

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
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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

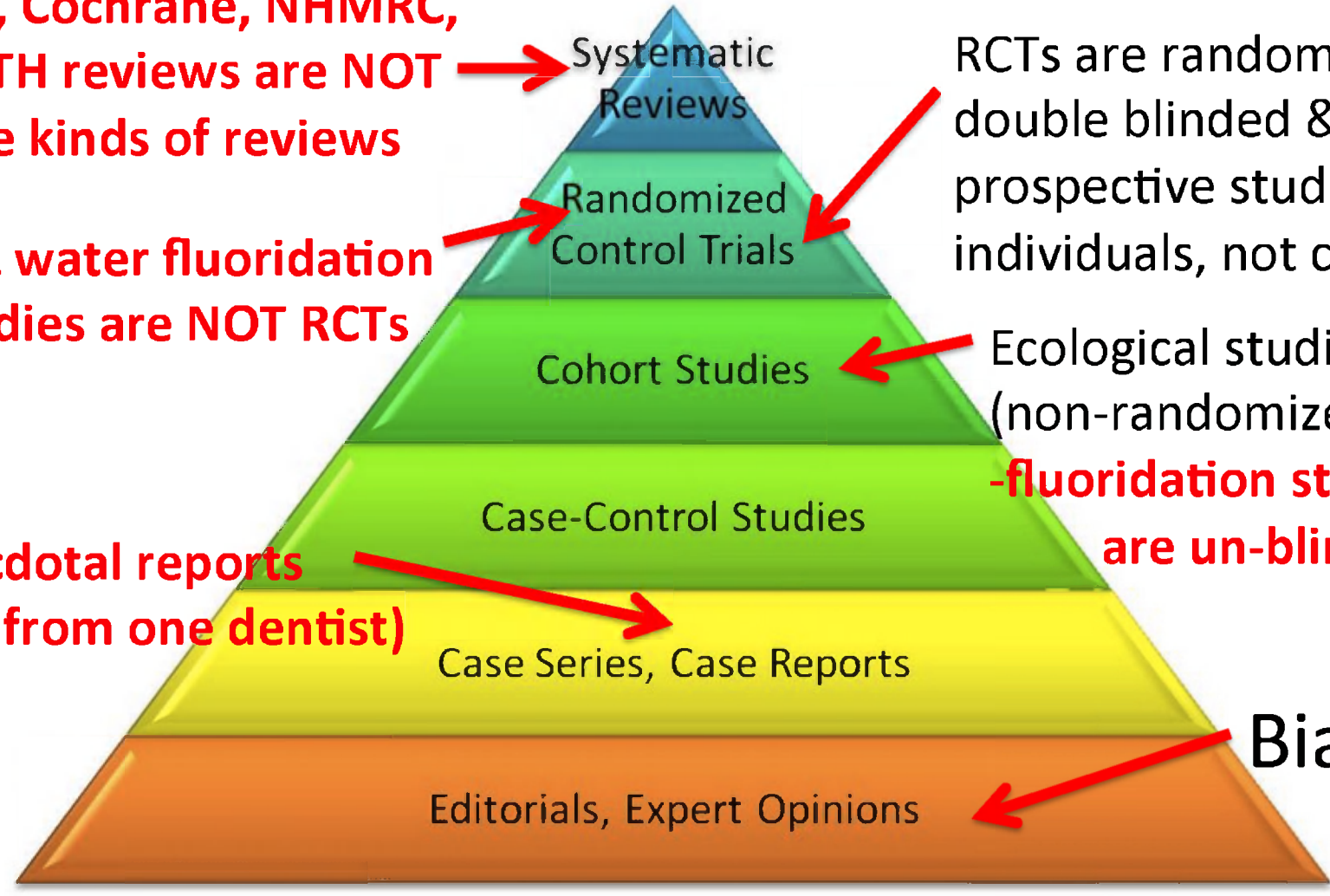
-evidence comes from weak UNBLINDED cross-sectional studies or non-randomized before and after studies

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

Study author	Country	Number of subjects	Age of subjects (years)	Surfaces saved with optimum fluoridation
Heller <i>et al.</i> 1997	US	18,755	12	0.5*
Brunelle and Carlos 1990	US	16,498	12	0.5*
Angelillo <i>et al.</i> 1990	Italy	643	12	0.6
Selwitz <i>et al.</i> 1998	US	495	8–16	1.2
Ismail 1991	Canada	219	10–12	0.7
Clark 1991	Canada	1131	6–14	0.8
Slade <i>et al.</i> 1995	Australia	9,690 vs 10,195	5–15	0.2
				1.1
Jackson <i>et al.</i> 1995	US	243	7–14	2.0*
Kumar <i>et al.</i> 1998	US	1,493	7–14	–0.2
Armfield and Spencer 2004	Australia	5129	4–9	1.5
		4803	10–15	NS
Komarek <i>et al.</i> 2005	Belgium	4468	7–12	NS
Spencer <i>et al.</i> 2008	Australia	8183 (SA)	5–15	NS
Nyvad <i>et al.</i> 2009	Lithuania	300	12–15	NS
Ekstrand 2010	Denmark	191 municipalities	15	1.0–2.0
Armfield 2010	Australia	128,990	5–15	0.5

* Difference was statistically significant.

