

# THE BRAIN BOOK

HOW TO THINK AND WORK SMARTER



PHIL DOBSON



# PRAISE FOR THE BRAIN BOOK

**“As demands on our time and attention continue to grow, understanding the resulting brain strain and techniques for dealing with it are key to becoming more productive.**

***The Brain Book* provides a quick and easy way to test a variety of techniques and tools to improve your daily workflows.”**

Chris O’Neill, CEO, Evernote

**“This is not just an important book, this is a guide to life. We are never taught about our brain, how to use it and how to get the most out of it. If you are looking to improve your performance, creativity or even reduce stress then take this book wherever you go!”**

Jake Dubbins, Managing Director, Media Bounty

**“If you could influence your brain and increase your performance, wouldn't you want to know all you could? This book is your best starting point. Phil Dobson shares a perfect blend of science and stories while also describing simple and practical tips you can put in place immediately.”**

Judy Goldberg, Founder, Wondershift

**“What a fantastic and genuinely helpful book. Recommending this really is a no-brainer!”**

Petra Kulyncz, Head of Learning & Development,  
Jamie Oliver Restaurant Group

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HOW TO THINK AND WORK SMARTER

PHIL DOBSON



LONDON  
MADRID  
MEXICO CITY

NEW YORK  
BARCELONA  
MONTERREY  
SHANGHAI

BOGOTA  
BUENOS AIRES  
SAN FRANCISCO

To Brian,  
I don't know who you are  
but I've typed your name so many times  
I feel you deserve a mention.

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# INTRODUCTION

Why are we taught so little about our brains?

Our brain is the one thing that's involved in everything we do. But we're never given a manual on how to use it, and we suffer as a result.

We spend our lives 'busy', working ever-longer hours. We make less time for ourselves, and our wellbeing suffers. We make less time for others, and our relationships suffer. We may feel tired, or find it hard to focus, but we respond as if the only answer is to do more of what we're already doing: to work even harder.

The solution is to work *smarter*. The purpose of this book is to help you understand the principles of thinking and working smarter, based on what we know about the brain.

First, I'll show you how to improve your overall brain fitness and function. This is the logical place to start, as you'll learn how to upgrade your whole system. Then we'll look at how you can use your brain better every day, to help you become more productive, more creative, and improve your memory. Then, I'll show you how to use meditation to strengthen your focus like a muscle. By the end of the book you'll know how to hypnotize yourself, and how to use mental rehearsals to improve your performance in just about anything.

Use this book like a manual, and refer back to it regularly. Start implementing changes straightaway, and see it as a learning process. Experiment, make it your own, and build on your success.

# MY JOURNEY

I used to work as a business development executive, but I would spend most of my time writing music. In 2007, I broke my ankle, and this experience prompted an unexpected shift in my career. I retrained as a hypnotherapist, and two years later, I set up my practice in London.

My experience as a hypnotherapist had a profound impact on me. I was struck with how much influence we can have over our emotions, behaviour, and experience. I became more aware than ever of how little we are taught about our brains, and how much we would benefit if we were.

I broke down the principles behind what I had learned as a therapist, and combined these with insights I'd gained from my degree in psychology, and I began working with organizations, teaching people mostly how to manage stress at work.

I wanted a deeper understanding of hypnosis, so I began to study neuroscience. As I was now self-employed, I was also more motivated to work 'smart.' I thought an understanding of neuroscience would help me in this regard, too.

The more I learned about the brain, and the more I applied it, the easier things became. I discovered tactics to improve my mental performance, systems to improve my productivity, and techniques to help me become more creative.

I now work with leaders in organizations all over the world, helping them apply what we know about the brain to improve and sustain their performance at work. This book is a collection of the insights they have found most valuable.

# YOUR JOURNEY

Read the following short descriptions of each chapter and then briefly scan the whole book. This will give you an overview of what to expect, and help improve your recall.

## 1. IMPROVING BRAIN FITNESS

We'll start by exploring how to create the conditions for optimal mental performance, from your brain's perspective. You'll discover how to manage stress, sleep better, use exercise and nutrition to boost your performance, and how to keep your brain young and adaptable.

## 2. IMPROVING PRODUCTIVITY

Next, we'll explore how to improve your day-to-day productivity. You'll discover how to prioritize better, manage your mental energy, and improve your focus so you do things quicker.

## 3. IMPROVING CREATIVITY

We'll move on to examine your creative brain. You'll learn about the creative process, types of creative thinking, and why you have ideas in the shower. You'll discover how to improve your problem-solving skills, think differently, and generate more – and better – ideas.

## 4. IMPROVING MEMORY

In this section, we'll discuss how to dramatically improve your memory. You'll learn about the memory process, and how to use the most effective memory techniques to improve your recall of lists, people's names, and everything you read.

## 5. USING MEDITATION

Then, we'll explore how you can use meditation to create measurable changes in your brain over time. You'll see how you can apply mindfulness and meditation techniques to regulate your emotions, increase your focus, and improve your health and wellbeing.

## 6. PROGRAMMING YOUR BRAIN

In this section, you'll discover how to programme your brain by directing its attention. You'll learn how to use mental rehearsals to improve your behavioural performance and skill, and regulate your emotional responses. You'll even learn how to hypnotize yourself.

## 7. CONCLUSION

We'll finish with a bullet-point review of the most valuable insights from each chapter. This will be useful when you come back to the book in a few months.

