



Oral Health in Primary Care

Center for Rural Health
University of North Dakota



Talking with your Patients about Safe Drinking Water, Community Water Fluoridation and Oral Health in the Pediatric Patient

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Housekeeping Items

- All attendees are muted and attendees cannot share video during this session.
- Remember to ask questions using the chat box.
- Slides and resources for today's session can be accessed on our [program website](#).
- Continuing education credits are available for today's session. To receive a certificate for continuing education, you must complete the evaluation.
- We have made every attempt to make today's presentation secure. If we need to end today's presentation unexpectedly we will follow-up with you using your registration information.

Land Acknowledgement Statement

[UND Land Acknowledgement Statement](#): Today, the University of North Dakota rests on the ancestral lands of the Pembina and Red Lake Bands of Ojibwe and the Dakota Oyate - presently existing as composite parts of the Red Lake, Turtle Mountain, White Earth Bands, and the Dakota Tribes of Minnesota and North Dakota. We acknowledge the people who resided here for generations and recognize that the spirit of the Ojibwe and Oyate people permeates this land. As a university community, we will continue to build upon our relations with the First Nations of the State of North Dakota - the Mandan, Hidatsa, and Arikara Nation, Sisseton-Wahpeton Oyate Nation, Spirit Lake Nation, Standing Rock Sioux Tribe, and Turtle Mountain Band of Chippewa Indians.

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Objectives for Today

- Attendees will be able to describe the benefits of CWF and Safe Drinking Water
- Attendees will learn, understand, and be able to share with their patients the importance of oral health and fluoride in pediatric patients
- Attendees will be able to address the status of CWF in ND



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The Benefits of Safe Drinking Water

Bottled Water: Concerns

- Regulated by FDA - Food
- Doesn't have strict controls which are applied to tap water
- Precautions by EPA¹:

*Some people may wish to take special precautions with the water they drink. In particular, people with immune systems that are weakened by AIDS, chemotherapy or transplant medications are more vulnerable to microbial contaminants in drinking water such as Cryptosporidium² **



1. Source: Accessed May 1, 2021 [Water Health Series Bottled Water Basics \(epa.gov\)](#)
2. Pregnant mothers



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The Benefits of Safe Drinking Water

Bottled Water: Concerns

- Distrust of tap water
- Perceived as more pure than tap
- Estimated by 2055 there will be more plastic bottles in oceans than fish
- Landfill nightmare
- No requirement to list background fluoride content – range from ND – double that in CWF¹
- **Mold – Kroger recall²**



1. Source: Accessed May 1, 2021: Information available by calling manufacturer or searching on website International Bottled Water Association [Bottled Water | International Bottled Water Association](#)
2. Source: Kroger recalls "Comfort for Baby" water because of mold, December 2017; <https://bit.ly/2QkMjpm>



The Benefits of Safe Drinking Water

Tap Water

- Purest water available on planet – U.S.
- Undergoes strict testing requirement of the EPA
- Constantly monitored for impurities (contaminants)
- Hesitancy to use, especially among immigrants whose tap water was not clean – were encouraged to drink bottled water



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Fluoride: A Naturally Occurring Mineral



- 13th most abundant mineral in the earth's crust
- **Surface water** (rivers) — typically low concentrations, 0.2 mg/L (ppm) or less
- **Groundwater** (wells) — higher concentrations, 0.1 mg/L to over 5.0 mg/L
- **Ocean** is typically 0.8 to 1.4 mg/L



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The Benefits of Community Water Fluoridation

Dr. Frederick S. McKay

- **1901:** He established his dental practice in Colorado Springs, CO
- “Colorado Brown Stain” — Only life-long residents (or those who had moved there as infants) had it
- **1908** – He began to investigate the extent of fluorosis in surrounding areas



Key Observation: Very few cavities in this population

(Source: “The Story of Fluoridation,” National Institute of Dental & Craniofacial Research, NIH, reviewed in July 2018, <https://www.nidcr.nih.gov/health-info/fluoride/the-story-of-fluoridation>)



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The Benefits of Community Water Fluoridation

Objective: Explore the link between fluoride & cavity reduction

1.0 mg/L fluoride led to optimal cavity reductions without brown staining

H. Trendley Dean

- 1931 begins to study epid. of F-
 - Improves technology of assay
 - Creates and index
- 1933 - Compares “High” and “Low” F-communities.
- 1939 - Compares “high” and “low” F-communities.
- 1941- Launches field investigation – “21 Cities” study.

