

Mindfulness – Possible Utility in PD Management

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Outlines

- Background on Stress
- What is meant by mindfulness
- Benefits of mindfulness on neuropsychiatric function
- Mindfulness and Parkinson's disease
- Current research and future goals

Background on Stress and PD

- We all know stress can worsen motor symptoms in PD, but very little good research examining the specific effects of motor symptoms
- Also wonder if stress may be related to the development or progression of PD, again fairly limited human data
- Wonder if reducing stress could have effects of PD symptoms and slow progression
- Could stress be a risk factor we could measure and modify

Background Stress and PD

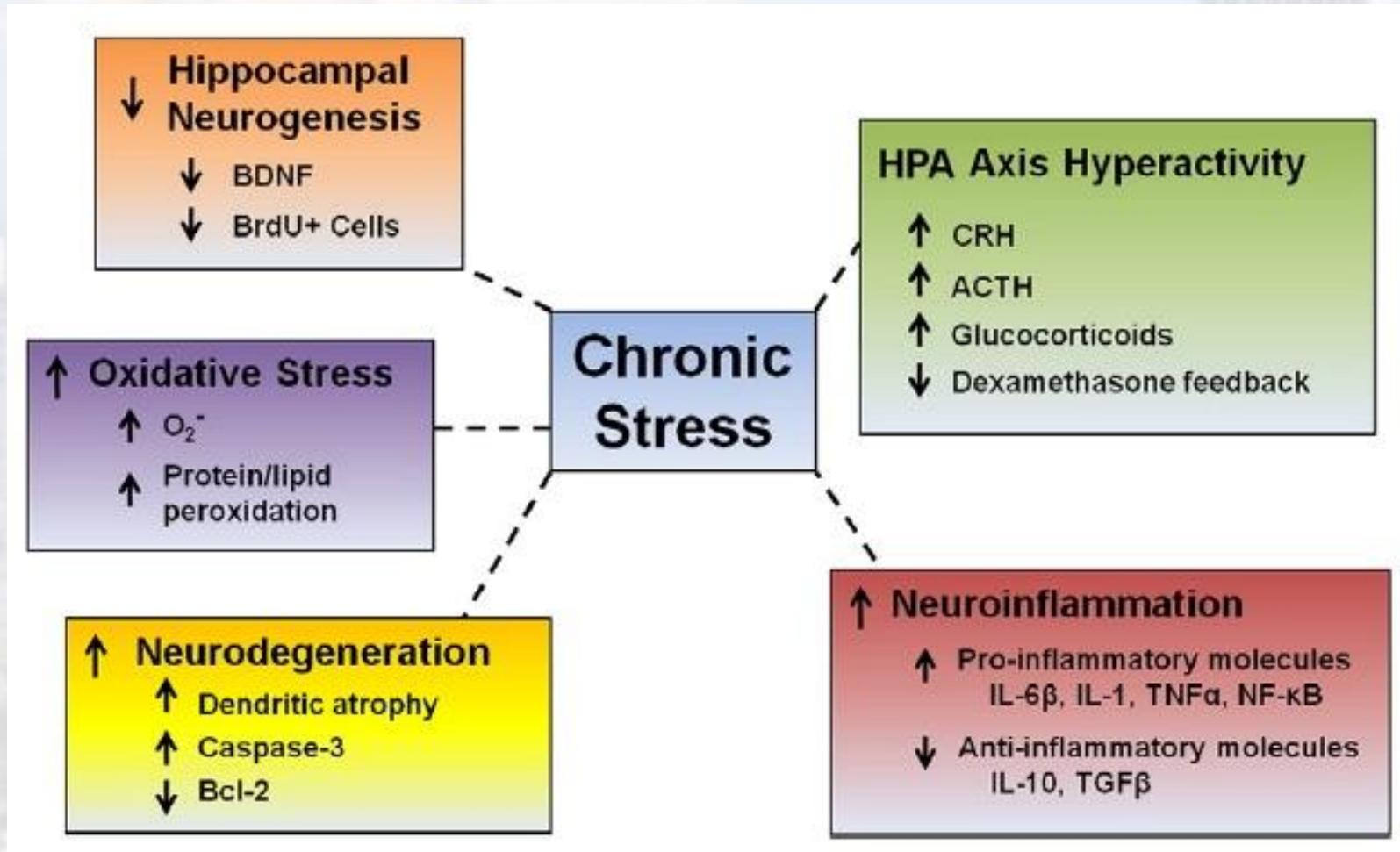
REVIEW

Pathogenesis of Parkinson's Disease

Etienne C. Hirsch, PhD,^{1,2,3} Peter Jenner, PhD, DSc, FRPharmS,⁴ and Serge Przedborski, MD, PhD^{5*}

- “...suggests that cell death in Parkinson's disease is caused by a multi-factorial cascade of pathogenic events and argues that for effective neuroprotective therapy for Parkinson's disease may have to rely on multiple drug interventions.”

