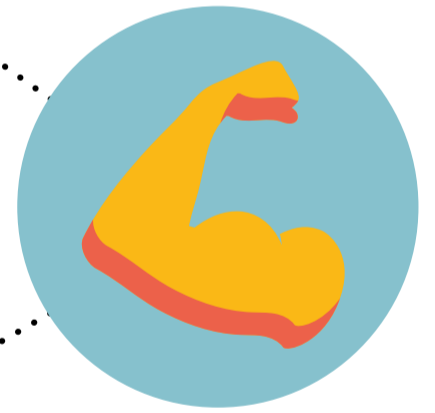


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FITNESS GUIDE



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Medical Disclaimer

This guide is a general-health document for adults 18 or over. Its aim is strictly educational. It does not constitute medical advice. Please consult a medical or health professional before you begin any exercise-, nutrition-, or supplementation-related program, or if you have questions about your health.

This guide is based on scientific studies, but individual results do vary. If you engage in any activity or take any product mentioned herein, you do so of your own free will, and you knowingly and voluntarily accept the risks. While we mention major known interactions, it is possible for any supplement to interact with other supplements, with foods and pharmaceuticals, and with particular health conditions.

For more information on the supplements mentioned in this guide, please visit [Examine.com](https://www.examine.com).

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Foreword

Welcome to *The Examine.com Fitness Guide: A blueprint for optimizing nutrition and supplementation*.

Kamal here. You likely know me as the cofounder of Examine.com. I want to take a moment to introduce you to the other cofounder, Sol Orwell. Just like you, Sol and I are constantly striving to raise our fitness levels; that's what drove us to create Examine.com in the first place.

During those hours when the Examine.com team is knee-deep in research logistics, practical questions of fitness keep coming up — but not along the lines of “Are eight reps better than twelve?” or “30 grams of protein four times a day, or 40 grams of protein three times a day?”

Rather, we're always thinking about the big picture of fitness. And the big picture isn't shaped by minute differences in exercise volume or protein intake, but rather by a variety of bottlenecks. By eliminating common stumbling blocks, you can optimize your results.

Figure 1: Roadblocks to optimal fitness



These six categories **come together to form the backbone of fitness**. And each is explored here, in detail, in this *Fitness Guide*.

But to understand the importance of these categories, numbers only go so far. So let's use a couple of examples: Sol and me.

Sol lost over 60 pounds of fat, massively improving his health and his overall fitness; he did it not with crazy diets or magic pills but with *scientific evidence*. Spreading the gospel of rational nutrition approaches became his calling.

At the start of his journey, Sol met me; I had lost 50 pounds of *muscle* due to the chronic pain caused by a genetic disorder called Ehlers-Danlos syndrome. Small world — it turned out Sol had the same condition!



Photo: Martin Donnelly



Photo: Aous Poules

People often associate gains in the gym to tweaks in workout routine or technique. The truth is, though, that problems like joint pain and sleep issues have a *much larger impact* on your ability to consistently exercise and increase your fitness. Unfortunately, as people get older, fat gain, muscle loss, and testosterone decline can seem inevitable.

That's why we wanted to write, first of all for ourselves, a no-nonsense fitness guide — a guide that covered the big picture, not just one facet of fitness. We've felt the impacts of all the multiple factors contributing to optimal fitness. We've seen the same in family and friends. We know that fitness is more than just building muscle. It will only take you a few seconds to think of your own family and friends, and of which bottlenecks might be getting in the way of their own fitness and health.

This guide is about empowering yourself. For each of the above categories, we first lay out the big picture, then we get into which supplements might

help you out, which are promising but still under-researched, and which are a waste of time and money. Our sincere hope is that you'll pour over what we've written, and use it to make yourself happier by being healthier and fitter.

We'll now hand over the mic to the researchers and experts who worked on this guide. Best of luck!



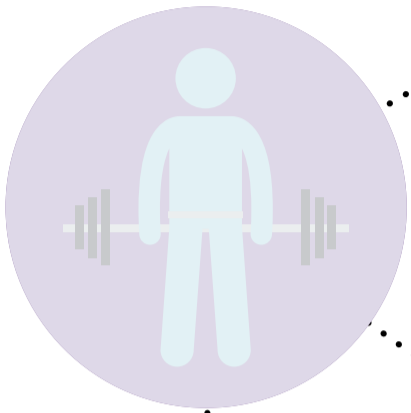
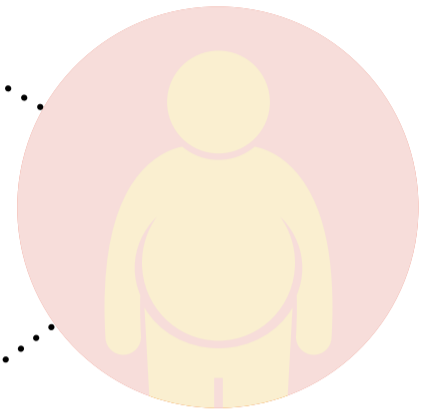
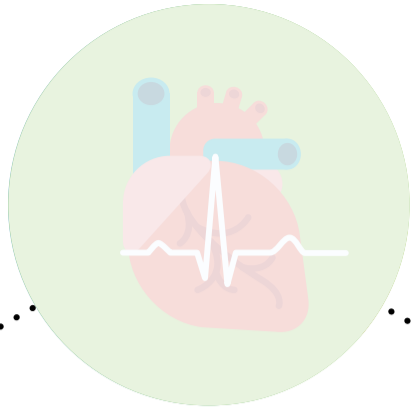
Kamal Patel, Cofounder
MBA, MPH, PhD(c) in Nutrition

How do all the various aspects of health fit together, given the thousands of papers published each year? Answering that question is both Kamal's favorite hobby and his job as cofounder and director of Examine.com. He's published peer-reviewed studies on a variety of topics, from vitamin D and cardiovascular risk to fructose and liver health. Kamal's views on research (and life) can be summarized by Maimonides's timeless saying: "Teach thy tongue to say 'I do not know,' and thou shalt progress."



