

The Emerging Neuroscience in Addiction & Recovery

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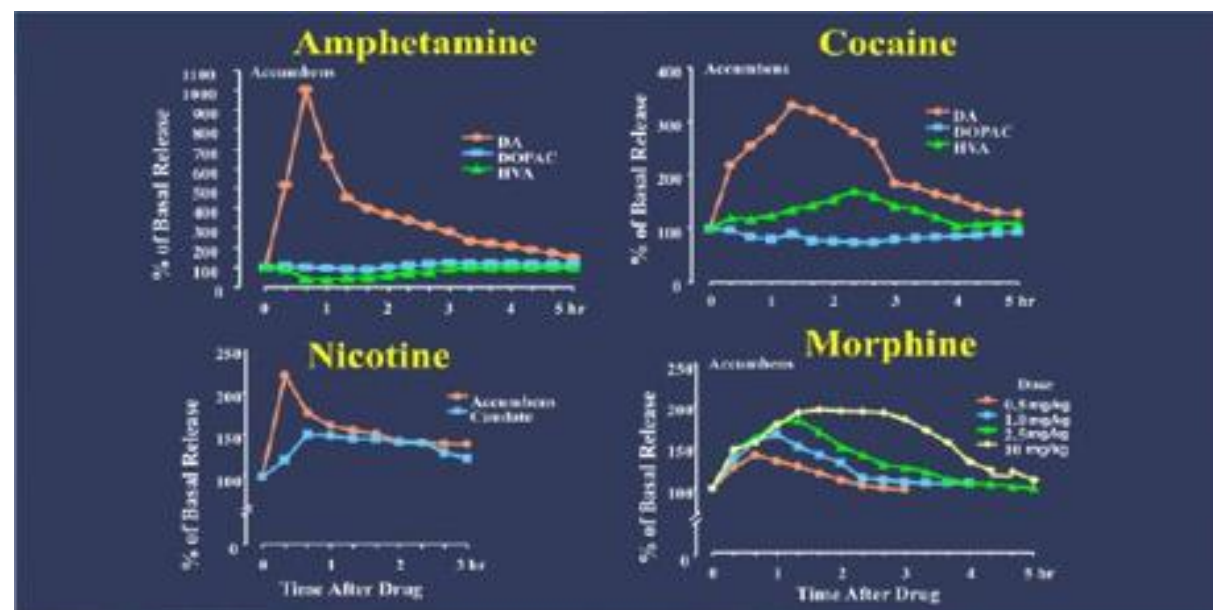
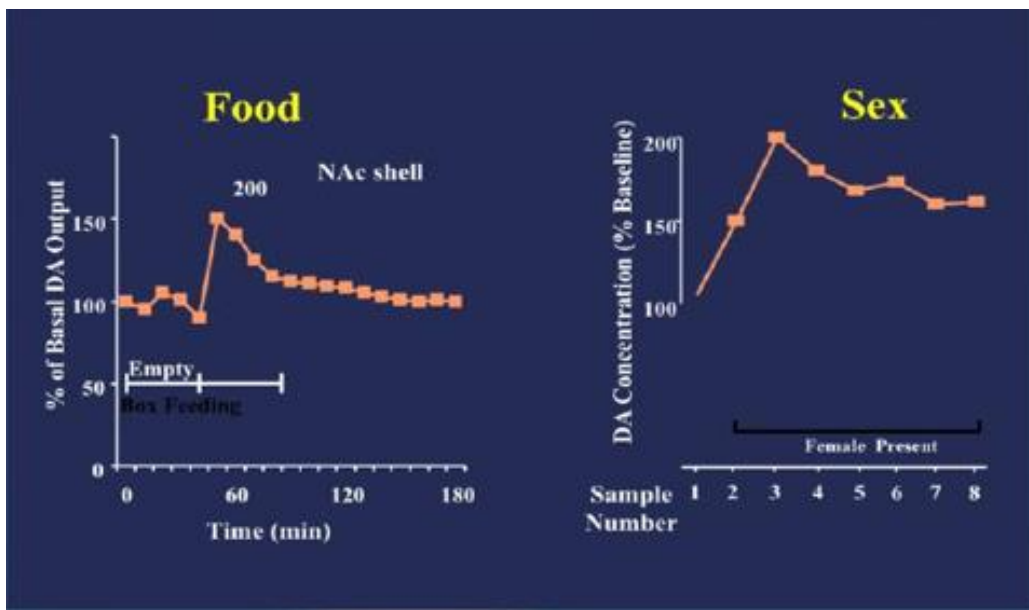
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Dopamine Dilemmas

Addiction is best conceptualized as a 'Reward Deficit Disorder'

Dopamine is a universal currency



Courtesy of Dr. Holly Geyer, Internal Medicine
Mayo Clinic-AZ

Oi G. Drug addiction associative disorder Eur J Pharmacol. 1999 Jun doi: 10443561.

