Submission to Calgary Council

by

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Member of the 2006 NRC Committee
on Fluoride in Drinking Water
This submission to Calgary Council summarizes:

- the weak evidence of fluoridation’s effectiveness
- the exaggeration of the reports that stopping fluoridation dramatically increases dental decay
- how humans react to swallowing fluoridated water
- a realistic cost-benefit estimate of fluoridation
- adverse health effect of swallowing fluoride
- how the CADTH report is biased and misleading
• the weak evidence of fluoridation’s effectiveness
• the exaggeration of the reports that stopping fluoridation dramatically increases dental decay
• how humans react to swallowing fluoridated water
• a realistic cost-benefit estimate of fluoridation
• adverse health effect of swallowing fluoride
• how the CADTH report is biased and misleading
WHAT IS THE EVIDENCE THAT FLUORIDATION IS EFFECTIVE?

There is not a single prospective double-blinded controlled trial (RCT) on fluoridation - this is the usual evidence needed for approval of medications.

-evidence comes from weak UNBLINDED cross-sectional studies or non-randomized before and after studies.
Pyramid of evidence for ‘proof of effectiveness’

York, Cochrane, NHMRC, CADTH reviews are NOT these kinds of reviews

ALL water fluoridation studies are NOT RCTs

Anecdotal reports (e.g. from one dentist)

RCTs are randomized, double blinded & prospective studies on individuals, not cities

Ecological studies (non-randomized) - fluoridation studies are un-blinded

Biased

Lowest Form of Evidence
Even if there were benefits from fluoridation they are very minor
from 2012 textbook by H. Limeback

Table 16-4 A summary of recent publications on surveys of the dental decay rates in children

<table>
<thead>
<tr>
<th>Study author</th>
<th>Country</th>
<th>Number of subjects</th>
<th>Age of subjects (years)</th>
<th>Surfaces saved with optimum fluoridation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heller et al. 1997</td>
<td>US</td>
<td>18,755</td>
<td>12</td>
<td>0.5*</td>
</tr>
<tr>
<td>Brunelle and Carlos 1990</td>
<td>US</td>
<td>16,498</td>
<td>12</td>
<td>0.5*</td>
</tr>
<tr>
<td>Angelillo et al. 1990</td>
<td>Italy</td>
<td>643</td>
<td>12</td>
<td>0.6</td>
</tr>
<tr>
<td>Selwitz et al. 1998</td>
<td>US</td>
<td>495</td>
<td>8-16</td>
<td>1.2</td>
</tr>
<tr>
<td>Ismail 1991</td>
<td>Canada</td>
<td>219</td>
<td>10-12</td>
<td>0.7</td>
</tr>
<tr>
<td>Clark 1991</td>
<td>Canada</td>
<td>1131</td>
<td>6-14</td>
<td>0.8</td>
</tr>
<tr>
<td>Slade et al. 1995</td>
<td>Australia</td>
<td>9,690 vs 10,195</td>
<td>5-15</td>
<td>0.2</td>
</tr>
<tr>
<td>Jackson et al. 1995</td>
<td>US</td>
<td>243</td>
<td>7-14</td>
<td>2.0*</td>
</tr>
<tr>
<td>Kumar et al. 1998</td>
<td>US</td>
<td>1,493</td>
<td>7-14</td>
<td>-0.2</td>
</tr>
<tr>
<td>Armfield and Spencer 2004</td>
<td>Australia</td>
<td>5129</td>
<td>4-9</td>
<td>1.5</td>
</tr>
<tr>
<td>Komarek et al. 2005</td>
<td>Belgium</td>
<td>4468</td>
<td>7-12</td>
<td>NS</td>
</tr>
<tr>
<td>Spencer et al. 2008</td>
<td>Australia</td>
<td>8183 (SA)</td>
<td>5-15</td>
<td>NS</td>
</tr>
<tr>
<td>Nyvad et al. 2009</td>
<td>Lithuania</td>
<td>300</td>
<td>12-15</td>
<td>NS</td>
</tr>
<tr>
<td>Ekstrand 2010</td>
<td>Denmark</td>
<td>191 municipalities</td>
<td>15</td>
<td>1.0-2.0</td>
</tr>
<tr>
<td>Armfield 2010</td>
<td>Australia</td>
<td>128,990</td>
<td>5-15</td>
<td>0.5</td>
</tr>
</tbody>
</table>

* Difference was statistically significant.
The ‘benefit’ of fluoridation can be explained almost entirely by biased *un-blinded* examiners


"Our meta-analysis thus shows that a lack of blindness is associated with an increase in effect size of approximately 27%.... This figure is comparable to estimates from all past meta-analyses on clinical trials of which we are aware. These meta-analyses suggested that a lack of blinding exaggerates the measured benefits of clinical intervention by 22% [11], 25% [12], 27% [10], 36% [8], and even 68% [9].”

