Caffeine

Is It Healthy?

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Is coffee part of your morning routine? Are you convinced that it is good for you? Have you ever considered that it might not be? Everything in moderation, right? Since the explosion of Starbucks, Tim Horton’s, and Second Cup, the popularity of caffeine has led people to turn a blind eye to its harmful health effects. Now the dangers are clear, and it is hard to refute that there are many symptoms generated by this addictive substance. I am often met with resistance when I ask people to eliminate caffeine (in all forms) from their diet. However, once I explain the harmful effects of caffeine and the benefits of lowering or eliminating it from their lifestyle, compliance increases. A colleague explained caffeine’s effects on the body in this useful analogy:

“Imagine you have a pair of soaked sponges. They are so full that the minute you pick them up, they spill over with excess water. These are your healthy adrenal glands that are spilling over with energy-producing and stress-regulating hormones, such as cortisol. With each event in your life, you start to squeeze the sponges little by little:

- Teenage years & parties
- University stress / cramming for exams
- College parties
- Finding a job after graduation
- Starting a career
- Buying a car
- Moving and buying a home
- Dating
- Planning a wedding and honeymoon
- Work promotions
Having a child
Having a second child
Divorce
Death of a loved one
Moving, etc.

If you don’t take time to recharge your batteries, or in this case refill your sponges, they will slowly start to dry out. When daily tasks become major stressors and you fall into a reactive mindset, caffeine can save the day. Caffeine does a fantastic job at squeezing your sponges (i.e. stimulating your adrenal glands) to release more water (i.e. produce more stress-regulating hormones). Unfortunately, when you’re in survival mode, you are often not taking the time to properly rest, eat healthy, and nourish your adrenals. As a result, your sponges dry out even more. Instead of one cup of coffee in the morning, you now need three cups to wring out the last few drops of adrenaline/cortisol until you eventually reach “adrenal fatigue.” Your body is no longer able to function properly and you can physically collapse. This is often seen after someone finishes a big project, goes out to celebrate, and within days, finds themselves sick.”[1]

The above analogy demonstrates the physiological effects of caffeine. It is important to recognize that caffeine is an addictive substance and that it can be a slippery slope into the dependency pit of addiction. A few questions to ask are:

1. Why do you need caffeine? Is it a pick-me-up because you are tired? If so, have you addressed why are tired? If you have problems sleeping, is it possible that caffeine is disturbing your sleep?
2. Can you go without caffeine without experiencing withdrawal symptoms?

I am asking these questions so you think about your behaviour. Listen, I get it, we all do things that aren’t good for us, and the key word in life is balance. I find it interesting when people are so proud that they don’t drink coffee, but they eat a ton of chocolate, drink pop (both of which have hidden caffeine), eat sugar-laden foods, or drink too much alcohol. My goal as a health-care provider is to assess your diet to see if what you are consuming on a daily basis is contributing to your health issues or supporting vitality. It is important to remember that everything that passes into your body informs your body. You are made of nutritional building blocks—such as water, vitamins, minerals, and fats—and some of these nutrients are essential. This means that we can’t make them ourselves—we must get them from our diet—and if we don’t, we will be deficient. My husband, who is also an ND, is anticoffee. When we practiced in Fort McMurray, word spread that he recommended patients to eliminate coffee. Some patients preferred to see me instead of him for that reason! What they didn’t know is that, depending on your individual health concerns, I may also have recommended that you quit coffee.
Let’s look at the list of potential side effects from overuse of caffeine:

1. **Negative Influence on Vitamins and Minerals:**[2]
   a. Caffeine’s diuretic effect depletes important minerals (e.g. calcium, magnesium, potassium, zinc, iron, etc.) and vitamins (vitamin B₁ [thiamine], vitamin C).
   b. Coffee reduces absorption of iron, calcium, and vitamin D, especially when it is consumed around mealtime. These minerals are extremely important, as deficiencies can lead to osteoporosis and anemia.
   c. In children and adolescents, caffeinated drinks interfere with essential minerals needed for growth and development.

2. **GI irritation:**[3]
   a. As little as one cup of coffee stimulates acid secretion in the stomach for more than an hour in a healthy individual. In someone with an ulcer, the effect is greater and lasts more than two hours.
   b. Long-term use of caffeine can play a role in ulcer formation. It can aggravate an existing ulcer[4] and interferes with the healing process.
   c. Diarrhea can also occur with the overuse of caffeine, which relaxes the smooth muscle in the colon. The laxative effect of caffeine can also create a bowel dependency.

