Back To Chiropractic Continuing Education Seminars
Thriving in Our Toxic World

KIM B. KHAUV, DC MPH
“Sola dosis facit venenum”
“Only dose makes the poison”

- Paracelsus, the father of modern toxicology
  (16th Century)
Toxicology Effects

• Our Home environment
• Our Workplace
• Our air/water/land/food
• Biological/Chemical warfare
• Government Decisions
• Global and local environment
<table>
<thead>
<tr>
<th>AGENT</th>
<th>LD50 (mg/kg)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol</td>
<td>10,000</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>4,000</td>
</tr>
<tr>
<td>Ferrous sulfate</td>
<td>1,500</td>
</tr>
<tr>
<td>Morphine sulfate</td>
<td>900</td>
</tr>
<tr>
<td>Phenobarbital sodium</td>
<td>150</td>
</tr>
<tr>
<td>Picrotoxin</td>
<td>5</td>
</tr>
<tr>
<td>Strychnine sulfate</td>
<td>2</td>
</tr>
<tr>
<td>Nicotine</td>
<td>1</td>
</tr>
<tr>
<td>$d$-Tubocurarine</td>
<td>0.5</td>
</tr>
<tr>
<td>Hemicholinium-3</td>
<td>0.2</td>
</tr>
<tr>
<td>Tetrodotoxin</td>
<td>0.10</td>
</tr>
<tr>
<td>Dioxin (TCDD)</td>
<td>0.001</td>
</tr>
<tr>
<td>Botulinum toxin</td>
<td>0.00001</td>
</tr>
</tbody>
</table>

* LD50 is the dosage (mg/kg body weight) causing death in 50 percent of the exposed animals.

From Casarett & Doull's, Toxicology

Botox anyone?
Mercury Pollution Cycle

- Fossil fuel (e.g., coal) burning
- Natural sources

Fish eat methylmercury-containing microorganisms
Microorganisms eat methylmercury-containing bacteria
Bacteria convert mercury to methylmercury

Mercury vapor from natural sources and fossil fuel burning is released into the atmosphere. It then falls back to the earth, leading to methylmercury accumulation in fish and other organisms.
What is a “body burden”?  

- The term "body burden" refers to the total amount of chemicals that are present in the human body at a given point in time.
- Sometimes it is also useful to consider the body burden of a specific, single chemical, like, for example, lead, mercury, or dioxin.

(www.chemicalbodyburden.org)

(www.pollutioninpeople.org)
Some chemicals or their breakdown products (metabolites) lodge in our bodies for only a short while before being excreted, but continuous exposure to such chemicals can create a "persistent" body burden.

* Arsenic, for example, is mostly excreted within 72 hours of exposure.

Other chemicals can remain for years in our blood, adipose (fat) tissue, semen, muscle, bone, brain tissue, or other organs.

* Chlorinated pesticides, such as DDT, can remain in the body for 50 years.
Do all humans carry this chemical body burden?

- Scientists estimate that everyone alive today carries within her or his body at least 700 contaminants, most of which have not been well studied.

Some of the chemicals residing in our bodies are pesticides, and some are used in or produced by other forms of industrial production.

Many are found in a wide variety of consumer products.
- Humans are exposed to chemicals through the food we eat, the air we breathe, and the water we drink and bathe in.
- Chemicals often coat the surface of dust particles, which we handle or inhale.
• Another source of exposure is the chemical body burden of our mothers.

• During pregnancy, the chemicals stored in a woman's body have the ability to cross the placenta where they may cause harm.
• Some chemicals from a mother's body are also mobilized and transferred to the breasts as she produces breast milk. These chemicals are then transferred to the baby during breastfeeding.

• Breast milk remains the best food for babies, as recent studies show, because of its immunological, nutritional and psychological benefits.

• The fact that industrial chemicals have contaminated breast milk is tragic.
What is the evidence for body burden?

- In 1944 researchers found residues of DDT in human fat, and in the early 50's, naturalists rightly concluded that DDT was directly responsible for thinning eggshells and declining populations of bald eagles and other birds.
- In fact, at about the same time, DDT was detected in Antarctic penguins living an extremely long distance from where DDT was being used.
DDT concentration:
increase of 10 million times

DDT in fish-eating birds
25 ppm

DDT in large fish
2 ppm

DDT in small fish
0.5 ppm

DDT in zooplankton
0.04 ppm

DDT in water
0.000003 ppm
• Chemicals that cause cancer are called **carcinogens**.

• Chemicals that cause birth defects are called **teratogens**.

• Chemicals that damage the normal development of the fetus, infant, or child, or damage our reproductive tissues are called **developmental/reproductive toxicants**.

• Some chemicals can cause damage through their ability to interfere with normal hormone function. These chemicals are called **endocrine disrupters**.
• Hormones play extremely important roles as they help to direct the development of the fetus, infant, and child.

• Most importantly, exposure to an endocrine disrupter at a low level during a critical time in development can have lifelong impacts.
AT THE WHAT-YOU-DON'T-KNOW-CAN'T-HURT-YOU FOOD PROCESSING COMPANY HQ:

NO, THIS IS NOT LIKE GUANTANAMO WHERE UNLAWFUL ENEMY COMBATANTS ARE FORCE-FED FOR THEIR OWN GOOD...

...WE JUST DON'T WANT TO SPOIL YOUR APPETITE BY DISCLOSING EVERY LITTLE THING THAT GOES INTO YOUR FOOD, THAT'S ALL; OPEN WIDE!

NATIONAL UNIFORMITY FOR FOOD ACT

U.S. CONGRESS

U.S. CONSUMER

YOU HAVEN'T TOUCHED YOUR CHEMICAL SOUP!

BIG FOOD CO.

"SOME MERCURY, ARSENIC, OTHER CARCINOGENS"

©06
Contamination of future generations by toxic chemicals can be prevented by working together to:

1) eliminate the most dangerous persistent chemicals that bioaccumulate (concentrate more as they get higher in the food chain);
2) develop alternative production methods that use non-toxic materials, and
3) ensure that communities, national governments and international agencies take a precautionary approach when it comes to chemicals released into our air, water, and soil.
• Some limited research shows that body burdens of some contaminants stored in fat can be lowered by a combination of special diets, exercise, and saunas. But data are very limited and preliminary.

• When some metals, like lead or mercury, are present in the body at fairly high levels, "chelating agents" are sometimes used to lower the total body burden of that particular metal.

• However, "chelation" treatments are somewhat controversial with potential side effects and have not been proven to consistently reduce toxic impacts of exposure.
Reference:

- www.chemicalbodyburden.org
- www.ewg.org
- www.ourstolenfuture.org
- www.pollutioninpeople.org
Additional Info

- **References**
  - Casarett & Doull’s Toxicology, The Basic Science of Poisons
  - Michael Kamrin, Toxicology: A Primer on Toxicology Principles and Applications

- **Web Sites**
  - Society of Toxicology (www.toxicology.org)
Water Fluoridation
Current Literature Review For Chiropractors

Kim B. Khauv, DC MPH
Overview

- WHAT IS FLUORIDE?
- WHAT NATURAL PROCESS CAN FORM FLUORIDE?
- WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?
- HOW DOES FLUORIDE HARM ANIMALS?
- WHAT DISEASES RESULT FROM EXPOSURE TO FLUORIDE ARE IN HUMANS?
- ARE THERE ALTERNATIVES TO FLUORIDE?
WHAT IS FLUORIDE?

- Substance Name -- Fluorine (soluble fluoride)
  CASRN -- 7782-41-4
  Primary Synonym -- Fluoride
  Last Revised -- 01/31/1987

- 7782-41-4
  Fluoride
  Fluoride ion
  Fluoride ion(1-)
  Fluorine
  Fluorine, ion
  Hydrofluoric acid, ion(1-)
  Perfluoride.
Electronegativity is a measure of the attraction that an atom has for the bonding pair of electrons in a covalent bond. Fluorine has the highest electronegativity of all the elements.
Fluorides are naturally occurring compounds. Low levels of fluorides can help prevent dental cavities. At high levels, fluorides can result in tooth and bone damage. Hydrogen fluoride and fluorine are naturally-occurring gases that are very irritating to the skin, eyes, and respiratory tract. These substances have been found in at least 188 of the 1,636 National Priorities List sites identified by the Environmental Protection Agency (EPA).

CDC: Agency for Toxic Substances and Diseases Registry
http://www.atsdr.cdc.gov/tfacts11.html
• Fluorine cannot be destroyed in the environment; it can only change its form. Fluorine forms salts with minerals in soil.
• Hydrogen fluoride gas will be absorbed by rain and into clouds and fog to form hydrofluoric acid, which will fall to the ground.
• Fluorides released to the air from volcanoes and industry are carried by wind and rain to nearby water, soil, and food sources.
• Fluorides in water and soil will form strong associations with sediment or soil particles.
• Fluorides will accumulate in plants and animals. In animals, the fluoride accumulates primarily in the bones or shell rather than in soft tissues.

CDC: Agency for Toxic Substances and Diseases Registry
http://www.atsdr.cdc.gov/tfacts11.html
# United States Recommended Dietary Allowances (RDA)


<table>
<thead>
<tr>
<th>Compound</th>
<th>units</th>
<th>Adult Males (25+years)</th>
<th>Adult Females (25+years)</th>
<th>Children 4-8 years</th>
<th>Infants 6-12 mos</th>
<th>Pregnant</th>
<th>Lactating+</th>
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</thead>
<tbody>
<tr>
<td>Calcium (Ca)</td>
<td>mg</td>
<td>1200*</td>
<td>1200*</td>
<td>800*</td>
<td>270*</td>
<td>1000*</td>
<td>1000*</td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td>mg</td>
<td>750</td>
<td>750</td>
<td>600</td>
<td>300</td>
<td>750</td>
<td>750</td>
</tr>
<tr>
<td>Chromium (Cr)</td>
<td>mcg</td>
<td>50-200</td>
<td>50-200</td>
<td>50-200</td>
<td>20-60</td>
<td>50-200</td>
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</tr>
<tr>
<td>Copper (Cu)</td>
<td>mg</td>
<td>1.5-3</td>
<td>1.5-3</td>
<td>2-Jan</td>
<td>0.6-0.7</td>
<td>1.5-3</td>
<td>1.5-3</td>
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<tr>
<td>Fluoride (F)</td>
<td>mg</td>
<td>4*</td>
<td>3*</td>
<td>1*</td>
<td>0.5*</td>
<td>3*</td>
<td>3*</td>
</tr>
<tr>
<td>Folate</td>
<td>mcg</td>
<td>400*</td>
<td>400*</td>
<td>200*</td>
<td>80*</td>
<td>600*</td>
<td>500*</td>
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<tr>
<td>Iodine(I)</td>
<td>mcg</td>
<td>150</td>
<td>150</td>
<td>120</td>
<td>50</td>
<td>175</td>
<td>200</td>
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<tr>
<td>Iron (Fe)</td>
<td>mg</td>
<td>10</td>
<td>(25-50y) 15(51+y) 10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>mg</td>
<td>420**</td>
<td>320**</td>
<td>130**</td>
<td>75*</td>
<td>350-400**</td>
<td>310-360**</td>
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</tbody>
</table>
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

TOOTHPASTE (DENTRIFICE)
WARNING LABEL FOUND ON

FLUORIDE TOOTHPASTE

**Active ingredients**
- Sodium fluoride 0.24% (0.14% w/v fluoride ion)
- Criclosan 0.30%

**Uses**
aids in the prevention of:
- cavities
- plaque
- gingivitis

**Purpose**
Anticavity
Antigingivitis

**Warnings**
Keep out of the reach of children under 6 years of age.
If more than used for brushing is accidentally swallowed, get medical help or contact a Poison Control Center right away.
Ask a dentist before use if you have
- bleeding or redness lasting more than 2 weeks
- pain, swelling, pus, loose teeth, or more spacing between teeth
These may be signs of periodontitis, a serious form of gum disease.
Fluoride Paste

Fluoride-containing paste is routinely used during dental prophylaxis (i.e., cleaning). The abrasive paste, which contains 4,000--20,000 ppm fluoride, might restore the concentration of fluoride in the surface layer of enamel removed by polishing, but it is not an adequate substitute for fluoride gel or varnish in treating persons at high risk for dental caries (151). Fluoride paste is not accepted by FDA or ADA as an efficacious way to prevent dental caries.
TOOTHPASTE (DENTRIFICE)


"Virtually all authors have noted that some children could ingest more fluoride from dentrifice alone than is recommended as a total daily fluoride ingestion."
“The mean amount of **fluoride** ingested per brushing, was 0.42 mg when using the 1,450 ppm F toothpaste and 0.10 mg, when using the 400 ppm F toothpaste...If using the 400 ppm F toothpaste twice daily no children of average weight would have exceeded ingestion of 0.05 mg F/kg body weight whereas 14 average weight children would have exceeded this value if using the 1450 ppm F toothpaste.