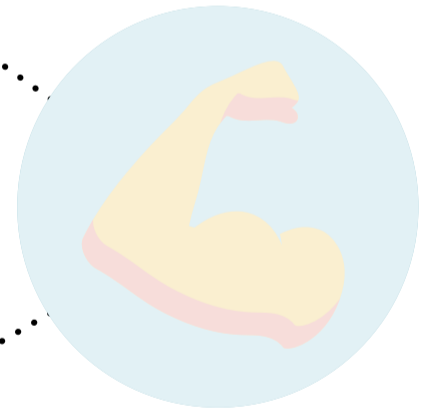
Sol Orwell, Cofounder

Profiled in *Entrepreneur*, *Forbes, Inc.*, *Men's Fitness*, and *Men's Health*, and an advisor to Arnold Schwarzenegger, Sol Orwell is an entrepreneur with a knack for solving problems that frustrate others. He has been building businesses since 1999 and is even now working to extend to other industries Examine.com's approach of nuance and non-sensationalism. In his spare time he eats copious amounts of cookies and hosts charity food-offs.



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PART VI: SLEEP



Introduction

Nearly twenty years ago, as a young pup researching weightlifting out of my dorm room, I suddenly reached my limit. I thought I knew everything about weights and nutrition (ha!) and it was time to move on to the next topic: sleep science. So I bought an accelerometer-equipped sleep watch on this cool new site called “eBay”.

Oh my. I was a mild data junkie before then, but the watch turned me into a level 10 junkie. When I got even a bit less sleep, it was highly correlated with lower test scores, more stress, and ... gym plateaus! Sleep seemed to be more influential than how much protein I got, what my lifting routine was, and pretty much anything else.

Digging Deeper: Sleep tracking? There’s an app for that

In the late 1990s, accelerometer-equipped watches became available for sleep tracking. They weren’t used for clinical sleep assessment — for which dedicated home devices,¹ clunkier but more accurate, had recently become available to physicians — but they did provide the curious layman with some sleep data.

Fast-forward a couple decades, and now anyone with a smartphone can use its accelerometer to track sleep, using cheap or free apps. But are these apps accurate? Can they really tell you how much time you spend in the different stages of sleep,² or how efficient your sleep was? Well, according to a recent study ... no, not really.³

Still, those apps might bring to your attention potential problems (e.g., if you learn that you get up at the same time every night, you can try to understand why). They may also, very simply, keep you invested in maintaining healthy sleep patterns.

There is anecdotal evidence that a smartphone will track your sleep more accurately if you strap it to your arm or leg rather than lay it on your bed (especially if your bed is of the memory-foam variety). But if you want better, you can purchase a fitness device. Not all such devices will be equally accurate, however, and any study on a given device is likely to have been funded by the device’s manufacturer.⁴ (Industry funding does *not* disqualify a study, but an industry-funded study is less likely to get published if it doesn’t produce favorable results.)

The problem

Lack of sleep can negatively affect every aspect of your life, and fitness is no exception. Lack of sleep impairs athletic performance, in both the short term⁵ and the long term, and it does so in several ways, some more obvious than others:

- **Impaired focus.**⁶ You simply can't give your all if you're not really "there" when you train.
- **Impaired skill acquisition.** Your ability to build specific brain-muscle connections (let's say, to throw a ball accurately) decreases with sleep deprivation, possibly due to a decrease in myelin production.⁷ Moreover, to build the *right* brain-muscle connections, you need to repeat the *right* moves, which becomes harder with impaired focus.
- **Impaired insulin signaling** and thus impaired glucose metabolism.⁸ Glucose, also known as blood sugar, is a main source of energy; if you cannot burn this fuel efficiently, you'll gas out sooner (and risk developing diabetes,⁹ to boot).
- **Increased inflammation**¹⁰ and thus increased risk of injury. Moreover, even low-level pain¹¹ fosters fatigue (you'll gas out even sooner) and further impairs focus.
- **Impaired cardiovascular health.** If you don't get enough sleep, you're at a higher risk for cardiovascular disease.¹² Impaired glucose metabolism is one of the probable causes.
- **Impaired muscle gain.** You've probably heard that "you grow when you sleep". In truth, we're still not quite sure that more muscle is built during sleep than during waking hours; but we do know that lack of sleep impairs muscle gain.¹³ The reasons are complex; they include a decrease in testosterone production¹⁴ and, as we saw, an increase in fatigue (if you can't exercise as hard, or as long, you limit your potential for muscle growth).

Wow. Is that all, now? Not quite. Because in addition to a decrease in athletic performance per se, lack of sleep also causes an **increase in fat gain**. And isn't *that* unfair? If you spend more time awake, shouldn't you burn more calories? And isn't burning more calories what *fat burning* is all about? So why does study after study show that you gain fat as you lose sleep?¹⁵

The main reason is simple: as you sleep less, you eat more. Even partial sleep deprivation can cause a 20% increase in voluntary energy intake.¹⁶ It also causes your body to burn less fat and more muscle (which is yet another reason why lack of sleep impairs muscle growth).¹⁷

Now I hope all this bad news won't keep you awake at night, or I've just become part of the problem! Because there are two big reasons people don't get enough sleep, and stress is one of them. The other big reason is that many people simply don't schedule enough time for sleep on a daily basis, instead hoping to "catch up" during the weekend (a strategy with very limited efficacy). Other reasons, less widespread but harder to address, include pain,¹⁸ sleep apnea, and the forms of insomnia not related to stress.

The solutions

So what can you do about it? Let's be blunt: all a supplement can do is *help* you fall asleep, *help* you stay asleep, and *help* you sleep better. No supplement is going to knock you out, and of course, no supplement will pack eight hours of sleep into five hours.

If you want your sleep to improve, you'll have to work with your supplements, not against them. You won't like it, but here it is: **First**, you need to schedule enough time for sleep each day. **Second**, you should try going to bed at the same time every day, even during the weekend, as this habit both improves sleep quality and reduces the time it takes to fall asleep. **Third**, for at least one hour before bed, you need to relax and avoid sources of blue light.

Blue light (produced by most screens as well as by the sun) can keep you awake even after you turn it off; and even after you fall asleep, it can still reduce your body's production of melatonin, thus decreasing the *quality* of your sleep.

