**Knowledge Translation in Canada - Today and Tomorrow**

Presenter: Dr. Sharon Straus

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>> JOANN STARKS: Hello and welcome to the webcast brought to you by the Center on Knowledge Translation for Disability and Rehabilitation Research (or KTDRR) at American Institutes for Research. The Center on KTDRR is funded by the National Institute on Disability, Independent Living and Rehabilitation Research (or NIDILRR), in the U.S. Department of Health and Human Services, Administration for Community Living. I'm Joann Starks with the Austin office of AIR and I also want to thank my colleague Steven Boydston, who is helping with the logistics.

In today's webcast, Dr. Sharon Straus will share information on the status of knowledge translation activities in Canada with a focus on the KT Canada network and the KT program at Saint Michael's hospital, and she will talk about key knowledge translation challenges.

Now, I'd like to introduce our speaker, Dr. Sharon Straus who is a geriatrician and clinical epidemiologist trained at the University of Toronto and University of Oxford, she is the Director of the Knowledge Translation Program and Deputy Physician and Chief at ST. Michael's Hospital, Director of the Division of Geriatric Medicine, University of Toronto and Vice Chair and professor department of medicine at the University of Toronto. She holds a Tier 1 Canada research chair in knowledge translation and quality of care and is the author of more than 400 publications and three textbooks in evidence‑based medicine, knowledge translation and mentorship. Dr. Straus is a highly cited researcher, and we are so pleased she agreed to take the time to share her thoughts today on knowledge translation. Thanks, everyone. Now, let's get started

Can I hand it off to you Sharon?

>> SHARON STRAUS: Great. Thanks so much, Joann. Thanks for the opportunity to speak to the group today and I wanted to thank you for your help and Steven as well for his IT help and here in Toronto, thank Meghan Storey who keeps everything organized and running here in Toronto, so thanks, everybody.

So, I was going to talk a little about knowledge translation in Canada and what I see as kind of as the current status and where I see some of the challenges. Just in terms of declaring competing interests, I don't do anything with industry. I've never accepted any funding from industry. I do a lot of work though for various journals, so you should be aware of that as I'm talking about some of the different activities. And I also have written a book on knowledge translation, and to keep that in mind though, is that the royalties go to a fund for trainees, so I don't benefit personally from the royalties from that book. And some of the material that I'm going to be talking about today has been included in our ‑‑ in discussions related to our book.

So, I wanted to kind of start off with, I mean, the reason why we're even talking about this today and everybody is on this webinar is that we all are kind of interested in this gap that's out there where we know there is lots and lots of research that's getting produced, but it's not necessarily being used in practice or in policy‑making.

In fact, we know that in studies that have been done, they estimated that about 85% potentially of research funding is wasted globally, and this adds up to a massive amount of money worldwide that results. We really see this as a challenge from a knowledge translation perspective, and that in KT, we use the term in Canada, knowledge translation, and I'll talk a little bit about why, but this is really seen as a potential solution.

The definition that I posted here is from the CIHR which is our national funding institute, similar to the NIH in the U.S. or the MRC in Australia, or the NIHR in the UK, and the idea behind knowledge translation is that it's very much this dynamic and iterative approach where we have the evidence and we focus on an interactive, tailored dissemination and implementation strategy for that knowledge.

One of the key things though to keep in mind is we don't just focus on the results of a single study, that we really want to focus our knowledge translation efforts on the totality of the evidence so that it should start with knowledge synthesis as the foundational component of any kind of KT activity.

And the other part of our CIHR definition focuses on who is this is targeting, and there is not a single group that is represented here. It targets everybody within the healthcare system, and so everybody including citizen, patients, clinicians, healthcare managers, policymakers, the people who are conducting the research, and the people who are funding research, and also people who are funding our healthcare system. So, it's really about making sure that we're using the evidence that's getting produced in the research across our healthcare system to improve outcomes.

And we were led by a study a few years ago by Ann McKibben who is a professor emeritus at McMaster and she led us on a study to look at all the different terms that people use to mean knowledge translation. I included this word cloud to highlight how many terms people are using. And I mentioned that in Canada we use knowledge translation, and it's because when the CIHR was created in Canada, it was created in an act of parliament, and when it was created, the legislation says the CIHR is responsible not just for funding research, but to ensure that that research is translated into improved outcomes for the Canadian population. So that's kind of what led us to use the term, knowledge translation, because the CIHR then created a platform for knowledge translation.