The 'benefit' of fluoridation can be explained almost entirely by biased *un-blinded* examiners

Holman L, Head ML, Lanfear R, Jennions MD (2015) Evidence of Experimental Bias in the Life Sciences: Why We Need Blind Data Recording. PLoS Biol 13(7): e1002190. doi:10.1371/journal.pbio.1002190

"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]."

8. Hróbjartsson A, et al (2012). BMJ 344: e1119.

9. Hróbjartsson A, et al. (2013) CMA Journal 185: E201–E211.

10. Hróbjartsson A, et al. (2014) Int J Epidemiol 43: 937–948.

11. Savović J, et al. (2012) Ann Intern Med 157: 429–438.

12. Wood L, et al. (2008) BMJ 336: 601–605.

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HEALTH

June 1, 2019 4:40 pm

**Reports exaggerating the
benefits of fluoridation**

Updated: June 2, 2019 12:03 pm

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



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**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 the drinking water can stop rampant dental decay like this.



CBC News
Dec. 8, 2014

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.**” CBC Journalistic Standards and Practices.

Scaremongering re: lack of fluoridation -used by Medical Officers of Health across Canada

The great fluoride debate



By Denis Langlois, Sun Times, Owen Sound
Friday, January 31, 2014 10:18:40 EST AM

Dr. Hazel Lynn,
Medical officer of health,
Owen Sound, Ontario



Medical officer of health Dr. Hazel Lynn holds up a picture of a child's teeth. Lynn said water fluoridation prevents tooth decay and is a safe practice. Others disagree. (JAMES MASTERS/QMI AGENCY)

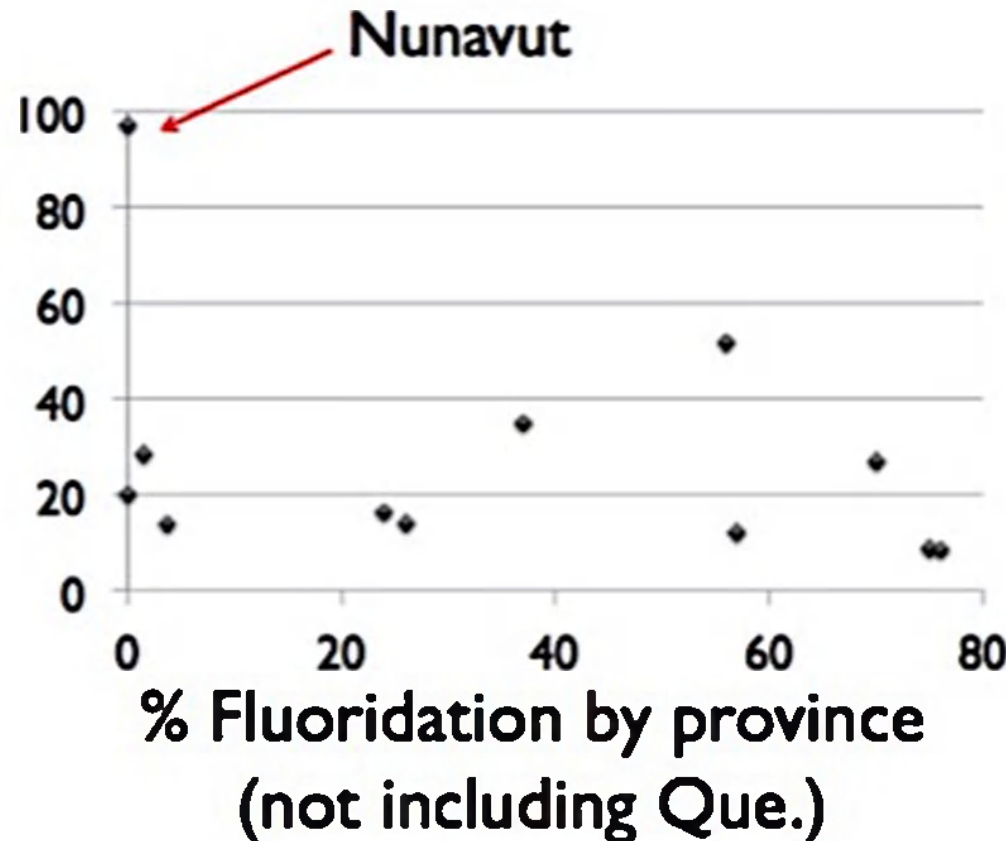
This kind of dental decay is not caused by a “fluoride deficiency” in the drinking water.