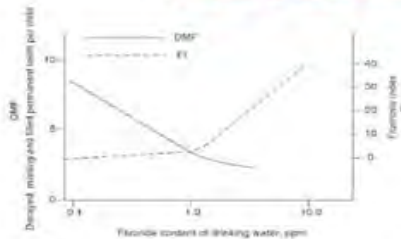


FIGURE 5.3 Relationship between the fluoride content of drinking water, water occurrence, and dental fluorosis. (Source: H. C. Hoagie, The concentration of fluorides in drinking water to give the index of minimum cavities with maximum safety. J. Am. Dent. Assoc. 40, 435-439, 1950. Copyright © 1950 American Dental Association. All rights reserved. Adapted 2008 with permission of the American Dental Association.)

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Mother Nature was Replicated

- 4 pairs of cities in the U.S. and Canada were identified to study the effect of water fluoridation
 - 4 cities adjusted to 1.0 mg/L of F, and 4 remained non-fluoridated
- Grand Rapids, Mich. was the first city to adjust fluoride levels in public drinking water (1945)
 - Muskegon, MI was the control city
- Cavity rates dropped dramatically: **60-70%**



(Source: "Evaluatory Surveys of Long-Term Fluoridation Show Improved Dental Health," U.S. Department of Health, Education and Welfare," March 1979, Ref. Document FL-109, accessed at <https://www.dentalwatch.org/usphs/fl-109.pdf>.)

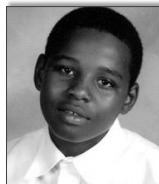


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Oral Health, Community Water Fluoridation and the Pediatric Patient

Dental cavities are the **most common chronic disease** for children and teens. It's significantly more common than *asthma, obesity, and diabetes*. **Infectious and Transmissible**

- Severe pain (toothaches)
- Difficulty in chewing
- Poor weight gain
- Difficulty concentrating
- Predictor of cavities later in life
- Costly to treat
- Deaths



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Oral Health – Systemic Health Implications

- Facial Cellulitis
- Systemic infection – Septicemia, brain abscess
- Diabetes – Strong evidence exists for a causal link between periodontal disease
- Obesity
- Coronary artery disease
- Metabolic syndrome
- Pregnancy outcomes/Preterm labor
- Oral health after menopause
- Rheumatoid Arthritis

(Source: Smiles for Life curriculum; "The Relationship of Oral and Systemic Health")



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Oral Health, Community Water Fluoridation and the Pediatric Patient

Is Water Fluoridation Still Necessary?

ABSOLUTELY!!



✓ Effect of Starting Community Water Fluoridation: **25%** cavity reductions in adults *and* children

(Source: <https://www.cdc.gov/fluoridation/basics/index.htm>)



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Oral Health, Community Water Fluoridation and the Pediatric Patient

Recent research confirms CWF's benefits



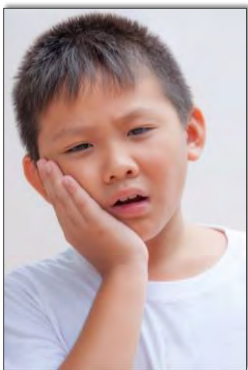
- Imagine a third-grade classroom of 30 children in a fluoridated community.
- These children would have **39 fewer** decayed tooth surfaces in their primary teeth than would the same number of third-graders in a community *without* fluoridation.

(Sources: G.D. Slade et al., "Water Fluoridation and Dental Caries in U.S. Children and Adolescents." *Journal of Dental Research*, 2018.)