But I know in the U.S. different terms are used, so dissemination implementation, for example is used at the NIH. If we were going to be doing this in the UK, people use the term implementation science, and so many, many terms are used to mean the very same thing, but this is what is challenging then when we go to the literature because if we're trying to find literature on this topic, what term do we use? And so, Ann McKibben and Cynthia Locker let us on this project a few years ago and did a systematic review of the terms and found more than 100 terms that people are using in the literature.

Other results of that first initiative then, Cynthia and Ann led us on a project then to create search filters, and so this is a link to the, the search filters that are posted on our freely accessible website through McMaster through the website, and these search filters have been validated for use in various electronic databases including Medline, and so by copying and pasting the search filters in, it allows us to do a much more focused search, a focused and efficient search and it's going to lead to us being a little bit more efficient in our searching for the knowledge translation literature.

Now, a byproduct as well of what they created is something that Brian Hanes created at McMaster and for those of you on this webinar who are clinicians, you're probably familiar with something Brian created which is called ACT Journal Club, and he started more than 20 years ago with the idea that there would be a team of research associates in Hamilton that read the top 120 medical journals every single week and they identify the articles that pass the methods criteria. If it's a therapy article, it has to be a systematic review of randomized trials or a single randomized trial and there is a single criterion for it to meet methodologically, but once it passes that filter it goes to clinicians that vote on whether it's critically relevant and newsworthy, so it filters out the top 2% of the literature.

Brian used a similar thing to create KT +, it's a freely accessible service that anybody can sign up for, and it allows you to have articles pushed at you that pass those filters that I talked about.

So, you know that if it's coming to you in your email inbox, it's already been kind of prescreened and that people have identified it as being relevant to knowledge translation. So, this screenshot that I've shown you here is what the KT + looks like, and this is something that was partially funded by KT Canada.

One of the challenges as well, in addition to kind of thinking about the different terms, are the different meanings of knowledge translation. I talked a little bit about the CIHR definition, and this slide shows the definition that's been adapted by others, including the NIH, and also the Implementation Science Journal, and we really talk about kind of the dissemination and implementation science and practice, so we think about the practice of dissemination, it's kind of that purposeful distribution of information. Whereas the science is around, how do we advance our knowledge around how to optimize that process, for example.

Similarly, we can think about both the practice and the science of implementation, and so the practice, the nuts and bolts of doing of using evidence in practice or policy, or in the science of how we study it. I think one of the things we always have to be thoughtful about when we're kind of undertaking any work is figuring out where are we in this 2X2 table?

So, I mentioned the definition of KT at the CIHR and I wanted to just talk briefly about the different types of knowledge translation at the CIHR because within the granting agency they talk about end of grant and integrated knowledge translation. Now, end of grant focuses on, as your project is finishing, how do we disseminate and implement those results? How do we facilitate the knowledge so that others are able to access it? Most of us are kind of familiar with very traditional strategies for dissemination, but this also includes the more interactive and tailored approaches to dissemination and also how do we implement the knowledge.

Now, in contrast then, the CIHR also talks about integrated knowledge translation, and by this they mean, what are ways that we can conduct research whereby the potential knowledge users or end users of the research and are partners in the process. That can be partners from the beginning of the research where the research questions are generated through to the design of the study, its conduct, its analysis, its interpretation, and then ultimately its dissemination and implementation. The idea behind this is that by using this more integrated KT approach, the results are going to be more useful to the end users and therefore they'll be more likely to use them in practice or policy.

Sometimes in the literature, sometimes there is a bit of an overlap between integrated knowledge translation and collaborative or participatory action research, and Ian Graham is part of his foundation grant that has been funded in Canada, is really trying to tackle this and bring some clarity to the differences and similarities across these. So, Joann mentioned kind of ‑‑ she asked me to talk about what's going on in Canada, and I thought I would talk a little about Knowledge Translation Canada, funded by our CIHR, our health research funding agency, but also the CFI, which is the Canada Foundation for Innovation and the CFI funds infrastructure, so it funds buildings and equipment. And we were pretty fortunate in 2007 to bring together a national collaboration that brought together research project funding as well as infrastructure funding to create Knowledge Translation Canada, and it included a group of more than 70 investigators from coast to coast and was led by Jeremy Grimshaw in Ottawa and myself in Toronto and we had partners from five other sites across Canada.

Alongside that, we were also very fortunate funding from the CIHR to develop a training initiative. We focused on really building capacity, not just in the science of implementation, but also in its practice. Now, since those two funding sources have finished, so those competitions finished, one of the things that's happened is there is a new funding initiative created in Canada called SPOR from CIHR, the strategy for Strategy for Patient Oriented Research. And it is analogous to PCORI although it has a much smaller budget than PCORI which we're very jealous of. But one of the things that they really try to do is embed knowledge translation within SPOR so each province and territory in Canada then has a SPOR support unit and knowledge translation is embedded as part of this.