Conclusions: **It is essential that parents of children aged less than 7 years apply a small (Pea-sized) amount of fluoride toothpaste on the toothbrush and discourage swallowing.**”
Factors influencing the amount of fluoride toothpaste applied by the mothers of young children Bentley EM, Ellwood RP, Davies RM BRITISH DENTAL JOURNAL 183 (11-12): 412-414 DEC 13 1997

“The mean weight of dentifrice, and therefore fluoride, applied was statistically less for the smear instruction than the pea but the difference was small. Significantly less weight of Colgate 0-6 gel was applied when compared with Colgate Great Regular Flavour (GRF) but the nozzle shape had no significant effect on the weight of dentifrice applied.

Conclusions: The difference in fluoride concentration between GRF (1450 ppm F) and Colgate 0-6 gel (400 ppm F) was the most important determinant of the amount-of fluoride applied.”
CDC: Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States

Fluoride Mouthrinse

• “Fluoride mouthrinse is a concentrated solution intended for daily or weekly use. The most common fluoride compound used in mouthrinse is sodium fluoride. Over-the-counter solutions of 0.05% sodium fluoride (230 ppm fluoride) for daily rinsing are available for use by persons aged >6 years. Solutions of 0.20% sodium fluoride (920 ppm fluoride) are used in supervised, school-based weekly rinsing programs. Throughout the 1980s, approximately 3 million children in the United States participated in school-based fluoride mouthrinsing programs (39).

  studies of the amount of fluoride swallowed by children aged 3--5 years using such rinses indicated that some young children might swallow substantial amounts (191).
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

FLUORIDATED TAP WATER
Ten Great Public Health Achievements –
United States, 1900-1999

• Vaccination
• Motor-vehicle safety
• Safer workplaces
• Control of infectious diseases
• Decline in deaths from coronary heart disease and stroke
• Safer and healthier foods
• Healthier mothers and babies
• Family planning
• Fluoridation of drinking water
• Recognition of tobacco use as a health hazard

www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm
Fluoridation of drinking water began in 1945 and in 1999 reaches an estimated 144 million persons in the United States. Fluoridation safely and inexpensively benefits both children and adults by effectively preventing tooth decay, regardless of socioeconomic status or access to care. Fluoridation has played an important role in the reductions in tooth decay (40%-70% in children) and of tooth loss in adults (40%-60%) (5).

http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm
Percent of Population on Public Water Systems Receiving Fluoridated Water - 1992

Source: Fluoridation Census 1992
Percent of Population on Public Water Systems Receiving Fluoridated Water - 2002

Source: Water Fluoridation Reporting System 2002
Does water fluoridation really work in reducing dental caries?
“National data collected in New Zealand over a 50-year period indicate that the decline in tooth decay in that country commenced before and independently of the introduction of fluoridation and other uses of fluoride... The recent decline in permanent tooth decay has been slightly steeper in nonfluoridated areas.”

“In this study in oral epidemiology, officially collected statistics are presented which show that, 15 yr after fluoridation commenced in Auckland, New Zealand, there was still a significant correlation between dental health of children and their social class. They also show that treatment levels have continued to decline in both fluoridated and unfluoridated areas, and are related to social class factors rather than to the presence or absence of water fluoridation.

In both areas the use of fluoride tooth-pastes and oral hygiene had been encouraged. When the socioeconomic variable is allowed for, child dental health appears to be better in the unfluoridated areas.”
“In addition to fluoridated water, the use of fluoride supplements was associated with both fewer caries and increased fluorosis. Conclusions: A suitable trade-off between caries and fluorosis appears to occur around 0.7 ppm F. Data from this study suggest that a reconsideration of the policies concerning the most appropriate concentrations for water fluoridation might be appropriate for the United States.”
“The prevalence of dental fluorosis in the United States has increased during the last 30 years, both in communities with fluoridated water and in communities with nonfluoridated water."

"During the past 40 years dental caries has been declining in the US, as well as in most other developed nations of the world... The decline in dental caries has occurred both in fluoride and in fluoride-deficient communities, lending further credence to the notion that modes other than water fluoridation, especially dentrifices, have made a major contribution."

Sample of Communities Rejecting Fluoridation since 1990 (complete list at: http://www.fluoridealert.org/communities.htm)

<table>
<thead>
<tr>
<th>Community</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Barbara, California</td>
<td>23-Nov-99</td>
</tr>
<tr>
<td>Johnstown, New York</td>
<td>19-Nov-99</td>
</tr>
<tr>
<td>Tooele, Utah</td>
<td>2-Nov-99</td>
</tr>
<tr>
<td>Wichita, Kansas</td>
<td>26-Oct-99</td>
</tr>
<tr>
<td>Boca Raton, Florida</td>
<td>25-Oct-99</td>
</tr>
<tr>
<td>El Cajon, California</td>
<td>27-Apr-99</td>
</tr>
<tr>
<td>Escondido, California</td>
<td>7-Apr-99</td>
</tr>
<tr>
<td>Helix Water District, California</td>
<td>7-Apr-99</td>
</tr>
<tr>
<td>Lakeside Water District, California</td>
<td>6-Apr-99</td>
</tr>
<tr>
<td>Hutchinson, Kansas</td>
<td>30-Mar-99</td>
</tr>
<tr>
<td>Riverview Water District, California</td>
<td>24-Mar-99</td>
</tr>
<tr>
<td>La Mesa, California</td>
<td>9-Mar-99</td>
</tr>
<tr>
<td>Santa Cruz, California</td>
<td>March 4, 1999 ...banned</td>
</tr>
<tr>
<td>Bremerton, California</td>
<td>2-Feb-99</td>
</tr>
<tr>
<td>Olympia, Washington</td>
<td>15-Dec-99</td>
</tr>
<tr>
<td>Seward, Nebraska</td>
<td>3-Nov-98</td>
</tr>
</tbody>
</table>
On November 1, 2005, the San Francisco Public Utilities Commission's (SFPUC) 2.4 million customers --except for those in Half Moon Bay-- will receive drinking water with fluoride. This is part of an overall effort by the SFPUC to fluoridate the remaining 20% of its customer service area. The SFPUC has supplied fluoridated water to San Francisco residents and the majority of its wholesale customers since the early 1950's.

http://sfwater.org/detail.cfm/C_ID/2614/MC_ID/10/MSC_ID/51/MTO_ID/61
FLUORIDATION STATUS OF BAWSCA MEMBER AGENCIES

Currently Receiving Fluoridated Water
- Alameda County Water District
- City of Hayward
- City of Mountain View
- City of Palo Alto
- Stanford University
- City of Brisbane
- City of Burlingame
- Cal Water Service Co. - Mid Peninsula (San Mateo)
- Cal Water Service Co. - City of South San Francisco
- City of Daly City
- Estero Municipal Improvement District
- Guadalupe Valley Municipal Improvement District
- Town of Hillsborough
- City of Millbrae
- North Coast County Water District
- City of San Bruno
- Westborough Water District

Will Receive Fluoridated Water Late Fall 2005
- Mid Peninsula Water District (Belmont)
- Cal Water Service Co. - Bear Gulch
- Cal Water Service Co. - Mid Peninsula (San Carlos)
- East Palo Alto County Water District
- City of Menlo Park
- City of Milpitas
- Purissima Hills Water District
- City of Redwood City
- City of San Jose - North
- City of Santa Clara
- Skyline County Water District
- City of Sunnyvale

Will Not Receive Fluoridated Water
- Coastside County Water District

Note: Lawrence Livermore Laboratory is an Associate Member
Proponents of Water Fluoridation will show this graph.
Centers for Disease Control (1999) -
Tooth Decay in the U.S. vs Fluoridation Status:

FIGURE 1. Percentage of population residing in areas with fluoridated community water systems and mean number of decayed, missing (because of caries), or filled permanent teeth (DMFT) among children aged 12 years — United States, 1967–1992
But then you can show them this graph.
World Health Organization Data (2004) -
Tooth Decay Trends (12 year olds) in Fluoridated vs. Unfluoridated Countries:
"The current reported decline in caries tooth decay in the US and other Western industrialized countries has been observed in both fluoridated and nonfluoridated communities, with percentage reductions in each community apparently about the same."

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

Bottled Water
### TABLE 3. U.S. Food and Drug Administration (FDA) fluoride requirements for bottled water packaged in the United States

| Annual average of maximum daily air temperature (°F) where the bottled water is sold at retail | Maximum fluoride concentration (mg/L) allowed in bottled water |
| --- | --- | --- |
| | No fluoride added to bottled water | Fluoride added to bottled water |
| ≤53.7 | 2.4 | 1.7 |
| 53.8–58.3 | 2.2 | 1.5 |
| 58.4–63.8 | 2 | 1.3 |
| 63.9–70.6 | 1.8 | 1.2 |
| 70.7–79.2 | 1.6 | 1 |
| 79.3–90.5 | 1.4 | 0.8 |

**Note:** FDA regulations require that fluoride be listed on the label only if the bottler adds fluoride during processing; the bottler is not required to list the fluoride concentration, which might or might not be optimal. FDA does not allow imported bottled water with no added fluoride to contain >1.4 mg fluoride/L or imported bottled water with added fluoride to contain >0.8 mg fluoride/L.

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

INFANT FORMULA
"Infant formulas reconstituted with higher fluoride water can provide 100 to 200 times more fluoride than breast milk, or cows milk."


“In the 1960s, most infants over 4 months of age were fed fresh cow's milk and intakes of F were therefore low. By the mid 1970s a trend toward more extended feeding of formula was evident and this trend has continued into the 1990s. Prolonged exposure to high intakes of fluoride during infancy is much more common now than in the past.”

*Fluoride intake by infants* Fomon SJ, Ekstrand J *JOURNAL OF PUBLIC HEALTH DENTISTRY* 59 (4): 229-234 FAL 1999
NO EVIDENCE OF TRANSFER OF FLUORIDE FROM PLASMA TO BREAST-MILK

"Parents should therefore be advised that they may be able to protect their children from dental fluorosis by breastfeeding their infant and by extending the duration for which they breastfeed. When infants are formula-fed, parents should be advised to reconstitute or dilute infant formula with deionized water (reverse osmosis, distilled, or low-fluoride bottled water) in order to reduce the amount of systemically ingested fluoride."


“Breastfeeding of infants should be encouraged, both for the many documented, general health benefits and the relative protection against ingestion of excessive fluoride from high quantities of intake of fluoridated water used to reconstitute concentrated infant formula early in infancy.”

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

PROCESSED CEREALS
“Food processing often concentrates fluoride and foods processed with fluoridated water typically have higher fluoride concentrations than foods processed with non-fluoridated water... A study that found marked differences between cereals processed in fluoridated and non-fluoridated areas showed that cereals processed in a fluoridated area had fluoride concentrations ranging from 3.8 ppm to 6.3 ppm...”

During manufacturing, infant dry cereals are processed in a slurry and placed in a revolving drying drum.

The water from the slurry evaporates, and the fluoride from the water remains in the cereal.

Thus, the fluoride concentration of the water used during processing can substantially affect the final fluoride concentration...

Infants who eat large quantities of dry infant cereals reconstituted with fluoridated water could ingest substantial quantities of fluoride from this source.

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

Juices & Sodas
"Our data suggest that young children who regularly or frequently drink substantial quantities of juice possibly should not receive dietary fluoride supplements, since they might be at increased risk of developing dental fluorosis."

"Seventy-one percent of the [sodas] had fluoride levels exceeding 0.60 ppm, which is considered to contain sufficient fluoride so that dietary fluoride supplements are contraindicated."


"Schulz (1976) found that nearly all soft drinks then manufactured in optimally fluoridated Baltimore (1.10 ppm) had fluoride concentrations of 0.8 ppm or greater. Shannon (1977) tested soft drinks manufactured in Houston, Texas... He found that fluoride concentrations... closely matched the fluoride concentrations of the bottling plants' water supplies. –

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

Tea
Tea is the second most commonly consumed drink in the world. Lungjing, pouchong, tienguanyin, oolong, pureh, and black tea specimens were purchased from different counties in Taiwan. Among six kinds of tea, black tea had the highest fluoride concentrations (8.64+/-2.96 mg/l), whereas pureh (1.97+/-2.70 mg/l) had the lowest levels. In addition, it was found that the critical step during the manufacturing process affecting the percentage of infusible fluoride was ball rolling rather than fermentation. Furthermore, intakes of high amounts (>/>=5 l/week) of certain tea may result in excess risks of dental or skeletal fluorosis. Tea lovers could be exposed to excess fluoride and may be at risk of fluorosis.
Tealeaves may release or absorb fluoride, depending on the fluoride content of water. Malde MK, Sci Total Environ. 2006 Aug 1;366(2-3):915-7.

As the tea plant (Camellia sinensis) is known to accumulate fluoride from the soil, the tealeaves may contain high concentrations of fluoride, which is easily released during infusion. In this study, we have tested the possible effect of original fluoride concentration in the water on the fluoride release from tea. Moreover, we wanted to test the possible capacity of tealeaves (commercially available tea) to absorb fluoride from high-fluoride water. In low-fluoride water, fluoride is easily released from tealeaves.
"Appropriate regulation of the fluoride content of tea commodities should be an urgent matter for public food safety policy."