Background on Stress



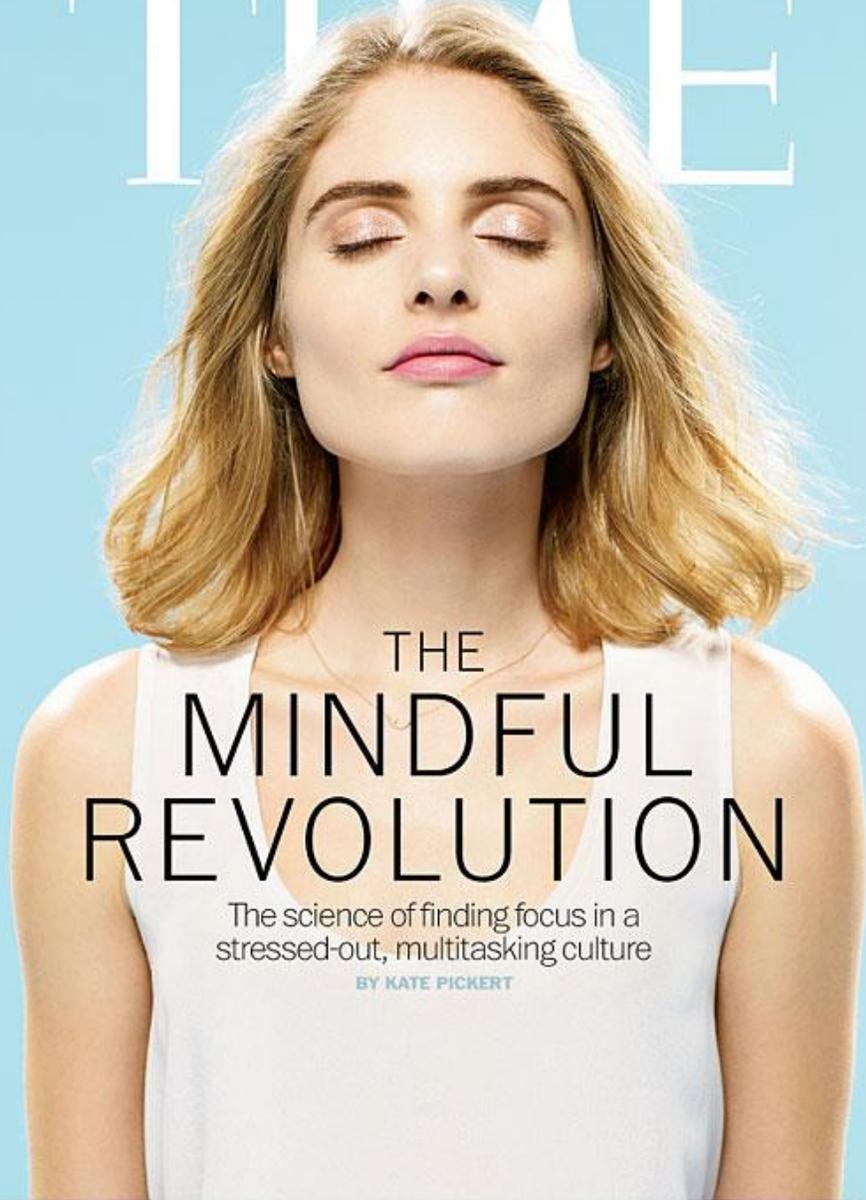
Mindfulness

- **Mindfulness is a means of improving mental health and reducing symptoms of stress.** Mindfulness is as a moment-to-moment non-judgmental awareness and a means to reduce stress and improve coping. Programs focus on tools to cope with intense physical and emotional situations, relaxation practices such as meditation and yoga, and discussion of techniques.

FEBRUARY 3, 2014

Fleeing Syria Photographs by James Nachtwey / Peyton Power / Steve McQueen

TIME



THE MINDFUL REVOLUTION

The science of finding focus in a stressed-out, multitasking culture

BY KATE PICKERT

time.com



MAGAZINE | The Muddled Meaning of 'Mindfulness'

Magazine

The Muddled Meaning of 'Mindfulness'

First Words

By VIRGINIA HEFFERNAN APRIL 14, 2015



Mindfulness Based Stress Reduction (MBSR)

TABLE 1. MBSR Program Outline

Session	Topic/Theme	Practices
1	Introductions: There is more right with you than wrong with you	Mindful eating, grounding practice, body scan
2	Stress: Our perceptions of our experience impacts our mood and physiology	Body scan, mindfulness of the breath
3	Noticing experience and savoring that which is pleasant	Mindful movement, spaciousness practice, mindfulness of sounds
4	Getting unstuck, noticing unhelpful habitual patterns	Mindful movement, short loving kindness, 3-minute breathing space
5	Spaciousness, the lifelong work of moving from reacting to responding	Mindful movement, loving kindness, choiceless awareness, walking meditation
6	Chronic pain	Mindful movement, mindfulness of the breath, loving kindness
Retreat	Deepening the practice on silent retreat	Mindful movement, body scan, mindfulness of the breath, walking meditation, loving kindness, mountain meditation, mindful eating, walking loving kindness
7	Interpersonal mindfulness, staying open in an unpredictable process	Mindful movement, mindfulness of the breath, walking meditation
8	Forgiveness and moving on, how to support your ongoing practice	Mindful movement, grounding practice, loving kindness

Standardised Mindfulness-Based Interventions in Healthcare: An Overview of Systematic Reviews and Meta-Analyses of RCTs

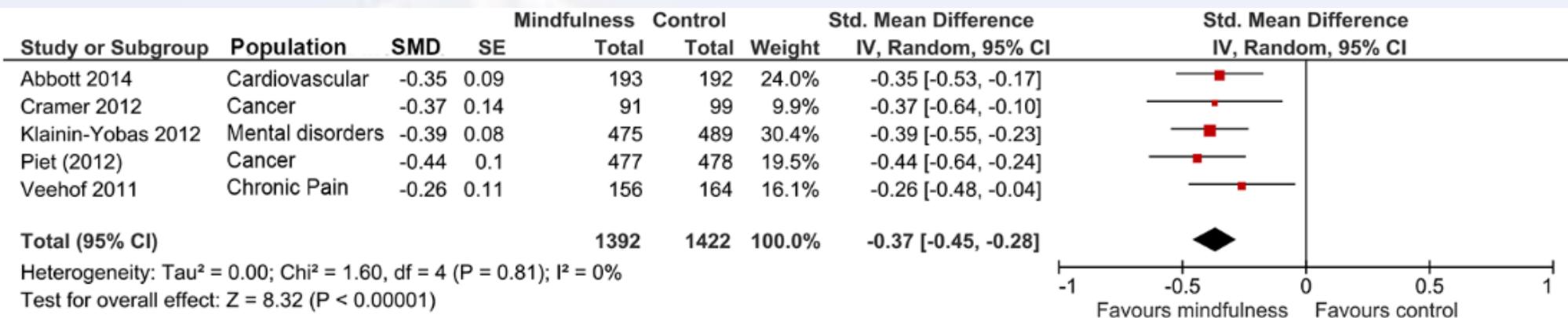
Gotink RA, Chu P, Busschbach JJV, Benson H, Fricchione GL, et al. (2015) PLoS ONE.

Table 2. Study characteristics.