And so all of the people who were involved in Knowledge Translation Canada then are playing these roles as part of the CIHR‑SPOR initiative and this has allowed not just the continuation of the growth in the research, but also in the capacity‑building and knowledge translation across Canada.

So, when KT Canada was initially funded, the idea was to create these four interlinked research programs that really brought together people from different experience and expertise across the country, people with qualitative and quantitative research expertise, people with backgrounds from sociology, anthropology, clinical epidemiology, health systems research, and so very different research paradigms and very different clinical paradigms as well.

One of the areas that we wanted to focus on was advancing the science of knowledge synthesis since we talked about how knowledge synthesis is the basis of KT activities, and also think being different ways of distilling the knowledge syntheses, the different products and tools and products that can be created from them, things like decision aids, Don Stacey’s Decision Aid database, for example, and the inventory created in Ottawa was linked to this. Similarly, things like creating products such as the work that France Légaré does around shared decision making tools.

The second area is the determinants of knowledge use, so what are the barriers and facilitators to using knowledge across different levels in the healthcare system, including work at the policy level, work that John Lavis has led, to projects that are more at the clinical front line, so projects led by people like Mitu at the University of Alberta. The third area was around the selecting tailoring and evaluating effectiveness and efficiency of KT interventions. Really trying to advance the science of evidence implementation and how do we develop interventions and test them across different settings, unique models of evaluation as well.

The fourth area was around sustaining knowledge translation, so what are the strategies that we can use to help assess the sustainability of KT intervention, what about monitoring sustainability, what about optimizing KT interventions. So, these were kind of the four themes that we identified from pooling our researchers across the country to find their interests.

We targeted three stakeholder groups, so we targeted ‑‑ we wanted to make sure that we didn't focus on kind of just one stakeholder group, so we wanted to include patients in the public is the one group, we included healthcare professionals, other types of informal caregivers, and then the third group was policymakers, so we really wanted to make sure we were broad in thinking about our stakeholder groups.

Now, as I mentioned alongside then we also have a national training initiative, and with that we have funding to build capacity focused on these kind of ‑‑ these goals where we wanted to bring together our colleagues across the country and provide opportunities for people to be kind of cross trained and cross fertilized across different sites, and to focus not just on the science of KT but the nuts and bolts of doing the evidence implementation and to ensure that people developed skills in both of these areas. We wanted to focus on linking trainees and mentors and mentorship was a key component and is a key component of the training initiative across the country. We not only linked people to mentors, but also tried to build capacity among the mentors, so doing mentorship workshops.

And then wanting to make sure that we partnered with other national and international groups to avoid duplication of effort and to really think about how we can advance, not just the science of KT, but also our training so that we can take advantage of other initiatives that are going on in other countries and avoid this duplication of effort that often happens. If anybody is interested, I've referenced the article from 2011 that appeared in Implementation Science where we talked about the core competencies that we used to create the in addition national training initiative and some of the initial steps we took when we built the National Training Program.

And so I mentioned then, the core competency, and we created this from our membership, so we surveyed people across the country who were involved in KT Canada as well as people who are the end users of the trainees that we were going to ‑‑ that we are producing.

We asked about kind of what their perceptions of the core competencies should be, and so these are the things that people identified, so being able to understand the theories and models and frameworks of KT and KT research, being able to build capacity around systematic reviews of KT questions, and so not the kind of simple straightforward clinical questions we see often answered by systematic reviews, but the complex questions we often try to tackle in KT.

The third core competency was around developing capacity in qualitative and mixed methods, and this is something that we really found over the last few years as wanting to build even further, as recognizing there is not a single research method you can use in KT that's going to be ‑‑ that is going to be able to be used to answer all of these questions, and that we have to really think about engaging others who have different research disciplines to be able to answer these questions together with them.

And then the fourth thing was in being able to develop the skills to evaluate KT intervention, and again, thinking about not just the quantitative study design, but the qualitative study designs and thinking about this across different care settings, across the healthcare system, and targeting our different stakeholder groups.

So, we divided this into kind of three streams, and the first stream then is for people who really are going to be targeted as researchers in knowledge translation, so we developed a number of different courses for these individuals. Some of them were online, some of them are in person. We also were able to provide salary support or student stipends for these individuals, and as I mentioned, being able to create mentorship.

Some of the courses, as I mentioned, were online, but some of them required the individuals to come together in person so that they could have exposure and access to others across the country, and because although we're a large country but we have relatively small population, and so people were coming from smaller universities, there might not be a large number of people with an interest or expertise in knowledge translation, so by coming together to do these courses, it allowed trainees then to develop collaborations with others across the country.