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**



http://www.hc-sc.gc.ca/ahc-asc/alt_formats/pacrb-dgapcr/pdf/branch-dirgen/wfc-efc-eng.pdf

<https://www.cihi.ca/en/access-data-reports/results?query=surgeries%2C+dental%2C+province&Search+Submit=>

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

Huffington Post Feb. 17, 2016

**Bold
claim**

"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:

**Bold
claim**

"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)

Admissions in an article McLaren wrote for the Canadian Association of Public Health Dentistry 2017 Fall Newsletter



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

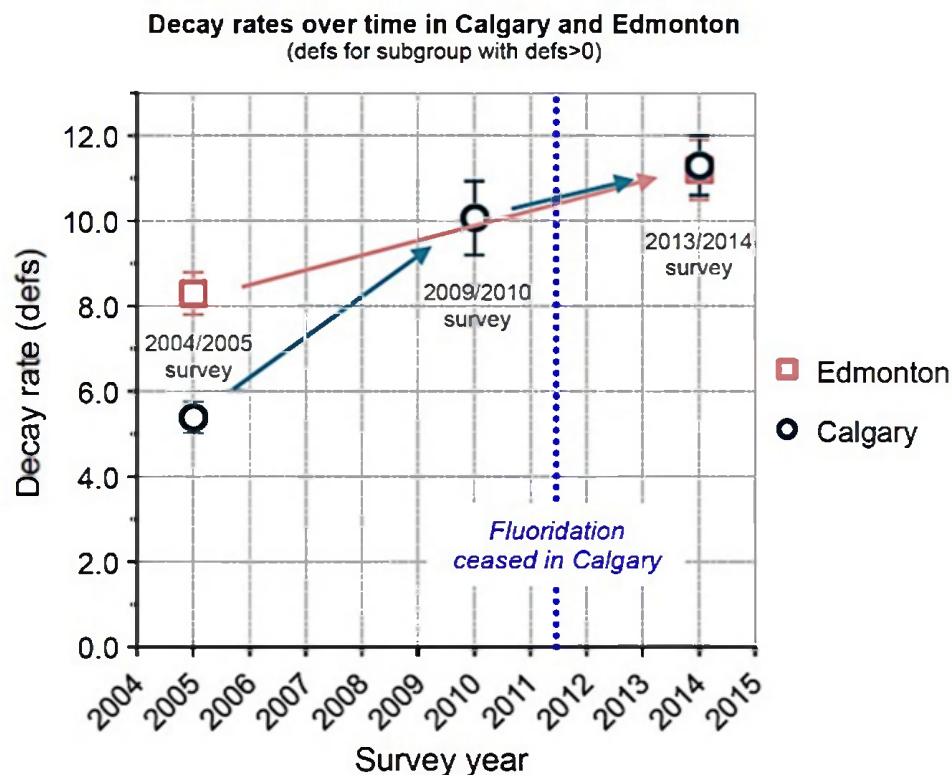


FIGURE 2 Dental decay rates for subgroup of those children with at least one defs (defs>0). Data for 2004/2005 and 2013/2014 from CDOE paper. Data for 2009/2010 from IJEH paper, but converted from deft to defs using conversion method described in text. Error bars indicate 95% CIs.

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.”

Neurath C, Beck JS, Limeback H, et al. Limitations of fluoridation effectiveness studies: Lessons from Alberta, Canada. Community Dent Oral Epidemiol. 2017;00:1–7

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

- the weak evidence of fluoridation's effectiveness
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Where does fluoridated water go?

outdoor uses
(storm runoff added to sewage?)



gardens & lawns



car
washing



pools and hot tubs



Water main losses

personal hygiene
(added to sewage)



bathroom



laundry



kitchen



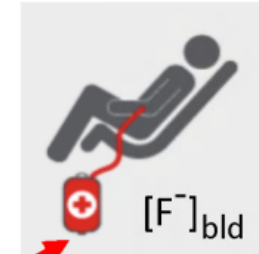
drinking, cooking =
only 1% of fluoridated
household water

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

How humans deal with fluoride

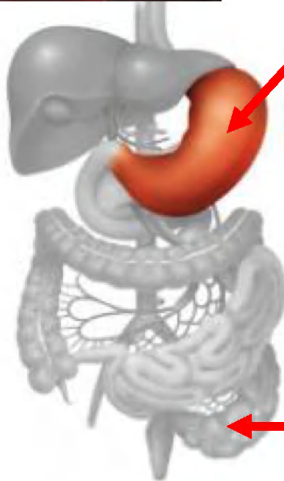


Example: drink 1.0L of H_2O with
0.7 mg fluoride/L (or 0.7 ppm)
means 0.7 mg F^- is ingested