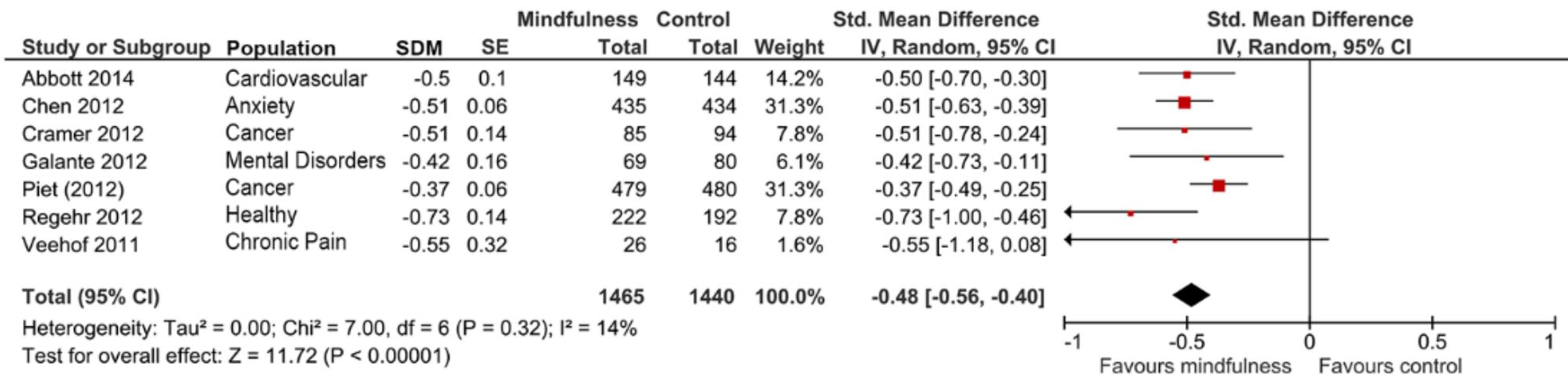
Author (year)	Design	Population (number of participants)	Intervention (number of RCT's)	Control intervention	Outcome measure
Ledesma (2009)	Syst & Meta	Cancer (381)	MBSR (4)	2 TAU, 2 not specified	Mental health, physical health
Piet (2012)	Syst & Meta	Cancer (955)	Both (9)	6 WL, 3 TAU	Depression, anxiety
Cramer (2012)	Syst & Meta	Cancer (327)	MBSR (3)	TAU, 2 AT	Quality of life, mental health
Ott (2006)	Syst	Cancer (326)	MBSR (3)	WL, 2 AT	Mental health, sleep, nutrition
Smith (2005)	Syst	Cancer (268)	MBSR (3)	WL, TAU, AT	Mental health, sleep
Shennan (2011)	Syst	Cancer (215)	Both (3)	WL, 2 TAU	Anxiety, mood, mental health
Veehof (2011)	Syst & Meta	Chronic Pain (409)	MBSR (7)	3 WL, TAU, 3 AT	Mood, mental health
Cramer (2012)	Syst	Chronic Pain (117)	MBSR (3)	2 WL, AT	Pain intensity, disability, safety
Kozasa (2012)	Syst	Chronic Pain (208)	MBSR (2)	WL, TAU	Depression, quality of life
Abbott (2014)	Syst & Meta	Cardiovascular (557)	Both (9)	6 WL, TAU, 2 AT	Depression, anxiety, stress, hypertension
Bohlmeijer (2009)	Syst & Meta	Chronic somatic diseases (667)	MBSR (7)	WL	Mood, anxiety, mental health
Lakhan (2013)	Syst & Meta	Chronic somatic diseases (883)	Both (10)	6 WL, 4 AT	Symptom severity
Chiesa (2011)	Syst & Meta	Depression (781)	MBCT (14)	12 TAU, 2 AT	Depression (relapse), quality of life
Coelho (2007)	Syst	Depression (265)	MBCT (3)	TAU	Mood
Piet (2011)	Syst & Meta	Depression (593)	MBCT (6)	4 TAU, 2 AT	Depression relapse
Chen (2012)	Syst & Meta	Anxiety (1244)	Both (13)	8 WL, 5 AT	Anxiety
Klainin-Yobas (2012)	Syst & Meta	Mental disorders (964)	Both (13)	10 TAU, 3 AT	Mood, anxiety, mental health
Galante (2012)	Syst & Meta	Mental disorders (859)	MBCT (11)	10 TAU, AT	Depression (relapse), anxiety
Davis (2012)	Syst	Mental disorders (90)	Both (2)	WL, AT	Clinical functioning, mindfulness
Strauss (2014)	Syst & Meta	Mental disorders (550)	Both (11)	WL, 4 TAU, 6 AT	Anxiety, symptom severity
De Vibe (2012)	Syst & Meta	Mixed population (1942)	MBSR (31)	21 WL, 3 TAU, 7 AT	Mental health, physical health, quality of life, social function
Regehr (2012)	Syst & Meta	Healthy adults (247)	MBSR (5)	unknown	Mood, anxiety, stress
Burke (2009)	Syst	Children (330)	Both (2)	TAU, activities	Social skills, attention, temperament, stress

Syst = Systematic Review; Meta = Meta-analysis; MBSR = Mindfulness Based Stress Reduction; MBCT = Mindfulness Based Cognitive Therapy; TAU = treatment as usual; WL = waiting list; AT = Active Treatment

