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Session: What Potentially Makes De-Implementation Different Than Implementation and Why Does it Matter? Thoughts on Theory, Outcomes and Patient Experience

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Christine Kowalski: Everyone for joining our session today. My name is Christine Kowalski, and I’m an implementation scientist with CEIR, the Center for Evaluation and Implementation Resources. And this IRG is a learning collaborative that’s set up for sharing best practices and lessons learned in implementation science. We just keep growing and we have over 500 members. And this session today is part of our monthly catalog of events. Do you have feedback about this session today? Please stay on to take the survey at the end. We would appreciate that. And I would like to thank our presenter for his work in preparing for the session today. We have Dr. Christian Helfrich speaking with us today. And he’s a research associate professor for the University of Washington. And as well a research investigator with the Veteran’s Administration Puget Sound Healthcare System. And as Heide said, he’s gonna be speaking with us today about the implementation and factors that may be important for as we’re distinguishing it between de-implementation. So we hope you enjoy this seminar today, and now I will turn things over to Dr. Helfrich.

[silence 0:01:10 – 0:01:20]

Heidi: Okay, Christian, we are seeing the presenter view, so you’ll need to do the display settings swap. Perfect. And you are currently muted. So at the bottom of the screen you’ll need to unmute yourself. [silence 0:01:35 – 0:01:45] Let me try. Okay.

Dr. Christian Helfrich: [laughs]

Heidi: Okay. Nope. I’ve got you. You’re unmuted now. Go for it.

Dr. Christian Helfrich: Okay. Great. Thank you. Okay. Excellent. All right. Good morning everyone, or good afternoon, depending on where you are. Thanks so much Christine, I appreciate the opportunity to present. And so I want to talk to you today about de-implementation. The inverse of implementation.

And I want to acknowledge that this is work that I’ve thought about through a grant made by the VA Quality Enhancement Research Initiative, or QUERI program. And a QUERI program actually dedicated to studying now we take or de-implementation low-value care in the VA. And this is work led by David Au, a critical care pulmonary physician and Health Services researcher here at VA. Christine Hartmann, Health Services researcher and Geriatrics researcher in Bedford. And myself. And it’s a big team. Who has contributed really a tremendous amounts of this thinking.

And I wanted to share with you some thoughts about what makes this, this being reducing low-value care I think a little bit different. We think a little bit different. And why, and what some of the implications are for us as implementation researchers. And since, just to get us on the same page, what do I mean by low-value care? Finding diagnostic or therapeutic practices within the healthcare and you know potentially the public health system, within the healthcare system, that provides no demonstrable benefits. We looked for a benefit and we failed to find a benefit. Or where we have demonstrated benefits, but we’ve also demonstrated harms. And those harms outweigh the anticipated benefits. And I think important to distinguish we have a wide range of documented sources of waste in the healthcare system. And there are other sources of waste than low-value care, there’s the administrative complexity, for example, from the fee based system. We have many layers of it, administration just to deliver healthcare much of which is redundant and potentially quite wasteful. We also have for example fraud. These are other sources of waste that are different than low-value care, low-value care is where we’re delivering care intentionally that turns out to not be valuable. And when I talk about de-implementation here’s the definition provided by Prasad and Ioannidis. Stopping practices that are not evidence-based. I would further specify that when we talk about de-implementation we’re talking about systematic efforts to end the use of low-value care. And I specifically mentioned that this is in instances where there’s not necessarily an alternative. Or it’s irrespective of whether or not there’s an alternative practice to replace it. We oftentimes have a new practice come into being or to become available that will replace an old practice. And I would specify in this case, with de-implementation we’re talking about where we find out there’s a low-value practice that we collectively deem should no longer be practiced. I would further specify within our team when we focus on low-value care, we’re motivated by preventing patient harm and improving the value and timeliness and access to care. We are intentionally not making judgements about where to intervene on low-value practices in terms of cost savings. We’re really focused on the value proposition in reducing patient harm.