That's been a real positive that I've seen as an outgrowth from this, is seeing over time how people have developed collaborations and how they've grown from trainees through to faculty now, and they're working on research grants together across different sites. We also wanted to make sure that we supported them in their career development, so not just thinking about kind of their participation in this training initiative, but how can we support them long term from a career perspective. Some of these topics would then get covered in our summer institute which is held annually, and we really tried in the Summer Institute and continue to try in the Summer Institute to not just focus on advancing the science around knowledge translation but giving people exposure to kind of the nuts and bolts of doing research as well and focusing on career development and mentorship.

As I mentioned, mentorship is a key component, has been a key component not just of our training initiative, but our research initiative overall, and we have done a lot of work, a lot of kind of research alongside on mentorship from a systematic review first on looking at what factors influence a career choice and showing that mentorship influences people's career choice through to then systematic reviews on mentorship itself and showing that mentorship is a good thing and it increases your personal development, influences your career choice, makes you more productive so you're more likely to have more protected time for academic work, more likely to get grants, more likely to have publications. Whenever I try to advertise mentorship to VPs at the research institute, I always talk about that because it has a huge impact on productivity when you have good mentorship. And the key thing that I find really important is that people are happier on what they're doing when they have good mentorship and you're more likely to retain people. So that is why we really wanted to focus on mentorship in our training initiative.

Our second stream is focused on people who are the ‑‑ who aren't necessarily going to be advancing the science of KT but wanting to learn the basics and wanting to learn more about how they get their research disseminated. And so, the focus for this stream was developing courses, such as our end‑of‑grant KT course which helps people over about a half day to a day to develop an end‑of‑grant KT plan that's tailored to their own research.

Similarly, we developed what we call a KT Basics or Practicing KT Course which is focused if you want to move beyond the end of grant KT but want to maybe focus more on how to implement your research in policy or practice, and this takes people through the kind of step‑by‑step approach. Then the third stream is around kind of really for anybody, so any decision maker, could be a clinician, could be a patient, could be a member of the public, could be a policymaker, and in particular focusing on what are the basics of KT. What is KT and what do I need to know about it in my particular setting.

We provided a number of different courses then that include both in‑person and online, to members of these different stakeholder groups. Having said that I'm going to spend the rest of the time kind of thinking about, based on what we've done in knowledge translation and what I've done personally in the last few years, what do I see as some of the challenges that need to be addressed in this field?

So, first of all, as Joann mentioned I'm a clinician so a lot of the work that I do stems from the patients that I see, and this is kind of the one of the issues that I see a lot, is that sometimes we think that if we just build the knowledge, if we just kind of tell people what to do, then it's going to fix everything. And I'm sure everybody on this webinar today is absolutely agrees with me that the lack of knowledge is not the biggest barrier to knowledge translation, so this is an example of a patient that I would typically see in my practice, a 74‑year‑old woman with multiple chronic diseases, so then you have to think about, how much time is required to implement recommendations from the relevant chronic disease practice guidelines? So, we have national guidelines in Canada, and one of our ‑‑ alongside with one of our trainees a couple of years ago, Jason Kur we looked at a study where we looked at the national guidelines and clinicians asked family physicians to apply these to patients into a consecutive series of patients and looked at how much time it took. If we just focus on the issues relevant to the patient that I mentioned, these are the ones that are focused and read, and it talks about how much time it's going to take to address the recommendation relevant to that issue.

So, these are just for things relevant to the initial management of those issues that I've identified. It doesn't relate to anything that, you know, if the patient comes in with concerns that they might want to have addressed, it doesn't relate to, well, if I do a lab test as suggested and it's abnormal, maybe what do I do then? These are just to do the initial ‑‑ the initial addressment of the recommendations. Overall for Mrs. M it's going to take about 129 minutes per year based on our national guideline, and our guidelines aren't that different from anybody else in the U.S. or in the UK, and in contrast, we know from the studies that Mrs. M is scene in primary care for only about 36 minutes per year, so we know that there is a huge ‑‑ there is a huge challenge around just the time available and the resources available to be able to address all of these different recommendations.

So Paul Glasziou, an amazing primary care physician in Australia, talks about how many studies have been published all the time. He created this for us two years ago when we were working on this topic, and it highlights how many articles are published every single day. While we were all sleeping last night, there were more than 75 new randomized trials published, that's just randomized trials. That's not things related to diagnosis or prognosis or etiology, so just the sheer volume of clinical literature out there every day is overwhelming and so how do clinicians keep abreast of this? When Brian Haynes created the ACP journal club more than 20 years ago he identified that for general Internet to keep abreast of the literature, we have to read 17 articles a day, 365 days out of the year. And given that that was done more than 20 years ago, it's probably double that now and that's just unrealistic for people to be able to do that. So again, just the sheer volume of literature that's out there.