# HOW TO USE THIS BOOK

*Consider your desired outcomes:* Think about what you want to learn, and what you hope to achieve by reading this book. What will the benefits be, for you? What will that enable you to do? You may wish to create an image in your mind that represents this future you. This will help you shift your behaviours in the direction you want.

*Create the right learning state:* What are you aware of right now? How is your body? How focused are you? Pause for a moment, close your eyes and take a deep breath. When you open your eyes, you will be less distracted and in a more receptive learning state.

*Act and monitor:* Through the book I'll explain principles and offer practical tips or techniques. Write notes as you go, either on the pages, or in a place that you can easily access. Apply the techniques, and notice what happens. Change what doesn't work, and build on the things that do.





# **IMPROVING BRAIN FITNESS**

Improving your brain fitness is the most obvious place to start, as it's equivalent to upgrading your entire system. If you take care of your brain, it tends to work better on all levels.

You may have a gym membership or invest in your physical health in other ways, but the chances are you leave your brain to fend for itself, trusting it will just do its job. What do you think is more important, your physical health or your mental health?

I've broken enough bones during my lifetime to know how much I've taken my physical fitness for granted. It's only when my limbs have been put in casts that I've appreciated how much I use my arms, wrists and ankles. I wouldn't want to wake up one day and realize I'd been taking my mental health for granted. By the time that happened, it might be too late.

## DEVELOP BRAIN FITNESS TO IMPROVE:

- 1. Your cognitive performance.** Your overall mental performance and agility will improve; you will be mentally sharper, and this will help you work better.
- 2. Your learning capability.** Your brain's responsiveness to experiences and environments will increase, and it will become more flexible; this is your brain's 'neuroplasticity'.
- 3. Your long-term mental health.** The more we learn about forms of dementia such as Alzheimer's disease, the more we come to understand them as lifestyle diseases. By investing in your brain fitness now, you can also reduce your chances of experiencing cognitive decline in the future.

# THE SENSE MODEL

## 5 STEPS TO IMPROVING BRAIN FITNESS



The SENSE Model reflects what I believe to be the five key factors that affect your brain fitness:

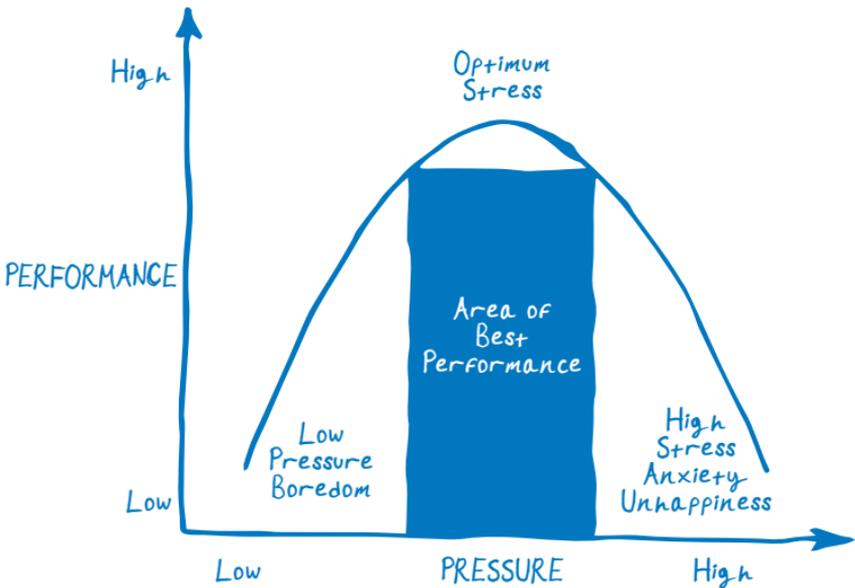
- **S:** Stress
- **E:** Exercise
- **N:** Nutrition
- **S:** Sleep
- **E:** Experience

We'll go through this model, and as we do, I'll suggest simple ways to ensure your brain is operating at its best.

# STRESS

Have you ever noticed that when you've been stressed, or felt overloaded, you've found it harder to think clearly, and your memory, or decision-making, has suffered? It's because stress can make you stupid.

You might enjoy juggling lots of projects, taking on challenges, and forever adapting to the unexpected. But your brain can find uncertainty and complexity threatening. If you feel particularly under pressure, or under resourced, your nervous system can respond in a way that affects your brain's functioning. If stress goes beyond a useful level, it leads to cognitive impairment.



# WHY DOES YOUR PERFORMANCE START TO SUFFER?

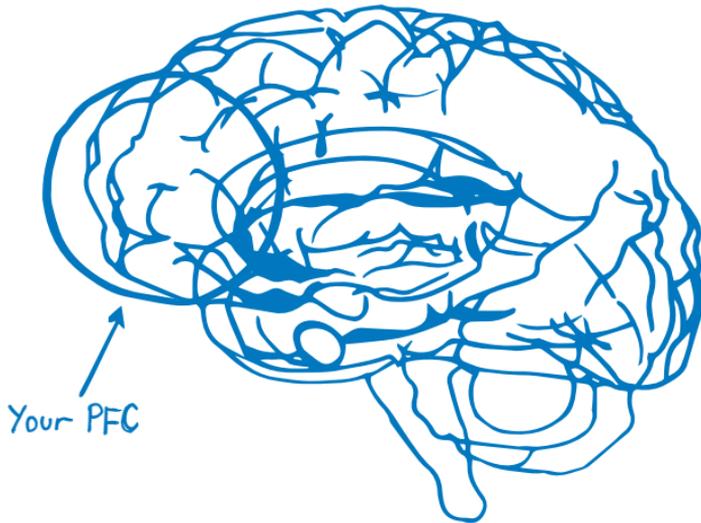
To understand why stress can impair your capacity to think, it's helpful to see stress in its evolutionary context: a response to a perceived threat. When humans are confronted by a threat, a complex phenomenon rapidly takes place. So imagine that a bear has walked into your room right now.