$[\text{F}^-]_{\text{bld}} < 0.01\text{ppm}$

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



$\approx 1\%$ is excreted by
breast milk,
sweat,
saliva

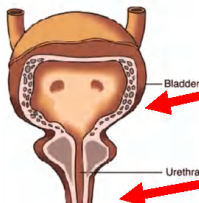


10% (0.07 mg) F^- is excreted in the feces

40% (0.28 mg) F^- ACCUMULATES in teeth
and bones

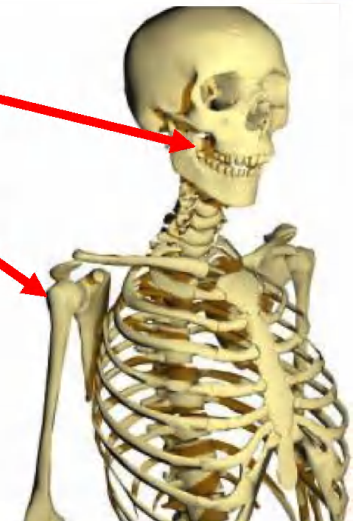


45% (0.32 mg) F^- is filtered in kidneys



then stored in the bladder

and finally excreted in the urine



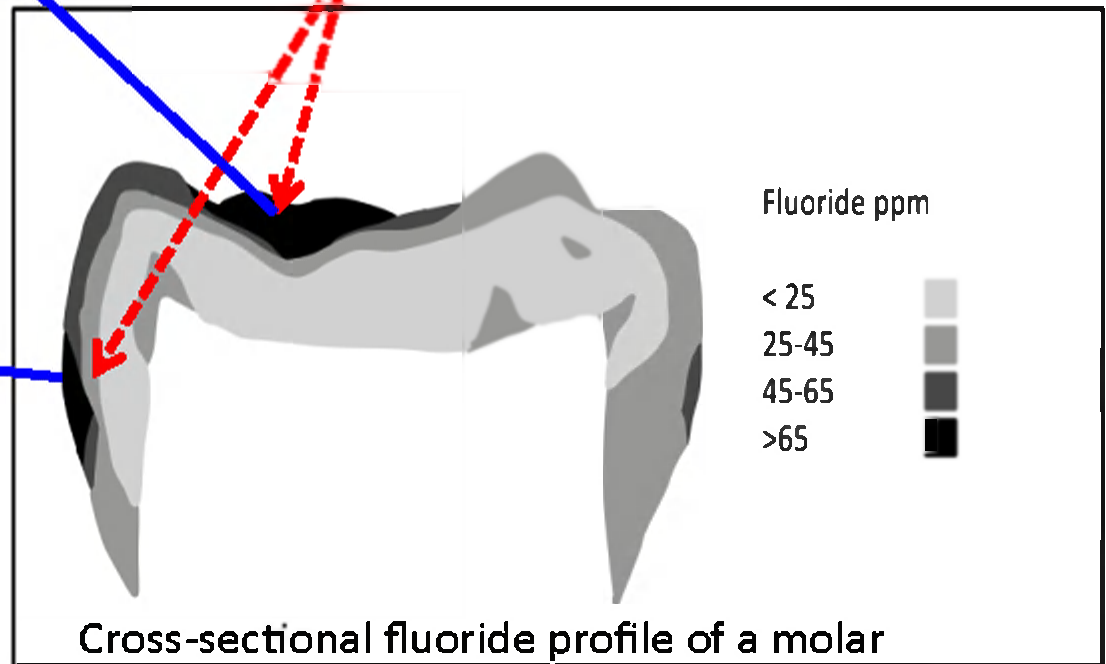
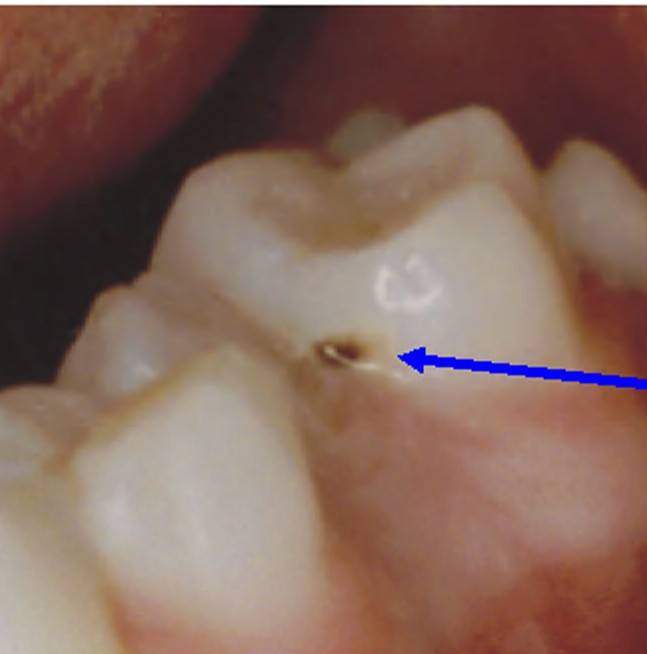
How fluoride works (it's topical !!)

*Fluorapatite builds up in areas of
demineralization-remineralization*

**-swallowing fluoride only
causes tissue damage**



Fig (2): Non cavitated white spot caries



Cross-sectional fluoride profile of a molar

Fluoride from tap water

-babies fed formula made with fluoridated tap water are overdosed on fluoride

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

*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

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)

10%
-if only
front
scored

Published studies (Canada vs elsewhere): prevalence of fluorosis of esthetic concern

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

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



Fluorosis stains prior to treatment.