Facilitation Of Sexual Behavior and Enhanced Efflux in the Nucleus

Accumbens Of Male Rats Sensitization Di Chiara A_ by synapt•c dopamine concentrat•ons •n the mesolimbic freely moving

Proc Acad SA_ COIL 20.1073.'

DA Receptor Upregulation

NA DENDRITE



Saline

Amph

Initial use triggers DA
receptor UPREGULATION

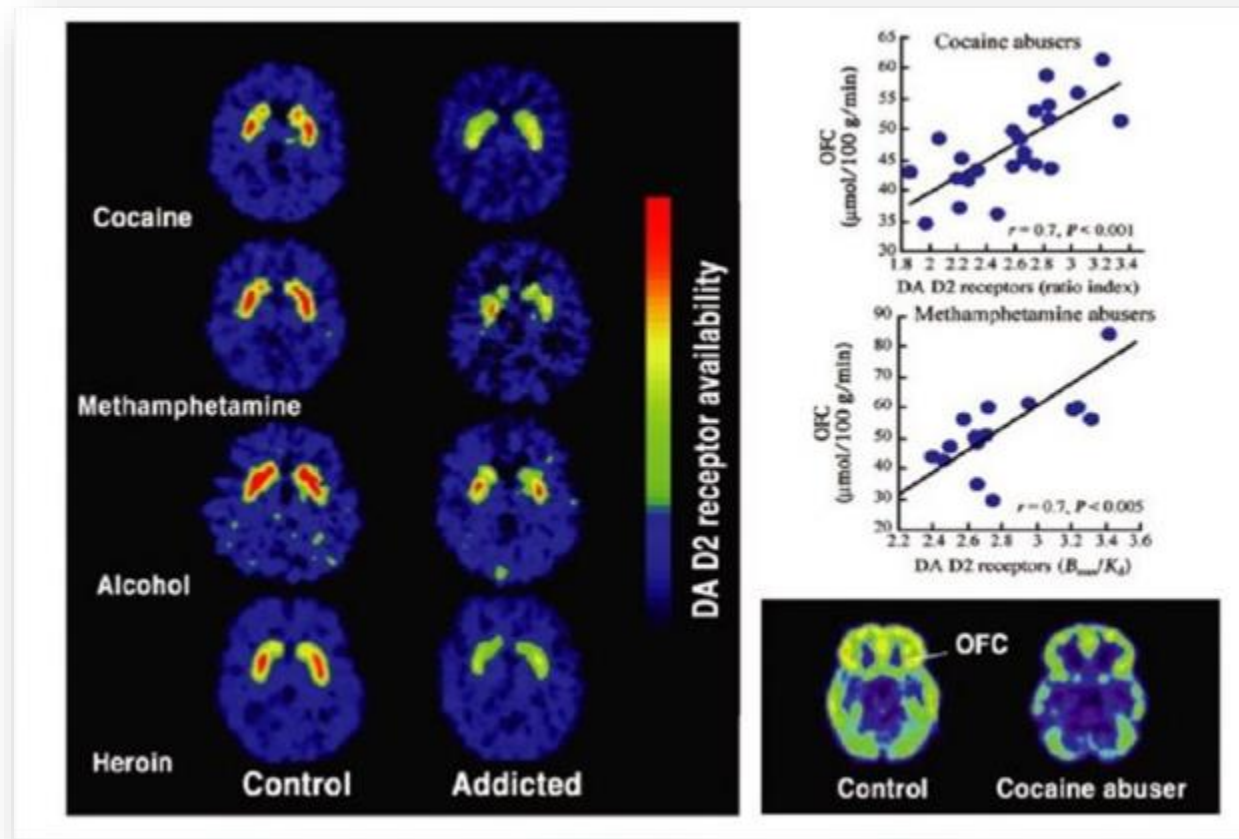
Results in corrupt messages about:

- Reward prediction
- Stimulus-response
- Approach behavior
- Learning (conditioned too)
- Decision Making

Courtesy of Dr. Holly Geyer, Internal Medicine Mayo
Clinic-AZ

Robinson TE, Kolb B. Persistent structural modifications in nucleus accumbens and prefrontal cortex neurons produced by previous experience with amphetamine. *J Neurosci.* 1997 Nov 1;17(21):8491-7. doi: 10.1523/JNEUROSCI.17-21-08491.1997. PMID: 9334421, PMCID: PMC6573726. copyright 1997. society for Neuroscience.