## **Your body's response**

Your heart rate elevates, your breathing quickens, and your muscles prime themselves for action. Your sympathetic nervous system prepares your body for 'fight or flight'.

## **Your brain's response**

As the bear walks closer, you need to make a split-second decision. This is no time for thoughtful deliberation or spreadsheets. Your brain strips your prefrontal cortex (PFC)<sup>1</sup> of its resources thereby inhibiting reasoning and 'executive function', so your thoughts don't slow you down. After all, you rarely escape bears by reasoning with them.



Now imagine you're at work. You're already overloaded with things to do and an unexpected and urgent piece of work comes in. Your nervous system cannot make the distinction between physical threat and mental overload, so it responds as if the bear has re-appeared: your heart rate and breathing quicken as your body prepares for a fight, and reasoning and critical thinking are inhibited.

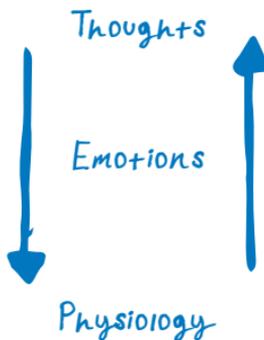
Reduced executive function when under threat used to provide an evolutionary advantage to help keep you alive. It now presents a disadvantage, compromising your health, impairing your thinking, and potentially damaging your brain.

## THREE APPROACHES TO MANAGE STRESS

The fight or flight response is a good illustration of how your brain and body work together as a system. To maintain your performance under stress, you need to be able to regulate this system. As William James, the father of modern psychology, noted: “The great thing in all education is to make our nervous system our ally instead of our enemy.”

To do this, think of your nervous system in three parts: your physiology, emotions, and thoughts. This interconnected system works both ‘top-down’ and ‘bottom-up’, so:

- Your thinking affects how you feel, and that influences your physiology (top-down).
- Your physiology affects your mood, and that influences your thoughts (bottom-up).



If you regulate one part of this system, you influence the others, as the parts are inextricably linked. This offers three ways to manage stress, and consequently improve your brain fitness:

## 1. Regulate your physiological state

If you ever feel stressed or anxious, and feel your mental performance may be suffering try to do the following.

- **Notice and regulate your breathing.** Stressed breathing tends to be quicker and from your chest. Slow your breathing down and breathe from your stomach. How are you breathing now? That's probably what you want.
- **Practise meditation or mindfulness.** One of the best ways to regulate your physiology over time is with meditation or mindfulness. Both are such valuable skills they deserve their own chapter (see Using Meditation, page 107). If you're keen to start straightaway, try the mindfulness app, Headspace.
- **Practise progressive relaxation.** Try this next exercise right now. It will show you how to regulate your physiology, and it will also help put you into a good learning state to continue reading this book.

## EXERCISE: PROGRESSIVE RELAXATION

1. Get comfortable in a chair, with your feet flat on the floor and your hands in your lap, and close your eyes.
2. Spend five minutes relaxing your whole body. Start by focusing your attention on your toes, and then consciously relax them. Some people like to tense the muscles first and then let them loosen. Once your toes are relaxed, relax your feet, ankles, calves, knees, thighs, and so on, all the way to the top of your head, and even your face.
3. When you are done, in your own time, open your eyes.

For a guided audio recording to help, visit: [www.brainworkshops.co.uk/brainbook](http://www.brainworkshops.co.uk/brainbook)

By deliberately relaxing your muscles and slowing your breathing, you'll lower your cortisol levels, activate your parasympathetic nervous system, and put your body into a state of rest and repair. If you do it regularly, you will improve your health, sleep better, and maintain greater access to higher-order cognitions, such as reasoning and decision-making.

### **2. Regulate your emotional state**

You probably know some people who don't cope at all well under pressure, and others that need stress to perform at their best. Everyone responds to stress differently, because we have varying degrees of emotional resourcefulness, or *resilience*.

To increase your resilience and make it more likely that you'll respond well to stress, do the following three things:

- **Make time for doing what you enjoy.** If you feel positive, you are more likely to see stress as a challenge rather than a threat, and be able to convert pressure into elevated – rather than diminished – performance. To sustain your performance at work, you need to make time to have fun outside of it.

Write down the five things you enjoy doing the most, or that give you the most energy. Make more time for them. Book at least one date to reflect this into your calendar right now.

- **Develop your 'locus of control'.** If you feel in control, things are less stressful, because you become more resourceful. External conditions may be outside your control, but how you respond to things is within your control.

Write down the top five things, activities, or people that frustrate you, or drain you of energy. Challenge how you respond to them. How can you react in a way that affects you less?

- **Remember your purpose.** You are more resilient when you feel you have a purpose, and more resourceful when you are making progress towards objectives you find meaningful.

If you feel stressed or you're having a rough time, remind yourself of the reasons you're doing what you're doing.

