Brain Is your sleep deprived?

Low mood, depression, forgetfulness and even Alzheimer's can be linked to tiredness, so...

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Most of us operate at 50 per cent of our mental capacity. It's like having a high-performance Ferrari and just using it to nip to the shops once in a while.



Having spent the past 25 years practising as a neurosurgeon, there is not much I don't know about the workings of the brain, and I am convinced the exquisitely designed organ can crank out a lot more power.

If you don't hit the open road occasionally and open the throttle, it could be all too easy to forget what your brain is really capable of achieving.

All this week, the Daily Mail has been serialising my new book, Keep sharp, which sets out a blueprint for optimising mental capacity and protecting yourself against dementia.

today, my focus is on sleep and relaxation because I believe it is possible to harness both to help switch the brain into hyperdrive status, and I'm going to o show you how.

studies show how chronic inadequate sleep puts people at a higher risk of dementia, depression and mood disorders, learning and memory problems, heart disease, high blood pressure, weight gain and obesity, diabetes, injuries, and cancer.

In fact, just one night of sleep deprivation it can spike levels of inflammation which is enough to encourage the accumulation of betaamyloid, the brain protein that has been associated with Alzheimer's disease.

An alarming 2013 study found that older adults whose sleep is fragmented are more prone to develop Alzheimer's, and worryingly, memory problems can occur years before a person is even diagnosed. I have to confess I sorely underestimated the value of sleep for far too long and wish I could gain back all those hours — possibly years — that I lost. Now I put sleep close to the top of my list in terms of priorities. Contrary to popular belief, sleep is not a state of neural idleness. Billions of molecular tasks go on during sleep at the cellular level to ensure that you can live another day. It is a critical phase during which the body replenishes itself in a variety of ways that ultimately affect every system, from the brain to the heart, the immune system, and all the inner workings of our metabolism.

Good sleep tidies up our memory hub (the hippocampus) and effectively scrubs the brain of metabolic refuse. It performs a double-duty: both decluttering and taking the rubbish out. And research now indicates that failure to remove this brain trash may be linked to a higher risk of developing dementia.

Among the more recent and captivating findings about sleep has been discovering the 'washing' effects on the brain.

Your body clears waste and fluid from tissues through the lymphatic system which carries toxic waste and cellular debris out of the body, filtering lymph fluid through the lymph nodes.

We used to think the brain didn't have a lymphatic system and instead relied on waste slowly diffusing from brain tissue into the cerebrospinal fluid.

But now scientists have identified a self-cleaning function the brain uses to get rid of waste called the glymphatic system and it goes into overdrive at night while we sleep.

We are quite clear that the quality of your sleep ultimately rules everything about you — how big your appetite is, how fast your metabolism runs, how strong your immune system is, how insightful you can be, how well you cope with stress, how adept you are at learning, and how well you can consolidate experiences in your brain and remember things.

sleep is essential for consolidating our memories and filing them away for later recall.

Research is showing that brief bursts of brain activity during deep sleep, called sleep spindles, effectively move recent memories, including what we learned that day, from the short-term space of the hippocampus to a kind of hard drive.

So, sleep cleans up the hippocampus so that it can take in new information which it then processes. Without sleep, this memory organisation cannot happen.

But more than just affecting memory, a sleep deficit prevents you from processing information in general. So not only do you lack the ability to remember, you cannot even interpret information to bring it into the brain and think about it.

Sufficient sleep keeps you sharp, creative, attentive, and able to process information quickly, and poor sleep can make you more likely to focus on negative information when making decisions. It seems clear that getting enough sleep now can improve your chances offending dementia in the future.

Once you learn how important sleep is in your life, my hope is that you will begin to prioritise it.

But I do recommend that you focus on rest too because it is important to build rest and relaxation into our waking lives if we want to stay sharp and focused.

Sleep might be the rejuvenating activity that the body demands, but there is a difference between sleep and rest, and our precious brain needs both.

Our mental well-being depends on this, and we know greater mental well-being is associated with reduced dementia risk.