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Major cavity increases after cessation:

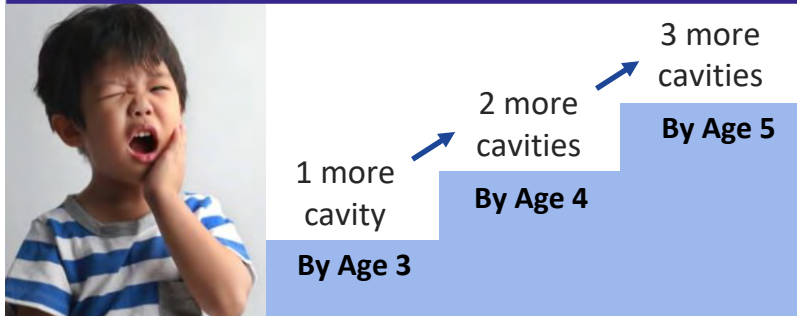
- **Juneau, Alaska** – Dental disease among preschool-age kids increased, requiring an average of 1 additional dental procedure *per child, per year*
- **Calgary (Canada)** – Cavity rates among children skyrocketed 146% in 3 years
- **Windsor (Canada)** – Cavity rates increased 51% in a 5-year period

(Sources: J. Meyer et al., *BMC Oral Health*, 2018, 18:215; L. McLaren et al., *Community Dentistry and Oral Epidemiology*, 2016; Windsor's oral health data was referenced in a story by Brian Cross in the *Windsor Star*, December 18, 2018)



Oral Health, Community Water Fluoridation and the Pediatric Patient

After fluoridation ended in Alaska's capital city, the average low-income child needed **1 additional procedure each year** to treat tooth decay



(Source: J. Hsieh, "Research Supports Claims That Teeth Worsen Without Fluoridated Water," National Public Radio, January 1, 2019; study referenced in the story was published by BMC Oral Health, 2018, 18:215; Meyer's study projected tooth decay treatments based on Medicaid dental codes.)



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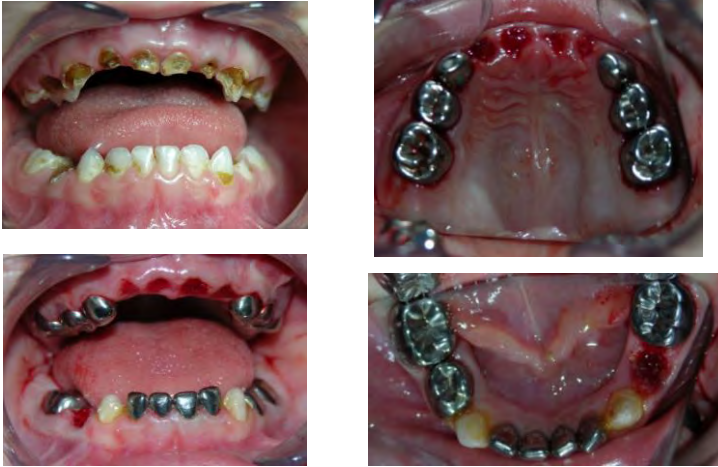
Oral Health, Community Water Fluoridation and the Pediatric Patient

- U.S. and International studies confirm benefits for children – 66-75% drop in OR with GA for ECC
- Water Operators **prevent more cavities** by fluoridating the water than all of us can do in our lifetimes



(Sources: J. Daley, "Tooth Decay: A Silent Epidemic, Especially For Poor Kids In Colo.," Colorado Public Radio, March 12, 2015; An alternative marker for the effectiveness of water fluoridation: hospital extraction rates for dental decay, a two-region study, Elmer et al, British Dental Journal 2014; 216: E10; Klivitsky et al, "Hospitalizations for dental infections - Optimally versus non-optimally fluoridated areas in Israel," Journal of the American Dental Association.)

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North Dakota and Community Water Fluoridation – Where to get information



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North Dakota and Community Water Fluoridation – Where to get information

- North Dakota ranks #5 in the U.S., of people on community water systems having optimally fluoridated water
- 96.5% = 688,710 out of 713,531 people in state
- This information is updated every two years and can be found on the CDC’s Fluoridation webpage¹



1. Source: CDC fluoridation statistics, 2018; <https://www.cdc.gov/fluoridation/statistics/2018stats.htm>



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North Dakota and Community Water Fluoridation – Where to get information

“My Waters Fluoride” – CDC public website for County level fluoride data²



North Dakota

List of Counties All Water Systems By County Fluoridation Reports

List of Counties

Select a county to view its public water systems.

