A Balance Between Yoga and Drugs: Engineering the Injured Brain to Find a New Way Forward

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Disclosures

• Dr. Spier is a rehabilitation physician, medical director, and shareholder at Highlands Regional Rehabilitation Hospital, and with the Mentis post-acute Traumatic Brain Injury program.
You become what you think about all day.
- Ralph Waldo Emerson
The injured brain is both susceptible and responsive to any input, ranging from our sensations to what we put in our body.
Our mission here is to highlight the similarities in yoga therapy and neuropharmacology, broadening the approach to both.
Objectives:

• What can be done to influence an individual's environment to promote wholistic healing?
• How do our thoughts, movement, breath & the drugs we put in us impact recovery?
• What ingredients create the best milieu for recovery?
• What techniques for mindfulness promote healing?
• What approaches can be used to access interventions?
The Yoga-Medication link as a meme

- Both have persisted in human culture for thousands of years
- More than fad diets and exercise crazes that fizzle prior to becoming persistent trends
- Both drugs and yoga are enduring memes of East and West
Yoga Therapy is a Modern Tradition

Not Yoga as Therapy
Not Yoga is Therapy
But Yoga Therapy

YT in Neuro-Rehab truly creates an interdisciplinary approach
Yoga Therapy

Our true purpose is to experience health at all levels of our being.

- “I am the answer”
- You are not your injury
Yoga Therapy is not Yoga in a Box
Cook from Scratch Every Time
What can be done to influence an individuals environment to promote wholistic healing?
Evidence-based medicine

Individual Clinical Expertise

Evidence-based medicine

Best External Experience

Patient Values & Expectations

Individual Clinical Expertise

Evidence-based medicine

Best External Experience

Patient Values & Expectations
Resilience

Definition: “... the ability to withstand and rebound from disruptive life challenges... involves dynamic processes fostering adaptation within the context of significant adversity.”

Balance DMN and engaged attention with active learning

resting

engaged
Where is the balance?

**active**
- Activating monoamine medications
- Acetylcholinergic medications
- Asanas
- Pranayama
- Therapy
- School/Work
- Productive activities

**resting**
- Gabanergic medications
- Histaminergic medications
- Sigma/Beta-blockers/Alpha-2 agonists
- Pranayama
- Yoga Nidra
- Meditation
- Sleep
Default mode network

Brain regions that are active when the individual is not focused on the outside world and the brain is at wakeful rest.

• Useful in conceptualizing a balance of activity and rest during treatment after brain injury
• What advantages may be conferred in comprehensive inpatient treatment programs outside of “therapy”
Effects of an Enriched Environment

- Increased cortical thickness
- Increased neuronal size
- Increased hippocampal neurogenesis
- Greater dendritic arborization
- Increased glia
- Increased capillaries
- More synapses
- Improved neurocognitive performance
- Higher brain weight
Exercise

- Vascular endothelial growth factor
- Brain derived neurotrophic factor
- Insulin Like growth factor – 1
- Fibroblast growth factor
- Ca dependent protein Kinase
- cAMP response element binding protein
- Synapsin – 1
- Hyppocampal neurogenesis
- Collagen IV
- Inhibition of TNF – alpha
How do our thoughts, movement, and breath as well as the drugs we put in us impact recovery?
A Wandering Mind Is an Unhappy Mind

Effects of yoga on the autonomic nervous system, gamma-aminobutyric-acid, and alostasis in epilepsy, depression, and post-traumatic stress disorder.


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THE ABILITY OF PROLONGED RESPIRATORY EXHALATION FOR REDUCING PHYSIOLOGICAL AND PSYCHOLOGICAL AROUSAL IN NON-THREATENING AND THREATENING SITUATIONS*

Bruce M. Caprio and David S. Holmes†

(Received 17 June 1983; accepted in revised form 12 December 1983)

Abstract—To determine whether slowing and altering the respiratory pattern is an effective means for reducing physiological and psychological arousal, subjects participated in one of three treatments in which they reduced their respiratory rate to 6 cpm, and either inhaled slowly and exhaled slowly, inhaled slowly and exhaled quickly, or inhaled equal amounts of time inhaled and exhaling. Other control conditions were added and the effects were not significant. Slow breathing with a slow and deep pattern of breathing was used to achieve a relaxation response. The results of the present study indicate that slow breathing with a slow and deep pattern of breathing was used to achieve a relaxation response. The results of the present study indicate that slow breathing with a slow and deep pattern of breathing was used to achieve a relaxation response.
What is the rigor of current lit?