3. **Cardiovascular system effects:**
   a. Caffeine raises blood pressure.[5] Hypertension is a risk factor in atherosclerosis and heart disease.
   b. Caffeine increases blood levels of cholesterol and triglycerides, which are risk factors in cardiovascular disease.
   c. Heart rhythm disturbances and arrhythmias[6] can occur with caffeine. Disturbances include an increased heart rate and excitability of the heart nerve-conduction system, leading to both palpitations and extra beats.
   d. Caffeine also increases norepinephrine secretion, which causes constriction of arteries, leading to restricted blood flow.
   e. Because of the cardiovascular stimulation of caffeine, it seems reasonable to assume that long-term consumption of four to five cups of coffee per day can increase the incidence of heart attacks (myocardial infarction).

4. **Central nervous system (CNS) effects:**[7]
   a. Caffeine is a CNS stimulant—it works by blocking the effects of adenosine, which is a substance that is created in the brain. Adenosine binds to its receptors and slows down nerve cells. This causes drowsiness and blood vessels to increase in diameter to let more oxygen in during sleep. Caffeine has a similar shape to adenosine and binds to its receptors, but it has a stimulating effect and speeds up nerve cells, thereby increasing energy.
c. Psychological symptoms of depression, general anxiety, or panic attacks may also occur.
d. Hyperactivity and bed wetting may also develop in children who consume caffeine.
e. Addictions: Experiments with animals show that when coffee is added to the diet, animals voluntarily drank more alcohol than the amount consumed without coffee.
f. Caffeine enters the blood and can have effects 15 minutes after it is consumed. It then takes about six hours for one half of the caffeine to be eliminated.

5. The exhausting effects of caffeine:\[8\]
a. Caffeine increases blood sugar levels (especially when it is sweetened), by stimulating the adrenal glands. Over time, stress, caffeine, and sugar consumption weaken adrenal function, resulting in fatigue.\[8, 9\] Because of tiredness, people turn to caffeine for that morning pick-me-up, as caffeine can override this fatigue by stimulating the adrenals. The problem is that over time, this contributes to chronic fatigue, adrenal exhaustion, and subsequent inability to handle stress and sugar intake. As such, adrenal exhaustion / stress / fatigue / hypoglycemia syndrome are associated with caffeine use.

6. Cancer-causing effects:
a. The incidence of bladder, prostate, ovarian, stomach, and pancreatic cancers is increased with caffeine use.
   i. Bladder cancer is aggravated by the combination of nicotine and caffeine, due to the mild dehydration that results from the use of these two drugs.
   ii. Ovarian cancer is increased in women with an association of long-term coffee intake.
   iii. Pancreatic cancer has also been in question as occurring more frequently with increased coffee use (more than three cups per day)\.\[10\]
   iv. Prostate enlargement and cancer may also be attributed to increased caffeine intake.
v. There is a higher incidence of stomach cancer with more than five cups per day.

7. Other effects:
   a. Kidneys: Caffeine is also correlated with kidney stones, possibly as a result of its diuretic effect and of the effects of chemicals used in processing coffee.\[11\]
   b. Fibrocystic breast disease may also be a consequence of caffeine use, as there is an increase in the size and number of cysts with caffeine consumption.\[12\] A reduction/reversal of the condition is experienced when caffeine is eliminated from the diet.

**Common Symptoms of Caffeine Abuse:**

<table>
<thead>
<tr>
<th>Symptom</th>
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<th>Symptom</th>
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</thead>
<tbody>
<tr>
<td>Agitation</td>
<td>Fatigue</td>
<td>Increased</td>
<td>Nutritional</td>
</tr>
<tr>
<td>Anxiety / nervousness</td>
<td>Gastrointestinal irritation</td>
<td>cholesterol and triglycerides</td>
<td>deficiencies</td>
</tr>
<tr>
<td>Bed wetting</td>
<td>Headache</td>
<td>Increased or irregular heart rate</td>
<td>Poor concentration</td>
</tr>
<tr>
<td>Depression</td>
<td>Heartburn</td>
<td>Insomnia</td>
<td>Tremors</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>Increased blood pressure</td>
<td>Irritability</td>
<td>Ulcers</td>
</tr>
<tr>
<td>Dizziness</td>
<td></td>
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<td>Upset stomach</td>
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</tbody>
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**Common Symptoms of Caffeine Withdrawal:**

<table>
<thead>
<tr>
<th>Symptom</th>
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</thead>
<tbody>
<tr>
<td>Anxiety / nervousness</td>
<td>Depression</td>
<td>Headache</td>
<td>Rapid heart rate</td>
</tr>
<tr>
<td>Apathy</td>
<td>Digestive upset</td>
<td>Insomnia</td>
<td>Ringing in the ears</td>
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<tr>
<td>Constipation</td>
<td>Dizziness</td>
<td>Irritability</td>
<td>Runny nose</td>
</tr>
<tr>
<td>Cramps</td>
<td>Drowsiness / fatigue</td>
<td>Nausea</td>
<td>Shakiness</td>
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<tr>
<td>Craving</td>
<td>Feeling cold</td>
<td>Poor concentration</td>
<td>Vomiting</td>
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**What Foods Contain Caffeine?\[13\]**

