



## *The Evidence* (transcript)

### *Season 1, Episode 5*

#### **Topic: The Brain Story**

[0:06]

[Announcer:] You are listening to The Evidence. Knowledge that inspires.

[0:16]

[Announcer:] The Evidence, produced by the Canadian Centre on Substance Use and Addiction.

[0:25]

[Lee Arbon:] And we're back with a brand-new episode of The Evidence.

[Amanda Deseure:] Typically this is where I would introduce Lee and myself as your hosts, but today we actually have a really big announcement. We are thrilled to introduce our third co-host.

[LA:] Yes, we're going from two to three with the addition of Victoria Lewis. Victoria, welcome to The Evidence.

[Victoria Lewis:] Hi guys, it's really great to be here today. Thanks for having me.

[LA:] Oh, we want to welcome you to the show. And of course, you know, you're not just new to the show, but you're also new to CCSA, and of course, as they say, to Canada, because you're originally from across the pond.

[VL:] I am, I'm from the lovely green land of Wales in the UK, and I've been in Canada a few months now.

[LA:] As the third co-host of the show, Victoria, you're going to be something really unique and different for us. You're going to be going out into the community and talking to people based on the topics that we're discussing with that particular episode. And today is your very first foray into the community.

[VL:] It certainly is, yeah. I'm going to be your new community correspondent. And recently, I attended the Brain Builders Lab in Ottawa.

[01:26]

[AD:] Yeah, so today we're talking about brains. Specifically, we're diving into how brains develop and what happens when developing brains experience adverse childhood experiences. And you and I attended the Brain Builders Lab together, and the Canadian



Centre on Substance Use and Addiction has been working with the Palix Foundation on this issue. And so, Victoria, do you want to set us up for your first interview?

[VL:] Well absolutely. And I'd just like to say that, yeah, for me this is an absolutely fascinating topic, because back in Wales I was working for a public health organization, and they did a lot of research into adverse childhood experiences and the impact they had on a population level. So, for me, getting to learn more about the neuroscience, and really how... the experiences we have when we are young really shape our brains and our bodies and how they develop.

[LA:] Alright, so we're going to go to break, and when we come back, we're going to dive right into Victoria's interview with Michelle and Nicole, which was recorded just recently at the Brain Builders Lab here in Ottawa.

[02:31]

[Announcer:] This is The Evidence. If you find today's topic interesting, be sure to visit [ccsa.ca](https://ccsa.ca) for more information.

[02:47]

[VL:] So, we're here at the Brain Builders Lab today. Now, thank you for taking a few minutes away from the Brain Builders Lab to speak to us. Do you mind introducing yourself?

[Nicole Sherren:] Hi, my name is Nicole Sherren, and I'm the scientific director at the Palix Foundation.

[Michelle Gagnon:] Hi, I am Michelle Gagnon, and I'm the president and CEO at the Palix Foundation.

[VL:] Let's start at the beginning. Before there was a Brain Builders Lab, there was the Brain Story. So, tell us a bit about the Brain Story.

[03:18]

[MG:] So, the Brain Story was, first off, we did not create the Brain Story. The Brain Story was created, and continues to be added to as knowledge evolves, but it was created probably almost 15 years ago by a group in the US called the National Scientific Council on the Developing Child that's made up of an interdisciplinary group of experts from both clinical sciences as well as neuroscience and psychology, who decided to get together and synthesize decades of peer-reviewed research related to brain development, and in particular, the role that experiences play in the neurodevelopmental process. And they wanted to synthesize and summarize this knowledge to reach non-expert audiences. And so, they are, they created the story, we've shortened it to call it the Brain Story. And what we've done through the Alberta Family Wellness Initiative is create all kinds of ways to share that story and... as I mentioned previously, it's, sharing is the first step. And we really want to promote deeper understanding of what the knowledge base is and promote its use to create much more effective policy and practice.

[VL:] Can you tell me a little bit about the course. What does it entail, who can take it?

[04:54]

[NS:] So, there's roughly 25 hours' worth of material, over 19 modules. It's completely free of charge for anyone to take. It is targeted primarily at professionals. And so, we have obtained accreditation from a number of professional bodies in Alberta, as well as, I believe you're



able to obtain some accreditation from national bodies. If you submit your certification, you can get some accreditation from, for example, people like the College of Family Physicians and those sorts of organizations. So, this is the opportunity for people anywhere in Canada, or really anywhere around the world, to actually get access to this information in a way that we believe will be really beneficial to their practice.