53 Counties			
Adams	Barnes	Benson	Billings
Bottineau	Bowman	Burke	Burleigh
Cass	Cavalier	Dickey	Divide
Dunn	Eddy	Emmons	Foster
Golden Valley	Grand Forks	Grant	Griggs
Hettinger	Kidder	LaMoure	Logan
McHenry	McIntosh	McKenzie	McLean
Mercer	Morton	Mountrail	Nelson
Oliver	Pembina	Pierce	Ransom
Ransom	Renville	Richard	Rolette
Sargent	Sheridan	Sioux	Slope
Stark	Steele	Sully	Towner
Traill	Wash	Ward	Wells
Williams			

2. Source: My Waters Fluoride; https://nccd.cdc.gov/doh_mwf/Default/CountyList.aspx



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North Dakota and Community Water Fluoridation

Fluoridation Status Report (North Dakota, 2020)

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All Water Systems

PWS ID	PWS Name	County	Population Served	Fluoridated*	Fluoride Conc.
ND-3900001	ABERCROMBIE CITY OF	Richland (Primary)	253	Yes	2.29
ND-1801056	AGASSIZ WATER USERS DISTRICT	Grand Forks (Primary)	2274	Yes	0.70
ND-1801056	AGASSIZ WATER USERS DISTRICT	Walsh	1030	Yes	0.70
ND-2700006	ALEXANDER CITY OF	McKenzie (Primary)	1283	Yes	0.86
ND-3501476	ALL SEASONS WD-SYSTEM V	Pierce (Primary)	1033	Yes	0.70
ND-3000012	ALMONT CITY OF	Morton (Primary)	117	Yes	0.70
ND-0900017	AMENIA CITY OF	Cass (Primary)	90	Yes	0.70
ND-3200023	ANETA CITY OF	Nelson (Primary)	213	Yes	0.70
ND-0800648	APPLE VALLEY COOP	Burleigh (Primary)	192	Yes	0.70
ND-0900030	ARGUSVILLE CITY OF	Cass (Primary)	457	Yes	0.70
ND-0201058	BARNES RURAL WATER DISTRICT	Barnes (Primary)	3941	Yes	0.70
ND-0201058	BARNES RURAL WATER DISTRICT	Griggs	144	Yes	0.70
ND-0201058	BARNES RURAL WATER DISTRICT	LaMoure	312	Yes	0.70

Abercrombie & Alexander have natural levels of fluoride, not adjusted



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North Dakota and Community Water Fluoridation

Annual Water Quality Report³ – also called CCR. Sent out annually to residents
Gives actual fluoride levels measured in the water

2019 WATER QUALITY TESTING RESULTS FOR REGULATED CONTAMINANTS								
Contaminant	Date tested*	unit	MCL	MCLG	Highest Compliance Level	Range of detections	Major Sources	Violation?
Inorganic Contaminants								
Barium	4/10/2017	ppm	2	2	0.00516	NA	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.	No
Cyanide	4/7/2015	ppb	200	200	66	NA	Discharge from steel/metal factories; discharge from plastic and fertilizer factories.	No
Fluoride #	4/10/2017	ppm	4	4	0.648	NA	Natural deposit erosion, additive to promote strong teeth.	No
Nitrate-Nitrite	5/8/2019	ppm	10	10	0.034	NA	Fertilizer runoff, leaching from septic tanks, sewage.	No
Radioactive Contaminants								

3. Source: Online search Water Quality Report, Bismarck, N.D.; accessed 5-1-21; <https://bismarcknd.gov/DocumentCenter/View/35538/2019-Bismarck-Water-Quality-Report>



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Clinical Case Presentation



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Vaccine Hesitancy = Fluoridation Hesitancy

It is critical to understand that “Hesitancy” falls into three basic groups and approaches differ:

1. Those who are hesitant as they truly believe that they have a condition that was caused by the public health preventive measure
2. Those who have heard that the public health preventive measure causes health conditions and are concerned about them
3. Those who vehemently oppose the public health preventive measure no matter what anyone has to say about it



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A long list of false claims by fluoridation opponents

