focus mainly on radical cystectomy. For those of you who don't know, it's the operation for removal of the bladder when you have advanced bladder cancer. Often times, it's for muscle invasive bladder cancer, or if there's non-muscle invasive bladder cancer that keeps coming back, then a lot of times your treatment team will say, "Hey, it's time for that bladder to come out."



Radical Cystectomy Complications

- 64% 90-day complication rate
 - 57% Grade II-IV Clavien-Dindo
- 26% Readmission Rate
- 3% 90-day mortality
- **ERAS** (Enhanced Recovery After Surgery)
 - 24.3% major complication
 - 29.6% readmission rate




The problem, as many of you know though, is that radical cystectomy is a really, really tough operation to get through. About two thirds of people will have a complication some time within 90 days. About a quarter of patients will actually have to get readmitted into the hospital. About a quarter of people, the complications are actually a major complication. Anywhere from three, and some of the literature will say even up to seven percent of patients will actually not make it 90 days.

I mentioned at the bottom of the slide, Enhanced Recovery After Surgery (ERAS) is something that has really been promoted within the last I would say five to 10 years. It's enhanced recovery, and a lot of it has to do with how can we get people through surgery efficiently, effectively, and quicker. The thing that we have found is that yes, we can get people through surgery quicker, we can get them out of the hospital, but it really hasn't changed regarding the major complication rates or the readmission rates. Really, what we're wanting to do is see if we can change the biology of the treatment instead of just the surgical aspects or some of those things.

I of course am biased, but I think that one of our strong suits at the University of Kansas is having Jill and the dietetics and nutrition teams and the folks that really lend a lot of information and are true partners in the treatment of these patients. What we wanted to focus on is the nutritional factors. I'm not going to get into the weeds with all of these studies that I have on these slides, it's probably a little beyond what our discussion is, but this slide basically says that if you are malnourished, you're more than likely going to have a complication around the time of radical cystectomy.

The one thing that I do want to focus on is the albumin, which is a protein in our bodies. It can be a measure of our nutritional factor. We all know, who do this science, that it's not a perfect test, just like a lot of tests just aren't perfect. But it is one of the markers of just general nutrition. All I want you to take away



Malnutrition

Nutritional Predictors of Complications Following Radical Cystectomy

David C. Johnson, MD, MPH¹, Stephen B. Riggs, MD², Matthew E. Nielsen, MD, MS^{1,2,4}, Jonathan E. Matthews, MPH^{1,4}, Michael E. Woods, MD^{1,3}, Eric M. Wallen, MD^{1,3}, Raj S. Pruthi, MD^{1,3}, and Angela B. Smith, MD, MS^{1,3}

Table 2a

Predictors of overall complications following cystectomy for treating bladder cancer, with special emphasis on selected nutritional-dependent prognostic factors [albumin distribution dichotomized at 3.5]

		Adjusted odds ratio (95% CI)	p-value*
Preoperative albumin < 3.5	Yes	1.79 (1.06, 3.03)	0.03
	No	Reference	
Greater than 10% loss in body weight in the last 6 months	Yes	1.03 (0.44, 2.52)	0.92
	No	Reference	
BMI	Per 1 unit increase	1.01 (0.98, 1.04)	0.73

*After adjusting for significant variables on bivariable analysis (BMI, age, sex, resident proximity to OR, year of operation, smoking history, pre-operative pulmonary and cardiac comorbidity, pre-operative acute renal failure, prior operations within 30 days, operative time, ASA classification, pre-operative blood transfusion). Remaining nutritional parameters were included in the multivariable model regardless of bivariable significance.

Johnson et al. World J Urol 2015

from this slide is if you have low pre-operative albumin, meaning that it's lower than it should be, you do have a higher overall rate of complications.

Dr. Lee: In fact, this is another study that looked at different factors to define malnutrition. Again, that albumin comes out, so less than 3.5. The BMI, so body mass index, I think many of you are probably familiar with BMI. I think most of us want to get to that lower BMI, but as you know, when your BMI is too low, that's not a good thing, so less than 18.5 is very, very cachectic (wasting away).