### 3. Regulate your cognitive state

Finally, you can meditate every day and have unusually high resilience, but if you can't manage your tasks and projects, your system will go back into stress due to cognitive overload. Managing your cognitive state is as important as any other stress intervention:

- **Do a brain dump once a week** (page 60). This is one of the quickest and easiest ways to reduce cognitive overload, and it will help you externalize all the things you need to do, immediately putting your brain into a more useful state.
- **Develop a working system that prevents overwhelm.** An effective and stress-free working method also deserves its own section, and I have devoted a whole chapter to this (page 37).
- **Practise meditation or mindfulness.** See the chapter, Using Meditation (page 107) to learn how to use meditation to manage your cognitive state.

## KEY TAKEAWAYS

You now understand how stress affects your brain, how it can affect your thinking, and specifically, what to do about it.

- Look out for signs of stress: feeling overwhelmed or mentally overloaded, feeling out of balance or out of control, making bad decisions, impulsivity, tiredness, disrupted sleep, elevated heart rate, stiffness, indigestion, or craving sugary foods.
- Regulate your physiological state: become more aware of your breathing and regulate it as necessary by slowing it down. Make time to relax, and learn how to use meditation, as described later in this book.
- Regulate your emotional state: make time for doing things you love, develop your locus of control, and remind yourself of your purpose.
- Manage your cognitive state: empty your mind regularly, and apply all the principles described in the chapter Improving Productivity.

Let's now continue with the rest of the SENSE Model, and the other four ways to improve your brain fitness.

# EXERCISE

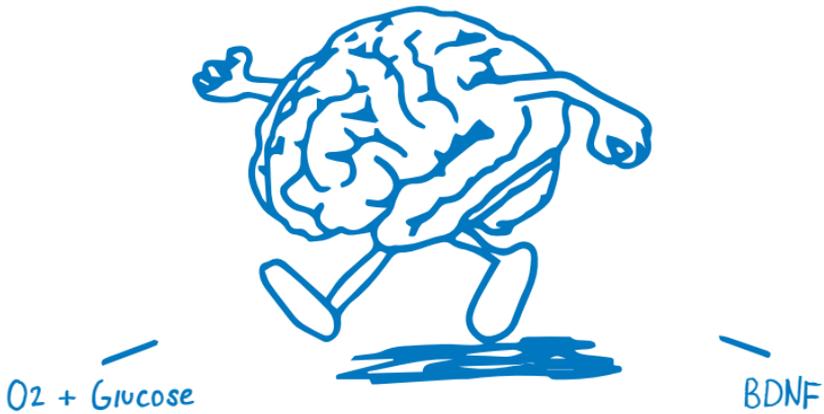
I don't think of myself as a strict 'morning routine' person, but I do try to walk for at least 20 minutes every morning before I begin working. I consider it the single best way to boost my concentration and energy levels throughout the day.

## SHORT-TERM MENTAL PERFORMANCE

Like any organ, your brain needs oxygen and glucose to function. As you exercise, your heart rate increases, your circulation improves and more oxygen and glucose flow to your brain, enabling it to work better.

Physical movement provides one of the easiest cognitive enhancement hacks there is, and you don't have to exercise for long to experience the benefits. A study from the University of Illinois found that students who had walked for just 20 minutes performed significantly better in cognitive tests than their counterparts who had been sitting still.<sup>2</sup>

How many days last week did you not do exercise? For each one, it probably took you longer to do your work than was necessary.



## LONG-TERM MENTAL HEALTH

Exercise also helps prevent dementia.<sup>3</sup> This is believed to be because physical exercise increases the production of brain-derived neurotrophic factor (BDNF), a protein that plays a significant role in the process of neurogenesis, the formation of new brain cells, and is an important regulator of neuroplasticity, the mechanisms underlying learning. So physical exercise also helps you learn.

- Grey matter refers to your neurons.
- White matter represents the connections between your neurons; their channels of communication.
- Exercise boosts production of the protein that enables you to make more grey and white matter.

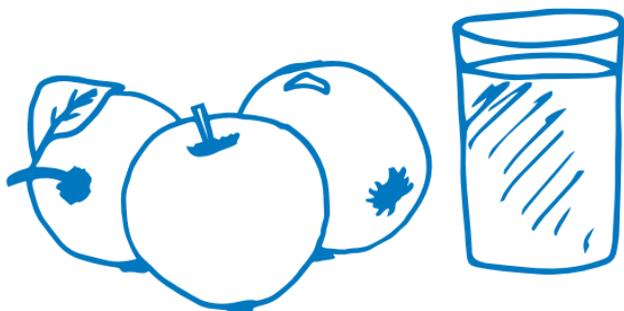
## THREE WAYS TO BOOST BRAIN FITNESS WITH EXERCISE

1. Do 20 minutes of moderate exercise every morning before work. If time won't allow this, consider short sessions of high-intensity interval training (HIIT). See exercise as an 'oxygen breakfast' for your brain.
2. Take more breaks throughout the day and when you have a break, move. Focus on increasing your blood flow rather than on burning calories.
3. Aim to do longer and more intense exercise sessions at least three times per week. The research suggests that to reduce your risks of dementia, you need to get a sweat going with aerobic exercise such as brisk walking, running, cycling or swimming for 30 minutes or more.<sup>3</sup>

# NUTRITION

I know you don't need to be told to eat your vegetables, but it's worth knowing the foods your brain has a particular fondness for.

## YOUR BRAIN'S FAVOURITE DIET



The most commonly cited recommendation from research on brain health and nutrition is to follow a Mediterranean diet.<sup>4</sup> A study of more than 2,000 residents of New York City, averaging 76 years of age, found that those eating a Mediterranean diet had a 68% lower risk of developing Alzheimer's disease.<sup>5</sup>

If you're getting hungry and like the sound of Mediterranean, go for fresh and natural whole foods, lean proteins, healthy fats, fruits, fresh and varied vegetables (especially green, leafy ones), pulses, whole grains, seeds and nuts.

