

The Neurology of Awakening:

Using the New Brain Research for Happiness, Love, and Wisdom

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Summary of Methods

Introduction

This is a summary of methods presented at the Neurology of Awakening workshop, as well as a list of nutritional supports for inner peace presented at the follow-up workshop on Awakening Your Brain. An understanding of their context is presumed, and this summary is no substitute for a meditation teacher or professional mental or physical health care.

Please contact either one of us if you would like to receive our free bimonthly newsletter offering news and tools from the intersection of psychology, neurology, and Buddhism.

A Limited Goal

These are methods designed to aid the steps identified by the Buddha that lead to attainable, but extraordinary, states of clarity. He taught that there is a progressive process in which " . . . *the mind is steadied internally, quieted, brought to singleness, and concentrated,*" leading to liberating insight. In short, these are ways to influence the brain toward fostering mental states of great steadiness, quiet, singleness, concentration, and insight. They may have other benefits as well, such as stress relief or happiness, but the emphasis here is on depth of contemplative experience.

General Factors

Being Awake

When you can, meditate during the times when you are maximally alert within your own sleep-wake cycle.

Minimize drains on your wakefulness, such as lack of sleep, fatigue, illness, hormonal conditions (e.g., thyroid problems), or depression

In sum: take care of yourself. Pay attention to physical factors, rather than trying to muscle through them or beat yourself up for not being able to overcome them. And if you are indeed fatigued, set reasonable goals for yourself, and hold them lightly.

Being Alert

- Posture - Provides internal, somatosensory feedback to the reticular formations that lead to alertness. Being upright says to the mind: "Wake up!"
- "Brightening the mind" - Here you deliberately activate an internal sense of energizing and enlivening your mind. In physiological terms, this is often correlated with a surge of norepinephrine, which helps you feel alert, relaxed, and exploratory (applied, hopefully, to the focus of your attention).
- Oxygen - Oxygen is to the brain what gas is to your car. By taking several deep breaths, you increase the oxygen saturation in your blood and thus "push the pedal" with your brain.
- Avoiding sugar and refined flour products and eating protein - Eating sugars (and refined flour products quickly get converted to sugar in the blood) creates a short-term increase in energy but then a crash. Protein calories crowd out sugars in your diet, plus help even out insulin metabolism.

Feeling Safe

In effect, the sense of safety tells the brain that it can afford to bring the troops in that have been manning the battlements, so to speak, scanning the forests and fields for danger, and put them to work internally keeping an eye on the breath.

For example, there is the Buddha's perennial, recurring instruction in the suttas to meditators to find a place of seclusion - safety - and sit down at the base of a tree - where he found his own enlightenment - with your back to it, protecting your most vulnerable flank. Further, other practices seem designed to help meditators get used to perceived threats - such as meditating on the jungle side of a well or simply being alone in the forest at night - and thus habituate the meditator, and his or her arousal system, to threats.

Also, some meditative practices have the side effect of overcoming fear, such as the charnel ground meditations or lovingkindness practice, even if that is not their primary purpose.

Here are several, well-proven methods for feeling safe:

- Bringing to conscious awareness that you are in a familiar setting that is safe. Perhaps take a minute or so at the start of a meditation, particularly in a new situation, such as at the start of a retreat, to look around or visualize the room, the people, the teacher, the strong walls surrounding it, the closed door, the protected setting, etc. to activate a sense of sanctuary, of being able to let down your guard because you're safe now. In a figurative sense, you are letting the Bodhi tree guard your back and flanks.

- Relaxing the body - Besides its psychological benefits, relaxing shunts blood flows away from unnecessary muscle metabolism, bringing more oxygen and nutrients to your inner organs and the brain.
- Diaphragmatic breathing - Especially exhalation
- Imagery - Spaciousness. "This too."
- Taking refuge - "We all need somebody to lean on."

Feeling Positive Emotion

- The soft smile emphasized by Thich Nat Hanh is important, because of the feedback loops to the emotional circuit.
- Metta practice - cultivating compassion, lovingkindness, etc. - activates positive emotion. It could also help release oxytocin, a hormone we'll say more about later that is involved in warm feelings of safety and contentment.
- Remember past states of positive emotion. Then access that bodily/emotional memory to rekindle the positive feeling.
- Keeping the right hemisphere busy could lead to positive feelings in at least two ways, which could be why so many meditative practices emphasize right-brain activities. First, areas within the left hemisphere of the brain help control negative emotion; for example, individuals with strokes on the left side of the brain are more likely to be depressed than those with strokes on the right side. Second, the right hemisphere seems more involved with scanning for threats (perhaps because of its specialization for visual processing - and threats as we evolved in the wild were often best *seen* before they got close enough to hear).