"Instant tea, one of the most popular drinks in the United States, may be a source of harmful levels of fluoride... The researchers found that some regular strength preparations contain as much as 6.5 parts per million (ppm) of fluoride, well over the 4 ppm maximum allowed in drinking water by the Environmental Protection Agency."
- 'Potentially harmful fluoride levels found in some instant tea'', Washington University School of Medicine, January 25, 2005.
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?
“Analyses of nineteen California wines revealed fluoride concentrations ranging from 0.23 to 2.80 ppm (mean 1.02 ppm, with seven samples above the international limit of 1 ppm).”


"Researchers from California State University in Fresno conducted a 5 year study (1990-1994) on vineyards throughout the San Joaquin Valley. They found that '[m]ultiple applications of Cryolite during the growing season significantly increase fluoride in wines.' Notably they found fluoride levels between 3 - 6 ppm in Zinfandel, Chardonnay, Cabernet Sauvignon, Chenin Blanc, Thompson Seedless, Barbera, Muscat Candi, Ruby Cabernet; and levels between 6 - <9 ppm in French Colombard and Zinfandel... At 6 ppm one glass of wine (175 ml) would have delivered as much fluoride as about a liter of optimally fluoridated water!"

"Beers brewed in locations with high fluoride water levels may contribute significantly to the daily fluoride intake, particularly in alcohol misusing subjects and this may contribute to alcohol-associated bone disease." 

"Soda pop and beer bottled with fluoridated water contain 0.7 to 1 ppm fluoride; consumption of these beverages is almost certainly more variable among individuals than consumption of water... If beer contains 0.7 ppm fluoride, heavy beer-drinkers may ingest more than 4 mg daily from beer alone."
“Foods made with mechanically separated chicken have the potential to be a major contributor to total fluoride intake... Fluoride contributed by foods made with mechanically separated chicken could increase the risk of mild dental fluorosis for children less than eight years of age when combined with other sources of fluoride exposure."


“We found that infant foods containing chicken were high in fluoride. Thus, any infants who regularly eat more than a couple of ounces of infant foods containing high-fluoride-content chicken would be at elevated fluorosis risk."

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

Fish/Seafood
"Food categories with the highest mean fluoride levels were **fish [2.118 ppm]**, **beverages [1.148 ppm]**, and **soups [0.606 ppm]**. Individual samples with the highest fluoride levels were **tea [4.97 ppm]**, **canned fish [4.57 ppm]**, **shellfish [3.36 ppm]**, **cooked veal [1.23 ppm]**, and **cooked wheat cereal [1.02 ppm]**."

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?
• Teflon is polytetrafluoroethylene (PTFE).
• Teflon has the lowest coefficient of friction of any solid material known to man. It is used as a non-stick coating for pans and other cookware.
• PTFE was discovered serendipitously by Roy Plunkett of DuPont in 1939, while attempting to make a new CFC refrigerant.
• DuPont patented it in 1941, and registered the Teflon trademark in 1944.
"Teflon-lined cookware may contribute to the fluoride ingested by humans. Full and Parkins boiled fluoridated water at a moderate rate until a one-third or one-half reduction in volume was attained, then determined the fluoride content of the residual water...

In Teflon-coated ware, the concentration of fluoride ion increased to nearly 3 ppm."

WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

Fluoridated Salt
• “The use of fluoridated salt is becoming increasingly widespread across the globe.

• Fluoridated salt usually contains about 250 ppm fluoride, which would result in a daily intake of 2.5 mg of fluoride per day for people consuming 10 grams of salt.

• Countries with extensive salt fluoridation programs include: Austria, Bolivia, Columbia, Costa Rica, Dominican Republic, France, Germany, Honduras, Nicaragua, Panama, Switzerland, and Venezuela.”
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?
"In the 1960s, the widespread use of the inhalational anaesthetic methoxyflurane was associated with a significant occurrence of postoperative renal dysfunction. This was attributed to hepatic biotransformation of methoxyflurane and subsequent release of inorganic fluoride ions into the circulation. Based upon the clinical experience with methoxyflurane, serum fluoride concentrations exceeding 50 mumol/l were considered to be nephrotoxic... Enflurane and even isoflurane may, when used during prolonged operations, also yield anorganic fluoride levels in excess of 50 mumol/l."
After prolonged anaesthesia, metabolism of sevoflurane to inorganic fluoride is of a greater magnitude than that of isoflurane and exceeds the nephrotoxic threshold."
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?
"Cigarettes may be another significant source of fluoride intake by humans."
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?
“In the Federal Register of February 15, 2002 (67 FR 7156) (FRL-6822-2), EPA issued a notice pursuant to section 408 of FFDCA, 21 U.S.C. 346a, as amended by FQPA (Public Law 104-170), announcing the filing of a pesticide petition (PP 1F6312) by Dow AgroScience LLC, 9330 Zionsville Road, Indianapolis, IN 46268. That notice included a summary of the petition prepared by DowAgroScience, the registrant. The petition requested that 40 CFR part 180 be amended by establishing tolerances for residues of the insecticide sulfuryl fluoride and the metabolite fluoride, from sulfuryl fluoride postharvest use, in or on:”
“1. **Fluoride in or on the following raw agricultural commodities:** Date at 5 parts per million (ppm), fig at 5 ppm, plum, prune, dried at 5 ppm, grape, raisin at 5 ppm, fruit, dried at 5 ppm, almond at 10 ppm, pecan at 23 ppm, pistachio at 18 ppm, **walnut at 30 ppm**, beechnut; butternut; cashew; chestnut; chinquapin; filbert; nut, brazil; nut, hickory; and nut, **macadamia at 30 ppm**, barley, grain at 10 ppm, corn, field, grain; and corn, pop, grain at 7 ppm, oat, grain at 17 ppm, rice, grain at 10 ppm, **wheat, grain at 25 ppm**, millet, grain; rice, wild, grain; sorghum, grain; and triticale, grain at 25 ppm and on the processed products corn, field, flour at 26 ppm, corn, field, grits at 10 ppm, **corn, field, meal at 28 ppm**, corn, field, oil at 3 ppm, rice, brown at 14 ppm, rice, polished rice at 18 ppm, rice, bran at 31 ppm, **rice, hulls at 35 ppm**, wheat, bran at 40 ppm, wheat, flour at 10 ppm, wheat, germ at 98 ppm, wheat milled by products at 35 ppm, wheat, shorts at 38 ppm, corn, field, refined oil at 3 ppm.”
Facilities approved to use sulfuryl fluoride as a fumigant:

• On July 15, 2005, US EPA approved a 70 ppm residue tolerance for fluoride on ALL processed food. Fumigation is approved in:
  • Food and feed processing plants
  • Bakeries
  • Bottlers
  • Canneries
  • Dairies, creameries, milk processing plants
  • Feed mills, feed stores
  • Fresh fruit packing and processing
  • Meat processing
  • Poultry processing
  • Wineries, wine cellars
  • Flour mills, machinery, warehouses, bins, elevators
• Egg processing
• Candy and confectionary plants
• Sugar processing, cane mills, etc.
• Cider mills
• Dry food products plants
• Tobacco processing
• Air treatment for processing and transportation of foods
• Beverage processing
• Nut processing
• Cereal processing
• Seafood processing
• Vegetable oil processing
• Spice mills
• Vinegar processing
• Farinaceous processing (noodles, etc.)
• Mushroom processing
• Dried fruit processing
• Pickle processing
• Ice plants
• Chocolate processing
• Fruit juice processing
WHAT IS FLUORIDE USED FOR AND WHERE IS IT FOUND IN?

Osteoporosis Treatment
“Fluoride.

The authors suggested that controlled trials of the efficacy of sodium fluoride should be conducted in patients with glucocorticoid-induced osteoporosis.

The Task Force agrees and further recommends that such trials utilize low-dose slow-release preparations of sodium fluoride.”
• “The pathogenesis of glucocorticoid osteoporosis is complex.
• For the prevention and treatment of glucocorticoid-induced osteoporosis, frequently used drugs today are fluorides, ossein-hydroxy-apatite complexes and, especially in acute glucocorticoid osteoporosis, calcitonin.”
Sodium Fluoride shipping label:
How much is produced annually?

- **Byproduct Calcium Fluoride** is recovered from industrial waste streams.

- About 10 million tons of phosphoric acid, H₃PO₄, are produced in the United States each year. Most of the acid (about 80%) is used in the production of agricultural fertilizers, with the remainder being used for detergent additives (about 10%), cleaners, insecticide production, and cattle feed additives. The commercial method of preparation is the addition of sulfuric acid to phosphate rock.

  \[
  3 \text{H}_2\text{SO}_4(\text{l}) + \text{Ca}_3(\text{PO}_4)_2(\text{s}) + 6 \text{H}_2\text{O}(\text{l}) \iff 2 \text{H}_3\text{PO}_4(\text{s}) + 3 \text{CaSO}_4·2\text{H}_2\text{O}(\text{s})
  \]

- **Byproduct Fluorosilicic acid** is recovered from phosphoric acid plants processing phosphate rock.

- **Byproduct Fluorosilicic acid**: 65,200 tons in 2001

CDC: Agency for Toxic Substances and Diseases Registry
http://www.atsdr.cdc.gov/tfacts11.html
“Fluorosilicic acid is mainly produced as a byproduct of the manufacture of phosphate fertilizers where phosphate rock, containing fluorides and silicates, is treated with sulfuric acid. “
“The chemicals most commonly used by American waterworks for water fluoridation are fluorosilicic acid, sodium silicofluoride, and sodium fluoride.”

fluorosilicic acid is as fluoridation agents for drinking water.
“Fluorosilicic acid is mainly produced as a byproduct of the manufacture of phosphate fertilizers where phosphate rock, containing fluorides and silicates, is treated with sulfuric acid.”
HOW DOES FLUORIDE HARM ANIMALS?
“rats exposed to 100 ppm fluoride showed significant neurodegenerative changes in the hippocampus, amygdala, motor cortex, and cerebellum.

These histological changes suggest a toxic effect of high-fluoride intake during the early developing stages of life on the growth, differentiation, and subcellular organization of brain cells in rats.”
• “Brain membrane lipid in rats were analyzed after being fed either 30 or 100 ppm fluoride for 3, 5, and 7 months...

• After 7 months of fluoride treatment, the total brain phospholipid content decreased by 10% and 20% in the 30 and 100 ppm fluoride groups, respectively...

• The results demonstrate that the contents of phospholipid and ubiquinone are modified in brains affected by chronic fluorosis and these changes of membrane lipids could be involved in the pathogenesis of this disease.”
“A suppression of spontaneous motor activity suggests that fluoride has, by a central action, inhibited motivation of these animals to exhibit locomotor behavior.
• “Wistar rats were supplied with drinking water containing either 30 or 100 ppm fluoride (NaF) for seven months...

• Total ubiquinone contents in rat liver were reduced by 11% in the group treated with 30 ppm fluoride and by 42% in the group treated with 100 ppm fluoride. In the subclasses of ubiquinone, both ubiquinone-9 and ubiquinone-10 amounts decreased after fluoride treatment.

• These modifications of membrane lipids might be induced by oxidative stress, which might be an important factor in the pathogenesis of chronic fluorosis.”
• “The US National Toxicology Program has shown equivocal evidence of carcinogenic activity of sodium fluoride (NaF) in male F344/N rats based on the occurrence of five osteosarcomas in treated animals.

• In the study the osteosarcomas developed mainly in the rat vertebrae... Significant increases in the frequencies of chromosome aberrations were induced in a dose- and treatment time-dependent fashion when NaF was administered to RVBd cells at 0.5 and 1.0 mM for 24 and 48 h.

• The results indicate that NaF is genotoxic to rat vertebrae, providing a possible mechanism for the vertebrae, as a target organ of NaF carcinogenesis.”
REPRODUCTIVE SYSTEM
“Albino rabbits were injected sodium fluoride solutions in the concentration of 5, 10, 20 and 50 mg/kg body weight/day subcutaneously for 100 days...

The data indicate that the structural alterations in the ovary were more pronounced with the concomitant increase in the dose of fluoride.”
• “Spermatogenesis ceased only in animals treated for 29 months.

• The difference in the structural changes observed in the testes of the 2 treated groups may have been due to the blood-testis barrier.

• It is concluded that ingestion of high concentrations of fluoride has harmful effects on the male reproductive system.”
• “The percentage of spermatozoa in ram semen with intact acrosomes and the level of spermatozoa motility decreased significantly after dilution and after 5 hr incubation at 38°C.

• These changes undoubtedly affect the physiological functions of the sperm.”
• “A single microdose (50 micrograms/50 microL) injection of sodium fluoride (NaF) into the vasa deferentia of adult male albino rats (Rattus norvegicus) caused arrest of spermatogenesis and absence of spermatozoa in the lumina of the seminiferous tubules of the testes, which consequently led to a decline in the sperm count in the caudae epididymides.