“Unlike in studies of drug effects, where a placebo is relatively straightforward, selection of a control condition is much more complex for behavioral interventions. Yet, because of its centrality to the interpretation of the study results, the comparison group is essential and must be selected with care and deliberation.”
Figure 1  Number of yoga intervention studies using passive and active comparison conditions.
Figure 2  Number of studies with passive only control conditions versus studies with active comparison conditions by year (ending mid-2012).
Yoga and Disorders of Stress

- The impact on the ANS has potential impacts
- Limited data
- Compelling explanation of basic principle
- Yoga practices associated with decreased cortisol
- Increase BDNF IGF-1
<table>
<thead>
<tr>
<th>Stress</th>
<th>Yoga-Based Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑ Sympathetic Nervous System (SNS)</td>
<td>↑ Parasympathetic Nervous System</td>
</tr>
<tr>
<td>↑ Hypothalamic-pituitary-adrenal Axis</td>
<td>↓ Hypothalamic-pituitary-adrenal Axis</td>
</tr>
<tr>
<td>↓ GABA Activity</td>
<td>↑ GABA Activity</td>
</tr>
</tbody>
</table>

**Fig. 3.** Stress related imbalance corrected by yoga-based practices.
Present Minded = Happy

- 250,000 samples
- 5000 people
- 83 countries
- age from 18 to 88
- 86 major occupational categories
- People were less happy when their minds were wandering than when they were not \( P < 0.001 \)

A Wandering Mind Is an Unhappy Mind
Matthew A. Killingsworth and Daniel T. Gilbert

Unlike other animals, human beings spend a lot of time thinking about what is not going on around them, contemplating events that happened in the past, or might happen in the future, or will never happen at all. Indeed, "stimulus-independent thought" or "mind wandering" appears to be the brain's default mode of operation (1, 2). Although this ability is a remarkable evolutionary achievement that allows people to learn, reason, and plan, it may have an emotional cost. Many philosophical and religious traditions teach that happiness is to be found by living in the moment, and practitioners are trained to resist mind wandering and "to be here now." These traditions suggest that a wandering mind is an unhappy mind. Are they right?

Laboratory experiments have revealed a great deal about the cognitive and neural bases of mind wandering (3, 4), but little about its emotional consequences in everyday life. The most reliable method for investigating real-world instances of experience sampling, which involves contacting people as they go about their daily lives to ask them about their thoughts, feelings, and actions at that moment. Unfortunately, collecting real-time reports from large numbers of people as they go about their daily lives is no easy matter and expensive that experience sampling has never been used to investigate the relationship between mind wandering and happiness and has always been limited to very small samples (6, 8).

We solved this problem by developing a Web application for the iPhone (Appie Incorporated, Cupertino, California), which we used to create an unusually large database of real-time reports of thoughts, feelings, and actions of a broad range of people as they went about their daily activities. The application contacts participants through their iPhones at random intervals, giving them more of 22 activities adapted from the day moni-tor method (5) and a mind-wandering question ("Are you thinking about something other than what you’re currently doing") answered with one of four options no, yes, something pleasant, yes, something neutral, or yes, something unpleasant. Our analyses revealed three facts.

First, people's minds wandered frequently, regardless of what they were doing. Mind wandering occurred in 46.9% of the sample and at least 50% of the samples taken during every activity except making love. The frequency of mind wandering in our real-world sample was considerably higher than is typically seen in laboratory experi-ments. Surprisingly, the nature of people's activities had only a modest impact on whether their minds wandered and had almost no impact on the pleasantness of the topic to which their minds wandered (5).

Second, multilevel regression revealed that people were less happy when their minds were wandering than when they were not [\( \bar{r} = 0.47, P < 0.001 \)], and this was true during all activities, including the least enjoyable. Although people's minds were more likely to wander to pleasant topics (42.3% of samples) than to unpleasant topics (26.5% of samples) or neutral topics (31% of sam-ples), people were no happier when thinking about pleasant topics than about their current activity (\( B = -0.52 \), not significant) and were considerably unhappier when thinking about neutral topics (\( B = -0.72, P < 0.001 \)) or unpleasant topics (\( B = -2.9, P < 0.001 \)) than about their current activity (Fig. 1, bottom). Although negative moods are known to cause mind wandering (1), time-lag analyses strongly suggested that mind wandering in our sample was generally the cause, and not merely the consequence, of unhappiness (12).