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Reports exaggerating the benefits of fluoridation

Should Calgary bring fluoridated water back? Council expected to review new study this month

By Carolyn Kury de Castillo
Reporter Global News

“[The] money that it will save people is about $64 for every dollar invested. So it’s a minor budget matter that will promote and protect the health of Calgarians,” Guichon said.
2014: Anecdotal reports (no studies) of increase in dental decay after Calgary ended fluoridation makes national news

Reports exaggerating the benefits of fluoridation

Calgary

Dental decay rampant in Calgary children, pediatric dentist says

Dentist says cavities in kids on the rise 3 years after Calgary stopped adding fluoride to drinking water

CBC News · Posted: Dec 08, 2014 11:19 AM MT | Last Updated: December 8, 2014
News reports showing rampant dental decay unrelated to lack of fluoride was irresponsible.

Reports exaggerating the benefits of fluoridation.

These pictures provided to the CBC are designed to instill fear: no amount of fluoride in the drinking water can stop rampant dental decay like this.

CBC Journalist failed to uphold standards.

“In matters of human health we will take particular care to avoid arousing unfounded hopes or fears in persons living with or close to those living with serious illnesses. **We will also avoid suggesting unproven benefits or risks to health related to changes in habits of consumption of food** or pharmaceutical products.” CBD Journalistic Standards and Practices.
This kind of dental decay is not caused by a “fluoride deficiency” in the drinking water.

This is scaremongering!
Fluoridation in Canada DOES NOT reduce day surgeries required to treat rampant dental decay.

Day surgeries per 1000 for cavities

CADTH assumes there are hospital costs associated with fluoridation free status but there ARE NOT.

% Fluoridation by province (not including Que.)


O’Brien’s Institute Lindsay McLaren’s Study: What was claimed? What was actually shown?

**Huffington Post Feb. 17, 2016**

"We systematically considered a number of other factors ... and in the end, everything pointed to fluoridation cessation being the most important factor," she said.

**O’Brien Institute for Public Health website:**

“This study points to the conclusion that tooth decay has worsened following removal of fluoride from drinking water, especially in primary teeth, and it will be important to continue monitoring these trends,” says Lindsay McLaren, PhD, from the University of Calgary’s Cumming School of Medicine, and O’Brien Institute for Public Health.

**Admission of what was actually shown**

cheminst.ca/magazine/article/the-great-fluoride-debate/

“We were not able to answer the question, ‘what has happened since cessation?’ We were able to answer the question, ‘what has happened between 2004-05 and 2013-14?’ when cessation happened in one community and not the other.” (McLaren)

**Calgary Herald, Licia Corbella: The science is not settled –Oct.12, 2017**

“For all tooth surfaces among permanent teeth, there was a statistically significant decrease in Calgary . . . which was not observed in Edmonton.” (study)
McLaren: “Some of the coverage was positive and accurate, but in other cases the study findings were misreported and the conclusions overstated; for example, suggesting that ‘cavities spiked since fluoridation was stopped’. There was no spike but rather a gradual increase, and the trend observed was not since fluoridation was stopped, but rather over a time period during which cessation occurred: 2004/05 to 2013/14 (cessation occurred in 2011).”
What was actually shown by McLaren

Neurath: “In summary due to the omission of key data that contradict the authors’ conclusion, inadequate control of confounding factors, and limitations in the design of the study that were largely unacknowledged, we believe that the claim by McLaren et al that their study supports the hypothesis that fluoridation cessation causes an increase in decay, is unjustified.”

**FIGURE 2** Dental decay rates for subgroup of those children with at least one defs (defs>0). Data for 2004/2005 and 2013/2014 from CDOE paper. Data for 2009/2010 from IJEH paper, but converted from deft to defs using conversion method described in text. Error bars indicate 95% CIs.