DA Receptor Burnout

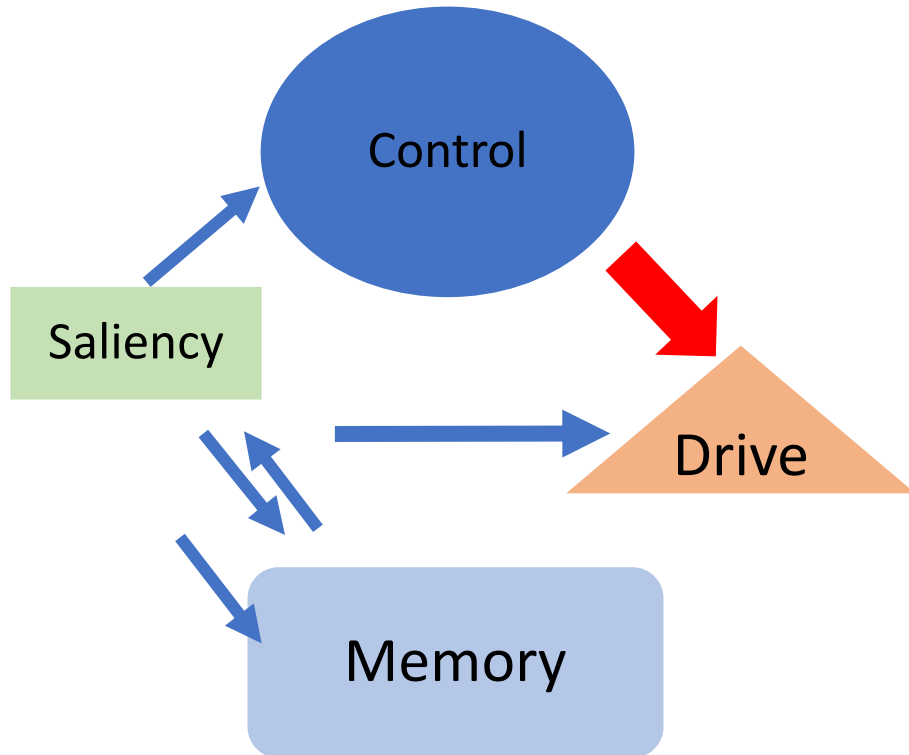


Courtesy of Dr. Holly Geyer, Internal Medicine Mayo Clinic-AZ

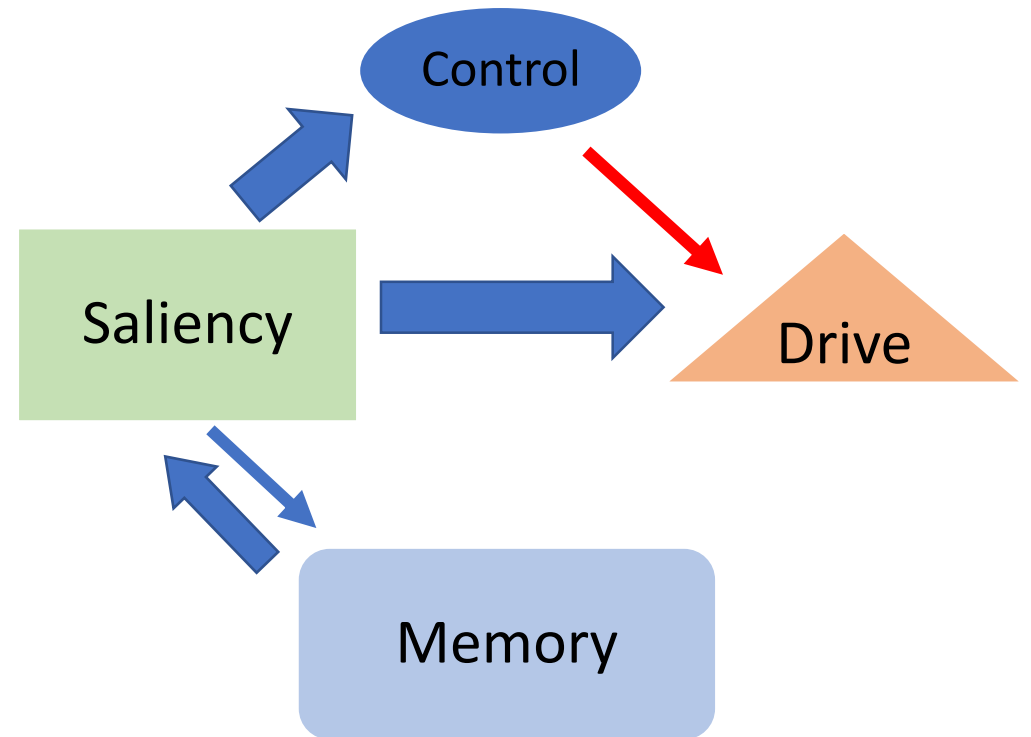
Volkow ND, Wise R.A. How can drug addiction help us understand obesity? Nat Neurosci. 2005 May;8(5): 555-60. doi: 10.1038nn1452. PMID: 1586062. Used with Permission.