So that's kind of at the individual level, but what about the organizational level? We did a project called Move On we did with colleagues including Barb Lou in sunny brook and across Ontario, we wanted to implement an early mobilization strategy for older adults. We know if any of you on the webinar have had a friend or relative or a colleague who has been admitted to the hospital, you know, as soon as we admit somebody to the hospital we put them to bed, and one of the challenges is when you're an old are adult and you get put to bed you're at risk of getting weak in the hospital or deconditioned, as we like to call it.

We know when patients are admitted to hospitals they're probably upright only about 30 minutes a day, they maybe get up to go pee if that and that's about it. So of course then, when they're in hospital they get ‑‑ they can be at risk for weakness and they lose their ability to look after themselves, and so we wanted to implement an early mobilization strategy because there has been systematic reviews and randomized trials showing if we do this in the hospital and do it right from the initial admission onward, that we can make a difference, but we don't do this.

But, one of the things that we wanted to do was, we had done it across some of our hospitals in Toronto and we got funding to do it across 14 hospitals across our province.

As part of this funding, the way the funding agency worked is that they went to the CEOs of the hospitals and asked which hospitals wanted to do it. So, all 14 hospital CEOs said they wanted to implement this. You can imagine if your hospital CEO says that, yeah, we're going to implement this, does this necessarily follow then that it's going to get implemented? Of course not, it's a great incentive a great facilitator if the hospital CEO is supportive in that way, but we all know for implementation to happen there is a lot of other factors that have to come into play.

One of the things that we identified early on is how do we assess organizational readiness? How do we know that these organizations are ready to implement? This led us then to a project that our team, Julie Julia More and Sylvia Conn led us on which was to develop a tool to help us identify an appropriate assessment for organizational readiness. And if anybody is interested, this tool is freely accessible from our website. This shows you what it looks like, and the publications describing how we developed and tested it are also freely accessible through Implementation Science.

The idea behind this is based on kind of where you are and what your setting is, you get asked a few questions and then it tailors the results based on what you've input. It gives you some suggestions for tools to use. So, what I've highlighted is just a few barriers, and we know that there is going to be barriers that exist at each level within our healthcare system, and so at the level of the patient, at the level of the provider, of the teams, the organizations, and at the system level. I often say that if we think about when something does happen, when evidence is getting implemented, the problem is a miracle because think of all the things that have to align for that to happen and for it to happen with high fidelity and good quality.

So, I often think that we, in many implementation projects, we don't spend as much time as we should thinking about and studying the barriers and facilitators to evidence implementation across the settings in which we're working. The second challenge that I wanted to highlight is that clinicians shouldn't be the only target for implementation or knowledge translation, and if you look at the literature over the last 10‑15 years, a lot of the early literature in knowledge translation implementation science has focused on the clinician audience, and I think partly that's been because a lot of the original literature focused on continuing education and continuing professional development, but we all know that clinicians are just one member of the stakeholder audience and that there are many other stakeholders that we have to ‑‑ that we have to consider.

And so, Andrea Trico who is a star researcher on our team here in Toronto led us on a project a few years ago where it looked at the influence and evidence around KT/QI interventions in patients with diabetes. These are the outcomes that she looked at. She looked at glycemic control, vascular risk factor management, the usual kind of clinical outcomes that are considered important in this area. If you look at the results of this study and just to orient people, if you have not seen a systematic review and meta-analysis in a while, the first column on this diagram shows the intervention. The second column is the number of trials, and then the next two columns are the results, and then the final diagram or the non‑official term that I like to use is the blobogram shows the result, and so if you look at the blobogram so the line of zero is the line of no difference, so if the results cross that line, that means that the results are not statistically significant.

And then as you can see on the right‑hand side, if everything is on the right‑hand side it favors the intervention and if everything is on the left‑hand side or to the left of the line of no difference, it favors the control.

Now, as we go down our list of interventions, we can see what are the interventions that are most effective? Well, the ones that we see that have the biggest effect size, so the ones that are furthest to the right, are not the ones that are targeting the clinicians, so but instead they're the ones that are targeting the patients, so you can see here the promotion of self‑management, patient education, patient reminders, and also the team changes and so when we're targeting the team and the patient, we're seeing a much bigger effect size than when we target the clinicians and I think is a great example that highlights we need to make sure when we developing our KT interventions we think broadly around the different stakeholder groups.