By occupying the right hemisphere with activities that only it can do, that could (A) reduce any interference with left hemisphere, emotion-regulation functions, and (B) draw the right hemisphere away from anxiety-activating scanning for threats.

These right-hemisphere intensive activities include:

- Visualization (a major practice in Tibetan Buddhism)
- Musical chanting, listening to gongs, drumming
- Whole body awareness
- Spaciousness, blue sky meditations

Rewarding Yourself (Appropriately) for Positive States of Mind

How about seeing the humor in your own mind, realistic self-praise, good company, etc. Let's take a minute now, and experiment with rewarding yourself for being here, having sincere aspiration, trying hard, staying with it, etc.

Steadying the Mind

Generating the Intention to Focus on One Thing

- Call to mind a sense of the state you are aiming for. In effect, you are using the frontal lobes to tell the hippocampus to activate a record of previously experienced "steadiness of mind," etc. Then, the activated sense both draws you into that experience itself and gives your frontal lobes a clear target state to sustain.
- Establish your intentions at the beginning of a sitting. You may do this wordlessly or say specific sentences, like "May my mind be steady." Or: "May attention stay settled on the breath."
- You can establish intention by "channeling" a teacher, mentor, or the Buddha himself. Imagine sitting upright "like a Buddha." Or being in the "zone" that a favorite teacher is in when he or she meditates.
- You could routinely re-establish your intention at short intervals, such as at the beginning of each inhalation and exhalation, or at the end of short intervals in walking meditation.

Managing the Tendency to Fatigue on Concentration

- "Cheat" a little by shifting your attention a bit, like from the initial point of contact of the breath at the upper lip to other sensations like it sliding down your airway. But don't do this any more than you need to.
- Deliberately set up a little overseer in your mind (likely directed by the anterior cingulate which we just discussed - the second thermostat that helps control control) that watches how well you are watching the object. That overseer monitors the intensity of your attention and gives it a boost if it starts to flag. By the way, the anterior cingulate really lights up with compassion practice, so it could help energize the overseer for yourself to start with a minute or two of compassion practice, including for yourself.

Managing the Tendency to be Distracted by Other Stimuli

- Use the brain's tendency to satiate on stimuli and then ignore them by taking a few minutes at the beginning to open up to external sounds, tactile sensations, etc. Get a sense of them as repetitive and non-threatening sensations that can be ignored.

- Use the frontal lobe intentionality engine to set filters that screen out unwanted stimuli. For example, think softly "I don't care about that, I'm not interested in thoughts or feelings or other sensations. Just the breath."
- Experiment with "batting away" or turning away from distracting thoughts, etc. before they fully take hold, and keep returning your focus to the object. The trick is to do this gently, without any anger or white-knuckling or suppressing.
- Remind yourself you can think about intrusive thoughts, feelings, problems, etc., later.
- If need be, shift the object of attention to be an intrusive stimulus, such as the grinding of an air conditioner pump, or a worry about something undone at home. In other words, if you are trying to meditate while someone is knocking loudly at the door, maybe start meditating on the sound of the knocking.
- Intensify the contact with the desired object of attention. For example, count the breath, footsteps (in walking meditation), etc. Or "note" the breath - e.g., "rising," "falling," "in," "out." Or bring a sense of emotional warmth, fondness, even devotion to the object that increases your sense of full engagement with it. This is especially easy to do with metta meditation.

Managing the Hunger for New Stimulation

- Increase your sensitivity to stimulation through sensory awareness practice or by focussing on the "neutral" aspects of experience. That's training your brain to, in effect, turn up the gain on your receptors so that they can receive and stay with relatively unstimulating experience.
- Be honest and kind with yourself about your temperament, especially if you have spirited or ADD/ADHD tendencies. Consider letting yourself attend more to the breath as a whole, or letting your attention move freely among the different sensations of the breath (e.g., belly, diaphragm, heart, upper lip, internal airways). And consider doing more walking meditation if your brain's preferred resting state requires more stimulation than the brain of the average person.
- Re-orient to each part of the breath (or other object of attention) as a *fresh* stimulus. Have a sense of "beginner's mind, or "don't know mind" for each breath, seeing its uniqueness. Further, try to pay attention to an increasing granularity of detail, such as the sensation of coolness or warmth at one spot on the upper lip.
- Trick the basal ganglia, to dampen its hunger for stimulation, by stimulating it with positive feelings. First, specifically try to call up or evoke a feeling of sufficiency,

no need for anything else, contentment. Second, activate a release of the hormone, oxytocin - which dampens the hunger for new stimulation - by imagining being hugged by someone who loves you for half a minute or so. Third, savor the pleasant sense of absorption itself.