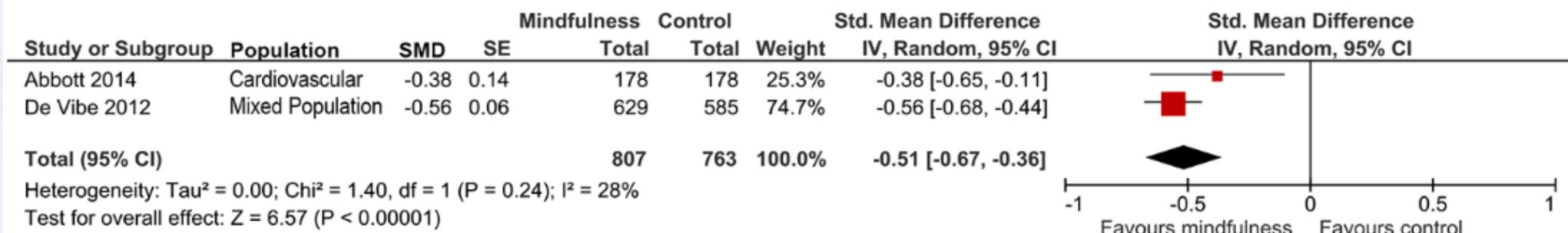
doi:10.1371/journal.pone.0124344.t002



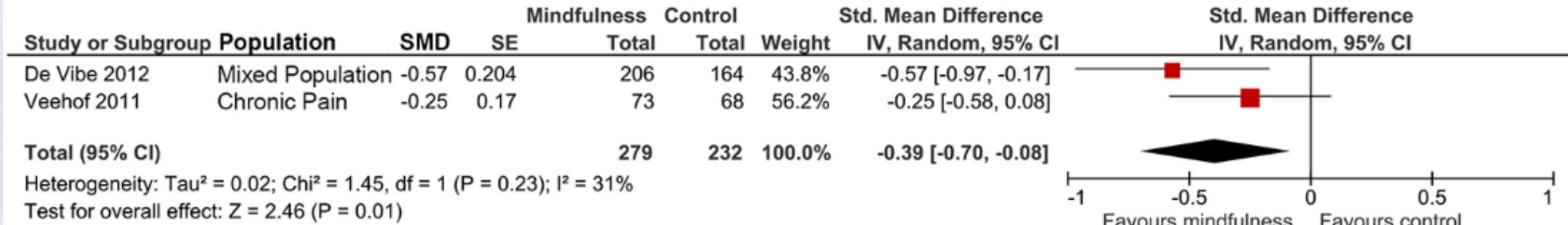
a) Depression



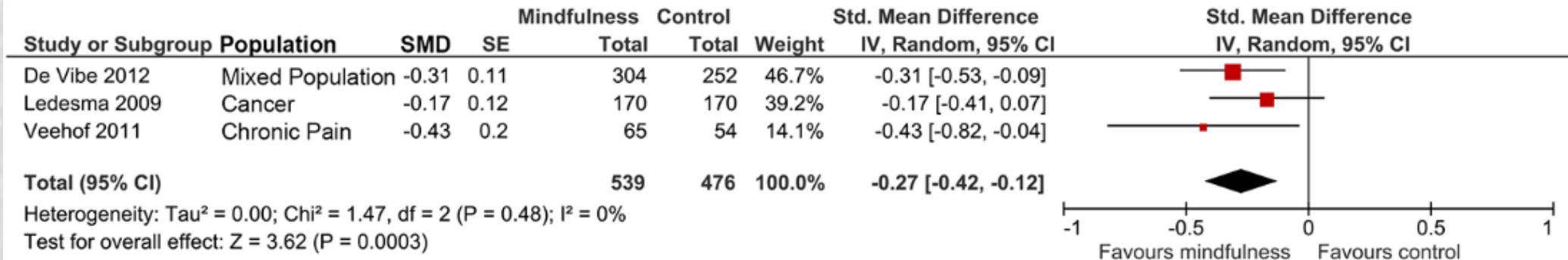
b) Anxiety



c) Stress



d) Quality of Life



e) Physical functioning

Mindfulness and Cognition

- Stress seems to have particularly negative effects on the hippocampus
- The negative effects of stress may be greater as persons age, experience cognitive decline, and lower their reserve
- There are specific aspects of cognitive function that appear sensitive to mindfulness

The potential effects of meditation on age-related cognitive decline: a systematic review

Tim Gard,^{1,2,3} Britta K. Hölzel,⁴ and Sara W. Lazar¹

- Included 12 studies (6 RTC's)
- Positive effect on:
 - Attention
 - Memory
 - Executive function
 - Processing speed
 - General cognition
- Studies were of limited quality - high risk of bias and small sample sizes
- **Conclusion** – mindfulness is feasible in older adults and there is preliminary evidence it may offset age-related decline

Mindfulness in Veterans

- Found 9 studies in the literature focused on Veterans

Mindfulness-based Stress Reduction (MBSR) Reduces Anxiety, Depression, and Suicidal Ideation in Veterans

J. Greg Serpa, PhD,† Stephanie L. Taylor, PhD,*‡ and Kirsten Tillisch, MD*§*

- Examined effects of mindfulness in 79 veterans
- Was a quality improvement project and there was not a control group
- Saw reductions in anxiety, depression, and suicidal ideations and improvement in mental health functionality
- These improvements were related to improvements in mindfulness
- They did not see improvements in pain intensity or physical functioning

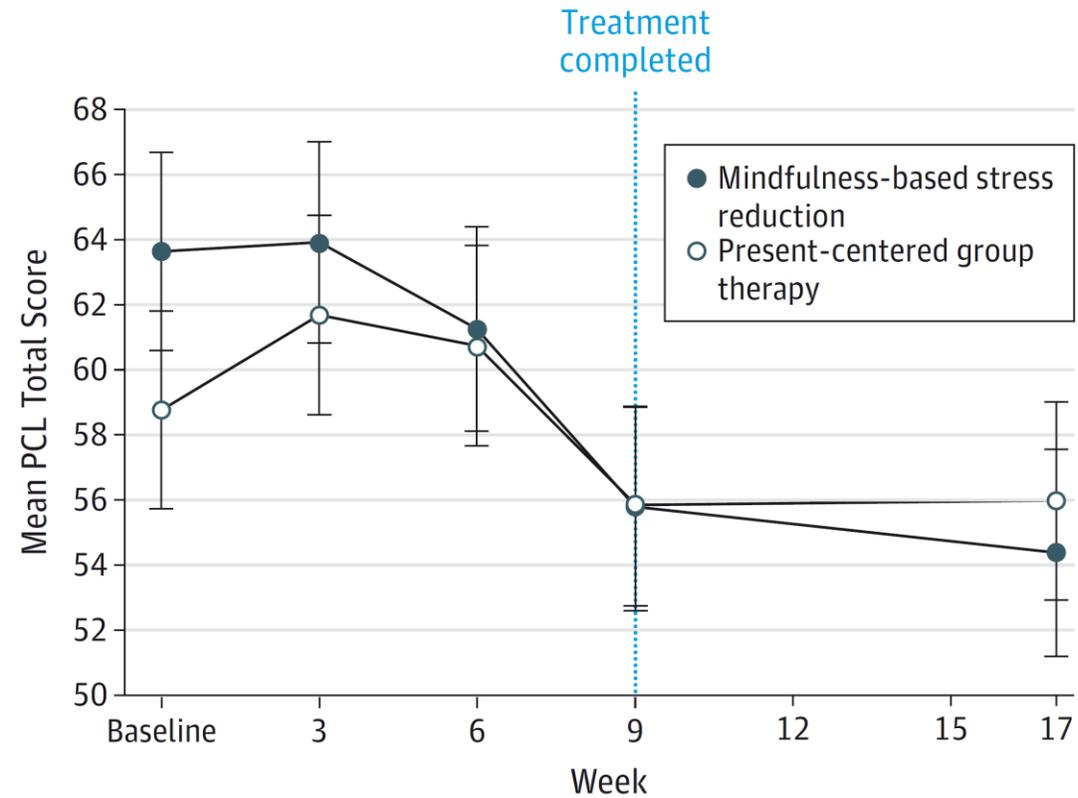
Mindfulness-Based Stress Reduction for Posttraumatic Stress Disorder Among Veterans

A Randomized Clinical Trial

Melissa A. Polusny, PhD; Christopher R. Erbes, PhD; Paul Thuras, PhD; Amy Moran, MA; Greg J. Lamberty, PhD;
Rose C. Collins, PhD; John L. Rodman, PhD; Kelvin O. Lim, MD

- Enrolled 116 veterans with PTSD
- Control group received 1.5 hour weekly group sessions focused on symptoms severity
- There was a great reduction in PTSD severity in persons in the mindfulness group
- 49% versus 28% had a clinically significant reduction in PTSD symptoms at 2 months follow-up
- There was no significant difference in loss of PTSD diagnosis between groups

Figure 2. Posttraumatic Stress Disorder Symptom Severity on the PTSD Checklist (PCL) as a Function of Treatment Group



No. of patients	Baseline	3	6	9	17
Mindfulness-based stress reduction	58	54	50	52	47
Present-centered group therapy	58	56	54	57	57

Data are intention-to-treat means; error bars indicate 95% CIs.

