Yoga & Meditation Program
for Individuals with Traumatic Brain Injuries

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Neurotrauma Outcomes Coordinator
Objectives

Discuss incidence of traumatic brain injuries (TBI) and effects post-injury

Discuss structural and physiological changes, benefits, and existing literature supporting use of yoga and meditation as a therapy for TBI survivors

Discuss the Love Your Brain (LYB) Organization and the integration of the LYB yoga & meditation program at ZSFG

Experience a guided mindfulness exercise and gentle chair yoga
Traumatic brain injuries (TBI) are a leading cause of death and disability worldwide. Annually ~2.8 million Americans experience a TBI\textsuperscript{1,2} and seek hospital-based care. 3.2 to 5.3 million people live with long-term TBI-related disability\textsuperscript{3}. 

TBI Epidemiology
Rising Incidence of TBI

Taylor et al, TBI Related ED Visits, Hospitalizations, and Deaths US 2007-2013. MMWR Surveill Summ 2017
Living with a TBI

Post-injury effects are wide-ranging:
- Cognitive
- Physical
- Emotional
- Behavioral symptoms

Evidence-based treatments:
- Physical Therapy
- Psychotherapy
- Cognitive rehabilitation
- Occupational Therapy
Whole-person post-injury effects

Physical: limited mobility, muscle atrophy, balance and gait difficulties, poor vision, headaches, chronic pain, dizziness

Mental/Cognitive: memory loss, difficulty concentrating and communicating, impulsivity, irritability, anxiety, lack of self-efficacy, denial

Reduced quality of life, depression, failed relationships, lack of motivation, low self-efficacy, unemployment
Challenges “Living” with a TBI

- Treatments offered during acute phase of recovery and often are short-term
- Long-term effects are heterogenous
- Limited community-based resources
- Caregiver/Family strain
## Factors that Influence TBI Outcomes

<table>
<thead>
<tr>
<th>Individual Patient Characteristics</th>
<th>Social-Environmental Factors</th>
<th>Access to Care Post-hospitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age</td>
<td>• Caregiver/Family support</td>
<td>• Various rehabilitation programs/facilities</td>
</tr>
<tr>
<td>• Genetic influences</td>
<td>• Socioeconomic status</td>
<td>• Discharge disposition</td>
</tr>
<tr>
<td>• Pre-injury functional status</td>
<td>• Social support</td>
<td>• Insurance coverage predictor</td>
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<tr>
<td>• TBI Severity</td>
<td>• Ability to live independently</td>
<td>• Continuity of Care</td>
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<td></td>
<td>• Ability to maintain employment</td>
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Yoga & Meditation as Therapy to Improve TBI Outcomes

- Mind-body holistic medicine
- Adaptable regardless of TBI severity
- Self-empowerment
  - Individual assumes active role in healthcare treatment
- Survivor and caregiver participation
- Numerous structural, physiological, mental health, and social benefits
  - Improve functional independence (work, leisure, community)
- Community reintegration
What is therapeutic yoga (union)?

“The application of yoga postures and practice to the treatment of health conditions. It involves instruction of yoga practices and teachings to prevent, reduce, or alleviate structural, physiological, emotional and spiritual pain, suffering or limitations”. 
Yoga & Meditation: Changes in the Brain

↑ Cortical thickness
- Self-regulation
- Decision making
- Improve attention skills & focus

↓ Amygdala
- Promote stress reduction
- Reduce mental fatigue

↑ Neuroplasticity
↑ Dopamine & Serotonin levels
↑ Relaxation

Structural Changes
- Augment memory
# Yoga & Meditation: Healing Benefits for TBI

<table>
<thead>
<tr>
<th>Cognition</th>
<th>Physical</th>
<th>Behavioral</th>
<th>Psychosocial</th>
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<tbody>
<tr>
<td>Self-regulation</td>
<td>Enhance muscular strength</td>
<td>Improve mood</td>
<td>Improve self-confidence and interpersonal relationships</td>
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<tr>
<td>Improve attention skills</td>
<td>Improve respiratory and cardiovascular function</td>
<td>Reduce stress, anxiety, depression, mental fatigue</td>
<td>Enhance community integration</td>
</tr>
<tr>
<td>Promote stress reduction</td>
<td>Build flexibility and coordination</td>
<td>Promote recovery from treatment and addiction</td>
<td>Enhance well-being and overall quality of life</td>
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<tr>
<td>Improve memory</td>
<td>Reduce pain</td>
<td></td>
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<tr>
<td></td>
<td>Improve sleep</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Improve parasympathetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>nervous symptom function</td>
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Existing Literature: Yoga & Meditation Interventions among TBI Participants