- Use the traditional instruction to say softly in your mind: "May piti arise (the Pali word for rapture or bliss)." Or: "May sukha arise (the word for joy or happiness)."
- You can always remind yourself of the truth that all stimuli are impermanent, empty, and not satisfying - they are not worth chasing or resisting. Call up a sense of disenchantment with the inner and outer worlds that is an important step along the path toward Awakening.

Quieting the Mind

Review of Methods

- Take a few minutes to satiate on and then ignore recurring sounds and sensations.
- Tell yourself to think about intrusive topics later.
- "Bat away" distracting thoughts or feelings.
- If need be, shift the object of attention to be an intrusive stimulus, and surrender to that.

Whole Body Awareness

From birth, the right, "visual-spatial" hemisphere is more responsible than the left, "verbal," hemisphere for sensing the state of the body. This is especially true when one is sensing the body as a whole, which draws upon the global, gestalt processing of the right hemisphere. When the right hemisphere is strongly activated in this way, it withdraws activity from the verbal centers, which helps quiet the mind.

You can do this whole body awareness starting with the breath as a whole. And then move out to the body as a whole. It is normal for this whole-gestalt sensing to "crumble" after some seconds, and when it does, just regenerate it.

Stilling the Verbal Centers

- Mantra meditation occupies the verbal centers with a repeating phrase. On the other hand, some people find that even that activates the verbal centers too much.

- It is possible to send a gentle intention to the verbal centers along the lines of: "Hush, now, it's time to relax and be quiet. There's nothing important to think about right now. You'll have plenty of time to think and talk later, throughout the rest of the day."

Letting Go of Self

Reducing self-oriented thoughts, perspectives, or frameworks dials down a major engine of mental activity.

- Get a sense of receiving the breath, of being a space it enters, rather than willfully going out via attention to "get" it.
- Add a sense of selfless devotion to the breath as your friend.
- Gently open out into a sense of space, of emptiness if you will, in which the edges of "me" blur and dissipate.
- Lightly bring to mind the knowledge that all research on the brain indicates that there is no single place inside it where self resides.
- Deliberately orient to experience flowing by as provisional, just the brain at this time, without identifying with it or attaching to it like velcro as "me" or "mine."

Coming to Singleness

Stability

In the great stability characteristic of "singleness," these modes of brain activity are sustained with great and largely effortless continuity:

- A recurring regeneration of intention - even part breath by part breath - to be completely present with every single sensation of the breath
- An intentional heightening of the sensory signals from that one region, which essentially trains the brain to favor those signals
- A relentless returning of attention to that one stimulus, which helps heighten the salience of those signals
- An intentional withdrawal of interest in, engagement with any other information, including sense data

Integration

- Whole body awareness - discussed previously - probably helps train the brain in the integration of sensory experience.
- Intend for there to be an integration of experience. You could do this first by tapping the memory of those experiences (or the sense of them, the first time, as described/transmitted by others such as teachers). Then, activate the frontal lobe engines of intention to sustain that quality of integration.
- Invoke the jhanic factor of singleness: "May ekagata arise."
- Open up to the "ka-woosh" of it all coming together.

Equanimity

This means not reacting to our reactions, *whatever* they are -- and in particular, not reacting to that initial, most basic tone of stimuli (including those originating in the mind itself) as being pleasant, unpleasant, or neutral. Neurologically, it probably means that the amygdala continues to label stimuli as being pleasant, unpleasant, or neutral, but the primary receiver of those signals, the inferior frontal lobe, does not trigger a secondary cascade of emotions, action plans, views, etc.

To put the dharma in neurological terms, you can change the factors that condition your amygdala to generate a pleasant or unpleasant tone in the first place. And you can cultivate a response by the inferior frontal lobe to that feeling tone which will act like a circuit breaker interrupting the secondary cascade.

To condition the amygdala to flag fewer stimuli as unpleasant, use any of the practices above to increase positive emotion, turn down the sympathetic nervous system, and increase your sensitivity to neutral stimuli. Additionally, when you recall anything challenging or painful from your past, deliberately try to do that in a context of spaciousness, and of compassion and encouragement for yourself; since memory is not so much recalled as reconstructed, the reconstruction in the positive context just mentioned re-shapes the memory over time in a more positive direction.

To increase the ability of the frontal lobes to break the cycle of reactions to the feeling tone:

- Cultivate an attitude of impartiality toward the world. Whether it's beautiful or ugly, good or bad, you bring the same stance of mindfulness and loving kindness toward it.
- Cultivate the mind of no preferences: "The great way is easy for one with no preferences."

