SECTION 1:
NOOTROPICS


Nootropics are “brain-boosting” compounds that enhance memory, cognition, creativity, motivation, and attention. These naturally occurring and synthetically derived compounds have limitless potential to enhance nearly all aspects of life.

Since the beginning of time, nootropics have played a vital part in life with special use in ceremonies and rites of passage among indigenous people to everyday, modern use. Yet, only since the invention of piracetam in the 1960s have nootropics been a focus of research and of wider interest to consumers, specifically for their brain-boosting properties.
SECTION 2:
WHAT ARE NOOTROPICS?
Nootropics improve brain activity, vision, and stress resiliency through a variety of mechanisms, including neurogenesis and enhanced neurotransmission, which leads to greater neural plasticity and protection. They boost cognitive function without causing adverse effects on brain health. Loosely defined, nootropics include a variety of compounds ranging from Adderall and amphetamines to teas, nicotine, and caffeine.

The first synthetically derived nootropic, piracetam, was originally intended to relieve motion sickness. Only after its use was it discovered to have positive effects on cognition. Since then, nootropics have been widely studied and developed. Synthetically derived nootropics, such as racetams, amphetamines, amakines, and other drugs used to treat attention deficit, sleep, and cognitive disorders, and dementia may be efficacious but often have harsh side effect profiles. Synthetically derived pharmaceuticals are often called “smart drugs” rather than nootropics, and some debate the merits of their neuroprotective effects.

On the other hand, naturally derived nootropics have all the brain-boosting properties but with substantially fewer side effects and low toxicity profiles. In short, natural nootropics provide the benefit of improved brain function and health while being both accessible and tolerable to most consumers.

Some of the most commonly known, naturally occurring nootropic herbs include Ginkgo biloba, American ginseng (Panax quinquefolius), Asian ginseng (Panax ginseng), brahmi (Bacopa monnieri), clove (Eugenia caryophyllus), cardamom (Elettaria cardamomum), cinnamon (Cinnamomum zeylanicum), and black pepper (Piper nigrum). Certain vitamins and minerals, such as Vitamins C, K, and B-complex vitamins, iron, calcium, magnesium, and zinc have nootropic properties as do certain amino acids. Nicotine and caffeine are also naturally occurring nootropics, though both have been synthetically derived to add to a variety of products.

While the vast majority of synthetically derived nootropics are available only as pharmaceuticals, which are regulated by the Food and Drug Administration, the opposite is true of naturally derived nootropics. These brain boosters have traditionally been chewed, brewed, or inhaled through foods, teas, and smoking (and now, aromatherapy), and because of their role as supplements, they are largely unregulated.
SECTION 3: NOOTROPICS & NEUROGENESIS

Nootropics promote neurogenesis—brain building through the growth of new neurons. Practically, this means nootropics have the ability to increase flow, concentration, and mental focus.

Some science and medical communities believe that by adopting certain lifestyle habits and using nootropic substances, individuals can increase their inherent intelligence and cognitive functioning. The premise behind this idea is that by promoting careful neural priming, our bodies more easily grow neurons (neurogenesis) and build new neural pathways.

Despite a previous belief that neurogenesis only occurred in children, scientists have learned otherwise. In the 1960s, research showed adult mice are capable of neurogenesis, and later evidence of neurogenesis in adult cats was found. These studies sparked hope that the same could happen in humans, and in the 1990s, adult neurogenesis was confirmed.⁴
As scientists learned more about neurogenesis, it became clear that the process requires certain building blocks, including:

- Morphogens, which support the development of precursor cells;
- Neurotrophic factors to protect neurons and help them grow (ex. BDNF);
- Neurotransmitters, such as GABA, glutamate, serotonin, and dopamine; and
- Transcription factors, which facilitate precursor cell division and organize neurons.\(^5\)

Nootropics contribute to neurogenesis in a variety of ways. For example, studies have shown nootropics can specifically increase levels of brain-derived neurotrophic factor (BDNF). This is a protein that occurs naturally in the brain and helps protect existing neurons in addition to promoting neurogenesis and synaptogenesis.\(^6\) BDNF regulates cell life cycles and helps improve synaptic plasticity. It ensures new connections form in the brain while organizing and consolidating memories. These processes are particularly important because they are required for learning new skills, maintaining mental clarity and focus, and regulating mood. As people age and begin to experience cognitive declines and “brain fog,” nootropics that stimulate BDNF have the potential to slow and even stop declines in cognitive and memory functions.\(^7\)

Additionally, nootropics act on a variety of neuronal pathways and affect neurotransmission therein. While not all pathways are known, nootropics directly affect cholinergic and dopaminergic pathways. Cholinergic pathways regulate neurotransmission that affects memory and cognition. Dopaminergic pathways regulate neurotransmission essential to executive function, learning, reward, and other cognitive functions. Therefore, it is thought that nootropic substances that work on these pathways can provide significant mental health and cognitive benefits.\(^8\)
SECTION 4:
NOOTROPICS & VISION

Frequently, enhanced visual acuity is reported after using nootropics. While the exact cause of these visual improvements is unknown, theories suggest this effect may be due to perception, relaxation, and in some cases, improved blood flow to the optic nerve.