The Final Result

Non-Addicted Brain



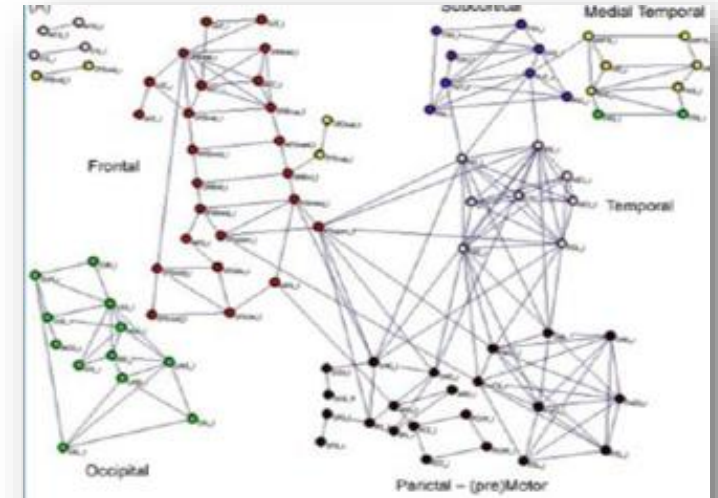
Addicted Brain



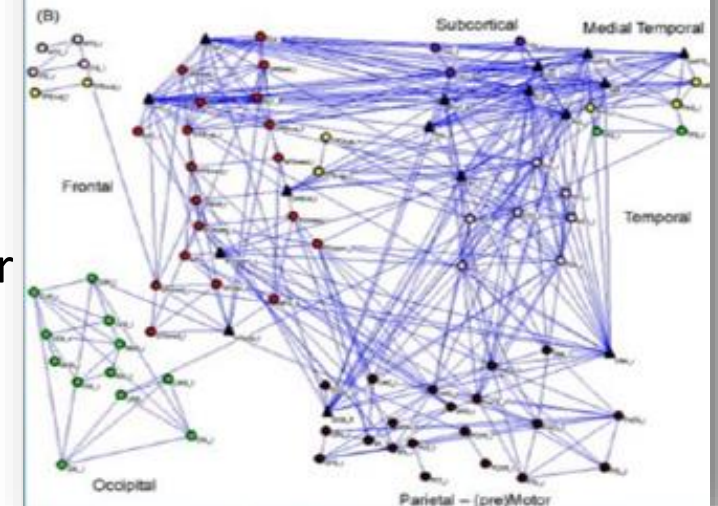
New Connections

Comparison of non-drug users and the chronic heroin users' brain functional networks during the resting state.

Non-drug User



Chronic Heroin User



Liu J, Qin W, Yuan K, Li J, Wang W, Li Q, Wang Y, Sun J, von Deneen KM, Liu Y, Tian J. Interaction between dysfunctional connectivity at rest and heroin cues-induced brain responses in male abstinent heroin-dependent individuals. PLoS One. doi: 10.1371/journal.pone.0023098. Epub 2011 Oct 18. PMID: 22028765; PMCID: PMC3196491.

Definitions

Dope-habits = Stands for routine activities that increase Dopamine in the brain/body. Short-Term. Instant. Effortless. Pleasure-seeking. Targeted for Self-soothing, Pain Avoidance. (May also involve cortisol, epinephrine, and other excitatory neuro-modulators).

“Excitatory”. Or “Dis-inhibitory”. Self-centered activity. Using, Taking, or Consuming focus.

*Dope is natural and good for its function and purpose. For instance, Dopamine can reward and increase motivation, attention, memory, learning, goal-directed activity, anticipation and excitement, etc.

Definitions:

Adaptive Past, Future & Current States of Consciousness

Faith, Hope, and Love-habits= Stands for routine activities that release a balance of “happy chemicals” (dopamine, serotonin, oxytocin, adrenaline) in the body/brain. Long-Term. Other-focused. Giving.

“Inhibitory”. Self focused on Relational/Connectedness. Steady state emotion. In future state of mind, usually requires pain, effort, stress, challenge, focus, endurance/grit or perseverance, and coping. In present state of mind, involves being mindfully present, in the moment, in relationship to God, Others, Creation or Self. In past state of mind, involves forgiveness, mercy, grace, redemption, restoration...

“Faith”, “Hope” and “Love” habits: the neuroscience of past, future, and present states of mind

Past-well-being is based on **Faith-habits**: focus the mind on the goodness, truth or beauty in our past necessary relationships to God, Others, Self and Creation e.g. corrective recapitulation; positive recall; restorative trauma.

Future-well-being is based on **Hope-habits**: focus the mind on achieving the future good, truth or beauty in our necessary relationships to God*, Others, Self and Creation. Hope sets the mind on calling, purpose, promises, hopes, dreams, visions, goals.

Present-well-being is based on **Love-habits**: focus the mind on the goodness, truth or beauty in our present necessary relationships to God, Others, Self and Creation. Love sets the mind on Mindfulness, Serenity, Gratitude/Thankfulness, Cherishing, Savoring (see spiritual practices list).

*God as you understand God

Daily Inventory: are we all “dope addicts”? 😊

How much of my day is geared toward achieving dope-hits, peaks or using dope to soothe myself, avoid pain, or get out of an emotional valley? Am I layering dope to achieve peaks? What activities do I use each day or regularly for soothing, pleasure seeking and pain avoidance?



Exercise: Do I have Daily Dope Habits?