Then a pre-operative weight loss of more than five percent, so if you're losing a lot of weight before surgery, again, that's not an ideal situation. What this study found was that if you had any of these nutritional factors that were depleted or any of these factors, your mortality likelihood is much higher, and your likelihood of survival is lower. That is really compelling evidence to say that nutrition is extremely important in outcomes for radical cystectomy.

One of the concepts that we want to make sure that we portray and get across to everybody is that just because somebody is obese does not mean that they can't be malnourished though. This slide essentially says that even at these higher body mass index categories, which is considered obese and overweight, there is a certain portion of these patients that are also showing signs of malnutrition, and so that's really important to keep an eye on as well too.

Very, very similar slide. Again, the biggest take home point, this is a lot of data on this slide. The biggest take home point is it's almost saying that regardless of obesity, your serum albumin, so again, your

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Malnutrition

- Nutritional depletion
 - Albumin <3.5 gm/dl
 - BMI <18.5 kg/m²
 - Pre-op weight loss >5%
- 90-day mortality
 - **16.5%** vs. 5.1%
- 3-year survival
 - **44.5%** vs. 67.6%

Time since surgery (months)	Not Nutritionally Deficient	Nutritionally Deficient
0	431	152
12	338	60
24	207	44
36	131	26
48	74	19
60	36	12

Gregg et al. J Urol 2011

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Malnutrition and Obesity

Arora et al. Bladder Cancer 2018

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Malnutrition, Obesity, and Complications

Feature	Univariate Models		Multivariable Model	
	Odds Ratio (95% Confidence Interval)	p-value	Odds Ratio (95% Confidence Interval)	p-value
BMI Category (ref = normal [18.5-24.9])				
Underweight (<18.5)	1.84 (0.95-3.58)	0.07	1.66 (0.84-3.28)	0.14
Overweight (25.0-29.9)	1.04 (0.82-1.32)	0.72	1.13 (0.89-1.44)	0.33
Obese Class I (30.0-34.9)	1.34 (1.03-1.74)	0.03	1.43 (1.09-1.86)	0.01
Obese Class II (35.0-39.9)	1.82 (1.26-2.63)	0.001	1.92 (1.32-2.79)	<0.001
Obese Class III (>40.0)	2.23 (1.40-3.53)	<0.001	2.32 (1.46-3.71)	<0.001
Unknown	0.70 (0.23-2.18)	0.54	0.65 (0.20-2.17)	0.49
>10% loss of body weight within 6 months (ref = no)	1.51 (0.93-2.43)	0.09	1.44 (0.88-2.36)	0.15
Preoperative Serum Albumin (ref >=3.5)				
<3.5	1.53 (1.13-2.08)	0.006	1.47 (1.07-2.02)	0.02
Unknown	0.89 (0.74-1.09)	0.26	0.88 (0.73-1.08)	0.22

Feature	Univariate Models		Multivariable Model	
	Odds Ratio (95% Confidence Interval)	p-value	Odds Ratio (95% Confidence Interval)	p-value
BMI Category (ref = normal [18.5-24.9])				
Underweight (<18.5)	3.72 (1.19-11.66)	0.02	3.04 (0.95-9.74)	0.0612
Overweight (25.0-29.9)	0.56 (0.27-1.16)	0.12	0.60 (0.29-1.25)	0.1685
Obese Class I (30.0-34.9)	1.00 (0.49-2.05)	1.00	1.06 (0.51-2.19)	0.8767
Obese Class II (35.0-39.9)	1.29 (0.50-3.35)	0.60	1.36 (0.52-3.53)	0.5291
Obese Class III (>40.0)	2.84 (1.14-7.05)	0.03	2.96 (1.18-7.42)	0.0207
Unknown	4.21 (0.89-19.89)	0.07	3.74 (0.78-17.91)	0.0983
>10% loss of body weight within 6 months (ref = no)	1.42 (0.43-4.63)	0.57	1.19 (0.35-4.04)	0.7833
Preoperative Serum Albumin (ref >=3.5)				
<3.5	2.82 (1.37-5.79)	0.005	2.33 (1.10-4.95)	0.0274
Unknown	1.88 (0.96-2.95)	0.07	1.81 (0.91-2.83)	0.1011

Arora et al. Bladder Cancer 2018

marker of nutrition, is more important in regards to overall complications. So, what leads to malnutrition?

