

## **January 21, 2016 Special Regional Council Meeting Transcript**

[Start of recorded material [00:05:26]

Chair Dale: I'll call to order the special council meeting for Thursday January the 21st, 2016. Roll call, all members are present except Councillor Carlson, Mayor Crombie. Okay, thank you. Councillor Downey is on other municipal business, Councillor Fonseca is absent, Mayor Jeffrey on other municipal business, Councillor Kovac, I know he was called to jury duty so he may still be doing that. Councillor Medeiros on other municipal business, Councillor Saito, Councillor Starr, Councillor - or Mayor Thompson on other municipal business and Councillor Tovey.

They're not at their seats yet but I appreciate that they're in the building. Are there any declarations of conflict of interest? Seeing none then, move by Councillor Iannicca seconded by Councillor Gibson that the agenda for the January 21st, 2016 special regional Councillor meeting be approved? All those in favour, opposed if any? Carried, thank you.

Well, good morning. I would like to give a brief outline for today's proceedings. Um, as you know we were asked to have an education session for members of council in order to inform them on the pros and cons of fluoridating water in the region of Peel. In accordance with the region's procedure bylaw section four, subsection eight, this meeting will be a closed meeting for the purpose of educating or training the members provided that no member discusses or otherwise deals with any matter in any way that materially advances the business or decision making the Council or committee.

We have received the request for an investigation into the closed meeting criteria and have been in contact with LAS, the closed meeting investigator and advised that no discussion should take place that will materially advance the business of council. Further in accordance with the bylaw, as I've just read, there will be no decision made in camera.

This session is to hear the information of those both in favour of water fluoridation and those against. We will hear from five delegates and a medical officer of health. Then break for lunch and then after lunch go back into close session to receive questions from the Councillors. There will be no debate amongst Councillor members or debating with the delegates. Please keep your questions focused and clarifying and not a speech or a

debate, thank you. I like - I'd now just like to call on Patrick to have some introductory remarks.

Regional Solicitor Patrick O'Connor: Thank you Mr. Chair. I just would like the opportunity to emphasize the importance of the advice you've just given Council. We are going in camera on the basis of a fairly narrow and focused, ah, exception in the municipal act to the general rule that meetings are to be open. What you do in camera will be closely scrutinized under the investigation that you've already had notices under, under way or will be under way to review what you do in camera.

So, it's quite important that you observe the Chair's, um, request, that you avoid any, um, discussion or questions aimed at advancing the decision making. It should not be a situation in which you are advocating or promoting a particular point of view, attempting through questions to, ah, promote a particular outcome or undermine any particular opposite point of view. So, I think if you look at it as an educational session, put on your student hat, as oppose to your Councillor hat for the time being, that you'll be on solid ground.

Chair: Thank you, I now call on Councillor Parrish, who's the Chair of the committee.

Councillor Parrish: Yes, thank you Chair Dale. I did chair strictly the organizational committee to get us here today. Again, we didn't make any decisions or have any conversations on whether we wanted fluoride in or out. What we did do is select on our committee these speakers who were the best of the batch. And hopefully they'll enlighten us one way or the other today. I'd like to thank our staff, they did a really good job, um, and I'd like to thank the Chair. And I'd like to thank John Sprovieri for being a first class Vice-Chair on this committee, did a good job. And, uh, thank you everybody for coming today and I would like to move us in camera.

Chair: Okay and Councillor Ras would you second that motion to move into camera? All those in favour then, opposed if any? Carried. If there's anyone in the room that has not, has not been specifically invited for the purpose of this session, I would ask that you, uh, kindly leave quietly and calmly, if there's anyone here that shouldn't be. And I would ask staff just to look around and make sure that those who are in attendance were invited.

So, I read this now, okay. Before I call on our first delegate I have a few words. In accordance with the region's procedure bylaw section four, subsection eight, this meeting will be a closed meeting for the purpose of education or training the members, provided that no member discusses or otherwise deals

with any matter in a way that materially advances the business or decision making of the committee or council.

Delegates have been provided with a 15 minute timeframe for their presentations. There will be no question whatsoever during or between the presentations. Please be respectful of each other and abide by the rules set out in the procedure bylaw. And on that note I'll call on our first delegate, uh, Dr. David Juurlink regarding the community water fluoridation, welcome.

Dr. David Juurlink: Good morning. Thanks for the opportunity to present here today. I'm not sure if I should give some introductions of my qualifications or not. No. I will say that, uh, when Dr. De Villa asked me to do this last year, I came to it as somebody who knew very little about, um, fluoridation. I have don't have a posi - I don't have a strong position of what you should do. So, I don't put myself in the pro or con camp.

I will say that I've - when she came to me I was sort of faintly in favour of it because of a project I had done in medical school that left me with the impression that there were some benefits to fluoride but I don't want to give you the impression that I know the literature on fluoride extensively, I haven't made a career out of it. But I know a lot about how chemicals affect people and I know a lot about how research is done and I know the strengths and weakness of various designs 'cause I do it as part of my work. I apologize, I've been under the weather so if it's apparent you have my apologies.

I'm going to speak very briefly about the chemistry of fluoride because I know how traumatizing the subject of chemistry can be. And I'm going to unpack some of the safety concerns as I see them. I am keenly aware that not everyone in the room shares, um, the opinions I'm going to pass onto you but these are my opinions nevertheless. I'm going to focus on fluorosis just a little bit 'cause I'm also aware that many people in the room know this topic much better than I do. But I want to spend a fair bit of time, uh, discussing this issue of fluoride and I.Q and a bit of its affects on bone. And I'll end with some final comments on HFSA as a fluoridating agent 'cause I've been told that's an area of concern for you.

Uh, so not to shock you with grade 11 or 12 chemistry but this is the periodic table, this is all of the known elements that are out there and floura - fluorine is up there and I've circled it just to the right of nitrogen and oxygen which you're now breathing and just above chlorine. And that's what we're talking about fluoride, the ion of that.

Um, when we ingest fluoride, whether through water or through sodium fluoride or sodium monofluorophosphate or any kind of

fluoridated compound, it's pretty well absorbed. It's influenced to a certain extent to what else is in your stomach and your intestinal tract but for the most part it's pretty well absorbed. And from there, uh, it generally has one of two fates. It's either eliminated by your kidney, as most, as many drugs are or it's taken up into bones and, uh, and teeth. Some of it does distribute to other organs but really the vast majority of fluorides in your bodies resides in your bone, bone compartment is what a toxicologist would call it.

Um, it doesn't enter particularly well into certain tissues, fat for example because fluoride tends to go where the water is and fat tissue doesn't contain a lot of water. It also, well it transfers into the brain a little bit, it doesn't actually go in there all that well because of something called the blood brain barrier. This is a physical barrier that opposes the entry of many compounds including fluoride into brain. It's not to say there's no transfer, but it's not the same as you would see into, uh, other tissues.

So, uh, when reviewing the issues, uh, of harm, uh, the one where I think the evidence is clearly the strongest is with dental fluorosis. I'm not going to speak too much about this as I said because there's more knowledgeable people in the room who spent their lives seeing this condition. I will make a point this is a great entity, uh, and it's a function of the fact that fluoride is incorporated into the developing, uh, enamel of our teeth.

The NRC report, that I suspect you'll more about later on today published in 2006, uh, makes the observation that severe fluorosis, uh, is not particularly common until you get to very high, uh, water fluoride levels. Now this is severe and I will accept the point that I think this figure looks quite a lot different if you lump all types of fluorosis into it. But severe fluorosis, which I would imagine is the most objectionable to a parent or to the person with the condition, is generally not going to be seen at levels of .7.

What about the effects on other tissues? 'Cause this is where, uh, I was shocked, uh, when I began to dig into this of the degree of misinformation on the internet. In fact it reminds me very much what I see routinely with regards to, um, mercury in vaccines, very, very vocal opposition to that practice based on extremely tenuous science.

So, before I talk about my views about what the evidence says I think we have to make a point about how we assess evidence generally. You may have seen this pyramid or something like it before. It says something about the hierarchy of medical evidence. And it started - it refers to the different types of studies that researchers do. I've published about 250 papers now.

I've used every single one of these designs and I know what their strengths are and I know what their weaknesses are.

At the top we have RCTs and then systematic reviews of them. An RCT, randomized trials, are - you hear about them in the paper all the time. These are studies where you take a large group of people. Ideally you divide them into two groups and you give one group the intervention and you don't give it to the other. And at the end of the trial you look and you see, uh, is there any difference in measurable outcomes in these two groups? This is sort of our strongest level of evidence to determine if something does something beneficial or something harmful. There are very, very few RCTs of this topic.

Most of what we were talking about is in the realm of we call observational studies, cohort case control. I'm not going to spent a lot of time talking about these. If you want then I can unpack the designs and what they do but many of the studies are ecological in nature. It's very hard to find a pyramid with ecological incorporated because of the, uh, not rarity, but, uh, the relative under use of these studies. I've published maybe half a dozen of these, there's not a lot of them out there.

Um, but they're very problematic to interpret. And I mean what these - they effectively look like this, you go to one community and you look at the prevalence of two separate things and you do the same thing in another community. You know, water fluoridation and I.Q for example, we'll talk about that. And from that you try and draw inferences about whether or not, um, there might be a relationship. They're very easy to do, uh, they're cheap. I mean if you've got the data you could do it on an Excel spreadsheet in an afternoon.

Um, and what - and it's important because a lot of the misinformation, or what I perceive to be misinformation about this issue has to do with issues like this. And the crux of it is this issue of association. The finding of high fluoride in water is associated with something else. It - the critical point, and the reason I've highlighted this is because it does not mean that the relationship is a causal one. There are very often reasons to explain associations that do not represent cause and effect. There are some very important limitations to these. If you look at this community and that community there are all kinds of things that you do not and you cannot measure that might well explain the relationship and in research we call those cofounders. And it's really easy to draw misleading conclusions from studies like this.

Um, I've given you one example in your report, I supplied it for you. So, some associations are simply meaningless, no one on the planet is going to believe that the - that a deficiency of

pirates in our, in, uh, the world is responsible for global, uh, warming. I mean you could find correlations like this all over, right?

Um, I will say, um, and I want to plant a flag here. In my, um, looking on the internet for research on this I found, as I said, a whole bunch of, uh, rather vociferous, uh, uh, presentations against fluoride. What you frequently see is this Y axis, this horizontal axis here is truncated, it doesn't go down to zero, right? If they - this is deceptive. And I have a suspicion that you're going to see figures like this later on today. And I think the first thing you should look at is does the axis go to zero? Because if it doesn't, it is exaggerating the association visually.

Now to be fair some associations are real. Um, I think few of us would dispute the notion that countries that have more hand guns have a higher rate of gun deaths. This is what this slide shows and not surprisingly the States is an outlier here. But we don't always have all of the data okay? And so if you take that line out and take some of those countries out, uh, you could easily form, this is the same data with just three countries as opposed to the entire group of them. You could easily draw the erroneous information that somehow increasing gun ownership is reduced with a reduced risk of dying from, uh, a gunshot wound. So, you - these studies are among the lowest levels of medical evidence and the simple fact that they're published does not mean that they say what they purport to say.

And so, in the context of the effect of fluoride on the brain, I mean most of the literature on this relates to the issue of I.Q and here is a review of - this is routinely pointed out by opponents of water fluoridation. This, uh, this review by Gragan and Landragin in 2014, it's actually an update of something they had done in about 2006 several years earlier. And, um, bottom line is in this new update they have added fluoride as a component of water that was neuro developmental adverse effects.

I've read this document in its entirety, the word fluoride appears one time only and it appears in this chart. And it's not supported by a citation, they don't reference it at all. Uh, that's highly unusual in the medical literature. Uh, I can tell you that I think they drew upon their own work for this. Um, so there is a large, a large body of work relating fluoride in water and I.Q. The majority of these studies come from China, some from Mongolia and Iran and a few other jurisdictions. But most of them are from China where the ground levels tend to be on the higher side and they really just asked does village water level correlate with the I.Q correlate with typically children in the village.

And often you'll hear references to the Harvard Study, which carries the [unintelligible [00:22:16] matter of Harvard and is

therefore presumably going to have some, uh, significance attached to it. This is a review of 27 of these studies and their conclusion supports the possibility of an adverse affect of high fluoride exposure on children's neurodevelopment. This is not definitive, it supports the possibility saying water fluoration causes developmental problems.

Um, you probably can't read this slide but I put it into to highlight the fact that we are talking about some exceptional studies here. If you're talking about .7 parts per million in Brampton's water, I mean these are levels of three, five, up to 11.5 milligrams per litre in the exposed communities. It's quite something. And the assessment to fluoride exposure isn't just water, sometimes it's coal burning, sometimes it's the assessment of fluorosis. These are studies that are inherently very, very different and what the researcher has done is role them all together into one.

Um, so the generalizability of this to North America I think is very, very tenuous. And importantly they cannot account for other things that are going on at the village level, air pollution, other things in the water like arsenic for example, socioeconomic status, parent's education, dietary habits and so on. You can read as well as I can there are many, many factors that might explain why one village has a different average I.Q by a few points than another.

Um, this has created a fair bit of consternation in various jurisdictions and here's a concern actually published in the New Zealand medical journal from health advocates in, uh, New Zealand being very, very critical of this study. And they conclude at best this paper provides nothing more than the merest suggestion of a possible or potential relationship. So, I agree with this conclusion, I think they are right on.

But if you actually go into the studies and unpack them, I mean it's amazing how bad these studies are. I've picked one up, Wang 2007, um, there's a study where they look at several villages and I've unpacked part of the main result's table here. But you can see there's three villages, they have their acronyms up top. Average fluoride about 8.3 parts per million and the control group is 0.5.

And they make the observation that the average I.Q in the high fluoride Village is about 100 and it's about 105 in the low fluoride and that's somehow meant to suggest on the basis of the fluoride having caused this notwithstanding all of those, uh, comments I made earlier. But I want you to look at these and ask yourself whether or not this is an important difference. And even if I had superimposed these two and we found that there was a slight difference in this versus that community, it's important to

remember a couple of things. I mean this is a 16 fold difference in this community here.

Chair: Doctor you have just under two minutes.

Dr. David Juurlink: 16 fold difference, if it takes 16 fold to show a difference like this, I mean you have to really wonder what to make of that. This does not show, this is not representative of 0.7 versus 0 or .2 or whatever your natural would be. It's the wrong question.

The other point to make is that how many studies out there haven't been published in this issue? Nobody knows. I mean you might say these are very consistent these studies, they show, the majority of them show some association. Well, there's a well described phenomenon called publication bias, where if you've got a study that shows no association, it doesn't even get written up sometimes let alone published. I mean this is a very important point for people who think about this issue.

Quickly onto bone, just to make the point that here we have some randomized trials, albeit in older people looking at fluoride for osteoporosis. And what we know is that people given sodium monofluorophosphate, 20 milligrams every day for many years, have increased bone density. We don't use this for treatment of osteoporosis because it doesn't actually reduce the risk of factors. And there are some observational studies, which are weaker than the RTCs, that suggest there might be increased risk but the risk is very small.

And the weight, this is from the NRC report and I'll just summarize, the weight of the evidence supports the conclusion that lifetime exposure to fluoride at levels of four milligrams per litre well above what you might be contemplating, uh, is more associated with an increase risk of factors compared to one, but again it's not 0.7 to zero. You can't take this into your decision making too seriously.

Finally, osteosarcoma, I was surprised to find a study that associated fluoride and water with osteosarcoma. They've looked back at age 7 and said how much fluoride were you exposed to? And what's amazing about this study was it only held in men and not women. And there's no biologically possible reason why that would be. And so, you're naturally skeptical of it and it's not too hard to find the follow up study where they actually went into people with osteosarcoma and they sampled the bone and found that the fluoride near the tumour was not different than the tumour anywhere else. Effectively I think debunking this association rather thoroughly.

Last minute if I can on HFSA, I had never heard of HFSA until Dr. De Villa approached me and I said what the hell's HFSA? I

go in to dig about it, it sounds like a scary chemical. Well, I am here to descarify this chemical. This is it, it is a very simple acid, a silicon atom and six fluorine atoms around it. And when you add it to water, the fluorine generally leaves and dissociates. That's what's being added to the water.

The silicon simply is not toxic, okay? I did not know that the amount of silicon I get from eating a banana, I had a banana this morning, it's several orders of magnitude higher than the silicon I would get from a litre of fluoridated water. Um, it seems to me the primary concern is with the contaminates in this compound and that's something I think warrants consideration. And I've dug into it a little bit. This is an NSF fact sheet, looking at 216 samples and by far the primary concern here is arsenic. And if I was a concerned citizen I would be wondering about the significance of this is and I know a little bit about arsenic, um.

Chair: Doctor, I've given you plenty of time.

Dr. Juurlink: You have, should I stop?

Chair: Yeah, no okay.

Audience: unintelligible [00:28:19]

Chair: Yeah, for sure.

Audience: I move that he [unintelligible [00:28:28]

Chair: I get criticized if I don't keep him on time and I'm criticized if I do. Go ahead, an expression of Council.

Dr. Juurlink: I'm almost done, very sorry.

Chair: Okay.

Dr. Juurlink: Um, so this has been studied and the best available evidence about the arsenic content of the very concentrated stuff, and I appreciate this is an industrial by-product, I would be scared of it myself if I hadn't read a little bit about it. The arsenic content is about 28 milligrams per litre.

When you dilute this down several hundred thousand fold, it equates to about .0000014 milligrams of arsenic. The WHO limit is .01. The water in Bangladesh, that is clearly associated with the development of cancer is hundreds, actually thousands of fold higher than this. So, the concentrations of arsenic that you would have in your municipal water if you used HFSA are vanishingly small. And if I was drinking your water I would not care about it.

So, um, just to summarize, I accept that fluorosis is a concern, uh, clearly the severity that is governed by your dose, which is a function of course is how much is in your water, but the evidence for adverse affects on health otherwise is extraordinary tenuous. I mean the best of the weak evidence is for fractures and it's really quite weak but the evidence linking fluorosis to I.Q and osteosarcoma is to bad as to be I think largely disregarded.

And this HFSA stuff, I mean it sounds like a scary chemical and people hear silicon and they think breast implants and all of the horrible connotations that go along with that, I have zero concerns about letting my three kids drink water that is fluorinated with this compound, and with that I'll end, Thank you for indulging me with extra time.

Chair: Just before I call on our next presenter I'd ask if you'd turn your cards around so - 'cause they just have the names on the one - that was to find your place. Alright, that's good. Our next delegate is Dr. Connett, welcome.

Dr. Connett: Good morning everybody. I'm going to talk some of health concerns of fluoridation. I've been researching this for 20 year, first as a professional chemistry at St. Lawrence University, my speciality was in environmental chemistry and toxicology, and then as the Director of the Fluoride Action Network.

In 2010, I published this book and I did in a written response to the questions of - I'll give you the opportunity, each one of you, to have a free copy in electronic form. I only ask you not to pass it onto anybody else. It's for your only use. Uh, the book has got 80 pages of references to the scientific literature. I was not the sole author, I had the help of James Beck M.D from Calgary and Spedding Micklem from Edinburgh.

What should I be talking about? Mother's milk protects babies from fluoride. Very important, this is nature's product, you'll see. The evidence that fluoride is neuro toxic is much more expensive, extensive than you heard from the last speaker. There's no adequate margin of safety to protect all children drinking fluorinated water from lowered I.Q. More evidence of harm to the brain was emerged recently. Why a drop of a few I.Q points at the individual level can be very serious at the population level. And finally three questions for you at the end.

Mother's milk, very, very low in fluoride, the average .004 parts per million in a non-fluorided area. I believe that nature is protecting the baby from fluoride. On the other hand if you live in a fluoridated community and you make up formula with fluoridated tap water, you can give approximately 100 to 250

times more fluoride than nature intended. That's reckless in my view.

The evidence that fluoride is neuro toxic, it's very strong. And you can go to this website, this site, to find all the studies I'm talking about or references including links to full copies of the paper. They're over 100 animal studies that shows prolonged exposure to fluoride can damage the brain. 49 human studies link modest to high fluoride exposures with lowered I.Q. 34 animal studies will show that rodents exposed to fluoride have an impaired capacity to learn and to remember, 12 studies which show other neuro behavioural deficits in both animals and humans. And three human studies, which shows that fluoride impacts the fetal brain.

Now animal studies are very interesting in this context because you heard from the last speaker how difficult it is to control all the variables when you're comparing two populations. But animals allow you to do that. Animals allow you to control every variable except the one you're looking at, in this case exposure to fluoride. So, they have the same housing, the same food, the same diet, the same water etc etc. etc. except for this one difference. And when they expose these animals in mazes and do standard tests, they find that the animals exposed to fluoride are less able to learn and memorize, very important support for the notion that fluoride is neuro toxic.

There are 49 out of 56 studies which have found an association to fluoride lowered I.Q from China, India, Mexico and Iran. One study in particular, the last speaker pulled out a study which he thought was particularly weak. I'm pulling out a study which I think is particularly strong, which is obviously what we should be most concerned about if we're protecting the population.

I've been to the studies in question by Xiang. The low fluoride Village had an average of 0.36 parts per million. The high fluoride had an average of 2.5 parts per million. He controlled for lead exposure, he controlled for iodine intake and retrospectively for arsenic. He found a drop of five to 10 I.Q points across the whole age range between the two villages. You can see the I.Q curve has been shifted right over.

Now what was particular strong about this study, because we've heard about the difficulty of controlling the variables between two communities, but what he did is he looked within the same village, the high fluoride Village, if you look at groups A, B, C, D and E you'll see subsections in which the fluoride concentration is steadily increasing from .75 to 1.5 to 2.5 to 3.3 to 4 and if you look at the I.Q, the main I.Q of those separate groups, you can see the I.Q is steadily decreasing.

So, we got something which makes the study more than an ecological study. We've got something that looks like a dose response, that as the fluoride level in the water goes up, the I.Q. in those groups of children, go down. And it looks here if you take that at face value, that the I.Q. is being lowered somewhere between .75 and 1.5 parts per million. That is extremely relevant to Brampton.

Also we should note that this isn't just concentration, we should be concerned about the dose. Now in these particular villages, these children were not getting fluoridated toothpaste, nor were they bottle fed, so our children in Brampton are getting more fluoride than in this study, which showed that I.Q. was lowered at this dose range.

Now you've heard about the Harvard Meta Analysis and they did acknowledge that there were many problems with the methodologies of these studies, but not all. So, I selected one which was particularly strong. But they also said that they're remarkably consistent. 26 out of the 27 showed a lower I.Q. and the average lowering was seven I.Q. points, which is pretty substantial. Now fluoridation proponents have argued that the concentrations in the high fluoride Villages were not relevant to water fluoridation. You heard the same argument from Dr. Juurlink today.

But they're wrong. If you look at all the studies here, the average, this is 20 that only involve water, not coal, if you take the mean of the ranges there, some have ranges, you take the mean of those and then you take the mean of everything, the mean overall is 3.52. 3.52 is less than the so called safe drinking water in the United States. And in several studies the high fluoride Village is less than 3 parts per million, here's 5, 1.8, 2, 2.9, 2.5, 2.38.

This is again extremely relevant. You can't just compare concentrations. Toxicologists know that the thing that hurts you is dose, not of milligrams per litre but milligrams per day. Milligrams per day depends upon how many litres you drink and how much fluoride you're getting from other sources. Now fluoridation promoters focus on the highest levels where I.Q. is lowered but toxicologists should go to the lowest levels, which causes harm. That's what you have to do.