Multiple X Daily

Daily

Multiple X Weekly

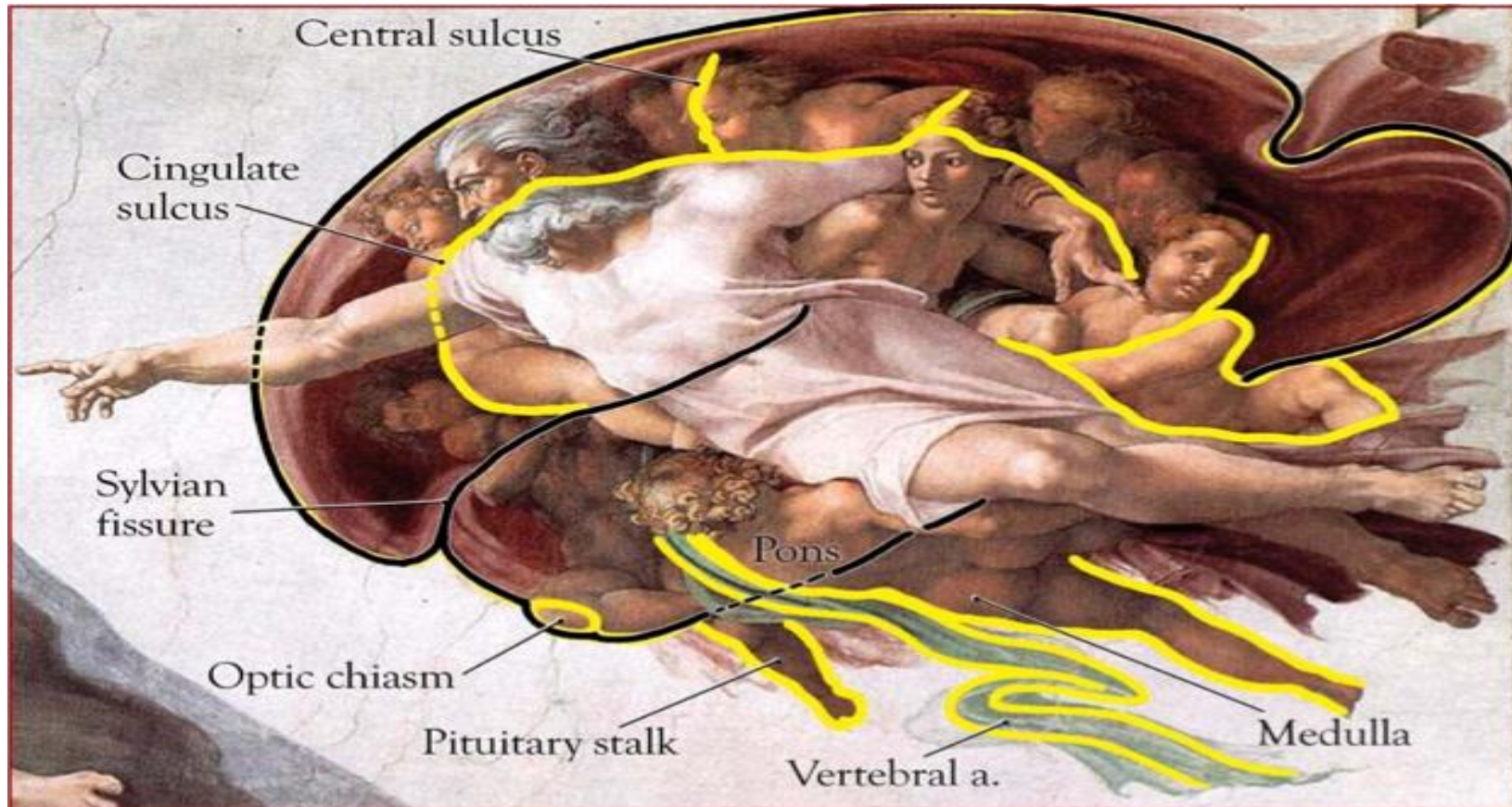
Weekly

Using the frequencies above, determine how often you participate in the following activities:

- Shopping/purchasing/consumption
- Psychotropics and Psychoactive substances (including herbal)
- Emotional and Relational drama; e.g. conflict, tension
- Stress/busy-ness/challenges (note how adrenaline and dopamine coincide)
- Gambling
- Phone Use
- Computer or Tablet screen time
- TV/Binge watching
- Social Media
- Food: Sugar
 - Chocolate
 - Carbs
 - Fructose
- Caffeine
- Porn/Masturbation
- Gaming/Virtual Realities/Avatars
- Violent or Titillating Media
- X-Treme _____
- Drugs
- Alcohol
- Outrage & Fear
 - News/Politics/Conspiracy
- Smoking/Vaping
- Energy Drinks
- Other Amusement/Recreation

How many of these activities do you “layer”? One after another or one on top of another?

The Neuroscience of Spirituality: God As You Understand God



Source: Newberg, A.; Waldman M. (2009). [How God Changes Your Brain: Breakthrough Findings from a Leading Neuroscientist](#). New York: Ballantine Books.