Why Juneau AK Medicaid study failed to show effect of fluoridation cessation

- only 2 time points chosen; before (2003) and after (2012) the year fluoridation ended (2006)
- almost a decade between points: too long (anything could have happened)
- year to year variation was not known – the increase seen could have occurred during fluoridation
- 6 yrs of fluoridation cessation did not affect > 7 yr olds. That was plenty of time to see an effect

**other explanations:**
- dentists were NOT blinded to fluoridation status and could have treated more aggressively because fluoridation halted
- dentists could have been maximizing dental treatment in Medicaid patients to maintain income and Medicaid reimbursement could have increased
- decline in oral home care in the younger children (older children not affected)
- worsening of sugar abuse (this seems to be worldwide trend)
- there could have been more Medicaid fraud (it happened in Anchorage)

Why the Windsor-Essex County Health Unit report failed to show fluoridation cessation increased dental decay

- hygienists were not trained to properly measure dental decay rates (10 second, no-touch exam with poor lighting at school was used)
- survey was unscientific, no adjustments for confounders like socio-economic status (the population of poor increased during the time of no fluoridation)
- before and after fluoridation based only on % caries free with no statistical analysis
- report was not peer-reviewed or published in a journal
- numerous mistakes were found including reporting of zero fluorosis where no permanent teeth existed
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Where does fluoridated water go?

outdoor uses
(storm runoff added to sewage?)

personal hygiene
(added to sewage)

drinking, cooking = only 1% of fluoridated household water

(a VERY small amount is filtered through humans but eventually ends up in the environment)
How humans deal with fluoride

Example: drink 1.0L of H₂O with 0.7 mg fluoride/L (or 0.7 ppm) means 0.7 mg F⁻ is ingested

F⁻ is converted to HF (at pH 1.5 in the stomach)
90% (0.63 mg) F⁻ is absorbed into blood

≈ 1% is excreted by breast milk, sweat, saliva

10% (0.07 mg) F⁻ is excreted in the feces

40% (0.28 mg) F⁻ ACCUMUATES in teeth and bones

45% (0.32 mg) F⁻ is filtered in kidneys then stored in the bladder and finally excreted in the urine

[F⁻]₉ < 0.01 ppm
How fluoride works (it’s topical !!)

Fluorapatite builds up in areas of demineralization-remineralization.

Swallowing fluoride only causes tissue damage.

\[ \text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2 \text{ (hydroxyapatite)} + 2\text{F}^- \]

\[ \rightarrow \]

\[ \text{Ca}_{10}(\text{PO}_4)_6(\text{F})_2 \text{ (fluorapatite)} + 2(\text{OH}^-) \]

Cross-sectional fluoride profile of a molar
Fluoride from tap water
-babies fed formula made with fluoridated tap water are overdosed on fluoride

<table>
<thead>
<tr>
<th>subject</th>
<th>volume fluid intake</th>
<th>fluoride concentration in liquid consumed</th>
<th>fluoride DOSAGE* (µg/kg per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 kg baby fed breast milk</td>
<td>up to 1 L</td>
<td>≈ 0.005 ppm</td>
<td>1</td>
</tr>
<tr>
<td>70 kg adult</td>
<td>1 L</td>
<td>0.7 ppm</td>
<td>10</td>
</tr>
<tr>
<td>70 kg adult</td>
<td>4 L</td>
<td>0.7 ppm</td>
<td>40</td>
</tr>
<tr>
<td>70 kg adult</td>
<td>2 L</td>
<td>2.0 ppm</td>
<td>57</td>
</tr>
<tr>
<td>70 kg adult</td>
<td>1 L</td>
<td>4.0 ppm</td>
<td>57</td>
</tr>
<tr>
<td>5 kg baby fed infant formula made with tap water</td>
<td>up to 1 L</td>
<td>0.7 ppm</td>
<td>140</td>
</tr>
</tbody>
</table>

*A dose refers to a specified amount of medication taken at one time. By contrast, dosage is the prescribed administration of a specific amount, number, and frequency of doses over a specific period of time. AMA Manual of Style*
Fluoridation - a poor tradeoff from 40 years of exposure

One tooth might have been saved from dental decay

........but look at the dental fluorosis that children have to deal with

A lifetime of fluoridation MIGHT save one tooth from dental decay

10% -if only front scored

Cochrane Review, 2015

Mild

This is ONLY from excess fluoride during first 6 mo. –NOT added toothpaste exposure