Some particular foods are known for their neuroprotective qualities:

- **Water:** often overlooked, adequate hydration is essential for maintaining mental performance. Your brain is more than 70% water, and dehydration will negatively affect your concentration, energy and mood.<sup>6</sup> Start each day with a large glass of water. Think of it as “smart drugs on tap”.
- **Fish and seafood:** eat more oily fish such as salmon, tuna, sardines and trout, that are high in the fats your brain needs. Despite the prevailing fear of fat, more than two-thirds of your brain’s dry weight is fat. Particular fats (medium chain triglycerides, or MCTs) have been associated with improved brain function.<sup>7</sup> Fish is also high in Omega 3 fatty acids, and specifically DHA (docosahexaenoic acid), which helps promote healthy neuronal function.<sup>8</sup> Coconut oil offers high levels of MCTs for vegans.
- **Vegetables and leafy greens:** no surprise, but your brain needs vitamins, too. You want your diet rich in vegetables and leafy greens to help maintain sufficient levels of vitamins C, E<sup>9</sup> and K<sup>10</sup>, needed to keep your brain sharp.
- **Eggs:** egg yolks are one of the richest dietary sources of choline, a precursor for acetylcholine, an important neurotransmitter needed to keep your memory sharp.<sup>11</sup> Unfortunately, chocolate eggs don’t work the same way.
- **Nuts:** walnuts contain high levels of omega 3 and vitamin E. Brazil nuts are rich in selenium which can improve brain health.<sup>12</sup>

- **Seeds:** flax seeds are excellent brain snacks as they are high in omega 3, and pumpkin seeds are good sources of zinc, important for maintaining memory.<sup>13</sup>
- **Berries:** blueberries, blackberries, strawberries and cherries are high in antioxidants. Coming from a variety of sources, antioxidants help regulate the oxidative stress that damages your brain cells, so a diet high in antioxidants may reduce the effects of age-related conditions such as dementia.<sup>14</sup>
- **Turmeric:** high in curcumin, an antioxidant and anti-inflammatory agent, turmeric can help protect neurological tissue as well as enhance the growth of new brain cells.<sup>15</sup>
- **Olive oil:** this is another good oil – research suggests that adding olive oil to your diet can help improve brain function (but don't start drinking the stuff).<sup>16</sup>
- **Green tea:** green tea serves as a neuroprotector through its detoxification and anti-inflammatory qualities.<sup>17</sup> Even black tea has an antioxidant effect.

## BE WARY OF

- **Sugar:** the link between sugar consumption and Alzheimer's disease is so great that Alzheimer's is often referred to as "Type 3 diabetes". Your brain needs glucose to perform, but a diet high in carbohydrates can lead to insulin resistance, a condition associated with increased risk of dementia.<sup>18</sup> Sugar also reduces the production of BDNF,

involved in learning.<sup>19</sup> Eat fruits and complex carbohydrates, of course, but be wary of added sugar in processed foods and drinks.

- **High GI foods:** the Glycemic Index (GI) is a measure of how quickly sugars break down. High GI foods (for example, white bread, pasta, white rice, potatoes, most cereals, and a lot of popular snacks) are broken down swiftly and lead to a rapid rise in blood sugar. This might be useful if you're recovering from exercise, but it can lead to a rapid decline in energy, and an inability to concentrate. Avoid these foods for lunch, and you're likely to feel more alert in the afternoon.

## OTHER CONSIDERATIONS

- **Vitamin D3:** this is known to play an important role in maintaining neural function.<sup>20</sup> This vitamin is made photosynthetically, through exposure to sunlight, so expose yourself to as much daylight as possible in the winter months. Go outside at lunch time. If you feel under-nourished by sunlight, consider taking vitamin D3 supplements.
- **Fasting:** there has been a recent proliferation of intermittent fasting (for example, the 5:2 diet), and the research offers some compelling reasons. Fasting has been associated with prolonged life in mice, immune system regeneration, and improvements in brain health (mainly due to increases in the production of BDNF).<sup>21</sup> But your body and brain need food to function, and I'm yet to meet a nutritionist who would prescribe fasting over a healthy, balanced diet. Many of us (myself

included) would benefit from consuming fewer calories, but if you're tempted to try fasting, consult with your doctor first.

- **Nootropics:** Nootropics (from the Greek *noos*, meaning mind) are smart drugs, consumed to enhance cognitive performance. Modafinil is taken to improve focus, piracetam to improve memory, and L-theanine for improved alertness. There are even advocates of micro-dosing LSD for cognitive benefits. These might sound tempting, but it's worth noting that artificially elevating levels of one substance could put your system out of balance, and some researchers believe nootropics may compromise long-term brain plasticity. It's food for thought, but proceed with caution.

## KEY TAKEAWAYS

- Eat a Mediterranean diet with plenty of oily fish and seafood, plus lots of varied and fresh vegetables.
- Consume less sugar, fewer refined carbohydrates and less processed foods.
- Drink half a litre of water when you wake up and stay hydrated throughout the day with water and green tea.
- If you anticipate a cognitively gruelling day, consider a breakfast of eggs and spinach, a lunch of protein and complex carbohydrates (vegetables and whole grains), snack on seeds and nuts, and stay hydrated throughout the day.