So what is the extent of this problem? Low-value care? How extensive is it? And of course the simple answer is, it depends. And it depends on the specific practice you’re talking about. It depends on the setting you’re talking about and it depends on a timeframe. There’ve been a number of metanalysis and systematic reviews of low-value care. And I think the more important thing to understand is depending on the practice and the settings—so for example one practice on one setting might be use of antibiotics to treat simple upper respiratory infections, most likely viral. Use of antibiotics to treat upper respiratory infections in US primary care settings. Or another might be use of imaging in actually diagnosing and treating incident lower back pain. Again, maybe in US primary care settings or US specialty care, orthopedic settings. You know. So depending on the practice, the essential thing is on the low end, across these literature reviews we generally find between 10 and 16% of care based on reviews—this is almost exclusively based on reviews of healthcare records—appears to be low-value. So we don’t know for certain, we don’t know for 100% that it’s low-value, but it’s certainly based on the reviews of medical records or administrative files, it appears to be low-value care. And on the high end, well on the high end there are instances where virtually 100% of the care is low-value. But in terms of common practices, on the high end, between 30 and 46%. So I think to me the essential message is, in the most conservative settings, in the settings where we find the least evidence of low-value care, we’re still talking about what appears to be 1 out of 10 instances of care appears to be low-value. So I think we have ample reason to believe that this is potentially a really big issue. There have been a number of estimates of the cost of overtreatment and low-value care. I’m using these two terms synonymously here. There are some differences. Some authors draw distinctions between, but I’m using them synonymously. But one of the most recent is by Shrank and colleagues in JAMA in 2019. And one of the things that they did that I thought was really valuable and new, was precisely distinguishing low-value care costs of low-value care from other sources of waste. And then also articulating what they thought the potential cost savings were based on interventions, policies, and strategies that exist today. Things that we already at least extensively know how to do and could implement. And they estimated that somewhere between $75.7 billion to $101.2 billion are currently being spent annually in overtreatment and low-value practices in the US currently. And they estimated that between $12.8 billion and $28.6 billion of those dollars wasted on low-value care could potentially be saved by implementing existing interventions policies practices. So things that had been demonstrated to reduce low-value practice in some setting, in some instance, if we were to be able to scale those up. These are the potential savings just based on what we know today. So for some context. Some other important factors in terms of understanding this challenge that we face with low-value care, there is some evidence based on national performance measures, largely measured through Medicare and Medicaid services, CMS data. But medical overuse does not seem to be improving. So it measures, quality improvement that assess medical overuse have a largely remained single in the past, approximately a decade. At the same time there’s some evidence for metrics for underuse, where we have failed to implement, effectively implement evidence-based care, measures of that closing underuse, gaps in underuse haven’t proved by and large. So we’ve seen improvement in underuse, we’ve not seen a similar improvement in overuse.

So what do we know about the drivers of low-value care? Well one I have to preface this by saying that we, within the implementation science community treat de-implementation and low-value care as a fairly novel topic. And as a labeled topic, as a topic that we give this specific terminology, de-implementation, it is relatively new. But it’s been around since the origins of Health Services research and implementation science. We’ve been trying to tackle for example inappropriate antibiotic prescribing for decades. But the literature on de-implementation specifically, so recognizing low-value services as this sort of special case and trying to tackle it with specific strategies and policies, is relatively recent. The literature on medical overuse has been doubling within the health services and clinical science literatures. Dan Morgan and colleagues have done a series of annual literature reviews and generally found a doubling of the literature. Wynn Norton and colleagues did a review of grant making over the past I think it was over 20 years from NIH and AHRQ the US Health Services funding agencies. And they found a small number of grants have been 20 in total have been made to de-implementation and the majority of those had been in the 2 years prior to their literature reviews back in 2017. And at the same time, so we have this growing awareness, at least within the literature, we also find from National Survey work done by Gary Colla and colleagues that within the practicing physician community anyway, the flagship national initiative to tackle low-value care, an initiative called Choosing Wisely, which is a collaboration between the American Board of Internal Medicine Foundation and consumer reports, and specialty care and practice professional communities, we find that awareness of that initiative has remained low among physicians. So this is an initiative precisely to engage physicians and identifying and tackling specific instances of low-value care in their specialties. And after years of the initiative being in place still only 1 out of 4 physicians, this is in 2017 were aware of the initiative. So it’s awareness within the practice community there’s some evidence, and this is limited, but some evidence that it remains low.

So again, just what do we know about the drivers of overuse. Of use of low-value care? There are many. And the literature on this is again growing. I would, I think that you can start perhaps in no better place than a proposed research agenda that Daniel Morgan and colleagues published in 2015 that really outlines some of these drivers. And it’s not a systematic literature review. So take this with a grain of salt. This is their perspective. But I think they captured it quite nicely. And they way that they framed it was in terms of intrinsic and extrinsic factors that drive overuse, and they looked at it in terms of factors on the patient level and the provider level. And the provider level from my perspective, they’re really talking about both individual provider level drivers, and sort of institutional organizational level drivers. And so some of the things they highlight is the lack of knowledge of harmful overuse. We know that providers oftentimes are unaware of the likelihood of adverse events or they’re downplayed by the provider, the medical community. We know that psychologically there’s often a greater regret for errors of omission and commission. That case for example where if they had a patient who was advised to get a PSA screening and subsequently got prostate cancer, that was way on the more than the patient who got a PSA inappropriately and subsequently got a biopsy and had an adverse event from the biopsy that regret for omission weighs more heavily on them than the commission. And related to this, a general belief that action is better than inaction. That doing something for the patient is better than standing by. Extrinsically you know that providers particularly within primary care in the past, you know again 20 years or so with the advent of managed care, that there’s often inadequate time. That times for those visits is diminished, and the time for having a rational conversation and explaining the pros and cons of different courses of action clinically is just not there. We know there’s a positive publication bias. Providers are much more likely to see preliminary often spurious findings for the new treatments or therapies. We know that guidelines generally have focused on underuse and as a consequence guidelines tend to inadvertently, not intentionally, inadvertently promote overuse. We know that medical culture generally favors again action over inaction. And that the providers who are most esteemed within medicine are those who are the most thorough and thought through all the possible courses of action that could be taken, not necessarily the one who prudently says, you know there’s really not anything useful that we can do in this case.

