The POWER of GRATITUDE and BREATH WORK in reducing cognitive decline

The 2024 Lancet Commission has identified **14 modifiable risk factors for dementia** that — if addressed — **could prevent 45% of cases**: head trauma - high blood pressure - diabetes - low education - depression - visceral obesity - smoking - air pollution - physical inactivity - loneliness - excessive alcohol - untreated hearing loss - oxidised LDL cholesterol - and untreated vision loss. In addition, obstructive sleep apnoea, sleep deprivation, chronic stress, and loss of life purpose also contribute to cognitive decline.

Two **empowering, cost-free & minimally time-consuming** strategies that can reduce Alzheimer's pathology and enhance cognition through multiple pathways are gratitude & breath work.

GRATITUDE AND THE BRAIN

Functional MRI shows that gratitude correlates with brain activity in the anterior cingulate cortex (ACC) and medial prefrontal cortex (MPFC), two of the first brain regions altered in Alzheimer's. A study of brain morphology found that being more prone to **feeling gratitude was linked to increased grey matter volume**.

Practising gratitude:

- improves subjective wellbeing
- increases resilience to stress
- strengthens the immune system
- reduces pain, inflammation, depression and anxiety
- raises oxytocin levels and promotes social bonding.

These are all pathways that improve cognition and reduce the risk of Alzheimer's.

Gratitude goes beyond thanking someone for something they did. Gratitude can arise from relief that one narrowly escaped an unwanted situation, or feeling deep appreciation for an emotionally moving experience. Gratitude comes from choosing to view a situation from a positive perspective, or taking the time to count our blessings. Gratitude means focusing on what we *have*, rather than on what we *don't* have. Gratitude entails paying attention to the beauty and kindness in the world, and deliberately noticing what we like in others. Gratitude reminds us that we have the ability to choose our attitude in any given situation, and it arises from remembering the good things in our lives: people, opportunities, experiences and unexpected moments that take our breath away. **Gratitude trains our brain to view a situation more positively, and it motivates us to take better care of our health.** These states of mind all improve outcomes in dementia patients.

Psychologists Robert Emmons and Michael McCullough did a series of experiments in which subjects were randomly assigned to one of three groups. The first group were told to keep a daily record of their hassles for two weeks, the second group their blessings (the Gratitude Group) and the third group, neutral life events. When compared to both of the other two groups, participants in the Gratitude Group felt better about their lives as a whole, had fewer physical complaints, spent significantly more time exercising, experienced better quality sleep, and were more optimistic regarding the upcoming week. The researchers then did a similar experiment with people suffering from neuromuscular diseases. Once again they found the Gratitude Group had greater improvements in mood, energy levels, pain relief, life satisfaction, sense of connectedness with others, and optimism.

PRESCRIPTION

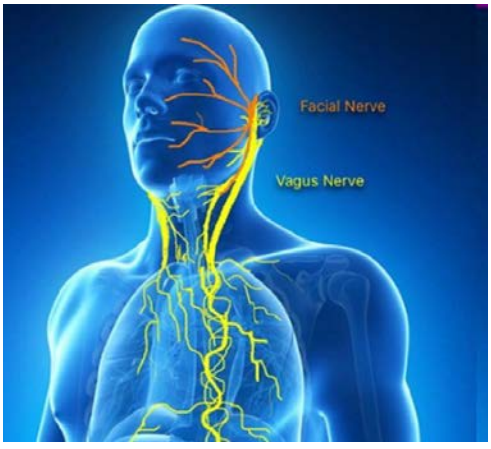
Buy an attractive, blank notebook and label it 'Thankful Thoughts'. Keep it by your bedside, and on waking every morning, write down at least 5 things you feel deeply grateful for. Elaborate as much as you can. Every evening before bed, write down 5 things you feel thankful for about your day, or 5 things you're grateful for in relation to your strengths & achievements. It doesn't matter if you start repeating the same things. The important thing is to feel a sense of genuine appreciation. Throughout your day, make a conscious effort to find things you feel grateful for.

BREATHING AND THE BRAIN

Research on yoga has shown that controlling our breath can make us feel calmer, less depressed and better able to manage stress. Controlled breathing also improves clarity of thinking, reaction time and problem solving. Following on from this, several studies have shown that specific breathing patterns not only improved mood and mental health, they also lowered levels of plasma amyloid beta (Aβ42 and Aβ40) & tau (total Tau and pTau-181).

EXPLANATION

As people get older, parasympathetic nervous (PNS) activity (the rest & digest system) declines, while sympathetic nervous (SNS) activity (the fright & flight system) increases. This is reflected in reduced heart rate variability (HRV). HRV refers to tiny fluctuations in the time interval between heart beats. High HRV means that your body can effectively adapt to change. Low HRV is indicative of current or future health problems because it means we are less capable of handling changes in our internal and external environment.



Age-related decreases in PNS activity (mediated by the vagus nerve) are associated with Alzheimer's-related conditions such as sleep disorders, diabetes and heart disease. In addition, **repeated stress induces both amyloid plaque formation & tau phosphorylation**, the two hallmarks of Alzheimer's.

The vagus nerve can be stimulated by breathing at a rate of 6 breaths per minute (inhaling for 5 seconds and exhaling for 5 seconds). This is reflected in a corresponding increase in HRV. Participants practised 20-40 minutes daily. After four weeks, there were significant reductions in the level of plasma Aβ and total Tau in younger adults and pTau-181 in older adults. This demonstrates that controlled breathing can modulate Alzheimer's blood biomarkers.

A second study at **Stanford University** found that just 5 minutes of daily breathing exercises called **cyclic sighing** increased PNS activity, reduced anxiety and improved mood even more effectively than mindfulness meditation.

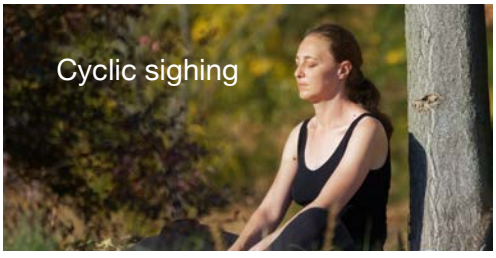
One hundred and eleven participants were randomly assigned to one of four groups:

1. Mindfulness meditation = passively observing one's breath.
2. Box breathing = inhaling for 4 to 6 slow counts, holding your breath for 4 to 6 counts, exhaling for 4 to 6 counts and holding your breath for another 4 to 6 counts.
3. **Cyclic sighing = slowly inhaling through your nose, then immediately taking a second sip of air to fill your lungs to full capacity. Then exhaling very slowly through your mouth.**
4. Cyclic hyperventilation = long inhalations followed by short exhalations.

While all three types of breath work enhanced equanimity & PNS activation more than mindfulness meditation, **cyclic sighing** was the most effective at improving mood and reducing respiratory rate. One explanation is that the slower the expiration, the greater the **increase in vagal (parasympathetic) tone**. Breathing exercises also provide a sense of **direct control over one's physiology**, which reduces anxiety, and strengthens our sense of agency and motivation to engage in health-promoting behaviours.

PRESCRIPTION

Sit or lie down and set a timer for 5 minutes. Inhale slowly through your nose. When your lungs are expanded, inhale through your nose again to maximally fill your lungs. The second inhale will usually be shorter than the first. Then exhale fully, as slowly as possible, preferably through your mouth. Repeat this pattern of breathing for 5 minutes. Your day will be better for it.



For more information please scan the QR code.

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