Moderate

This is where F-toothpaste swallowing starts to show up (age 1.5 – 3 yrs) -it’s additive

Severe

This is from excess fluoride that was in the child’s bone from birth and from external sources (water, toothpaste, supplements, pollution)
## Published studies (Canada vs elsewhere): prevalence of fluorosis of esthetic concern

<table>
<thead>
<tr>
<th>Study</th>
<th>fluoridated</th>
<th>% esthetically objectionable dental fluorosis</th>
<th>non-fluoridated</th>
<th>% esthetically objectionable dental fluorosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clark 1997</td>
<td>BC cities</td>
<td>up to 5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brothwell 1999</td>
<td>Ontario towns</td>
<td>19%</td>
<td>Ontario towns</td>
<td>5%</td>
</tr>
<tr>
<td>Leake 2002</td>
<td>Toronto</td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ito 2007</td>
<td>Brampton</td>
<td>9%</td>
<td>Caledon</td>
<td>3.6%</td>
</tr>
<tr>
<td>Cochrane 2015</td>
<td>worldwide data</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurath 2019</td>
<td>NHANES (US)</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CADTH: “the prevalence of dental fluorosis of “any level” at 0.7 ppm and 1.0 ppm was 40% and 48%, respectively, while the prevalence of dental fluorosis of “aesthetic concern” was 12.0% and 12.5%, respectively.”

**The cost to treat dental fluorosis was not considered by CADTH**
Many studies show fluoridation increases the risk of getting porcelain veneers at the dentist.

Mild fluorosis appears as barely noticeable white spots or white streaks in the tooth’s enamel. These spots or blotches become more noticeable in cases of moderate fluorosis and they are especially noticeable as the teeth become dry as may happen during exercise or any prolonged period of mouth breathing.

A much more attractive smile after treatment of fluorosis with porcelain veneers.
Scientists have focused on fluoride's effects on bone because so much of the chemical is stored there. Studies have shown that high doses of fluoride can stimulate the proliferation of bone-building osteoblast cells, raising fears that the chemical may induce malignant tumors. Fluoride also appears to alter the crystalline structure of bone, possibly increasing the risk of fractures.
Research ignored by CADTH

Toronto vs Montreal Bone Study

These hip bones were at risk for fracture due to high fluoride content

Much higher fluoride content in fluoridated Toronto

Hip bones donated during total hip implant surgery

Fluoridated since 1964

Never fluoridated

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20 year dental savings of a proposed return to fluoridation in Calgary

Equipment upgrade = $6 million
Cost to fluoridate for 20 years (with all costs included)
≈ $20 million
Claimed savings ≈ $26 million × $64 ≈ $1.664 billion
    Population of Calgary = 1.5 million
Savings per capita ≈ $1,109.33

Modern studies show that 20 years of fluoridation saves maybe 0.5 teeth from dental decay.

$2,218.66 to fix one tooth in each and every Calgarian if fluoridation is not re-instated?????

SOMETHING IS DRASTICALLY WRONG WITH THAT COST SAVINGS CLAIM
The cost of treating dental fluorosis if Calgary re-instates fluoridation

1. in 40 yrs., 650,000 children under age 6 will be exposed to fluoridated water
2. 1 in 10 (65,000) will end up with objectionable dental fluorosis
3. if half (32,500) get microabrasion and or bleaching, this will cost $32.5 - $50 million
4. if 40% (26,000) get bleaching/microabrasion PLUS some cosmetic fillings, this will cost up to $75 million
5. if the remaining 10% elect to have porcelain veneers the cost is up to $130 million

Total cost to treat dental fluorosis = $255 million

6. If one tooth is saved from dental decay/person after 40 yrs. and it costs $175 to repair, then the dental cost savings is 1.5 M X $175 = $263 Million

It is NOT cost effective to fluoridate if dental fluorosis is factored in

Sources:
1. www12.statcan.gc.ca/census
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CADTH Dismisses Non-dental Side Effects of Ingested Fluoride