There’s a similar set of factors on the patient level. Again a belief that more care is better care. A lack of awareness of harm. This is even more profound among patients I think. I think in many cases we as a consumer, consuming public, consumers of healthcare we’re really, wretchedly ignorant of the potential harms from overuse. There’s a discomfort with uncertainty. We want to know, it comes into play really with diagnostic, inappropriate diagnostic. In lab tests we see no downside in understanding more about our illness and have a tremendous discomfort with the idea that we could be harboring some illness, that it’s possible to diagnose. Extrinsically we know that media often misrepresents research and again this is pernicious because precisely those findings that are likely to get picked up and of most interest are those that are somewhat anomalous. So there is this bias that actually I think favors various findings or potentially. We know that advocacy groups form generally around instances of underuse. There’s tremendous advocacy around cancer screening. There are no advocacy groups that are formed around more prudent use of screening for example.

So all of this sets us up as a research community, and as a quality improvement community trying to tackle these instances of overuse. And I think 1 of the questions that comes up is so what is this, what do we know from this current literature and background that informs how we proceed? And in what ways, that I’d like to talk to you today about, is what ways does this differ from how we approach or think about implementing evidence-based practices? Where we’re trying to close gaps where there’s underuse of evidence-based care when we’re faced with overuse of low-value care, how do we think about this? In what ways is it different? And I think that there are three things that I’d like to talk with you about. One is that outcomes may be different, and specifically in unintended consequences. That we may have instances of unintended consequences that are fundamentally different. I think that low-value care is driven by heuristics at the individual level and routines at the organizational level that are fundamentally different. The precisely the challenge when we’re dealing with implementation is that these don’t exist. And I’d like to talk about that. And the underlying cause of low-value care, I’ll just say that I think that we don’t appreciate that this is just baked into our scientific method. And that we treat low-value care as anomalous when in fact we should view it as something to be expected and something in fact that is again part of inappropriate scientific process.

So outcomes. How do these outcomes potentially differ? Beth, I always mispronounce Beth’s last name, but Beth Prusaczyk and colleagues have written about low-value care and de-implementation. One of the things they highlight is the history and cultural context of low-value care. Mainly that a low-value practice has a history and a culture context. When we’re trying it implement a new practice it is a challenge in part precisely again because it has no, it’s something that patients are not aware of. And our trying to understand. And low-value practices have this context in history that we have to take into account. And there’s this great ad campaign that illustrates exactly this point. Trying to promote mammograms for breast cancer screening in the US. And this is back in the 80’s. But as you can see the ad campaign is, if you haven’t had a mammogram you need more than your breasts examined. And what had subsequently happened is this push for screening for breast cancer, which was tremendously underused at the time. And there was, and you may not remember this, but at that time the mortality rate for breast cancer was tremendous. I don’t have the figures off the top of my head, but it’s improved dramatically. And part of the reason why it’s improved is because the cancers are being caught earlier. So legitimately there was a push to promote use of mammograms, and earlier breast cancer screening. That was an appropriate outcome to advocate for. But the way that they did it was in this very stark term in retrospect of course. It’s incredibly insulting tone. And what we know now, is that in fact it’s more nuanced. It’s not that every woman should have an annual breast exam, you know starting at 30 or 35 or 40, that it’s more nuanced. And we know now that there are downsides. That in fact mammograms are not fool proof. That you can have false positives and that those can have downstream consequences. Negative consequences. But in the context of this underuse of breast cancer screening, efforts to change screening to be more rational and more evidence-based ran into in many instances tremendous pushback. I remember as a doctoral student attending a meeting sponsored by the American College of Obstetrics and Gynecology, and I remember in the middle of the session being presented by an epidemiologist about the evidence for breast cancer screening. And we talked about adverse outcomes. And an OB-GYN literally explained from the audience how can it possibly be a bad thing to screen for breast cancer. It was inconceivable to the OB-GYN that there could be any downside. So these practices have a historical and cultural context that don’t exist for implementation or don’t, rarely exist for implementation of underused practices.