Faith, Hope, & Love Mindsets are Rewarding:

Steady-state, Positive emotions reward and sustain new habits.

Positive emotions are the rewards that come during and at the end of faith-habits, hope-habits, and love-habits .

These emotions are longed for, enjoyed, and then can be sustained as a steady state of being.

In addition, these steady states broaden and build our abilities to experience negative emotions in a therapeutic and transformative way (e.g. resilience, recapitulation, restorative trauma).

The broadening and building of these abilities also enhances the experience of our primary relationships to God, others, self and creation and thereby recursively leads to a greater ratio of positive emotions to negative emotions. (sources: Anna Lembke, Barbara Fredrickson; Charles Duhigg; Wendy Wood, Robert Lustig).

Life Balance:

Body-brain Balance Of Dope-habits And Faith, Hope & Love-habits



Neuro-spirituality and Spiritual Practices
(adapted from Andrew Newberg and other neuroethology research by Walsh)

The Pain Vs. Pleasure Balance

What do we mean by long term “PAIN”? Repeated, increased and habitual indulgence in short-term, transitory, excitatory, self-centered emotional states (pleasure) results in physical tolerance, addiction, receptor reduction/down regulation, neuron destruction, and dopamine depletion thus also mood disorders.

Can also lead to apathy, anhedonia (loss of the experience of pleasure), hyperalgesia (increase in the sensitivity and experience of pain), and despair. *This is the leading hypothesis for “deaths of despair”, the epidemic of mood disorders, the pandemic of collective trauma and the epidemic of overdose deaths.

(credit to: Anna Lembke)

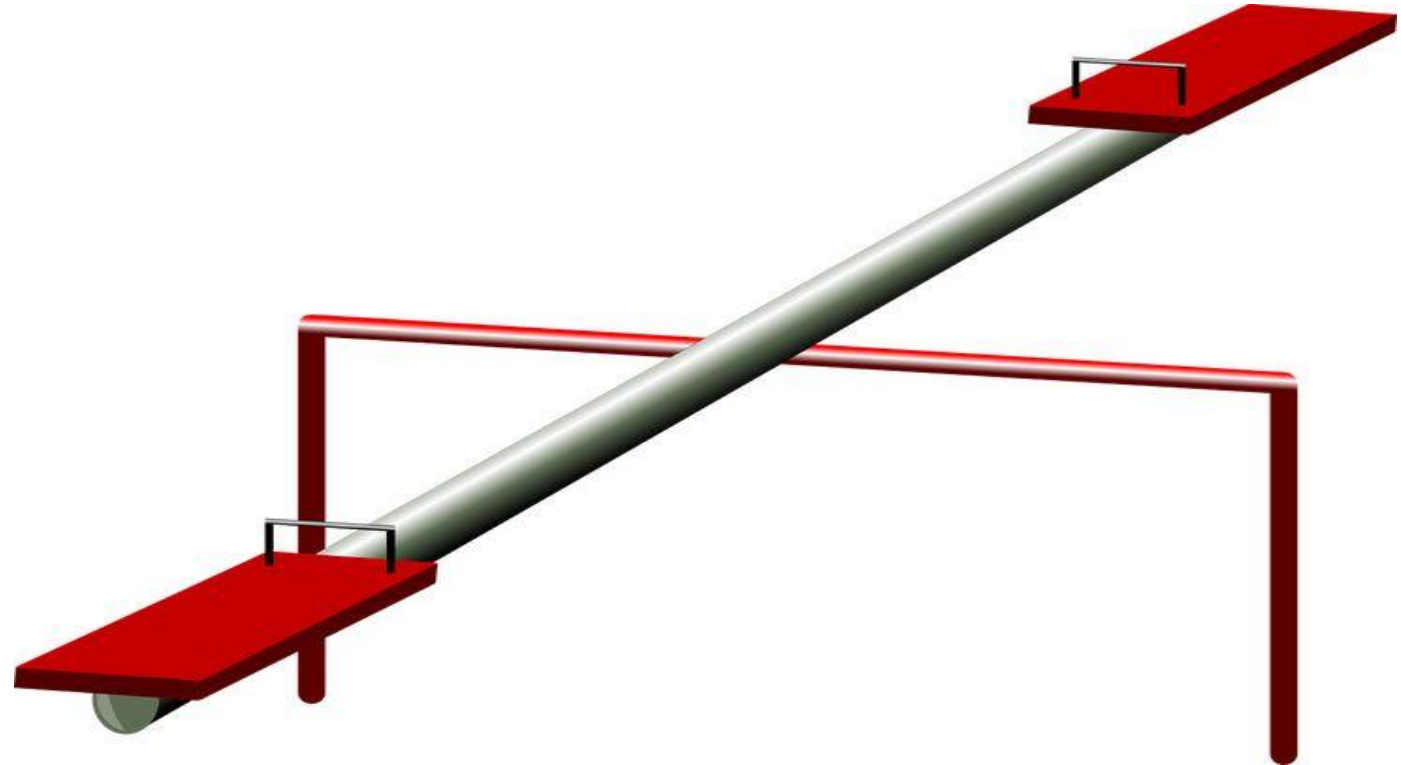
The Pain Vs. Pleasure Balance

What do we mean by long term “PLEASURE”? In contrast, *positive steady state emotions* are chemically inhibitory, long lasting, other-centered (result in connection and contribution), and increase coping and brain-enhancement/neurogenesis.