[VL:] The Brain Story talks a lot about adverse childhood experiences. What is an ACE, and how can they affect brain development?

[05:52]

[NS:] So, an adverse childhood experience is an experience that research has shown creates risk across the lifespan for specific types of health outcomes, social outcomes, learning outcomes. And the mechanism of action, the reason why ACEs exert their effects is because they cause something called toxic stress during the developmental period. So, toxic stress is a prolonged activation of the stress response system where stress hormones, they are elevated and they remain elevated for long periods of time, and where children don't have access to enough buffering support from the adults around them to help bring those stress hormones back down to baseline levels. So, it's stress hormones themselves that get biologically embedded, not just in our peripheral systems, such as our cardiovascular system, our metabolic system, our immune system, but also in the developing brain. So, they have an impact on how executive function, brain circuits, develop, how we regulate our response to stresses. And those types of impacts can actually, again, get biologically embedded in that brain circuitry, and remain over the course of a lifespan to make people more sensitive to stressful situations throughout their lives, and then potentially more vulnerable to diseases which are sensitive to stress, which is, you know, pretty much most chronic diseases out there. So, that's what an ACE is.

[VL:] So, I mean, what is the connection between adverse childhood experiences, brain development and addiction?

[07:34]

[NS:] Well, so we know that addiction, we used to think of addiction as being primarily a disease of the reward and motivation systems, and what newer research over the past 10 to 15 years has shown is that, yes, absolutely, addiction is a disorder of the reward and motivation systems, but it also has a very significant impact on our executive function system, as well as on our stress response system itself. And so, people who have experienced adversity in childhood, who have compromised executive control, who have difficulty managing their responses to stress, are already now set up to be vulnerable to addiction because the addictive disorder actually causes changes in those systems themselves. You place those changes on top of systems that are not functioning well in the first place, and you can create somebody who can very quickly go down the path to addiction. And as we know, not everyone who uses ends up with an addiction...

[VL:] That's right.

[NS:] ...so we do know that there are certain parts of our biology that make us vulnerable, and it's not just our genes. Because we also know that the experiences that we have in childhood actually have an impact on gene expression. So, it's that... interaction between the experiences that we have and the biology that we have that can set us up to make us vulnerable to outcomes, and specifically outcomes like addiction. Because quite frankly, those addictive substances elevate mood. We know they do that. And people who have



difficulty coping with stress are often anxious, maybe even depressed some of the time. So, you know, you have to factor in the aspect of some people who will potentially turn to either substances or behaviours that engage their reward system as a way to cope with current dysfunction.

**[09:34]**

[VL:] What does this mean for our understanding of addiction and substance use disorders, and actually how we support people who either have experienced adverse childhood experiences, so are therefore more vulnerable, or how we support people who are actually having lived experience of substance use disorder?

**[09:51]**

[NS:] Well, I think one thing we have to keep in mind is that as we think about how we provide services to people who are actively struggling with addiction, as well as trying to achieve stable recovery, we have to think about people who might be using for different reasons. You know, for a long time we've thought about addiction as being simply a hedonistic kind of chasing a high type of disorder. And if all you're doing is trying to manage somebody's substance use or that symptomatology, without potentially wondering what might underlie the drive and the motivation to use, you may not be treating the whole addiction; number one. Number two, we know that addiction is more than drugs, alcohol and gambling, there are a lot of other behaviours that engage that reward system, and that we very much need that top-down executive control in order to, you know, keep in balance, right. And so, if we can't expand our notion of addiction as being something that is literally in the brain rather than being in a psychoactive substance, we're actually not really going to be fully treating people as well, we're going to be potentially treating their alcoholism, but ignoring the fact that they gamble, or the fact that they're on the internet all of the time, or the fact that they're looking at online pornography all of the time. But we do now know that at least some of those behaviours are linked to the addictive process which is occurring in the brain. But we can also now think much more broadly about prevention of addiction and health promotion as being more than just educating people on the dangers of drugs, right. You know, we can actually build skills, we can build capacities that will strengthen people's executive function, strengthen their ability to cope with stress, so they don't necessarily turn to some of these behaviours when they face a challenge in their life. So, I think it really opens the door to a much broader understanding of how do we prevent these diseases as well.