And they have an effect on how we approach this. More broadly, overuse by definition has constituencies. Wynn Norton and David Chambers had written about this. These can include financial constituencies which pharmaceutical companies for example they have a dog in the fight as it were for new medication. These can be professional even in the absence of financial incentives. There are professional affiliations and professional commitments. And they can have political constituencies. And again, I think oftentimes you know it’s easy especially in this political day and age for us to vilify people who don’t share our beliefs that I think in many cases the constituencies for low-value practices are people who are motivated by very altruistic outcomes. Again like in the case of breast cancer screening, you have very passionate advocates for increasing breast cancer screening who arrived at that position precisely because they saw women dying needlessly. They’re not crazy for being concerned that the efforts to reduce access to care or treatment could harm patients. They’re not crazy for believing that. We think in this particular case the excess use of mammograms has downsides, but they have to recognize that there are constituencies for these practices. In some cases they’re financial, and in some cases they are not altruistic. But in other cases they are absolutely altruistic. And I think this is just part of this historical context we have to take into account.

I love this, just speaking of just based constituencies, and in some cases again these are not altruistic. And in some cases when we’re talking about tackling low-value care it can get dirty. And I love this quote from Rodney Dangerfield from the very forgettable film. But he quipped, the football team at my high school, they were tough. After they sacked the quarterback, they went after his family.

For us as implementation researchers most of time we don’t have to worry about people going after our family. But in fact, there are instances, there have been instances and not one, not two, but multiple instances where researchers have highlighted the evidence of a low-value practice and they have been targeted personally by constituents for the low-value practice. And I highly recommend checking out this lecture by Rick Deyo at the Birnbaum lecture in 2008. This is a lecture put on by what had been a group health research institute out of Kaiser Permanente. It’s an actual annual lecture. Rick Deyo is a Health Services researcher, and he was instrumental in leading the agency for Health Care Policy and Research, the precursor to AHRQ. Their work on lower back pain, lower back treatment guidelines which ran afoul of orthopedic surgeons. And basically they concluded that there was very little indication—I don't remember the specifics—but very little indication for any surgical interventions for lower back pain. And they were striking right at the heart of the very lucrative practice for orthopedic surgeon. And the orthopedic surgeons went to congress and tried to get AHRQ defunded, and nearly succeeded. And Rick Deyo got attacked. Up to and including having people contact—he was at the University of Washington at the time—contact the University of Washington to advocate for in having him removed from the faculty and other professional consequences. There are more examples, Greg Simon at the what again is now Kaiser Permanente had a similar experience. I don’t remember what the practice was but his research undercut. There are multiple instances of this. And I think it’s something that kind of, it happens rarely. But I think it’s something we also as a research community can’t be blind to. When we try to reduce a low-value practice. There are constituencies. And as a Lea Ranghart [phonetic 0:27:40] the health economist said, one person’s waste is another person’s income. So when we try to tackle these practices I think we have to be aware that there are constituencies.

There’s another unintended consequence. And this comes out of the psychological, there’s something termed psychological reactance. And that’s the technical definition is negative cognition when an individual feels their freedom or prerogative is threatened. And what this means is really two things. That when we feel like someone is abridging our freedoms or our prerogative, our ability to make decisions for ourselves, we respond with a combination of mistrust and counterarguments. So on the one hand we tend to come up with reasons why the person or the entity that we feel is abridging our freedoms is wrong or motivated by animus or something, some reason why what they’re saying is actually incorrect. And we also respond with anger and irritation. So we respond with this emotional feeling of anger. And I think that the important thing is when we try to de-implement low-value practices there is a distinct possibility that we could provoke psychological reactance both among patients and providers. And I’m particularly concerned about this at the patient level, because I think we have ample reason to believe that efforts to be more rational with healthcare can really poison the well. We have to broadly for patients and the public to become mistrustful of healthcare. And for those of you who are bit younger and don’t remember, all you have to do is go back and look up health maintenance organizations or managed care in the 90’s and how people responded to that. And this is literally something that started appearing in pop culture. These references to managed care. The bloodsucking, you know turning primary care doctors into bloodsucking bureaucrats. Just out to you know reduce healthcare costs in the back of consumers. I think that it’s a real danger that we can end up provoking those types of feelings.

And so what does psychological reactants look like in the real world? Well we’ve got some examples today from the COVID pandemic. And efforts to promote the use of masks to prevent transmission of COVID-19, or the SARS, the virus. In terms of counterargument we see people talking about what the motivation for mask wearing is. And again this falls on political lines, and I don’t mean to draw politics into this, but it’s a perfect example where people who are opposed to wearing the mask bring up arguments that are totally unrelated to public health. It’s isn’t about the mask, it’s about control. Political control. This headline of a customer at a Costco. A classic example of counterargument. This isn’t about preventing transmission of the disease; this is about controlling my personal freedoms.

And likewise, expressions of anger. So when a person is required to wear a mask in a store actually becoming violent. Again, this is a rare instance and I totally cherry picked this headline, this is not the most common outcome from mask wearing. But it illustrates this very human reaction. I think for many of us who there’s a scientific, we will identify with in the issue of mask wearing that is with promoting mask wearing. But in many instances, we are going to be on the other side. You know? As individuals we are as susceptible as implementation researchers, we are as susceptible to psychological reactants as anyone.