The evidence for EVERY side effect was dismissed by the un-named CADTH authors

<table>
<thead>
<tr>
<th>Mortality</th>
<th>IQ and Cognitive Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherosclerosis</td>
<td>Thyroid Function</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Kidney Stones</td>
</tr>
<tr>
<td>Cancer</td>
<td>Chronic Kidney Disease</td>
</tr>
<tr>
<td>Hip Fracture</td>
<td>Gastric Discomfort</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>Headache</td>
</tr>
<tr>
<td>Musculoskeletal Pain</td>
<td>Insomnia</td>
</tr>
<tr>
<td>Neonatal Height and Weight</td>
<td>Reproduction</td>
</tr>
<tr>
<td>Down Syndrome</td>
<td>Refractive Errors</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
</tr>
<tr>
<td></td>
<td>Myocardial Infarction</td>
</tr>
</tbody>
</table>

**SUMMARY**

“There was **insufficient evidence** for an association between water fluoridation at the current Canadian levels and all-cause mortality, atherosclerosis, hypertension, skeletal fluorosis, osteoporosis, musculoskeletal pain, newborns’ height and weight, thyroid function, CKD, self-reported health outcomes (gastric discomfort, headache, insomnia), reproduction (fertility, abortion), refractory errors, diabetes, and myocardial infarction.”
Research ignored by CADTH
Low level fluoride exposure can affect sexual development in humans

<table>
<thead>
<tr>
<th>Study</th>
<th>subjects</th>
<th>fluoride exposure</th>
<th>effect on sexual development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schlessinger et al, 1956</td>
<td>girls 7-18 yrs. (Newburgh NY)</td>
<td>1.2 ppm in drinking water</td>
<td>earlier menarche by 5 mo.</td>
</tr>
<tr>
<td>Farkas et al, 1983</td>
<td>girls 10-19 yrs. (Hungary)</td>
<td>1.09 ppm in drinking water</td>
<td>no significant difference</td>
</tr>
<tr>
<td>Liu et al, 2019</td>
<td>girls 10-17 yrs. (Mexico City)</td>
<td>mean urine F = 0.59 ppm</td>
<td>trend is earlier menarche but no significant difference</td>
</tr>
<tr>
<td>Liu et al, 2019</td>
<td>boys 10-17 yrs. (Mexico City)</td>
<td>mean urine F = 0.59 ppm</td>
<td>later pubertal development</td>
</tr>
</tbody>
</table>
Research ignored by CADTH

Studies show teeth are more yellow in fluoridated areas

**Perceptions of desirable tooth color among parents, dentists and children**

(31.6 percent) were dissatisfied with their tooth color, and of those subjects, 552 (70.0 percent) felt that their teeth were too yellow.

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Canadian Dental Association **Confusion**

Advice: Limit fluoride toothpaste to avoid swallowing fluoride. But encourage toddlers to drink fluoridated water? This confuses dentists and the public.

143 mL 0.7 mg/L fluoridated water

357 mL 0.7 mg/L fluoridated water
Canadian Dental Association Recommendation to prevent dental fluorosis: “the total daily fluoride intake from all sources should not exceed 0.05-0.07 mg/kg/day.”

Infant formula use after birth with fluoridated tap water increases dental fluorosis by 400% higher.

- Infant Formula up to 0.5 ppm
- Fluoridated water 0.7 – 1.0 ppm

= 0.20 mg fluoride/kg/day

Who monitors my fluoride intake?
Fluoride & IQ studies: these studies were NOT reviewed by CADTH (compare to the Lead-IQ studies that contributed to the banning of lead in drinking water, paint, gasoline etc.)

Fluoride is just as neurotoxic as lead according to recent studies.
Ontario Public Health Damage Control
to protect Fluoridation in Ontario
(Referring to the Bashash et al, 2017 fluoride and IQ study)

OPH: “the article is not able to provide insight into possible mechanisms
behind the association observed.”

This was an epidemiology study. Has Public Health Ontario even studied
the biological, biochemical, genetic mechanisms of harm from fluoride?
It is Public Health’s job to protect Ontarians, not criticize researchers who
are finding damning evidence that prenatal fluoride lowers offspring IQ

OPH: “A large body of evidence links relatively low level exposure to lead and
methyl mercury to neurotoxicity and adverse effects on neurocognitive
development at the population level. A similar body of evidence does not exist
for fluoride.”

Seriously? Because Ontario public health says so?
There are dozens of published studies linking low level of
fluoride exposure to fluoride neurotoxicity.