In the case of perceived visual improvements, when nootropics known to heighten focus and mental clarity are used, the peripheral effects of the enhanced cognitive qualities may lead to perceived visual improvements. In other words, the individual may more quickly and comprehensively process visual stimuli and respond to visual cues. Thus, vision itself has not been affected but ancillary functioning has.

In other cases, nootropics like vinpocetine, derived from the periwinkle plant, may enhance vision by increasing blood flow to the retina and optic nerve.9

Further studies are required to understand the nootropic mechanisms of action and their full implications for enhanced visual acuity and perception.
SECTION 5:
NOOTROPICS BENEFITS
Nootropics are used to achieve a variety of results. These can include increased concentration, memory enhancement, brain health, improved mood, and anti-aging effects.
INCREASED CONCENTRATION

Nootropics are most recognized for their ability to enhance cognition and increase concentration. These improved functional capabilities are due largely to the ability of nootropics to stimulate neurogenesis and neurotransmitter functioning throughout the central nervous system. Some nootropics, like phenylpiracetam, can improve motor functions and improve physical capacity, which may amplify the perceived cognitive effects of the compounds.\(^{10}\)

Naturally occurring compounds in the Rhodiola rosea plant accomplish a similar function. Studies show potent adaptogens in Rhodiola fight the effects of mental fatigue and result in increased mental output.\(^{11}\)

FLOW STATE

Not only can nootropics enhance concentration, they can also promote flow state experiences, in which one reaches optimal functioning capacity.

Flow state is “the psychological mental state of a person who is immersed in an activity with energized concentration, optimal enjoyment, full involvement, and intrinsic interests, and who is usually focused, motivated, positive, energized, and aligned with the task at hand.”\(^{12}\)

MEMORY ENHANCEMENT

Memory enhancement is one of the cognitive benefits of nootropic use. Because optimal cognitive functioning relies on the capacity to store and access information efficiently—or simply, memorization and recall—memory enhancement naturally occurs with increased cognition. Memory benefits are both acute and long-term as nootropics stimulate neurogenesis and offer neuroprotection, especially at synapses.

Phenotropil and vitamin D are both effective nootropics that offer memory benefits.\(^{13,14}\)
**IMPROVED BRAIN HEALTH**

Many nootropics improve blood and oxygen flow to the brain resulting in increased function and better brain health. Again, the ability of nootropics to protect and stimulate neural activity—including neurotransmission and chemical output—not only results in immediate results but potentially cumulative protective effects for the brain and central nervous system.

Poor diets, stressful environments, and many other factors can affect brain health and deteriorate many functions. Natural and synthetic nootropics have been observed to protect the brain’s health, reverse damage from injuries, and prevent the onset of Alzheimer’s, Parkinson’s, and other conditions.15,16

**ANTI-AGING BENEFITS**

As the brain ages, there is a natural process of cognitive decline. The speed and occurrence of the decline can vary depending on brain and overall health and wellness.

When cognition begins to decline, details become harder to grasp, metabolism can falter, and depression can ensue. However, nootropics can be taken at any age to begin improving cerebral resilience to damage caused by stress, anxiety, aging, and disease.17 Studies have found that some effective nootropics can actually reverse the damage caused by certain conditions and essentially rejuvenate the brain.18

**IMPROVED MOOD**

One of the greatest obstacles to achieving optimal functioning, especially flow state, is mood. Moods characterized by sadness, anger, frustration, and irritability can greatly distract from tasks at hand and may affect one’s ability to set and recognize goals, maintain relationships, and engage in daily activities.

Nootropics can balance hormones and neurotransmitters in the brain to stimulate mood-boosting benefits. Because of their neuroprotective characteristics, nootropics may also offer protection against future occurrences of negative or depressed mood. Citicoline and certain racetams are some of the most well-known nootropics that deliver this mood-lifting effect.19
SECTION 6: USING NOOTROPIC SUPPLEMENTS

CREATE A PLAN

Before adding nootropics to your routine, consider the outcome you wish to see. Create a plan for starting and adding nootropics based on the desired results. Use this as a flexible guide—be willing to adjust as necessary to allow your body time to adjust to and metabolize the nootropics.

Be careful to read side effect profiles, interactions, and precautions before deciding on any nootropic or nootropic “stack.” Share this plan with your physician.
CONSULT A PHYSICIAN

During the physician consult, consider current health issues, desired outcomes, monitoring guidelines, and any other factors that may influence your health. Some nootropics may be medically indicated and require a prescription and monitoring by your healthcare provider. It is important to comply with your provider's instructions to ensure wellness.