Because playing games and answering emails tend to stimulate your brain, those activities are less than ideal near bedtime. Still, if you really need to use your phone, tablet, or computer at night, consider using a program that reddens your screen light after sunset. Or, if you cannot easily adjust the color balance of your screen, start wearing [blue-light-blocking glasses](#) a couple of hours before bedtime.

**Tip: What should you avoid doing before bed?**

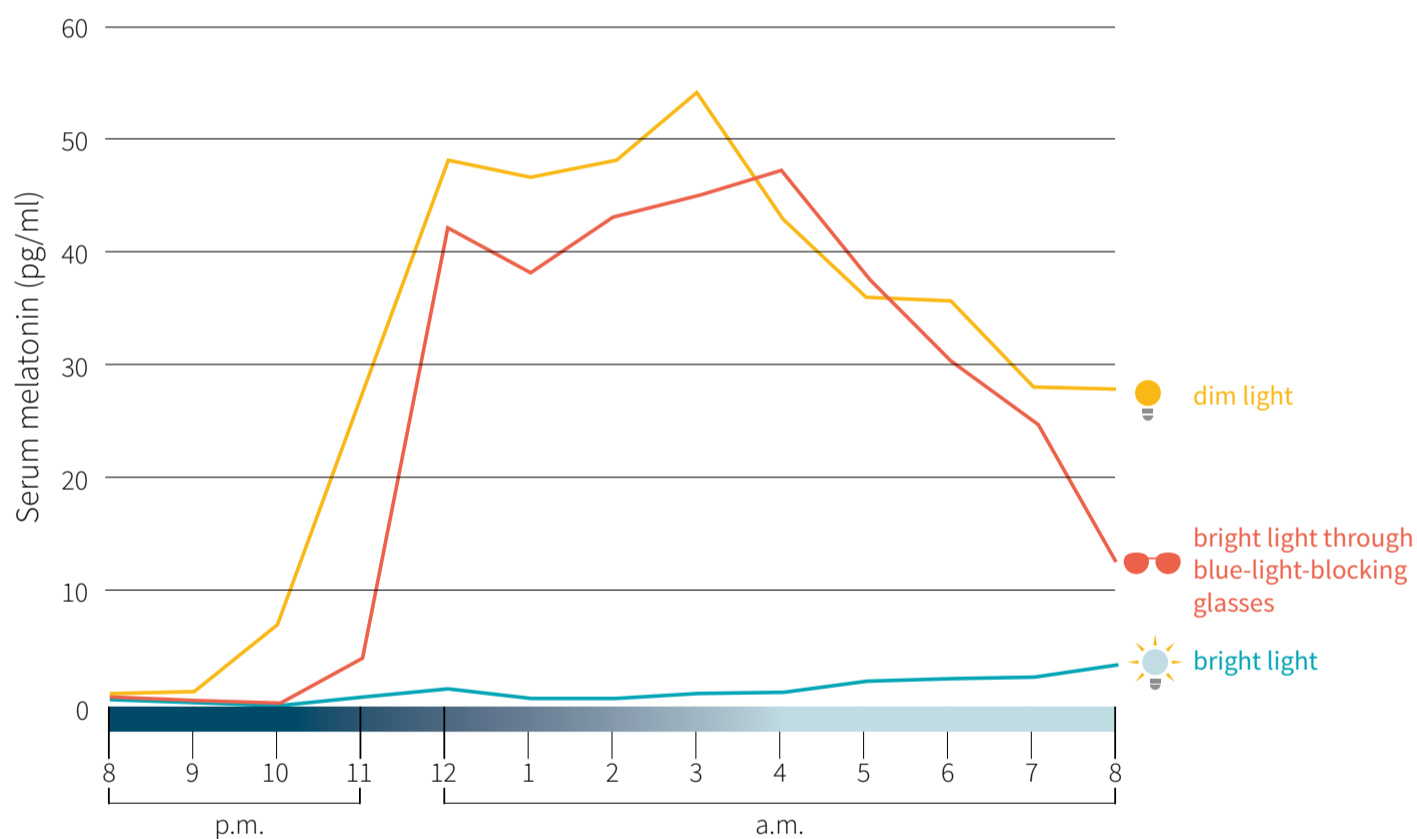
If you ask people what they'd like to do before bed, you might hear answers such as meditate, read a book, or share some *special time* with their partner. But in reality, texting, playing games, or working is becoming more prevalent by the year, to the probable detriment of [sleep quality](#).¹⁹

Aside from fiendishly typing and checking social media, are there any other activities you should avoid in order to get a sound night's sleep?

Eating right before bed is often targeted as a sleep killer. But the evidence is more nuanced; in some people, consuming small amounts of food, such as a glass of milk or a small snack, can benefit sleep.²⁰ Nighttime exercise is another frowned-upon activity, yet recent trial²¹ and survey²² evidence has shown a potential benefit on sleep.

As it stands, more than what your pre-bed activities are, what's likely to hurt your sleep at that time is excess light exposure. The bright lights of a gym will have this effect, but so will using a tablet — a light-emitting device — rather than reading a printed book.²³

Figure 1: Effect of light on melatonin production



Source: [Kayumov et al. J Clin Endocrinol Metab. 2005 May.](#)

All set? Then, after the eyes, the ears. Noise can both reduce sleep quality and make it harder to fall asleep,²⁴ so minimize the noise in your bedroom. If that doesn't suffice, get earplugs, but keep in mind that earplugs attenuate high frequencies more than they do low frequencies — they may protect you against cars honking, but not much against traffic rumble.

Noise is bad enough, but heat can be worse.²⁵ A bedroom warm enough to raise your core temperature can impair sleep quality and even cause insomnia.²⁶

Conversely, a bedroom cool enough to lower your core temperature (but not so chilly as to be uncomfortable) will help you fall asleep faster and enter the deeper stages of sleep sooner.²⁷ An instinctive desire to reduce one's core temperature also explains why some people like to keep a foot outside their cover (hands and feet being especially good at dissipating body heat).

There you have it. If anything, supplementation should be considered a solution of last resort, reserved for people who cannot sufficiently improve their sleep through lifestyle changes. And even if you do need them, do not feel you have to take supplements daily: if their efficacy seems to wane as weeks go by, try taking them only three to five nights a week.