Judge for yourself by reading the original article referred to above
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5915186/
Another Canadian study shows a link between increasing fluoride exposure and lowered IQ.

“38% (of the subjects) received "optimal" levels of community fluoridated water.”

CONCLUSION

“An increase of 1mg/L of maternal urinary fluoride during prenatal development was associated with a decrease of Full Scale IQ by 4.5 points in young boys.”

This new study was not reviewed by CADTH – it was a published abstract, full [paper to be published Aug. 19, 2019 in JAMA-Pediatrics Fluoride Exposure during Fetal Development and Childhood IQ: The MIREC Study. Rivka Green, Bruce P. Lanphear, Richard Hornung, David Flora, E. A. Martinez-Mier, Gina Muckle, Pierre Ayotte, Christine Till. Abstract S02.01.22 2018 ISES-ISES meeting
Canadian Fluoride and Thyroid Study:
“Fluoride exposure among adults with moderate-to-severe iodine deficiencies living in Canada may increase risk for underactive thyroid gland activity.”

Synthroid (levothyroxin) is the most prescribed drug in the US (for treating underactive thyroid)

Underactive thyroid leads to:
- higher cholesterol
- depression
- fatigue
- hair loss
- weight gain
- memory loss
- sensitivity to cold

In children:
- delayed puberty,
- delayed growth,
- delayed tooth development

Higher levels of urinary fluoride associated with Attention Deficit Hyperactivity Disorder (ADHD) in children

Higher levels of urinary fluoride during pregnancy are associated with more ADHD-like symptoms in school-age children, according to University of Toronto and York University researchers.

"our findings suggest that even these relatively low levels of aluminium and fluoride are associated with deleterious effects on dementia risk, which should be weighed against their beneficial uses."

Fluoride is neurotoxic. So is Aluminum. Together they are associated with dementia!
New Study Links Low Fluoride Exposure to Alzheimer’s Disease

“Fluoride raised the numbers of senile plaque in (brains of) mice carrying APP/PS1 double-transgenic mutation”

“long-term exposure to fluoride may be considered a risk factor in the development of Alzheimer’s Disease.”

…the doses of fluoride exposed to mice were equivalent to 1.5 ppm (close to the drinking water standard set by WHO) and 15 ppm, respectively, in drinking water for humans.

CADTH did not review ANY animal research

open access paper

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Community Water Fluoridation Programs

This is more of a political statement than a scientific one since so much science was ignored.

Bottom Line
There is consistent evidence to support CWF’s benefits in reducing dental caries, and insufficient or no evidence to suggest that it leads to adverse health outcomes.

CADTH’s fluoridation report cannot be trusted. It DOES NOT protect Canadians.
Why the CADTH reports are biased and not scientific

- the authors (still un-named) relied heavily on previous biased government reviews
- they cherry picked studies that only focused on showing safety (e.g. citing Broadbent IQ study as high quality without citing the published critique showing that it was not)
- when the studies were claimed irrelevant to the Canadian setting they were ignored but when they deemed important (e.g. hospital admissions in the UK due to dental decay) they were included
- rigorous studies on fluoride and lowered IQ were ignored (see IQ studies in previous slides of this submission)
- CADTH completely ignored the 2006 NRC report and ALL animal evidence
- CADTH authors made numerous serious errors (e.g. claiming the Peckham study did not cover the entire country when it did, or misinterpreting the results of the Choi fluoride and IQ studies.)
- when there were studies of concern (e.g. 2 studies showing a link to diabetes) they were dismissed as not providing enough proof
- the CADTH’s entire cost analysis was based on ONE weak study in Australia (Arrow et al, 2016) and did not include the cost to treat dental fluorosis

In my opinion, the CADTH reports are biased and designed to promote fluoridation, not look at the fluoride science rigorously
Bottom Line for Calgary Council

- the CADTH reports are biased and flawed
- the evidence for fluoridation benefit is very weak
- the benefit, if there is any, is very small and it will cost Calgary a lot of money to restart fluoridation
- evidence is mounting that children will be harmed by fluoridation (not only dental fluorosis but injury to the thyroid, brain, pancreas etc.)
- if the O’Brien Institute for Public Health wants to protect Calgarians, it should recommend the status quo (no fluoridation). This would mean Calgary will continue to stand with BC, Quebec and most of the rest of the world outside of the US, NZ and Australia, in not adding industrial waste fluoride to its drinking water