And understanding this I think can help us as we’re doing our work. Being empathetic with patients and recognizing that in spite of our motivations trying to improve care when we try to reduce low-value practices we could provoke that kind of reaction. This idea of psychological reactants even when it’s not called psychological reactants, has been written about widely. And I would just, for folks who really want to dive deeply into this topic I highly recommend the book, this is a decade old now, but a book called Being Wrong by Kathryn Schulz. And it’s a very careful look at essentially the cognition of being wrong. And as she puts it, what does it feel like to be wrong? It feels like being right. Because if someone who is wrong, that’s exactly, you think that you’re right. And she explores what the cognitive process is of processing the fact that what is wrong and how we react. And as she points out, the more we feel attacked by our position, the more likely we are to harden our views on that position. So again, I highly recommend that book for those who are interested in doing a deep dive. So obviously this is covered in popularity, do we actually have evidence of this from implementation research? Not much. But we do have some. And the clearest example of this is from work—that I’m aware of—is from work on audit-and-feedback. And there was a metanalysis—this was back in 1996—a metanalysis of audit-and-feedback interventions. And fully a third at that time, a third of the audit-and-feedback interventions were actually associated with significantly worse quality of care. Either decline in quality of care or when compared between groups significantly worse quality of care. And one of the most instructive findings that they have was that association was strong, that audit-and-feedback was more likely to be associated with worse quality of care the more that the audit-and-feedback could be characterized as being directed at the individual as opposed to the practice. So the more that one might consider it as a personal critique as opposed to a critique of the practice, the more likely they audit-and-feedback was to be associated with worse quality of care. And that’s one reason why I think that we have to be, we in the implementation science research community have to be incredibly cautious about how we characterize providers around the topic of adoption and implementation. And quickly possibly the most widely cited implementation and dissemination framework out there, Rogers’ Diffusion of Innovations, does exactly this. It characterizes adopters in these 5 categories, the last of which are laggards. That’s such a demeaning term. And one as it turns out I think is really, really inaccurate in most settings. That there are not people who are broadly laggards in terms of adoption in their practice. That turns out to be almost certainly erroneous. But again, it also regardless of its validity, it’s just incendiary. It’s just insulting. And I think we’ve got to be as researchers, as scientists, we’ve gotta be extremely cautious about how we characterize people in terms of their adoption or rejection of new practices, or in the case of low-value care their adherence to a practice that we think no longer should be used or used to the same degree.

And I will just briefly note, my concern over patient resistance to changes in care. Well not changes in care. But specifically a reduction of low-value practices. But this is a literature that’s not terribly deep. And more importantly I think as a literature it is overwhelmingly based on hypotheticals focused through interviews with patients. Asking them, what do you think about low-value practices in general? What would you think if your providers suggested you forego a test or a cancer screening exam? And not about specific instances of low-value care. So this this is a fairly—from my perspective—fairly thin literature. However, there are a couple of important things that exist in the literature currently about how patients respond to our efforts to reduce low-value practices. One, providers are very aware of this potential. I mean in saying this, that’s hardly shocking. Providers are well aware of this. And they site this as a potential obstacle. And these citations that I’ve got here are specifically on the literature of de-prescribing. So trying to reduce low-value prescriptions. So providers report this being patient what I would term broadly as patient resistance. So more broad than reactance, more broadly than the counterarguing and the anger, just patients being resistant to reducing low-value drug. And this is a variate for providers and I think a couple of interesting things there, one that this is something that providers highlight. As researchers, if we want to increase the effectiveness of de-implementation strategies we need to be able to help providers overcome patient resistance. A second thing is, this may emerge even in instances where there’s not objective evidence, or where we lack objective evidence of patients resisting. We did this work by Krysttel Stryczek and then Toral Parikh, these are researchers out of our group. Krysttel and Toral led this really interesting work. As part of a provider randomized quality improvement intervention we did to try to reduce inappropriate use of inhaled corticosteroids for patients with mild to moderate COPD. And one of the things that we found was that again providers were very concerned about how patients would react if they proposed taking them off the inhaled corticosteroid. But when we asked about specific examples of when that happened we could never get an example. This is a brief quote from one of those interviews, could you give me an example of when, the time when that conversation happened? When a patient resisted coming off of an inhaled corticosteroid. With this specific drug? No. But it happens all of the time. And I think that one of the important things here, and this is not to diminish that the provider is saying, because in fact it’s entirely possible that highly, that an interaction with a patient where you try to take them off of a medication, even if it wasn’t the same medication, a different medication and they responded really badly. That could be highly salient when you consider tackling a different drug. So I think that this is not to put up as evidence that providers are somehow irrational about this concern. Only to say that this can still be a concern even when we don’t find evidence in this specific instance that patients are resisting a change. That’s the point I’m going to make.