And here notice you heard that the levels went up to 11, 11.5, but those are only two studies and in each case that's a range. What they don't talk about in that range from 2 to 11, some of those children may be lowered to two parts per million. So, that is deceptive and it's misleading. Um, this is what they should have gone to, the lowest study where it's .57, that's what a

toxicologist would do, go to the lowest level where harm is observed.

The Xiang study suggests that I.Q is lowered between .75 and 1.5 parts per million. That means there's no adequate margin of safety to protect all our children. Can you just hold the clock for a moment. I need some water, can you hold that clock for me? My mouth is very dry, thank you very much. So, there's no adequate margin of safety to protect all our children from lowered I.Q.

Audience: [unintelligible [00:39:32]

Dr. Connett: Yes, okay. Dr. William Hursey, former risk assessment specialist at the [UEPA] who've I known for many, many years, has used standard risk assessment procedures to determine based upon these Chinese studies, it was based on the Xiang study in particular, what the safe level of fluoride would be to protect all our children, not just the average child but all our children from lowered I.Q.

And the level that he comes up with is remarkably low. It's .15 milligrams per day, .15 milligrams. Children are already exceeding that dose just from swallowing toothpaste. So, we have a serious problem on our hands if you use standard risk assessment procedures. So, there's certainly no margin of safety to protect the brains of all children exposed to fluoride of the United States or Canada from a combination of water and other sources.

The very last children who need a loss of I.Q points are children from low income families who are precisely the children targeted in water fluoridation program. These children have so many strikes against them with poor diet, poor housing, exposure to lead in the inner cities and so on. The last thing you need to do to those children is to shave off an I.Q point of two.

But it's not just lowered I.Q that is of concern. A recent Canadian study found that an association between the prevalence of ADHD in the United States with fluoridation. So, the data is the United States but the researchers were Canadian, Malin and Till.

And basically what they did was they looked at the States in terms of the percentage of the state fluoridated, that's the bottom axis, and the prevalence of ADHD in those same states. And they took the data from 2003, 2007, 2011. You see there's a strong relationship between the prevalence of fluoridation in the state and the prevalence of ADHD, which goes up, uh, with successive years. And, um, Landrigan and Grandjean, uh, has already been mentioned, included fluoride as a neuro toxic

environmental neurotoxic. They did actually refer to their own meta analysis in 2012 to best of my remembrance. Grangan said fluoride seems to fit in with lead, mercury and other poisons that cause chemical brain drain. Grandjean is well known for this work on mercury.

And this is an incredible double standard. When you consider the steps that U.S and Canadian author - agencies, have been taken to reduce the exposure of our children to lead and now they're doing similar things with mercury. And the reason they're doing that is because these substances are neuro toxic, there's nothing wrong with that. Of course we want to reduce the exposure of children to neuro toxic. And it's not easy. It's not easy and it's very expensive to remove the lead and mercury from our children's lives. But how extraordinary it is then that these same agencies are standing by where we deliberately add this suspected neuro toxic to the drinking water of our kids every. It's an incredible double standard. And hopefully you guys can put it right, at least in Brampton.

Now I want to explain why a small loss of I.Q at the individual level is very serious at the population level. Now here's - I.Q like any human trait is normally distributed, the bell shape curve, which means that the vast majority of people are clustered around the average of your trait in question, in this case I.Q. So, most people are clustered around an I.Q of 100.

But the interesting part of this curve are the two tails, those shaded areas represent on the one hand the green shaded area is the fraction of children in your population, which is very bright or geniuses. And the mauve area is the fraction of children in your population that is mentally handicapped. Remember those areas 'cause they're important.

Now if we shift the I.Q down by five I.Q points, uh, the average parent or school teacher is not going to notice the difference between two children of a five I.Q point difference, from 100 to 95. Two siblings, two members of your class, you would not be able to detect that.

But look what happens to the two tails, if you shift the population down by five I.Q points, you halve the number of geniuses, the number of very bright people in our communities, your population and you double the number of mentally handicapped. That has incredibly serious economic and social ramifications for a country like Canada and the United States competing in the global market to reduce the number of geniuses in your society and the cost of handling all those mentally handicapped people, very serious.

So, lastly three key questions I'd like to leave for you but indirectly to the promoters of fluoridation. Have the promoters of this practice convinced you that they have strong scientific evidence, not opinion, but primary studies, that allows them and you to confidently ignore all the evidence of neuro toxicity? You heard Dr. Juurlink today make a good effort to discourage you from thinking that lowered I.Q was a serious problem. He did not look at all the evidence of neuro toxicity, nor did he offer anything in the way of primary studies, basically mainly opinion.

And I would add one more thing, the worst evidence we have in science, the worst evidence we have at all, is when governments do not do the studies. And even those I.Q studies have been conducted in the 1990s, they've been in the English literature. There's been no effort in any fluoridated country until about a year ago to check to see if there's any influence on I.Q in these fluoridated countries. That's bad science when you don't even look, concluding that the absence of study is the same as the absence of heart, which of course is nonsense.

Second question is how can any promoter of fluoridation claim that it's safe when in fact there's no adequate margin of safety to protect all our children from lowered I.Q. they have the responsibility to give us the evidence of why we can safely, safely ignore the evidence I've talked to you, the evidence I've shared with you this morning.

And why are proponents prepared to take such serious risks when the evidence of swallowing fluoride lowers tooth decay is very weak, which you'll hear from Dr. Hardy Limeback next or later. And there are alternative approaches to fighting tooth decay, practiced in most countries in the world, including 97% of Europe, which don't force people, force fluoride on people who don't want it, which allows me to end with the most and simplest argument against fluoridation.

No government, local, regional, federal, has the right to force individuals to take medicine without their informed consent. This is been violated every day. If you continue with this, Brampton is doing to every single citizen in Brampton, what no Dr. in Brampton can do to anybody. This is a gross violation of ethical standards. As I said informed consent to medication and it's amazing to me that Dr.s are prepared to stand by and let communities do this.

So, at the end of the day, whether you're convinced, I think the evidence of fluoridation work is extremely weak. I think the evidence is growing yearly that there are serious, serious health risks involved. But certainly there's not enough evidence that it works so well, there's no dangers to allow you to have the

confidence to violate this ethical standard of informed consent to medication.

Chair: Thank you very much Doctor, I appreciate it. Now I'd like to call on Dr. Hardy Limeback.

Audience: [unintelligible [00:48:27]]

Chair: It's a point well taken and I don't even have mine on me today, thank you Councillor. Please proceed, go ahead Doctor.

Dr. Limeback: Thank you very much for inviting me. As some of you know, I see some familiar faces, I've spoken to Peel before. I've been a long time resident of Peel, I grew up here in Clarkson Lorne Park. I chose to raise my family here. I set up my dental office to practice. I first associated it in Brampton back in 1983 and then I opened up my own dental office in Clarkson Lorne Park and practiced there until I retired last year. I'm fully retired and you keep asking me to come out of retirement to do this kind of stuff and I don't like doing it.

But anyway, I'm a professor of emeritus, I've done years of research on dental fluorosis and tooth development and I'm going to show you some interesting information. The scientific method is basically somebody poses a hypothesis and the supports of water fluoridation oppose this hypothesis, they say artificial water fluoridation is safe and effective.

Now the great tragedy of science according to Huxley, is the slang of a beautiful hypothesis by an ugly fact. Albert Einstein also said no amount of experimentation can ever prove me right, a [science study]. A single experiment can prove me wrong. Now that's a scientific method.

So, if you paraphrase these two giants in science, no amount of evidence can ever prove artificial fluoridation to be safe and effective. A single ugly fact can show it is not so. So, I'm going to show you some ugly facts. We've seen this graph, this is clearly a level of evidence where systemic reviews of randomized control studies is the highest level of evidence. Randomized clinical trials are double blinded so that the examiners and the patients don't know what they're getting. And then below that is cohort studies, case control studies, case series, case reports. You're going to hear some case reports and then of course medical opinion or dental opinion is way at the bottom in terms of level of evidence.

Now there's so many confounding factors that have resulted in the decline of dental decay worldwide in Western countries of civilized - industrialized countries. It could have been penicillin, Vitamin D, sweeteners, fluoridated toothpaste, Chlorhexidine,

fissure sealants, Xylitol, it could have been more frequent visits to the dentist, better hygiene, all those things has resulted in a decline of dental decay worldwide.

Now the most recent review, the Cochrane Review, and we hold the Cochrane library as the standard for reviews, the most recent review on water fluoridation was bias, it was funded by the CDC and funded by oral health epidemiologists. There's not a single randomized, double blinded clinical study, not one. They used weaker studies, non randomized. Only three studies were done after the introduction of toothpaste, which is fluoridated. They didn't control for confounding, only three confounders. They especially did not control for delayed tooth eruption. I submitted a critique of this, uh, review on the fact that they left out delayed tooth eruption and they didn't change it. In fact when we criticized them about acknowledging that they had, uh, CDC funding, they took that out.

So, it looks like the actual evidence for water fluoridation is not systematic reviews of RCTs, it's a systematic review of cohort studies. There's much lower level of evidence. The original work that was done by [Dean] in the 40s is still what Health Canada used as a review. And these were cherry picked cities, uh, and is considered the best evidence for an association between fluoride in the drinking water and lower caries. In actual fact the optimum was not one part per million. Back in those days it's closer to .35 if you include all the cities that he left out purposely. And there are other research studies to show that the optimum is closer to .35.

In fact the other study that Health Canada used clearly shows that .35 is probably where it stops providing a benefit and you may only get one tooth saved from fluorodating for a lifetime. And as was mentioned before, there's very little difference between the toxic levels that you're getting at 1.5. The Americans still consider four parts per million, but 1.5 is the rest of the world. And the ranges that used to be in the States and Canada was .7 to 1.2 and then they lowered that, Health Canada suggested .7, bias committee. And Ontario was smart enough to lower it even further .5 to .8 and the natural range goes up to .35. So, there's not much that diff - that natural range is actually at optimum. So, there's not much difference between .6, which you've got in Brampton and the natural level .35, you're not going to get any benefit whatsoever.

In fact a lifetime of fluoridation in this study showed maybe a savings of one tooth from a filling, a lifetime of fluoridation. Some of these studies have never looked at, most of them have never looked at the other agents that might influence caries, calcium, magnesium, all of these elements have been shown to

increase or decrease the risk of caries. But they've never been incorporated into the studies to look at the confounding.

We know that water is different across the country. Here in Southern Ontario the water's actually very hard, it has a lot of calcium magnesium. In B.C it's soft water, very soft water. If you put fluoride in the drinking water in B.C you're going to have a completely different physiological affect, uh, than somebody living in Ontario.

We've seen from Dr. Juurlink how fluoride gets into the body and how it's metabolized, remember that it's taken up by your bone. You're drinking the water right now and taking it up in your bone, but it also goes in your teeth. Throughout a lifetime it accumulates in your teeth. You can't rid of it by breastfeeding, you can't get rid of it by spitting it out, you can't get rid of it by sweating. It goes - half of it stays in your bones and it takes about 20 to 30 years of going on a fluoride free diet to get rid of it. So, it accumulates throughout lifetime. And once it gets in your body it acts like a bomb, it destroys everything.

I got interested in this because I started seeing severe fluorosis, not mild fluorosis, severe fluorosis. That graph that Dr. Juurlink showed was a concocted graph by the fellow that I know on a committee, 'cause I was on that committee just to conveniently get at two parts per million and up. But at one point per million you see lots of severe fluorosis in other countries. In Canada, in my practice I saw a lot of it. So, here you see some pictures, clearly this is a problem for some people who don't want their children to have this problem. Uh, it's treated with, uh, veneers, it's treated with microabrasion bleaching. There's a lot of money spent on this treatment.

So, the soft water versus the hard water issue is really important because it changes the absorption of the fluoride into your system. And so, maybe it might be better to protect your body by drinking more calcium while you're being exposed to fluoride. So, maybe you're having orange juice with calcium added to it, that might be better than orange juice without calcium. You remember that orange juice is made with city tap water.

The Canadian dental association has limits, the toxic level is based on a dose per kilogram and when you use formula, you're starting with a little bit of fluoride and you're adding fluoridated water and you can even buy fluoridated water from Wal-Mart still today called nursery water.

Uh, and what happens with a small baby is you end up with a 400% higher dose than what the baby, uh, is supposed to have. That level of .05 to .07 milligrams per kilogram per day is the upper level that they should be exposed to. That's according to

the Canadian Dental Association. But dentists never look at this. They never work this out for you or for your kids. So, an infant formula fed baby is not protected by the calcium, they have hundred times more intake of fluoride than breast fed babies as we heard from Dr. Connett. And that is what's leading to fluorosis, the exposure you get from birth to age, uh, 1 or 2, that's when you get fluorosis because you're getting way too much fluoride, uh, from infant formula. And this is a systematic review showing, uh, the link between infant formula and dental fluorosis.

In the States they're treating the moderate to severe fluorosis with porcelain veneers, it's a huge expense. And the fluorosis is increasing in the United States. It might be in Canada but they haven't done any studies yet. The actual cost is not one dollar spent saves 38 dollars, that's wrong. If you do the right math, a minimal correction, you have three dollars per person per year. Think about 40 years of fluoridation times three is \$120, that's one filling. So, that's the correct number, you save one filling per person per lifetime of fluoridation. And that cost is eliminated by the cost of treating the dental fluorosis. It's a wash, you don't get any benefit at all.

My research has shown that fluoride affects the teeth, it changes the dentin in your teeth, it makes the dentin more brittle. We may have, we don't have studies to show it yet, but I have the studies to show that the teeth are more brittle and we may have an epidemic of broken teeth in fluoridated cities, we just haven't done the studies yet, just like the bone studies.

Our bone study, which I got a grant to study from the federal government and we got this interesting information, Toronto versus Montreal showing that there's more fluoride in the bone of Toronto residents compared to Montreal, which was never fluoridated. That fluoride by the way is so high that it can actually cause some problems. In our publication we see the strength of the bone is lower in the more fluoridated group but never came out in the abstract for political reasons.

The osteo class is the bone, is the bone cell the removes bone. It's exposed to 25 parts per million and some people that have been exposed to it for a lifetime. This is cau - this causes early bone cell death, it causes the rease - the release of fluoride into the system. The bone is the, um, source of your immune system. So, locally the fluoride escapes and affects the immune cells. And it actually changes the architecture of the bone.

Fluoride was not supposed to affect your bone, fluoride was only supposed to affect your teeth. You're not supposed to swallow it. And there is some concern that it may induce malignant tumours, this is the scientific American study. We mentioned,

Dr. Jurrlink mentioned, the Bassin study, nothing has yet been published that, uh, that goes against this study, this is a pretty good study in terms of evidence for the risk for bone cancer. The EPA said that if you only have one human study you can have 20 other studies that don't find a link. But if there's one human study that shows a link to cancer, then it should be taken out of the water, but they haven't done that yet.

We heard about the [unintelligible [01:02:58] acid. Unfortunately it does cause problems. Here's an animal, animal study showing that it increases lead uptake. So some of the problems we might be seeing is because of the lead uptake using this chemical. And it accumulates in the calcifying plaques in your coronary arteries. We don't know what affect it has. It accumulates in the pineal gland in the brain.

So, in summary it, uh, accumulates over a lifetime in bones, in teeth, uh, causing some strength problems, calcifying [atlasforotic plaque] in the pineal glands. This is a lifetime accumulation. We haven't got studies yet to show how severe of a problem this is. So, artificial water fluoridation toxicity is well, is well supported by science. The toxicity is supported by science. I gave you a number of ugly facts. So, therefore safe and effective hypothesis has to either be altered or completely abandoned. Thank you, look at, I'm right on time.

Chair: Yeah, thank you very much, you are, great job, thank you. I now call on Dr. Howard Pollick to come forward please.

Dr. Pollick: Good morning Mr. Chairman and members of the board. Uh, ladies and gentlemen it's a pleasure to be here, thank you for inviting me. Uh, my name's Howard Pollick, I'm in the School of Dentistry at UCSF in San Francisco. It's a little colder here. So, um, but I used to live in Winnipeg for a year so I know what cold really is.

Uh, we've been asked to answer some questions based on the body of evidence is water fluoridation an effective health strategy? And based on the body of evidence in current oral health behaviours and context is fluoridated water still needed? The answer to that in my opinion is yes. And is human consumption of fluoridated drinking water safe? I say yes again. And does human consumption of fluoridated drinking water result in any adverse health effects? I say no. I could step off the podium now, I've answered your questions. But I'll carry on for the other remainder of my time.

And why do I say this because of effectiveness and cost savings according to recent authoritative evidence based reviews. From Health Canada 2010 published, uh, December 2010. The U.S Community Preventative Services Task Force in 2013, the new

U.S public health service [CDC] new guidelines in 2015 and as mentioned the Cochrane review, uh, also 2015.

So, the Health Canada document, uh, in, uh, 2010 on fluoride is an extensive document. I hope you have access to that. Uh, in that document it states that the maximum acceptable concentration for fluoride in drinking water is 1.5 milligrams per litre. And it states that the optimal concentration of fluoride in drinking water for dental health has been determined to be 0.7 milligrams per litre for the communities who wish to fluoridate. And that this concentration provides optimal dental health benefits and is well below the maximum acceptable concentration to protect against adverse affects.

That document also states that the best available evidence from studies following withdrawal of water fluoridation and indicates that caries prevalence increases, approaching the level of the low fluoride group, furthermore there appears to be some evidence that water fluoridation reduces the inequalities in dental health across social classes in 5 to 12 year olds using the standard measures for measuring caries prevalence, the decayed, missing and filled teeth, primary teeth and permanent teeth.

The Canadian children, age 6 to 12, that document talks about dental fluorosis and states that recommendations in the 1990s have resulted in reduced fluoride intake for infants and young children to the extent that fluorosis prevalence is markedly reduced. That the prevalence of Canadian children with moderate dental fluorosis is too low to be reported, that 60% of the children have teeth that are normal in appearance with no fluorosis, 24% have questionable fluorosis possibly as the result of the use of medication, fevers or fluoride exposure during younger years, which have caused slight aberrations on the enamel. 12% have very mild dental fluorosis and 4% have mild dental fluorosis from the survey of 2010.

These are photographs of enamel fluorosis, uh, on the top left are normal looking teeth, the middle top is, uh, questionable dental fluorosis, uh, the top right is very mild dental fluorosis, the lower left is mild dental fluorosis and then there are photographs of what tooth decay looks like when it's not treated. Um, and on the lower right can extend through the enamel, through the dentine, through the pulp of the tooth, through the bone to cause that swelling under the lip, uh, it would cause a bacteraemia. It could be very, very serious and individuals have died as a result of the infection that we call dental caries, uh, tooth decay, what you might call cavities.

Most people don't allow that to happen, they go to the dentist, get these things fixed. But obviously these photographs show that these individuals didn't go in a timely manner to get their

teeth fixed and many children and adults don't go in a timely manner unfortunately. There are no negative health consequences associated with mild fluorosis according to this Health Canada document. There is less tooth decay experienced with mild fluorosis and the literature would also demonstrate that there is no real cosmetic problem arising from the mild forms of dental fluorosis according to Health Canada 2010.

With regard to safety, the weight of evidence from all currently available studies does not support a link between an exposure to fluoride in drinking water at 1.5 and any adverse health effects including those related to cancer, immunotoxicity, reproductive or developmental toxicity, genotoxicity and/or neuro toxicity. And that the weight of evidence also does not support the link between fluoride exposure and IQ deficit as there are significant concerns regarding the relevant studies due to weakness in quality, credibility and methodology.

The U.S Public Health Community Preventative Services Task force was established 20 years ago and is independent, unfederal, unpaid panel of experts in various areas of public health, research, practice etc. And they identify population health interventions that are scientifically proven to save lives, increase lifespan, improve quality of life, they produce recommendations to help inform the decision making at various levels of government and research organizations.

In 2013 they reaffirmed and updated their 2000 recommendations for water fluoridation citing strong evidence of effectiveness and reducing tooth decay across populations. Based on 28 studies about the effects of community water fluoridation on caries, 16 about oral health disparities, 117 about dental fluorosis, most of these studies were included in the existing systematic review in England in 2000. And that search period was up to 1999. And the more recent review included, uh, search up to 2012, additional studies on caries of disparities and fluorosis.

Again, they found strong evidence that community water fluoridation was effective. There were 11 studies that found a median benefit in terms of the, uh, an increase in individuals who were caries free, didn't have any tooth decay at all and one study 25%. And that there was a decrease in overall severity of tooth decay, the number of teeth affected by tooth decay, a median of more than two teeth. Task force recommended fluoridation to prevent or control caries in communities.

Um, more recently the Community Preventative Services Taskforce has come up with a economic evaluation of community water fluoridation. This was available in January 6th online of this year. And the search period was from 95 to 2013.

I've added this slide to what you might have in your documents because I've updated this information based upon this current information. Uh, this is based on 10 studies. Per person annual cost for communities with more than 10,000 people was less than a dollar per year per person. The benefit cost ratios ranged up to 135 to one for large communities in particular the Colorado study.

In 2015 the National Health Conference in the United States, they finally came out with the recommendations for going to .7 as it had been in Canada for some time. They started this review in 2010, they made a recommendation provisionally in 2011 and, uh, the intent was to balance the health effects or preventing tooth decay across the lifespan while reducing fluoride exposure in children and noted that within six months of their provisional recommendation, uh, two thirds of the water districts had changed to .7.

Their recommendations, their paper that's published talks about the rationale, the importance, uh, the trends and availability in fluoride sources, dental fluorosis, relationship between caries and fluorosis at varying water fluoridation concentrations. Um, and the change, uh, that standard, uh, consumption of water now across all temperature ranges in the United States. And the various processes that they went through and they deliberated with the comments for four years before finalizing their recommendation, which didn't change.

[They dealt with] comments that supported the recommendation, opposed the recommendation with either being too high or too low, comments on dental fluorosis, bone fractures, skeletal fluorosis, carcinogenicity, I.Q and other neurological deficits, effects I should say, endocrine disruption, effectiveness in caries prevention, cost effectiveness safety, ethics of the water fluoridation and how they're going to monitor implementation of the new recommendations and summary and conclusions. And the full federal panel considered the comments and the responses in the context of the best available science. They did not alter its recommendation that the optimal fluoride concentration of drinking water for the prevention of dental caries in the United States be reduced to .7 than a previous range.

Then the Cochrane review came out in June. Um, and their task was to evaluate the effect of water fluoridation on the prevention of caries. Considering levels that were .4 or lower to be non-fluoridated, they reviewed 20 studies, 70% were conducted prior to 1975, that's the time that they felt fluoride toothpaste, uh, became very, uh, prominent. Um, this was compared to 28 studies from the Community Preventative Services Taskforce. So, they had stricter criteria on which, uh, studies they would review.

Uh, they did not review outcomes other than caries and dental fluorosis. They only reviewed prospective studies that had a concurrent control, not a historical control, comparing at least two populations, one receiving fluoridated water, the other non fluoridated groups comparable in terms of fluoridated water baseline. And they stated that due to the nature of the research question, randomized control trials are unfeasible.

Their findings were that there was 35% reduction in the severity of tooth decay in primary teeth and 26% reduction in permanent teeth and 15% increase in children with no decay. They stated that the applicability of the results of their current lifestyles is unclear because the majority of the studies were conducted before fluoride toothpaste and other preventative measures that are widely used.

CDC commented on the Cochrane review in July, stating one key difference between this public health service review and the Cochrane review is that the Cochrane used more restrictive criteria for including studies in their analysis and although valid peer review studies document the effectiveness of community water fluoridation in children and adults even after the use of fluoride toothpaste. These studies were not considered by Cochrane. With regard to children, estimates of fewer children affected by cavities in fluoridated communities and a higher percentage of caries free children are similar to findings in other evidence based reviews.