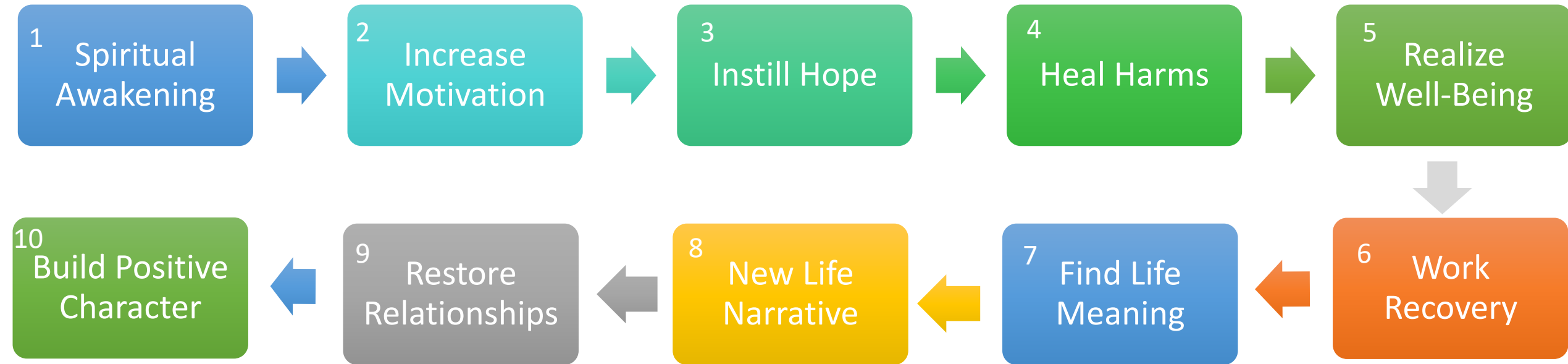


(Credit To: Anna Lembke)

Daily and Weekly Deep Habits	Short Term Consequences	Long Term Consequences
	↑ Pleasure	↑ Pain
	↑ Pain (Purposeful)	↑ Pleasure



The “How” of Life Transformation



Spiritual Exercises

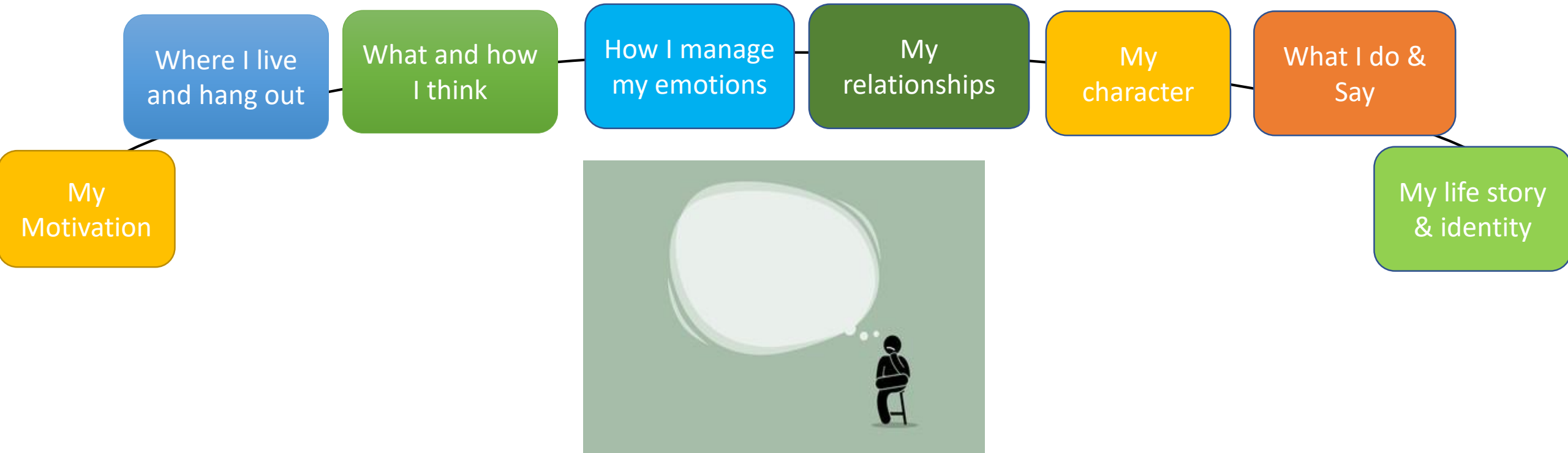


Spiritual Exercises

Daily & Practiced Meditation + Deep and Continuous Prayer +
Compassionate Service + Fellowship + Giving/Tithing +
Worship + Confession + Thanksgiving + Forgiving + Praise +
Solitude + Humility Disciplines + Soul Friendships + Sacred-
book reading + Sabbath + Work/Exercise + Fasting (Diet
Health) + Recreation