Dr. Lee: When you're getting care when you have cancer, dysgeusia is a term that we have really been thinking about a lot, focusing on a lot. People who are undergoing chemotherapy often times will have smell and taste changes specifically. In fact, I've had people, and my partners have said the same thing, that even people who don't undergo chemotherapy actually will have taste changes. A lot of these factors will contribute to the fact that, and again, a lot of you out there may have already been through chemotherapy or are going through chemotherapy. Those taste changes and smell changes really are altered, and really decrease your ability to get good nutrition.

Additionally, if you have diarrhea or constipation, you can have poor intake of nutrients or malabsorption of nutrients. I'm going to take the side of the patient. We as patients say, "Well, this is just a part of treatment and I just have to deal with it," or, "It's just part of treatment and let's just see." But there are actually ways to improve your nutrition even when you're suffering from these things, and there are tips and methods to really improve upon this. That's part of what we really wanted to get across to patients.

Furthermore, if you look at the guidelines for the treatment of non-metastatic muscle invasive bladder cancer, and this was put out by the SUO, the AUA, basically saying that we have a duty as clinicians to attempt to optimize patient performance status in the peri-operative setting, and performance status is highly dependent on nutrition and overall health.

What we aim to do, where this project came from, was that we wanted to create a very systematic way of dissemination information through a video education series. This is where Mugur is just a phenomenal investigator, looking at really how do we get information across to patients. Because when I first met Mugur, I thought that videos were just you take an iPhone, you walk around and you just record some information and then you give it to people and that's how you teach somebody through a video. But there's a lot of good science out there in

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Malnutrition

- Dysgeusia
 - 73% of carbo/cisplatin patients have smell/taste changes
- Diarrhea/Constipation
 - Poor intake
 - Malabsorption of nutrients
- Guidelines for the Treatment of Non-metastatic Muscle-invasive Bladder Cancer
 - **"Clinicians should attempt to optimize patient performance status in the perioperative setting"**

Bernhardson et al. Support Care Cancer 2008, Caffo et al. Cancer 1996, Chang et al. J Urol 2017

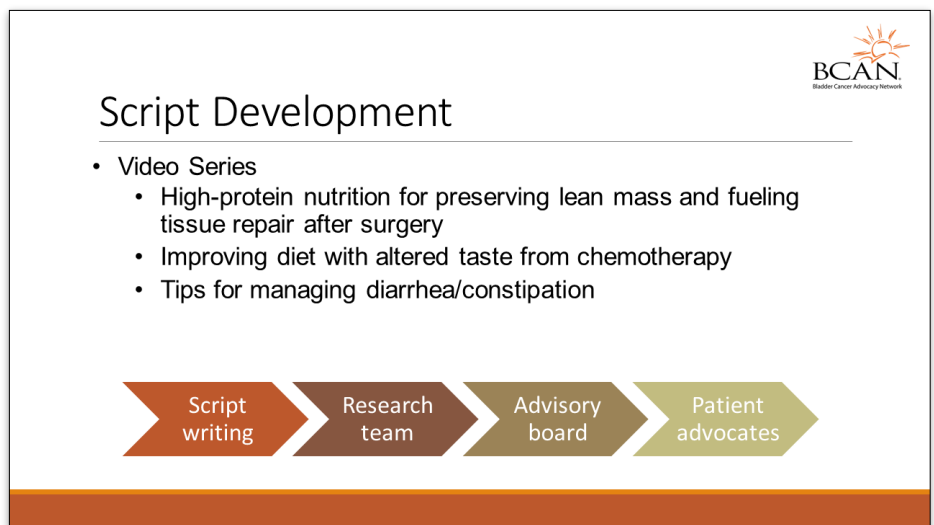
Video Education Series

- Key goals and objectives
- Practical application through recipe demonstration
- 4-7 episodes 3-5 minutes each
- Emotion elicitation audio and filming "movie-like" Attention and information access

terms of how you actually engage patients, how you actually study the engagement of patients, and so he's really introduced me to a world of video and education that I didn't even know existed.