• Scanning electron microscopy of cauda and vas deferens sperm revealed deflagellation and tail abnormalities.

• Thus microdoses of sodium fluoride were found to affect reproductive function and fertility rate.”
• “A wide variety of structural defects were observed in the flagellum, the acrosome, and the nucleus of the spermatids and epididymal spermatozoa of fluoride-treated rabbits.

• The abnormalities observed render the sperm nonfunctional and ineffective, and thus there is a possible role of fluoride in causing infertility.”
nicotinic acetylcholine receptors
The results suggest that the deficit of nAChRs induced by fluoride toxicity occurs at the level of post-transcription of the receptor gene, in which a mechanism might be involved in the damage by oxidative stress.”
• Since nAChRs play major roles in cognitive processes such as learning and memory, the decrease in the number of nAChRs caused by fluoride toxicity may be an important factor in the mechanism of brain dysfunction in the disorder.”
•“The DNA damage in pallium neurons in rats of the fluoride group was much more serious compared with those of the control group,

•CONCLUSION: Sodium fluoride could induce DNA damage and apoptosis in rats brain.”
Fluoride and Humans
• “The intelligence was measured of 907 children aged 8-13 years living in areas which differed in the amount of **fluoride** present in the environment.

• The Intelligence Quotient (IQ) of children living in areas with a medium or severe prevalence of fluorosis was lower than that of children living in areas with only slight fluorosis or no fluorosis.

• **A high fluoride intake was associated with a lower intelligence.**

• **The effect of exposure to a high level of fluoride on intelligence may occur at an early stage of development of the embryo and infant when the differentiation of brain nerve cells is occurring and development is most rapid.”**
Higher drinking water fluoride levels were significantly associated with higher rates of mental retardation (IQ <70) and borderline intelligence (IQ 70-79).

In endemic fluorosis areas, drinking water fluoride levels greater than 1.0 mg/L may adversely affect the development of children's intelligence.”
HOMEOOSTASIS DISTURBED
Decreased $T_3$, $T_4$ concentration in blood or low body temperature

HOMEOOSTASIS
Normal $T_3$ and $T_4$ concentrations, normal body temperature

HOMEOOSTASIS RESTORED
Increased $T_3$ and $T_4$ concentration in the blood

Hypothalamus releases TRH
Anterior pituitary releases TSH
Anterior pituitary releases TSH
Thyroid gland releases $T_3$ and $T_4$
• These findings indicate that children with or even without dental fluorosis from exposure to excess fluoride, either through drinking water or through other sources, may have thyroid hormone derangements that may not be clinically overt until late stages.

• Determining free T-3, free T-4, and TSH is therefore important for a proper diagnosis of potential health problems.

• Withdrawal from fluoride sources along with measures to correct the thyroid hormonal status may be necessary to promote better health in such children living in fluoride endemic areas.”
WATER FLUORIDATION...

CAUSES DENTAL FLUOROSIS

"Fluorosis is poisoning by fluorides"
—Webster's Encyclopedic Unabridged Dictionary

Very Mild
1 ppm
Brigham City, Utah

1 mg per day
Prescription Fluoride
White and Brown Enamel

Severe
Water 4 mg/day
Brown Pitted Enamel
Do you have dental fluorosis?
Moderate effects of Fluoridated water
Arrows point to discolored, cracked or pitted areas
Countries with endemic fluorosis due to excess fluoride in drinking water
• “A strong positive correlation (P < 0.05) was found between the caries experience and the fluorosis scores of children in the high fluoride area (Leeu Gamka) but no correlation could be found in the other two areas.

• Significantly (P < 0.01) more children had decayed teeth in the high F area (Leeu Gamka) than in the other two areas.

• CONCLUSION: The results suggest a positive association between high F levels in the drinking water and dental caries.

• Furthermore, a low caries experience and no difference in DMFT and fluorosis between the two low fluoride areas were found.”
• “Those who brushed their teeth before the age of 25 months had 11 times the odds of fluorosis compared with those beginning toothbrushing later; prolonged use of infant formula (greater than or equal to 13 months) was associated with 3.5 times the risk of fluorosis, compared with no, or shorter duration of, formula use.

• We estimate that these factors were responsible for 72% and 22%, respectively, of the cases in our population.
The Third Eye of Mammals is Pineal Gland

Figure 1. Physiology of Melatonin Secretion.
Melatonin (inset) is produced in the pineal gland. The production and secretion of melatonin are mediated largely by postganglionic retinal nerve fibers that pass through the retinohypothalamic tract to the suprachiasmatic nucleus, then to the superior cervical ganglion, and finally to the pineal gland. This neuronal system is activated by darkness and suppressed by light. The activation of $\alpha$, $\beta$-adrenergic receptors in the pineal gland raises cyclic AMP and calcium concentrations and activates aroylalkylamine $N$-acyltransferase, initiating the synthesis and release of melatonin. The daily rhythm of melatonin secretion is also controlled by an endogenous, free-running pacemaker located in the suprachiasmatic nucleus.
“There was a positive correlation between pineal F and pineal Ca (r = 0.73, p<0.02) but no correlation between pineal F and bone F.

By old age, the pineal gland has readily accumulated F and its F/Ca ratio is higher than bone.”
• “Similarly, higher activities of serum transaminases (SGOT and SGPT) might be due to altered liver function, since both of these enzymes are known markers (of liver function).

• Thus, the above data reveal altered liver and Kidney function in fluorosis-afflicted individuals with high urine and serum fluoride but low sialic acid levels compared to normal controls.”
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Received: 24 July 2005  Accepted: 07 November 2005
5 Contact Information and Murray A. Mittleman6, 7
OBJECTIVE: We explored age-specific and gender-specific effects of fluoride level in drinking water and the incidence of osteosarcoma. METHODS: We used data from a matched case-control study conducted through 11 hospitals in the United States that included a complete residential history for each patient and type of drinking water (public, private well, bottled) used at each address. Our analysis was limited to cases less than 20 years old. We standardized fluoride exposure estimates based on CDC-recommended target levels that take climate into account. We categorized exposure into three groups (<30%, 30-99%, >99% of target) and used conditional logistic regression to estimate odds ratios.
RESULTS: Analysis is based on 103 cases under the age of 20 and 215 matched controls. For males, the unadjusted odds ratios for higher exposures were greater than 1.0 at each exposure age, reaching a peak of 4.07 (95% CI 1.43, 11.56) at age 7 years for the highest exposure. Adjusting for potential confounders produced similar results with an adjusted odds ratio for males of 5.46 (95% CI 1.50, 19.90) at age 7 years. This association was not apparent among females. CONCLUSIONS: Our exploratory analysis found an association between fluoride exposure in drinking water during childhood and the incidence of osteosarcoma among males but not consistently among females. Further research is required to confirm or refute this observation.
The mean value of fluoride in patients with other bone-forming tumors was approximately 50% of the group of osteosarcoma; however, it was significantly higher when compared with patients of group I. Serum sialic acid concentration was found to be significantly raised in patients with osteosarcoma as well as in the group with other bone-forming tumors as compared to the group of controls. There was, however, no significant difference in the group of patients of osteosarcoma when compared with group of patients with other bone-forming tumors. These results showing higher level of fluoride with osteosarcoma compared to others suggesting a role of fluoride in the disease.
“A review of recent scientific literature reveals a consistent pattern of evidence--hip fractures, skeletal fluorosis, the effect of fluoride on bone structure, fluoride levels in bones and osteosarcomas--pointing to the existence of causal mechanisms by which fluoride damages bones.
• There were 26 periarticular, six femoral neck, three pubic rami, three tibia and fibula, one greater trochanter, and two subtrochanteric fractures.

• Vertebral fractures appeared first, then periarticular, then femoral neck, and lastly long-bone shaft fractures.

• All fractures were spontaneous in onset.

• The peripheral fracture rate during treatment was three times that in untreated osteoporosis. Roentgenograms must be repeated at intervals of three to four weeks before the pathognomonic callus becomes visible, and the diagnosis can be made.

• Trabecular stress fractures tend to occur in the first 18 months of treatment, and cortical stress fractures occur after 30 months of therapy.”
“We conclude that stress fracture patients had more severe trabecular and cortical OP and possibly a poorer bone-forming capacity before therapy than patients without stress fractures. We suspect that fluoride therapy may temporarily further weaken bone and so lead to stress fractures in severely osteoporotic patients.”
• “We report clinical and bone morphometric findings in 18 osteoporotic patients who experienced stress fractures during fluoride therapy.

• The clinical course was favorable in all patients who stopped fluoride, although 5 patients who continued the treatment had either completion of femoral neck stress fractures to hip fractures (n = 2), or recurrent stress fractures (n = 2), or both (n = 1).

• Fluoride appears to be a key factor in the pathogenesis of stress fractures, and may be associated with increased trabecular resorption in some treated patients.”
• “Fifty-four women in the fluoride group and 24 in the placebo group had side effects sufficiently severe to warrant dose reduction;

• the major side effects were gastrointestinal symptoms and lower-extremity pain.

• We conclude that fluoride therapy increases cancellous but decreases cortical bone mineral density and increases skeletal fragility.

• Thus, under the conditions of this study, the fluoride-calcium regimen was not effective treatment for postmenopausal osteoporosis.”
ELEVATED BLOOD LEAD
• We report here on a statistical study of 151,225 venous blood lead (VBL) tests taken from children ages 0-6 inclusive, living in 105 communities of populations from 15,000 to 75,000....

• These data contradict the null hypothesis that there is no difference between the toxic effects of SiF and sodium fluoride, pointing to the need for chemical studies and comprehensive animal testing of water treated with commercial grade silicofluorides.”
Lead, a toxin that lowers dopamine function, has been associated with violent behavior as well as learning deficits.

• Hydrofluosiliic acid and sodium silicofluoride, which were 'substituted for sodium fluoride without testing as chemicals for public water treatment, increase absorption of lead from the environment and are associated with violent behavior.

• Given the costs of incarcerating violent criminals, these side-effects justify a moratorium on using silicofluorides for water treatment until they are shown to be safe.”
• Both CA frequency and MN frequency of the workers increased with length of the chemical exposure period up to 10 years.”
REPRODUCTIVE SYSTEM
• “The current study was to see whether **fluoride** would also affect human birth rates.

• **Most regions showed an association of decreasing Fertility rate with increasing fluoride levels.**

• There is no evidence that this outcome resulted from selection bias, inaccurate data, or improper analytical methods.

• Whether or not the **fluoride** effect on the fertility rate found at the county level also applies to individual women remains to be investigated.”
URINARY SYSTEM

- Renal artery & vein
- Right kidney
- Left kidney
- Major calyces
- Cortex
- Medulla
- Minor calyces
- Renal pelvis
- Renal sinus
- Right ureter
- Left ureter
- Bladder
- Ureteral orifices
- Detrusor muscle
- Bladder neck
-Internal urethral sphincter
• “The present study was designed to evaluate the role of fluoride in urolithiasis in humans.

• The prevalence of urolithiasis was 4.6 times higher in EA than in NEA. Furthermore, the prevalence was almost double in subjects with fluorosis than without fluorosis in the endemic area.

• In conclusion, the data suggest that fluoride in vivo may behave as a mild promoter of urinary stone formation by (a) excretion of insoluble calcium fluoride, (b) increasing oxalate excretion and (c) mildly increasing the oxidative burden.”
• “The feasibility of an integrated biological and physiochemical water treatment process for nitrate and fluoride removal has been evaluated...

• In all cases a fluoride concentration of 20 mg/l in water could not be reduced to the acceptable level of 1.5 mg/l.”
THERE IS HOPE
ALTERNATIVES TO FLUORIDE TOOTHPASTE

1. Baking Soda
2. Hydrogen Peroxide Solution
3. Propolis & Myrrh Baking Soda Toothpaste
“The inhibition on proliferation and differentiation at 2 mmol/L NaF was antagonized by vitamin C.

CONCLUSION:

• Fluoride had a two-phase effect on osteoblasts, vitamin C could antagonize the inhibitory effect of higher concentration of fluoride on proliferation and differentiation of osteoblasts.”
• “The results showed that the degree of DNA damage in the fluoride group and the selenium group were significantly greater than that in control group (P < 0.01).
• The damage in the fluoride group was even more serious.
• Moreover, the joint antagonistic effect of selenium and zinc against fluoride was more obvious.”
• Further, the toxic effects of fluoride are reversible if its exposure is withdrawn for 2 months.”
• “These results show that NaF affects testicular steroidogenesis, protein levels, and HSD and SDH activities in mice.
• The effects, however, are transient and reversible, with the amino acids glycine and glutamine producing marked beneficial effects.
• A protein-supplemented diet might therefore ameliorate the toxic effects of fluoride in endemic areas.”
To analyze the effectiveness and safety of water fluoridation, we will need to answer three basic questions:

- #1 What is fluoride?
- #2 How does fluoride help prevent tooth decay?
- #3 Does water fluoridation work?
#1 What is fluoride?