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,

1190 BOOKCLIFF AVENUE #201, GRAND JUNCTION, CO 81501



Julie M Gillis
DDS PC

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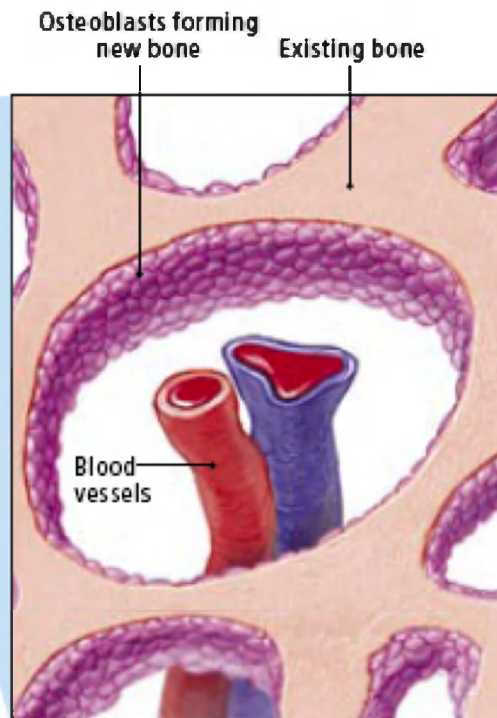
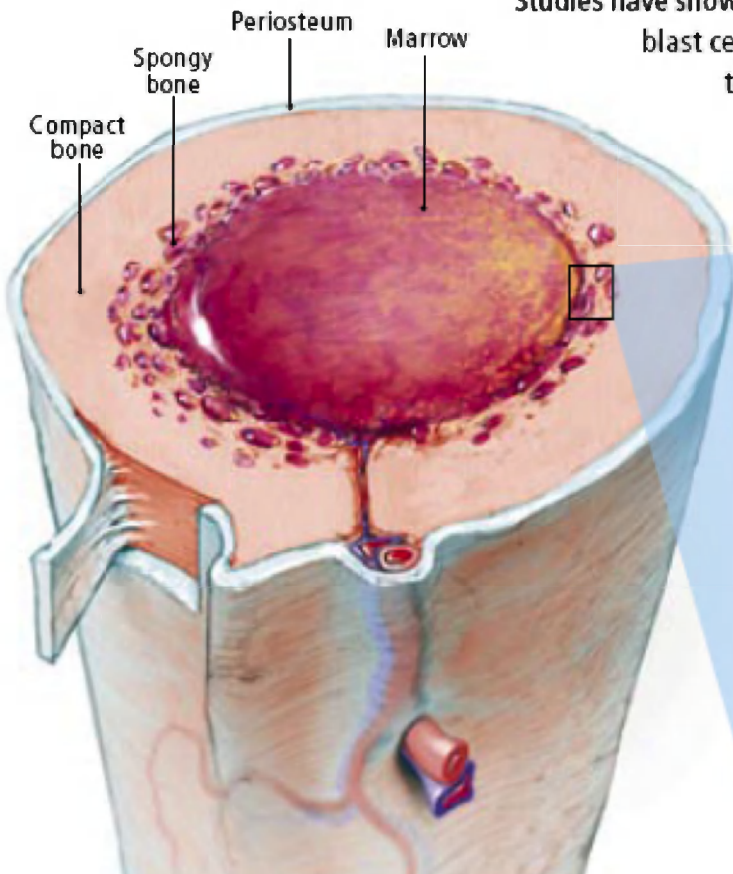
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Research ignored by CADTH ...may induce malignant tumours!

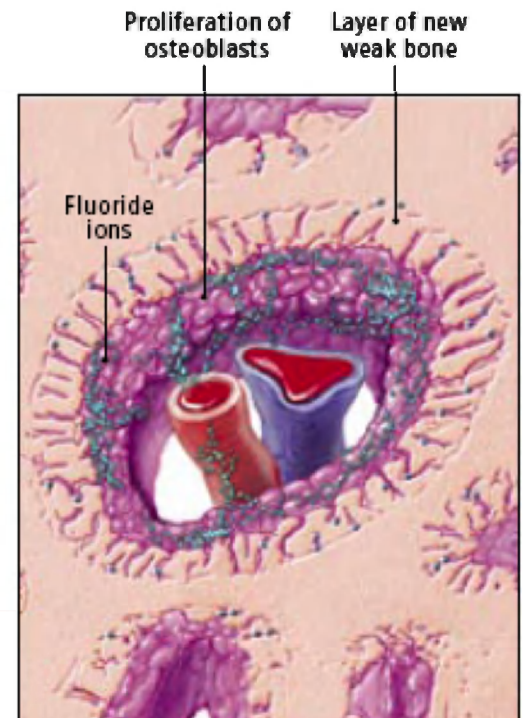
[AREA OF CONCERN]

IS FLUORIDE WEAKENING BONE?

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.