Third, what people were thinking was a better predictor of their happiness than was what they were doing. The nature of people's activities explained 4.6% of the within-person variance in happiness and 2.5% of the between-person variance in happiness, but mind wandering explained 16.5% of within-person variance in happiness and 17.7% of between-person variance in happiness. The var-iance explained by mind wandering was largely independent of the variance explained by the na-ture of activities, suggesting that the two were independant influences on happiness.

In conclusion, a human mind is a wandering mind, and a wandering mind is an unhappy mind. The ability to think about what is not happening is a cognitive achievement that comes at an emotional cost.

References and Notes
low breathing [...] reduced chemoreflex sensitivity, but long-term yoga practice was responsible for a generalised reduction in chemoreflex

Yoga and chemoreflex response to hypoxia and hypercapnia
Lucia Spicuzza, Alessandra Gabutti, Cesare Porta, Nicola Montano, Luciano Bernardi

We tested whether chemoreflex sensitivity could be affected by the practice of yoga, and whether this is specifically because of a slow breathing rate obtained during yoga or as a general consequence of yoga. We found that slow breathing rate per se substantially reduced chemoreflex sensitivity, but long-term yoga practice was responsible for a generalised reduction in chemoreflex.

• THE LANCET Vol 356
  October 28, 2000
• L. Spicuzza, A. Gabutti, C. Porta, N. Montano, L. Bernardi
• N22 Y10&C12
MBI Mindfulness-Based interventions

- June 2, 2014
- E. Larouche, C. Hudon, S. Goulet
- Hippocampal damage is central in MCI/AD, MBI may be helpful
- MBI may reduce stress, depression, metabolic syndrome
Prevent neuro-endocrine cascade leading to MCI/AD

- Neuro-endocrine
- Transmission regulation
- Immune
- Modifiable risk factors
Hatha Yoga and BMI + #ofRx

- N211 age match 182
- F>45yrs
- 1/x BMI&Rx to YogaxT
- Controls did significantly less non-yoga exercise
- Exercise and processed sugars were controlled for and the difference in groups still significant
- Would yogis be less likely to take meds?
Pharmacological management of neurobehavioral disorders following traumatic brain injury—A state-of-the-art review

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Abstract—Pharmacological management of neurobehavioral disorders following traumatic brain injury (TBI) is common practice. However, the evidence available to guide this practice remains sparse. This review summarizes, in brief, the state of knowledge, organized via a time continuum from injury as well as by symptom complex. The areas of neuroprotection, hypoarousal, attention and memory deficits, aggression, agitation, depression, and mania are reviewed. The literature was searched with PubMed on the terms “traumatic brain injury” or “brain injury” with “pharmacology” (and the symptoms according to which this review is arranged). Additional searches were conducted with the specific symptoms as search terms, crossed with the therapeutic agents or drug classes discussed. Where a paucity of prospective data exists, case reports and retrospective studies are included. Studies to date have yielded minimal positive evidence for enhancing function, memory, and behavior after TBI. No single agent likely will become sentinel in the recovery process, and combination therapy in the acute and postacute settings are required. A need exists to further define the role of psychopharmacology in postacute TBI medicine and the specific characteristics of subpopulations who might benefit.

Key words: aggression, agitation, arousal, attention, depression, mania, memory, neuroprotection, pharmacology, psychosis, traumatic brain injury.

INTRODUCTION

More than 5.3 million people, or approximately 2 percent of the U.S. population, are living with disabilities resulting from traumatic brain injury (TBI). TBI also accounts for a large proportion of casualties among surviving soldiers of the conflicts in Iraq and Afghanistan, with 22 percent of wounded soldiers having sustained injuries to the head, face, or neck [1]. The neurobehavioral sequelae of TBI are the most debilitating problems to survivors in their attempts to reestablish family and work relationships [2].

Abbreviations: ADHD = attention deficit hyperactivity disorder, BID = bis in die (twice a day), CSF 5-HIAA = cerebrospinal fluid 5-hydroxyindoleacetic acid, DR5 = Disability Rating Scale, DSM = Diagnostic and Statistical Manual of Mental Disorders, FIM = Functional Independence Measure, GABA = gamma-aminobutyric acid, GCS = Glasgow Coma Scale, GOAT = Galveston Orientation and Amnesia Test, GOS = Glasgow Outcome Scale, ICP = intracranial pressure, ICU = intensive care unit, IM = intramuscular, MCS = minimally conscious state, MMSE = Mini-Mental State Examination, NMDA = N-methyl-D-aspartic acid, PTA = posttraumatic amnesia, PVS = persistent vegetative state, RLAS = Rancho Los Amigos Scale, SPECT = single-photon emission computed tomography, SSRI = selective serotonin reuptake inhibitor, TBI = traumatic brain injury, TID = ter in die (three times a day), VS = vegetative state, WMS = Weschler Memory Scale, WNSSP = Western NeuroSensory Stimulation Profile.