• The ADA’s answer is: fluoride is a naturally occurring element that prevents tooth decay systemically when ingested during tooth development and **topically when applied to erupted teeth.**
#1 What is fluoride?

- Rebuttal: The ADA's answer to the question above leads one to believe that fluoride is something that occurs naturally in water. One would assume from their statement that some type of natural fluoride is added.
- This is not the case; only calcicium fluoride occurs naturally in water, and it has never been used for fluoridation.
- Instead, according to the CDC, the chemicals most commonly used by American waterworks for water fluoridation are fluorosilicic acid, sodium silicofluoride, and sodium fluoride.
#2 How does fluoride help prevent tooth decay?

- The CDC states: "Fluoride's caries-preventive properties initially were attributed to changes in enamel during tooth development...
- However, laboratory and epidemiologic research suggests that fluoride prevents dental caries predominately after eruption of the tooth into the mouth, and its actions primarily are topical for both adults and children."
#2 How does fluoride help prevent tooth decay?

• Rebuttal: Both the ADA and the CDC’s answers states that fluoride benefits teeth topically. If fluoride provides its benefits topically, it makes more sense to apply it in the form of toothpaste.  
• To put it in the drinking water, where systemic exposure and all the accompanying risks become inevitable, does not make sense.
#3 Does water fluoridation work?

• Los Angeles County is 44% fluoridated, yet 75% have tooth decay. (LACHHS, 2000)
• The city of Long Beach is fluoridated, yet have more cavities (75%) than the State of California (71%) while the state-wide fluoridation rate is only at 27%. (Press-Telegram, 2/6/06)
• Alameda County, with five fluoridated districts, had twice the statewide number of students needing urgent dental care. (Contra Costa Times, 02/06/2006)
#3 Does water fluoridation work?

- In comparison, Nassau County, New York, has a 50% cavity rate while being NON-fluoridated. (Nassau County Community Health Assessment 2005-2010)
- Researchers discovered in New Zealand over a 50-year period, the decline in tooth decay in that country commenced before and independently of the introduction of fluoridation and other uses of fluoride. (Colquhoun J., 1993)
#3 Does water fluoridation work?

Meanwhile...
Fluorosis, a condition of white spotted, yellow or brown and sometimes pitted or crumbly teeth, caused by too much fluoride, is on the rise over the past 30 years in the United States.

In Conclusion:

• Fluoride effects teeth topically and systemically prior to tooth eruption.
• Water Fluoridation does not work.
• Fluoride is found in many water based foods like juices, baby formula and used in pesticides.
• Fluoride effects intelligence, fluorosis, bone fractures, kidneys, the brain, reproductive systems, DNA, and liver.
• Vitamin C, selenium, zinc, glycine, glutamine, and calcium can help reverse the toxicity effects of fluoride.
For more information read this book

the fluoride deception

Christopher Bryson

with a foreword by Dr. Theo Colborn
Topics to discuss:

• Endocrine disruptor: Phthalates
• Personal Care Products
• Drug-Herb-Vitamin Interactions
Endocrine Disruptor: Phthalates
• **Substance name:** Dibutyl phthalate
• **CASR number:** 84-74-2
• **Molecular formula:** C16H22O4
• **Synonyms:** DBP; Di-n-Butyl Phthalate; n-Butyl phthalate; 1,2-Benzenedicarboxylic acid dibutyl ester; Phthalic acid dibutyl ester; o-benzenedicarboxylic acid, dibutyl ester; benzene-o-dicarboxylic acid di-n-butyl ester; dibutyl 1,2-benzenedicarboxylate; Benzenedicarboxylic acid, dibutylester; Dibutyl o-Phthalate

• **Common uses:**
Dibutyl phthalate is a man-made chemical that is added to plastics and other chemicals. **In plastics it helps keep them soft (a plasticizer).** It is also used in elastomers, lacquers, explosives, printing inks, resin solvents, perfume oil solvents, paper coatings, adhesives, and nail polish. **It is used as a solid rocket propellant.**

The National Pollutant Inventory (NPI) www.npi.gov.au
Dibutyl phthalate is used extensively throughout society, it is now widespread in the environment. Most people are exposed to low levels in air, water, and food. In many cases the largest source of exposure is from food containing dibutyl phthalate. Some of the dibutyl phthalate in food is from plastics used to wrap and store the food and certain types of food (especially fish and shellfish) may absorb larger quantities of dibutyl phthalate (from 50 to 500 parts per billion).

• By what pathways might Dibutyl phthalate enter my body? Dibutyl phthalate can enter the body when a person breathes air containing it, or when a person drinks water or eats food that has been containing with the compound. Dibutyl phthalate can enter the body through the skin, but this is very slow.

The National Pollutant Inventory (NPI) www.npi.gov.au
Over the past 3 years, animal experiments have indicated that low exposures can grossly alter the organs that in adults produce and deliver sperm.

The evaluators noted, however, that low phthalate concentrations show damage to animals only when the exposure takes place during some precise window of vulnerability. This period in test animals approximately corresponds to the end of a woman's first trimester of pregnancy, a time when many women don't yet realize they're carrying a child.
Tests by Greenpeace, an environmental group, found that this IV bag contains 39 percent DEHP by weight. Though saline and glucose leach relatively little of this phthalate from such bags, fattier substances—such as food or blood—may leach large amounts. (Greenpeace)
Epididymis (left) from an unexposed adult rat is more than three times the size of this sperm-storing organ (right) from an animal exposed to DBP in the womb.
The normal testis, left, comes from a healthy male rat. Tissues center and right come from a rat exposed to DEHP while its reproductive tract was maturing. The center tissue is a small testis filled with fluid. The corresponding tissue from the other side of the same animal exhibits no visible testis or sperm-storing epididymis. Another DEHP-exposed animal from the same set of EPA tests developed a "testis" that was nothing but a sack of blood. (Joseph Ostby / EPA)
Seminal vesicle from unexposed adult rat (left) weighs 1,700 milligrams, or more than 7 times as much as the one from the animal exposed to DEHP during development (right). Males have a pair of these pouches, which secrete fluid to carry sperm. (Joseph Ostby / EPA)
Phthalates: In the House/Office
Phthalates, alkylphenols, pesticides, polybrominated diphenyl ethers, and other endocrine-disrupting compounds in indoor air and dust.

We sampled indoor air and dust in 120 homes, analyzing for 89 organic chemicals identified as EDCs. These are the first reported measures in residential environments for over 30 of the compounds, including several detected at the highest concentrations. The number of compounds detected per home ranged from 13 to 28 in air and from 6 to 42 in dust. The most abundant compounds in air included phthalates (plasticizers, emulsifiers), o-phenylphenol (disinfectant), 4-nonylphenol (detergent metabolite), and 4-tert-butylphenol (adhesive) with typical concentrations in the range of 50-1500 ng/m3.

Rudel RA, Camann DE, Spengler JD, Korn LR, Brody JG.
Phthalates in indoor dust and their association with building characteristics

Abstract: In the present study we examined associations between the concentrations of different phthalate esters in the dust from these bedrooms and various characteristics of the home. The study focused on BBzP and DEHP because these were the phthalates associated with health complaints. Associations have been examined using parametric and nonparametric tests as well as multiple logistic regression. For both BBzP and DEHP, we found associations between their dust concentrations and the amount of polyvinyl chloride (PVC) used as flooring and wall material in the home.

Bornehag CG, Lundgren B, Weschler CJ, Sigsgaard T, Hagerhed-Engman L, Sundell J

• Source: ENVIRONMENTAL HEALTH PERSPECTIVES 113 (10): 1399-1404 OCT 2005
The association between asthma and allergic symptoms in children and phthalates in house dust: a nested case-control study.

The aim of the present study was to investigate potential associations between persistent allergic symptoms in children, which have increased markedly in developed countries over the past three decades, and the concentration of phthalates in dust collected from their homes. This investigation is a case-control study nested within a cohort of 10,852 children. From the cohort, we selected 198 cases with persistent allergic symptoms and 202 controls without allergic symptoms.

This study shows that phthalates, within the range of what is normally found in indoor environments, are associated with allergic symptoms in children.

Phthalates: Medical Equipments/Medicine
Use of Di(2-ethylhexyl) Phthalate-Containing Medical Products and Urinary Levels of Mono(2-ethylhexyl) Phthalate in Neonatal Intensive Care Unit Infants

• **Participants:** We studied 54 neonates admitted to either of two level III hospital NICUs for at least 3 days between 1 March and 30 April 2003.

• **Conclusion:** Intensive use of DEHP-containing medical devices in NICU infants results in higher exposure to DEHP as reflected by elevated urinary levels of MEHP.

• Ronald Green; Russ Hauser; Antonia M. Calafat; Jennifer Weuve; Ted Schettler; Steven Ringer;

• Environ Health Perspect. 2005;113(9):1222-1225. ©2005 National Institute of Environmental Health Sciences
PVC-plasticizer DEHP in medical products: do thin coatings really reduce DEHP leaching into blood?

• The levels of toxic oxidation products of DEHP generated in the blood, particularly, were found as high as in the uncoated tubing. The coatings improved the hemocompatibility, but are not safe protection against the hazardous metabolites of DEHP.

• For pregnant women, neonates and children, we would recommend using the available surface-coated plasticized PVC tubing sets, but free of DEHP.

Health risks posed by use of Di-2-ethylhexyl phthalate (DEHP) in PVC medical devices: a critical review.

CONCLUSIONS: The observed toxicity of DEHP and availability of alternatives to many DEHP-containing PVC medical devices presents a compelling argument for moving assertively, but carefully, to the substitution of other materials for PVC in medical devices. The substitution of other materials for PVC would have an added worker and community health benefit of reducing population exposures to DEHP, reducing the creation of dioxin from PVC production and disposal, and reducing risks from vinyl chloride monomer exposure.

• Tickner JA, Schettler T, Guidotti T, McCally M, Rossi M.
Evaluation of childhood exposure to di(2-ethylhexyl) phthalate from perfusion kits during long-term parenteral nutrition.

Leachability of the plasticizer di(2-ethylhexyl) phthalate (DEHP) from administration sets into intravenous parenteral emulsions containing fat was investigated. DEHP is added to polyvinyl chloride (PVC) to impart flexibility.

Consequently, total parenteral nutrition (TPN) mixtures containing fat emulsions should be stored in ethylvinyl acetate (EVA) bags rather than PVC packs.

These results suggest that children treated with prolonged TPN are regularly exposed to significant amounts of DEHP.

One potential source of exposure is medications. The need for site-specific dosage medications has led to the use of enteric coatings that allow the release of the active ingredients into the small intestine or in the colon. The enteric coatings generally consist of various polymers that contain plasticizers, including triethyl citrate, dibutyl sebacate, and phthalates such as diethyl phthalate (DEP) and dibutyl phthalate (DBP). Further research is necessary to determine the proportional contribution of medications, as well as personal care and consumer products, to a person's total phthalate burden.

- Hauser R, Duty S, Godfrey-Bailey L, Calafat AM.
Possible impact of phthalates on infant reproductive health.

Another study found a reduction of the anogenital index (AGI) in infant boys with increasing levels of MBP, MEP, monobenzyl- and mono-isobutyl phthalate in maternal urine samples during late-pregnancy. **Boys with small AGI showed a high prevalence of cryptorchidism and small genital size.** Taken together these studies suggest an antivirilizing effect of phthalates in infants. Most of these findings are in line with animal observations.

As phthalates are produced as bulk chemicals worldwide, these new findings raise concern about the safety of phthalate exposure for pregnant women and infants.

- Lottrup G, Andersson AM, Leffers H, Mortensen GK, Toppari J, Skakkebaek NE, Main KM
Prenatal exposures to phthalates among women in New York City and Krakow, Poland.

The mean personal air concentrations of DBP, di-isobutyl phthalate, and DEHP are higher in Krakow, whereas the mean personal air concentration of DEP is higher in New York. Statistically significant correlations between personal air and urinary levels were found for DEP and monoethyl phthalate ($r = 0.42$, $p < 0.05$), DBP and monobutyl phthalate ($r = 0.58$, $p < 0.01$), and BBzP and monobenzyl phthalate ($r = 0.65$, $p < 0.01$). These results demonstrate considerable phthalate exposures during pregnancy among women in these two cohorts and indicate that inhalation is an important route of exposure.

- Adibi JJ, Perera FP, Jedrychowski W, Camann DE, Barr D, Jacek R, Whyatt RM.
• RESULTS: All phthalate monoesters were found in breast milk with large variations [medians (minimum-maximum)]:

• CONCLUSIONS: Our data on reproductive hormone profiles and phthalate exposures in newborn boys are in accordance with rodent data and suggest that human Leydig cell development and function may also be vulnerable to perinatal exposure to some phthalates. Our findings are also in line with other recent human data showing incomplete virilization in infant boys exposed to phthalates prenatally.