▲ Normal Bone Formation

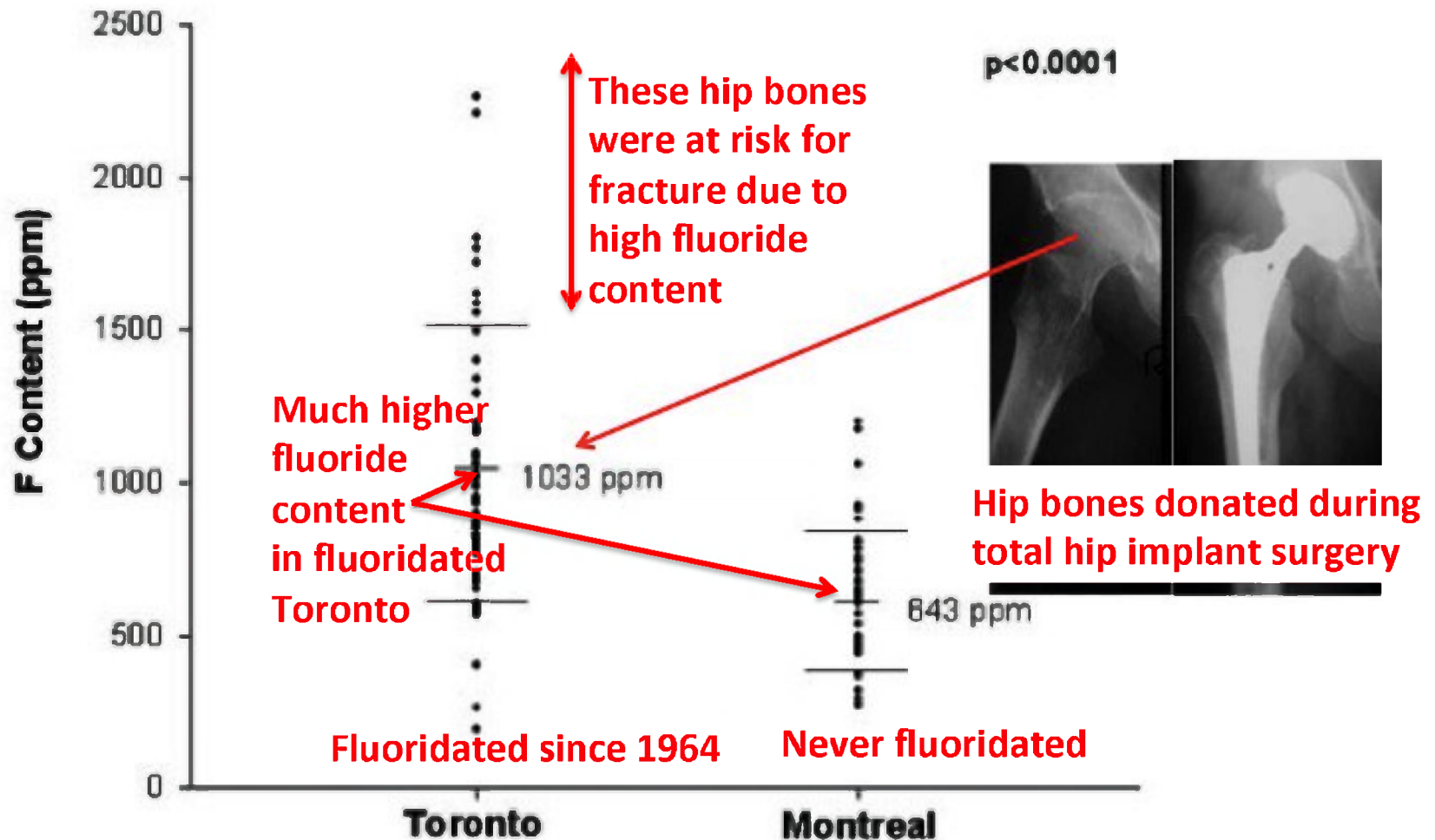


▲ Effects of Excessive Fluoride

Fagan. D. Second thoughts
about fluoride. Sci Amer Jan, 2008, 74-81.

Research ignored by CADTH

Toronto vs Montreal Bone Study



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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 X **\$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 = \$255million

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 \text{ M} \times \$175 = \263 Million

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

- Sources:
1. www12.statcan.gc.ca/census
 2. www.cochranelibrary.com, Neurath et al 2019, JDR Clin Trans Res
 - 3, 4, 5. www.alberta.ca/dental-fees.aspx
 6. Slade et al, 2013 J Dent Res

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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

Mortality

Atherosclerosis

Hypertension

Cancer

Hip Fracture

Osteoporosis

Musculoskeletal Pain

Neonatal Height and Weight

Down Syndrome

IQ and Cognitive Function

Thyroid Function

Kidney Stones

Chronic Kidney Disease

Gastric Discomfort

Headache

Insomnia

Reproduction

Refractive Errors

Diabetes

Myocardial Infarction

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

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

Research ignored by CADTH

Studies shows teeth
are more yellow in
fluoridated areas

AND more prone to
catastrophic fractures

Perceptions of desirable tooth color among parents, dentists and children

JAY D. SHULMAN, D.M.D., M.A., M.S.P.H.;
GERARDO MAUPOMÉ, C.D., M.Sc., Ph.D.;
D. CHRISTOPHER CLARK, D.D.S., M.P.H.;
STEVEN M. LEVY, D.D.S., M.P.H.