TAPER DOSE

When starting nootropics, it is often recommended that users taper their dose. In other words, start at a lower dose and adjust it upward until the recommended dose or desired effects, whichever comes first, are achieved. In some cases, this may require trying multiple nootropics singularly or in combination. Likewise, when discontinuing nootropics, consider downwardly tapering the dose to avoid any side effects.

USE WHEN NEEDED

If you are using nootropics to fight fatigue, reduce stress, or improve concentration, consider using them only when necessary. Continual and persistent use may result in dependency and dulled effects of the nootropic.

If desired results are not achieved after reaching the recommended dose, consider using a different nootropic or augmenting the current regimen instead of continuing to increase dose. Increasing doses past recommended levels may result in adverse effects.
While naturally derived nootropics offer a myriad of health benefits and have very low side effect profiles, they are still very potent compounds. As such, they can also have adverse effects on the body if they are not used as directed or in the correct doses. Side effects may include headaches, upset stomach, dependency, and others.

Please note, side effect profiles of synthetically derived nootropics tend to be much more common and profound but may include the following as well:

**HEADACHES**

The increase in brain activity caused by some nootropics can cause headaches from synaptic-overstimulation. Stimulants and racetam nootropics are particularly known for this effect.

**GI TRACT ISSUES**

The digestive tract requires nutrient balance and regularity. A sudden introduction of nootropics may result in an upset stomach, especially as the body attempts to find homeostasis. Introduction of nootropics and/or large doses of these supplements may cause nausea, diarrhea, or other discomforts.

**FATIGUE AND INSOMNIA**

Nootropics can increase the capacity for mental and physical output, which may disrupt regular sleep and wake schedules. As a result, users may experience fatigue and/or insomnia.

**DEPENDENCE AND ADDICTION**

Nootropics that affect dopaminergic action excite the pleasure centers of the brain. These chemical pathways and centers actively play into addiction. Therefore, any abrupt or significant change in
nootropic use may affect mood, motivation, and the potential for addiction.

Some nootropics, like caffeine, can cause resistance requiring the user to increase doses over time in order to achieve consistent effects.

It is not uncommon for users to experience "brain fog" when discontinuing nootropics. Once the nootropic is fully metabolized and the brain readjusts to its baseline, the fog should disappear. This is should be a temporary experience and is not necessarily an indication of addiction.

OTHER POTENTIAL SIDE EFFECTS

Other potential side effects of nootropics include moodiness, restlessness, and feelings of anger or sadness. Some nootropics can also aggravate conditions of hypertension or lightheadedness.20

Side effect profiles vary by nootropic. While the most common side effects are listed above, users are advised to research the side effect profile and precautions for use of each nootropic before adding any to their routine.
While brain-boosting supplements and smart drugs are the most commonly thought of nootropics, other options exist. Nootropics started with botanicals. Native peoples and early civilizations experienced the benefits of the essence of plants in food, drink, smoke, and aromatherapy. Those benefits are still available today.
ESSENTIAL OILS AS NOOTROPICS

Many essential oils have nootropic properties. These oils are concentrated aromatic compounds derived from plant roots, flowers, seeds, leaves, branches, and even rinds. Essential oils provide a range of health benefits when used topically or aromatically.

Many studies attest to the nootropic effects of essential oils. These effects encompass the many benefits of nootropics—focus, clarity, enhanced memory and concentration, improved visual acuity, stress relief, and more.

For example, in one study, inhaled lemongrass, or Cymbopogon citratus, showed promise as a memory-restoring agent in healthy women. Another revealed that when inhaled, essential oils like lavender and rosemary produced positive effects on cognitive performance and mood. Further, essential oils like grapefruit, fennel, Estragon, and black pepper modulated sympathetic activity in adults when inhaled.

While further research is needed, there is strong evidence to suggest that when inhaled, essential oils can provide nootropic benefits with fewer side effects than other supplements.

Just as nootropic supplements may be “stacked,” nootropic essential oils can be blended to induce desired benefits. For example, FOCUS MONQ is a Nepalese-infused nootropic blend, which includes bergamot, black pepper, caraway, cardamom, cinnamon, and several other nootropic essential oils, and is designed specifically to help users achieve flow state.
SECTION 9:
CONCLUSION

Nootropics—brain boosters—are naturally and synthetically derived compounds (including essential oils) with the potential to improve brain health and function. Their benefits range from stress relief to focus, clarity, enhanced cognition and memory, improved vision, and more. In some cases, nootropics can even promote flow state and help the user achieve a state of optimal functioning and fulfillment.

Because of their ability to promote and protect brain health, nootropics are popular and show promise to improve quality of life measures. Further, these compounds may even protect against the effects of aging.

Coupled with healthy diets and lifestyles, nootropics have the potential to enhance daily performance as well as long-term health and longevity, offering users a sort of fountain of youth springing directly from the plants we breathe. Find your FOCUS and breathe in the benefits of nootropics every day.
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