It may take you a couple of months to determine your optimal combination of supplements, and a couple more to ascertain your best supplementation schedule. Every few months afterward, consider pausing supplementation to determine if non-supplemented sleep quality has improved.



Kamal Patel, Cofounder
MBA, MPH, PhD(c) in Nutrition

Kamal Patel is cofounder and director of Examine.com. He holds two master's degrees from the Johns Hopkins University, in business and in public health, and is on hiatus from a PhD in Nutrition for which he's investigated the link between diet and chronic pain. He's published peer-reviewed articles on vitamin D and calcium, as well as on a variety of clinical research topics. He's also been involved in research on fructose and liver health, on nutrition in low income areas, and on mindfulness meditation.

References

- 1 Su et al. “[A comparison of polysomnography and a portable home sleep study in the diagnosis of obstructive sleep apnea syndrome](#)” (2004)
- 2 Shrivastava et al. “[How to interpret the results of a sleep study](#)” (2014)
- 3 Bhat et al. “[Is there a clinical role for smartphone sleep apps? Comparison of sleep-cycle detection by a smartphone application to polysomnography](#)” (2015)
- 4 De Zambotti et al. “[A validation study of Fitbit Charge 2™ compared with polysomnography in adults](#)” (2018)
- 5 Mah et al. “[The effects of sleep extension on the athletic performance of collegiate basketball players](#)” (2011)
- VanHelder and Radomsk. “[Sleep deprivation and the effect on exercise performance](#)” (1989)
- 6 Alhola and Polo-Kantola. “[Sleep deprivation: Impact on cognitive performance](#)” (2007)
- 7 Bellesi et al. “[Effects of sleep and wake on oligodendrocytes and their precursors](#)” (2013)
- 8 Broussard et al. “[Impaired insulin signaling in human adipocytes after experimental sleep restriction: a randomized, crossover study](#)” (2012)
- Buxton et al. “[Sleep restriction for 1 week reduces insulin sensitivity in healthy men](#)” (2010)
- Donga et al. “[A single night of partial sleep deprivation induces insulin resistance in multiple metabolic pathways in healthy subjects](#)” (2010)
- Bosy-Westphal et al. “[Influence of partial sleep deprivation on energy balance and insulin sensitivity in healthy women](#)” (2008)
- VanHelder and Radomsk. “[Sleep deprivation and the effect on exercise performance](#)” (1989)
- 9 Cappuccio et al. “[Quantity and quality of sleep and incidence of type 2 diabetes: a systematic review and meta-analysis](#)” (2010)
- Chaput et al. “[Sleep duration as a risk factor for the development of type 2 diabetes or impaired glucose tolerance: analyses of the Quebec Family Study](#)” (2009)

- Beihl et al. “[Sleep duration as a risk factor for incident type 2 diabetes in a multiethnic cohort](#)” (2009)
- 10 Mullington et al. “[Sleep loss and inflammation](#)” (2010)
- Simpson and Dinges. “[Sleep and inflammation](#)” (2007)
- 11 Haack et al. “[Elevated inflammatory markers in response to prolonged sleep restriction are associated with increased pain experience in healthy volunteers](#)” (2007)
- 12 Michiaki et al. “[Sleep duration as a risk factor for cardiovascular disease — a review of the recent literature](#)” (2010)
- 13 VanHelder and Radomsk. “[Sleep deprivation and the effect on exercise performance](#)” (1989)
- 14 Cote et al. “[Sleep deprivation lowers reactive aggression and testosterone in men](#)” (2013)
- Leproult and Van Cauter. “[Effect of 1 week of sleep restriction on testosterone levels in young healthy men](#)” (2011)
- Penev. “[Association between sleep and morning testosterone levels in older men](#)” (2007)
- González-Santos et al. “[Sleep deprivation and adaptive hormonal responses of healthy men](#)” (1989)
- Cortés-Gallegos et al. “[Sleep deprivation reduces circulating androgens in healthy men](#)” (1983)
- 15 Nedeltcheva et al. “[Insufficient sleep undermines dietary efforts to reduce adiposity](#)” (2010)
- 16 Bosy-Westphal et al. “[Influence of partial sleep deprivation on energy balance and insulin sensitivity in healthy women](#)” (2008)
- 17 Nedeltcheva et al. “[Insufficient sleep undermines dietary efforts to reduce adiposity](#)” (2010)
- 18 Sasaki et al. “[Nocturnal knee pain increases with the severity of knee osteoarthritis, disturbing patient sleep quality](#)” (2014)

- Blay et al. “[Chronic painful physical conditions, disturbed sleep and psychiatric morbidity: results from an elderly survey](#)” (2007)
- ¹⁹ Whipps et al. “[Evaluation of Nighttime Media Use and Sleep Patterns in First-semester College Students](#)” (2018)
- ²⁰ Kinsey and Ormsbee. “[The health impact of nighttime eating: old and new perspectives](#)” (2015)
- ²¹ Flausino et al. “[Physical exercise performed before bedtime improves the sleep pattern of healthy young good sleepers](#)” (2011)
- ²² Buman et al. “[Does nighttime exercise really disturb sleep? Results from the 2013 National Sleep Foundation Sleep in America Poll](#)” (2014)
- ²³ Grønli et al. “[Reading from an iPad or from a book in bed: the impact on human sleep. A randomized controlled crossover trial](#)” (2016)
- Chang et al. “[Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness](#)” (2014)
- ²⁴ Basner et al. “[ICBEN review of research on the biological effects of noise 2011–2014](#)” (2015)
- Halperin. “[Environmental noise and sleep disturbances: a threat to health?](#)” (2014)
- Hume et al. “[Effects of environmental noise on sleep](#)” (2012)
- ²⁵ Libert et al. “[Relative and combined effects of heat and noise exposure on sleep in humans](#)” (1991)
- ²⁶ Lack et al. “[The relationship between insomnia and body temperatures](#)” (2008)
- ²⁷ Murphy and Campbell. “[Nighttime drop in body temperature: a physiological trigger for sleep onset?](#)” (1997)

Core Supplements

Core supplements have the best safety-efficacy profile. When used responsibly, they are the supplements most likely to help and not cause side effects.