**[11:58]**

[VL:] It's about taking a completely different approach...

[NS:] Absolutely, absolutely. Absolutely.

[VL:] ... to how, how it's been done in the past, isn't it, I guess. So, I'm just going back to talk about adverse childhood experiences for a moment. Can you give me an example of adverse childhood experiences, and who might typically experience them?

**[12:19]**

[NS:] Sure. So, the best studied types of adverse childhood experiences are different types of child maltreatment, as well as different types of family dysfunction. So, for example, things like child neglect, physical abuse, sexual abuse or emotional abuse. And the types of family dysfunction that we... are the best studied are really things like living with somebody who actually has an active addiction, someone who has an untreated mental illness, domestic...



witnessing domestic violence in the home. And why is that? Because quite often, we think of a child's caregivers as being their primary buffering system. But when they become the source of the toxic stress in the child's life, not only is there that constant source of toxic stress, the child's just lost their primary buffer. And so, it's a bit of a double hit. But those are the types of things that can cause a lot of toxic stress for children. Of course, they're not the only adverse childhood experiences out there. But they are the best studied. And it turns out that there is excellent research showing that this is actually a really common problem. This is not about special, vulnerable populations. So, the adverse childhood experiences study from California, the initial study that was done in this area, that looked at over 17,000 individuals, was a study of mostly Caucasian, middle-class, highly educated, employed Americans with health insurance. And they found that fully two-thirds of people said that at least one of those types of experiences had occurred in their background before the age of 18. And we've done some follow-up work, surveillance, in Alberta as well, and seen similar numbers. So, this is not about special populations. This actually cuts across the entire spectrum, this is a societal problem rather than an individual problem.

**[14:19]**

[VL:] It can happen to anyone, basically.

[NS:] Absolutely.

[VL:] I mean, finally, I mean, how does Brain Story science actually integrate into people's, sort of, professional and personal lives, how can they actually use this?

**[14:31]**

[NS:] Well, certainly everyone can find a way to think about this science meaningfully from a personal perspective. We're all human beings, we all have families, many of us have children. And we've repeatedly heard that that is a great value-add for people. We're at the early days of thinking about how this information can actually get on the ground in a number of different sectors, and that's been one of the purposes of the Brain Lab here over the past couple of days. And so, we've been able to bring some of our really successful change agents and leaders from Alberta who have been able to get this information into systems in key ways. So, we are now seeing some changes in how people provide services in health care. We are seeing a great amount of uptake in schools, in changing how schools provide services, seeing large-scale change within the family justice system. How do we move families out of the court system? Because divorce is, you know, it's a social issue with a few legal implications, instead of a legal issue, you know, with a couple of social implications. And so, we've seen this, this broader change happening in the province, but again we're still at the early days of really figuring out what this means, and I think that people need to keep in mind that how you apply this information in systems and services and in practices is highly contextual. It's not going to necessarily look the same from agency to agency. A lot of people are already using some aspects of this science, whether they understand that or not, but could benefit from aligning to even more of it as they learn more about that science and what it actually means. And so, I think the process of getting this information on the ground is always going to be an iterative one. So, anyone who works with kids and families who prides themselves on being a client-focused, or patient-focused, depending on what service sector that they're in, type of organization, knows that that is an ongoing, iterative practice. You never stop asking yourself how do you better serve your client base. And I think the really exciting part of this work is that while we're seeing some really great change, you never stop asking yourself how can you be better brain science-informed, how can you better align with that



science. And so, we're in that journey right now and really pleased that we can partner with the CCSA on this process as well.

**[17:18]**

[VL:] Well, thank you so much for joining us for the podcast today, and thanks for taking time out to talk about the really, really exciting, amazing work that you're doing.

[MG:] Thank you.

[NS:] Thank you.

**[17:40]**

[Announcer:] *Addiction News Daily* delivers a news scan of relevant articles, events and resources related to substance issues directly to your inbox, Monday to Friday. Join our almost 3,000 subscribers in receiving news that's relevant and interesting. Sign up today by visiting [www.ccsa.ca](http://www.ccsa.ca).

**[18:08]**

[AD:] Welcome back, we are now joined by Dr. Doris Payer, CCSA's brain development expert. Welcome Doris.