Dr. Lee: We wanted to also have not just didactics and just somebody lecturing to somebody and saying, "Oh, here. Eat this, eat this, eat this." No, we wanted to have practical applications. We wanted to create recipes and how to make those recipes with demonstrations. We wanted to create about four to seven episodes for each of the subjects we were going to focus on. About three to five minutes, because as you know, our attention spans aren't always the longest and you want to get things in bite-sized pieces. We also wanted to, and again, this was terminology that Mugur really introduced me to, but emotion elicitation audio and filming. So, movie-like quality, and that really gives patients and the audience, they'll focus better and they'll get that information a little bit more effectively.

The script development, again, my initial thought was, "Oh, you just write the script and you record." But really, the important thing is that you've got to make sure that we use an iterative process, meaning that it goes through different levels. We chose, for the three video series, high protein nutrition, so we want to make sure that we keep lean muscle mass and fuel and tissue repair after surgery which is obviously very important. Then dealing with dysgeusia, so the altered taste from chemotherapy and other treatment, and then tips for managing diarrhea and constipation.



We had a team, actually one of Jill's research assistants really worked super hard on writing the script and then it got passed around to the research team, and so we picked at it, we went through it multiple times. I don't know how many times it goes through the process of email back and forth and down to each little word about ... We wanted to talk about specific things and get everything in a short amount of time. We've got Mugur on the other end saying, "Hey, hey, hey. We can't record for 17 hours here. We've got to cut this down into a certain amount of time."

So, we really went through the process and snipped it and cut it and then we passed it on to an external advisory board of external nutritionists and dieticians who are experts in these fields. And then once we were done with that, we passed it on to our patient advocate partners who obviously are very, very important in this process because if they don't understand it and they're giving us poor feedback, then it makes no sense to them, then it doesn't do any good for us.

What we did was we did our video recording. Our actors were physicians, nutritionists and dieticians, which interestingly enough, one of the nutritionist dieticians who was in the video that I'm going to share with you later actually has a background in acting, so we were very, very lucky to have that. Whereas the one video that I recorded, I had to read off a teleprompter because I am not an actor. But

we had people from the research team, and we recorded this at the University of Kansas, the Clinical Research Center in the teaching kitchen, so we had a great venue to be able to record these videos.

Dr. Lee: We do these video analyses, and this is the fascinating science behind it. Mugur, you may want to chime in on this part, but we have an application ... Do you want to chime in, Mugur?

Dr. Geana: Yes, yes. All right. First of all, let me say how honored I am not only of participating in this seminar, which I think is extremely important, but also being part of this extraordinary research team. One of the things, what we did is a combination of artistry with science basically. Because after we got the scripts, and I still remember the first version of the script, it was so technical and scientific. We took that script and working together both with Jill, with Heather, and with Eugene, we actually took that narrative and more or less converted it in a story. We made it accessible so we can deliver the information that's pertinent and accurate to the patient but in a way that it's accessible to them as well.

After we were done with the script, then the next step was we filmed it. Here is where the artistry came, because we actually worked and we consulted with professional filmmakers. One of the things that we did that Eugene mentioned a little bit at the beginning, was we filmed in 24 frames per second, so just for you to have an idea what this technical thing means, is that normally what we see on TV, our screens or the computer, they work at 30 frames per second, sometimes at 60 frames per second. 24 frames per second is what we see the movies being filmed when we're going out on the big screen at the movie theater. And that 24, that difference of six frames per second makes everything more smooth and more accessible in terms of the image, so that's one of the things we did.