Magnesium

Why it's a core supplement

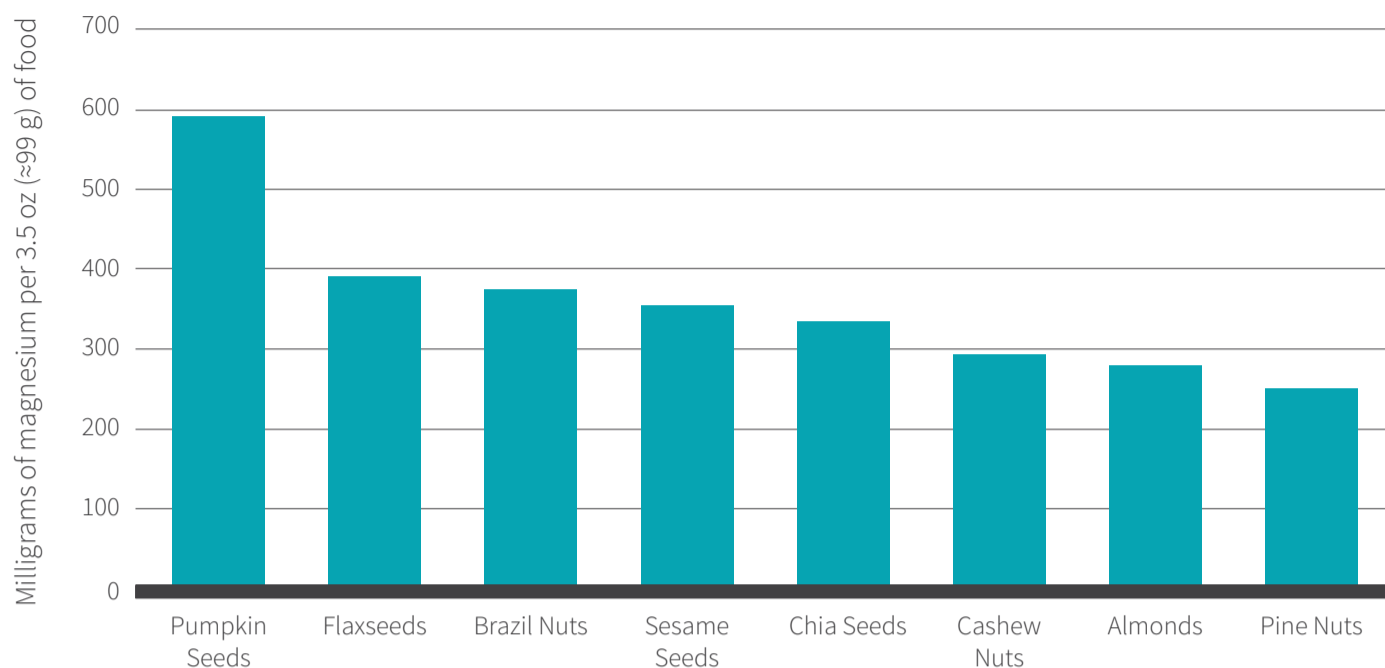
Magnesium (Mg) is a dietary mineral that plays an important role in the brain. A deficiency can result in abnormal neuronal excitations leading to impaired sleep. Magnesium is lost through sweat, so deficiencies are more common in athletes, but they are not unknown in the general population.

Magnesium is usually safe, but it may impair the absorption of some pharmaceuticals, notably bisphosphonates. Magnesium acts synergistically with calcium channel blockers to lower blood pressure, creating a risk of hypotension (i.e., low blood pressure). If you take any medication, talk to your doctor before you consider supplementing magnesium.

How to take it

A diet comprising magnesium-rich foods (such as fish, nuts, beans, and green leafy vegetables) renders supplementation unnecessary, at least for the purpose of improving sleep. In case of magnesium deficiency, adding or increasing [dietary sources of magnesium](#) should be the first option, but in the absence of practical ways of doing so, supplementation can be used.

Figure 2: Magnesium content of seeds and nuts



Low dietary magnesium can impact sleep quality. Nuts and seeds are a great source of magnesium. Incorporating some of the above foods into your diet can help ensure sufficient magnesium intake.

Commonly supplemented forms include citrate, gluconate, and glycinate. To increase absorption, magnesium gluconate should be taken with a meal; other forms can also be taken on an empty stomach. Magnesium oxide is better avoided: it has low bioavailability, which can cause intestinal discomfort and diarrhea.

The standard dose is 200 mg of elemental magnesium once a day, though up to 350 mg can be used. Because magnesium might have a sedative effect, it is often supplemented before bed.