# SLEEP

In 2010, doctors in Britain issued more than 15 million prescriptions for sleeping pills.<sup>22</sup> Since 2000, sales of energy drinks have also increased by 75%.<sup>23</sup> It seems we can neither fall asleep nor stay awake.

Given the pleasures of sleep, it amazes me how willing some of us are to give it up. Yes, we're all busy. But when we're tired we start to make bad decisions. We lose the ability to distinguish important work from unimportant work. Our workload increases, so we work even longer, and sleep even less.

Sacrificing sleep to get more work done is a fallacy: with less sleep you may have more time to work, but you have no cognitive competence with which to do it.

## HOW MUCH SLEEP?

*"I need my sleep. I need about eight hours a day, and about ten at night."*

**Bill Hicks**, American stand-up comedian

The vast majority of us perform best after seven to nine hours of sleep.<sup>24</sup> Some people maintain they need less sleep, simply because we tend to be unaware of the degree to which our performance suffers.

## THE COSTS OF SLEEP DEPRIVATION

Insufficient sleep is correlated with impaired logical reasoning, decision making, memory, attention, and reaction times.<sup>25</sup> Sleep debt is also found to be cumulative; if you sleep for less than six hours a night for five nights in a row, you can expect your cognitive performance to drop to that of a person who hasn't slept for 48 hours.<sup>26</sup>

Over years of poor sleep, you suffer cortical atrophy. Your brain literally starts to shrink.<sup>27</sup>

## SLEEP CYCLES

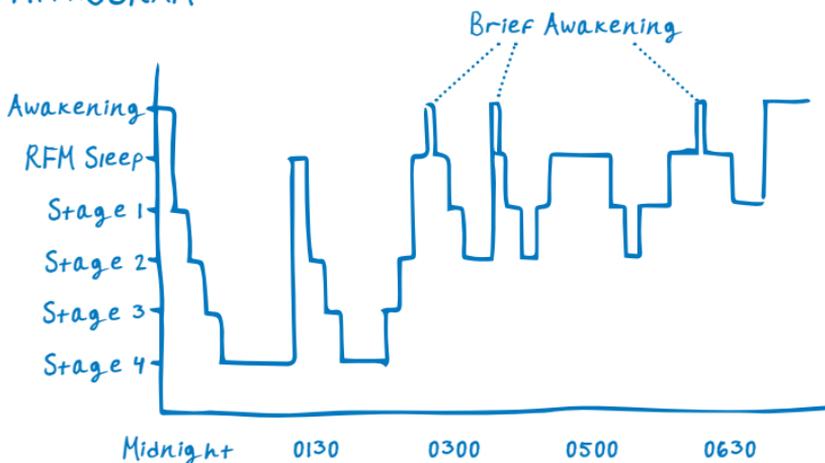
To cultivate a healthy relationship with sleep, it helps to understand your sleep. You probably already know that you sleep in cycles. During every 90-minute cycle, your brain shifts through different stages that correlate with different brain 'states' as measured by EEG (electroencephalography) machines. Broadly speaking, you divide your sleep between periods of deep (slow-wave) sleep, and REM (rapid eye movement) sleep.

The first few cycles of sleep, soon after you've fallen asleep, are characterized by a lot of deep sleep, when your body produces the growth hormone. This helps promote physical restoration.

Subsequent sleep cycles, in the latter half of your night's slumber, tend to involve a greater proportion of REM sleep, (associated with dreaming) and this promotes learning, memory, and mental restoration.

Five sleep cycles (seven-and-a-half hours) allows for more cognitive restoration than four cycles (six hours), and consequently promotes superior mental function. Less than six hours, and you really start to suffer.

## HYPNOGRAM



## WASH WHILE YOU SLEEP

Your brain also undergoes a toxin wash while you sleep. During your waking hours, your brain's electrical and chemical activity produces a by-product, beta amyloid, often referred to as plaque. While you sleep, your glymphatic system (your nervous system's waste disposal system) flushes out neural toxins and brings your brain's toxicity back to healthy levels.

If you don't get enough sleep, you risk a progressive build up of plaque. Once plaque levels reach a critical level, you are at risk of developing Alzheimer's disease.<sup>28</sup>

## TO PARENTS OF YOUNG CHILDREN

I hope this isn't making you (any more) anxious. You're probably more acutely aware than most how sleep deprivation can affect mental function. Over time, your sleep *will* recover. And we wouldn't be as successful a species as we are, if all parents ended up with dementia because their children kept them up over a few years.

## THREE WAYS TO SLEEP BETTER

I can't stress the importance of sleep enough. If you want to perform anywhere near your best, or care even remotely about your long-term mental health, get your seven to nine hours of sleep each night. If you struggle with sleep, there are simple things you can do to help.

Begin by tracking your sleep. Even if you only record your sleep for a week, it will help you understand your own sleep patterns. To do this you can use apps (for example, Sleep Cycle alarm clock), or wearable devices that record your movement over the night and provide you with your 'hypnogram' the following day.

To improve your sleep, remember that sleeping isn't a skill you need to learn, and it's definitely not the case that the harder you try the easier it gets. Sleeping well is the result of creating the right environmental, physiological, and mental, *conditions*. This offers three ways to improve your sleep:

## 1. Create the right environment

- Increase your exposure to daylight. Go for a walk at lunchtime; this will expose you to the blue light that is necessary for setting a healthy sleep/wake pattern.
- Significantly reduce your exposure to light at night. Send a message to your brain that it's time to sleep. If you find it hard to fall asleep, stop using artificially lit screens (especially laptops, tablets, and mobile phones) an hour before sleep. Use software (such as F.lux), that removes blue light (the frequencies that disrupt your sleep most) from your computer monitor as it gets dark.
- Set your room temperature to around 18 degrees C.