Also, we used a lot of cinematic tools and tricks like we used shallow depth of field, we used camera movements, things that you don't usually see when you're thinking in terms of this is a professional video or a training video about nutrition in oncology. Also, we tried to avoid talking heads, the way I call them, as much as possible. That was the science behind it. Of course, we used lights to create the mood and everything else.

Video Analysis


- Noldus
 - Facial Expression Recognition Software
 - Body Language and Emotion Evaluation

The software interface displays a video of a woman speaking, a timeline with colored bars, and a graph showing emotion levels over time. The graph has a y-axis from 0 to 100 and an x-axis with time markers. A red line represents the emotion level, showing a peak around 0:20. A pie chart in the top right corner shows 'Anger 18.4%', 'Sadness 4.6%', and 'Happy 42.2%'.

The science behind it is “okay, so this is how we want the message to be delivered, let's see how good we can actually estimate how that information was delivered”. We approached it in two ways. One of them is we wanted to make sure that our narrators, the actors who are playing in our videos, because they were not professional actors with one exception that Eugene mentioned. They conveyed the emotion that we were looking for, okay.

Dr. Geana: For example, we wanted to make sure that Jill doesn't look angry when she's talking about broccoli, for example, right? So, we used this suite that does what's called facial emotion recognition. We analyzed all the segments of the videos that end up in the final production to make sure that the emotion that is conveyed is a positive one, that it's the correct body language. And not only the voice and the words, but also the way people act conveys the information that we're looking at, and create that positive emotion. So, that was one of the things.

In addition to that, we also wanted to make sure that the way we put together the videos and the way we're delivering catches the attention and the focus of the patients. We did a study in which we used what's called eye tracking to really see what parts of the video people are paying attention on. And if they're not getting distracted by for example things that are happening in the background or flowers that's there, and we wanted to make sure that the attention and the way we're conveying information elicits the maximal engagement of the patients with the video. Can we get the next slide, please?




Video Assessment


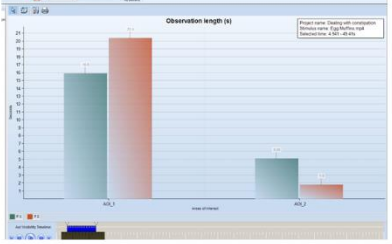
- 16 participants
 - 12 RC and 4 caregivers
 - Maximum sampling approach
- Quality of videos
 - Survey/Interviews
 - Likability
 - Attention
 - Understanding
 - Behavioral Intention

Engagement
"Please rate your level of engagement with the video and explain your rating"
"Does the video answer questions you have about nutrition?"
Was the information adequately described for you to act upon the instructions given?"
Usability
"How could the videos be improved?"
"Is there anything else you would like to share?"

Okay, so here is something that you see that we did eye tracking and then we analyzed where patients were looking as the narrative was ongoing, as the video was playing, where they were looking. We combined this with a series of questions and metrics that we had and we asked the patients at the end of this experiment. It was very, very interesting because Eugene mentioned about making sure we have the attention focus for three to five minutes, and that's why we only had three to five minute videos. But it was so interesting because on some specific topics, like for example dealing with constipation, some of the feedback that we got from patients were, "Oh, we wanted to know more about it. We actually wanted a longer video."