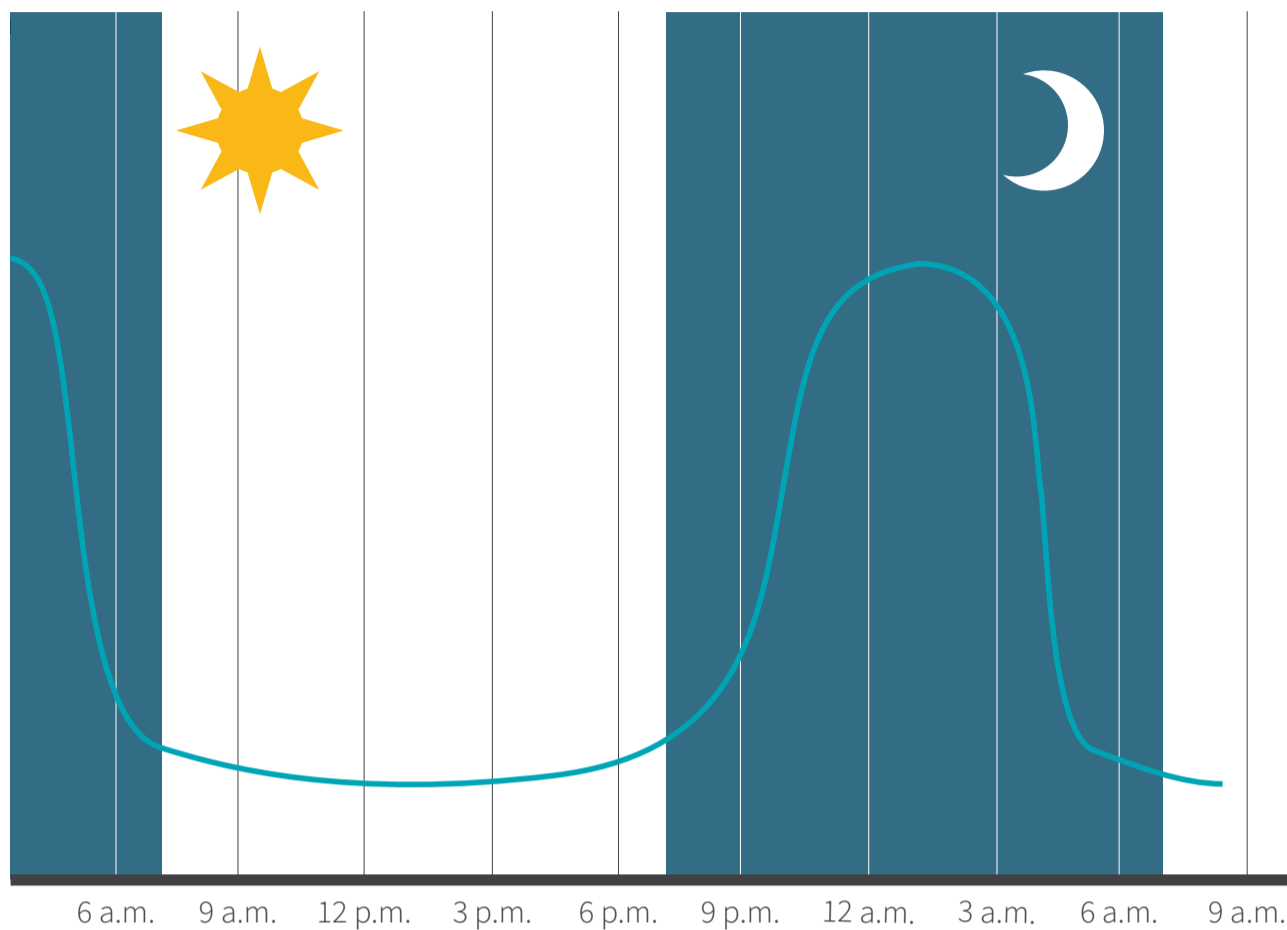
Avoid taking magnesium, [calcium](#), [iron](#), and [zinc](#) at the same time in combinations of 800+ mg, since high amounts of these minerals will compete for absorption. Magnesium may also impair the absorption of antibiotics, notably those in the tetracycline class (e.g., doxycycline) and quinolone class (e.g., ciprofloxacin), so take magnesium and antibiotics at least six hours apart.

Melatonin

Why it's a core supplement

Melatonin is a hormone involved in the circadian rhythm (which dictates sleeping and waking cycles). As you wake up in the morning, melatonin levels go down, while at night, or if you dim the lights, melatonin production increases.

Figure 3: Natural melatonin variations throughout the day



Melatonin's benefits hinge on its ability to decrease the time it takes to fall asleep. If you fall asleep easily, you do not need to supplement melatonin.

Your body can make melatonin out of the amino acid L-tryptophan, but since supplemental melatonin is inexpensive, readily bioavailable, and more reliable than tryptophan, there is no reason to include tryptophan in your sleep stack.

How to take it

Take 0.5 mg (500 mcg) half an hour before bed. Increase by 0.5 mg each week until you find the lowest effective dose that works. Do not take more than 5 mg. Time-release melatonin may be more effective at sustaining sleep throughout the night.

Primary Options

Primary options may provide substantial benefit, but only in the right context. A primary option is not for everyone, but if you read the entry and find that you meet the criteria, consider adding the supplement to your combo.

Lavender

Why it's a primary option

Lavender (*Lavandula*) is traditionally used in aromatherapy for its relaxing scent. Because of the difficulty of blinding aromatherapy studies, a lot of the evidence for lavender's effects stems from lower-quality studies, but newer studies have examined oral supplementation to treat anxiety.

Intrusive thoughts can increase the time it takes to fall asleep; lavender can ease anxiety and reduce those intrusive thoughts. Lavender can also improve sleep *quality*, though more research is needed to determine the mechanism behind this effect. Likewise, more research is needed to confirm if lavender and [lemon balm](#) are indeed synergistic.

Because anxiety is prevalent in younger women, anxiety treatments are often taken along with contraceptive pills. One study has shown that lavender doesn't interact with a type of estrogen-based birth control: ethinyl estradiol with levonorgestrel.

Yet lavender may have hormonal effects. [The Endocrine Society](#) and the [National Institutes of Health](#) warn that there is mechanistic and anecdotal evidence that lavender oil has estrogenic properties and can cause gynecomastia (enlarged breasts in males). It is reassuring that none of the clinical trials have reported gynecomastia among their subjects, but still, if you are male and your breasts become tender, stop using lavender.

How to take it

Take 80 mg of Silexan, a lavender oil preparation standardized for the active component linalool at 25–46% of total weight, 30–45 minutes before bed. After two weeks, if no benefit has been observed, the dose can be increased to 160 mg (this is the *maximum dose*).

Lavender oil is also used in aromatherapy — burned as a candle, heated, placed in a vaporizer, or added to a hot bath. The number of variables (product concentration, proximity of the user to the source, size of the room ...) makes recommending dosages exceedingly difficult, but studies have used at least 30 minutes of exposure in a well-ventilated room either at night or in the afternoon.