Now, since this study was done we've similarly seen the result in other systematic reviews that we've done, so if anybody is interested in another topic that you've seen similar results we had a paper that came out in the CMAJ a couple of years ago looking at frequent users of the healthcare system. People who frequently get admitted to the hospital or to get seen by their family physician, and again we saw a similar trend that interventions that are targeting the team or targeting the patient were more effective than those targeting the clinicians alone.

So the third challenge that I wanted to highlight is something that I've stolen from Martin Eccles and he was the founding editor along with Brian Mitman of the Journal of Implementation Science and Martin talks about, it seemed like a good idea at the time principle, and the idea behind that is sometimes when we're developing interventions we don't necessarily use what's already been known, so we don't necessarily look at the evidence, we don't necessarily use theory, models or frameworks alongside the evidence to help us develop our interventions.

That's a huge, huge challenge in the area, we're not building on what's already known, we're not testing different interventions and advancing the science. This is I see as a real gap in the area, and certainly this is identified when Jeremy Grimshaw did his systematic review more than 10 years ago and looked at randomized trials of guideline implementation strategies.

What he found was out of more than 250 trials very few studies used any kind of evidence to inform the development of the interventions, so I think this is a real fault of us as researchers where we're not building on the science of what's already known.

Similarly, work has been done in specific areas, so Noah Iris for example, led the Cochrane review of audit and feedback, and there is more than 140 trials of audit and feedback but very few head to head trials, and very few of the studies use elements from theory that are going to suggest how to optimize the intervention, so again not building on the science of knowledge translation or implementation.

Similarly, Deb White led us on a project a few years ago, where she did a systematic review of studies and quality and safety teams and lots of hospitals and organizations are trying to implement quality and safety teams, but again highlighting that we're not really building on the science that's already there.

The fourth challenge I wanted to highlight, and this is something that we're kind of interested in right now in tackling, is thinking about sustainability. A lot of times people don't think about sustainability until the end of a project, and one of our thought leaders in Canada Dr. Began more than 10 years ago that Canada is a country of perpetual pilot projects in healthcare. Kind of the new innovation in starting something, but spend less time thinking about the sustainability. I think there are lots of reasons why this is the case, and I think partly, you know, we've got different timelines for research funding, from policy cycles. We have concerns around that people raise from an academic environment where you get academic credit for staying engaged with a project over time, so I think there are different threats to sustainability not just related in a clinical context, but these external factors that we have to think about as researchers in this area.

And I wanted to kind of highlight that I do think it's important to bring common sense into this and that one of the things I worry about is that because of the focus that we've had on knowledge translation, that you know we're really engaging everybody to disseminate and implement their research and avoid research waste, which I think is hugely important, but we have to match it appropriately. We have to conduct it carefully and ensure if it's a result of a single small study that’s not something that should necessarily change practice or influence policy, and that we have to be judicious and use a common-sense approach to our KT and make sure that our KT strategies really match the research that we're doing.

And then the last thing I wanted to mention was, was the work on KT theories models and frameworks and that there has been a huge ‑‑ I think a lot of kind of discussions in the literature about how we're not really building on what's already known and that if people might use a theory, you know, in a project and use it as part of a grant, that they don't necessarily really use that theory throughout the research project. Similarly, we talk about there is a lot of work in the literature showing how many different theories, models, and frameworks there are and Lisa Strifler a PhD student working with us here in Toronto has done a scoping review to highlight how many theory, models and frameworks there are, and how the majority of them get used only once and so we're not testing these theories and models and frameworks very well and to me is this is a huge gap in the area. We have to think about what's already out there rather than creating a new theory, model and framework, let's look at what's out there and test some of these and test them robustly and see if we can advance the science in this area.

Just to summarize, I really think it's critical we move beyond the lack of knowledge. We think about who we're targeting for implementation, we build on the science. So, beware the Martin Eccles it seemed like a good idea at the time principle, think about sustainability from the beginning and think about how we can advance the science of sustainability. Related to that as well, think about how we can advance the science of scalability, and I don't think we need another KT or implementation theory model or framework to be created, and I worry sometimes that we feel we need to do this or encourage our graduate students to do this, and instead we should be thinking about testing those that have already been developed.

So, having said that, I just wanted to acknowledge our amazing group of people here at St. Mike's including Julia Moore and Meghan and all the KT Canada investigators and members of the scientific community and training committee that have been with us for more than 10 years now, and who are the reason that, that we've been able to do some amazing things with research and trainees in the country.