[Doris Payer:] Thanks, thanks for having me.

[AD:] Before we dive into the interview, I thought it'd be great if we could start by you telling us a little bit about yourself.

[DP:] Sure, so I'm a knowledge broker at CCSA, and I'm the project lead on CCSA's Brain Story initiative. And in terms of my background, I was trained as a neuroscientist, so my background is in addiction neuroscience. But the reason I wanted to become a neuroscientist was because I always wanted to change how we perceive and treat people who use drugs. And I thought that brains were the answer to that, I thought that by understanding brains we could make it more clear that, you know, this is a brain issue, it's not a morality issue, and that this could really change policies and how folks are perceived if they're using drugs. And then I finished school and got out into the real world and realized that understanding brains was a really small piece of the puzzle of understanding drug policies and services and so forth. And, so I started downplaying my background in neuroscience a little bit. But then I joined CCSA and I was handed this Brain Story file completely serendipitously, and suddenly my life came full circle, and it was okay to be a neuroscientist again, it was actually an asset to be a neuroscientist, and the whole point of the initiative is to use brain science to change the stigma around substance use and to change how we perceive and treat folks who use substances, and so the Brain Story essentially made my life make sense.

**[19:49]**

[LA:] You know, we, earlier, just to transition a little bit, we had Victoria talking to Michelle and Nicole about what the Brain Story is, but maybe you can enlighten us on why CCSA got involved and what CCSA's role in this initiative is.

[DP:] Well, at CCSA, we think that the Brain Story science is a key knowledge competency for anyone who works with people who use substances, or people who are at risk of using substances. So, this includes professionals in substance use prevention, so, educators, health care providers... social services providers, to make sure that we build strong, resilient



brains, but also it matters to professionals who are in addiction treatment or recovery efforts, but also criminal justice and public safety. And this makes sure that, again, there are fewer stigmatizing attitudes and an understanding of what is happening in the brains, potentially, of someone who uses substances, and also to make sure we have services that are trauma-informed and grounded in science. So, CCSA's initiative really had two parts, one was to promote the Brain Story certification course as far and wide as we could, and, as part of that, we translated the certification course to French recently, to make it accessible to even more Canadians, and that was released a couple of weeks ago, so it's available on Alberta Family Wellness Initiative's website now. And the second part of CCSA's initiative was to organize the Brain Builders Lab, which was an event that brought people from across the country together to really put that knowledge into action. So, part one of the initiative was, you know, it's well and good to increase the knowledge and increase the capacity, but part two really tries to put that into action and tries to integrate it into the professional and personal lives of people.

[21:45]

[AD:] So, you mentioned the Brain Builders Lab, and Victoria actually interviewed Alberta Family Wellness Initiative earlier in the show. I was wondering if you could tell us a little bit more about what the lab was?

[DP:] Sure. So, the Brain Builders Lab was a forum and workshop that was meant to bring people together to actually integrate Brain Story science into their work. And so, we had invited 62 Brain Builders to attend the event, and all of them had completed the certification course, and that was to make sure that they all came in with the same knowledge base. And then, the point of the event was to really sit down and hash out some action plans of how they were going to take that knowledge and spread and embed the Brain Story in their spheres of influence. So, we had people from across sectors. We had health care and public health represented, we had social services represented, government, education, corrections, criminal justice. So, we covered a number of sectors, we covered nine provinces, and, yeah, everyone came together and was divided into groups and in their groups came up with tangible project plans that they're now implementing.

[22:55]

[AD:] Sounds like a very wide breadth of people being brought together all to take about ACEs. Actually, in addition to interviewing the Alberta Family Wellness Initiative, Victoria also interviewed a few of the participants from the lab, and I thought we could listen to those now and get your feedback on them.

[DP:] Yeah, that'd be great.

[23:13]

[Cynthia Olsen:] My name's Cynthia Olsen, and I coordinate a municipal drug strategy for the city of Thunder Bay.

[VL:] So, how do you think the last couple of days have gone? Have you enjoyed the Brain Builders Lab? I mean, how do you think you'll take what you've learnt and put it into practice when you get back home?