Mindfulness in other Neurological diseases

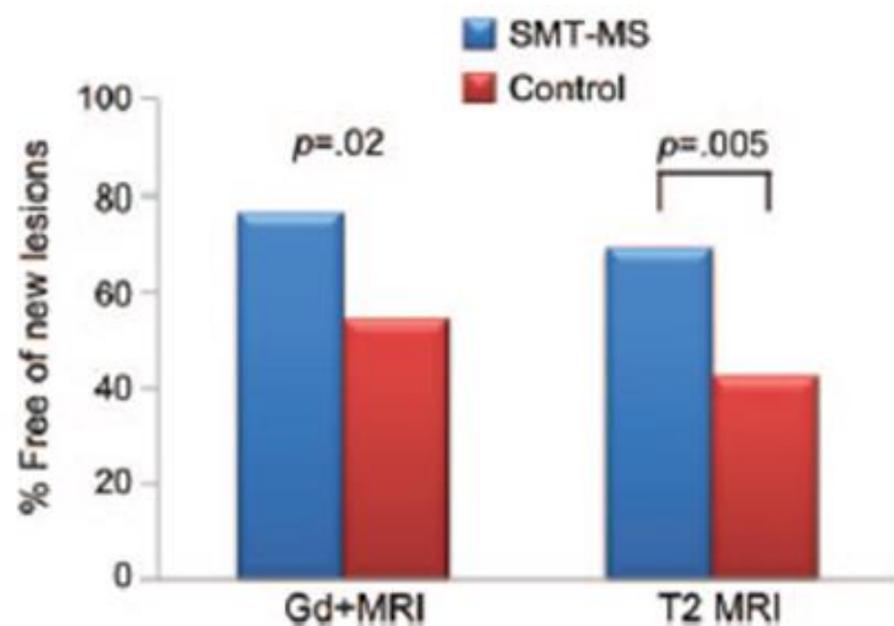
A randomized trial of stress management for the prevention of new brain lesions in MS

David C. Mohr, Jesus Lovera, Ted Brown, et al.

Neurology 2012;79;412;

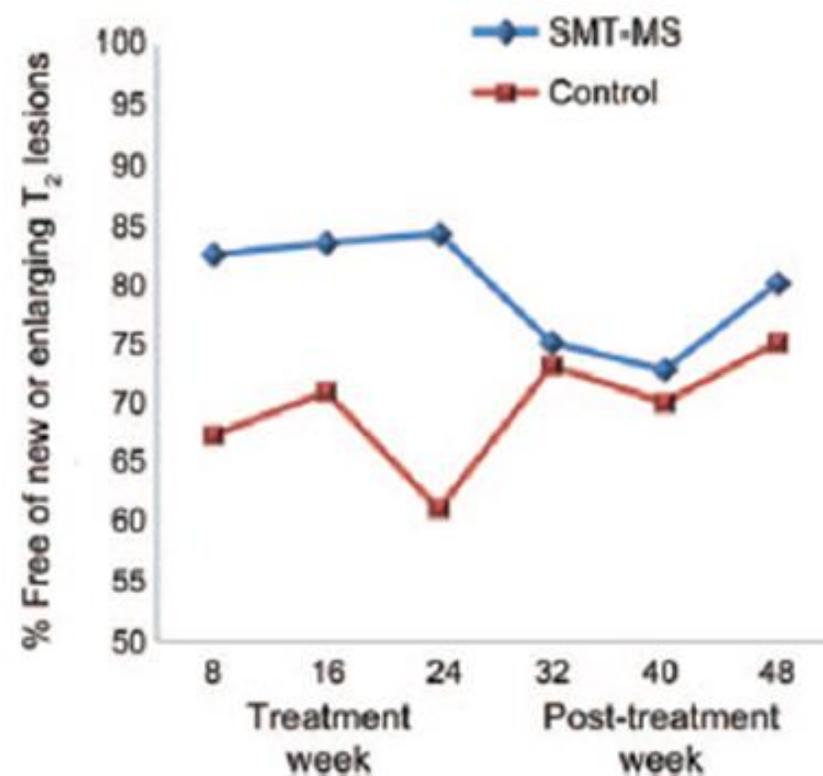
- 121 patient with relapsing MS were randomized to a stress management therapy vs. wait list control
- The stress management therapy is a structured program and involved 16 individual sessions over 24 weeks with a trained therapist
- The primary outcome measure was the development of new gad positive lesions on MRI

Figure 2 Percent of participants free of gadolinium-enhancing (Gd+) and T2 lesions by treatment group during 24-week treatment period



SMT-MS = stress management therapy for multiple sclerosis.

Figure 3 Percentage of participants free of new or enlarging T2 lesions at each time point by treatment group



SMT-MS = stress management therapy for multiple sclerosis.

Mindfulness in Parkinson's

- 3 small published studies





A qualitative analysis of mindfulness-based cognitive therapy (MBCT) in Parkinson's disease

Lee Fitzpatrick^{1*}, Jane Simpson¹ and Alistair Smith²

¹Institute for Health Research, Lancaster University, UK

²Older People's Mental Health Services, Lancashire Care Foundation NHS Trust, Chorley, Lancashire, UK

- 11 of 12 subjects completed the intervention

Themes were:

- Changing patterns of coping
- The role of mindfulness in consolidating coping skills in context of loss
- Group support in the context of loss and society the stigmatizes difference
- The dualism of experience between PD and mindfulness meditation – very calm and peaceful was different that typical feelings on having PD



Review

Mindfulness based intervention in Parkinson's disease leads to structural brain changes on MRI

A randomized controlled longitudinal trial

Barbara A. Pickut^{a,b,g,h,*}, Wim Van Hecke^{a,c}, Eric Kerckhofs^d, Peter Mariën^{e,g}, Sven Vanneste^a, Patrick Cras^{a,b,h}, Paul M. Parizel^{a,f}

- Randomized 30 people to usual care versus MBSR
- 14/15 completed MBSR, 13/15 controls completed
- Used MRI data as outcome
- Found increased gray mater density in the region of interest analysis in the right amygdala and bilaterally in the hippocampus
- Whole brain analysis showed increased grey matter density in the left and right caudate nucleus, the left occipital lobe at the lingual gyrus and cuneus, the left thalamus, and bilaterally temporo-parietal junction.
- They did not correct for multiple comparisons

Mindfulness Training among Individuals with Parkinson's Disease: Neurobehavioral Effects

Parkinson's Disease
Volume 2015, Article ID 816404

Barbara Pickut,^{1,2,3,4} Sven Vanneste,^{1,5} Mark A. Hirsch,⁶ Wim Van Hecke,^{7,8} Eric Kerckhofs,⁹
Peter Mariën,^{10,11} Paul M. Parizel,^{1,8} David Crosiers,² and Patrick Cras^{1,2,12}