With regard to adults, research published in peer reviewed literature published in Australia and United States found differences in caries experience in teeth or tooth to surfaces with caries between adults who have access to community water fluoridation and those who do not. And lower levels in adults who are exposed to fluoridation even after other sources of fluoride such as toothpaste, fluoride toothpaste, became widely available. Cochrane only included studies where the outcomes were evaluated in two points in time. Clearly such an evaluation over a long could be difficult with adults. No studies met Cochrane's criteria regarding the effectiveness of water fluoridation in adults.

Data from national surveys in the U.S show that the prevalence of tooth decay for groups of adolescents defined by poverty status or race or ethnicity has continued to decline over time. And the biggest advantage of community water fluoridation is it is the best method of delivering fluoride to all members of the community regardless of age, education, income level or access to routine dental care. Both the Cochrane review and the latest review conducted by the taskforce identify the need for more research to address the effectiveness of fluoridation.

CDC monitors benefits and risks of fluoridation through the United States National Health and Nutrition Examination Survey and since 2013 have been collecting data on fluoride content of home water samples for children and exposure to other sources of fluoride toothpaste etc. Dentists assessed measures of caries, fluorosis and dental sealants and researchers will continue to examine data for tooth decay as well as dental fluorosis at a national level and for social economic and racial groups.

You've heard about the NRC report of 2006, which focused on naturally occurring fluoride levels of two to four milligrams per litre, notably higher than community water fluoridation and found only increase of severe dental fluorosis, noted a prevalence of that fluorosis was near zero, where there's less than two milligrams per litre and concluded that lifetime exposure to drinking water of four milligrams is likely to increase bone fractures as compared to exposures at one milligram per litre.

So, in summary all these recent reviews agreed that community water fluoridation is demonstrated to reduce the burden of tooth decay, that the surveillance of dental caries, dental fluorosis and fluoride intake will monitor the changes that might occur following the implementation of the recommendation of .7. I will just leave you with this slide, thank you very much.

Chair: Thank you Doctor, thank you for keeping within the timeframe as well. I'm going to suggest before we go to our next speaker and then call on Dr. de Villa that we take a five to 10 minute health break.

I'll call on Dr. Myron Allukian to come to the podium please, welcome sir.

Dr. Allukian: Mr Chair, members of the Peel Council, ladies and gentlemen, good morning. Just so you know I have a little bit of a sore throat so I'm hoping I can get through these 15 minutes. My name is Myron Allukian and I am a dentist board certified in dental public health. I was the dental director for the city of Boston for some 34 years, a public servant serving a community of 600,000 people who during the day went to up to 1.2 million people as people moved into the city for their work and for going to schools.

I am not a pro fluoradationist, I just want to make that clear right from the beginning but I am a public health professional. And as a public health professional, as a public servant, from my patient of 600,000 people in Boston, I did whatever I could to improve their oral health and their public health. [REDACTED]



As city dental director, well before I became city dental director, I was with the Third Marine Division in Vietnam; I was at the Marine field hospital. We had mass casualties in the middle of the night, we treated dental patients in the morning and in the afternoon we were free because of the heat.

So, I started volunteering in the orphanages, the schools and the refugee camps. And I saw hundreds and hundreds of kids in pain and infection. We made a difference in their lives. And I said that's what I want to do as a dentist, is to prevent pain and suffering in kids and for people who suffer unnecessarily.

When I became the dental director for the city of Boston, I was shocked at how great the dental needs were in Boston and Massachusetts. We had six times more tooth decay in Massachusetts than in Vietnam in teenagers, unbelievable. When I did a screen of [head start] children age 4, they had four teeth affected by tooth decay. I would screen kids who had an abscess and the puss is coming out in their mouth during the screening. I would look in the mouths of 14 and 15 year olds and in the back of the teeth, just a few white spots of broken teeth. It was shocking.

I developed a dental care delivery system of over 100,000 patient visits. I developed the first homeless dental program in the country. I developed a program for the development of disabled children in our schools and I was on the forefront of accessing dental care for people with AIDS and HIV. I also set up the first tobacco program, uh, in the city of Boston and it ended up with restaurants and bars not being, people not being able to smoke in public buildings.

So, my whole career has been focused on improving and impacting the health and oral health of a community. Because there was so much disease, oral disease, affecting almost everyone, I said we have to prevent the disease any way we can. And the way we found to prevent the disease [or to stop the community water fluoridation.]

It took eight years because we were part of a regional water supply and we had to convince 32 other cities in towns that fluoridation was in their best interest. During those eight years we had 70 bills on the legislature saying it caused cancer, it was

toxic, it was mass medication, it was a communist plot, I've heard all of those stories. All of those bills were defeated.

And in 1978 we became fluoridated. As a result of that we've seen an enormous change in the oral health of people in our city. Now I have seen it quoted that Boston was a failure, not with the kids that we looked at, not with the adults we say. As a matter of fact the day we were going to implement fluoridation we were not able to do it because something happened in terms of the administration so we had to delay it. The next day we got lots of complaints from people, I'm breaking out in hives, you know, my skin is turning blue etc etc., it must be due to the fluoridation. The fact was we hadn't begun fluoridation yet. So, people were embarrassed that we had all these problems but we had not yet fluoridated. As you know when you deal with the public, when you're dealing with hundreds of thousands of people, different people have different perspectives on life.

Uh, as a result of the work I did in oral health, I was asked to chair the U.S Surgeon General's Report, uh work group on fluoridation and oral health for the 1990 objectives for the nation. Uh, I've been on the advisory committee for Healthy People 2010 to 2020, which are the national prevention objectives for the United States.

And I'm also a past president of the American Public Health Association, second dentist in 118 years. It represents 77 different health disciplines. Uh, in APHA, which is the oldest and largest public health association, uh, in the world just so you know has had some 19 resolutions, uh, supporting fluoridation. And our membership is made up of environmentalist, nutritionists, public health nurses, physicians and infectious disease experts etc. etc., the best minds in our country through our governing council.

But what is the problem? We have a disease that affects almost everyone. That's the nature of tooth decay. I call it a neglected epidemic. It's neglected because society has not addressed it. Some societies have, some countries have, many countries haven't. If you have an infection in the arm in the United States you can be covered by Medicare or you have health insurance. You have an infection in the mouth, not everyone has dental insurance. And it's the same in Canada, your health insurance [probably] provides you, an infection in the arm you can get treatment, infection in the mouth, tooth decay, it's not covered. And what you pay for dentistry in this country is 50% more than what we pay in our country, 6% of the total health expenditures goes to dental care.

So, you need to do more and more prevention and the best preventive measure we have is community water fluoridation,

everyone benefits. There are more people with no disease at all, those people who have the disease have less of it and if you have the disease, the lesions are much smaller. Now when you read the statistics they say oh 30%, 20 - it doesn't give you those other ways of looking at it. But when I look in kid's mouths in Boston today, I don't see bombed out back teeth where there's nothing left. They have cavities but not to the extent they have. And we've cut the amount of tooth decay in Boston at least 50%, everyone benefits.

What is fluoride? It's a naturally occurring compound, 13th most abundant in the earth's crust. Every water supply has it, whether it's fluoridated or not there's fluoride in the water. You cannot - you can use every medical experiment you can every form of chemistry, you never eliminate a trace amount of fluoride, it's always there. It's in some foods. And there's no difference between a fluoride ion that's put there by humans or a fluoride ion by nature. A fluoride ion is a fluoride ion is a fluoride ion. Solid gold is solid gold, whether it's dug out of the earth or it's made by humans. And a fluoride ion is a fluoride ion.

How did we learn about fluoridation? Well for generations in the United States we had about 10 million people living in communities that were naturally fluoridated at different levels, 10 million people for generations, as high as eight parts per million of fluoride. And looking at the different levels in the different communities, we found that between seven tenths and 1.2 parts per million, you got the maximum benefit with less tooth decay and the least amount of fluorosis. And as long as I'm mentioning fluorosis, fluorosis occurs in non fluoridated communities and fluoridated communities, just so you know that. So, when you hear fluorosis you don't go uh oh, fluorosis, it occurs in non fluoridated communities and I'll explain why a little bit later.

The ocean is 1 to 1.2 to 1.4 parts per million of fluoride. Do we see fluorosis of shark's teeth? I haven't seen it yet. But they're very sharp. Do we see cancer or lower I.Q among fish? I haven't seen it yet, someone's going to do the study. But naturally fluoride is in seawater and all the fish in the sea are exposed to it on a regular basis.

Uh, what is fluorosis? Fluorosis is a slight specking or what you could call freckling of the teeth that to the average person is not noticed. To the average person with very mild fluorosis, a questionable fluorosis is not noticed. I've done studies in fluoridated and non fluoridated communities, I'll see a little fluorosis, I'll mention to the kid have you ever noticed that? No, I haven't noticed it.

Now studies have shown, again in non fluoridated and fluoridated communities, the major reason for fluorosis is too much fluoride toothpaste or inappropriate use of fluoride supplements, fluoride prescriptions and supplements. And I will provide to the council two papers, uh, one by [tent pendrous] that has done studies that shows fluorosis is caused mostly by toothpaste, fluoride supplements and a letter by Dr. Steven Levy. Dr. Levy is doing the most comprehensive study, uh, some 1,000 kids for 19 years who also says the same thing.

The, uh, I want to talk a little bit about the Harvard study, there is no such thing a Harvard study. There's studies done by people affiliated with Harvard. I've been on the Harvard faculty, uh, for almost 50 years, the dental school and medical school. I used to be on the faculty of the school of public health. [Bassin] a graduate, one of our graduates was in my department of the study. She said there were many confounding variables and said there may be osteosarcoma. That study has been reputed by a much larger study that shows [unintelligible [01:43:16]

The Harvard I.Q study, which people say, uh, that was done on 27 cross sectional studies, the rat studies that 230 times that have shown there's no relationship. The control group was .07 parts per million to the high fluoride. So, instead of saying your I.Q is down, they should be saying your I.Q is better at the recommended level. But they didn't do that. And I will give you a paper I wrote that said that. And just so you know, Hong Kong, which has been fluoridated since 1961, has the highest I.Q in the world, uh, just so you'll know that. In the United States the I.Q has been going up on a regular basis for the last 30 years.

Uh, I only have three minutes left so I'm going to go quickly through my slides. You are responsible for the health of the community. Do what's in the best interest of your community. This is what we'd like to see in every child, we don't necessary see that. This is a 5 year old child before fluoridation in Boston. This is what we'd like to see in every adult. A 19 year old female with fluoridation this would not happen. Last tooth in his mouth, I call it Custer's last stand, fluoridation, nature's way to prevent tooth decay.

13th most abundant element in the earth's crust, everyone gets on a regular basis. On a non fluoridated community, fluoride is part of bone, it accumulates in bone, it accumulates in teeth. That's normal. So, when someone intimates it's a problem, it's a normal part of life, it's a normal part of the human body. Odourless, colourless and tasteless, it prevents the disease by 25, 35%, less pain, stronger teeth, lower bills. Recent studies have shown there's fewer hospitalizations, adults hold their teeth

longer and they have less tooth decay, cost savings for Medicaid, 23 to 26 dollars per person per year, a great savings.

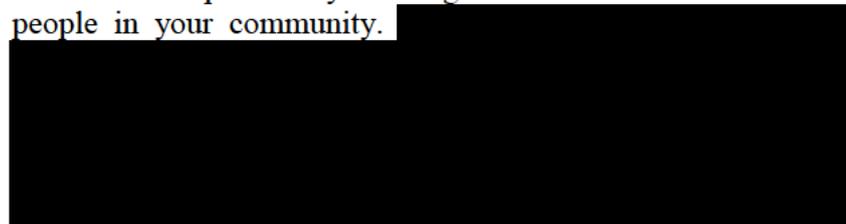
Systematic review of cross savings recently done by the US Community Preventative Services Taskforce, which was authorized by the U.S congress, which is made up of Democrats and Republicans shows what the cross savings are, enormous savings.

Uh, worldwide there are about 470, 480 million people on fluoridation, we began fluoridation in the United States in 1945 with clinical trials. As a result of those trials we saw the benefits; we had medical evaluations done on these kids in the Newburgh-Kingston Study. We've had over 4,000 studies done on fluoridation and fluorides. Today we have over 210 million people, almost 75% of the U.S population in the public water supply getting these benefits.

Why do people challenge fluoridation? If you go on the internet you get very confused and the internet has confused lots of people. In Massachusetts, we had 50 communities challenging it in the last two years. I heard all the arguments. Every community supported fluoridation once they heard the facts. We get the three deans from Harvard to write a letter saying it's safe and effective based on the facts and the evidence.

The State Supreme Court in the United States, at least 20 have looked at fluoridation, 20 State Supreme Courts have said it's not mass medication, it doesn't cause cancer etc. etc. A U.S Supreme Court almost a dozen times has denied reviewing fluoridation as a constitutional issue. We've had a number of countries do reviews with the best experts, it's safe and effective, national organizations, nothing is so contagious as example.

You have a responsibility of doing what's best for the 1.4 million people in your community. 

  
And I hope you do what's right in the public interest and what's right in the public good for your community, thank you.

Chair: Thank you Doctor. I now call on Dr. De Villa to come forward, welcome.

Dr. De Villa: Thank you, so, good morning members of regional council. It's been quite a morning I would say and you've heard from a number of presenters so far on the subject of community water fluoridation. Some of you may have heard things that support

your perspective and others of you may have more questions than you did at the Start of this morning.

But I can tell you that Peel Public Health has rigorously reviewed the research evidence on the topic of community water fluoridation. Our process is independent; we are not beholden to any other organization or other level of government. My only obligation, by law in fact, as medical officer of health, is to protect the health and wellbeing of the 1.4 million residents of the region of Peel.

To this end we use the best available evidence to guide our decisions and recommendations even if this means changing our current practice. I want to assure you that we at Peel Public Health always remain open to changing course should the best available evidence on the subject point us in a different direction from our current practice.

Some of you who are new to council may not know that Peel Public Health uses an internationally recognized process to review all available evidence on a topic. And it's through this process that we're able to meet our mandate to provide to you, our board of health, the information you need to make confident decisions. The process that we use looks at the entire body of research evidence. Nothing mentioned by any of our guests is new to us. We do not leave anything out.

This process that we use is the very same process that council has trusted Peel Public Health to use in all of our work, whether we're talking about responses to measles outbreaks or preparation to Ebola or issues regarding immunization and the countless other Public Health situations that you have successfully navigated with us.

This process determines a few things. One of which is the quality of each piece of evidence that factors our decisions when it comes to reviewing scientific research. This means that greater weight is given to studies and reviews that are of higher scientific quality.

We also need to ensure however that our research is applicable to our local context. Our in depth understanding of the oral health of Peel's residents and the impact that external factors like income and education have on health status help us ensure that research that we use to make decisions and recommendations is relevant.

So based on the results of this process I want to share with all of you the five key reasons why we currently fluoridate water in Peel. So first, it is an inclusive solution that supports the majority of our residents, but especially those who are new to

Canada and have come from places where access to oral health prevention and treatment services is limited. We know that oral health is not only the result of brushing and flossing. Factors like income and country of origin play a role as well, and based on the discussions that we have had in council, I know that you, as councillors want to do more to support our vulnerable populations.

Many of our residents do not have access to dentists. It is just too expensive when you're focussed on paying bills or making the rent. According to the Ontario Dental Association Fee Guide a single cavity can cost up to \$314 to fix. Almost one in five Canadians report that in the past 12 months they didn't go to the dentist because of cost and in Peel, one in two, that's 50% of our residents in the low to middle income group and those new to the country have not visited a dentist in the past year. With water fluoridation you need only drink your tap water to get some of the protective benefits for your teeth.

The second reason for which water fluoridation is provided to Peel residents is that it has been proven to be an effective solution. As you've heard, there is more than 70 years of research and observation on this topic. Based on this research we know that children living in fluoridated communities, compared to those from low or non-fluoridated communities have up to 35% less cavities in baby teeth, 26% less cavities in permanent teeth and 15% more cavity-free teeth. I want to point out that these numbers do not come from any single study or any group of studies that's selected because they point to a preferred conclusion. They are the result of the combined body of the best research evidence that's available.

Third, community water fluoridation is a less costly solution than the currently available alternatives. Under the Ontario Public Health Standards we are required to provide access to fluoride for our population, and based on the evidence and cost, providing that access through community water fluoridation is the most effective and efficient method. The current cost of water fluoridation in Peel is about \$450,000 a year or 32 cents a person to provide the protective benefits of fluoridation. In contrast we would be looking at about \$9 million a year if we were to provide topical fluoride only to at risk children between 5 and 17 years of age. If we were to provide topical fluoride to our entire community it would cost us about \$110 million a year.

That's more than the entire budget for public health in any given year, at this point. Fourth, water fluoridation is an ethical solution. Some people struggle with the idea or the thought that fluoride is some sort of mass medication that goes against the principle of individual consent, but water fluoridation is not mass medication. It is an ethical approach to ensuring that

everybody receives the benefits of fluoride. As you know Canada, like many other countries around the world, as a history of fortifying food and water products when the added ingredient has the potential to do immense good for the population. As an example, Vitamin D was added to milk to eliminate rickets and continues to be added to milk to promote strong bones for all.

Iodine is added to salt to effectively tackle thyroid issues, and in a similar vein, we require children attending schools to be vaccinated against measles, for example, because such action has been shown to be in the best interests of the population. Water fluoridation is no different. Fifth, water fluoridation is a safe solution. You've heard a number of arguments about the presumed dangers of fluoridation. However, none of the arguments against the safety of water fluoridation stand up when put under careful examination. Some argue that fluoride is toxic. Today you've heard from an expert toxicologist on the subject and he has provided you with his assurance.

As your medical advisor, I can assure you that fluoride is not toxic when used as it is in Peel. These levels have been proven to be safe, including when additional sources of fluoride are factored in. Some raise an even scarier sounding objection to water fluoridation. They contend that it may cause cancer and neurotoxicity or reductions in IQ. These terms are scary but I can tell you that, based on Peel Public Health's independent review of the existing research on this subject, that fluoride, at the levels that we use, does not cause cancer and it does not cause neurotoxicity and it does not reduce IQ. The quality research evidence is clear on this point. You've heard a lot today about dental fluorosis. In Canada the prevalence of moderate and severe fluorosis is low, too low in fact to allow reporting in the Canadian Health Measure Survey.

Research shows that the majority of dental fluorosis has no effect on tooth function and some of what gets labelled as fluorosis in children's teeth may actually be the result of other causes, such as exposure to antibiotics or other medications during tooth formation. There exist many myths about fluoride. They are simply not true and I would encourage members of council to consider the best research evidence available on the subject. To recap, Peel has chosen community water fluoridation because it is an inclusive solution. It is an effective solution, a financially sound solution, an ethical solution and a safe solution for our residents and their health.

The staff of Peel Public Health and I are committed to continually monitoring both the health status of our population and the most up to date research on the topic to ensure that we can continue to provide you with the best advice in support of your decision-making on behalf of the residents we serve. In

fact, we are currently in touch with researchers at the University of Calgary who are about to publish the first part of their study which looks at the oral health impact of the City of Calgary's decision to stop community water fluoridation in 2011. This study is of particular relevance to us as Calgary is similar to Peel in many ways.

The specific details of the Calgary research cannot be released at this time as the study is in the process of being peer reviewed for publication in a reputable journal. We will be able to share the full findings of the study once it is published. However, the lead researcher did receive permission from the journal to share the following statement, and I quote, a study looked at the effects of stopping community water fluoridation in Calgary. Conclusions of that study point to a negative effect on dental health in children, end quote. Thank you again members of Region Council for your attention and I'll turn it back over to the chair.

Chair: Thank you very much and, uh, I think what we'll do is we'll break, uh, for lunch because it was scheduled for, uh, 11:30 and we'll reconvene at noon, is that fair for the members?

Male Voice 1: Yeah.

Chair: So we'll move ... a motion moved by Councillor Starr, seconded by Councillor Carlson, that we move out of camera, all in favour, opposed, if any.

A motion to move out of camera, all in favour. Okay and then, uh ... now we, I'd like to ... a motion from, uh, Councillor ... oh, Councillor Parrish and seconded by, uh, Councillor Sprovieri, receipt-receipt of all the delegations, all in favour, opposed if any, carried, thank you, recess until noon. [Break for lunch]

I'll do a roll call. Uh, present, uh, all Councillors present excepting, at this point in time, Mayor Crombie, C-Councillor Downey, Councillor Iannicca, Mayor Jeffrey, Councillor Kovac, Councillor Medeiros, Councillor Moore, Mayor Thompson, Councillor Tovey, and just-just for information, um, this is for questions only.

We're asked not to get into debate with or ... either, uh, members of council or with the presenters themselves, and to get in the queue, you just press your button, here, to put the mic on and that'll-that'll get you into the queue. If someone's speaking you can still press the button and that'll put you, um, next or whatever, in-in the queue anyways.

Ava Macintyre, Acting Regional Clerk: Yeah and questions of clarification and for their information

Chair: Yeah, so it's basically questions for clarification and for information only. I have a motion moved by Councillor Carlson, seconded by Councillor Innis, uh, in accordance to Section 20 ... or 239 3.1 of the Municipal Act 2001 as a minute. A motion was placed and was carried and moved into closed session for the purpose of educating members of council. All in favour, opposed if any, carried. Thank you, so we're in camera, uh, Councillor Groves.

Councillor Groves: Thank you Mr. Chair, um, this is to Dr. De Villa, um, can you tell us, or tell me, how much fluoride is in our water?

Dr. De Villa: So ... can you hear me? Is this on? Through the chair, our water, uh, is meant to be fluoridated at a level of about .7 parts per million.

Councillor Groves: Okay. Okay, thank you and on ... in your presentation I just wanted to find out how you broke out for Caledon, uh, because I know that in Councillor Downey's ward, part of it is, um, fluoridated water and the other part is not. Um, I just wanted to know how that was broken out.

Dr. De Villa: How which was broken out?

Councillor Groves: Ward 2 in Caledon.

Dr. De Villa: In what specific way are you looking at it being broken up?

Councillor Groves: So your presentation, um, where you have the list on-on all the municipalities and you've got different wards, how many kids were screened, um, and I just wanted to know how Councillor Downey's ward was broken up, because I think part of her ward is on fluoridated water and the other part isn't.

Dr. De Villa: So I'm sorry you're going to have to help me, uh, identify which portion you're looking at.

Councillor Groves: RC26.

Dr. De Villa: RC26.

Councillor Groves: Oh, well they're all RC26, so it's page one, two, three, four. Page four of your presentation.

Dr. De Villa: No, so these are, these are screening results for the whole ward. It's not broken out into sections. So you can see what you have are the total number of children screened.

Councillor Groves: No, I know that, but I just wanted to find out because, Councillor Downey's ward is split between areas that are fluoridated and areas that are not.

Dr. De Villa: Yeah, right. So right, that's actually not my area of expertise.

Councillor Groves: Okay.

Dr. De Villa: However, I understand that Mayfield West is fluoridated.

Councillor Groves: Yep.

Dr. De Villa: So is that what your question is getting at? I'm sorry –

Councillor Groves: Yes.

Dr. De Villa: – I thought you were asking me something about the numbers and which ones of those would have received the fluoridated water –

Councillor Groves: I, sort of, wanted to know maybe if you had a percentage or something that showed how many were from the areas that were fluoridated and not, but I can get that after. I –

Male Voice 2: It's not broken up.

Dr. De Villa: It's not.

Councillor Groves: Okay.

Dr. De Villa: Yeah.