  • Main KM, Mortensen GK, Kaleva MM, Boisen KA, Damgaard IN, Chellakooty M, Schmidt IM,
  • Source: ENVIRONMENTAL HEALTH PERSPECTIVES 114 (2): 270-276 FEB 2006
• Premature breast development (thelarche) is the growth of mammary tissue in girls younger than 8 years of age without other manifestations of puberty. **Puerto Rico has the highest known incidence of premature thelarche ever reported.** This study suggests a possible association between plasticizers with known estrogenic and antiandrogenic activity and the cause of premature breast development in a human female population.

• [Colon I, Caro D, Bourdony CJ, Rosario O.](#)
Phthalates: Males
• METHODS: Between January 2000 and May 2004, we recruited 463 male partners of subfertile couples who presented for semen analysis to the Massachusetts General Hospital.

• RESULTS: There were dose-response relationships of [monobutyl phthalate]MBP with low sperm concentration...and motility... There was suggestive evidence of an association between the highest MBzP quartile and low sperm concentration ...

• CONCLUSION: The present study confirms previous results on the relationship of altered semen quality with exposure to MBP at general population levels.
Result(s) PCBs were detected in the seminal plasma of infertile men but not in controls, and the concentration of PEs was significantly higher in infertile men compared with controls. Ejaculate volume, sperm count, progressive motility, normal morphology, and fertilizing capacity were significantly lower in infertile men compared with controls. The highest average PCB and PE concentrations were found in urban fish eaters, followed by rural fish eaters, urban vegetarians, and rural vegetarians. The total motile sperm counts in infertile men were inversely proportional to their xenoestrogen concentrations and were significantly lower than those in the respective controls.

Conclusion(s) PCBs and PEs may be instrumental in the deterioration of semen quality in infertile men without an obvious etiology.

Roya Rozatiz D.M., a, P. P. Reddy Ph.D., b, P. Reddanna Ph.D., c and Rubina Mujtaba Ph.D., a Fertility and Sterility Volume 78, Issue 6, December 2002, Pages 1187-1194
Phthalates: Human Development
The age-adjusted AGI decreased significantly with increasing phthalate score ($p$-value for slope = 0.009). The associations between male genital development and phthalate exposure seen here are consistent with the phthalate-related syndrome of incomplete virilization that has been reported in prenatally exposed rodents. The median concentrations of phthalate metabolites that are associated with short AGI and incomplete testicular descent are below those found in one-quarter of the female population of the United States, based on a nationwide sample. These data support the hypothesis that prenatal phthalate exposure at environmental levels can adversely affect male reproductive development in humans.
Phthalate esters (PEs) have been suspected to be environmental endocrine disruptors and the detailed mechanism remains unclear. The activities of these chemicals can be enhanced through chemical modification under the environmental conditions. We demonstrate that PEs acquire unequivocal estrogenic activity by light exposure.

- Chemosphere. 2006 Feb 6;
Which means sunscreens containing Phthalates exposed to sunlight leads to estrogenic activities.
Phthalate exposure and human semen parameters.

BACKGROUND: Specific gravity-adjusted phthalate metabolite levels were categorized into tertiles. RESULTS: There was a dose-response relation between tertiles of mono-butyl phthalate and sperm motility.

CONCLUSIONS: There were dose-response relations for monobutyl phthalate and monobenzyl phthalate with one or more semen parameters, and suggestive evidence for monomethyl phthalate with sperm morphology.

Duty SM, Silva MJ, Barr DB, Brock JW, Ryan L, Chen Z, Herrick RF, Christiani DC, Hauser R.
• Epidemiology. 2003 May;14(3):269-77.
The relationship between environmental exposures to phthalates and DNA damage in human sperm using the neutral comet assay.

One hundred sixty-eight subjects recruited from the Massachusetts General Hospital Andrology Laboratory provided a semen and a urine sample. Eight phthalate metabolites were measured in urine by using high-performance liquid chromatography and tandem mass spectrometry; data were corrected for urine dilution by adjusting for specific gravity. The neutral single-cell microgel electrophoresis assay (comet assay) was used to measure DNA integrity in sperm. **In conclusion, this study represents the first human data to demonstrate that urinary MEP, at environmental levels, is associated with increased DNA damage in sperm.**

- Duty SM, Singh NP, Silva MJ, Barr DB, Brock JW, Ryan L, Herrick RF, Christiani DC, Hauser R.
Phthalate exposure and pulmonary function.

For a change from the 25th to the 75th percentile in MBP level among men, FEV1 decreased 112 mL (SE = 51, p = 0.03). Monoethyl phthalate (MEP) was associated with lower FVC and FEV1 values in men. Monoethylhexyl phthalate (MEHP), the metabolite of the plasticizer commonly used in medical tubing, was not adversely associated with any of the pulmonary function parameters evaluated. Our results suggest that MBP and MEP, but not MEHP, may influence pulmonary function among adult males.

• Hoppin JA, Ulmer R, London SJ.
• Environ Health Perspect. 2004 Apr;112(5):571-4.
Phthalates: Personal Care Products
Consumer Update — FDA admits inability to ensure the safety of personal care products

• "The [Food, Drug and Cosmetic Act] contains no provision that requires demonstration to FDA of the safety of ingredients of cosmetic products... prior to marketing the product." — FDA response to EWG petition, September 29, 2005

• Eighty-nine (89) percent of the 10,500 ingredients FDA has determined are used in personal care products have not been evaluated for safety by the CIR, the FDA, or any other publicly accountable institution.

• www.ewg.org
Why This Matters — Cosmetics and Your Health

**Why personal care products?** At first blush it may seem that mascara and shaving cream have little relevance to the broader world of environmental health. Think again. In August 2005, when scientists published a study finding a relationship between plasticizers called phthalates and feminization of U.S. male babies, they named fragrance as a possible culprit. When estrogenic industrial chemicals called parabens were found in human breast tumor tissue earlier this year, researchers questioned if deodorant was the source. And when studies show, again and again, that hormone systems in wildlife are thrown in disarray by common water pollutants, once again the list of culprits include personal care products, rinsing down drains and into rivers.
Personal care product use predicts urinary concentrations of some phthalate monoesters

Abstract: Phthalates are multifunctional chemicals used in a variety of applications, including personal care products. A nurse-administered questionnaire was used to determine use of personal care products, including cologne, aftershave, lotions, hair products, and deodorants. Men who used cologne or aftershave within 48 hr before urine collection had higher median levels of monoethyl phthalate (MEP) (265 and 266 ng/mL, respectively) than those who did not use cologne or aftershave (108 and 133 ng/mL, respectively). For each additional type of product used, MEP increased 33% (95% confidence interval, 14-53%).

Duty SM, Ackerman RM, Calafat AM, Hauser R

• Source: ENVIRONMENTAL HEALTH PERSPECTIVES 113 (11): 1530-1535 NOV 2005
Phthalates and human health

Abstract: The diesters of 1,2-benzenedicarboxylic acid (phthalic acid), commonly known as phthalates, are primarily used as plasticizers in the manufacture of flexible vinyl which, in turn, is used in consumer products, flooring and wall coverings, food contact applications, and medical devices. (1-3) Manufacturers use low molecular weight phthalates (for example, diethyl phthalate [DEP] and dibutyl phthalate [DBP]) in personal-care products (for example, perfumes, lotions, cosmetics), as solvents and plasticizers for cellulose acetate, and in making lacquers, varnishes, and coatings, including those used to provide timed releases in some pharmaceuticals. (3-5)

- **Hauser R, Calafat AM**
Are our products harming our health? To learn about the safety of ingredients in personal care products, the Environmental Working Group compiled an electronic database of ingredient labels for 14,100 name-brand products and cross-linked it with 37 toxicity or regulatory databases. Here's what we found:

- More than one-third of all personal care products contains at least one ingredient linked to cancer.
- 57 percent of all products contain "penetration enhancer" chemicals that can drive other ingredients faster and deeper into the skin to the blood vessels below.
- 79 percent of all products contain ingredients that may contain harmful impurities like known human carcinogens, according to FDA or industry reviews. Impurities are legal and unrestricted for the personal care product industry.
Top 20 Brands of Concern

Skin Deep's safety assessment ratings provide a measure of potential health concerns linked to ingredients used in popular health and beauty brands. The brands listed below contain ingredients with the average highest levels of concern according to our rating system, from among the 121 brands with at least 25 products in Skin Deep's database.

1. Dark & Lovely, L'Oréal
2. Chanel, Chanel
3. Clarins, Clarins Paris
4. Lierac, ALES Group USA
5. Banana Boat, Playtex Products
6. Te Tao, Kuan Ltd.
7. Ultima II, Revlon
8. Estée Lauder, Estée Lauder
10. Revlon, Revlon

www.ewg.org
Top 20 Brands of Concern

11. **Fresh, Fresh**
12. **Sally Hansen, Del Laboratories, Inc.**
13. **Murad, Murad**
14. **B. Kamins, Kamins Dermatologics**
15. **Clairol, Procter & Gamble**
16. **Elizabeth Arden, Elizabeth Arden, Inc.**
17. **Gillette, Procter & Gamble**
18. **Freeman, pH Beauty Labs**
19. **Color Me Beautiful, Color Me Beautiful**
20. **CARGO, Cargo Cosmetics Corp.**
1. Dark & Lovely, L'Oréal
   Score: 4.6   Concern: higher   Rank: 965 of 1006 (1=lowest concern)

Dark & Lovely makes these product types: Hair Color and Bleaching, Conditioner, Relaxer, Styling Gel/Lotion, Shampoo

Quick Facts
• 28 products (browse)
• 0 unique ingredients
• 96 ingredients raise health concerns
• 32 violations, restrictions, and warnings
• 1 proprietary ingredients - identity unknown

Industry panel assessments
• 112 ingredients have been assessed by the cosmetics industry
• -112 ingredients have not been assessed by the cosmetics industry
• 13 ingredients not assessed by industry have been assessed by FDA 1of the unassessed ingredients is innocuous (e.g. table salt)

Other ingredient hazards
• 189 ingredients have data gaps and not assessed
• 8 ingredients have occupational hazards
• 20 ingredients have other relevant risk considerations
2. BRAND REPORT: Chanel
owned by Chanel
Chanel makes these product types: Facial Cleanser, Facial Moisturizer/Treatment, Anti-aging, Perfume, Around-eye Cream, Eye Makeup Remover, Body Wash/Cleanser, Acne Treatment, Lip Balm/Treatment, Exfoliant/Scrub, Moisturizer

Score: 4.4  Concern: higher  Rank: 950 of 1006  (1=lowest concern)

• Quick Facts
• 26 products (browse)
• 0 unique ingredients
• 73 ingredients raise health concerns
• 25 violations, restrictions, and warnings
• 2 proprietary ingredients - identity unknown
2. BRAND REPORT: Chanel

**Endocrine disruptor**

- 7 ingredients considered potential endocrine disruptor(s), raising concern for impaired fertility or development, and increased risks for certain cancers ISOBUTYLPARABEN [11], BUTYLPARABEN [11], SODIUM METHYLPARABEN [2], METHYLPARABEN [22], ETHYLPARABEN [14], DIETHYL PHTHALATE [3], PROPYLPARABEN [19]

**Skin sensitizer**

- 20 ingredients with potential to instigate immune system response that can include itching, burning, scaling, hives, and blistering of skin (sensitization)POLYSORBATE-20 [8], ISOBUTYLPARABEN [11], BUTYLPARABEN [11], LACTIC ACID [2], HEXYLENE GLYCOL [1], PROPYLENE GLYCOL [20], SODIUM METABISULFITE [1], SORBIC ACID [3], BENZOPHENONE-4 [1], TOCOPHERYL ACETATE [10], SODIUM LACTATE [5], TRIETHANOLAMINE [4], CHLORHEXIDINE DIGLUCONATE [2], COCAMIDOPROPYL BETAIN [1], METHYLPARABEN [22], ETHYLPARABEN [14], DIETHYL PHTHALATE [3], BENZOPHENONE-5 [1], PROPYLPARABEN [19], BHT [5]

**Immunotoxicity hazards**

- 6 ingredients potentially harmful to the immune system SODIUM METABISULFITE [1], ZINC OXIDE [1], TRIETHANOLAMINE [4], ZINC GLUCONATE [2], DIETHYL PHTHALATE [3], BHT [5]
### Top Ingredients of Concern