- Enrolled 30 participants, 27 completed
- Randomized to MBSR or best clinical care, raters were blinded
- Significant changes in:
 - UPDRSm (27->22 vs 23->29, $F=4.39$, $p<0.05$)
 - One Facet of Five Facet Mindfulness Questionnaire - observe
 - One component PDQ-39 - pain
- No significance difference other UPDRS subscales, total FFMQ or PDQ-39, or Beck Depression Scores between groups
- Statistics and control group appear a bit weak

Mindfulness Training among Individuals with Parkinson's Disease: Neurobehavioral Effects

Barbara Pickut,^{1,2,3,4} Sven Vanneste,^{1,5} Mark A. Hirsch,⁶ Wim Van Hecke,^{7,8} Eric Kerckhofs,⁹ Peter Mariën,^{10,11} Paul M. Parizel,^{1,8} David Crosiers,² and Patrick Cras^{1,2,12}

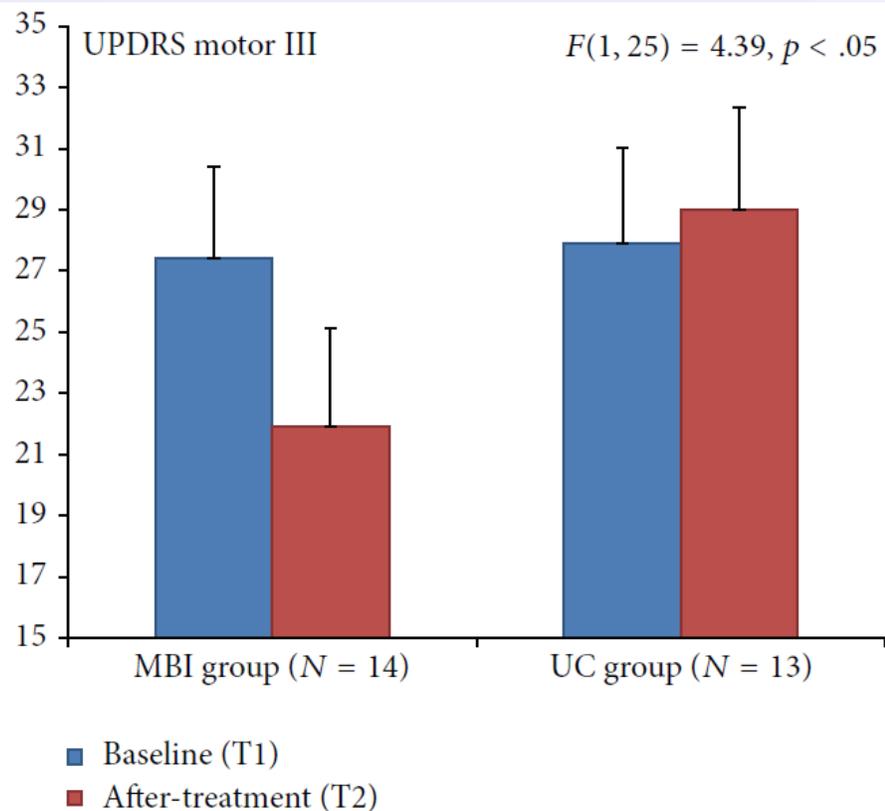


FIGURE 1: Unified Parkinson's Disease Rating Scale (UPDRS) for motor change showed a significant effect for the MBI group.

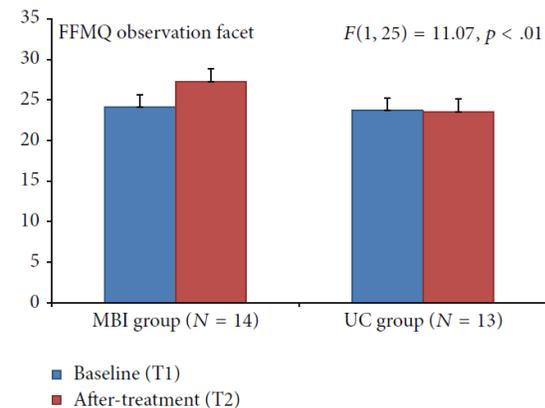


FIGURE 2: Five Facet Mindfulness Questionnaire (FFMQ) for observation facet showed a significant effect for the MBI group.