Councillor Groves: Thank you.

Chair: Councillor Miles.

Councillor Miles: Thank you Mr. Chairman. I just, um ... and, uh, thank you gentlemen for your presentations. Where I'm struggling with the information that was provided to us this morning is the comments, um, in regards to the validity of studies where some doctors have told us that the studies are not scientific enough in nature. Other doctors say the studies are skewed by panellists and lack of information and other doctors have said there's numerous scientific studies to support the evidence. So if I could, I'm going to start with, um, Dr. Limeback. In your ... I'm just ... I'm looking at your presentation to us and in-in your comments, in many cases, you really referred to the fact that the studies that, um, are being used to determine the health benefits of fluoridation are biased.

Um, they're not randomised. They're weak, um, you know ex ... etc., etc., so, um, I mean, we're trying to make decisions based

on the information and we really do seem to have a conflicting, um, opinion from the, from you, you, all of you, in regards to the validity of the studies that are being used in order to determine whether fluoridisation is a good thing or a bad thing. So can you comment on that please, based on your presentation?

Dr. Limeback: Sure. Is this on? Yes, the, um, Cochrane Review is considered one of the best standards of reviewing the literature and the Oral-Oral Health investigators were, um, basically, hired by the CDC, which is promoting water fluoridation, to review the water fluoridation literature, and what they did was they looked for randomised clinical trials. Remember, those are the trials that determine the effectiveness of a drug. Most drug companies would never get their product to market unless they could provide randomised clinical trials, they're double-minded. That's what Health Canada requires us, what the FDA requires. Um, there isn't a single randomised clinical trial for water fluoridation, not a single one, and it can be done.

I've pr-provided feasibility studies on how to do that, but because there's not a single randomised clinical trial they went to a lower level of evidence and just collected all of the studies and said these are the studies we're going to go with and we're going to say that there's a 35% reduction of dental decay. Well, they can't say that without looking at randomised clinical trials.

Councillor Miles: Okay, thank you. If I c-could, Mr. Chairman, now, could I, um, ask Dr. Pollick, who did ... in your presentation you cited many, many different studies that have been done that actually support fluoridisation. So, um, are these ... do-do you find that these ... that-that these reports have been biased, not scientific in nature, etc., and that the findings are questionable?

Dr. Pollick: Thank you for the question. Um, so I presented, uh, the information as reported, uh, by groups, uh, such as Health Canada, uh, US Public Health Service, CDC, Cochrane Review, uh, Community Preventive Services Task Force and they, themselves, had criteria for judging whether the studies were acceptable and those reviewers, uh, of those, uh, different, um, uh, papers had criteria that were met or not met. I mentioned the fact that Cochrane Review had stricter criteria than some of the ... one of the other reviews but they still came up with the conclusion that there was, uh, the benefit of community water fluoridation. So in my opinion, they are sufficiently sound studies. If they had felt that there were no sound studies they would have stated that.

Councillor Miles: Okay, thank you and if I could just, to Dr. Juurlink ... did I pronounce that right?

Dr. Juurlink: No, it's Juurlink.

Councillor Miles: Okay, Juurlink. So-so Dr. Juurlink, you're here, um, on saying that you are not for ... against fluoridisation that you were simply looking at the broader picture, methodology, scientific evidence, etc. So you've listened, and I-I don't ... I don't have no expectation that you're gonna debate, um, what the other Doctors have said but, for me, I'm trying to figure out whether or not the scientific data that we have and all of the long lists of studies that are actually, um, around the world, um, for the majority, in support of fluoridisation, um, as a public health tool. So can you comment just on how-how we can trust the findings?

Dr. Juurlink: Well, um –

Councillor Miles: I don't know if that's a fair question.

Dr. Juurlink: Yeah, it is a challenging ... it is a challenging question on a couple of levels. First of all, uh, I think I was brought here to comment on the toxicity angle, not so much the effectiveness angle, and I can't say to you that I've done anything more than look at the Cochrane Review, of late, with regard to effectiveness. Um, so I'm ... um, I think what I would say is that, as regards the level of evidence regarding the toxicity of municipal water fluoridation, uh, it is difficult to overstate just how weak these studies are, and I say that as somebody who does these sorts of studies all the time and I review them for other journals all the time.

Um, if your decision hinges on the tox ... if your decision what to do in Brampton hinges on the toxicity issue, I think it's a mistake to listen to people who are, um, not objective in their assessment of these studies. I-I said, at the outset of my talk, uh, that I don't really have an agenda or, sort of, a ... you know, I-I-I guess I, upon reflection, will admit the leaning in of ... direction of fluoridation because it's ... I'm, you know, having grown up as a classical physician and been taught that this is something that works, I accept it, uh, but really, on balance of the ... sort of, the benefits of the intervention and the toxicities of the intervention the toxicities are grossly exaggerated. That's my 30-30,000 foot view of the literature and, I guess.

As I said, I can't say that I've dissected every study that's out there but, I mean, it's really ... just-just because there are studies doesn't mean they're good and it's by definition. You know, we look at the levels of evidence in randomised trials. I-I agree, in theory, you could do a randomised trial to test this. It would take a lot of money and a lot of time. Um, I do tend to ramble at times and I'm not sure if I've answered your question squarely or not.

Councillor Miles: You-you-you ... yes, you are answering my question. So-So basically what you've said is the studies that have dealt with

toxin-toxicity, impact on IQ, impact on-on the body, have been grossly exaggerated.

Dr. Juurlink: That's my view, yes.

Councillor Miles: That's your view. Okay, I appreciate it, thank you.

Chair: Uh, thank you. Councillor Sprovieri.

Councillor Sprovieri: Uh, thank you Mr. Chairman and, uh, thank you gentlemen for the presentations. I have a question for ... one question for everyone. I'll start off with, uh, Dr. Juurlink. As you know, uh, we're just lay people. We're not doctors, we're not scientists. We're not any kind of professional in the field of medicine or dentistry or chemistry or anything like that. So we were given the task to decide whether we'd put this material into the water or not, and not being knowledgeable. Uh, we have to rely on people like you, but n-now we're getting a very mixed message here from, as you heard yourself, from professionals, very qualified professionals, every one of you, uh, Dr. Connett, Dr. Limeback, yourself and the other two presenters, from experience. So we-we really have a hard task to try to decide who to, who to listen to.

So I have a question for you, uh, the ... I've done a lot, a lot of reading research on this topic for the last six years and the thing that really influences me is, uh, what-what I read and, uh, what I learn and I read just exactly what-what I'm hearing here today, a very mixed message. So the question I have for you is, uh, first of all, that, uh, the, um, uh, Region Peel is provided with a material data safety sheet from Brenntag Canada Inc., who is a supplier of the HFSA, uh, uh, chemical to the, to the Peel region this, uh, they get their data from the National Sanitation Foundation, who's responsible to, uh, to test the H-HFSA for toxins, the level of toxins, like lead and arsenic and mercury and so on, and in their, uh, int ... their material, I think it's very highly credible, it-it states that, uh, first of all, H-HFSA is a toxic, uh, and dangerous chemical. That's what they say right there in the front page.

Dr. Juurlink: That would be true if you consumed it at 23%.

Councillor Sprovieri: Right, okay. Uh, they also said that chronic exposure and I would imagine chronic exposure means doing it every day, like most of us do. Would you agree with that?

Dr. Juurlink: Uh, but that would, uh, meet the definition of chronic exposure, to me, yeah.

Councillor Sprovieri: Okay, thank you. So it says that the chronic exposure may cause, uh, a number of things. It causes, uh, problems with the kidneys.

It also may cause, uh, damage, um, to other parts of the body, um, and things like, uh, heart, asthma, nerve, intestinal and thuo, uh, theorheumatism problems. So it says –

Dr. Juurlink: Sorry, the last word.

Councillor Sprovieri: Uh, rheumatism.

Dr. Juurlink: Rheumatism.

Councillor Sprovieri: Rheumatism? Okay.

Dr. Juurlink: Arthritis.

Councillor Sprovieri: Arthritis.

Dr. Juurlink: Yeah.

Councillor Sprovieri: So it says that, uh, being exposed to it chronically, uh, it could ... all these could come about. Now, I heard, uh, Dr. Limeback say that, uh, this ... it also says that fluoride is the bone seeker in this material. It's a bone seeker, so that tends-tends to correlate with what Dr. Limeback has said. So, um, knowing this, and if, um, in your expert opinion, since this, uh, fluoride, we drink it, uh, every day and it, uh, accumulates in our bones, it-it's retained, it's ... that, to me, would mean that it's chronic and a, uh, and, uh, a number of these issues, uh, may-may happen to people but, as you know, most of us here don't have that problem, but obviously these people, uh, claim that this can cause this problem, but I also heard Dr., uh –

Chair: Councillor, could you be more specific to the question?

Councillor Sprovieri: Yeah, yeah, well I'm coming to it. Well, Dr. Connett say that, uh, having ... or Dr. Limeback said, having a healthy diet in calcium helps reduce these effects, uh, of fluoride. I'm not sure which one said that, but having ... uh, Dr., uh, Dr. Limeback said having a healthy diet of calcium reduces ... which most of us here, who are fairly affluent, have a fairly good diet. So probably most of us don't see that effect. So, uh, would you agree with that?

Dr. Juurlink: I think you've made three points Councillor.

Councillor Sprovieri: Yeah.

Dr. Juurlink: The first is about the calcium and it's ... no one's going to disagree with the idea that things like calcium, which are positively charged ions, are going to bind to negatively charged ions and that will influence their absorption. Most of the North American population doesn't get enough calcium in its diet but that's point number one, point number two, you asked about ...

you commented about it being a bone seeker and that's, uh, that's not an unfair characterisation. I mean, fluoride goes to calcified tissues. It goes to teeth. It goes to bones and what doesn't go to those tissues, primarily, is eliminated, uh, in the urine, but I wanted to get back to your ... your comment about the MSDS on, uh, on the, on the HFSA.

This is material safety data sheets that, uh, most chemicals have and that, uh, we use them all the time to make decisions about, you know, the safety. If we've got an industrial ... at the Poison Centre, if I get a call from somebody who's exposed to this stuff, the first thing I would do is go to the MSDS. Um, when the MSDS says it causes those things, um, I'd like to see the evidence that supports that, because I don't see how it's possible, um, and I say that because I've shown you how simple a chemical this is. I mean, it really is. Put it this way, if it did cause those things it would have to be one of three possibilities, three. Uh, it would have to be the fluoride. It would have to be the silicon or it would have to be the contaminants.

So, um, if someone wants ... so it's not the silicon, full stop, cannot be, um, for the reasons I mentioned in my talk. It's not the contaminants, full stop, uh, because of the extraordinary dilution that renders the concentrations in your drinking water, basically, zero or close enough to zero. As a toxicologist I don't care about it. So then the question is, is it, is it the fluoride? If the HFSA and MSDS is accurate and it's the fluoride that does this, um, where is the evidence, and I think that's where I step back and say this is ... we've looked at the evidence and we, reasonable people, can disagree on what the evidence says but I think it's, uh, pretty clear, most of it, uh, very, very weak. So anyone who puts on an MSDS for HFSA, that this ...that it causes these things, I think is very gravely overstepping what the evidence says.

Councillor Sprovieri: Well, I –

Chair: Councillor Sprovieri, Councillor De Villa, like raised her hand for, Dr. De Villa.

Councillor Sprovieri: Sure.

Chair: I said Councillor De Villa.

Dr. De Villa: Thank you Mr. Chair. I, uh, I think the other issue is, -is, in respect of the MSDS sheet, as Dr. Juurlink was talking about earlier, there's, uh, an opinion or a-a fact that stated in respect of the product at-at 23% versus that which is actually included into water, um, which is diluted significantly in order to get down to .7 parts per million. So there may be part of your issue as well, over and above that which Dr. Juurlink has already indicated.

Councillor Sprovieri: Okay, so Dr. Juurlink, uh, as I said, we, uh, we have to make a decision. I-I'm familiar with the, uh, the Safe Drinking Water Act, the safe, the safe Drinking Water Act. Are you familiar with that, uh, Act?

Dr. Juurlink: No.

Councillor Sprovieri: Very, very, um ... that's what ... v-very serious act. It was a result of what happened –

Dr. Juurlink: It sounds very serious.

Councillor Sprovieri: Yeah, very serious. So-So, um, I-you may ... just for your information, I think ... I can say this because we're in camera, Peel Regional Council ... Peel region has lawsuit pending a lawsuit against the region from a group of residents from-from Peel region. Now, when I read the Peel Act, uh, the Safe Water Act it says no person shall cause or permit anything to enter a drinking water system if it could result in a drinking water health hazard. Now I heard you say that it's so diluted that, uh, you know, this stuff is harmless. It also goes on to say, it say ... it says dilution is no defence. That's what the Safe Drinking Water Act says, that dilution is no excuse to put anything in the water that could be harmful. Uh, so I have a copy here, I can share it with you –

Dr. Juurlink: Well, I mean, you'll have to ask a lawyer or someone who deals in public policy, I-I don't but, um, to say that dilution is no defence flies in the face of a very important principle of toxicology, which is dose response, uh, and, in general, the more of a compound you are exposed to the more benefit, if there's benefit and the more harm, if there's harm. Uh, so for ... um, you know, for me to entertain what you've just said. I mean, uh, I think it reduces to, um ... well, let me just put it this way, um, if ... let's say that someone added something that was very clearly toxic to the water supply, um, but the amount reaching the individual consumer was infinitesimal, um, I think that that ... the-the idea that that's going to cause some degree of harm , um, is, uh, faulty, and I-I, sort of ... I think contradicts what you just said.

Councillor Sprovieri: Well, I-I appreciate you saying that, uh, although I have a statement from the Health Canada website. Health Canada says that every effort should be made to reduce the amount of arsenic that goes into our drinking water.

Chair: Councillor Sprovieri, you're leaning more into debate than just questions here.

Councillor Sprovieri: Well, it is a question. Uh, uh, so are you aware of that?

Dr. Juurlink: To what point? I think this is really important because a lot of the ... to the extent that I'd be able to glean it from my look at the internet, which is a frightening thing to look at when you come across stuff like this, the arsenic is a concern. I mean, so people hear industrial by-product. They hear waste. They hear arsenic. They hear some long chemical name and any right-minded person would stand up and say I-I can't believe this is being put in our water, and I don't blame them for thinking it. What I'm telling you is that, having looked at this compound and considered the concerns, objectively, from the perspective of dilution it can't be that this is a dangerous thing.

So I understand that people will hold this opinion and I understand that I may not change someone's opinion if they hold it, but that's ... it's my opinion nevertheless.

Councillor Sprovieri: Well, thank you for that but we have all-also heard opinions from –

Dr. Juurlink: No, I agree. I-I-I know there are people that will disagree.

Councillor Sprovieri: Yeah and so we have to, now, try to decide who to listen to. Mr. Chairman, I think Dr. Connett would like to comment.

Dr. Connett: Can I respond to this same issue?

Councillor Sprovieri: Certainly, I'll ask ... I was going to ask you the same question.

Dr. Connett: Okay, fair enough. Well, I'd like to say a little bit about arsenic. In fact, the whole notion of the answer to pollution is to dilution is actually a discredited environmental approach, but let's look at arsenic. Uh, the American Water Works Association in the United States was very, very concerned when the United States Environmental Protection Agency reduced the maximum contaminant level of arsenic to ten parts per billion, and the reason that they were concerned about that is the American Water Works Association has a guideline that says we should not add arsenic, any substance, above one tenth of the maximum contaminant level.

So we should not be adding more than one part per billion of arsenic; and then they referred to analyses which found that the highest level of arsenic which had been actually found, from the dilution of this chemical was 1.6 parts per billion, which would be prohibitive then, and the average was about .41 per billion of arsenic. Now, to put that into perspective and Dr. Juurlink may correct my numbers here, but this is from memory. The incremental cancer risk from one part per billion of arsenic is 3,000 in a million, okay? So .4 would be about 1,300 in a million incremental cancer risk, okay? Now, again, to put that into perspective, I've done a lot of health risk assessments for

incinerators and I know the-the principal regulatory agencies, they start with the ... an acceptable risk of one in a million, and if you look at facilities that have been approved throughout the United States, the highest that they will consciously sanction is one in 10,000, one in 10,000, that's the highest and yet in this, with arsenic, we could be over that, well over that.

We could be over one in a thousand incremental cancerous. Now, to put it into regulatory framework, in the United States and I think the same in Canada, we have actually two numbers. We have the maximum contaminant level, which for fluoride, of course, is 1.5 parts per million, and if the American Waterworks was to follow its principle it shouldn't be adding fluoride above .15, but put that to one-side. We also have the maximum contaminant level goal, and that is the safe level, safe level in the drinking water, which is protective of health that's based upon the best science that they have and adequate margins of safety. The MCLG for arsenic is zero, zero.

The MCL for arsenic, as I've mentioned, is ten parts per billion. Now why, then, is the MCL so much higher than this MCLG of zero? Answer, economics, economics. They set a level of ten parts per billion because they knew that some of the western states had high natural levels of arsenic and so it was going to cost them a lot of money. You couldn't possibly get it down to zero. So the ten parts per billion is a compromise between what is safe and what is economic. So that ... notice that that maximum contaminant level is based upon removal of arsenic, how much money you're gonna remove arsenic. Therefore, to use this MCL to justify the deliberate and conscious addition of arsenic to the drinking water is unconscionable. In other words, the MCLG for arsenic is because it's a known human carcinogen, and for the EPA there's no safe level for a human carcinogen, and we can argue until the cows come home.

One in, uh, one in 3,000, one in a thousand is acceptable or not, but the simple truth, here, is that when you add arsenic to the drinking water you're increasing the cancer risk for the population. Now, Dr. Juurlink here, obviously, clearly accepts the-the answer to pollution is dilution. He's-he thinks it's so dilute, but I say look at the cancer figures. Any addition of arsenic, in my view, deliberate addition of arsenic, some of it is in ... unavoidable, but the deliberate, uh, addition of arsenic is not acceptable.

Councillor Sprovieri: I will ask you that too, to clarify, Dr. Juurlink.

Dr. Juurlink: This notion that this infinitesimal level of arsenic causes cancer is ... it's not, it's not plausible. The data, linking water, arsenic and cancer, it comes primarily from, um, China, Taiwan, Bangladesh, where the levels are very, very high, uh, and just to

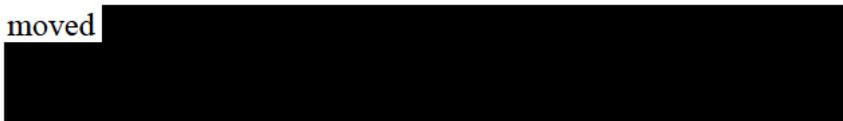
put it back into perspective, I've done the math again, the-the levels, um, in Bangladesh, roughly, look five ... it depends on where you are, but roughly about five fold higher than the WHO acceptable limit. They are roughly 3,500 times higher than the levels that you would encounter by putting the HF ... putting the HFSA in the water with a little bit of arsenic and diluting it out. U, so that's ... you know, when you live on the planet you're going to be exposed to chemicals

If you had shrimp last-last week you had a lot of arsenic in your shrimp, whether you realise it or not. It's everywhere. Um, I don't say that the answer to pollution is dilution. What I say is that the risks of a chemical are governed by the amount you're exposed to, and when it's so dilute you are just not exposed to enough to cause harm.

Councillor Sprovieri: And-And I appreciate, through the Chair, although ... though it also says that it's accumulative.

Dr. Juurlink: No, it's not. So-So-So, unlike fluoride, which tends to distribute and stay in bones for years, it's ... half of the 20 years, as Dr. Limeback said. Arsenic is generally eliminated pretty well via the kidneys. I mean, we see ... you know, we see arsenic poisoning from time to time, acute, uh, and it's generally eliminated pretty well.

Councillor Sprovieri: And so is lead and so is mercury?

Dr. Juurlink: No, those are different, and so I think, uh, that it's important to ... you know, I don't want to leave you with the impression that I'm not concerned about lead in drinking water, I certainly am. All you have to do is look to Flint, Michigan and watch the news. Um, I mean, uh ... but there, again, you know, we know that when ... we have a house that was built in the thirties and we moved  and it's a much more pernicious toxin, I would tell you, than fluoride, for sure.

Councillor Sprovieri: Okay.

Dr. Limeback: Well, thank you for that and uh, just to add, if I may, the MCLG for lead is also zero.

Dr. Juurlink: Well, I mean, if you could avoid lead you would avoid it, but we can't, even on the planet ... you all have measurable lead in your bodies.

Councillor Sprovieri: And we understand that but us, we're approving to add more to it, that's what I'm struggling with.

Dr. Juurlink: No, you're not approving more lead, you're approving the ... you are contemplating the decision to allow, into the water supply, a chemical that contains very small amounts of arsenic, and when diluted, the amounts are so trivial that no one should be worried about drinking it. You've got to be clear on that.

Councillor Sprovieri: And lead too, as you said, lead and mercury.

Dr. Juurlink: Well, the lead, so if you look at the studies, 218 or so studies within the HFSA, the lead contents are very, very minimal.

Councillor Sprovieri: Well, uh, then I have a question for you then, that I really thought it ... if you have all these ... uh, I take, for example, a-a cocktail of alcohol drinks. So you have a little bit of cognac, a little bit of brandy, a little bit of gin, a little bit of –

Dr. Juurlink: It sounds like a bad idea.

Councillor Sprovieri: – vodka, a little bit of ... and-and so you put it in a glass and you drink it. So now you have about two ounces or ... of all this mixture and your drink it and ... but on the other hand you could take a half an ounce of cognac and drink it today, probably doesn't do anything. Take a half ounce of, uh, gin a day after, uh, it doesn't do much, but when you put it all together, and that's what I'm concerned about, that we have all these things together. We have arsenic, we have lead, you have mercury, you have, uh, fluoride, that are all toxins, according to the sheet here.

Dr. Juurlink: But you-you've hit directly on the concept of dose response. So the reason why something bad might happen if you decided to combine five different ... ten different types of alcohol at the same time is because you'd be exposed to a lot more of the same substance. Um, being exposed to trivial amounts of multiple different substances, uh, is not inherently ... again, it's an effect of being on the planet. It's not inherently dangerous.

Councillor Sprovieri: Okay, I appreciate that. So I don't know if anybody else wants to ask a question. Okay, okay, uh, I'll withdraw and then I'll come back again Mr. Chair.

Chair: Alright, Councillor Palleschi.

Councillor Palleschi: Uh, Doctor, Doctor, Doctor.. Um, Dr. Juurlink, um, you talked a little bit about arsenic in-in the water and what I, kind of, really wanted to know, aside from that, was, uh, you didn't touch much on the mercury they found in the water and mercury, to me, it scares me a little bit and I just wanted to know if you could comment on-on that being in the –

Dr. Juurlink: Yeah, so I see, uh, for a number of patients with elevated mercury levels and I also see a great deal ... can everyone hear me okay, of misinformation about what that actually means. So mercury is a ... well, it's a highly variable content. Not all mercury is the same, they're different species of mercury, and we care about some more than others. In the analysis that I described to you, there's 216 samples of HFSA. This is from the NSF fact sheet. Percentages of samples with detectable levels of mercury is 0%. So the ... nobody wants to have mercury in their water but, I mean, the idea that mercury is going to come from HFSA is implausible, in the extreme.

You are much, much more likely to be getting in your system through the sushi you had yesterday, and the primary source of mercury in people who don't have an occupational exposure is diet and it's primarily fish. So worrying about it in your water supply is something I would dismiss without question.

