This information is a paraphrase by Catherine Haug of “The Borax Conspiracy” by Walter Last (1), with a few added notes of my own. I started using borax following the instructions below in July 2012 and can attest that it has greatly helped with osteoarthritic pain in my knees. However, don’t expect immediate results. It has taken you a lifetime to get to where you are today; it may take a few months to start reversing the process.

*I am not a doctor and am not qualified to advise you on your specific health situation.*

**Chapter 1: Health Benefits of Boron, an Overview**

Boron is an essential trace element for humans, and it is available in several forms:

- Present in unrefined sea salt, and in trace element supplements made from sea salt;
- Mined as borax - yes, that laundry additive from 20 Mule Team and other brands;
- Boric acid is made by mixing borax with acids such as hydrochloric acid, then removing the sodium chloride (salt) byproduct of that reaction;
- Synthetically chelated by citrate, aspartate or glycinate for use in supplements.

The most abundant form of naturally-occurring boron is as borax, which is a salt of boron. It can be converted to boric acid by mixing with an acid such as hydrochloric acid. Most supplements provide boron in chelated form.

**Essential benefits of boron in the human body:**

- Essential for the integrity and function of cell walls, including transmission of signals across the cell membrane
- Essential for healthy bone and joint function by regulating the absorption and metabolism of calcium, magnesium and phosphorus through its influence on the parathyroid glands. These glands cannot function properly without adequate boron, just as the thyroids cannot function properly without adequate iodine.
- Affects metabolism of steroid hormones, especially sex hormone: increases testosterone levels in men, and estrogen levels in menopausal women.
- Has a role in converting vitamin D to its active form. This in turn increases calcium uptake and deposition into bones and teeth (as opposed to calcification of soft tissues).
- Redistributes calcium deposits from soft tissues to bone and teeth (when adequate magnesium is present), thus reversing osteoarthritis and hardened arteries.
**Other benefits of boron:**

- Borax (and boric acid) have good antiseptic, antifungal and antiviral properties, but only mild antibacterial action.
- Its antifungal action is very effective against candida problems.
- Improvement of heart problems, vision, psoriasis, balance, memory and cognition.
- Helps to rid the body of fluoride accumulation, and of toxic heavy metals.
- Boron compounds, in general have anti-inflammatory and anti-tumor properties; and are anti-coagulant (‘blood-thinning’), anti-neoplastic (anti-cancer) and hypolipemic (reduce fats and cholesterol in the blood) agents.

**Boron deficiency:**

- When there is insufficient boron in the parathyroids to keep them in check, they become overactive and release too much parathyroid hormone (PTH). This in turn raises the blood level of calcium by removing it from bones and teeth. This leads to osteoarthritis, osteoporosis and tooth decay.
  
  High levels of calcium lead to calcification of soft tissues including: endocrine glands (especially the pineal gland and ovaries); arteries (arteriosclerosis), kidney stones (which can lead to hardening of the kidneys and kidney failure).
- Deficiency of both magnesium and boron is especially damaging to bones and teeth.
- Involuntary muscle contractions and stiffness.
- Increased risk of cancer, as boron deficiency impacts cell signaling across the cell membranes, which may be an important cause for initiation of tumor growth.

**Chapter 2: Boron as a Supplement**

Boron is an essential trace element for humans, and it is available in several forms:

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- Boric acid is made by mixing borax with acids such as hydrochloric acid, then removing the sodium chloride (salt) byproduct of that reaction;
- Synthetically chelated by citrate, aspartate or glycinate for use in supplements.

Growing up in the 50s and 60s, I am very familiar with the 20 Mule Team Borax ads for the TV show “Death Valley Days” hosted by Ronald Reagan (long before he became president).
But this article is not so much about borax’s cleaning abilities, but rather about its health benefits when taken internally. Remember that borax is not a soap or detergent, but rather a salt of borax. It is not a synthetic chemical but rather is mined from the deserts of California and Turkey as a mineral salt, sodium borate. A box of 20 Mule Team Borax (or other brands) is pure enough to ingest. According to Walter Last, it is 99% pure (990 g/kg borax), and is safe to use; it is the legal standard for agricultural grade borax.

Indeed, borax is important in soil to support the plants that grow in it; soil deficient of borax can cause health issues for plants. (See GHOrganics.com for more). It is present in many of the plants we eat, but because of soil deficiencies in borax due to chemical fertilization and other factors such as drought, levels of boron in edible plants are less than they should be. For this reason it may be prudent to take supplemental boron.

NOTE: see Maryland Cooperative Extension: Soil Amendments (5) or SoilMinerals.com (6) for using boron in the garden.

Most mineral supplements contain chelated boron - especially calcium supplements, as boron is essential to calcium metabolism. Too much boron could be problematic, tho (see Toxicity, below), so keep track of your intake. 3 mg/day of ionic boron (B) is optimum for healthy individuals, according to Walter Last. (See Borax as a supplement section below for more detail on dosage).