## 2. Create the right physiological state

- Lower your cortisol levels by relaxing your body. If you wake in the middle of the night, try practising meditation or mindfulness, or progressive relaxation before you go to bed.
- Lower your core temperature. Try a cool bath or shower before bed. A hot bath two hours before bed can also work, as it can cause a subsequent downward spike in your temperature.
- Avoid caffeine and alcohol if you can't sleep, and avoid large meals late at night. Alcohol may help you fall asleep but will disrupt the quality of that sleep.

## 3. Create the right mental conditions

- Empty your mind regularly. It's not an overactive mind that keeps you up, it's just one that needs managing. Do regular brain dumps (see Improving Productivity chapter, page 37).
- Stop working at least two hours before bed. Don't check your emails or other news feeds before bed. Let your brain wind down.
- Practise meditation or mindfulness to quieten your mind after work.

## OTHER CONSIDERATIONS

### Apply the 90-minute rule

To wake up feeling as alert as possible, try to wake up at the end of a 90-minute sleep cycle. If you need to wake up at 7am, you would want to fall asleep at either 11.30pm (five cycles), or 10pm (six cycles). Sleep Cycle alarm clock and similar apps can help with this.

### Kick-start your alertness in the morning with:

1. **Water:** drink half a liter of water to hydrate your brain.
2. **Movement:** do a short burst of exercise to oxygenate your brain.
3. **Light:** get outside for a proper dose of blue light to illuminate your brain.

## DEALING WITH JET LAG

These are the approaches I find help the most:

- 1. Before you travel:** a day or two before, start eating your meals an hour earlier if you're flying east, or later, if you're heading west. This will start shifting your body clock in the right direction before you even get on the plane. If possible, start adjusting your sleep patterns, too.
- 2. As you travel:** change your watch or clock as soon as you get on the flight and start adapting your sleep/wake cycle as soon as you can. Shift your meal times, too: if it's dinner time at your destination, eat something.
- 3. After you land:** spend as much time as possible in daylight the first day after landing. Eat a meal that is rich in tryptophan (an amino acid found in, for example, turkey, beef, or spinach) for your evening meal, as this will help induce sleepiness. Kick-start your alertness (as described on the previous page) on your first morning, and then get into your normal routine as soon as possible.

## THE EFFECTS OF NAPS

Your brain likes naps. The trick is to keep it short and at the right time of day. Aim to have a nap that lasts between 20-30 minutes and no longer. If you go too far into a sleep cycle you'll wake feeling sluggish and disorientated. The best time of day for naps is between 2-4pm, when you have a natural slump in energy. Done properly, naps can improve your subsequent attention and thinking speeds by more than 20%.<sup>29</sup>

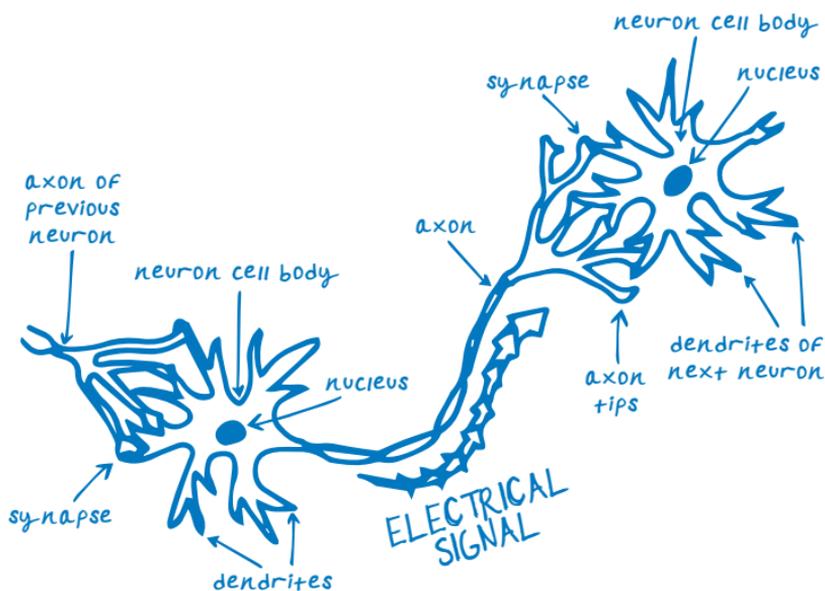
# EXPERIENCE

Stress management, exercise, nutrition, and sleep, all create the right conditions for optimal mental performance. But to keep your brain in shape you also need to nourish it with experience, in the form of learning, challenge, and novelty.

## NEUROPLASTICITY

Brain cells (neurons) communicate with other cells by sending electrical impulses (action potential) along a wire (called an axon). The speed of transmission along the axon is based, in part, on how well it is insulated by a white, fatty substance called myelin.

The more one neuron communicates with another and the more its axon is used, the thicker the axon's insulation becomes, through a process called myelination. Myelination is therefore a process of cellular learning: helping neurons to communicate with one another better, based on their needs. This is the principle behind a process called 'neuroplasticity'. This is your brain's capacity to learn and adapt, based on experience.



## LEARNING NEW THINGS KEEPS YOUR BRAIN YOUNG

Consider life's learning curve. When you were born, your brain cells were largely unconnected. Over the first two years of your life, they started to connect rapidly as you adapted to novel motor and sensory information. Over this time you formed as many as two million new synapses (connections) every second, until you had about 1,000 trillion of them.