Councillor Palleschi: Okay and then you left ... after your presentation your last comment was that you're okay with your kids drinking the water with fluoride in it. Where you live, I don't remember.

Dr. Juurlink: North Toronto.

Councillor Palleschi: If they took out the fluoride –

Dr. Juurlink: Don't hold it against me.

Councillor Palleschi: I won't. If they took out the fluoride in your drinking water would you substitute it with anything for your children or would you be okay with that?

Dr. Juurlink: Now, I mean, it's not something I would think about. I mean, I would have to review in a bit more detail than I've heard today, the evidence that it's actually helpful, but I would imagine that the ... because the decision for me, really, turns on the risks versus the benefits. What I'm here to tell you is that the risks are nowhere near as great as the internet would tell you or, I suppose, Dr. Connett's book, and I mean no disrespect to him. I spent some time with his book and I think we just disagree. So for me the decision turns on the effectiveness of it, and so the answer to your question is it would depend on what I thought of the effectiveness of fluoride and it would require me to back to the literature.

Like really, the crux of the point is that the things that might be in our water supply, courtesy of fluoridation, do not concern me at all.

Councillor Palleschi: Okay. I'll leave my last question for Dr. Connett. You mentioned that there was some studies done in China, India and Mexico.

Kind of, the first thing that I think about, in those three countries, are high pollution rates. Couldn't there be other variables, and Dr. Limeback also had some other studies that mentioned other countries with, kind of, the same ... similar things. Like, could there be other variables to skew those studies?

Dr. Connett:

Obviously, always there are confounding ... the potential for confounding variables is very large, but in the case of pollution, in order for that to be a confounding variable you'd have to show that the pollution levels in one community, the high fluoride community, from the water is significantly greater than the pollution levels in the other village, the low fluoride Village. So that's what you would have to do. There's no reason to indicate that there was a much higher level of pollution in the villages I visited in China, the Xiang Study, but can I remind you what Xiang did? Xiang looked ... he subdivided one village into five different concentrations and found what Dr. Juurlink wants to find, is a dose-related response.

That couldn't possibly be due to pollution because all the kids were in the same village. He eliminated that kind of confounding variable, and I think we've heard some very exciting information this morning, as far as the quality of these IQ studies. We heard from the Medical Officer of Health that they've done high quality, objective analysis of the neurotoxicity, and based upon their analysis they concluded there's no problem. Well, this is exciting news for me because I've been asking to see that kind of data for a very long time. I showed you the data that I'm basing my concerns on. It's 314 different studies. We have 314 red flags being waived. Now, I'm not saying that it's absolute proof, but there's a lot of dangers here, a lot of risks that red flag.

I want to know how many green flags there are. I want to know how many green flags that Dr. Juurlink found when he reviewed the literature, which said to him I can sell this as no problem. No, all he did was to attack one or two studies for their methodology, but we're in a very unfortunate position that very few of the countries, world-wide, including Canada, have done any studies of their own. Even though these first IQ studies became available to the west in English in 1996, the year I got involved. I've been following it ever since, neither Australia, New Zealand, Ireland, England, Canada or the United States has set out to replicate these findings, attempt to reproduce these findings

Their attitude is the absence of study is the same as the absence of harm. So, again, if you want to look at quality of studies, the worst study is the one that's not done, and I would put to you the reason that these studies are not done in the fluoridated world is because they are protecting the fluoridation programme.

Councillor Palleschi: Dr. Limeback, did you have any ... did you want to make any comments to that or anything to add?

Dr. Limeback: In terms of the evidence?

Councillor Palleschi: In terms of anything that would, kind of, skew the results or, in particular, the studies that you had done with the chemistry on the [Dentyne 02:44:34].

Dr. Limeback: I don't understand why the Peel Public Health will say that there's no evidence of any harm when we clearly have published the effects on bone and teeth. I'm flabbergasted.

Councillor Palleschi: Okay, thank you.

Chair: Okay. Thank you Councillor. Councillor Shaughnessy.

Councillor Shaughnessy: Great, thank you very much. This has been really exciting for me. I find it fascinating, how we have experts here and everybody has a different opinion. I'm looking at the chart that was given to me by the Region Peel here, and my ward is in Ward 1, in Caledon, under the name Shaughnessy, and it's a really small sampling, but what's fascinating about it, it's the only ward, in the Region Peel, that has absolutely no fluoridation whatsoever, and it has the lowest number, but it's also the lowest sampling. So if the Region Peel wanted to undertake a study or somebody else wanted to undertake a study, in comparison, I think Ward 1 would be an excellent opportunity because there is absolutely no fluoridation.

Now, you could draw many reasons why that number is low. Yes, Ward 1 is an environmental area, environmentalists live there. People are really concerned about their health. Maybe that is it, I don't know, but it would be interesting.

Dr. Limeback: Dr. Ito did it.

Councillor Shaughnessy: Did he?

Dr. Limeback: Yes and his Masters of Science Thesis was on Caledon, compare non-fluoridated versus fluoridated. Guess what he found? No difference and carries a higher rate of fluorosis in the fluoridated Caledon area.

Councillor Shaughnessy: What year did he do that?

Dr. Limeback: Oh, it was 2006, 7, 8, something like that.

Councillor Shaughnessy: Okay.

Dr. Limeback: And he reported it at a scientific meeting and it's in the form of a thesis and an abstract, but it was never published.

Councillor Shaughnessy: Okay. I find it very interesting, but just Caledon's big. It's, like 56% of the area mass of the Region Peel, but my Ward 1 is absolutely no fluoridation.

Dr. Limeback: By the way, I looked at the lead levels in Lorne Park, [REDACTED] where the fluoride level was .66, and Lorne Park once had .37 and Caledon, the region that was not fluoridated, the lead levels were high in the fluoridated areas and medium in the .37, and in Caledon, where it was .02 was very low lead levels.

Councillor Shaughnessy: Fascinating.

Dr. Limeback: Based on the studies that show that using HFSA increases lead uptake.

Councillor Shaughnessy: Great, thank you. 1 other question, and I'll try and keep it short because I know there's other people, but I did the thing, I looked at everybody's information, pro and con, but then I did the unthinkable. I went on the internet and reviewed, and some of the information I would actually like to have some clarification on. 1 of the pieces of information I saw, it says that 97% of Western European populations drink non-fluoridated water. They included Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Luxembourg, Netherland, Northern Ireland, Norway, Portugal, blah, blah, blah. They don't have fluoridation and they're ... I'm trying to think of the right word.

The cavity rates has gone down at the same level at which the fluoridation communities have gone. So, to me, I don't understand how that happens, how both can go down and one has fluoridation and one doesn't. First I'd like to know whether that is true, that these countries do not have fluoridation, and if somebody would like to talk about why those levels have consistently come down in fluoridation versus non-fluoridation.

Dr. Connett: Okay, those graphs that you may have seen are based upon World Health Organisation data, online. They made it available online. They've tracked tooth decay in 12 year olds in a multitude of different countries, including Canada, the United States and so on, and you're completely right. If you look at the DMFTs, decayed, missing and filled teeth for 12 year olds, from the 1960s to the present the decay rates have been coming down as fast, if not faster, in the non-fluoridated countries. Now sometimes proponents of fluoridation in the United States say well, we know that fluoridated toothpaste yes, that will also reduce tooth decay, but you need both.

Well, all these countries have fluoridated toothpaste. Some of them have fluoridated water. Wouldn't you expect, then, to see

the decay rates coming down faster, with those that have both fluoridated water and fluoridated toothpaste? No, it's a wash. It's coming down at the same rates. You can't use this to prove that fluoridation is not effective. It's not scientific enough for that, but it is suggestive that the fluoridation factor is being drowned out by other factors, some of the ones that Hardy mentioned this morning. It's drowned out by better standard of living, which goes with better availability of dental care. It goes hand-in-hand with better diet and maybe the presence of antibiotics are killing the bacteria in our mouths, but there's a lot of things which run parallel with the standard of living. So that's maybe what we're looking at, is the overall indicator, the standard of living.

As the standard of living goes up tooth decay comes down. Tooth decay really reflects poverty, poverty. Most at 20% of the tooth decay in the United States is concentrated in low income families, 20%. 80% of the tooth decay is in that 20% area and rather than giving everybody fluoride, we should be taking special methods to address low income families, tooth decay, and they're doing that in Europe, they're doing that in Scotland, with the Childsmile programme. It's been very effective. What they do is very simple. They make sure that every child, when they get into kindergarten, first school; they're taught how to brush their teeth.

They're also taught to have healthy snacks, not all this sugary food and so on, sugary drinks, health snacks, and not only are the educating the kids, but they're also educating the parents at the same time. In short, we need education, not fluoridation, to fight tooth decay in low income families, and this is cost-effective. On the website you will see, and maybe in the extra slides I had in my thing. If you look at the extra slides, there's a discussion of Childsmile programme in Scotland and it's been very cost-effective. They reduced their dental costs at the same time that, I think, if I remember the figures correctly, for 12 year olds tooth decay has gone down ... the number of decay-free teeth has gone from about 50% to 73% in 12 year olds, in a relative short period of time. They're above their goal.

Their goal was 70% free of tooth decay, and so I think rather than spending more money on fluoridation we should spend the money on looking at the programmes that have been successful in Scotland, in Denmark. Denmark has another educational orientated programme. This is what we should be doing and, of course, one of the tragedies in the United States is that even though we know tooth decay is concentrated on low income families, 80% of dentists in the United States will not treat on Medicare, the ones who really need it most, and that's not entirely the fault of the dentist, because the return, the federal government gives such poor returns for treating children in Medicare, but that is the fact. We should be targeting the

problem, not this one size fits all of putting this pixie dust in the drinking water.

Councillor Shaughnessy: Is there anybody else that would like to answer my question having to do with the lack of fluoridation in Europe versus ... and Dr. De Villa would like to, but I think this gentleman would like to also.

Dr. De Villa: Please, I'll let Dr. Pollick go first. He's only here today.

Councillor Shaughnessy: Thank you.

Dr. De Villa: You have the rest of the year with me.

Councillor Shaughnessy: Sounds good.

Dr. De Villa: Or the rest of the term I should say.

Dr. Pollick: Thank you, I'd like to answer that question and perhaps give a response to some other questions that I didn't get a chance to before. So with regard to Europe, it's true that water fluoridation is at a low level. The country of Ireland has fluoridation of the water supply. There are communities in England that do have fluoridation and there's efforts to continue to expand fluoridation in England, but also there's salt fluoridation in many European countries, South American countries. So Germany and France and Spain. Spain actually has some water fluoridation and some salt fluoridation, but it's recognised that having, sort of, a national approach to fluoride is appropriate to help reduce the burden of tooth decay not only for children but for everybody, and we know that, as we age and the population is ageing everywhere, that we also get exposed to tooth decay on the roots of our teeth because they're not covered by enamel.

So the issue is what programme can we provide for the lifespan and not just for children. So this country has the history of the discovery of fluoride in water and imitating the natural situation to about one part per million of fluoride to reduce the burden of tooth decay, reduce ... or minimise the amount of dental fluorosis, and so those community trials have started. 1 of them is here in Ontario, in Brantford, and they continued for many years and demonstrated 50 to 70% reduction in tooth decay. It was overwhelming, in terms of its benefits, and so many communities in the United States took it upon themselves to fluoridate their water supplies by decisions of state government, city government, whatever it might have been, and so we have the history in the United States that other countries don't have. So that's one, addressing the European situation. To go back to the HFSA issue, I'm sure you've been given the NSF fact sheet on fluoride additives, and not only is it dilution effect, because one part of HFSA is diluted in more than 180,000 parts of water,

but there's actually a chemical reaction of HFSA in water, such that HFSA breaks down to free fluoride ions, some hydrogen ion, so it's slightly acidic, and silicon. You've heard that there's no problem with silicon.

So HFSA doesn't reach us, you know, when we're drinking water from our homes. In fact, the NSF document is based upon evidence by Urbanski, was one of the authors, that looked at the breakdown of HFSA in water and it said that by the time it reaches the home there's no more HFSA in the water and probably not ... there's not HFSA before it leaves the water treatment plant. So the material safety data sheet, on HFSA, applies to that chemical before it's added to water and it's there for the safety precautions that have to be taken by those handling that very strong acid, before it's diluted. So the NSF document is available to you, I hope, and you can take a look at that. So I just wanted to make those comments.

Dr. Allukian: I'd just like to add something.

Dr. Pollick: Can I just add one more thing?

Dr. Allukian: Sure thing.

Dr. Pollick: So one of the things you should look at, and Dr. Limeback mentioned this, is look at the water quality reports that come out of the Region of Peel and you'll see that the evidence on arsenic and lead and mercury show that there's negligible concentrations of those elements and others in your drinking water, and it does have ... it has been fluoridated. Maybe not in your particular ward, but throughout.

Dr. Allukian: I'd just like to add something in terms of the low income. In the City of Boston we have something like 55 to 60 different ethnic groups, a high percentage of African Americans, high percentage of Hispanics. Without water fluoridation we would not be able to make any impact on those populations. Oral health education is nice but it doesn't prevent tooth decay. With health education you need to one, give people the information. Two, you have to motivate them and then three, you have to change behaviour, and anyone who works with kids knows that by getting up and talking about health education you're not going to make much of an impact on oral health.

It may with a few individuals but not community-wide, and the other thing is what we need to do is look at are there any studies that show how these different ways of prevention work. Probably the best study that's ever been done was the one done in the United States, the National Preventative Dentistry Demonstration Programme on 20,000 children. It's a longitudinal study in five fluoridated and five non-fluoridated

communities. They had kids doing oral health education. They had them brushing and flossing. They had them using fluoride tablets, fluoride rinsers and they had them getting professionally applied topical fluoride, where you have to go to a dentist, a hygienist and they paint the fluoride on the teeth. What did they find?

What they found ... and also dental sealants. They did find that dental sealants work but it cost \$23 per child. They found that the most cost-effective preventive measure of all these modalities, irrespective of all the variables, was community water fluoridation, and that study was done over a four year period. The data is there and it clearly shows that the most cost-effective preventive measure, to reach a whole community, is water fluoridation. The Scottish programme was mentioned. I don't know the exact cost for the Scottish programme but I think it's maybe 120 or \$130 per child. You are paying about 35 cents per child, per person, here to fluoridate.

Enormous cost benefit ratio between fluoridation and a programme on kids, and then the other thing about the Scottish programme, it's for children only. With water fluoridation everyone benefits, irrespective of age. Focussed programmes on children don't necessarily show benefits in adulthood. With water fluoridation everyone gets the benefit.

Dr. Pollick:

Can I add a comment? So thank you. The last national study that was done in the United States, on tooth decay and fluoride in the water, is now some ... almost 30 years old. It's embarrassing to say it but that's the situation. There are, as I mentioned, ongoing efforts, now, to update that information through household surveys, but what they found was very interesting, because although they found, across the board, a benefit of fluoridation for children, and they looked at 5 to 17-year-old children, they were also able to divide the country into seven different regions, and it turns out that those seven different regions had different areas covered by fluoridation, and where there was about 75% of the region covered by fluoridation they were not able to detect a difference in tooth decay between the kids in the non-fluoridated versus the fluoridated area, and you may ask why is that, since we're recommending fluoridation?

I'll get to the reason for that in a second. What they did find, however, was in the western part of the United States which, at the time, had less than 20% of the region fluoridated, there was a 60% difference, a benefit for kids in the fluoridated area. So why should be there that benefit in the 20% that's fluoridated versus the 75% that's not? It turns out there's this thing called the diffusion or halo effect, that people might reside in one part of town that's fluoridated but they have dinner with friends in a different part of town that's unfluoridated. They go to restaurants

that ... so the boundaries are a little fuzzy. Also, foods and beverages are produced and distributed in supermarkets, that may come from a fluoridated area to a non-fluoridated area, containing fluoride because they're treated with the local water. So there's this diffusion effect that dilutes or minimises any difference.

So the study that was referred to by Dr. Ito in Caledon, I think it was, was of a population group that ... where the area has more than 75% fluoridated. They also have very low levels of tooth decay, so that's one explanation why you might not find a difference if you were to go and do this study that you're suggesting, because of this diffusion effect. If the whole area was fluoridated there would be even lower levels of tooth decay, rather than, let's say, 75%. So we know that 75% or approximately 75% of Ontarians have access to fluoridated water, and Dr. De Villa wanted to make a comment.

Dr. Connett:

Can I respond to that? The study that Dr. Pollick is referring to is a study by Brunelle and Carlos, where they looked at 39,000 children in 84 communities. It cost tax payers millions of dollars, and what they ... and I want to draw attention particularly. Whenever you hear promoters of fluoridation talking about tooth decay, they always talk about percentages, savings in percentages. What they're doing there is to conceal the actual benefit, or at least give a very positive spin on the benefit. The percentage is a relative difference, and I'll give you some figures so you can understand this.

Not the absolute saving. So in the study that Howard is talking about, they compared 8,000 children who always lived in fluoridated communities with 8,000 children who always lived in non-fluoridated communities, and they found the average saving for children, as you said, age 5 to 17 was .6 of one tooth surface. This, as registered as a relative saving is 18%, 18%. So let's give you the numbers. If anybody can do arithmetic in their heads, probably not many, but the average decayed, missing and filled surfaces, in the fluoridated communities, was 2.8, 2.8 surfaces. The average in the non-fluoridated was 3.4 surfaces, and if you take 2.8 from 3.4 it's .6 of one tooth surface. That's the saving. If you express .6 over 3.4, as a percentage, it's 18%.

Now if the average person, when they hear a saving of 18% oh, that's pretty good. They think there's 18% of their mouths are reduced, but it's not, it's a relative difference. It's the vagaries of comparing two small numbers and reporting it as a percentage. Now, to take the second point that Dr. Pollick has mentioned, and that is the halo effect, these same authors adjust it for the halo effect, and they were able to suggest that if you take into account the halo effect it went up to 25%. We're still just talking about one tooth surface. Now, I ask you, when you come to risk

benefit analysis, if you've got, in one scale pad, that the average saving, from 5 to 17 year olds, is .6 of a tooth surface, and we're talking about, possibly, lowering their IQ, possibly lowering thyroid function, possibly increasing, lifetime, their risk to arthritis, because the first symptoms of fluoride's damage to the bone, long before you get a weakening leading to bone fractures, is just like arthritis, lifetime exposure.

These two scale pads, to me, my view of it, I don't know about yours, but I think a saving of .6 of one tooth surface, and Hardy gave similar figures, and you put all these other risks in this scale pad that, in itself, is pretty dicey. Then you'll throw in something else. The proponents of fluoridation, in 1999 the CDC conceded that the predominant benefit of fluoridation is topical, not systemic, topical. In other words, when they conceded that, that you could get the benefits by applying fluoride directly to the teeth, which means you can use fluoridated toothpaste, it just doesn't make sense, does it? If you can get the benefits of the organ that you want to help, namely the teeth and you can do it directly, because the teeth are outside the body, you can brush it one and you could spit it out. You've accomplished two things with that.

You minimise the exposure to every other tissue in the body and you don't force it on people that don't want it. Everybody out there is getting fluoridated toothpaste. You have to pay more money to get non-fluoridated toothpaste. You have to go to health stores, not the pharmacist in the [main 03:09:44], to get non-fluoridated toothpaste. The whole thing does not make sense.

Dr. Pollick:

I'd like to comment on the .6 number. They looked at 5 to 17-year-old children. Five year olds don't have many, if any, permanent teeth. They were just looking at permanent teeth there. They also looked at the primary baby teeth, and we can get to that, but because five year olds don't have very many teeth there's not going to be a benefit of fluoridation in five year olds' permanent teeth, but by the age of 17 you've got all your permanent teeth, apart from your wisdom teeth, and by the age of 17 the difference was not .6, it was 1.5 tooth surfaces. So as you get older there's an accumulating benefit, added benefit, every year that the child gets older.

Tooth decay is a chronic disease. The longer the teeth are exposed in the mouth the more susceptible they are to getting cavities that can be detected and treated, if necessary. So it's not just .6 but 1.5 and whereas, on an individual basis, you know, a cavity, we heard today, might cost more than \$300 to treat. That cavity might not just be a cavity. It can get treated with a filling. It might lead to a root canal treatment. Some of you may have had root canal treatment. Some of you may have had extracted

teeth. Some of you may have had to have those teeth replaced with bridges or partial dentures or full dentures or implants. It's very expensive. In the United States over \$111 billion is spent on dentistry every year.

So we're trying to reduce the burden of dental disease, to reduce the expense to individuals, and we can do that at a very cost-effective way, through water fluoridation. It's not a panacea. You still have to brush your teeth. You still have to go to the dentist, so that if there's something early it can be caught before it becomes a bigger problem, but we ought to do what we can to try to help, especially the most vulnerable in our society, who may not have access to the dentist, who may not be told to brush their teeth by their parents. You know, I wasn't told to brush my teeth by my parents before I went to bed every night. So yes, fluoride toothpaste works, but so does fluoridated water. In countries where there have been studies looking at fluoridated versus non-fluoridated areas, the benefit is there with fluoridation.

Chair: Actually, I'm going to move on to the next question here, because we've taken up ... well, I've got a whole list here. I'm going to move on to Councillor Parrish.

Councillor Parrish: Yes, thank you. [REDACTED]  
[REDACTED] .. okay, I'm going to challenge the Chair. The type of fluoride we put in our water is a by-product of the production of fertiliser, is that correct? Let's try with Dr. Juurlink, because he looks to be the chemicals whiz kid over there, and it's quite different from pharmaceutical level, fluoride, in composition.

Dr. Juurlink: No, I mean, if someone's been given sodium fluoride, which is a very different chemical, it's just ... it's another way of getting fluoride into one's –

Councillor Parrish: Okay, but the question I'm asking, pharmaceutical quality fluoride, if I was taking tablets, they wouldn't have all the by-products in them that you get out the other –

Dr. Juurlink: That's correct.

Councillor Parrish: Okay and the type of sodium ... or the type of fluoride that we use, how toxic is that in its simple form, if we got a gallon of it? Could it do any damage?

Dr. Juurlink: Do you mean the HFSA stuff?

Councillor Parrish: Yeah.

Dr. Juurlink: Well, it's an acid, and concentrated it would be dangerous, if spilled on your skin. I could use an analogy to answer your question. At our Poison Centre we cover Ontario and Manitoba. We regularly deal with hydrofluoric acid exposure. It's used to etch glass. It's used for rust removal, and we'll frequently see people who have had an accident or sometimes either suicidal exposure to the stuff. It's horrible. It's a very, very dangerous compound because it's concentrated. When it's dilute it doesn't hurt you, and the evidence for that is when you ingest fluoride, whether it's 20 milligrams of sodium fluoride in a tablet, as proven in those studies did for years. Fluoride combines with hydrogen in the acid in your stomach. It makes hydrofluoric acid.

You know what we don't see? Holes being burned in the ... sort of, the wall of your abdomen, with the stuff coming out. There's no harm to it. Again, it's a function of the amount you're exposed to. So your question, if you're exposed to their concentrated solution, I would discourage that rather strenuously.

Councillor Parrish: Okay. Is there a safe way of disposing of it? Let's say we waved a magic wand and said we're not using that stuff anymore, so fertiliser companies, you have to figure out a safe way to dispose of it.

Dr. Juurlink: I'm not an industrial chemist. It's beyond my expertise.

Councillor Parrish: Okay, to –

Dr. Connett: I have studied the chemistry of this. Several things, number one, the reason this has come about is that when you extract phosphoric acid or soluble phosphate from phosphate rock, which is insoluble in water, you add sulphuric acid to it and that generates two very toxic gases. 1 is called hydrogen fluoride, which you've mentioned which, in a solution is hydrofluoric acid, and the other one is silicon tetra fluoride, and for about a hundred years these gases dissipated the vegetation and crippled cattle in the area of the phosphate plants and then, eventually, they were required to put on a scrubbing system, which consists of just a spray of water, and that spray of water converts these two gases into this hexafluorosilicic acid, HFSA.