So overuse also requires overcoming heuristics. Individual habits. And I think that there’s an equivalent at the organizational level. So when I talk about heuristics what do I mean? There’s some fascinating literature out of cognitive psychology and behavioral economics in the past, again couple of decades, on cognition and how we make decisions. And you may be aware of this literature. Daniel Kahneman won a Nobel Prize in Economics for this work that he did with aim and diversity. And he’s got a book out, I highly recommend, it’s called Thinking Fast and Slow. And it outlines we kindly think that decision-making, human decision-making largely occurs through 2 types of cognition. One called system 1 is fast, efficient, intuitive, and it’s based on learned mental models or heuristics. And occurs largely subconsciously. And the second is a slow, effortful, reflective cognition. It’s conscious, it’s deliberative. Potentially corrective. And it represents how we learn. And I’m actually gonna give you an illustration of these 2 systems in just a second. But I think one of the most important things is that much of our behavior, our day to day behavior is actually driven by that system 1. It’s fast, efficient, it’s mostly automatic. It’s not mindless necessarily. There’s actually different types of system one cognition. Psychologists now believe that there are multiple types of system 1 cognition. So it’s not necessarily mindless but it is again largely automatic.

I’d like to give an example. Heidi let’s go ahead and pull up that video if we could.

[silence 0:41:23 – 0:41:34]

Heidi: Okay. So I’ve got that in the\_ Let’s see if it will let me talk. Okay. So I have that in the multimedia viewer here.

Dr. Christian Helfrich: Okay. And if you want to go ahead and hit play. And I think I should be able to control the timing on it, yeah?

Heidi: Hopefully.

Dr. Christian Helfrich: We will find out. And Heidi, just a heads up, at least I’m not seeing the video yet.

Heidi: Oh, fantastic. Um.

Dr. Christian Helfrich: You might have to\_ I wonder if you’ll have to take the presentation over, away from me.

Heidi: Yep. I might have to take presentation back. Which is fine. Okay. So I’m just going to start the video at the top then here. Yes?

Dr. Christian Helfrich: Great. That’s perfect. Yes, please. Thank you. And unfortunately we’re still, just a heads up I’m still not seeing the video.

Heidi: Okay. Because it is playing for me here. And where we got it\_ We have it playing.

Dr. Christian Helfrich: All right. I’m seeing the multimedia viewer come up.

Heidi: Okay. So I just restarted it. It reloaded it here.

Dr. Christian Helfrich: Excellent.

Heidi: We may have to watch that Grammarly commercial we’ve got again.

Dr. Christian Helfrich: [laughs] Yes.

Heidi: [laughs]

Dr. Christian Helfrich: Well ladies and gentlemen, our session today is sponsored by the following. Okay. I just muted, are you still hearing the sound?

Heidi: I just paused it.

Dr. Christian Helfrich: Okay. So it’s paused for you?

Heidi: Yep. Now I’ve got it playing.

Dr. Christian Helfrich: Okay. Well folks, we want to go to 2 minutes 30 seconds on the video. So watch the video to 2 minutes 30 seconds and then pause.

[inaudible video sounds 0:44:19 – 0:46:16]

Dr. Christian Helfrich: All right, and let’s go ahead and pause there. Hopefully, we’re supposed to watch this again to about 2 minutes 30 seconds. So what you see is this guy trying to learn to ride a bicycle with the handlebars reversed. And when we talk about system’s 1 thinking, this automatic thinking, this is what having learned to ride a bike is. It’s a bunch of mental shortcuts that allows someone to—as he said—it’s a set of algorithms that allows someone to push down on the pedals, to control the handlebar, to balance their body on the bicycle in a way that is entirely unconscious. It does not take conscious thought. And in fact, if you start consciously trying to think about what you’re doing when you do something like ride a bicycle, you can actually jar yourself out of those algorithms and you can subsequently crash. Because you try to take control, consciously of something that you have an algorithm for and your conscious mind cannot process the information fast enough. Cannot take conscious control as well as efficiently as that algorithm. And so this is an example, being able to ride a bike is an example of a system 1 cognition, this automatic efficient, fast, heuristic driven cognition. And just like with in this instance where he’s trying to ride a bicycle where this fundamental mechanism, steering mechanism is reversed. Is inconsistent with his learned heuristics, just like in this case where suddenly you cannot ride a bicycle, I think oftentimes our heuristics we become aware of them precisely when they start failing us. Precisely when they start leading us to outcomes that are undesirable like crashing a bike. Now what I’d like folks to do, is to fast forward to 3 minutes and 28 seconds. So if we drag, and Heidi I think they’ll have to do this, I think each individual has to do this on your screen. You’ll have that multimedia viewer that Heidi brought up. Just move your cursor to 3 minutes 28 seconds and click on it. And go ahead and play. And you’re going to play to 3 minutes 59 seconds. So a little more than a minute. So just go ahead and fast forward, and we’re going to see him learn how to ride this reverse bicycle. So fast forward to 3 minutes 28 seconds and play it until about 3 minutes 59 seconds.