**Strength and Balance**  
(Schmid et al, Disabil Rehabil, 2015)

**Quality of life**  
(Donnelly et al, Brain Injury, 2016)

**Reduced stress**  
(Silverthorne et al, Int J Yoga Therapy, 2012)

**Mental Fatigue & Information Processing**  
(Johansson et al, Brain Injury 2012)

**Attention**  
(Cole et al, Mil Med 2015)

**Self-Efficacy**  
(Azulay et al, J Head Trauma Rehabil, 2013)
A retrospective study on the acceptability, feasibility, and effectiveness of LoveYourBrain Yoga for people with traumatic brain injury and caregivers

Kyla Z. Donnelly, Kim Baker, Ramsay Pierce, Amanda R. St. Ivany, Paul J. Barr & Martha L. Bruce

TBI Survivors

• 705 with TBI
• Average age was 43 (SD 12.8)
• Sustained TBI 4.8 years prior (SD 7.7)
• Significant improvement from baseline to post intervention scores
  • QOLIBRI ($p<0.00$)
  • Resilience ($p=0.0004$)
  • Cognition ($p<0.00$)
  • Positive effect and well-being ($p<0.00$)

Caregivers

• Observed changes in the ability for person with TBI to self-regulate.
• Perceived improvements in ability to relax, improved sleep quality, and physical strength.
• Reported enhanced self-care
Community-based TBI Yoga Program at ZSFG

- Became clinical affiliates with Love Your Brain Organization
- Trained, multidisciplinary clinical staff to facilitate yoga, mindfulness, and psychotherapy
- Integrated into Community Wellness Center
- ZSFG is offering free, ongoing, 6-week yoga and psychoeducation program
Yoga Session Structure

10 minutes

• Welcome & Breathing Exercises
  • Enhance nervous system regulation and attention control

45 minutes

• Gentle Yoga
  • To improve strength flexibility and balance

15 minutes

• Guided Meditation
  • Enhance attention control, mood, nervous system regulation

20 minutes

• Discussion with psychoeducation
  • Build community connection and skills in resilience
Yoga & Meditation: Adapted for TBI Patients

1. Slow, simple, poses, gentle movement, modifications for all
2. Proprioception and interoception, OVER alignment
3. Transitions-slow and safe, trained clinical staff
4. Integration of class themes and psychoeducation to address psychological challenges
ZSFG Pilot Series

- TBI survivor or caregiver
- **18 participants** (12 TBI survivors, 6 caregiver family/friend) participants
- Mean program satisfaction was **9.8 out of 10**
- **100%** would recommend to a friend

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>(n=18)</th>
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<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>52.4 (20-78)</td>
</tr>
<tr>
<td>Female</td>
<td>11 (61%)</td>
</tr>
<tr>
<td><strong>TBI Severity</strong></td>
<td>(n=12)</td>
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<tr>
<td>Mild</td>
<td>3 (25%)</td>
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<tr>
<td>Moderate</td>
<td>4 (33%)</td>
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<tr>
<td>Severe</td>
<td>5 (42%)</td>
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<tr>
<td><strong>Participation</strong></td>
<td></td>
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<tr>
<td>Less than 3 sessions</td>
<td>5 (28%)</td>
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<tr>
<td>3 or more sessions</td>
<td>13 (72%)</td>
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Yoga & Mindfulness Guided Experience
ZSFG Pilot Series
WELCOME!
ZSFG Love Your Brain Yoga & Meditation Series

Michele Diaz, RN, MS
Carol Blacker, LCSW
Cynthia Simon, NASM, CYT
Jo Brainin-Rodriguez, MD, CYT
Kerry Kuistad, LCSW, CYT

Brain and Spinal Injury Center
San Francisco General Hospital
University of California at San Francisco
Future Directions

Continue ongoing yoga program at ZSFG

Spanish and English

Program expansion to Laguna Honda

Collaborate with neuropsychology to integrate cognitive rehab component
Thank You!

Questions?
References