<table>
<thead>
<tr>
<th>Drink</th>
<th>Portion</th>
<th>Amount of Caffeine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>1 cup (8 oz.)</td>
<td>95–150 mg; varies depending on the roasting and grinding. Dark roasts tend to have less caffeine than lighter roasts, but it is a subtle difference.[14]</td>
</tr>
<tr>
<td>Coffee (decaf)</td>
<td>1 cup</td>
<td>2–12 mg</td>
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<tr>
<td>Green tea</td>
<td>1 cup</td>
<td>24–45 mg</td>
</tr>
<tr>
<td>Black tea</td>
<td>1 cup</td>
<td>14–70 mg</td>
</tr>
<tr>
<td>Hot chocolate</td>
<td>1 cup</td>
<td>8 mg</td>
</tr>
<tr>
<td>Coke, Mountain Dew, Tab, Pepsi</td>
<td>12 oz. (1 can)</td>
<td>46 mg</td>
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</tr>
<tr>
<td>Cocoa/Chocolate</td>
<td>50 g</td>
<td>3-63 mg</td>
</tr>
<tr>
<td>Guarana root[^15]</td>
<td></td>
<td>3.6%–5.8% by weight</td>
</tr>
<tr>
<td>Kola nut[^16]</td>
<td></td>
<td>2.0%–3.5% by weight</td>
</tr>
<tr>
<td>Yerba mate tea[^17]</td>
<td>1 cup</td>
<td>85 mg</td>
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**Drugs**

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<tbody>
<tr>
<td>Excedrin</td>
<td>65 mg</td>
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<tr>
<td>Anacin</td>
<td>32 mg</td>
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<tr>
<td>Midol</td>
<td>32 mg</td>
</tr>
<tr>
<td>Dristan</td>
<td>16 mg</td>
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**How much is safe?**

Three hundred milligrams per day (300 mg/d) is thought to be a moderate daily intake, and is not linked to any negative health effects; however, we often recommend drinking less than this.

**PREGNANCY AND CAFFEINE[^18]**

- Although research is conflicting, there is enough evidence that large daily doses of caffeine are harmful in pregnancy. Therefore, we recommend eliminating caffeine if trying to conceive or in pregnancy, until more research is done. Some studies have shown that caffeine intake of more than 300 mg/d can cause delayed conception.
- Birth defects have been noted with higher levels of caffeine use during pregnancy. Caffeine crosses the placenta and affects the fetus, and it has mutagenic effects (i.e. it breaks chromosomes in nuclei of cells and interferes with the repair of DNA).
- There is strong evidence that large daily caffeine consumption may increase miscarriage, preterm delivery, and low birth weight (especially when infants are premature).
- Caffeine easily passes from mom to fetus through the placenta. Due to the immature fetal organs, the fetus may have a harder time breaking down caffeine.
- Even moderate amounts of caffeine can increase fetal heart rate and movement patterns.
Maternal Effects

- Hydration is important in pregnancy, since blood volume increases. Since caffeine acts to increase urination, it therefore decreases body fluids and blood volume.
- A pregnant women’s ability to break down caffeine slows down as pregnancy progresses.
- Breast-feeding: High caffeine intake by a nursing mother can cause the baby to be irritable and have disturbed sleep cycles.

Ways to Decrease Caffeine Intake

- Cut back gradually: Keep a log of how much caffeine you consume (remember to include medications), then gradually decrease coffee by one cup per day.
- Substitute with herbal tea, hot cider, or healthy coffee substitutes.
- Ask others to decrease coffee intake with you, as there is strength in numbers.
- Dilute your regular coffee with hot water.
- Drink lattes with more milk than coffee.
- Brew tea/coffee for less time.
- Change routines—for example, if you need caffeine in the morning to give you a boost, try a light walk for 20 minutes; physical activity can greatly increase energy levels.
- Ensure you are drinking the minimum water requirement, which is half your body weight in ounces—for example, if you weigh 180 lb, your minimum water amount is 90 oz. or 3 L. Remember that coffee is a diuretic, so depending on how many cups you are drinking per day, you may be in a negative water balance and most likely need to consume more.

References

Christina Bjorndal, B.Comm, ND, graduated from The University of British Columbia in 1990 with Bachelor of Commerce Degree with honours. She was Valedictorian of her graduated class. She completed her Doctorate in naturopathic medicine from CCNM in 2005. She is one of the only licensed NDs in Canada with an expertise in the treatment of mental illnesses such as depression, anxiety, bipolar disorders, eating disorders, ADD/ADHD, OCD, and schizoaffective disorders. Having overcome many challenges in the sphere of mental health, Dr. Chris is especially exceptional about sharing her motivational speeches about how to overcome barriers in life and to encourage others to achieve their full potential. She is currently completing a book on mental health. www.drchrisbjorndal.com