Now the story gets interesting with the contaminants, because there's a lot of contaminants in this phosphate rock, including something which hasn't been mentioned yet. It's the same phosphate rock from Polk County, Florida, is also mined for uranium. So you've got the potential for a radioactive isotope in there, and I'd be interested in whether you think the pollution is the answer to the ... dilution is the answer to radioactive isotopes, but that's a different story.

- Councillor Parrish: You guys aren't allowed to fight.
- Dr. Connett: Yeah. So they can't dump that stuff into the sea, by international law. They can't possibly dump it locally because it's far too concentrated, but there's a vagary in hazardous waste regulations in the United States, which is if a chemical company produces hazardous waste and someone buys it from them it's no longer treated as a hazardous waste. It's treated as a product, and that's when the public water utilities come into it, because they do need a massive quantity of water to dilute this hexafluorosilicic acid down to safe levels. You need 180,000 gallons of water to dilute one gallon of hexafluorosilicic acid down to one part per million.
- Councillor Parrish: So ... and I'm going to interrupt you because I'm getting to ask the questions. So what happens is, instead of coming up with an expensive and safe way of disposing of a by-product of industry we have said everybody in the world will swallow it.
- Dr. Connett: Yeah.
- Councillor Parrish: Their own little piece of it.
- Dr. Connett: That's right.
- Councillor Parrish: Okay, I like that answer. I also am curious as to who started the studies that keep producing the A-okay. I can remember, as a kid, and I'm probably older than most of you, that smoking experiments were done all the time and they were paid for by the cigarette companies and they kept coming back and saying cigarettes are fine until more and more people were dying of lung cancer, at which point somebody decided it wasn't so fine. So I've heard, and I could be corrected, that it was Kellogg and Post cereals that started the testing for fluoride so that mums could give their kids sugar cereals and not worry about it because we're taking care of it over here. Is this accurate or am I dreaming?
- Dr. Connett: Well, what I can tell you about the sugar lobby is that one year before the US Public Health Service mysteriously endorsed fluoridation, in 1950, what was mysterious about that, is that not one single trial that they started, including Brantford, Ontario had been completed. So halfway through the trials the US Public Health Service endorses fluoridation. 1 year before that the sugar lobby said we need to find a way to reduce tooth decay without reducing sugar consumption. The sugar lobby, including Kelloggs and so on proceeded to put a lot of money into nutrition departments at places like Michigan and Harvard for professors of nutrition to both extol the virtues of fluoride as a sugar, as a nutrient, and extol the virtues of fluoridation.

So the sugar lobby has always benefited from fluoridation, and even last year there was a study done in a ... published in a magazine called PLOS, which revealed collusion between the sugar lobby and the National Institute of Dental Research, where the sugar lobby was steering the researchers away from looking at sugar as one of the main causes, excess sugar as one of the main causes of tooth decay.

Councillor Parrish: Dr. Limeback, you've got a good chart on one of your pages that shows the tracking of dental cavities in Brasil from no sugar at all, almost dead zero –

Dr. Limeback: That's Japan.

Councillor Parrish: Is that Japan?

Dr. Limeback: Yes, that was a –

Councillor Parrish: What happened in Brasil? Wasn't that Brasil?

Dr. Limeback: It kept going down.

Councillor Parrish: Okay.

Dr. Limeback: So that was –

Councillor Parrish: But that was sugar-related.

Dr. Limeback: That was the lack of sugar in the Second World War, where they didn't get any sugar from anywhere, and when there was no sugar supply at all, in the country, the cavity rate went down to zero.

Councillor Parrish: Okay and Dr. Connett also said it doesn't make sense. You had a little outburst in the last series of questions, that this doesn't make any sense. It makes perfect sense. It's disposing of a lethal chemical without a lot of fuss on the part of the government. It's not forcing the government to put your eyeballs and your teeth into OHIP. They don't have to pay for that, and I think it's ... listening to our own staff say it's less costly, it's more effective, it's more efficient, I actually don't care about efficiency and reducing of costs. I care about the health of the kids and the health of the adults that are helping dispose of this lethal chemical.

I like the education programme in Scotland and I like your discussion of it and thank you very much for including it, and I'm still not 100% convinced but I'm pretty sure I'm 99% convinced, and I thank you all for coming today to get rid of it.

Chair: Councillor Ras.

Councillor Ras: Thank you Mr. Chair and thank you all for coming today. This has been an amazing discussion. I've had an open mind throughout the last few months, when I've started looking into this. A few questions and many of them have already been answered. What percentage of ... you mentioned Ontario's but what percentage of Canada's population is fluoridated or uses fluoridated water?

Dr. Limeback: I can answer that. The Health Canada website says that, or used to say that two-thirds of Canada was fluoridated. It's now gone down to one-third. We have been keeping track of it. Not me personally but the citizens opposed to fluoridation have been keeping track of all the communities who have stopped fluoridating. It's now down to a third. Ontario is the large ... by far, the largest community or province with a population still fluoridated. Quebec has, pretty well, eliminated it. BC has eliminated it. Cities all across Canada have eliminated. We've heard that Calgary stopped it.

They won't find much of a change in dental decay rates in Calgary, and so what I think is going to happen is once Ontario decides that they don't need it, that it might cause more harm than benefit, Canada will basically drop it, in my opinion.

Councillor Ras: Dr. De Villa wants to add to that.

Dr. De Villa: If I may, on that point, it's actually a little closer to 37%.

Councillor Ras: Thank you and that was ... I'm not too sure if this question was answered. So there is no ... if we had a choice ... I've looked at some of the data and it looks like there's an optimal range of .35, and are you suggesting that if you were to fluoridate that's the rate you should do it or are you suggesting zero, at all?

Dr. Limeback: My personal opinion is that there's enough fluoride in the Great Lakes, right now, that if you increase the fluoride levels to .35 it wouldn't do much good.

Councillor Ras: Okay, so there's that natural background –

Dr. Limeback: Yeah.

Councillor Ras: – rate? Okay, thank you for that. I am a little surprised. When you go through the data of how controversial this is, in so many different countries, that there isn't better data and there isn't more current data, and maybe Doctor, here, like you can comment on that one.

Dr. Juurlink: And, again, I come to this as somebody who only began reading about this data a few months ago, but I guess what surprises me is that ... I'm going to phrase it a bit differently. With all of the ... for decades now we've been fluoridating this community or not

fluoridating that community. Changes have been made, you know, in Calgary, for example. It seems to me, as somebody who's in the business of evaluating evidence and evaluating epidemiologic data, as an epidemiologist, it's what I do, if there was a tangible human harm, other than fluorosis, we would have known about it by now. I appreciate the disagreement but the ... maybe I'll just leave it at that, because I sense that Dr. Connett wants to disagree with me.

I'm curious to hear the nature of his disagreement, but the ... I think the [hidradenitis], the variation in the studies isn't, at all, surprising. There are no randomised trials. We've heard about it. It's theoretically possible, in terms of looking at the benefit. Absent to that, the best level of evidence for benefit is going to be what happens after communities begin fluoridation. The best evidence for harm will be what's happened after a community's begun fluoridation, the on, off nature. What happens afterwards is going to be your best [unintelligible 03:25:21].

Dr. Pollick:

I'd just like to add, if I may that, you know, I presented the best reviews and current reviews. When those reviews are done it's not on the basis of a single day's discussion about the issue, but the experts in the various fields of public health and toxicology, etc. pour over the studies. Dr. Limeback was part of a group, a committee that reviewed fluoride in drinking water for the National Research Council. There were a dozen or so individuals on that committee. There were people who opposed ... were opposed to fluoridation and there were people who were in support and people who were ... came at it from a neutral point of view. I think that was probably right, and they concluded that there were three potential problems with fluoride in drinking water and that they were not related to water fluoridation.

They were dealing with high fluoride in the drinking water naturally occurring. There are parts throughout the world that have what's called endemic dental fluorosis because there's high natural fluoride in the water. You're blessed that you don't have that here, and so at the level that we're talking about, in terms of fluoridation and the mechanism by which things are fluoridated and the safety studies that have been done on HFSA, whether or not it's extracted from the ground in conjunction with the fertiliser industry.

Um, there is sufficient and overwhelming evidence to, to give these reviewers who came up with the Health Canada report, the community preventative services taskforce report, the Cochrane report and the, uh, U.S. Public Health Service report and they're very recent reports that confirm the benefit and do not say that we should stop fluoridation. They recognize that it continues to be a benefit. They have adjusted downwards the concentration that they consider to be optimal for the protection of health and I

just think you should take that into consideration when you're deliberating because those individuals spent a lot of time studying all of the details and, um, you know, Dr. Limeback can testify to the fact that that committee deliberated for some two, three years or so.

Dr. Limeback:

Mm-hmm.

Dr. Pollick:

And to make a decision on the basis of a single day's, uh, discussion of this kind without taking into consideration the value of those reviews, those current authoritative reviews, um, I, I think you should weigh those quite heavily.

Dr. Allukian:

And Doctor, I think you can go next and I'll -

Dr. Limeback:

- Thank you. I just wanted to respond to Dr. Juurlink saying that there are - uh, he, he's wanting to see some studies from Calgary that will be peer reviewed and published and possibly that will happen. There already are studies in Canada on fluoridated communities. One was by Chris Clark and he published that when, uh, Kamloops stopped fluoridating the caries rates continue to decline. That's already published. He compared Kamloops and Comox in B.C. and obviously we're gonna have to look at all of the studies combined when they start adding up and doing a proper meta-analysis of all the fluoridation, uh, studies.

Now, the important thing is whether they do them correctly. One of the problems that, um, I alluded to that nobody is taking into consideration except for one publication is that there is an effect of a delay in tooth eruption when people ingest it. When you drink the water, when kids drink the water it actually causes a delay in tooth eruption and when that happens the teeth don't get exposed to sugar as long as the other teeth that have already come up in non fluoridated areas. So the difference between the two like these studies have been saying, 18 percent difference, is completely wiped out if you take into consideration the eruption of the teeth. One study did and they found no difference.

Dr. Pollick:

There are other studies if I may add that have looked at eruption of teeth and whether it's delayed by water fluoridation. The latest was published in the Journal of Public Health Dentistry in 2014 stating exposure to fluoride in drinking water did not delay the eruption of permanent teeth.

Dr. Limeback:

That was Kumar, yeah.

Dr. Pollick:

Yes. That was Jay Kumar who was also a member of the, uh -

Dr. Connett:

- Yeah, yeah. I'd like to respond to several things. One is you mention why has this gone on for so long and the problem is it's

gone on for so long because politics has interfered with science and here's the bottom line. When policy is king science becomes a slave. Fluoridation because policy in the United States in 1950. It stopped serious research on the health effects from that moment onwards. Um, let's – and, and what you've got be aware of is when pro fluoridation governments like Health Canada Agency, when they commission experts to review the literature, they handpick experts to come back with that which is going to support their policy. It's, it's a self fulfilling prophecy. Let's look at the Health Canada. In 2007 they selected six experts to review the literature not just on benefits but on risks and of those six experts four were pro fluoridation dentists. Four out of six experts were dentists and known to be pro fluoridation.

Now, Health Canada had a very easy way of demonstrating their objectivity on this issue because they had two people on the National Research Council they could have drawn upon. One was a dentist who was pro fluoridation, Jay Kumar from New York State, and the other was a dentist who was anti fluoridation from Toronto. And even those – even though these experts came together in Toronto they chose Jay Kumar from New York State to be their expert. If they wanted to show their objectivity they would have chosen both; one known to be anti fluoridation, one known to be pro fluoridation, both taking part in this three year survey of the literature. And with respect to that – okay, I'll come back to the other point in the moment but let's now see where that went to. There were these six experts who came to Toronto and –

Chair Dale: - I think you should get back to the point.

Dr. Connett: And, and, and I'm coming back to this point because this is very serious. Those six experts when they addressed neurotoxicity said the weight of evidence, the weight of evidence shows that fluoride is not neurotoxic. When I looked at their report I found that they only looked at five IQ studies. By this time there were 23 IQ studies. Well, Health Canada then came out with their draft report. They just completely copied the language of these six experts that fluoride was not neurotoxic citing these five studies. Then they asked the public participation and I said to them you only looked at five IQ studies, here are the references to the other 18 studies that you didn't review. There are 23 studies. And then I waited for Health Canada to come out and their final report was almost word for word the same as the draft, no acknowledgement of those 18 missing studies. And I put to you that what you're looking at here is a self fulfilling prophecy when a pro fluoridation government sets up review panels and we've seen it again and again and again. Hardy and I saw it in action in Ireland with the fluoridation forum in 2002, a complete dummy review. We saw it in Australia, the National Health and

Medical Research Council. Their report was in 2007. One year before the National Research Council report came out, the most thorough –

Chair Dale: - Doctor., I think we've gotten the point.

Dr. Connett: No, no, let me – no, I haven't quite got to the point because I can nail it.

Chair Dale: Well, do it in 30 seconds.

Dr. Connett: Okay. The National Health and Medical Research Council in Australia said – acknowledged in one sentence that this 500 page report existed but then said it was not relevant to fluoridation in Australia because they fluoridate at .6 or whatever it was to 1.2 and yet in the National Research Council report in chapter two which was an exposure analysis they showed that certain subsets of the population including bottle fed infant were exceeding the EPA safe reference dose for fluoride, drinking fluoridated water. So how can you say a report is not relevant to water fluoridation as Howard Pollick has again reiterated today when in fact their own exposure analysis suggested that bottle fed infants were exceeding the EPA's safe reference dose.

Chair Dale: Thank you. Going to move on to the next question.

Dr. Allukian: Can I say a few words?

Chair Dale: Okay.

Dr. Allukian: I've been very quiet and I've been waiting. I just want to correct a few things that have been said. It's been said a number of different times here that CDC funded the 2015 Cochrane Review of Fluoridation. I have an email from the head of the oral health program at CDC saying they did not do that but people keep saying that over and over. I'd be happy to share it just for your information.

There are over a quarter of a million studies done every year. There are good studies, there are weak studies, there are poor studies. It's very hard for you to sit here and someone says there's this study, there's that study. What you need to look at, uh, what do the experts that work for you and for your community say. You've got a health department, multidisciplinary, epidemiologists, water folks, etcetera, etcetera. What do they have to say about these studies?

The other thing you have to remember is there have been over 4,000, 4,000 studies done on fluorides and fluoridation, 4,000. There are good studies and poor studies. How do you differentiate that? You can't separate that out here because everyone's going to say something different. You look at review

panels for different countries. When you look at the different countries and their review panels with the best experts they all come out and say it's safe and effective. It comes down to who are you going to believe. Do you really believe that every state health department in the United States is putting a neurotoxin in the water and something that's gonna cause cancer? Every major health department in the country for all the major cities that are fluoridated are we polluting our people and causing cancer? As a health department our job is to promote and protect the public's health. We have cancer control. We deal with lead. We deal with all these variety things and we also get fluoridation because we're dealing with a disease that affects almost everyone in the community. It's debilitating and it's costly.

I mentioned to you earlier the National Prevention Demonstration Program, 20,000 kids, five different modalities. Fluoridation was the most cost effective. Twenty thousand kids over four years. That has not been – I've mentioned it twice. You look at studies like that not in – at this study they said this or that. Twenty thousand kids over four years. We've had 20 U.S. Supreme Courts look at this. It doesn't cause cancer. It's not medication. It's not against the constitution. Twenty different U.S. Supreme Courts. We've had the U.S. Surgeon General from 1950 on, Democratic and Republican administrations where they have the top people available to determine what is this public health measure. You think every single one of them is going to support something that causes all of these problems? And we've had 70 years of fluoridation in our country. We don't see IQ going down. It's going up. We don't see people getting cancer. We don't see all of these problems and that's what we do in public health. We monitor the health of our community and when we see something going up we find out why is that happening and with water fluoridation we're not seeing anything that's causing all the problems.

Now, I mentioned we had 15 communities where it was raised as a problem and where do they get their information. They get it from the same source that is sitting at this table from that fluoride action network and we bring it to the community. People raise all of these fears. We go over them one by one. We bring in our physicians, we bring in our dentists, we bring in our public health people, we bring in our water operators, we bring in a toxicologist and after much discussion at everything the decision makers say it's safe and effective. The data's overwhelming. Every credible, every credible major health organization in the country in the United States, just about everyone has supported fluoridation as safe and effective. Do you think the American Academy of Pediatrics is gonna support a public health measure that creates problems for children or the National Cancer Institute is gonna support something that causes

cancer? These are the things you need to consider. We're sort of reinventing the wheel here.

Chair Dale: Thank you, Doctor.

Dr. Allukian: And just my closing statement: You don't need to reinvent the wheel. If it's not broken you don't need to fix it. It works, it's helped your community and you should continue to do what's in the best interest of the community all ages, all sectors.

Chair Dale: I do recognize that we're not making a decision here today, um, however we are at bare quorum, I want to thank those that are still in attendance. Next on the list is Councillor Carlson.

Councillor Carlson: Thanks very much, Mr. Chairman. I've learned something scientific here today, that three out of five experts have a moustache.

Other than that I don't know if I'm any wiser or not. Uh, it's difficult for us because I think those of us who have been around for a while have been through eggs are bad, eggs are good, you know, coffee's bad, now it's good again. Now I've decided I just pick the answer that I like, you know, and then carry on from there. Red wine, etcetera.

So laypeople – it must be extremely frustrating to try to drill this, what, whatever side you're on this to drill it into the heads of people who are addicted to Dr. Google and, and, you know, and then worse of all like a jury we're charged to interpret all the information and come up with a verdict. So, uh, I don't envy you for coming, I know you're impacted, but I also like to believe that you're professional, compassionate and decent human beings before you started being doctors.

So in the course of a lifetime I want to hear from each of you everything you've read and learned and with – and taking into account you're doctors biased towards quick change. Are you more or less convinced of your position as time goes by? Is there some – are we, we drifting or going towards, you know, the exit of – the graduation of fluoride because there's enough in toothpaste and other programs or is this – or are you more convinced as time goes by that this is just a debate that comes up and that needs to be dealt with because truly, I am absolutely as neutral as you could be on it because I, I think everybody was a great speaker today and, and, and nobody wants to overmedicate the public and - I know it's not medication but, uh, we have to make a decision on this so I'm really – I'm none the wiser but I'm better informed. So if you – just tell me what your lifetime experience is and I – you know, I don't need – just be humans for a second. Thanks.

Dr. Juurlink:

It's tough to be human but uh – so I'll do my best. So the, the –

I'm obviously joking but, um, trying to lighten it up a little bit. Um, uh, I can't comment on the effectiveness of fluoridation. I defer all of that to these guys, um, but I can comment on the toxicity of it and with respect to the comments that were made earlier, Dr. de Villa when she came to me didn't know what my opinion would be about the toxicity of fluoride or about HFSA. Um, I don't – I've regularly been a thorn in the side of Health Canada, particularly during the last administration, uh, and I don't have any conflicts of interest that I can put on the table, certainly not with drug companies or anything like that.

So I sort of, uh – you know, I'm attuned to this issue of conflict of interest but I think I'm reasonably credible when it comes to the issue of human toxicity of chemicals and I, I hope that you consider that when you, um, make your decisions and you, uh, accept what I've told you about the toxicity. I don't have a reputation. I have no skin in this game at all. Um, but I, I do think that, uh – just a couple of quick points, 60 seconds I'll be done.

Um, you know, studying the effects of a long term intervention is difficult and so when Dr. Limeback says that in Kamloops they stopped fluoridating and the caries rate went down, they kept going down, that isn't the question. The question is how much more would they have gone down if the fluoride had been retained, okay. It's a really important question that I don't think there's an answer for. Um, but you know why there are so many studies out there that are confusing and causing people consternation? It's because they're so bad. If they were definitive, if they were good this would be settled. The reason you are still debating this is because a pocket of people has latched on to a totally plausible hypothesis that just isn't well supported by data.

There are thousands of studies out there of various sorts. If this was clear we already know by now from the data that are out there. The reason there are so many studies is because they are as bad as they are.

Dr. Connett:

Well, those studies were sufficient to persuade the national toxicology program to review the neurotoxicity of fluoride. But to come back to your question, I started this in 1996 [REDACTED] put a bunch of papers on my desk and put a cup of tea down. I should have been suspicious. And I said what's this and [REDACTED] fluoridation. I said take that away, these people are crazy. I had fallen victim of the prevailing attitude in the United States that people opposed to fluoridation were flat earth society, etcetera, and I didn't want to be stigmatized in that way. But I did read the literature and I was very, very struck at the time with a

couple of things. One, that whilst fluoride is not very reactive from a chemical point of view, it's extremely active biologically and then the second thing that struck me was how low the level was in mother's milk.

Now, we've heard from several speakers that there's plenty of fluoride out there. It's the thirteenth most abundant element in the uni – in our planet and it's 1.4 parts million in the sea. So now the question becomes in all the twist and turns of evolution why did nature in her wisdom give so little fluoride to the newborn baby. That suggests two things. One, that the baby doesn't need fluoride otherwise she's goofed or number two, that it is dangerous to nature and to the subtle, delicate mechanisms of biochemistry of the newborn baby. And then when you say well, is there evidence that fluoride is incompatible with biology and the answer is yes. It interferes with biology at a very fundamental level. It interferes with hydrogen parts, it complexes with many metal ions, metal – many metal ions like calcium and magnesium that we need to function properly and metal ions like lead and aluminium and getting them into places where they otherwise would not go.

So there's plenty of plausible reasons why evolution did not deliver – did not use fluoride in the mainstream of biochemistry and certainly did not deliver it to the newborn baby. That was very, very striking to me. The reason that [REDACTED] had put those papers on my desk is that evening Canton, New York where I live, the village of Canton, New York was discussing whether they were going to continue fluoridation and I said to [REDACTED] as we were walking in I said this one's going to be easy. I said when they hear what I read this afternoon there's no way they're going to continue this. When we walked into the chambers it was flooded. It was a whole posse of dentists from villages from miles around, one or two doctors, and, um, and we heard the usual stuff from dentists, no difference between fluoridation and chlorination, never seen any examples of dental fluorosis, etcetera, etcetera. [REDACTED]

[REDACTED] Then we got to the audience and the audience says well, I'm not a scientist but I trust my dentist. My dentist tells me it's good. Another one said I'm not a scientist but I trust my doctor.. My doctor. tells me it's safe.

Well, after the meeting I went up to the doctor in question and I gave him three papers. I said, "Would you read these?" He said "No, I don't have time to read those." I said, "Well, that's not very responsible. You've just heard these people saying that they trust you and you tell them it's safe." He said, "Well, I don't have time to read up on every subject that comes across my desk." And I said, "Look, I quite understand that. Don't get me wrong, I don't expect you to, but you shouldn't present yourself

as a professional who's studied the literature and it's your professional judgement that this is safe when all you're doing is parroting some professional body, somebody else, not your own."

And so the reason I mention that story is that that for me is a microcosm which I've seen all over the world that professionals are getting up on public platforms, dentists, doctors, health directors, federal officials and stating quite categorically that fluoridation is safe and effective when you find out later that they haven't studied the literature and that's what I find reprehensible.

Please remember that none of the people on this platform accept any liabilities for harm that may be caused in your communities. We are giving you advice and a lot of it is confident advice, but none of this advice is coming from the position that if we are wrong you're going to suffer. Take that in mind because it's you that are gonna have the liabilities, you, not us. You have the liabilities.