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Email: rzafonte@partners.org
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The following information was taken from a lecture presented at the 2014 AAPM&R conference.

Neuropharmacology in TBI: What We Know and What We Don’t.

Heidi Fusco, M.D. Assistant Professor of Rehabilitation Medicine Mount Sinai Rehab Hospital

Jaime M. Levine, D.O. Assistant Clinical Professor Rusk Rehabilitation
Few pertinent Positives or Negatives

Some cons

Citicoline and atomoxetine do not have literature that supports use in promoting cognitive function after TBI
Atomoxetine does not significantly improve performance on measures of attention
Currently there is limited evidence for supporting or refuting the use of levodopa to support post-stroke motor recovery
Currently there is limited evidence for supporting or refuting the use of amphetamines to support post-stroke motor recovery
The evidence for the efficacy of dopaminergic agents in aphasia therapy is mixed
A very small number of patients with disorders of consciousness are responders to zolpidem, and it is not possible to distinguish responders in advance
Quetiapine can be used in severe cases of severe agitation, however olanzapine has slightly more support when agitation exists with psychosis

Some pros

Methylphenidate relatively safe, and recommended to improve attention, processing speed, concentration and vigilance but limited evidence that it improves functional outcome
Cholinesterase inhibitors have preliminary evidence for recovery of attention
Escitalopram and Donepezil are supported in the literature for memory recovery in CVA
Amantadine has most support for improving executive function after TBI
Memantine alone or combined with constraint-induced aphasia therapy in chronic poststroke aphasia patients improved aphasia
Melatonin has value for sleep disorders following head injury
Donepezil may improve the FIM motor score in elderly cognitively impaired patients post stroke
Amantadine, methylphenidate, propranolol, valproic acid have evidence for treatment of agitation after brain injury
Increasing Research in Brain Injury


Symptoms Drugs Target

- Depression
- Sedation
- Attention
- Tone
- Pain

- Psychosis
- Irritability
- Aggression
- Memory impairment
- Seizures
“Yeah, but good luck getting it peer-reviewed.”
What ingredients create the best milieu for recovery?
Yoga and Medication

• Both are tools that can be used to target different goals
• Both start low and go slow, but go!
• Both have compliance issues
• Both have an LD 50 and therapeutic ranges
• Both can be changed, adjusted and modified
• Both are subject to clinician and patient bias for and against
Examples of Synergism

• Yoga Nidra & Ambien, Rozerum, sleep hygiene
• Bhvana & Zoloft, Music, exercise
• Dosha assessment & CBT, Vocational therapy
• Prana Vayus & sleep study, endocrine Dx/Tx
• Langhana/Brahmana & Valproate, citalopram
• Chakra balancing & family and group therapy
Examples of Synergism

• Asanas & intrathecal baclofen
• Vinyasa & keppra/vimpat
• Mudra & PRN IM Geodon/ PO Propranolol
• Pranayama & Amantadine/Buspirone
• Somatics & Zofran/Meclizine
• Kosha balance & CBT/escitalopram/Duloxetine
• Nadhi Sudi & Maxalt MLT & Ibuprofen
Yoga Therapist Acumen

Available Supporting Literature

Clinical decision making

Basic Principle
Physician Acumen

Basic Principle

Available Supporting Literature

Clinical decision making
What techniques for mindfulness promote healing?
Demosthenes

*Demosthenes Practicing Oratory*

Jean-Jules-Antoine Lecomte du Nouy
(1842–1923)
Yoga Therapy Rx Demosthenes

Name: Demosthenes 45 YOM SM
Dx: Multiple Blast Injuries/MCC

Major Barriers:
• Blocking of speech
• Anxiety
• Low frustration tolerance
• Musculoskeletal pain secondary to OA
• Post Traumatic Migraines
Yoga therapy Rx Demosthenes

• Initial Evaluation
  Practice yoga nidra without tensing of the body
  - No ‘seizures’ blocking in practice.
  - Takes minutes to come out of relaxation, tearful
  - Writes that he hates that he can’t talk