[CO:] Well, what I was really excited about was not only taking the Brain Story certification, but coming together with colleagues across Canada to see passion about how do we spread the word about this science to different communities and in various different ways. And so,



hearing from the experts that the CCSA has brought in, Alberta Family Wellness folks that are here, as well as others who have already begun implementing this Brain Story science within their respective organizations, or spheres of influence, has been very valuable. And, I think the group that, you know, we've been partnered with, to develop an overarching goal of what we want to accomplish is super exciting to have connection to people across Canada to do this work.

**[24:23]**

[Lee-Ann Chevrette:] My name is Lee Ann Chevrette, and I'm the coordinator for the Thunder Bay Crime Prevention Council in Thunder Bay, Ontario. The Brain Story certification program and the training that we're attending today, or the last couple of days, I think has been a phenomenal opportunity, first, to have gone through the certification process and learn the science behind healthy brain development, and then, to connect with people across the country who are invested in and committed to bringing this back to their communities and embedding this information into the work that they do in their communities. For myself, it's very relevant, because I work in the realm of crime prevention, community safety and well-being. And, while we look at a lot of the risk factors for crime and victimization, and we tend to focus on those, often, what underlies a lot of those risk factors is trauma. So, we need to have a deeper understanding of the impacts of trauma, how that affects brain development, and how we can support people in a better way in our communities who have experienced adverse childhood experiences, who have experienced chronic trauma, and to recognize in a more compassionate way that people have been impacted, so we can provide appropriate supports.

**[26:04]**

[LA:] So, after hearing some of that feedback from those who attended, what are your thoughts on what they had to say?

[DP:] Well, for starters I'm really pleased that everyone felt so positively about the event. And, yeah, I mean, it sort of reflects much of what I heard as well about people appreciating the cross-sectoral nature of it, and the cross-country nature of it, and, you know, what I heard was that folks really appreciated coming together at the same table and being able to be in the same room and talk to each other, and that there's so much value in talking face to face and in the group work that they did, and, you know, it really helped them break through silos and realize that there are people in all sorts of other sectors who are talking about the same thing, just maybe in different language or in different ways, but everyone has the same idea. And so, I think, people appreciated being able to come together and discuss it together, and I also think they appreciated having access to the expertise that we brought in, and so this was a way to exchange knowledge, not just with experts, but also with other movers and shakers and each other.

**[27:13]**

[LA:] Okay, so now that the lab's over, what do you think, you know, from a CCSA perspective, but also the participants who attended, what do you think, you know, the biggest learning opportunity moving forward is?

[DP:] Well, for CCSA, I think it's recognizing that the time is ripe to address this and there is an enthusiastic community out there who wants to move ACEs knowledge forward in the substance use field, and you know, it's events like the Brain Builders Lab that can help catalyze that kind of work and the energy, and harness the energy behind it. And for the



Brain Builders, I think the biggest learning might have been that they're not alone, there's an entire community out there, regardless of sector, regardless of where in the country they are, who have the same idea, and who want to move this forward. And, you know, it really helps build a community of champions that hopefully will expand across the country.

**[28:17]**

[AD:] You also mention these project plans and project charters. What exactly are the projects, or maybe an example you can give us of what a project might be that some of the Brain Builders are working on?

[DP:] Yeah, they're all very different, actually. And they tackle different dimensions of the problem, so, for example, one group is looking at creating a policy pitch for greater investment in early childhood education, so 0–6 years and perinatal care, and then, some of the groups are based on geographical location, so we have an entire Atlantic provinces group who... is spread across sectors, but they're really going to try to leverage their resources and their successes across their provinces to move this forward in their area. We have a group that's focused on northern, rural and remote issues, which I think is very important when talking about ACEs. We have lots of folks who are interested in promotion and prevention, so a lot of public health units and so forth. We have a group that's focused on issues to do with substance use specifically, and then a group focused on educating future health care and social service providers, which can also be very important. So, it really... all of the groups take a little piece of the problem and sort of tackle it from their own angle.

**[29:44]**

[AD:] That's incredible. It sounds like the Brain Story knowledge, and the knowledge brought from the lab is going to extend pretty, pretty wide across Canada. It's a pretty far-reaching initiative that you've taken on.

[DP:] Here's hoping, yeah. I mean, ACEs relates to everything, right, from prevention to substance use treatment, and it really, it's relevant everywhere. So, yeah, pretty excited to have that reach.