Now I think here we have a very useful exercise. Dr. Juurlink has said essentially that this neurotoxicity stuff in my book is crap, that these studies are worthless. Okay, where is his complete review of the literature? He pulled out one study, one study. Where is his review of the other 49 studies? Where is his review of the animal studies? Where is his review of the behaviour studies? What, what evidence can you produce to knock out the fact that fluoride interferes with the learning and memorization of animals? Surely that must make him blink just a little bit.

So what I'm asking for here is I, I can produce 314, they're all listed on our webpage, 314 red flags. How many green flags can Dr. Juurlink produce? Not reviews done by dummy review p-panels, but what primary studies can he say this is my green flag? This is my flag which enables me to suggest to you you don't have to worry about any of these neurotoxic effects at all or is it just pointing out at the weaknesses of the methodology? Is it an absence of study which allows him to conclude that there's no problem. As just as Dr. Juurlink has produced that, your chief medical officer told us categorically that they have done an objective analysis of the neurotoxicity and they have concluded that there's no problem.

All right. I hope that one of you councillors or all of your councillors will make sure that we have the document, the written document which supports that analysis and when you've got that written document and when you've got the contribution of Dr. Juurlink, then compare it with the evidence that we have produced; over 100 animal studies, 49 IQ studies, 34 memory

and learning experiments with animals, other neuro behavioural studies and fetal brain damage studies. It's called weight of evidence. Weight of –

Chair Dale: - Doctor., in fairness I'd like to move on.

Dr. Connett: Thank you.

Chair Dale: Thank you.

Dr. Limeback: So you asked about our life journey. I, I'll see if I -

Councillor Carlson: - Or a short version of it, yeah.

Dr. Limeback: I'll see if I can sum it up in-in a couple of minutes. Um, I went to University of Toronto to do a PhD in biochemistry. I was never trained as a dentist until I finished my PhD. In fact, I was still, uh, defending my thesis when I got into dental school. When I went to through dental school I understood that I was not question the dentists. If I wanted to get through I had, I had to follow what they said. When they poked on a tooth and they said there's a cavity there I had to fill it. That was my job as a student to follow their guidelines which are wrong and I stopped questioning.

With regards to fluoride my PhD was on collagen chemistry and one of the best inhibitors we had for the, uh, conversion, pro-collagen to collagen which makes up all your connective tissue, skin, bone, dentin, all the connective tissue in your body. The potent inhibitor was PMSF, phenylmethylsulfonyl fluoride. It's the fluoride the inhibit the serine proteinases and when I started studying, uh, enamel proteins I discovered that the serine proteinases were inhibited and so did a whole bunch of other, uh, good researchers, [Pem and Best 03:52:54] and, and all of these people that published in the literature found an effect of fluoride on the enzymes that were producing teeth that were responsible for the proper formation of teeth. There's all kinds of studies now to show that it, it interferes with the teeth.

When I saw all the fluorosis in my practice as a practising clinician I thought it can't be just the teeth. Fluoride has a devastating effect on all kinds of tissues in the body. So then I decided to try and study bone because I figured that's where it was accumulating and I got grants to study th-the effect on bones and we did a couple of really neat experiments that were chemical analysis of the bones, not epidemiological studies. We, we looked at this at a biochemical point of view looking at, at how fluoride affected the tissue. Like I said, it was not supposed to affect any other tissue except the teeth but we swallow fluoridated water. It affects all kinds of, uh, organs.

So as I was treating dental fluorosis trying to figure out to, um, improve the conditions of these kids' teeth, I discovered that the fluoride was, uh, was also causing damage to the enamel, was causing damage to the bone from our research and dentin inside your tooth and then I got asked to go onto this National Academy of Sciences, uh, review committee and I discovered from all of the literature that other people had started looking at of the problems with the thyroid, the problems with, uh, cancer. I could not believe all of these things that were being attributed to fluoride accumulation. Remember, it accumulates in your skeletal system. The bone cells sees a huge amount of fluoride and it's in your bodies right now.

So that's why I became so passionate about not only treating the kids with dental fluorosis but saying what are we doing? We can prevent dental decay with topical fluorides and toothpaste. Why do we need to drink it and cause all this damage to kids, kids' bodies? That's my, my story.

Councillor Carlson: Thanks very much.

Dr. Pollick: Everybody's got a story. So my story – in fact the – a Scottish psychiatrist R.D. Laing wrote on the politics of experience one time. Don't know if any of you read that book, but, uh, it's fascinating how we all view the same thing differently. We all to different – we – I attended a, um, a memorial recently, a funeral, and the people that got up and spoke about this individual, uh, you would think that that individual was different people to diff – to those individuals. We are different to different people and the subject of fluoridation is no different.

So it, it's based upon our experiences where we've come from and Dr. Juurlink is a toxicologist, a physician and it's coming from that point of view. Uh, Dr. Connett comes from the point of view of having some expertise in dioxin, uh, that he wrote about and, uh, so he's, he's got that frame of mind about, you know, waste and, and problems. Dr., um, Dr. Limeback.

Dr. Limeback: That's okay.

Dr. Pollick: I'm sorry, Hardy. This the first time we've met actually. Um, and, and he's coming from the point of view of, of a biochemist and, and when you're doing studies on, on, particularly on fluoride it's a very active element, uh, ion. It's the most electronegative ion in the table of elements. Um, that's why a very small amount can make a big difference. Um, so I'll tell you my experience.

[REDACTED] Our  
community wasn't fluoridated. [REDACTED]



So we're part of the pre fluoride generation whether it's toothpaste or fluoridated water. So that's part of my experience.

The other is that, uh, I was interested more in public health than in dentistry when I entered dental school and I eventually got a, a master's in public health at University of California Berkeley and during that time there was a fluoridation referendum on the ballot locally and so I got very involved and I studied fluor-fluoridation literature. I did a lot of papers on, on fluoride from various aspects. Um, I was asked to be the principle investigator for the, um, survey of children and to find out what their oral health needs were in California. We looked at over six and a half thousand kids, uh, and found that there was a 40 percent benefit for children living in a fluoridated area in terms of less tooth decay in grades K through three, primarily in their baby teeth.

Um, I've been involved with promoting fluoridation in California based upon my experience of having delved into the literature and my experience as a dentist seeing this dramatic change in terms of the kind of dentistry that we've been doing over the last 40 or 50 years that I've been a practising dentist. We used to have to drill every tooth and put multiple matrix bands on to fill amalgam into those teeth. Now it's a single tooth restoration that we're often doing. Um, people are flossing to the grave as I say. They're, they're uh, keeping their teeth throughout life.

I was involved in the 1995 California fluoridation law that promoted fluoridation and in the last 20 years we've gone from 16 percent, one-six, 16 percent to 62 percent of the California population now covered by water fluoridation. When communities are presented with the evidence from the pro and the con side, uh, they've chosen to fluoridate in the main. Not every community.

Um, I've been involved with a technical review on cancer, um, when a-a committee of the California EPA reviewed all of the evidence on cancer and they concluded that, uh, it's not a carcinogen. And lastly, I just want to quote from a book that I think is a fascinating read. It's a page turner. It's called "Fluoridation Wars", okay. It's how a modest public health measure became America's longest running political melodrama. And on page 363 after well referenced, uh, material that goes into everything that's been discussed today and more

it's a – and it takes a viewpoint of looking at the pro fluoridation movement and the anti fluoridation movement. It's written by two, uh, environmental hydrologists who don't have a stake in fluoridation. It's an excellent, uh, write – read. It says overall the pro fluoridation movement is the clear winner on the credibility front. Those to whom we usually turn for expertise on scientific, medical and technical matters speak pretty much with one voice in favour of the fluoridation paradigm. I could go on and talk about the negative things about the pro fluoridation movement but on balance they side with the pro fluoridation movement. I recommend this.

Dr. Allukian:

Well, good to speak to you again and, uh, I enjoyed the day though very frustrating because I've heard many things that are completely false and untrue and misleading. Uh, that's probably the purpose of this. Uh, I've been asked a number of times to be in debates on fluoridation and I usually say you want a circus, you wanna entertain people I'll do a debate, but you can't make an informed decision because, uh, it's very difficult when you hear different people from different perspectives and you don't know the signs, you don't know epidemiology, you don't know biostatistics, you don't know infectious disease rates and cancer rates and that was the problem we had in Massachusetts for years. For some ten years in Massachusetts it was a public vote as to whether or not a community fluoridates. As a result of that only seven percent of the state was fluoridated. So the legislature in its infinite wisdom formed a legislative commission to look at all of the studies what is happening in the state, pro and con, etcetera, etcetera, and they realized that if you have the public vote given the tactics and the misinformation that is used to sway the vote, the voters will not be making an informed decision.

Let me give you one tactic. We had one community that was fluoridated for three years. There was a petition that the public could vote on it again. The night before the vote a postcard was mailed to every household with a dead rat saying fluoride kills rats, it's gonna hurt you and your children and fluoridation was voted out of that community at that time. Now many years later they put it back in, but they put it back in because as a result of our legislative commission it was recommended that the board of health make the decision to fluoridate not a public vote. And if the public is concerned and gets ten percent of the registered voters signatures in 90 days then it can be a public vote. And after that decision was made we went from a couple of communities to over 140 communities in Massachusetts with fluoridation serving four million people.

Now it still comes up as an issue. I mentioned we had 15 challenges in the last couple of years. Why is that? Well, if you go on the internet and put in fluoridation you're going to get

every known malady that affects human beings is caused by fluoridation and we are misinforming and misleading thousands of individuals everyday with junk science on the internet. And when had these challenges in these different communities they would raise those issues, we would explain them, we would bring in – we have four medical schools in Massachusetts, Harvard, Tufts, BU and U Mass. I'm on the faculty of the three dental schools. We bring in the best experts, educate and inform people and the bottom line is in every single one of those communities we con, we continue with fluoridation and that's the position you are in.

You're hearing from, quote, experts who disagree and what you need to do is look at who are the reputable organizations and agencies, who are the reputable commissions where people have different views on epidemiology, biophysics and argue it out, the different countries that have done this over and over and it comes out safe and effective. Why would every state health department in the United States support fluoridation if it was causing harm? Give me a break. Two hundred and ten million people in the United States, 18,000 different water systems. We are not having any problems in our country with any of the diseases that are mentioned. Our IQ keeps going up. Hong Kong, highest IQ in the world, fluoridated since 19 [unintelligible 04:05:34] and they keep quoting the Chinese studies. Well, they don't mention the Hong Kong IQ which is the highest in the world.

So in closing who are going to believe? Are you going to believe the public servants that work for you in your health department, in the reputable and credible agencies of your country and your province or are you going to believe this study says this or that sort of thing? Look at the studies. Have knowledgeable people look at the studies, see which are evidence based. I mean one of the comments made here was when the Harvard study was done on osteosarcoma nothing was ever done to refute that. Totally untrue. Totally untrue. I gave you a paper that I had written with the documentation of that study that showed that that graduate student study, the largest study done more comprehensively showed that there was no relationship. So it's a question of who are you going to believe.

Chair Dale: Thank you. Uh, um, Councillor Sprovieri, I have – you're next, but I also have Councillor Tovey and Councillor Starr. They haven't had an opportunity to ask questions so I'll go, I'll go to them first then we'll – and then we'll close with the ... All right. So we'll go to Councillor Tovey.

Councillor Tovey: Yes, thank you, thank you very much and thank you, Mr. Chair. You're right, this has been an absolutely fascinating day and, and, and I must say it's been very good theatre as well. Um, I

guess part of our challenge is, you know, we're all – we're not experts. We're all generalists and we're expected to make some extremely important decisions on, on behalf of 1.4 million people roughly being generalists so we do have a tendency to rely on experts. Um, I've always been very statistically driven. Everybody on council knows that. When I look at reports I look at a lot, a lot of reports, I look at a lot of study and I'm sort of, sort of more with you, um, on, on some of the science that I've been reading in the last while and the internet is, uh, uh, does not seem credible to me, honestly. Um, but there was one study and I guess I wanted, um, Dr. Allukian to talk to which was the CDC study, this one here which is actually one of the best ones I've read and the interesting thing about this study and this is sort of what I look for when I'm examining studies, there was 11, uh, people on this, uh, recommendation, fluoride recommendation workgroup.

The CDC was the August 17, 2011 study that came out and, uh, I Googled them and they're some of the most impressive people in the United States as far as dentistry goes and chemistry and then they had a recommendations review committee that had 23 people on it which were again incredibly – I Googled a whole bunch of them and they're all very, very well respected, well recognized experts in their field. So that's a total of 33 people that looked at this and one of the people that was on it I noticed was a Myron Allukian Junior. So that would be your son, I guess [laughs].

Dr. Allukian: Actually it's –

Councillor Tovey: - No. I'm just kidding. So actually I found this to be probably one of the best studies I've read and I was wondering if you could comment on the quality of people that worked on this study and what the results were.

Dr. Allukian: Yeah. Uh, that was a long endeavour. I think we were two or three years in the process on that, uh, project. Uh, they had an initial group of people who worked on the report, then they brought in external reviewers. Uh, we had many, many discussions. We looked a variety of stories, uh, and essentially what we came out with is that fluoridation is safe and effective.

Now, people have taken that study and they have said well, it's only a topical benefit. There is a topical benefit there's no question, but there's also a systemic benefit and that's why fluoridation is good because, uh, one, your teeth are stronger and that lasts you through life and then you continue to get the topical benefit from community water fluoridation because as the water goes over the teeth it becomes part of the plaque and gets into the crevices and the saliva keeps bathing the teeth with

this demineralization and remineralization. So there is a topical benefit, but there's also a systemic benefit.

Uh, we did have the top people in the country on that. Sometimes we disagreed on how to interpret studies, but the bottom line was fluoridation is safe and effective and cost effective and practical.



Chair Dale: Thank you. Councillor Starr.

Councillor Starr: Yeah, I guess on – um, I used to watch a program many, many years ago and it was “Dragnet” and I don’t know if you remember but, uh, Sergeant Joe Friday would say to Detective Frank Smith – see, I remember those people – and they’d go out to the front door and a lady would come out and just the facts, ma’am, just the facts. And you know what, that’s the trouble [laughs]. I guess a lot of us probably are experiencing. Th-the, no matter which report you read it can be factual or it can – you know, or is it anecdotal and, and I think that it is very, very confusing. But to Dr., um, Limeback, uh, the one study that caught my eye was the water hardness. Uh, I don’t know if it’s a comparison or ... Is there any direct relationship and anybody can answer it – any direct relationship to the hard – or the types of water that are available in the world – you pointed out Canada and it’s quite a range. Uh, is there any sort of causal relationship, uh, between fluoride and the type of water and what’s put into that type of water? Uh, is there any effect basically or can there be?

Dr. Limeback: What I have seen from the literature is that nobody has actually studied epidemiologically the connection between various elements in the water and caries. What they have studied is when they do correlation with, um, the elements in teeth and looked at h-how much caries they developed they have those elements, um, and find associations in terms of lower caries risk. But it would be wonderful if they could do like the one study I showed comparing the ingestion of soft water versus hard water fluoridated to the same extent and it does make a difference in terms of absorption. You can absorb it faster if it’s hydrofluoric salicylic acid. And so, so there are studies out there but they’re not enough in terms of epidemiological.

Councillor Starr: Yeah, it just – actually it just jumped out at me because it almost seems like in the giant matrix that we’re trying to assemble that’s almost a sidebar that’s missing and I don’t know if that’s correct or not but I mean I, I, I take a look at that and, uh, maybe

in future studies, whatever, that'll be something that'll be included.

Dr. Juurlink: [Unintelligible 04:13:06] Limeback was talking about this [unintelligible 04:13:08] and as you were talking about it, I pulled it up. This is about the water hardness question specifically and if you read – I'll just read you one of the conclusions of the study. Um, if any differences, uh, in fluoride bioavailability which is a ten dollar word for absorption, uh, between drinking waters in which fluoride is present naturally or added artificially or the waters are hard or soft were small compared to the variation from person to person. So the normal person to person variation and absorption is there. The contribution of hard or soft water is trivial compared to that according to the McGuire study which you've – well, it characterizes it is very small and they're abstract.

Male Voice 3: [Unintelligible 04:13:49]

Dr. Jurrlink: Well, I'm just quoting them verbatim.

Dr. Allukian: Let me, let me just add. I-I think what you need to do is talk to your water engineers. Depending on your water system it can be anywhere between ten to 30 additives to the water supply in terms of making it clear, in terms of dealing with bacteria, in terms of odour, etcetera, etcetera. Uh, most, uh ... I-I-I should – I don't want to use the word civilized, but most progressive communities, um, have water standards to protect the public, uh, and to make sure that what is done to the water to make it safe and potable, uh, is based on the best science available. We have standards in the United States that every water department has to meet. We have national standards. The water is monitored also by the state. It's also monitored by the local community. They take samples, uh, as it's coming out of the water plant. They take samples out of the water system.

I'm not talking about fluoride. I'm just talking about in general. So in general, uh, where you have a progressive community and a good water system, uh, your water operators should know what they're doing because there are national standards. The question is are they being monitored and enforced and I would imagine in most major cities in most communities in North America that is being done. Now, someone – it's been said well, there are countries that don't have water fluoridation. Well, part of the reason is they don't have good water distribution systems or they have so many inlets it becomes, uh, too expensive to fluoridate the water and some of those countries have used salt fluoridation instead of water fluoridation. There may be 70 million people on salt fluoridation in different parts of the world.

So you have to look at the community and what is the ability of the community to serve the public and what is in the public's best interest. And as a public servant my whole life has been to do what's in the best interest of my community and that's true of every state health department in the United States and every major health department in the United States and I would imagine that's the motive of your health department to do what is in the best interest of the community to promote and protect the public's health.

Councillor Starr: And, and then I have one quick question on the actual systems itself and I, and I – as I was thinking or as I was listening I thought of Walkerton, uh, and I'm not sure if you can answer that or our, our staff but how, how is the fluoride or the, the actual chemical fed into the system? Is it a drip feed or is it a bulk feed or, uh ... I mean, I, I'm interested because I'm just thinking that okay, is it, is it a bulk dump feed uh-uh-uh, you know, is it 10,000 parts per million as it goes in and then it mixes with all the other water, uh, or is it uh-uh-uh, you know, like an intravenous that's monitored? I-I-I don't –

Chair Dale: - Councillor Starr, I'm going to ask staff to answer that. I think Mark's here, I believe.

Mark Schiller (ED of Water and Wastewater): Yeah, to use terms you use it's more like a drip feed. It's a, it's a large – stored in a large tank and then metering pumps pump it in slowly based on how much water we're making to hit that target of .7 milligrams per litre. So if we make more water we add it a little more quickly, if we're pumping less water on a day like today versus the summer we'd be adding it more slowly.

Councillor Starr: Okay, great.

Mark Schiller: It'd be great to look at smaller communities because I visited a small community where they had problems with their water pipes and drinking water pipes. Uh, they were so badly gunged up. Um, like Flint's having a huge problem right now and so what happened was that they had to actually load the system at the plant with two or three parts per million to get the .7 parts per million at the other end. So those poor people at the beginning of the plant, uh, uh, where the water was being served, those houses were at the maximum and the people at the end were at the optimum which didn't make sense at all.

Chair Dale: Thank you, Councillor Starr. Councillor Sprovieri.

Councillor Sprovieri: Yeah, thank you, Mr. Chairman, and, uh, uh, finally I get, I get to ask a question Mr. [Lodiak 04:18:01]. Dr. Allukian, uh, just to, uh – I listened to you very carefully about you said there's no

problems in the U.S. with health problems and, you know, the – and, and fluoride helps, uh –

Dr. Allukian: - Not, not with fluoridation. Not from fluoridation.

Councillor Sprovieri: No. No, um, just in general there's no – you know, there's – but I understand that, uh, they're calling for one in every three people will get cancer. Uh, they're – I read that, uh, the Hispanics and black African Americans they have the highest, um, fluorosis level and they also have the lowest IQ levels in the U.S. That's the people that are the most at risk and the poorest of the U.S. population. So I don't know whether it's a correlation to that or not. Uh, you also said that, uh, this has been before the courts a number of time. There's three cases, uh, that, uh, I was able to dig up. They were very high profile cases where, uh, um, this, um, fluoridation was, uh, was challenged and one was, uh, uh, uh, was in [Aikenda] versus Westview. The trial judge, uh, he concluded based on all the information that he received from all the experts – it was a very prolonged, uh, trial and he concluded at the end of the day there was enough evidence that, uh, fluoridation caused some health problems. The other one was, uh, in Illinois, Pure Water Committee versus the Director of Public Health, uh, that, uh, the judge also, uh, went in favour of the, uh, of the people who were challenging, uh, with the same conclusion and –

Chair Dale: - Councillor Sprovieri, I'd appreciate if you'd get to a question.

Councillor Sprovieri: Okay. I'll come to the question. And, and the next one was, uh, Texas versus City of Houston, uh, the water – the Safe Water Foundation versus the City of Houston. The same thing came about. The judge ruled in favour of the challengers and said that there was enough evidence from the medical evidence that there was – uh, that fluoridation, uh, causes health problems. And in all three cases the state used its police act that overruled the ruling in those three cases.

Dr. Allukian: Okay, let me clarify that. You mentioned Illinois and Pennsylvania specifically. Uh, you mentioned the lower courts. Uh, that Pennsylvania case, uh, has been mentioned by, uh, Dr. Connett's predecessor, Dr. Yiamouyiannis a number of times. Uh, the Pennsylvania Supreme Court – uh, with both Pennsylvania and Illinois the U.S. Supreme Court said there's not a problem just so you know that. Those, those two – and the supreme court, as you know, is much higher –

Councillor Sprovieri: -Yeah, I know the supreme court. Yeah.

Dr. Allukian: - than the lower courts. So both those supreme courts said there's no problem. I'm not familiar with what happened in Texas, but Houston is still fluoridating today. Uh, and

sometimes people against fluoridation have said well, these have been raised in court and they try restraining orders. Uh, there was no restraining order in Houston to stop fluoridation that I'm aware of. It's continued to fluoridate. Uh, so I would go with 20 U.S. Supreme Court's decisions that have all said essentially the same thing, it's safe, effective, not a problem.

I think the fact that the U.S. Supreme Court of the whole country which is made up of Republicans and Democrats with different points of view has, has denied reviewing fluoridation as an issue 11 times. To me that – the weight of the evidence is there. I can find some judge somewhere who may be confused and say something, that's easy to do, but you need to look at your state supreme courts, you need to look at the U.S. Supreme Court and that's how I would make my decision, not an isolated case of a lower court with something happens and I think that happened in the 70s or 80s, uh, the one in Pennsylvania. I think it was –

Councillor Sprovieri: Dr. Connett, you have something to say about that?

Dr. Connett: Yeah. I, I, I do want to clarify this situation. Whilst it's true that the higher court threw out these three decisions, they didn't throw them out on the scientific grounds, on the actual evidence. They threw 'em out on jurisdictional grounds. So please remember, three –

Councillor Sprovieri: - That's what I read, yeah.

Dr. Connett: - three, three courts in the United States including Judge Flaherty who was a member of the Pennsylvania Academy of Sciences who knew the issue who heard from experts from both sides like today under oath concluded that fluoridation is harmful. That's what the conclusion was based upon testimony under oath, uh, cross-examination, etcetera, that fluoridation was harmful. Then the higher courts were brought in and said you don't have the jurisdiction to rule against this and it was thrown out on legal grounds.