- No toxicological testing has been conducted on fluoride
- The ADA says it shouldn't be used in infant formula
- Fluorosis is a sign of toxic effects
- It causes ADHD
- It causes Alzheimer's
- It harms the kidney, the immune system and other systems
- It's a conspiracy — the phosphate fertilizer industry is disposing of its "hazardous waste"
- Cavities have fallen in all nations, so fluoridation must not matter
- Some people are allergic to fluoridated water
- It causes thyroid problems
- The only way fluoride works is by topical application
- This is "forced medication"
- The Cochrane Group says there's no evidence behind fluoridation
- Water systems should use a pharmaceutical grade of fluoride



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Case #1 – Compassion and Empathy

Those who are hesitant as they truly believe that they have a condition that was caused by the therapy:

- Attended a political meeting as I was running for office
- Elderly woman in wheelchair approached me shaking her finger
- "You're the reason I'm in this wheelchair. CWF made me sick. My doctor told me so!"
- Empathetically and compassionately discussed her condition. Expressed my concern for her health. Briefly discussed that the scientific studies on CWF do not bear out any adverse health effects
- I stated that "while nothing is ever 100%, scientific studies didn't show any illness like she had". She wasn't buying it. "Just stop it now!"



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Case #2 – Has heard about potential problems

- Donna, the mother of two children in my office for over 8 years, came to me with a question
- Moms on the baseball field had been talking about a mommy blog they'd read which stated that fluoride causes cancer
- Donna and I spoke about what she'd heard and the source of it. There were internet articles that were being circulated
- I offered to review those for her if she'd send them to me. I let her know that the research doesn't support this claim, but I'm always interested in reading new information



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Case #2 continued

- I let her know that my two young children used fluoride supplements and that I wouldn't do anything to risk their health.
- Donna called me back later that day.
- She stated that the articles were from an obscure website and as a pharmaceutical representative, she should have known better than to have accepted what was being said at face value.
- Donna's confidence in our relationship gave her the comfort & trust that she needed



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Case #3 – Opposes Fluoride and Fluoridation

Julie has two boys ages 3 and 5 years old when they first entered the practice
 For personal and religious beliefs, she does not want fluoride used on her boys in the office
 Oral hygiene = typical boys
 No fluoride toothpaste at home
 Discussed diet, home care, risk of cavities especially without using fluoride toothpaste
 Mom continued to refuse at each checkup
 We continued to discuss at each checkup.....it's our job to discuss prevention



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Case #3 continued

Fast forward four years

- The boys are now 7 and 9 years old
- Early cavities began to appear and were pointed out
- Mom agreed to move them to 3 month checkups
- After much discussion about how long the teeth were going to be before falling out, what else could be done, and what if they came in even more frequently.....
- Mom agreed to application of fluoride varnish twice per year
- The boys were also shown these areas and now were motivated



Courtesy California Dental Association



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North Dakota and Community Water Fluoridation

Summary:

- Discuss fluoride and water fluoridation at every checkup
- If your community is not fluoridated, discuss with the patient/parent that they're experiencing more cavities and more severe cavities than they would if their water was fluoridated
- If your community is fluoridated, discuss the healthiness of the teeth with the patient/parent and how fortunate we are to have fluoridated water
- If you are on well water, we will need to check it for fluoride level to see if it is adequate or not

Inoculate your community against challenges to CWF by this short conversation



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Resources

CDC: [Water Operators and Engineers](#)

CDC: [Water Fluoridation Information](#): General and specific information on CWF

[American Fluoridation Society](#):

- For the latest information on studies, explaining them, refutations, and scientific hyperlinks

American Dental Association:

- [Fluoridation Facts](#): Detailed information on common claims and charges made against CWF with answers and fully referenced
- [Frequently asked questions](#)
- [Mouth Healthy](#): More information on Fluoridation from ADA

American Academy of Pediatrics:

- [Campaign for Dental Health](#) Fluoridation Information and resources
- [Water Operators Section](#): Information for Water Operators



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Thank you!

Time for Questions & Answers

EVALUATION

At the end of today's session, please take a moment to complete a **brief** survey about today's training. If you would like continuing education credit, you must complete the evaluation.



Make new QR code and add the URL to the evaluation here in this text box



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Upcoming Clinics

Title of Next Clinic Here

Month Day, 2021
Time – Time am, Central
REGISTER HERE: Add URL HERE

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