- Cultivate a kind of disenchantment with the world and its pleasures. A hot fudge sundae is just a hot fudge sundae. It's nice . . . but that's all it is, and even that passes quickly.

Selflessness

This is a profound attenuation of the sense of "I" or "mine."

- By withdrawing attention from every aspect of the sensory world except the sensations in one tiny part of your body, you reduce the activity of the parietal lobes. That in turn could quiet the specific areas which generate the sense of being a body in the world, and the sense of an "I" within the body.
- Giving oneself utterly over to the breath - or any object - radically reduces the activation of self; non-self information dominates consciousness and crowds out self-focused information, and this change in the subjective sphere must be mirrored by changes in the brain, such as in the parietal region.
- In the great quiet and steadiness of singleness, the recognition of the completely constructed - made up - nature of self is very powerful, and helps you not identify with the seeds of self that may bubble up into awareness.
- In meditation, experiment with completely abandoning, completely releasing any sense of self.

Nutritional Interventions for Feeling More Peaceful

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Perspectives

Anxiety comes in many flavors – worry, unease, apprehension, nagging fears, concerns, nervousness, panic – and it wears on the sense of inner peace. Happily, there are many effective ways to address it. These include:

- Psychological methods (e.g., relaxation, imagery, cognitive techniques): Very effective, with additional benefits of increased self-knowledge, learning general purpose skills, and helping other mental health issues.
- Prescription medications: Powerful, but may have side effects or be addictive
- Nutritional methods: Often very effective. Widely available. Side effects are uncommon (by using pure molecules the body routinely metabolizes).

Nonetheless, do not take amino acids that are neurotransmitter precursors if you are on an anti-depressant (unless you do so under the supervision of a licensed healthcare practitioner). In general, start with low doses, increase slowly, and stop if you feel at all uncomfortable.

The Glutamic Acid and GABA Neurotransmitters

A common physical cause of anxiety is an excess of excitatory neurotransmitters relative to inhibitory neurotransmitters. A major excitatory neurotransmitter is glutamic acid (also termed glutamate), and a major inhibitory one is GABA.

In the sections that follow below, this handout describes multiple ways to increase GABA activity and thereby reduce anxiety – and increase your sense of feeling safe, secure, and peaceful.

Vitamin B-6

GABA is made from glutamic acid, and this reaction requires vitamin B-6, in the chemical form of “pyridoxal-5-phosphate (P-5-P).” Try 50 mg./day of P-5-P on an empty stomach.

Tryptophan or 5-Hydroxytryptophan

These amino acids build serotonin, an important neurotransmitter. One of serotonin’s functions is to act as a “neuromodulator” that increases GABA’s activity, and it also helps decrease overactive norepinephrine, dopamine, adrenalin, and cortisol – all of which can make you feel nervous. Serotonin also supports sleep and mood; it is a primary neurotransmitter that helps us feel good. It is manufactured in the body from the amino acid, tryptophan, or more directly, from the metabolite of tryptophan called 5-hydroxytryptophan (5-HTP).

You can increase your serotonin by taking tryptophan (500 – 1500 mg./day). It may make you sleepy, so consider taking it at night (which can help if you have insomnia). Or take 5-HTP (50 – 200 mg./day); best on an empty stomach, in the morning, if you want the primary effect during the day.

Taurine

Taurine is an amino acid that binds to the GABA receptor, stimulating GABA-like activity. Taurine also helps the body retain magnesium, which is very relaxing. Taurine is generally very safe, and essential for breast-feeding mothers, or women who have breast fed for a long time. Try 1000 mg./day in the morning on an empty stomach.

Theanine

Theanine is an amino acid (found in green tea) that is “antagonistic” to glutamic acid (thus inhibiting its effects). You could try 100 – 200 mg./day, taken anytime. (Unlike all the other nutrients listed in this handout, theanine is not essential for health and thus routinely present in your body.)

GABA

In principle, GABA is supposedly blocked by the blood-brain barrier, but many people do report a calming effect from taking it. Consider 250 - 750 mg./day, best on an empty stomach.

Progesterone (for women only)

Progesterone stimulates the GABA receptor. As a woman approaches menopause, progesterone usually decreases before estrogen does. So supplementing progesterone may be helpful. You could use Pro-Gest crème during the second half of your cycle. Hormone supplementation is complex, so I recommend you try it only in consultation with a health professional.

Glycine

In the spine, glycine performs a GABA-like role, balancing glutamic acid. Try 500 – 1000 mg. or more each day, or take enough magnesium glycinate to get 400 mg./day of magnesium.