Secondary Options

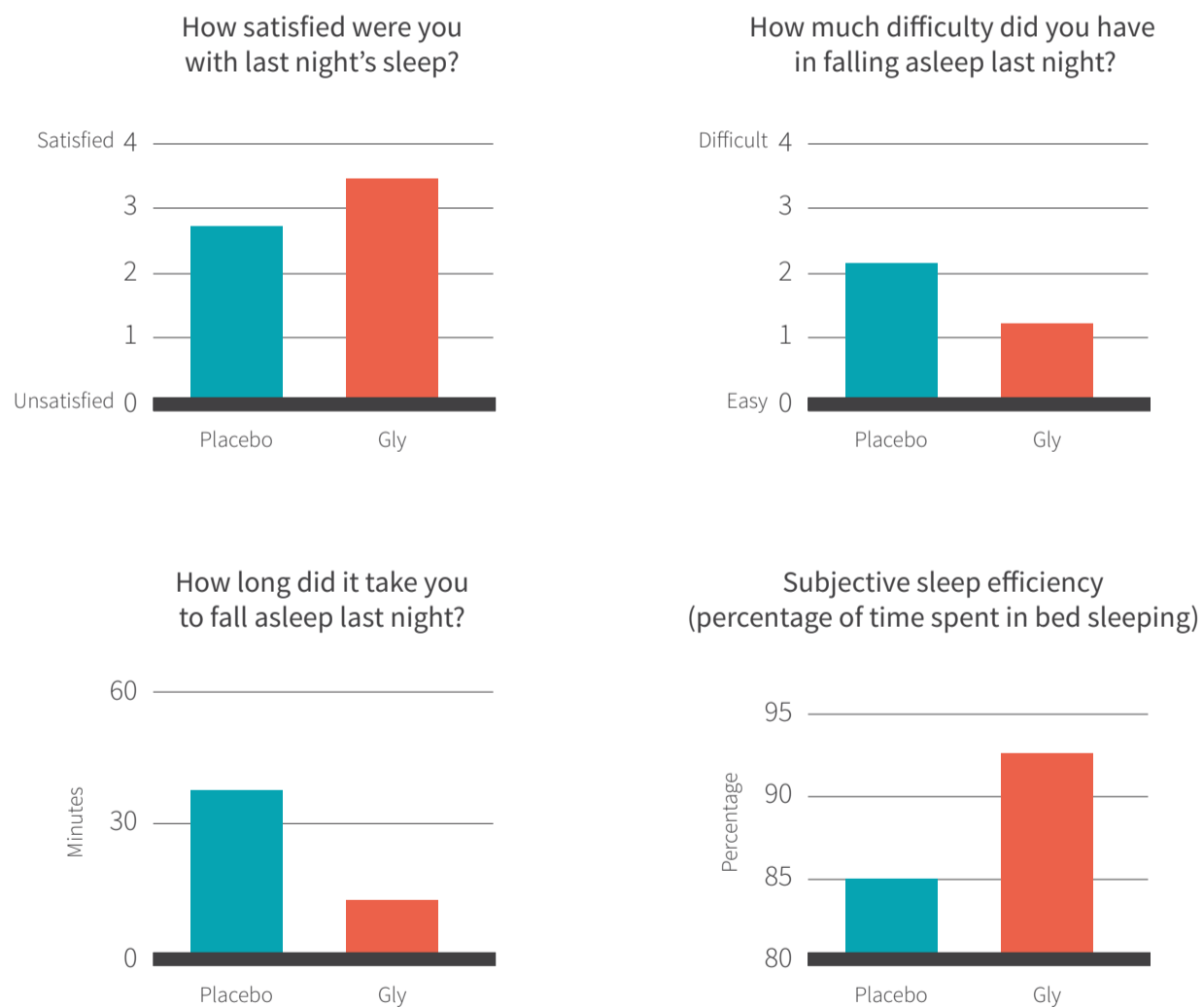
Secondary options have less evidence for their effects. They could work or be a waste of money. Keep them in mind, but think twice before adding them to your combo.

Glycine

Why it's a secondary option

Studies on glycine have not found supplementation to improve sleep quality or reduce the amount of time it takes to fall asleep, but participants reported feeling significantly more rested the following morning.

Figure 4: Effects of glycine on subjective sleep quality



While some studies have shown improvements on the perception of sleep quality with glycine supplementation, those studies have all been short term.

Source: [Yamadera et al. Sleep and Biological Rhythms. 2007.](#)

Though glycine does not provide the health benefits that result from improved sleep quality, the perception of having had a good night's sleep makes for a comfortable and energetic morning. Plus, glycine is cheap and safe, making it a viable supplement option.

However, studies on glycine have all been short term (four days or less), and anecdotal reports suggest that benefits wear off. Therefore, glycine is probably best used intermittently.

How to take it

Take 3 g of glycine 30–60 minutes before sleep. Glycine is usually taken with food, but further research is needed to determine how important mealtime supplementation really is. If eating too close to bedtime disrupts your sleep, take glycine on an empty stomach instead.

Glycine can be purchased as pills but is cheaper as bulk powder, which should be mixed with water and tastes rather sweet.

Lemon Balm

Why it's a secondary option

Lemon balm (*Melissa officinalis*) is a light sedative. Like [lavender](#), with which it may be synergistic, lemon balm can reduce the time it takes to fall asleep.

Unlike benzodiazepines, lemon balm is not potent enough to have addictive or habit-forming properties. Nevertheless, any supplement with a sedative effect can disrupt working memory and reduce attention span. Do not drive or operate heavy machinery after taking lemon balm or any other supplement with a sedative effect. Do not take lemon balm during the day.

How to take it

Take 300–1,200 mg of lemon balm 30–60 minutes before bed. Start with 300 mg; ramp up to 600 mg over the course of a week if no lower dose proves effective. Only take a dose larger than 600 mg if it provides noticeably greater benefits.

Lemon balm is also used in aromatherapy, but studies tend to examine oral supplementation because it is a more reliable delivery method.

Valerian

Why it's a secondary option

The root of valerian (*Valeriana officinalis*) was one of the first sleep aids on the market. Like glycine, it seems to improve subjective reports on sleep and mood (well-being, alertness) the morning after supplementation.

Valerian is one of the best-researched sleep aids, second only to melatonin, yet how it influences sleep on a neural level is still uncertain. Moreover, like St. John's Wort, it interacts with the enzyme CYP3A4 and so with many drugs.

How to take it

Take a capsule or prepare an infusion 30–60 minutes before bed. While infusions are difficult to dose due to variations in steeping, look for capsules that contain 450 mg of a valerian extract standardized for 0.8–1% valerenic acids.

How can we make this even more useful for you?

Fill out our [quick survey](#) (it only takes a few minutes) and help us make the *Fitness Guide* work better for you.