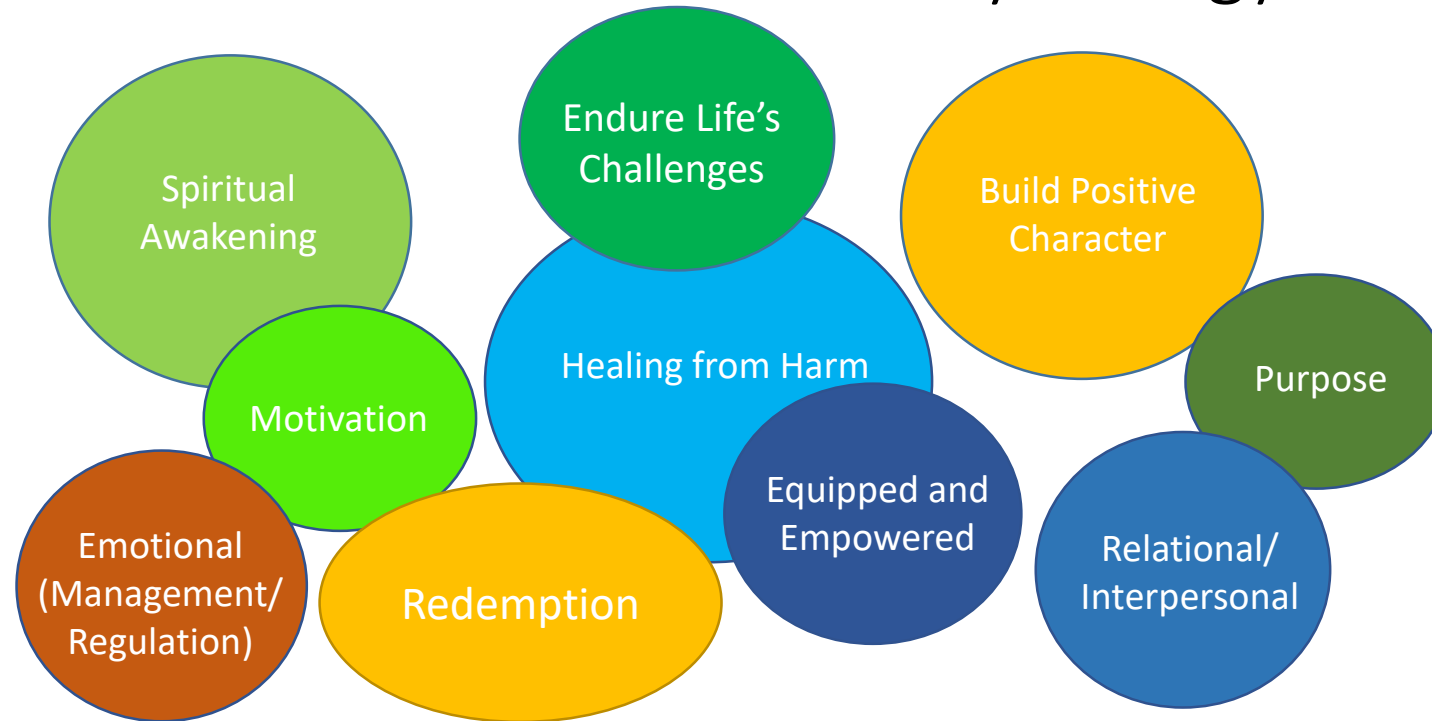
Serenity Mindset

What we need to change can be changed



Build Strengths:

The Power of Positive Psychology



Good Feelings Reward New Habits



Optional Exercise: being present in my body

Body scan/somato-sensory/primal feelings. Feeling a sense of:

Pleasant vs unpleasant

Well vs Ill

Threatened vs safe

Up, down or normal mood

Stressed vs at ease

In control vs out of control

Depressed

Regulated vs unregulated

Loss vs gain

Manic

Pain vs pleasure

In right relationship v not
right relationship

High energy vs low energy

Alert/vigilant/on guard

Free & uninhibited vs
inhibited

Satisfied vs

unsatisfied/discontent

Wanting to seek
people/wanting to
detach/avoid

Comfortable vs
uncomfortable

Mindful vs distracted

Tense vs relaxed

Connected vs disconnected

Rested/tired

Open vs closed

Thank you for joining us!

Behavioral Health Awareness Series

If you are an Evernorth or Cigna customer and have questions about Substance Use treatment or about your benefits and how to use them, please contact:

Stephanie Gissal - 800.274.7603 x398516

Alex Turner - 800.274.7603 x513597

Wanda Russell – 800.274.7603 x342063