So, I'm open to questions now, and also wanted to say that if you have any questions after this session, always feel free to email me. Thank you very much.

>> JOANN STARKS: Thank you very much, Sharon. I think the audience probably will have some questions for you. I see someone is getting ready to type something that hasn't showed up yet in our Chat Box. Our plan in holding this webcast was to be able to share some of the ideas from Canada with viewers here in the U.S., but we did notice that we got a majority of participants who registered from Canada, so probably a lot of our audience are people that you may already know, Sharon, that hopefully they will have some questions for you. You really covered a lot of great information during this presentation, and we really appreciate you taking the time. We have someone again getting ready to type something. I don't see anything right there.

I'll ask you a question that occurred to me. Just at the very end where you talked about all the multiple models, theories and frameworks and you said we don't need to create a new one but look more carefully and study those that are already out there. I remember hearing Jeremy Grimshaw make a presentation about that at least 10 years ago at a forum that took place in France and I'm not sure if you were at that, but that was one of his comments at that time, so of the models and frameworks out there, are there any that you see as most likely to need more study? I know the one that we use a lot is the knowledge‑to‑action framework, and I don't know how much actual research there has been on the implementation of that model, for example.

>> SHARON STRAUS: That's a great question, Joann and in fact there was a study that came out looking at the use of knowledge, the Knowledge Action Framework, Andrew Booth was one of the authors and looked at how often it was used and it is one of the ones that gets used a fair bit, and so from the scoping review that Lisa has led us on and currently presented this at the D&I meeting in Washington, and the manuscript is now under review, but one of the things that ‑‑ one of the things that she identified were the most common theories and frameworks, the most common are out there‑‑ but also which of the ones that was considered full spectrum, and that we mean it tackles everything from identifying the knowledge gap through to engaging stakeholders to developing the intervention, evaluating it, and sustaining it.

And so, there were far fewer theory, models, and frameworks that were considered full spectrum, so there were only 26 compared to the more than 100 plus others that maybe were only a certain component of the implementation process. So, I think that's one of the things that we would suggest people to consider as well when you're doing some kind of summation of rotation work is to think about, you know, are you focusing on a full spectrum approach and is that kind of a theory, model or framework that you would like to look at, or is there one particular aspect, maybe you're interested in assessing the context only and that would kind of target you in a different way.

So, I think that's one of the things that I think people are needing to think about, and one of the next pieces of what Lisa wants to do and what she's starting to work on is developing a tool to help people select the theory, model, and framework, because I think that's again, one of the challenges because there are so many how do I pick one.

And the other person just to, for those who are interested, the other person who is interested in working in this area in the U.S. is Sarah Burkan and she's really doing some fantastic work in this area as well, and so I think stay tuned. I think over the next year you'll see kind of some advances where various groups are trying to push to make it a little bit easier for people to identify a potential theory, model, or framework to inform their own work, but also to identify potentials that you can maybe test in your own work.

>> JOANN STARKS: Thank you. We have a comment from Jen. I appreciate that you mention that we don't need more theories, models and frameworks, but need to test them. In my doctoral trainings I recognized there many theories but it was hard to know if they were tested robustly as you just kind of addressed now in your comments.

Do you know if a seminal piece of literature that you feel adequately tests the theory?

>> SHARON STRAUS: So that's great question, and if you're interested, I don't think there is just one, but if you're interested I can, Jen, I can put you ‑‑ email me and I can put you in touch with Lisa and we can give you ‑‑ we can give you some references that I think you'll find helpful because I think you've identified some of the key issue, is that a lot of these theories, and models and frameworks were maybe initially developed or postulated, but there is very few of them that end up getting tested.

>> JOANN STARKS: That is really great, Sharon. I was wondering, if you wouldn't mind, whatever you were going to share with her, you might be able to share with all of us. We could, in fact, send it out to everyone that registered and participated in today's webcast.

>> SHARON STRAUS: Yeah, no, happy to share resources.

>> JOANN STARKS: We have another question. If you have any suggestions on identifying sustainable and non‑sustainable approaches in practice. We’re getting some good questions here.

>> SHARON STRAUS: Yeah. Exactly. If anyone is interested in this, I recently got a foundation grant which is from CIHR which is the seven years of programmatic funding to look at sustainability of KT interventions, and as a first step, we previously have done a scoping review of the sustainability of chronic disease management intervention that came out of Implementation Science, and we are trying to ‑‑ the goal is to kind of build on that but to do a larger kind of systematic review and network meta analysis of sustainability of KT interventions, and if anybody is interested, we're just ‑‑ we just registered the protocol in Propero maybe a week or two weeks ago, but the idea is to use that to kind of inform some future work on understanding how we can optimize KT interventions and then test different approaches to optimizing KT interventions.