[inaudible video sounds 0:48:50 – 0:49:35]

Dr. Christian Helfrich: Hold on. I’m sorry. Actually, I said more than a minute. In fact it was less than a minute. 3 minutes 28 seconds to 3 minutes 59 seconds. Okay. So and what we see is that he actually learns how to ride this backwards bicycle. So he’s created a new set of heuristics. He’s created a new set of pathways that have allowed him to learn now to ride this reverse steering bicycle. And one of the things that I think he points out is that as he’s initially doing this, as he’s initially establishing his new heuristics, he has to pay attention. So he’s actually engaged in type 2 cognition rather the effortful, conscious cognition. That’s how he’s learning how to ride this bicycle with reversed steering. And he has to pay attention. And if something happens, like cellphone ringing that distracts him he loses the thread and crashes. And so we need to engage to learn these new heuristics. We have to actively suppress our old heuristics. And if we’re distracted we crash. You know? When we’re distracted we lose thread. Now what I’d like folks to do is again just fast forward to 4 minutes 54 seconds. So drag that cursor, go up to 4 minutes 54 seconds, and we’re gonna watch him try to ride a conventional bicycle again. So fast forward to 4 minutes 54 seconds. And then you’re going to watch it until 6 minutes 16 seconds please.

[inaudible video sounds 0:51:08 – 0:52:24]

Dr. Christian Helfrich: All right. So hopefully you guys have watched this. And you can see him now riding the bicycle. So Heidi, can you go ahead and give me control back and I’ll put my slides back up and wrap things up here. But this, and apologies if anyone had any trouble watching the video. Just look for Smarter Every day Backwards Brain Bicycle or Backwards Bicycle, and that should come up. But it’s this beautiful illustration. Oh, let me see. Am I\_ Yeah, there we go.

And are you seeing the presentation view?

Heidi: It looks correct, yes.

Dr. Christian Helfrich: Okay. Great. So again look up Smarter Every day Backwards Bicycle if you had any trouble viewing that videos, and apologies if you did. But it illustrates perfectly how we, when we, to replace, when we have an existing practice like riding a bicycle and we’re faced with replacing it with something. A bicycle that has reversed steering. The old algorithms don’t work. We have to actually actively suppress that original heuristic and actively learn this new heuristic. And I think one of the important things is that old heuristic is still there. It’s still under the surface, and it can come back. And you saw that when he started trying to ride a regular bicycle again in Amsterdam, eventually that old heuristic came back, the old algorithm came back. That same thing I think happens with any of our practices. And I think that’s exactly what happens when we ask clinicians to change a long established practice. They have to actively suppress and existing heuristic while they try to establish a new one. And especially early on, little distractions can jar them out of their efforts to suppress the old heuristic and they’ll fall back into the old heuristic. I think that’s particularly important because of a few things. One, the guidelines that we’re asking providers to practice by become increasingly more complex, objectively more complex. This isn’t me waxing nostalgic about the good old days when things were simple. Objectively, guidelines have become more nuanced, more detailed and we have now specialties and subspecialties, each one producing guidelines. So our evidence-based guidelines are more complex to process and to execute. We use heuristics precisely to deal with complexity. And when we’re faced with complexity we can’t consciously process we fall back on heuristics; we fall back on mental models and shortcuts. And I think there is an analogy at the organizational level with routines. I think we do exactly the same thing.

Right now we’re doing some work trying to promote the use of coronary interventions. Interventions to open up a blocked coronary arteries. And traditionally these are preformed through the femoral artery in the groin. But they can be preformed through the radial artery in the wrist or the arm. And the radial artery is much safer, much more comfortable for patients. But it’s a smaller diameter of artery, a little more technically challenging because of the anatomy. But one of the challenges that we found, is that there are a number of organizational routines that differ for each of these, when you do the procedure through the femoral artery versus through the radial artery. The setup is different. And so as a provider if you’re team is not well versed in the setup for the radial procedure, it makes it just a little bit more challenging. And the set up when you have a team that is accustomed to working with each other and preforming a procedure in a certain way, they can setup for a femoral procedure in their sleep. They know exactly what they’re doing. And what the radial artery, when they have to position the arm so for the provider to get access and they have to make sure that the right catheters and the right guide wires are on the table. Each of those things initially is a conscious effort. Each of those things they have to suppress the old mental models, and they have introduce these new ones. And that’s a conscious, effortful thing.

I think one of the reasons—and this is my last point, I’ll wrap up here but—one of the challenges is that evidence-base, that knowledge-base that we expect providers and clinicians to practice on is constantly changing. And we often don’t recognize it as a body of knowledge that is constantly changing. We tend—I think—we tend to view low-value practices as somehow anomalous. These sort of, these sometimes quaint, sometimes horrific, things that can you believe that anyone ever thought—and episiotomy for example was a good idea. But the reality is, is that underlying evidence-base on which we practice healthcare constantly changes. And again I have a number of books to recommend. There’s a great book called the Half Life of Facts by Samuel Arbesman. I highly recommend it. It’s just a fascinating exploration of this. But we know there is a predictable change and a predictable expiration of what we currently know to be facts. Our knowledge is constantly evolving. And in surgery there’s a literature review by Hall and colleagues from 1997 where they examined exactly this. What was the half life of assumed understood facts of surgery? And they calculated at that time it was approximately 47 years. So in approximately 47 years half of what was understood to be true would be subsequently found to be false or to be revised significantly. So and these are practices like pre-frontal lobotomy anxiety. There was a time when that was viewed as a legitimate treatment for anxiety.