**Help make the
Fitness Guide better**

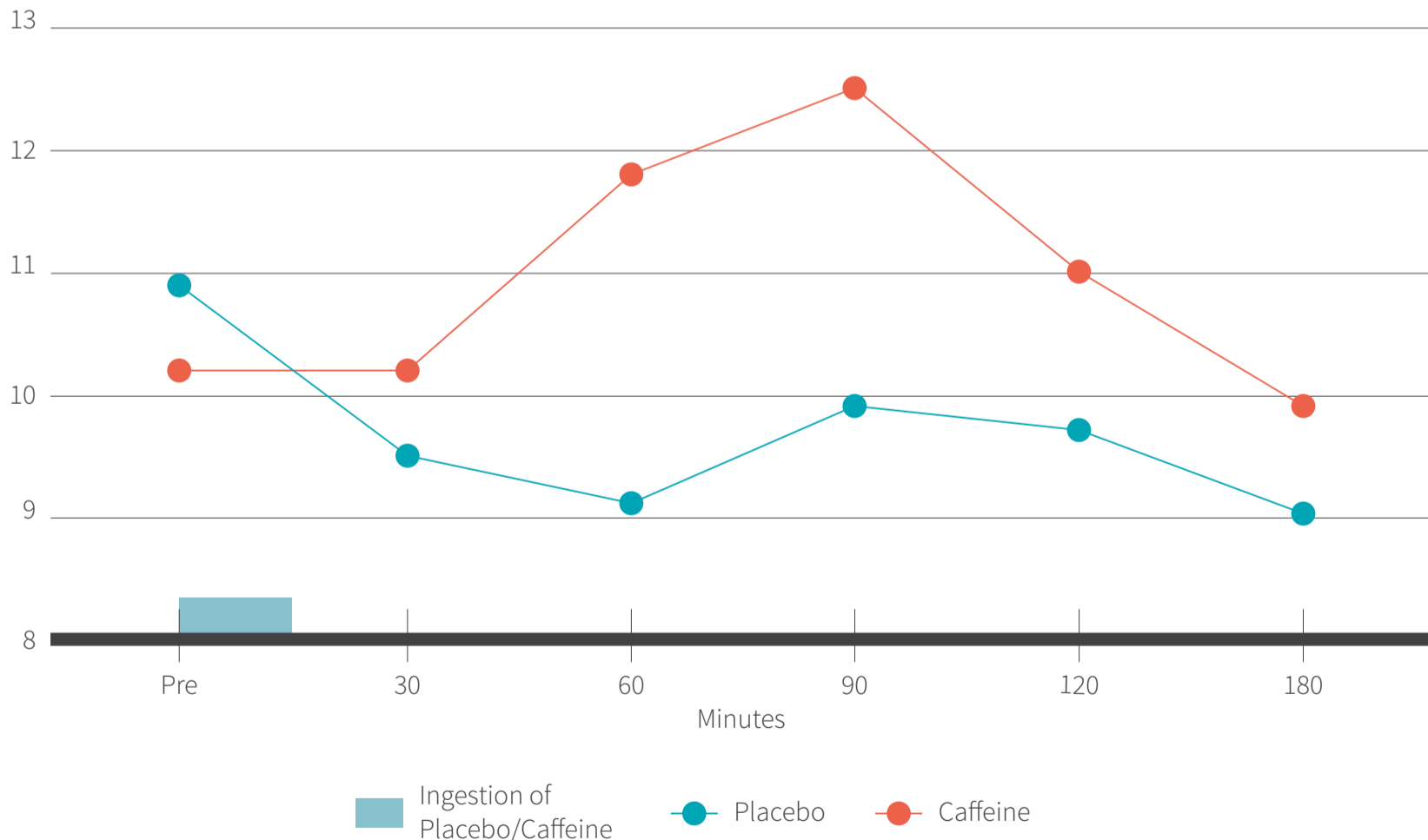
Inadvisable Supplements

Inadvisable supplements are either potentially dangerous or simply ineffective, marketing claims notwithstanding. Do not add them to your combo. At best, they'll be a waste of money; at worst, they can cause you harm.

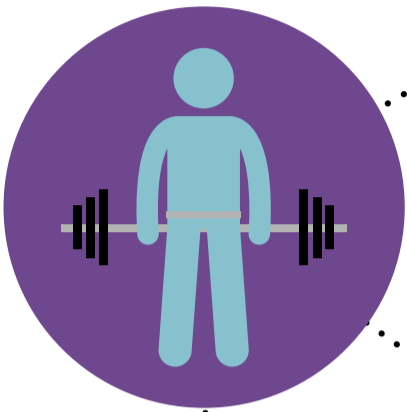
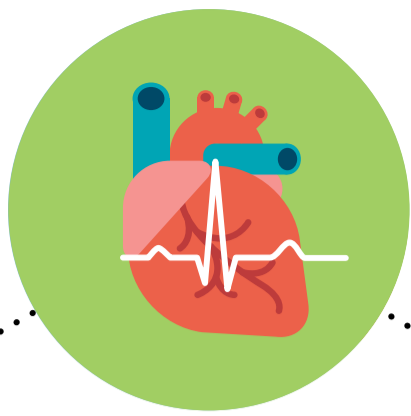
Caffeine

People with a caffeine tolerance may still be able to fall asleep after ingesting caffeine, but this stimulant will still negatively affect sleep quality. Caffeine should not be consumed before sleep even by the most veteran coffee drinkers. While some studies suggest that caffeine paired with 15-minute “power naps” can benefit alertness more than caffeine or naps alone, this benefit does not extend to longer sleep durations.

Figure 5: Effects of caffeine on cortisol levels

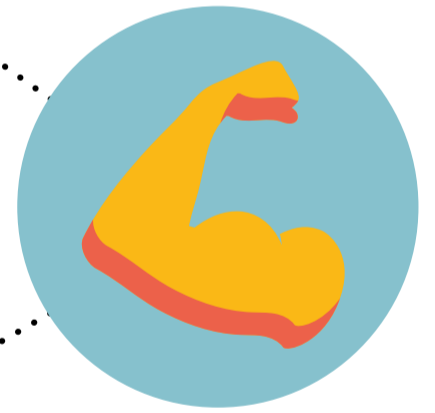


Source: [Lovallo et al. Pharmacol Biochem Behav. 1996 Nov.](#)



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