By your second birthday, your brain had tripled in size and actually had more synapses than you do now. Then you began a process of synaptic 'pruning': some connections were removed in order to strengthen others. In your teens, your brain underwent a second

period of rapid growth and neural reorganization. It wasn't until your mid-twenties that your brain was fully developed.<sup>30</sup>

It's now up to you. Your brain was very adaptable when you were young, but to keep it this way, you need to continue to learn new things. Your brain now operates on a 'use it or lose it' basis. The degree to which your brain continues to develop, or wither away, is largely based on how much you train it like a muscle.

A wonderful, and often-cited, study compared the brains of taxi drivers in London with those of London bus drivers.<sup>31</sup> It was found that the taxi drivers had enlarged hippocampi, the part of the brain involved in memory and spatial navigation.

This study is relevant for two reasons. First, it demonstrates that brain plasticity lasts long into adulthood. Second, it provides the perfect illustrations of the conditions that promote brain growth and development: the taxi drivers enjoyed learning, novelty and exploration.

“Anyone who stops learning is old, whether at 20 or 80. Anyone who keeps learning stays young,” asserted Henry Ford, the US industrialist and founder of the Ford Motor Company. There is a neurological truth in this. If you continue to learn and challenge your brain, it strengthens, grows, and remains younger for longer.

- **Learn a language.** Learning new languages is arguably at the top of the pile in terms of long-term cognitive benefits. People who are bilingual tend to have more flexible brains, can be better at directing their attention and are less likely to suffer with symptoms of dementia.<sup>32</sup> Have a look at Duolingo, Busuu or Livemocha (language acquisition apps) to learn or develop a language.
- **Learn to play a musical instrument.** I was lucky enough to pick up a guitar when I was young and now play a number of instruments. It's not only good for your brain fitness, improvising music with other people is one of the most rewarding experiences I think there is. If you've ever wanted to learn a musical instrument, start now! Researchers have found musicians to have increased grey matter volume in their motor, auditory, and visual-spatial brain regions,<sup>33</sup> and playing musical instruments has been associated with improved mental flexibility, vocabulary, and non-verbal reasoning.<sup>34</sup>
- **Learn to juggle.** Juggling can help reduce stress and anxiety, and even improves your brain connectivity and coordination.<sup>35</sup> Buy some juggling balls and you'll be able to teach yourself.
- **Practise memory techniques.** You can strengthen your memory directly by practising challenging memory techniques described in the chapter, Improving Memory (page 91).

- **Practise meditation.** One of the best forms of brain training there is, meditation is covered in its own chapter, Using Meditation (page 107).
- **Learn new skills or develop the skills you already have.** For example, if you'd like to learn how to code, look online at the Codecademy. LinkedIn provides a catalogue of career skills through its online learning platform, LinkedIn Learning. Try new things and broaden your experiences. Take a class in something that interests you. Learn how to take better photographs, how to cook, how to draw, try creative writing, video editing, or learn how to produce music.
- **Learn new academic subjects.** Look into Coursera (one of my favourites) for degree-length courses, the Khan Academy and MIT OpenCourseWare for science courses, or Udemy for more bite-sized learning.
- **Read broadly.** Try new authors, and explore new genres. Consider a reading group if you enjoy the social element. Try the app, Blinkist, to find overviews of popular books and see if any take your fancy, or if you'd prefer daily articles on topics you're interested in, try the app Flipboard.
- **Play games.** Do crosswords and Sudoku, play Scrabble, chess, or any game that you enjoy, and makes you think.

- **Explore and travel more widely.** Investigate your neighbourhood (and try it without Google maps). Research your local area or the city you live in and discover what's around you.
- **Challenge your routines and make unconscious behaviours conscious.** Take a different route home, use your non-dominant hand more, try doing things with your eyes closed. Do things the hard way sometimes, and deliberately live outside of your comfort zone.
- **Keep socially active.** Make plenty of time for your friends and meet new people. Nourish your relationships.

All the learning resources listed above are included in the resources page in the Appendix.

## IMPROVING BRAIN FITNESS: PUTTING IT ALL TOGETHER

Now you know how to improve your cognitive performance, develop your learning capability, and protect your long-term mental health.

To summarize the SENSE Model in as practical a way as possible:

- **Stress:** Manage your stress and regulate your nervous system as necessary. Meditate for 10-20 minutes every morning.
- **Exercise:** Do 20 minutes of moderate exercise every morning, and 30 minutes of aerobic exercise three times per week.
- **Nutrition:** Drink half a litre of water when you wake up, and another one-to-two litres of water throughout the day. Eat a Mediterranean-style diet and consume less sugar.
- **Sleep:** Get between seven and nine hours of sleep every night.
- **Experience:** Learn a new language or a musical instrument, embrace novelty, and keep an active social life.

# IMPROVING BRAIN FITNESS: REVIEW

## The SENSE Model

- **Stress:** How does stress affect your brain? How can you regulate your physiology, improve your emotional resilience, and manage your cognitive overload?
- **Exercise:** How does exercise affect your brain? What are the ways to boost your mental performance and protect your brain's health?
- **Nutrition:** Describe your brain's favourite diet? What about drink?
- **Sleep:** How many hours of sleep do you need? How can you sleep better?
- **Experience:** Why is continuing to learn new things important? What would you like to learn?

*Specify what you will do differently from now on?*

STRESS	
EXERCISE	
NUTRITION	
SLEEP	
EXPERIENCE	