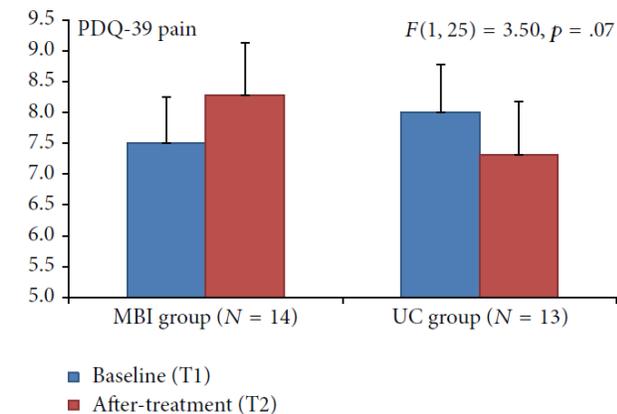


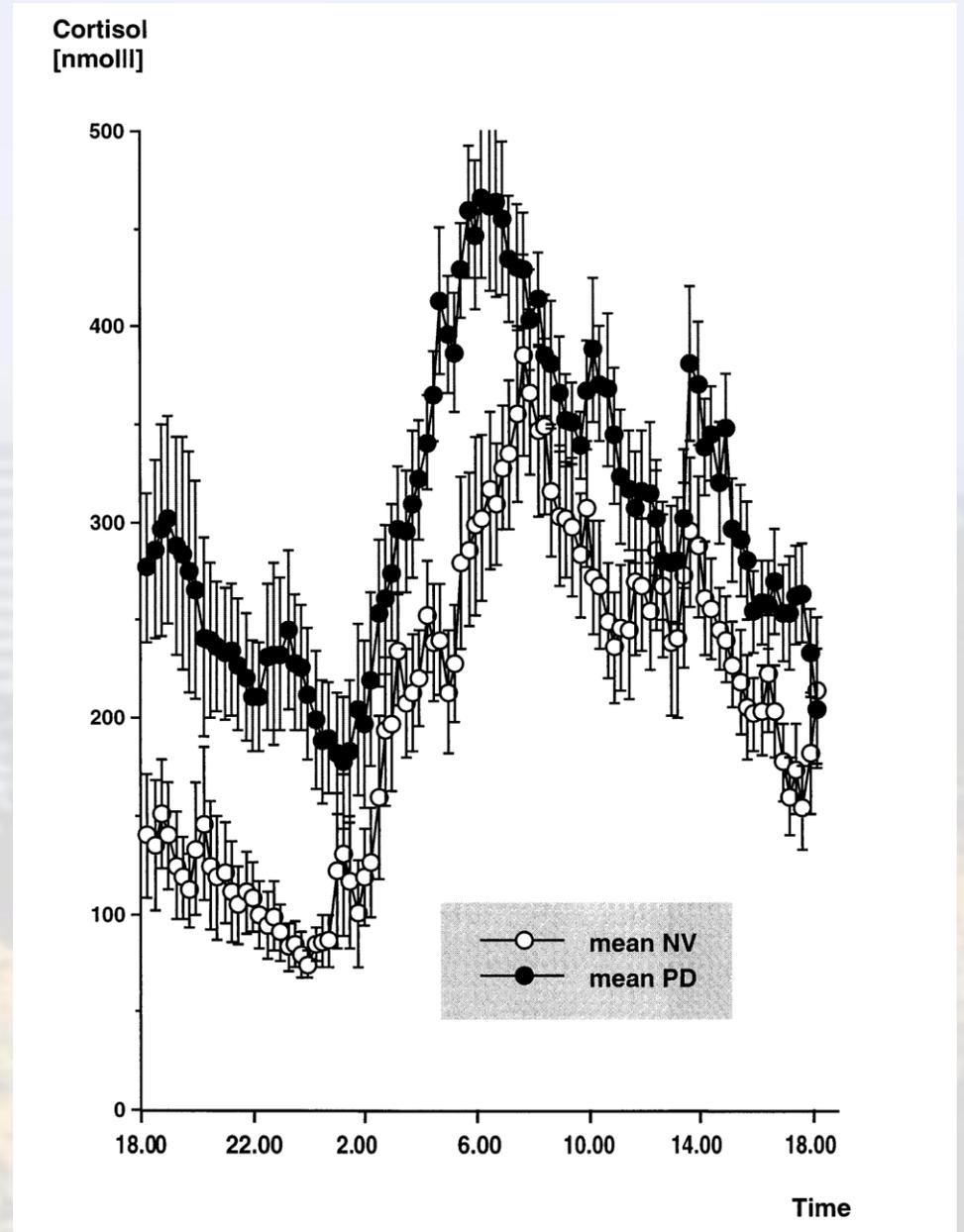
FIGURE 3: Parkinson's Disease Quality of Life (PDQ-39) showed a marginal significant effect for the MBI group.

Current Research related to Mindfulness

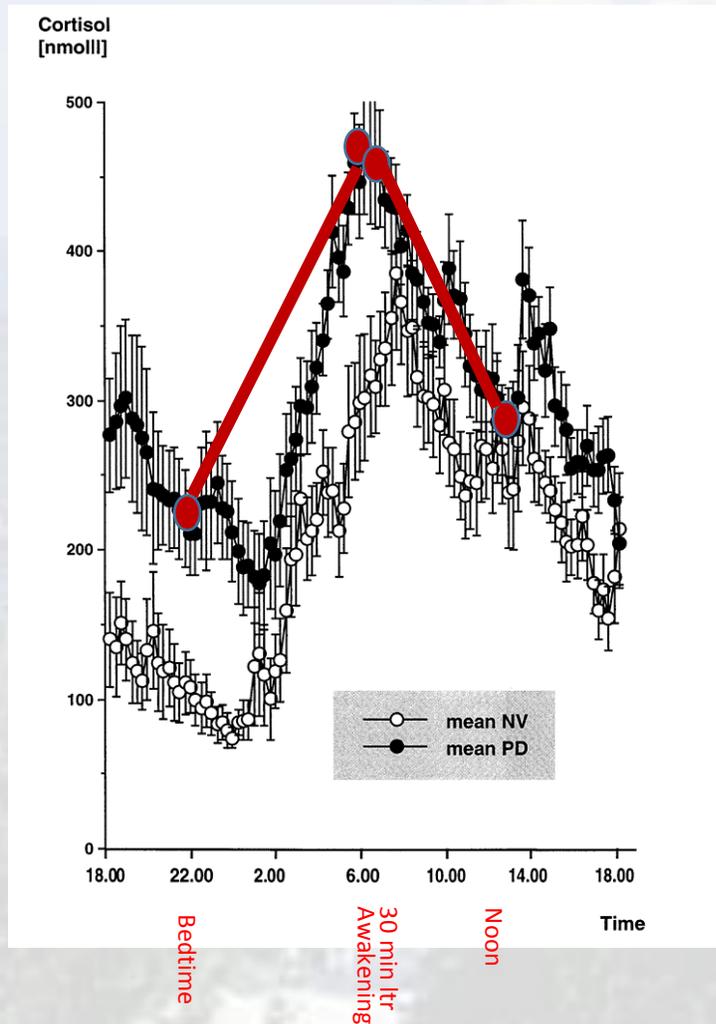
- Salivary cortisol in PD
- Small pilot using tele-medicine to deliver mindfulness
- Planning to apply for VA Merit this Winter proposing a larger mindfulness intervention in PD

Salivary Cortisol

- Is objective marker of the function of the HPA axis and stress
- Measures vary through out the day
- May be different in PD than others
- A study done by Hartman in 1997 at 12 person with PD and 10 age matched controls
- Persons with PD had higher total cortisol levels over 24 hours and specifically higher levels over night when levels usually drop



Our Study of salivary cortisol in PD



- We are looking at cortisol at 4 times points over 30 days in
 - 20 persons with PD and high stress
 - 20 persons with PD and low stress
 - 20 age matched controls
- Looking at
 - Anxiety (HAM-A)
 - Depression (HAM-D)
 - Stress (Perceived stress scale)