So I think that it’s important to recognize. And it’s important to recognize that that’s not going to change. And I would distinguish this, we also need to be aware of the proliferation of horse pokey and proliferation of findings with the product of poor science. And it’s important because the half life effects, that observation that’s not based on poor science. That is just science. Science is a process of articulating and testing falsifiable hypothesis and some of them are going to be wrong. That’s the way that science advances. In addition we have this issue, and I love this, this is actually articulated in what’s called Brandolini’s Law. Also the more colorfully called the Bullshit Asymmetry Principle. And that is that it is really, it’s much easier to produce bunkum, it’s much easier to produce a false fact that it is to debunk that same fact. It’s easier to just make a wild assertion about something that’s untrue than it is to carefully debunk that untruth. And again, I bring this up because both things occurred. We have a half life of facts, part of the knowledge that we’ve carefully developed through rigorous scientific testing is going to turn out to be wrong. That’s just the way science works. And we have to accept that. In addition, there is this issue that we’re producing a lot of spurious findings. Both things are true.

And to tackle this I think one of the things that we need as a healthcare system, as a learning healthcare system, as a healthcare system that tries to both deliver healthcare and learn how to deliver healthcare better at the same time, I think we need to set up that expectation that scientific knowledge is an evolving evidence-base. That should just be expected. It’s not an error. It’s not someone’s fault. It’s the way that science worked. And we can do this, there are a number of promising ways that we can do this systematically. Laura Damschroder and colleagues, we’ve got a paper that’s coming out on models of embedded research. How do we get researcher working closely with the healthcare community so that as new findings are coming out we can speed the implementation of those findings. I think there are some promising models. Additionally, this issue of how to jar groups of people out of spurious thinking, there’s actually an extensive literature on this, around group think. That’s when we collectively engage in delusions. And there are some very concrete practice that we might test out including things like formalizing counterarguments. Having someone designated as being a countervailing opinion when we’re considering for example changes in the guidelines we endorse as a system. We may as a system want to change the bar for accepting new findings as we put them into practice. Especially again given the proliferation of new research that’s occurring. That’s something that we may want to consider. And also just to note, there is this, one of the, well I’ll just mention, there’s some very interesting work on automaticity that’s system 1 thinking and creativity and innovation. And I just mention this because I think we don’t want to lose sight of the fact that much of the creative and in creativity and innovation that occurs actually occurs through our ability to deal with complexity through that automatic thinking. And the point of this, my point is not to suggest that we need to get rid of heuristic thinking. To the contrary. That’s the only way that we’re able to deal with complexity. It’s just that we need to recognize that our reliance on heuristics, these mental models, that is creates challenges for us when we have reduce low-value care.

So again, sorry I’ve gone over here a little bit. But just in closing, I think in dealing with de-implementation of low-value care and thinking about how this is different, we need to take into account unintended consequences. Especially again, this idea of psychological reactants. And we need to be able to anticipate and measure it when we do studies. And come up with strategies to mitigate it. We need to be aware that much of our behavior as humans is driven by heuristics and routines. We need to be able to take that into account when we try to create change around a clinician. And create a space for learning that active suppression of existing heuristics is going to be particularly challenging with de-implementation. It’s something fundamentally different than with implementation. And then again, I think in the context of the learning healthcare system, we need to think about overuse is something that’s just a routine part of the learning healthcare system. This is something we should expect. It’s not the same as medical errors. It’s not an anomalous outcome. It’s something that’s going to happen. We’re going to have practices that we subsequently find are inaccurate. Or invalid. We need to as a healthcare system have ways of identifying them. And speeding their discontinuation. And that can be done, I think, through structures like embedded research. I think there is some promising ways we can do this.

Again, apologies for going over. But for those of you who hung in there, thank you for hanging in there. And Heidi I don't know if there’s any time for questions or answers. You know? But I welcome feedback and yeah. Thank you so much.

Heidi: We are out, thank you so much Dr. Helfrich, but since we are a bit over on time, and you have your email address up on the screen, I’m just going to let people if they do have a pressing question they can contact you directly at that email address. But we do need to wrap things up here. We’ve lost a good portion of our audience, but for those of you who are still with us, thank you so much for joining us today. When I close the meeting out you will be prompted with a feedback form. Please take a few moments to fill that out. We really would appreciate all of your feedback. Thank you everyone for joining us today. And we look forward to seeing you at a future HSR&D Cyberseminar. Thank you everyone.

[ END OF AUDIO ]