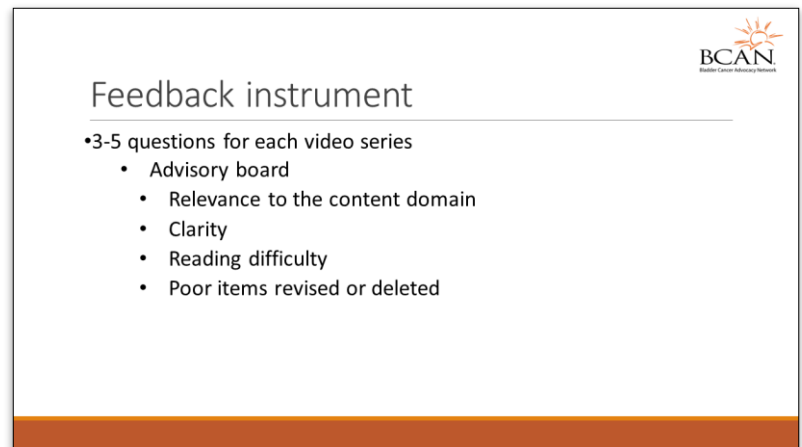
Video Assessment

That's why we have a series. Each of the three topics that Eugene mentioned earlier has a series of videos, and it's a combination between instruction and education videos with cooking demonstrations. When it came to cooking demonstration, we didn't want you to feel like you were in a clinical setting. We wanted to take you outside of it and put you in a cooking show, okay. Think Rachael Ray, right? That was the kind of emotion and feature we wanted to convey, so we filmed accordingly in order to do that.

This is the production part, and the testing of both the production, the delivery, and the impact that the videos had in our patients.

Dr. Lee: All right, great. But coming up with knowledge questions, we wanted to make sure that we include knowledge questions to make sure that people are understanding the information that we are trying to deliver. We did the same thing with this. We went to an advisory board. We wanted to make sure our questions, they were relevant, they were clear, that they were at an appropriate reading difficulty, and that we would revise or delete poor items.



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Feedback instrument

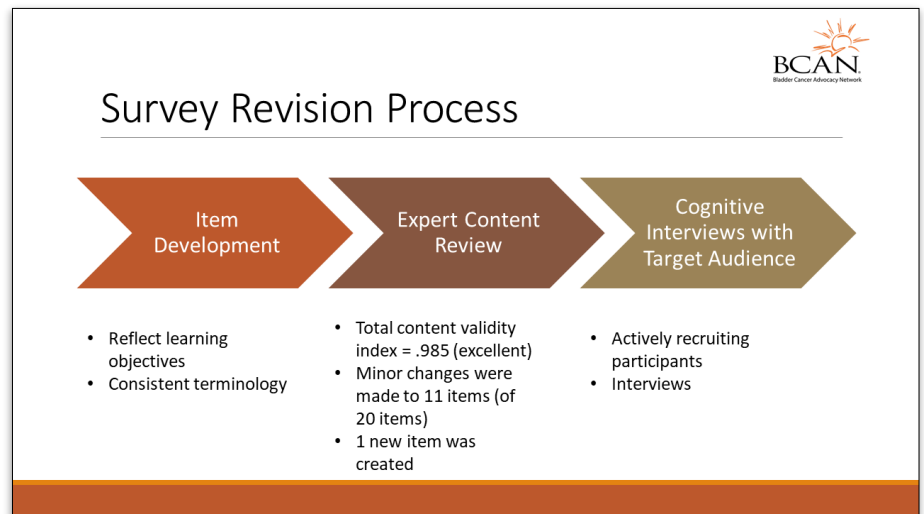
- 3-5 questions for each video series
 - Advisory board
 - Relevance to the content domain
 - Clarity
 - Reading difficulty
 - Poor items revised or deleted

This was also currently being undertaken with semi-structured interviews as well, too. The reason I say currently undergoing is because obviously with COVID, our people interactions had to be cut out and so we had to change our process into being able to do things through Zoom and telephone visits. But again, these questions are not implemented in the videos yet because we are still trying to test them with patients right now, and so that's still an ongoing process.

This again is the survey revision process. We developed the ideas or the questions, we wanted to make sure that the expert content review was good, and then cognitive interviews with target audience, again, that's where we are right now with active recruitment. But again, it's been difficult because of COVID.

What I do want to do is actually just go ahead and show you one of our videos, and then I'm going to open it up to questions. To

watch the video go to Youtube.com and follow this link: https://youtu.be/8Z7T36_Sitl.



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Survey Revision Process

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graph LR; A[Item Development] --> B[Expert Content Review]; B --> C[Cognitive Interviews with Target Audience]
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- Reflect learning objectives
- Consistent terminology
- Total content validity index = .985 (excellent)
- Minor changes were made to 11 items (of 20 items)
- 1 new item was created
- Actively recruiting participants
- Interviews

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