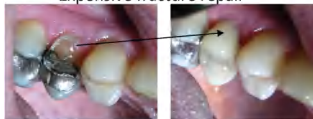
**(31.6 percent) were
dissatisfied with their
tooth color, and of
those subjects, 552
(70.0 percent) felt
that their teeth were
too yellow.**

JADA, Vol. 135, May 2004 **595**



vertical fracture
of the 1st molar
in a 14 yr. old

Expensive fracture repair



Vieira A et al. J. Dent Res. 2005, 84(10):951

Canadian Dental Association **Confusion**

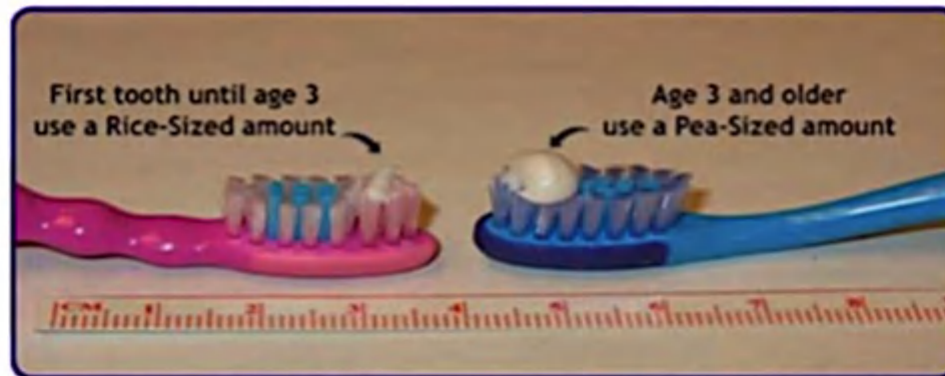
Advice: Limit fluoride toothpaste to avoid swallowing fluoride.

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

Photo used with permission from Canadian Dental Association (CDA)

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

400%
higher



Infant Formula
up to 0.5 ppm

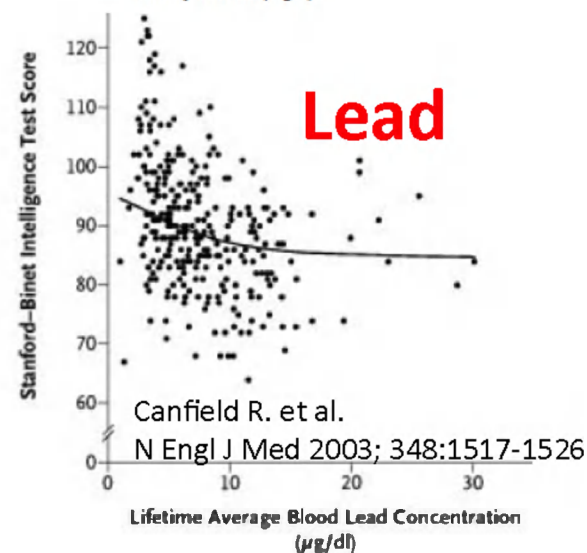
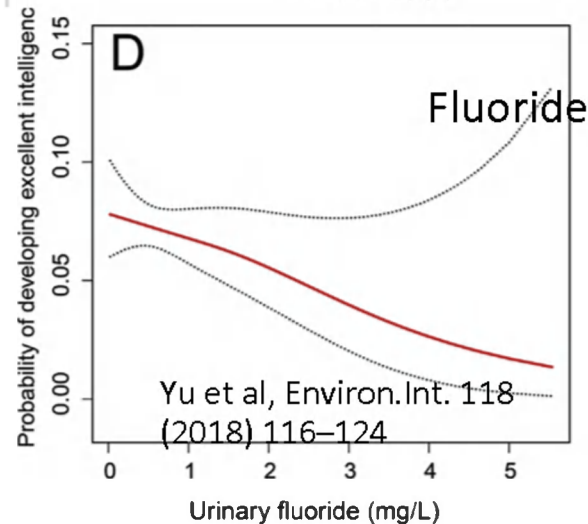
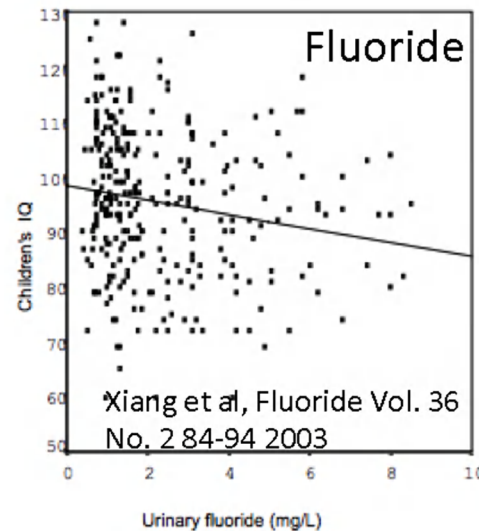
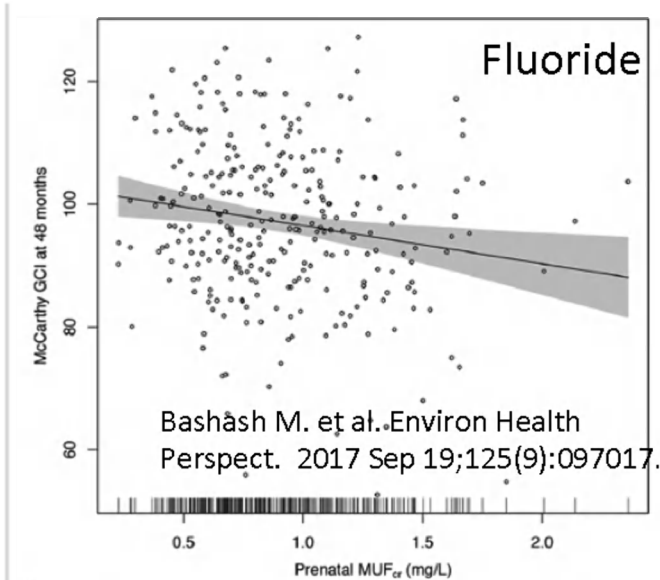
Fluoridated water
0.7 – 1.0 ppm