[LA:] I mean, as you say, it relates to everything and because we're talking about brains and how they relate to substance use and addiction, how do you think with what comes out of this program will affect the other work that CCSA does?

[DP:] Well, so one of the initiatives that this is related to is CCSA's stigma initiative, which is really focused on trying to recognize and combat the stigma that we see in ourselves and in our workplaces and in our society. And, a lot of what those stigma workshops focus on is neuroscience, and it talks about brain development and trauma, which is essentially the Brain Story, so there's a lot of overlap there, and I think, using the language and the concepts from the Brain Story can make... the attendees of the stigma workshops... make it easier for them to advocate against stigma. And I also think there's a relationship to some of the work we're doing with Indigenous communities where trauma, and especially intergenerational trauma, can be a big issue, and this isn't something we have formalized yet, but I think it's a very ripe opportunity that hopefully we can pursue in the future.

**[31:20]**

[AD:] So, what do you think is next for the Brain Story, what's the next year look like?



[DP:] Well, so for the next two years we're going to support the Brain Builders in implementing their projects, and in two years' time they'll come back together to see how did we do, did we have an impact. And part of supporting the Brain Builders and implementing their projects will be a community of practice platform that we're building right now. And that platform really has two purposes: one is to help the Brain Builders implement their projects, so it's really meant to be a place where they can communicate with each other and share resources and see what the other groups are up to. But also, the second part is that this is a chance for everyone who wasn't able to come to the Brain Builders Lab to link into the work that we're doing. So, we know there's a lot of enthusiastic, capable people out there who want to make a difference as well, and this is really a chance for them to maybe align with a project that they're interested in, or connect with the Brain Builders and lend some of their resources and maybe enrich some of the projects. And so, this is something everybody will be welcome to join and we can talk about how to move ACEs and substance use forward.

[32:33]

[AD:] Dr. Doris Payer, thank you so much for joining us. This has been so interesting and I think I speak for Lee and I both when I say I think we've learned a lot about adverse childhood experiences. And it's really nice to hear that your story's come full circle in returning back to neuroscience.

[DP:] Yeah, thank you very much for having me. I love talking about this stuff, so thanks for bringing me on.

[LA:] Alright, we're going to go to break and we'll be right back.

[33:08]

[Announcer:] Like our show? Have a comment or question? Want to suggest a guest for The Evidence? Email us at [podcast@ccsa.ca](mailto:podcast@ccsa.ca) and let us know. We want to hear your take on The Evidence.

[33:32]

[AD:] Welcome back. I am so glad that Dr. Payer was able to join us. It's been super interesting to see how far-reaching the issue of adverse childhood events is.

[LA:] Right, I mean both Doris's conversation and that of, from the representatives of the Palix Foundation was fantastic. And it brings our episode to a close. Which also means it brings Victoria's first episode as co-host to a close. Victoria, how do you think your first foray into the podcast world went?

[VL:] I've had a lot of fun, Lee. It's been a really good episode, I think. And I feel from my point of view, I knew a little bit about adverse childhood experiences from like a public health, population perspective. But I feel like I've learnt so much about neuroscience and really how these early experiences are actually built in to our brains and our bodies so, yeah, it's been fascinating.

[34:19]

[LA:] I think it's going to add something, you know, another element to our show from just, rather than just being in the studio and talking to guests in the studio.

[VL:] I absolutely love it. I like being there in the moment and really trying to capture the essence of what's going on, so, yeah it was a great experience for me.



[LA:] So, this has been another episode of The Evidence. Please join us again for our next episode in the near future. For Amanda, Victoria and myself, goodbye.

[35:07]

[Announcer:] This is The Evidence. If you find today's topic interesting, be sure to visit [ccsa.ca](https://ccsa.ca) for more information. Technical and editing support for the podcast is handled by Christopher Austin. The Evidence is owned and produced...

[Background voice:] Copyright, 2019.

[Announcer:] ... by the Canadian Centre on Substance Use and Addiction.



Canadian Centre  
on Substance Use  
and Addiction

CCSA was created by Parliament to provide national leadership to address substance use in Canada. A trusted counsel, we provide national guidance to decision makers by harnessing the power of research, curating knowledge and bringing together diverse perspectives.

CCSA activities and products are made possible through a financial contribution from Health Canada. The views of CCSA do not necessarily represent the views of the Government of Canada.