However, it is far less expensive, and perhaps more effective, to use borax from the laundry section of your grocery store. Walter describes how to prepare this for ingestion (don’t just swallow the powder).

Using Borax as a supplement

The best way to do this is to make up a batch of concentrate, which is then taken by adding the recommended dose to a glass of water or juice, and taken with a meal. Or it can be added to a smoothie which is a meal in itself.

[Note: see toxicity, below for the safe upper limits for boron consumption.]

How to make the concentrate; dosage

Dissolve borax powder in filtered or distilled water (free of chlorine and fluoride) to make up a batch of concentrate, and store in a clean glass jar out of reach of small children (I store mine in the refrigerator):

• 1 lightly rounded teaspoonful (5 - 6 grams) of borax
• 1 liter of water (4.22 cups, just shy of 4 1/4 cups; since the amount of borax is not very exact, you could certainly use a quart of water)
Standard dose:

This is for people without mineral deficiency symptoms, but I also recommend you start with this dose even if you have mineral deficiency symptoms, just to be sure you won’t have any problems with the boron.

- 1 tsp (5 ml) of concentrate added to a glass of water, juice, or smoothie, and best taken with a meal (a smoothie can be a meal in itself). This contains 25 - 30 mg of borax, which provides about 3 mg boron. Take 1 dose per day to start.

If that single dose feels right after a week or so, then take a second dose with another meal. This can be taken indefinitely.

Increased dose:

This is for those with boron-deficiency symptoms: arthritis, osteoporosis, or menopause (and other low sex-hormone issues), or calcium-magnesium balance issues:

- 1 tsp (5 ml) of concentrate with a meal (can dilute in water or juice) three times a day. But start out at dose of once a day and gradually increase.

High dose

This is for candida treatment or removing fluoride from the body (per Earth Clinic on borax cures and Fluoride Poisoning). The dose is dependent on body weight (compared to normal for your height and body build). Always start out with the standard dose (above) and gradually increase to the appropriate high dose.

Warning: These are high doses, so take with caution and under supervision of your qualified healthcare practitioner. The National Institute of Health (NIH) has established the safe upper limit (UL) for boron intake by adults to be 20 mg/day. These ‘high doses’ exceed that limit. These doses are not appropriate for infants and children.

- **Low to normal weight:** 100 ml of concentrate (6 Tbsp plus 2 tsp), diluted in water or juice, spaced out during day. Alternately, measure 1/8 tsp of borax powder and dissolve in 2 quarts clean water to drink throughout the day. This provides about **60 mg boron**. Keep this out of reach of small children.

- **Heavier individuals:** 200 ml (13 Tbsp plus 1 tsp) of concentrate, diluted in water or juice, spaced out during day. Alternately measure 1/4 tsp of borax powder and dissolve in 2 quarts clean water to drink throughout the day. This provides about **120 mg boron** Keep this out of reach of small children

Note: The higher doses are fairly alkaline and may taste soapy. You can neutralize this (to diminish the soapy taste) with lemon juice, vinegar or ascorbic acid (vitamin C) powder.
Health Benefits of Boron as a Supplement

*Cautionary notes*

**Alternatives to borax/boric acid (where not available)**

In most countries, borax and boric acid are listed as a reproductive poison, so may not be available.

Boron tablets (chelated boron, not borax) are usually allowed and provide 3 mg elemental boron per tablet. Because this is not ionic boron (not a salt), it is much less effective, especially against candida and certain pathogens such as mycoplasma, nor as a quick cure for arthritis, osteoporosis, or hormone balancing.

For maximum effectiveness, Walter recommends 3 or more boron tablets, spaced out throughout the day for an extended period, combined with sufficient magnesium (Mag Chloride is his recommendation and mine), and a suitable antimicrobial program.

**Side effects:**

The following side effects are signs of healing, and are necessary if you want to improve your health.

- **Muscle relaxation:** It is known that high cellular calcium levels cause muscle contraction with cramps or spasms, a common cause of pain. Boron (from borax), especially with magnesium, relaxes muscles by assisting the pumping of calcium from the cells to the extracellular fluid. This is generally seen as a positive side effect.

- **Herxheimer reaction:** When taken at the recommended dosages above, this is the most common side effect, from candida die-off. This reaction indicates a healing reaction with beneficial long-term effects. The Herxheimer reaction is felt mainly as flu-like symptoms (tired & achy muscles, fatigue, headache, nausea). See FalconBlanco.com: The Healing Crisis, or Herxheimer Reaction for lots of good info.

  If you experience this reaction, lower your dose, then slowly build back up. Or take a break for a few days, then start again at a lower dose before building back up.