= 0.20 mg fluoride/kg/day



COF-COF.co

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

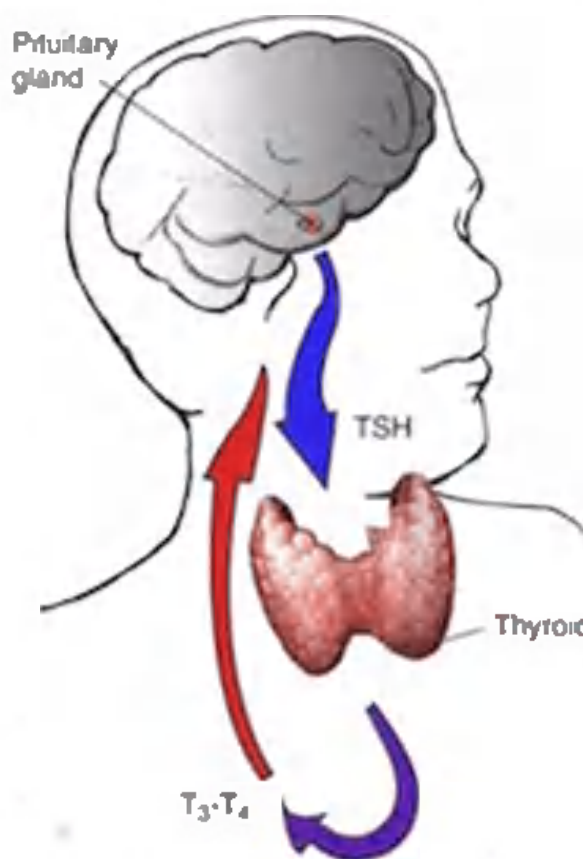
Fluoride Exposure during Fetal Development and Childhood IQ: The MIREC Study.

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

Study: Malin AJ, Riddell J, McCague H, Till C. Fluoride exposure and thyroid function among adults living in Canada: Effect modification by iodine status. Environ Int. 2018 Dec;121(Pt 1): 667-674. **Not reviewed by CADTH**

Prenatal exposure from fluoridated water is now linked to increased ADHD in children



UNIVERSITY OF TORONTO
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FACULTY DATABASE

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SUPPORT/CAMPAIGN

Not reviewed by CADTH

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

October 10/2018

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.

Study: Bashash M, Marchand M, Hu H, Till C, Martinez-Mier EA, Sanchez BN, Basu N, Peterson KE, Green R, Schnaas L, Mercado-García A, Hernández-Avila M, Téllez-Rojo MM. Prenatal fluoride exposure and attention deficit hyperactivity disorder (ADHD) symptoms in children at 6-12 years of age in Mexico City. *Environ Int.* 2018 Dec;121(Pt 1):658-666. doi: 10.1016/j.envint.2018.09.017.

Not reviewed by CADTH

Aluminium and fluoride in drinking water in relation to later dementia risk

Tom C. Russ, Lewis O. J. Killin, Jean Hannah, G. David Batty, Ian J. Deary and John M. Starr

“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

<https://alzres.biomedcentral.com/articles/10.1186/s13195-019-0490-3>

Cao K, et al. Exposure to fluoride aggravates the impairment in learning and memory and neuropathological lesions in mice carrying the APP/PS1 double-transgenic mutation.

Alzheimers Res Ther. 2019 Apr 22;11(1):35

- 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

Posted on CADTH.ca Apr.2019

EVIDENCE
HIGHLIGHTS

Highlighting the Evidence

Community Water Fluoridation Programs



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.

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

**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