• Recommended POA
  30 min 1:1s, 2x a week
  pranayama and yoga nidra
  no asana
Yoga Therapy Rx Demosthenes

• **Over the Next Month**
  Client experiences “loosing himself” during deep relaxation
  **Discussion:** "losing yourself” is simply existing in true peace
  *This Peace is always present, we always have access to it.*
  Client acknowledges he has control & wants to be able to access this peace without being guided to it

• **Home Practice**
  Inhale – breath enters every cell, brings in energy and life force, cleanses, washes
  Exhale - release tension, anxiety, let go of anything he is trying to get rid of
Yoga Therapy Rx Demosthenes

- **Attends Relaxation Group**
  Participates fully through the entire class, including tense/release during yoga nidra. Remains in control and even smiles when the door behind his head is opened.

- **Meditation in Movement**
  Focus: Keeping body strong while relaxed. Allow breath and mental focus to “rise above” the body
  Sun Salutations and foundational asanas

- Client now appropriate for Hatha Group in addition to 1:1s and relaxation group

- Home Practice
Philosophy will clip an Angel's wings,
Conquer all mysteries by rule and line,
Empty the haunted air, and gnomèd mine—
Unweave a rainbow, as it erewhile made
The tender-person'd Lamia melt into a shade
--John Keats, *Lamia*

*The Lamia (1909)*
Herbert James Draper
Yoga Therapy Rx Lamia

**Name**: Lamia 58 YOF

**Dx**: TBI MVA +ETOH grand child killed in accident

**Major Barriers**:

- Client is resistant to yoga, says she can’t do it b/c of wheel chair
- Psychologist having a difficult time accessing deep-seated guilt/emotional traumas
- Low self-esteem/self worth
Yoga Therapy Rx Lamia

- **Initial Evaluation**
  - Approach as a physical practice to address shoulder issues
  - Pranayama and yoga nidra included
- **Over the Few Months**
  - Breath-Body communication
  - Introduce more movement/hip openers
  - Meditation introduced

Client shares she will be going to confession to take the eucharist for the first time in 19 years. Her family will be with her. She reports she hasn't been because she hasn't "been worthy," but she is now. Approaches psychologist in hallway. Client moves out of her chair to practice yoga nidra laying down.
Perseus

*Perseus with the head of Medusa*  
(1554)  
Benvenuto Cellini
Yoga Therapy Rx Perseus

**Name:** Perseus 50 YOM

**Dx:** TBI Blast injuries PTSD

**Major Barriers:**

- PTSD
Yoga Therapy Rx Perseus

Initial Evaluation
- Introduction to Hatha & Relaxation Group
- Focus on modifications to maintain asanas
- Embraces entire session, says it’s "cool"

Over the First Few Weeks
- Expresses desire to not be on so many medications (he discusses with MD), but concerned about the nightmares from the PTSD that occur when not on certain meds.
- Discuss using Yoga to help him thru this process.
- Client given audio version of yoga nidra
- Attends Hatha, Gentle, & 1:1 each week
Yoga Therapy Rx Perseus

Over the Next Months
- Shoulder Surgery: practice pranayama techniques, body-breath communication
- Initiates conversation in which many aspects of his recovery are discussed, *highlights acceptance and present moment awareness*.
- Introduce Mindful Meditation

  *Neurons that Fire Together, Wire Together*

- When client becomes agitated, annoyed with his lack of control over his situation, he is to stop and take a deep breath and try to access the peace inside.
Another Day

- Client is "not good" when I first enter the room due to the fire alarm going off hours earlier. Expresses he couldn't get far enough away, the sound brought him back to being under airstrikes and waiting for casualties to come in.

- He never felt like he was physically in war and kept telling himself "I'm ok, It's ok"

- We practice the session with an emphasis on being present with the body, mind and breath.

- Closing meditation: Loving Presence.

Discuss: Neurons that fire together, wire together and how there is no path in the brain that can't be rewired.
Pandora

_Pandora_ (1896)
John William Waterhouse
Yoga Therapy Rx Pandora

**Name:** Pandora 28 YOF  
**Dx:** Major Depression TBI

**Major Barriers:**
- insomnia
- previous suicide attempts
- anosagnosia
- decreased attention
- feels helpless (but not hopeless)
Yoga Therapy Rx Pandora

Initial Evaluation
- Particularly anxious with akathisia and popping of joints
- Client already in Hatha and Relaxation Groups

Focus
- Breath-Body-Mind Connection
- Meditation in Movement
Yoga Therapy Rx Pandora