MBSR Pilot

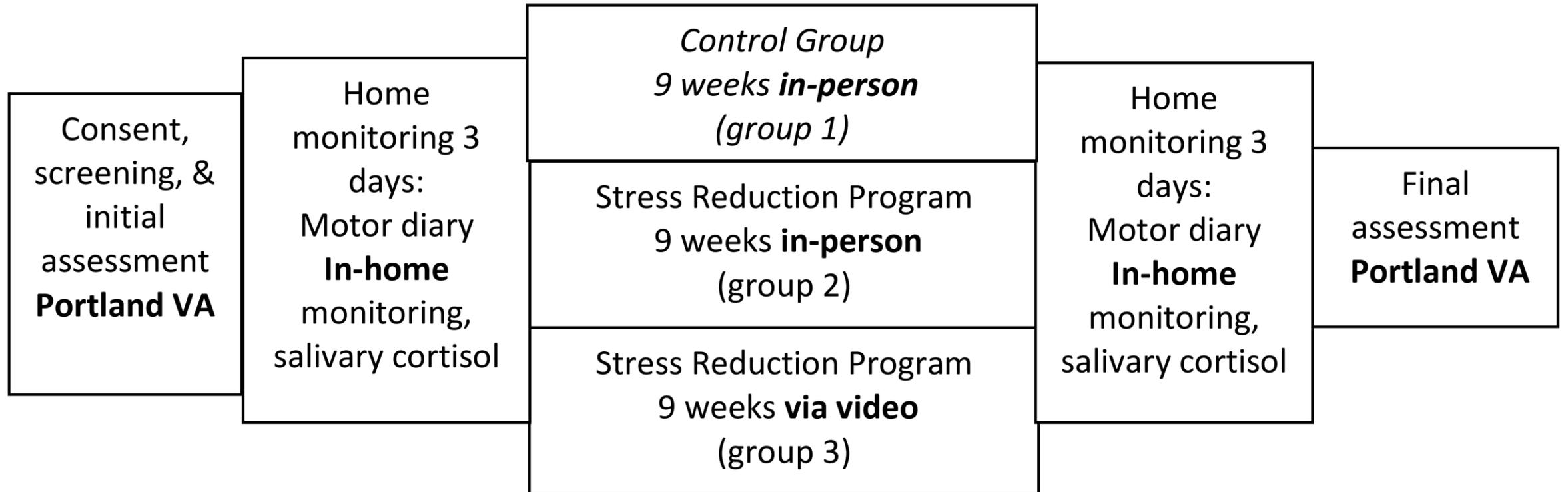
- Completed a 10 weeks (90 minute) mindfulness class for person with PD and their caregivers delivered via telemedicine
- Very small group – 3 persons with PD completed, 2 caregivers completed
- Lessons Learned
 - All agreed tele-medicine was fine as delivery format (one class done with just telephone was not as liked)
 - Need to have lots of options for mindfulness practice away from classes
 - Technology access for home practice was a barrier
 - Hearing was a barrier for a one patient who dropped out

Planned Merit Project – The Effects of a Mindfulness Based Stress Reduction on Motor and Psychological Symptoms of Parkinson's Disease

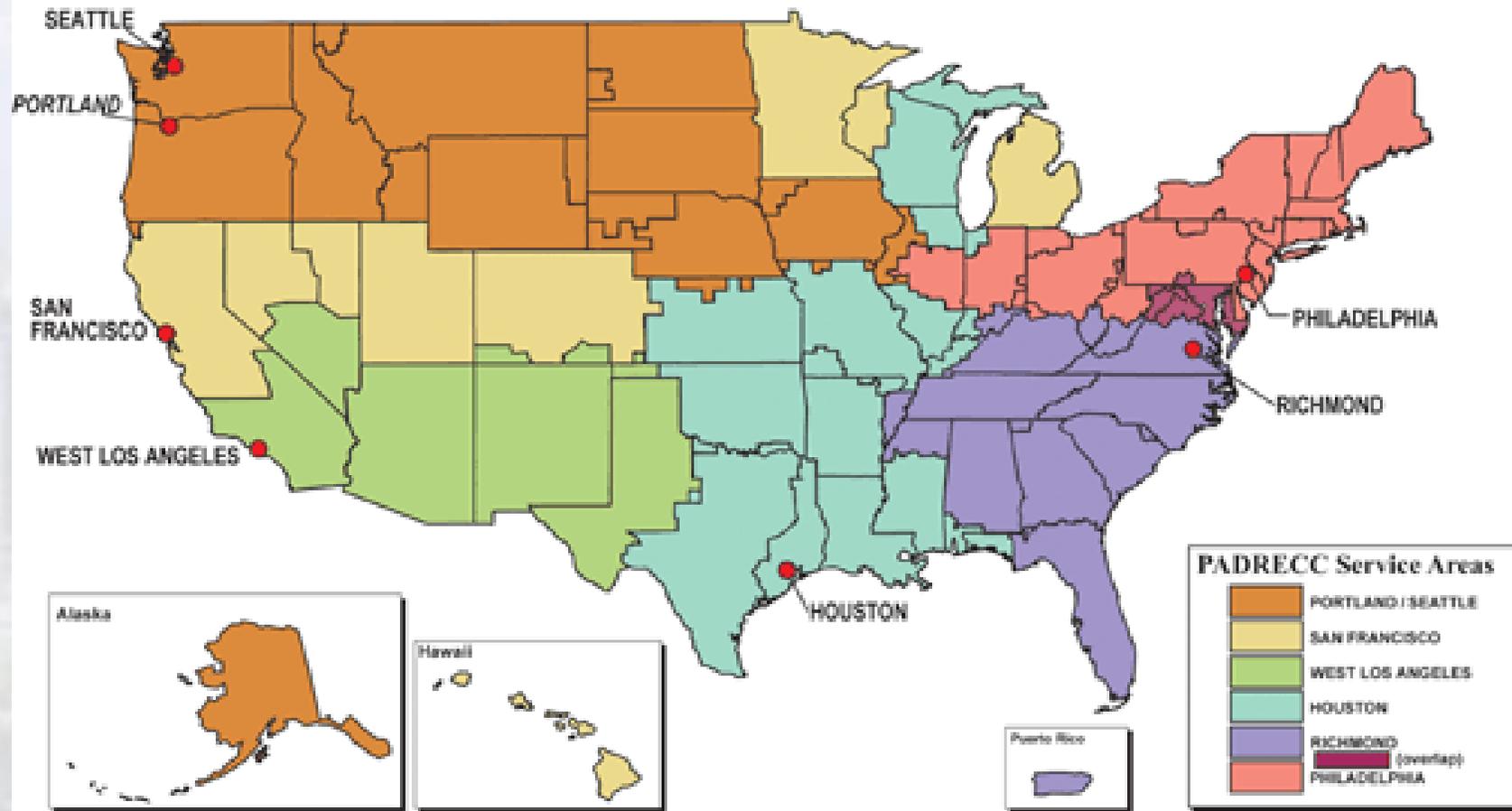
Specific Aims:

- To examine the effects of a stress reduction program in persons with PD on psychological and physiologic measures of stress.
- To examine the effects of stress reduction on motor symptoms of PD measured via patient report and objective in-home monitoring.
- To determine the feasibility of a stress reduction program in PD delivered via a video conference platform as compared to a similar program carried out in-person.

Study Design



Recommended Service Areas for PADRECCs



Goals

- Initial goals
 - To show benefits of mindfulness on psychological symptoms of PD
 - To explore effects of mindfulness on motor symptoms of PD
 - To show the feasibility of delivering mindfulness via telemedicine
- Ultimate goal
 - To perform a larger multi-centered study using telemedicine to reach persons closer to where they live and increase enrollment of rural veterans
 - To study the possible neuroprotective/disease modifying effects of mindfulness

Questions?