- **Temporary pain:** In cases of longstanding and severe calcifications, temporary pain in the area of the calcifications (typically hips and shoulders) or in the kidneys, or numbness/reduced sensitivity in hands and feet. This is because the release of calcium into the immediate area or the blood happens more quickly than the body can redistribute the calcium to the bones where it belongs, or to excrete it. Note that these problems are temporary healing reactions that cannot be avoided if you want a higher level of health.
What to do if you have a side effect:

Please know that the side effects mentioned above are signs of healing, and are necessary if you want to improve your health. You can minimize the negative effect by:

- increasing fluid intake
- use more organic acids such as lemon juice, ascorbic acid, or vinegar
- improve lymph flow by rebounding, walking or inverted positions. A small personal trampoline is great for this.

If the discomfort is too great for you despite the above recommendations, lower the dose until the problem subsides, then gradually increase again, slowly.

If the discomfort becomes unbearable, temporarily stop the treatment until the problem subsides, then reintroduce at a lower dose and slowly increase with time.

Toxicity: Are Borax, Boric Acid and Boron safe for ingestion?

The National Institute of Health (NIH) provides the following information on the safe upper limit (UL) for boron intake:

- Adults, and pregnant or breast-feeding women over 19 years of age: 20 mg/day
- Adolescents, and pregnant or breast-feeding women 14 - 18 years of age: 17 mg/day
- Children 9 - 13 years old: 11 mg/day
- Children 4 - 8 years old: 6 mg/day
- Children 1 - 3 years old: 3 mg/day
- Infants: no UL has been established

Dosages that exceed these ULs could be toxic. Infants should not be treated with any form of boron except under the care of a qualified medical professional.

Boron Citrate and other Chelates

As a supplement, boron is usually chelated by citrate, aspartate or glycinate. It is currently not listed as toxic or poisonous, so is not a consideration in this debate. However it should be noted that chelated boron is not as effective as borax/boric acid in treating problems like arthritis, osteoporosis, and sex hormone deficiencies, because it first has to be removed from the chelate structure (chelate means “claw”), which is difficult.

Boric Acid

The National Institute of Health (NIH) believes boric acid to be quite toxic. However, the instances cited involve large or repeated doses over an extended period of time. Most other sources indicate it is no more toxic than salt.
Other reliable sites such as BeyondPesticides (7) indicate that boric acid is no more toxic for humans than salt or baking soda. Boric acid is toxic to certain insects (like ants), but for larger animals like birds and humans, it is toxic only when given in large doses (similar to salt or baking soda). It is far more safe as a pesticide than synthetic pesticides. They do, however, caution to keep it out of reach of children.

In the stomach, the alkaline borax reacts with the acidic hydrochloric acid secreted by the stomach, to form boric acid (a weak acid) and sodium chloride (salt). Therefore I believe one can assume the degree of toxicity would be the same for boric acid as it is for borax.

NOTE: when taking boric acid supplementally instead of borax, the dosage must be adjusted (because the molecular weight of boric acid is much less than that of borax). Consult your pharmacist to help you adjust dosage.

**Borax**

If you read the borax box, you will see warnings such as these; are they all valid?

- Avoid contact with eyes;
- Do not take internally;
- Keep out of reach of children;
- Not for drug use.

If you look up borax toxicity or borax poison on the internet, you will find lots of warnings. Are they serious? Should you heed them? Here are some facts (and rebuttals, in blue italics) from CrunchyBetty.com: Getting to the bottom of Borax - Is it safe or not? (2)

- The FDA banned borax as a food additive, and the European Chemicals Agency added it to their “list of substances of very high concern” a few years ago. *This has to do with an ongoing debate as to whether excess boron in soil harms crops, and not so much about human ingestion at reasonable doses.*

- Borax is classified as non-carcinogenic, and a mild skin irritant. *On the other hand, several studies in the ToxNet database show borax is only a very mild lung irritant and causes no lasting damage. Additionally, it does not penetrate the skin well (3), and is not considered to be bio-accumulative (repetitive dosing doesn’t build up in your system).*

- It has potential to disrupt the reproductive system, according to studies on mice. *The mice in the study were given very high doses of ingested borax. Nevertheless this is why it should not be given to infants and very young children, who would be most at risk from such damage at even moderate dosage.*
• Like salt, baking soda and water, it is acutely toxic at extremely high doses. Ingesting moderate quantities may lead to gastrointestinal upset and nausea. The toxicity problems were observed in the mice only at very high dosages. It is risky to extrapolate from the effect on non-primate animals to humans. The Material Safety Data Sheet (4)(MSDS) lists borax with a health hazard level of ‘1’, the same as baking soda and salt.

Walter Last believes the demonization of borax is an attempt by the pharmaceutical industry to discredit an effective and inexpensive competitor to their expensive synthetic pharmaceuticals.

I do believe that one should use caution when treating children with borax (or boric acid); it should not be given to infants at all. But adults only have to be concerned if they are given megadoses - the same kind of doses that would make table salt and other common foods toxic/poisonous. The key is moderation.

On the other hand, the benefits of treating boron-deficient humans with borax are tremendous.

Sources:
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