And because I'm a geriatrician, most of the kind of clinical areas that we're focusing on are going to be in older adult, but we're certainly interested in partnering with others if anybody has a particular interest. The grant that I put in is a large international group us with those who have these interests, includes colleagues from the U.S. Ross Bronson, Proctor for example, David Chambers, as well as people from Australia, so Paul Glosziou from Australia and colleagues then from the UK and Europe are involved as well as across Canada, and really what we're trying to do is think about, then once we've identified ways of optimizing sustainability, is then to test it in these different settings and so in these different projects that people are doing so that we can understand how we can maybe optimize sustainability across interventions and settings.

>> JOANN STARKS: Great. Sharon, do you mind if I put your email address in our chat box?

>> SHARON STRAUS: No, for sure, yeah, happy to, go ahead.

>> JOANN STARKS: All righty. Thank you. We have another question. Let me make sure we don't pass it up here. From Adora, thank you for the presentation, could you elaborate on the value of creating a tool to select a KT model, theory, or framework when we do not yet have enough evidence to support most of them? Should selection and evaluation be always done within the same project even if it is for a portion of the model instead of the full spectrum?

>> SHARON STRAUS: Yep, so two questions, so two great questions, and so the idea behind creating a tool to help people select is because it's to get after the issue we talked about, is that people really struggle with how do you identify a tool and certainly this is one of the things, one of the outcomes of our national training initiative, with KT Canada has been the recognition that this is a common theme that comes up whenever we're doing any courses with our trainees, with our summer institutes, it's a common, common concern and issue that our trainees and supervisors identify is selecting a theory, model, or framework to inform their work.

And that's kind of why this idea was ‑‑ was generated that Lisa is tackling for her thesis to help come up with an approach for people to consider a theory, model, or framework because sometimes what we end up doing is pick one that maybe we know or maybe that we've heard of recently, and rather than kind of being thoughtful about the approach. And so, looking at kind of how they were developed, how they were tested, and what settings they might have been tested or maybe they weren't, but maybe this is an opportunity to test that potential theory, model, or framework.

And then with regards to the selection of a theory, model, or framework, one of the things, again, that we're ‑‑ that Lisa is focusing on is the criteria that should be used to help us select. So I mentioned, for example, are you doing an implementation project, and so then you want, you know, a full‑spectrum theory, or is it one aspect of implementation or dissemination that you're working on, and so then do you want to find a theory, model, or framework that's specific to that.

There are other criteria that I think could be used as well, and that's again one of the pieces of what is currently undertaking to understand that and use that to inform the development of the tool.

>> JOANN STARKS: Great. Thank you. Jen also provided a reference from Proctor et al. from Implementation Science in 2015, so that's available in the Chat Box. Do you have any other questions? I want to make sure I'm not missing anybody here.

>> SHARON STRAUS: I think ‑‑ so one of the things that Lenola did in the implementation article if it's the one you mean on sustainability, there is a nice article she did on an exercise to kind of lay out the agenda in the sustainability world and to try and identify where the gaps are.

And I think that was a really nice start to kind of ‑‑ and to showcase how we haven't necessarily kind of tackled these areas. And then the other thing related to that that I mentioned briefly as well is scalability, and so sometimes we initially focus on the implementation in a couple of settings, but advancing the science of how we understand how to scale up an intervention across different types of settings.

>> JOANN STARKS: Great. Thank you very much. We've got just a couple minutes left if we have maybe one or two short questions.

We'll see if anyone else has questions, but we'll put together the information that was shared here in the Chat Box and some of the items you mentioned and we'll make that available to everyone who participated today. I guess we don't have any other questions coming in, so our time is almost up. I want to thank you, Dr. Sharon Straus for sharing information today. The term knowledge translation originated in Canada and we were really glad we were able to hear from such a knowledgeable international expert about the current activities related to KT and ideas that you're looking at in Canada.

We hope that everyone will take a few minutes to give us some feedback about the webcast by filling out a brief evaluation. The link has been placed in the chat box, and I think we also have it here on one of our final slides.

And we will be sending an email to everyone that registered because we would really like to get everyone's feedback. Thank you again, Sharon, and thanks everyone for coming today, and also thank you to the AIR staff that helped with the planning and logistics. And of course, we want to acknowledge NIDILRR for their support to offer these webcasts and other events. We look forward to seeing you at the next Center on KTDRR webcast which will be airing on next Wednesday January 17 at 3:00 p.m. eastern you can visit our website at www.ktdrr for the details. Thanks again and good afternoon.

(end)