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<tr>
<td><strong>1. MERCURY</strong></td>
<td>Unsafe for use in cosmetics according to FDA; Possible human carcinogen; Possible human reproductive or developmental toxin</td>
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<tr>
<td><strong>2. THIMEROSAL</strong></td>
<td>Unsafe for use in cosmetics according to FDA; Possible human carcinogen; Possible human reproductive or developmental toxin</td>
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<td><strong>3. LEAD ACETATE</strong></td>
<td>Known human reproductive or developmental toxin; Prohibited for use in cosmetics in the European Union; Color not approved for use around eyes, in eye products</td>
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<td><strong>4. FORMALDEHYDE</strong></td>
<td>Known human carcinogen; Not safe for use if aerosolized, in aerosolized product; Skin sensitizer</td>
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<tr>
<td><strong>5. TOLUENE</strong></td>
<td>Unsafe according to International Fragrance Association; Possible human reproductive or developmental toxin; May contain harmful impurities or breakdown products</td>
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### Top Ingredients of Concern

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<td><strong>6. PETROLEUM DISTILLATES</strong></td>
<td>Prohibited for use in cosmetics in the European Union; Possible human carcinogen; May contain harmful impurities or breakdown products</td>
<td></td>
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<tr>
<td><strong>7. ETHYLACRYLATE</strong></td>
<td>Unsafe according to International Fragrance Association; Possible human carcinogen; Skin sensitizer</td>
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<td><strong>8. COAL TAR</strong></td>
<td>Known human carcinogen; Prohibited for use in cosmetics in the European Union; May contain harmful impurities or breakdown products</td>
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<tr>
<td><strong>9. DIBUTYL PHTHALATE</strong></td>
<td>Prohibited for use in cosmetics in the European Union; Possible human reproductive or developmental toxin; Endocrine disruptor</td>
<td></td>
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<tr>
<td><strong>10. POTASSIUM DICHROMATE</strong></td>
<td>Possible human carcinogen; Possible human reproductive or developmental toxin; Skin sensitizer</td>
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</table>
INGREDIENT REPORT: DIBUTYL PHTHALATE
(89 products)
As listed on the labels: DIBUTYL PHTHALATE; DIBUTYL PHTHLATE
DIBUTYL PHTHALATE is found in these product types: Nail Polish, Nail Treatment

European Union - Classification & Labeling
DIBUTYL PHTHALATE; ; DBP
• May be toxic to the reproductive system (European Union classification)
• May cause harm to the unborn child
• Limited evidence of reproductive toxicity (European Union classification)
• Possible risk of impaired fertility
• Dangerous for the environment
• Very toxic to aquatic organisms
American Products (www.nottoopretty.org)

HAIRSPRAY
Contains Phthalates
Aqua Net Professional Hair Spray
Herbal Essences Non Aerosol Hairspray
Jheri Redding Finishers Flexible Hold Hairspray
Pantene Pro V Strong Hold Spray
Pantene Pro V Stronghold Healthy Hold Spray
Rave 4x Mega
Redken Cat Finishing Spritz
Salon Selectives Hold Tight Style Freeze Maximum Hold
Finishing Spray
Sebastian Collection Shaper Plus
Suave Maximum Hold Hairspray Unscented, non-aerosol
Suave Naturals Extra Flexible Hold Non Aerosol Hairspray
Freesia
TRESemme European Freeze-Hold Hair Spray
VO5 Crystal Clear 14 Hour Hold
Vidal Sassoon Microfine Mist Hair Spray, Aerosol
HAIRSPRAY

Phthalate Free
Aussie Mega Styling Spray
Helene Curtis Finesse Touchables Silk Protein Enriched
Helene Curtis Thermasilk Heat Activated Firm Hairspray
Suave Naturals Aloe Vera Extra Hold Hairspray
American Products (www.nottoopretty.org)

DEODORANTS

Contains Phthalates
Arrid Extra Extra Dry Maximum Strength Solid
Arrid Extra Extra Dry Ultra Clear Ultra Clean Spray
Arrid Extra Extra Dry Ultra Clear Ultra Fresh Spray
Ban Delicate Powder Roll On
Degree Original Solid Anti-Perspirant & Deodorant
Dove Solid Anti-Perspirant Deodorant
Secret Sheer Dry Regular
Secret: Powder Fresh Aerosol
Sure Clear Dry Anti-Perspirant & Deodorant
American Products (www.nottoopretty.org)

DEODORANTS
Phthalate Free
Certain Dri Anti-Perspirant Roll-On
Dove Powder Anti-Perspirant Deodorant
Lady Speed Stick Soft Solid Anti-Perspirant
Secret Anti-Perspirant & Deodorant Platinum Protection Ambition Scent
Soft & Dri Anti-Perspirant Deodorant Clear Gel
American Products (www.nottoopretty.org)

FRAGRANCES
Contains Phthalates
- Calgon Hawaiian Ginger Body Mist
- Calgon Turquoise Seas Body Lotion
- Charlie Cologne Spray
- Escape by Calvin Klein
- Eternity by Calvin Klein
- Fire & Ice Cologne Spray
- Freedom
- Jovan White Musk
- Lancome Paris Tresor
- Liz Claiborne Eau De Toilette Spray
- Oscar
- Parfums de Coeur White Tahitian Ginger Fantasy
- Poison by Christian Dior
- Red Door
- The Healing Garden Pure Joy Body Treatment
- White Diamonds Elizabeth Taylor
- Wind Song Extraordinary Cologne by Prince Matchabelli

FRAGRANCES
Phthalate Free
All of the fragrances we tested contained phthalates
American Products (www.nottoopretty.org)

HAIR GEL
Contains Phthalates
Clairol Herbal Essences Natural Volume Body Boosting Gel
Dep Level 4 Shine Gel
LA Looks Styling Gel: Extra Super Hold
Suave Naturals Ocean Breeze Extra Control Spray Gel
TRESemme European Slick Melting Gel
Pantene Pro V Spray Gel Volumizing Root Lifter

HAIR GEL
Phthalate Free
Physique Extra Control Structuring Gel
HAIR MOUSSE
Contains Phthalates
Aussie Megahold Mousse
Clairol Herbal Essences Styling Mousse Maximum Hold
Helene Curtis Salon Selectives Rise Up Volumizing Mousse
Pantene Pro V Mousse Body Builder

HAIR MOUSSE
Phthalate Free
Finesse Touchables Silk Protein Enriched Mousse
Helene Curtis Thermasilk Heat Activated Mousse for Fine/Thin Hair
L'Oreal Paris Studio Line: Springing Curls Mousse
NAIL POLISH
Contains Phthalates
Avon beComing Radiant Long Last Nail Gloss
Cover Girl NailSlicks
Maybelline Express Finish Fast-Dry Nail Enamel
Maybelline Ultimate Wear Nail Enamel
Naturistics Super Shine Nail Gloss
Oil of Olay Nail Laquer
OPI Nail Laquer
Orly Salon Nails French Manicure
Orly Salon Nails Nail Color
Sally Hansen Chrome Nail Makeup
Sally Hansen Hard as Nails Nail Polish
Sally Hansen Hard as Nails With Nylon Nail Polish
Sally Hansen Teflon Tuff Nail Color
Tropez Nail Enamel
Wet N Wild Crystalic Calcium Enriched Nail Color
Wet N Wild Nail Color
COVERGIRL

nailslicks

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1 lucky winner!

CG Smoothers NailSlicks Gel NailColor in the shade that's just right for you
20 lucky winners!

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NAIL POLISH
Phthalate Free
Kiss Colors Nail Polish
L'Oreal Jet Set Nail Enamel
L'Oreal Jet-Set Quick Dry Nail Enamel
Maybelline Shades of Your Nail Color
Naturistics 90 Second Dry! Super Fast Nail Color
Revlon Nail Enamel
Revlon Super Top Speed
Urban Decay
American Products (www.nottoopretty.org)

HAND AND BODY LOTION
Contains Phthalates
Jergens Skincare Original Scent Lotion
Nivea Creme

HAND AND BODY LOTION
Phthalate Free
Curel Soothing Hands Moisturizing Hand Lotion
Eucerin Dry Skin Therapy Original Moisturizing Lotion
Lubriderm Skin Therapy Moisturizing Lotion
Neutrogena Hand Cream
Suave Naturals Sun Ripened Moisturizing Body Lotion
Vaseline Intensive Care Advanced Healing
Vaseline Intensive Care Dry Skin Lotion
Something has come between me and my Calvins

Toxic chemicals in beauty care products.
Calvin Klein’s Eternity, Aqua Net Hair Spray, Salon Selectives Hair Mousse, Dove Solid Anti-Perspirant.
All these cosmetics and beauty aids have two things in common.
They’re manufactured by Unilever, the Dutch-based consumer products conglomerate.
And they all contain toxic chemicals called phthalates (THA-lates).
Phthalates have been shown to damage the lung, liver and kidneys, and to harm the developing testes of male offspring.
These results come from animal tests which, according to government scientists, are relevant to predicting health impacts in humans.
Last week, the European Union ordered a phase-out of two phthalates in cosmetic and beauty products.
Today, the U.S. Cosmetics Ingredient Review Panel will decide whether American consumers will be protected.
Safe alternatives to phthalates are already being used in many beauty products. Now is the time for the federal government—and for companies like Calvin Klein and Unilever—to act decisively.
After all, Eternity is a long time.

Learn more at www.NotTooPretty.org

This ad sponsored by Women’s Voices for the Earth, Environmental Working Group and Health Care Without Harm
Women’s Voices for the Earth, 114 West Pine Street, Missoula, MT 59802
For baby, it could really be poison.

Toxic chemicals linked to birth defects are being found at alarming levels in women of childbearing age. And according to new laboratory tests (see chart at right), these same chemicals are being added to popular cosmetics and beauty aids from Poison perfumes to Arm-Extrax Dry deodorant.

Manufacturers use these chemicals, known as phthalates (pah-lates), to add flexibility and help dissolve other ingredients. They're also used in industrial adhesives, and in medical and consumer goods made with polyvinyl chloride plastic (PVC).

But phthalates have been shown to damage the lungs, liver and kidneys, and to harm the developing fetuses of offspring.

These results come from animal tests which, according to government scientists, are relevant to predicting health impacts in humans.

Despite this, the Food and Drug Administration doesn't regulate phthalates in cosmetics. In most cases, phthalates aren't even listed on the label. The FDA must act now. All cosmetics — as well as food-related and medical products containing phthalates — must be labeled. And manufacturers should publicly pledge to voluntarily remove phthalates as quickly as possible.

Phthalate-free alternatives are available in every product category. And some companies have already announced phase-out policies.

In the meantime, we believe that every consumer — indeed, anyone who cares about the health of future generations — should demand action from companies and the FDA. Learn more at www.NotTooPretty.org.

After all, Eternity is a long time.
Organizations:

• **Phthalates in building products:**
  Healthy Building Network, [www.healthybuilding.net](http://www.healthybuilding.net)
  Contact: Bill Walsh, 202-232-4108, bill@healthybuilding.net

• **Phthalates in cosmetics:**
  Coming Clean, [www.come-clean.org](http://www.come-clean.org)
  Contact: Bryony Schwan, 406-543-3747, swan@womenandenvironment.org

• **Phthalates in medical devices:**
  Health Care Without Harm, [www.noharm.org](http://www.noharm.org)
  Contact: Stacy Malkan, 202-234-0091, ext. 14, smalkan@hcwh.org

• **Phthalates in nail polish:**
  Environmental Working Group, [www.ewg.org](http://www.ewg.org)
  Contact: Mike Casey, 202-667-6982, mcasey@ewg.org

• **Phthalates in toys:**
  Greenpeace
  Contact: Lisa Finaldi, lisa.finaldi@dialb.greenpeace.org
Terminology

- **Body Chemistry** - Your body functions because millions of chemical reactions are constantly going on inside you.
• When the body isn’t working properly, drugs can often replace a chemical that is missing, block an unwanted reaction, or enhance the body to lose or need more of important nutrients, such as potassium, sodium, calcium, or some vitamins.
Terminology

- **Side effects** - All drugs have the potential to cause unwanted symptoms, or side effects.
- **Depletions** - Happens when a drug causes the body to lose a nutrient.
- **Interactions** - Happens when a nutrient affects the way a drug works, or when a drug affects the way a nutrient works. Interactions can be beneficial or harmful.
Legend

May be beneficial
😊 **Depletion or interference** - the medication may deplete or interfere with the absorption or function of the nutrient. Taking these nutrients may help replenish them.

😊 **Side effect reduction/prevention** - taking these supplements may help reduce the likelihood and/or severity of a potential side effect caused by the medication.

😊 **Supportive interaction** - taking these supplements may support or otherwise help your medication work better.
Legend

Avoid

☑️ *Adverse interaction* - Avoid these supplements when taking this medication because taking this medication because them together may cause undesirable or dangerous results.