Councillor Sprovieri: And what about this, uh –

Dr. Allukian: - Can I respond to that about Judge Flaherty because it –

Councillor Sprovieri: - Uh, can I just – can we – can I just ask the – the other clarification I read and actually we had a petition sent from the Latino American Union just recently and, and they're claiming that Hispanics have the highest, um – and the black Africans have the highest, uh, fluorosis level and the lowest IQ levels also in the U.S. Are you aware of that Dr. Connett?

Dr. Connett: CDC 2005 has a table, table 23 which clearly shows that black Americans, Hispanic Americans have higher dental fluorosis

rates than whites. There's no, there's no clear reason why that is so, but of course the concern is that they might also be more susceptible to other toxic effects of fluoride which allows me address something that's been discussed several times. We see no evidence of-of-of harm. No evidence of harm. Well, it's interesting. There's an epidemic of hypothyroidism in the United States. There's an epidemic of arthritis in the United States. What do we know about those two diseases? We know that Doctors used to use fluoride tablets to lower thyroid function in the 30s, 40s and 50s in Argentina, France and Germany. Uh, and the-the-the doses that they gave them were comparable to what we're getting today. But knowing that, no fluoridated country has ever attempted to see if there's any connection between fluoridation status or fluoridation dose, whatever, and hypothyroidism. They simply have not done it. But recently, last year, Stephen Peckham did this in the U.K. and he did find a relationship. It's not the end of the world. The-the-they probably call it weak evidence. But he found with the general practices reporting from 98 percent of the general practitioners reporting in England he found on the incidences of hypothyroidism it was higher in the fluoridated communities than the lower fluoridated communities, about two to one comparing Manchester and, and, and Birmingham.

As far as arthritis is concerned even though we know it's well established that the first symptoms of fluoride poisoning of the bone is just like arthritis, pains in the joints, stiffness in the joints, pains in the, in the bone. And yet none of these health authorities have ever attempted to see if there's a connection between fluoridation exposure, fluoridation exposure or fluoridation status. Then there's another thing. Somewhere between one and four percent of the population may well be hypersensitive to fluoride, super sensitive to fluoride. It's what you would expect, normal distribution curve, you expect most people to have an average response, some people to be super resistant and some people super sensitive. It's what you would expect.

Despite the fact that we have literally thousands of individuals reporting symptoms which occur when they're exposed to fluoride and disappear when they remove the source of fluoride come back when they have it again, things like – simple things like nausea and rashes and, and a number of other headaches and so on, migraines, not one single government that promotes fluoridation, not one health agency in any of these countries including Health Canada has ever attempted to put this on a scientific level. They've just let these people just swallow in their own problems without attempting. Even when citizens have offered to be guinea pigs in double blind studies they still have not done it. And so again I come back to a phrase which I hope you remember. When policy is king science is a slave and you

can see that again and again and again and it most ob-obviously manifests itself in several things. One: The studies are not being done. The conclusion is the absence of studies the same as the absence of harm. Number two: When studies are done they are conducted by pro – known to be pro fluoridation panels.

In fact, if you go to this book that Howard mentioned, one of the things that they could see there in that book is that what – they say one thing that the fluoridation is – anti fluoridationists are correct on is the way that panels are selected by governments to come back with these rubber stamps like Health Canada in 2010, 2011. It's, it's, it's there. They said there's an incestuous relationship between the, the experts that appear again and again in these panels. You referred to 2000 – CDC 2001. Perhaps it's time to just put the CDC into perspective here. The CDC only has one small division involved in fluoridation. They have 30,000 staff at the CDC. They've got specialists in everything under the sun, but only 30 people in the oral health division are involved in fluoridation and their job is to promote fluoridation. They don't study the health effects of-of fluoridation. They promote it. And these 30 people are largely dentally trained.

Now let's take the statement that was made by the Minister of Health here, David Hoskins I think his name is, who quoted the Centre of Disease Control saying that fluoridation is one of the top public health achievements of the 20<sup>th</sup> century. Let me tell you about that. That was written by two people; one, a dentist who had never written anything on fluoride before and two, an economist. The, the study that underpinned that statement was not externally peer reviewed. The CDC has an in house journal called "Mortality and Morbidity Weekly Report". That is not externally reviewed. It's essentially reflects CDC policy. CDC policy is the promotion of fluoridation. And so when you – you-you're looking at a lot of self fulfilling prophecies here. You got two chains of command. You got the Centre of Disease Control in Atlanta, Georgia which actually pays for employees in various state health departments. One of the people that you'll find there are state oral health directors. It's carrying out policy. Bureaucrats know that when they're in a bureaucracy if they challenge policy their job is on the line. They're risking their jobs. And so throughout Canada we got medical officers of health who are essentially rubber stamping the policy of Health Canada. There isn't independent statements here. But again, I come back to, to, to one thing. I've said we have heard from this medical officer of health that they've done a thorough, objective analysis of the, uh, the neurotoxic effects. Please, let's make sure that you have that side by side with our analysis of the neurotoxicity and see whether the red flags outweigh the, the green, green flags.

Dr. Pollick: I'd just like to say that CDC reviews the latest evidence and if they hadn't reviewed the latest evidence they wouldn't have adjusted the fluoride level for community water fluoridation to .7. They extensively reviewed the evidence including all the comments that were sent by Dr. Connett and me and everybody and they concluded that the evidence supports water fluoridation. They do review the evidence. They're just not promoting, uh, policy.

Dr. Connett: It was a pathetic review.

Councillor Sprovieri: So can, can I just –

Chair Dale: - Actually, we're getting into debate and I –

Councillor Sprovieri: - I just – I'm not –

Chair Dale: - Excuse me, Councillor Sprovieri.

Councillor Sprovieri: Well, I still have questions.

Chair Dale: Yeah, but we are getting into debate and I'd rather it stick to the questions.

Councillor Sprovieri: So a question to you Dr. Pollick is that so there was a problem with the, the previous dosage of 1.5 that, that people were receiving for ages and finally they, they said oh, it's too much, we have to reduce it because it's harmful. Now how do we know that ten years from now they're going to say oh, .7 is too high and we had better reduce it to .5 or maybe to .2. So from my understanding, Doctor, is that this level has been reduced over the, over the years. So here we are today. Uh, they admitted that there was a problem at 1.5 so you better reduce it to .7. Is that, is that right?

Dr. Pollick: I think they do review based upon credible evidence and the evidence showed that there was, uh, uh, a change in the knowledge base of how much water is consumed by, uh, individuals. Previously it was based upon climate. In hot climates people drink more water as you've heard. In cold climates the –

Councillor Sprovieri: - So-so-so basically –

Dr. Pollick: - water district doesn't use as much water.

Councillor Sprovieri: - 1.5 was a problem then.

Dr. Pollick: It wasn't 1.5. It was between .7 and 1.2 –

Councillor Sprovieri: - There was a problem.

Dr. Pollick: - and it was, uh, not so much as a problem, but they wanted to reduce the risk of dental fluorosis for young children. As been said before, the risk for dental fluorosis has been demonstrated to be due to swallowing of fluoride toothpaste by young children and, uh, uh, wrongful taking of fluoride supplements and so water fluoridation does contribute about ten to 15 percent of very mild to mild dental fluorosis and the increase found in dental fluorosis could have been changed as they did in Australia by introducing lower concentration of fluoride in toothpaste and abandoning the use of fluoride supplements as well as reducing the fluoride concentration of water as was done in Canada based upon the evidence.

Councillor Sprovieri: Okay, I understand. Now to Dr. Allukian -

Dr. Allukian: Could I answer that -

Councillor Sprovieri: - you mentioned that Hong Kong has the highest IQ level.

Dr. Allukian: And I'm not saying it's because of fluoridation. I'm just throwing it out so you know.

Councillor Sprovieri: But I'm - uh, just from my understanding they're a seafaring island, very rich. They eat most - a lot of fish which is very high in Omega 3 which is actually, actually very good for the brain. Uh, would you not - would you say that is correct or not?

Dr. Allukian: I'm not familiar with Omega in fish but I know that fish has fluoride in it as well. But let-let-let me get back to the, uh, zero - the fluoride level and the change. Uh, studies show - it used to be that the fluoride level was 0.7 to 1.2. So if you're in a hot climate the recommended level was 0.7 because you're drinking more water. Uh, if you're in a cold climate you're drinking less water so it was 1.2. And studies show that with air conditioning, the way the heating systems are, whether you're in a hot or cold climate your water intake is the same. So they said because it's the same we can have one national standard at 0.7 and that's how they came to that.

Now, in terms of fluorosis which has been raised many times and we've said many times its primarily due to fluoride toothpaste and a second source of systemic fluoride like fluoride pills and drops and prescriptions, fluoride toothpaste in the United States is anywhere between 1,000 to 1,500 parts per million of fluoride. One thousand to 1,500. So if a child at a very young age is consuming too much fluoride toothpaste they're gonna get - they may get fluorosis and that, that is why we recommend that for very young children that they - their teeth - with a fluoride toothpaste they're supervised by their parents and they're-they're not doing this on their own and that there's a

very small amount of fluoride toothpaste on the brush. So that's the relationship in terms of fluoride toothpaste and fluorosis.

Councillor Sprovieri: Can Dr., uh, Juurlink mention – talk about Omega 3? Uh, sorry, uh, uh, the benefits of Omega 3?

Dr. Juurlink: Not with any genuine wisdom. It's not – I mean it's – my sense is that Omega 3s are, uh, advocated primarily by companies that sell them. Uh, but I think a very important point has to be made and I think Dr. Connett, um, you know, he's made it for me in a sense. The-the – this business about the thyroid, uh, finding for example, that fluoridated communities might have more hypothyroidism, underactive thyroid than non fluoridated communities. Um, it highlights what's wrong with these studies. As it happens, we know what the cause of almost every single case of hypothyroidism is. It's a burned out thyroid from autoimmune disease or from an overactive thyroid or from having your thyroid taken out. Um, we know from randomized trials – I showed you a randomized trial. Twenty milligrams of fluoride a day. It's the equivalent of drinking 25 or 30 litres of water at .7 parts per million for years and you know what they didn't find? Hypothyroidism is one of their outcomes.

So I think it's, it's a good example of how these association studies generate conclusions that are easily accepted if you haven't actually unpacked the analysis loaded but they're wrong and he, he's just given us a good example of that.

Dr. Connett: Well, the point I was making though is that even though doctors were using fluoride to lower thyroid function and it was successful, even with that knowledge governments have not conducted any study whatsoever to investigate this possible relationship and when – that's extraordinary to me. It seems to fly in the face of basic scientific understanding, just flies in the face of it. What is the rational explanation? They don't want to find a problem with fluoridation. They don't want to find it.

Dr. Juurlink: I mean we have a large randomized trial or years of taking massive doses of fluoride with no increase in hypothyroidism.

Dr. Connett: Well, we have –

Chair Dale: - Okay, I'm gonna to, I'm gonna cut off the – sorry. Gentlemen, I'm gonna cut off that debate and Councillor Sprovieri, do you have –

Councillor Sprovieri: - One final question.

Chair Dale: Okay. Just the one person I will.

Councillor Sprovieri: Yeah, Dr. de Villa. Yeah, just to Dr. ... Dr. de Villa, um, you in your presentation you, you've quoted, uh, a statement, uh, from

the American Dental Association. You said water that has been fortified with fluoride is similar to fortifying salt with iodine, milk with Vitamin D and orange juice with Vitamin C. That was in your, uh, in your presentation there. I, I wrote it down word for word.

Dr. de Villa: Yeah. I didn't make any comment in respect of orange juice and I didn't attribute anything to the American Dental Association.

Councillor Sprovieri: Well, I know you didn't, but that's – the American – that's actually the American Dental Association that, uh, also has made this statement. So I don't know whether you also developed that idea or whether you got it from this but ...

Dr. de Villa: I was simply talking about the practice of the fortification of food and water products.

Councillor Sprovieri: Yeah. Okay. So, so, so here's a question for you. Um, from my research I, I've learned that, uh, water fortification, um, minerals like, uh, iodine and Vitamin D and Vitamin C are classified as a, um, natural, uh, health product in the Health Canada classification of, uh, the various products related to health. So I have the list of all the – uh, and they classified it as a natural health product, these, um, these, um, that you mentioned like iodine and Vitamin D, Vitamin C. Health Canada regulates, uh, the hel – the natural health products. They regulate. Uh, it's a regulated ... Uh, Health Canada – um, in 1957 the Supreme Court of Canada ruled that, uh, uh, the fluoridation was a medication and in turn, um, in order to, uh – uh, they could have regulated it based on that decision but they did not. So they turn around and said oh, no, water fluoridation is a water treatment chemical.

So we have a memo from Health Canada that was sent to Peel Region 2000 and – last year, 14 and also in 2002 – 12 that says that fluoridation, uh, is a water treatment chemical. Now, my understanding is that water treatment chemicals are like chl-chlorine which is a water treatment chemical is regulated by MOE, Ministry of the Environment, yet neither Health Canada nor MOE will regulate fluoride. And even though you say that it's a, it's a, it's a nutrient –

Chair Dale: - Mr. Sprovieri, what's your question please?

Councillor Sprovieri: So the question is why has Health Canada and the province of Ontario washed their hands of responsibility and liability and give it to us councillors who really don't know too much about it to make this very important decision which we could be liable and there's – as you know, there's a lawsuit against us that, uh, is pending. So-so the question is why do you think neither Health Canada nor MOE will take responsibility and regulate

this product that you claim is like a natural health product, it's a fortification.

Dr. de Villa: So through the chair, I-I-I don't think I'm in a position to speak for either Health Canada or the Ministry of Environment and climate change. My comment in the remarks that I made this morning were in respect of actions that we take at a population level when that particular action has the potential to provide immense benefit to a population. So that was the kind – that was the statement I was making in respect to water fluoridation –

Councillor Sprovieri: - Well, but Dr. de Villa, Dr. de Villa, in all due respect –

Dr. de Villa: - And if I may, the point I was trying to make is that it is similar in that regard to such practices as the fortification of milk with Vitamin D or the addition of iodine to salt and in fact, the use of immunization or the requirement to have immunization amongst school children because again, these actions actually have a potential – a great potential benefit to our population at that population level.

Councillor Sprovieri: So Dr. –

Chair Dale: - Councillor, Councillor Sprovieri, I-I've been pretty lenient and we're, we're getting in more debate. We-we'll have an opportunity –

Councillor Sprovieri: - Can I ask a question?

Chair Dale: We-we'll have an opportunity to –

Councillor Sprovieri: - The question was why is this responsibility given us to councillors when the province or the federal government should be responsible for this product whether it be a health – uh, whether it be, um, a, a health product which they claim or whether it be a water treatment chemical which they also claim. So, so why are we being given this responsibility and, um, and, uh, uh, and, and ... So, so it's you're saying because you believe it's, it's helpful and it's good but then we hear the other experts say that there's no actual studies. I have a report here Dr. – Mr. Chairman from – can I, can I just finish here?

Chair Dale: Yes. Yeah, actually – no, Councillor Sprovieri, I'd like to hear from Patrick.

Regional Solicitor: The questions are becoming[Unintelligible 04:43:06]

Chair Dale: Yeah, we've got to be careful John. You really have to be cautioned.

Councillor Sprovieri: Well, we're in camera, right?

Regional Solicitor: You really have to be cautioned that you're not properly in camera if you pursue that course of action.

Councillor Sprovieri: Okay. All right. Can I ask then, Mr. Chairman, a last question?

Chair Dale: You said that the last time.

Councillor Sprovieri: I know, but it's related. Um, last year and, uh, actually two years ago, June 22, 2014 I received a, a, a – uh, myself and members of council received a memo from, uh, our, our commissioner Janette Smith and, um, and Dr. Mowat who at the time was a health medical officer and it went to, also to Patrick O'Connor and the solicitor and, uh, in that memo it states this. When HFSA is added to our water the concentration of fluoride, ions, is increased, but trace amounts of other elements like lead and arsenic can also be present. The NSF looks to the toxicology studies that Health Canada and the U.S. EPA have performed and to, and to the maximum limits that they have set for these impurities in water. Yet we have a memo from, uh, both Health Canada and the U.S. EPA and they say we do not perform toxicology testing on HSF – on H – uh, on fluoride. So, so, uh, I don't know where you got that information, Dr. de Villa, that – or even, uh, uh, Janette –

Chair Dale: - Councillor Sprovieri, I-I-I don't believe that's part of this –

Councillor Sprovieri: Can I ask –

Chair Dale: - No. No. Actually –

Councillor Sprovieri: - So can I ask, uh, does Health Canada actually do or EPA do toxicology testing, Doctor, uh, uh, that you're aware of?

Dr. Pollick: Can I answer the question.

Councillor Sprovieri: Yeah, I know, but are you aware of any toxicology tests have been done.

Dr. Juurlink: Your question is relating to the toxicology comments [unintelligible 04:45:14] and it sounds like there's someone who's better able to answer that.

Dr. Pollick: So, uh, the toxicology of, uh, HFSA is not done because –

Councillor Sprovieri: - What about, what about –

Dr. Pollick: - because the toxicology of HFSA –

Councillor Sprovieri: - Okay, okay, okay. I understand that. You –

Dr. Pollick: - HFSA, I answered this question before is not part of the water that you drink.

- Councillor Sprovieri: So has it, has it been done on, uh ... Well, it says right here in the report it's been done. It just – I just read it.
- Dr. Pollick: Toxicology – you said the toxicology of HFSA has not been done.
- Councillor Sprovieri: No, here it says it's been done by either, uh, Health Canada or UP – or the U.S. EPA.
- Dr. Pollick: Well, what they do is that they, they test drinking water, the water that you drink. It doesn't have HFSA in it.
- Councillor Sprovieri: Who, who tests for that?
- Dr. Pollick: Well, the water company, the water district. Every water district monitors the contents of water that's other than H<sub>2</sub>O and you can see that in the water quality reports.
- Councillor Sprovieri: So – okay, so doctor. do, do they do, uh, toxicology testing on fluoride?
- Dr. Pollick: Water is safe to drink if it meets the regulatory standards. The regulatory standards are set under the, uh, safe drinking water act that you mentioned earlier and, uh, so the regulatory language is there. Uh, your public works department representative could answer that question better than me.
- Councillor Sprovieri: So, so Dr. Pollick, I read that, uh, toxicology testing is done on, on, uh, uh, chlorine which is a water treatment chemical. There's toxicology testing done on that. So why is there toxicology testing done on fluoride which my understanding is there are about the same amount of – they're almost i-i-identically toxic to each other.
- Dr. Pollick: I defer it to the public works department, uh, uh, to, uh, to answer that question.
- Councillor Sprovieri: And any other, anybody else answer, Dr. Connett or Dr. Limeback, uh, this question.
- Dr. Allukian: I'm not sure we understand your question. Is your question –
- Councillor Sprovieri: - My question is ...
- Dr. Allukian: - why aren't toxicology studies done on fluoridated water? Is that your question?
- Councillor Sprovieri: No. On, on fluoride.
- Dr. Allukian: On fluoride in what, in what form?
- Councillor Sprovieri: How does, how does fluoride affect – we heard fluoride affects –

Dr. Allukian: - You mean the fluoride ion?

Councillor Sprovieri: We heard fluoride affects people possibly with all kinds of ailments, uh, from the other doctors.

Dr. Connett: Quite frankly, I think the real issue is fluoride's toxicity, particularly neurotoxicity. But putting that to one side, the arguments on the other side is that HFSA given a large excess of water it's an equilibrium. It dissociates. And they're arguing that PH7 at the water works this will be completely dissociated. So there's absolutely no need to do any studies on HFSA itself because we should really assume it's just like fluoride. So we've done the studies on fluoride, ions, many studies. Okay. Now, the problem with this is that the study done in the University of Michigan showed indeed that with a large excess of water and we got a large excess here, 180,000 to one, this hexafluorosilicic acid does completely dissociate, but it is PH dependent. In acid conditions there is a persistent pentafluoro silicone complex.

Okay, so we have a possibility and no one has investigated it but it should be put on the table. Again, for me, I think the issue is fluoride ion, but this come to ... What happens when you get a mixture of hydrated silica and fluoride ions coming from the water department and it goes into your stomach? When it goes into your stomach you get a PH of one or two at which point these entities can re-associate and form the pentafluoro silicone complex which nobody has studied. So if you really want to get acute on the chemistry of what's missing it's what is the potential impact of this, uh, penta silicone fluoro complex. Nobody knows because no one has studied it.

You might also throw in the fact that if you make soda pop, um, um, drinks, the, um, fizzy drinks. If you make fizzy drinks with, um, fluoridated water, again if hydrated silica and fluoride ions are there the equilibrium again could be shifted back to a silicon fluoride complex. No one has studied this, but don't be surprised. This is so arcane a study compared to the vast majority of studies that they should have done and one of the conclusions from the National Research Council chairman, uh, Dr. [Dual], was that how surprised they were considering how long fluoridation has been going on how so few answers to very basic questions about fluoride toxicity have been conducted.

Chair Dale: Doctor., I'm going to cut you off there.

Dr. Connett: Thank you.

Chair Dale: Councillor Sprovieri, fine. I'm just going to ask David. He had a couple of points he just wanted to raise and then we'll conclude.

Chief Administrative Officer David Szwarc: Are these mics on? Yes. Councillor Shaughnessy the – uh, sometime earlier today asked the question arising from this information that was provided, um, and Dr. Ito, Dick Ito's study was mentioned. The committee had asked staff to do a summary of Dr. Ito's, uh, study and to also to ask Dr. Ito himself to summarize in his own words what his study said. Both the staff summary and Dr. Ito's summary was provided to you and is attached to the agenda. So if you didn't get a chance to see it I wanted to bring it to your attention because he describes his study he did in Caledon and he also describes in his own words how that study should be interpreted. So I bring that to your attention.

Male Voice 4: [Unintelligible 04:51:25]

Chair Dale: No. No, that isn't a – well, you can bring it. I can –

Councillor Sprovieri: Can you bring this back to in camera for our next council meeting because I have a number of questions [unintelligible 04:51:34].

Chair Dale: Okay. Uh, I have a, a resolution moved by Councillor Ras, seconded by Councillor Kovac that council move out of in camera. All in favour. Opposed if any. I have a motion moved by Councillor Groves, seconded by Councillor Carlson that the in camera presentations listed as items 8.1, 8.5 – 28.5 inclusive listed on the January 21<sup>st</sup>, 2016 special regional council agenda be received and further, that the oral in camera report from the medical officer of health listed as item 8.6 regarding water fluoridation, council education session (a meeting held for the purpose of educating or training the members) be received. All in favour. Opposed if any. Carried.

I have another motion moved by Councillor Starr, seconded by Council Parrish that Bylaw 8-2016 to confirm the proceedings of special regional council meeting at its meeting held on January 21<sup>st</sup>, 2016 and to authorize the execution of documents in accordance with the Region of Peel bylaws relating thereto be given the required number of readings, taken as read, signed by the regional chair and the regional clerk and the corporate seal be affixed thereto.

And just before we adjourn, I certainly on behalf of council want to thank all of you gentlemen for coming here today and, uh, uh, expressing your expertise with respect to this topic and, um, I, I think it's been a very informative meeting. Um, I think it was a lot of good questions were answered. I, I think it certainly helped us, uh, for future decisions that we have to make and, uh, I also want to thank staff for organizing and arranging this offsite meeting here today and particularly, I want to thank all of

the councillors for attending today, especially all of you who stayed for the full session, greatly appreciate it.

Um, I have a motion moved then by Councillor Palleschi and seconded by Councillor Innis that the January 21<sup>st</sup>, 2016 special regional council meeting be adjourned. All in favour. Carried. Thank you.

[End of recorded material 04:53:35]