Over the Next Months
- Client excuses herself during the day when anxiety attack is approaching to practice the breathing exercises
- She falls asleep
- Client reports feeling much better after full yoga sessions, exhibits a smiling face and calm nature.
- Uses pranayama before job interviews
Incidental teaching and Yoga
What approaches can be used to access interventions?
Compliance and Communication

- Medication prescriptions never filled: 20% to 30%
- Medication not continued as prescribed in about 50% of cases
- The World Health Organization estimated that by 2020, the number of Americans affected by at least one chronic condition requiring medication therapy will grow to 157 million

Medication Adherence in United States

- Rates of medication adherence drop after first six months
- Only 51% of Americans treated for hypertension are adherent to their long-term therapy
- About 25% to 50% of patients discontinue statins within one year of treatment initiation

Resident: John D.  
Calm =  
Swearing = X  
Hitting = ■

Month: Sept. 08

Interval ending at:

Comments:
Objective Measures

J.R. Significant Behavioral Events
(SIB, Property Destruction, Aggression)

Cumulative events
Days

- Admit to STE's
- DC Prozac
- Prozac 40mg
- Holida

Days: 8/11/13, 8/15/13, 8/17/13, 8/28/13, 9/10/13, 9/11/13, 9/12/13, 9/13/13, 10/15/13, 10/17/13, 10/18/13, 10/19/13, 11/8/13, 11/9/13, 11/10/13, 11/11/13, 12/2/13, 12/3/13, 12/4/13, 12/5/13, 12/6/13, 12/7/13, 12/8/13, 12/9/13, 12/10/13, 12/11/13, 12/12/13, 12/13/13, 12/14/13, 12/15/13, 12/16/13, 12/17/13, 12/18/13, 12/19/13, 12/20/13, 12/21/13, 12/22/13, 12/23/13, 12/24/13, 12/25/13, 12/26/13, 12/27/13, 12/28/13, 12/29/13, 12/30/13, 12/31/13, 1/1/14, 1/2/14, 1/3/14, 1/4/14, 1/5/14, 1/6/14, 1/7/14, 1/8/14, 1/9/14, 1/10/14, 1/11/14, 1/12/14, 1/13/14, 1/14/14, 1/15/14, 1/16/14, 1/17/14, 1/18/14, 1/19/14, 1/20/14, 1/21/14, 1/22/14, 1/23/14, 1/24/14, 1/25/14, 1/26/14, 1/27/14, 1/28/14, 1/29/14, 1/30/14, 2/1/14, 2/2/14, 2/3/14, 2/4/14, 2/5/14, 2/6/14, 2/7/14, 2/8/14, 2/9/14, 2/10/14, 2/11/14, 2/12/14, 2/13/14, 2/14/14, 2/15/14, 2/16/14, 2/17/14, 2/18/14, 2/19/14, 2/20/14, 2/21/14, 2/22/14, 2/23/14, 2/24/14, 2/25/14, 2/26/14, 2/27/14, 2/28/14, 3/1/14, 3/2/14, 3/3/14, 3/4/14, 3/5/14, 3/6/14, 3/7/14, 3/8/14, 3/9/14, 3/10/14, 3/11/14, 3/12/14, 3/13/14, 3/14/14, 3/15/14, 3/16/14, 3/17/14, 3/18/14, 3/19/14, 3/20/14, 3/21/14, 3/22/14, 3/23/14, 3/24/14, 3/25/14, 3/26/14, 3/27/14, 3/28/14, 3/29/14, 3/30/14, 3/31/14

Cumulative events range from 0 to 30.
Mellaril Dc’d, numerous alternates tried

Mellaril restarted
The Enduring Cult of Apothecary


- As a profession dates to 2600 BC Babylon (Allen, Jr. Lloyd. A History of Pharm Compounding Secundum Artem. Vol 11 #3.)

- Food, Supplement, Drug

- Given by a socially trusted position, Shaman, Doctor, Religious leader, Curandero

- Culturally ingrained, FDA, Bulletin #5
The Enduring Cult of the Yogi

- No physical, cognitive, or emotional barrier to entry
- Adaptability: personal practice evolves with needs
- Vestibular & Proprioceptive
- Memory: Meditation increased frontal cortical thickening, increased gray matter density
- Spiritual: not culture or faith specific

- Breathing: Autonomic control (dysautonomia)
- DMN: low freq alpha & theta waves (memory)
- Conditioning: 60% of max capacity
- Zero negative side effects
- Cost: zero and up
Finito