☑️ *Reduced drug absorption/bioavailability* - Avoid these supplements when taking this medication since the supplement may decrease the absorption and/or activity of the medication in the body.
Legend

Explanation required

📖 **Other** - Before taking any of these supplements or eating any of these foods with your medication, read the drug article in full for details.
ACETAMINOPHEN

• Acetaminophen is used to reduce pain and fever.
• Unlike NSAIDs (nonsteroidal anti-inflammatory drugs), it lacks anti-inflammatory activity.
• Acetaminophen is available by itself or in nonprescription and prescription-only combination products used to relieve pain and the symptoms associated with colds and flu.
ACETAMINOPHEN

Common Names:
• 222 AF
• Abenol
• Boots Children’s Pain Relief Syrup
• Cephanol
• Children’s Feverhalt
• Infadrops
• Pain Aid Free
• Paldesic, Paradin
• Tylenol
• WestCan Extra Strength Acetaminophen
ACETAMINOPHEN

Combination Drugs:
• Alka-Seltzer Plus
• Excedrin PM
• Midrin
• Nyquil Hot Therapy Powder
• Theraflu
• Tylenol Allergy Sinus
• Tylenol Cold
• Tylenol with Codeine
• Vicodin
# ACETAMINOPHEN

| 🧡 May be Beneficial: Side effect reduction/prevention | Milk thistle N-acetylcysteine |
| 🧡 May be Beneficial: Supportive interaction | Vitamin C |
| ☹ Avoid: Reduced Drug absorption/bioavailability | Hibiscus |
| 📖 Check: Other | Schisandra |
| Depletion or interference | None Known |
| Adverse interaction | None Known |
## ACETAMINOPHEN

<table>
<thead>
<tr>
<th>Emoticon</th>
<th>Ingredient</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>☻</td>
<td>Milk Thistle</td>
<td>Shown to elevate liver glutathione levels</td>
</tr>
<tr>
<td></td>
<td>(Silymarin)</td>
<td></td>
</tr>
<tr>
<td>☻</td>
<td>Vitamin C</td>
<td>Prolong the time acetamin stays in body</td>
</tr>
<tr>
<td>☺</td>
<td>Hibiscus</td>
<td>Could decrease levels of acetaminophen</td>
</tr>
<tr>
<td>☺</td>
<td>Foods:$\uparrow$carb, $\uparrow$Pectin</td>
<td>Interfere w/ acetamin absorption (broccoli, brussels sprouts, cabbage, jellies)</td>
</tr>
<tr>
<td>☺</td>
<td>Foods: Alcohol</td>
<td>Cause liver damage w/ $\uparrow$ acetamin</td>
</tr>
<tr>
<td>☾</td>
<td>Schisandra (Gomisin A)</td>
<td>Protect against liver damage but did not prevent glutathione depletion</td>
</tr>
</tbody>
</table>
Amoxicillin

Member of the penicillin family of antibiotics. Used to treat middle ear bacterial infections.
Amoxicillin

Common names:
• Almodan
• Amix
• Amoxil
• Amoxycillin
• Polymox
• Trimox
• Wymox

Combination drug:
• Augmentin (amoxicillin/clavulanate)
| ☺  | May be Beneficial: Depletion or interference | Vitamin K |
| ☺  | May be Beneficial: Side effect reduction/prevention | •Lactobacillus  
•Acidophilus  
•Probiotics  
•Vitamin K |
| ☺  | May be Beneficial: Supportive interaction | •Bromelain  
•Saccharomyces  
•Boulardii |
|     | Depletion or interference | Not Known |
|     | Adverse interaction | None Known |
### AMOXICILLIN

<table>
<thead>
<tr>
<th></th>
<th>Probiotics</th>
<th>Decrease frequency of diarrhea</th>
</tr>
</thead>
<tbody>
<tr>
<td>😊</td>
<td>Vitamin K</td>
<td>Excessive bleeding due to reduced Vit K activity</td>
</tr>
<tr>
<td>😊</td>
<td>Bromelain</td>
<td>Increase absorption of amoxicillin</td>
</tr>
<tr>
<td>😊</td>
<td>Lactobaccillus</td>
<td>Prevent antibiotic induced diarrhea</td>
</tr>
</tbody>
</table>
FLUOVOXAMINE (Prozac)

Member of the selective serotonin reuptake inhibitor (SSRI) family of drugs. Fluoxetine is used to treat depression, bulimia (binge-eating and vomiting), obsessive-compulsive disorder, and other conditions.
<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>☺</td>
<td>May be Beneficial: Depletion or interference</td>
<td>Melatonin</td>
</tr>
<tr>
<td>☺</td>
<td>May be Beneficial: Side effect reduction/prevention</td>
<td>•Ginkgo biloba</td>
</tr>
</tbody>
</table>
| ☺      | May be Beneficial: Supportive interaction | •DHEA  
•Folic Acid |
| ☹      | Avoid: Adverse interaction | •5-HTP  
•Alcohol  
•L-tryptophan  
•St. John’s wort |
| 📚      | Check: Other | Melatonin |
### FLUOXETINE

<table>
<thead>
<tr>
<th>😊</th>
<th>Melatonin</th>
<th>Lowered melatonin levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>😊</td>
<td>Ginkgo biloba</td>
<td>Alleviating sexual side effects in men and women</td>
</tr>
<tr>
<td>😊</td>
<td>DHEA</td>
<td>Dehydroepiandrosterone shown to restore the response of beta-endorphin (pain/pleasure sensation)</td>
</tr>
<tr>
<td>☹️</td>
<td>Alcohol</td>
<td>Intensify dizziness and drowsiness; risk of accidental injury.</td>
</tr>
</tbody>
</table>
ASPIRIN

A drug that reduces swelling, pain, and fever. Have been recommended to reduce the risk of heart attacks and strokes. In the future aspirin may be recommended to reduce risk of some cancers.

Reye’s syndrome, a rare but serious illness affecting children and teenagers, have been associated with aspirin use.
ASPIRIN

Common names:
• Boots back pain relief
• Aspirin
• Aspro Clear
• Nu-Seals Aspirin
• Novasen
• Caprin

Combination Drugs:
• Alka-Seltzer
• Anacin
• Soma Compound with Codeine
• Percodan
• Fiorinal
## ASPIRIN

<table>
<thead>
<tr>
<th>Emotion</th>
<th>May be Beneficial: Depletion or interference</th>
<th>Avoid: Adverse interaction</th>
</tr>
</thead>
</table>
| ☺ | • Folic acid  
  • Iron  
  • Vit B12  
  • Vit C  
  • Zinc | • Coleus  
  • Ginkgo biloba  
  • Vit E |
| ☻ | May be Beneficial: Supportive interaction | • Cayene  
  • Licorice |
| ☠ | | |
## ASPIRIN

<table>
<thead>
<tr>
<th>Icon</th>
<th>Supplement</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>☺</td>
<td>Folic Acid</td>
<td>Increased loss of Folic Acid in urine, with arthritis patients</td>
</tr>
<tr>
<td>☺</td>
<td>Iron</td>
<td>GI bleeding is common side effect of Aspirin, iron-deficiency anemia</td>
</tr>
<tr>
<td>☺</td>
<td>Vit B12</td>
<td>Lowered Vit B12 and C levels, Aspirin damages stomach, reduce absorption of B12 and C</td>
</tr>
<tr>
<td>☺</td>
<td>Vit C</td>
<td>Lowered Vit B12 and C levels, Aspirin damages stomach, reduce absorption of B12 and C</td>
</tr>
<tr>
<td>☺</td>
<td>Zinc</td>
<td>3 grams of aspirin lowers Zinc blood level</td>
</tr>
<tr>
<td>☺</td>
<td>Cayenne</td>
<td>Cayenne contains capsaicin; stimulates nerves to protect against damage to stomach</td>
</tr>
<tr>
<td>☺</td>
<td>Ginkgo biloba</td>
<td>Leads to increased bleeding w/ aspirin</td>
</tr>
<tr>
<td>☺</td>
<td>Vit E</td>
<td>Increase bleeding gums</td>
</tr>
</tbody>
</table>
HEPARIN

Heparin is a natural product, available by prescription, which is used as an anticoagulant (slows the rate of blood clot formation). Heparin is used to prevent formation of blood clots (after surgery) and to help dissolve blood clots already formed (deep vein thrombosis, pulmonary embolism)
HEPARIN

Common Names:
• Calciparine
• Hepalean
• Heparin Leo
• Multiparín
• Uniparín Calcium
## HEPARIN

<table>
<thead>
<tr>
<th>😊 May be Beneficial: Depletion or interference</th>
<th>Vit D</th>
</tr>
</thead>
</table>
| ☹ Avoid: Adverse interaction                  | •Digitalis  
•Dong quai  
•Fenugreek  
•Ginger  
•Ginkgo biloba  
•Horse chestnut  
•Red clover  
•Reishi  
•Sweet Clover  
•Sweet woodruff |
| 📘 Check: Other                                | Potassium |
HEPARIN

| 🤗 | Vit D | Heparin may interfere with activation of Vit D |
| 🙁 | Ginger | Reduce platelet stickiness in test tubes |
| 🙁 | Ginkgo biloba | Reduce ability of platelets to stick together |
| 🙁 | Herbs | Containing coumarin-derivatives (dong quai, fenugreek, horse chestnut, red clover, sweet clover, sweet woodruff) |
| 🙁 | Reishi | Increase bleeding time |
| 🙁 | Alcohol | Increase risk of serious bleeding |
| 📚 | Potassium | Heparin causes hyperkalemia (abnormally high potassium levels) |
ATORVASTATIN

Common name: Lipitor

Is a member of the HMG-CoA reductase inhibitor family of drugs that blocks the body’s production of cholesterol. It is used to lower elevated cholesterol.

Best absorbed without food in the morning.
**ATORVASTATIN (Lipitor)**

<table>
<thead>
<tr>
<th>🤗</th>
<th>May be Beneficial: Depletion or interference</th>
<th>Co Q10</th>
</tr>
</thead>
</table>
| 🚫 | Avoid: Adverse interaction                  | • Grapefruit or grapefruit juice  
   |                                             | • Vit A |
| 📚 | Check: Other                                | • Magnesium Hydroxide  
   |                                             | • Magnesium Oxide  
   |                                             | • Magnesium containing antacids  
   |                                             | • Niacin |
# ATORVASTATIN (Lipitor)

<table>
<thead>
<tr>
<th>وغيرها</th>
<th>Co Q10</th>
<th>Decreased CoQ10 in 14 days; 50% @ 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>📚</td>
<td>Magnesium containing antacid</td>
<td>Interfere with Lipitor absorption; take 2 hours before or after antacid</td>
</tr>
<tr>
<td>📚</td>
<td>Niacin (Vit B3)</td>
<td>Cause muscle disorders (myopathy) that can become serious (rhabdomyolysis).</td>
</tr>
<tr>
<td>📚</td>
<td>Vit A</td>
<td>Increased levels of Vit A in 2 years of treatment</td>
</tr>
<tr>
<td>📜</td>
<td>Grapefruit / juice</td>
<td>Contains substances that may inhibit the body’s ability to break down Lipitor, increase its toxicity</td>
</tr>
</tbody>
</table>
ORAL CONTRACEPTIVES

Birth control pills are primarily used to prevent pregnancy and to treat menstrual irregularities and endometriosis. Available as an estrogen and progestin combination or as a progestin-only product.
ORAL CONTRACEPTIVES

Common names:
• Brevinor
• Levlen
• Necon
• Ortho Tri-Cyclen
• Ovran
• Ovrette
• Triquilar
# ORAL CONTRACEPTIVES

| ☺ | May be Beneficial: Depletion or interference | Folic Acid  
|   |                                             | Magnesium  
|   |                                             | Vit B1, B12, B2, B3, B6  
|   |                                             | Vit C  
|   |                                             | Zinc  
| ☺ | May be Beneficial: Side Effect reduction/prevention | Folic Acid  
|   |                                             | Vit B6  
| ☺ | May be Beneficial: Supportive interaction | Folic Acid  
| ☹ | Avoid: Adverse interaction | St. John’s wort  
|   |                                             | Tobacco  
| ☹ | Check: Other | Calcium  
|   |                                             | Copper  
|   |                                             | Iron  
|   |                                             | Manganese  
|   |                                             | Vit A  

## ORAL CONTRACEPTIVES

<table>
<thead>
<tr>
<th>Smiley/ Sad Face</th>
<th>Source</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>☺</td>
<td>Folic Acid</td>
<td>OC can cause folic acid depletion</td>
</tr>
<tr>
<td>☼</td>
<td>Magnesium</td>
<td>Lowered serum Magnesium levels</td>
</tr>
<tr>
<td>☼</td>
<td>Vit B6</td>
<td>Vit B6 depletion and clinical depression</td>
</tr>
<tr>
<td>☼</td>
<td>Others</td>
<td>Decrease in Vit B1, B2, B3, B12, C and Zinc</td>
</tr>
<tr>
<td>☹</td>
<td>St. John’s Wort</td>
<td>Cause/changes intramenstrual bleeding</td>
</tr>
<tr>
<td>☹</td>
<td>Tobacco</td>
<td>5X greater risk of dying from a heart attack.</td>
</tr>
<tr>
<td>☹</td>
<td>Calcium and Copper</td>
<td>Increase absorption of CA and Copper</td>
</tr>
<tr>
<td>☹</td>
<td>Manganese</td>
<td>Interfere with Manganese absorption</td>
</tr>
</tbody>
</table>