### Aims
Assess recruitment response rate & enrollment rate of U.S. subjects in a study of yoga for depression
Assess attrition & adherence rates of depressed U.S. subjects in a time-intensive yoga-based intervention
Assess whether subjects practicing yoga intervention exhibit reduction in depressive symptoms

### Subjects
- Adults 18 and older interested in learning a yoga practice that may help reduce depressive symptoms
- Consecutive sampling of outpatients recruited thru two UCSF outpatient clinics via flyers
- Major depression diagnosed with Mini International Neuropsychiatric Interview
- Baseline score on Hamilton Rating Scale for Depression (HRSD) >13
- Baseline score on Beck Depression Inventory-II (BDI) >13
- Not taking antidepressant medication OR Stable dose of antidepressant medication for > 2 months
- No participation in any other yoga or mind-body practice during the study
- No acute psychosis or suicidal ideation

### Intervention
- Daily 30-minute home practice of 4 yoga breathing exercises (with audiotape) and
- Weekly 60-minute instructor-led group practice of 4 yoga breathing exercises (see attached)

### Duration
Total duration of study: 4 weeks

### Outcome Measures
- Total number of people responding to recruitment ads over a one month period
- Total number of subjects enrolled in the study over a one month period
- Percentage of assigned intervention sessions completed by subjects
- Change in mean scores on Beck Depression Inventory (BDI) pre- and post-intervention
- Change in mean scores on Hamilton Rating Scale for Depression (HRSD) pre- and post-intervention

### Results
- Recruitment response rate:
  - 42 subjects/month
- Enrollment rate:
  - 12 subjects/month (Female: 9; Age: 28 to 61 yrs)
- Concurrent antidepressant medication use:
  - 9 subjects
- Total Attrition:
  - 3 subjects
- Mean percentage Group Practice sessions completed:
  - 68%
- Mean percentage Home Practice sessions completed:
  - 63% (home data was missing on 3 subjects)
- At conclusion of study, 75% of subjects indicated willingness to attend 3 group practices/wk at research site

Pre-intervention to post-intervention change in mean BDI scores and in mean HRSD scores were both statistically significant, supporting potential antidepressant benefits of yoga in this sample:

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention N=12</th>
<th>Post-Intervention N=10</th>
<th>Pre-Intervention N=12</th>
<th>Post-Intervention N=9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean BDI</td>
<td>28.67</td>
<td>17.90</td>
<td>25.25</td>
<td>13.67</td>
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<tr>
<td>SD</td>
<td>12.61</td>
<td>13.82</td>
<td>6.00</td>
<td>6.40</td>
</tr>
<tr>
<td>SEM</td>
<td>3.64</td>
<td>4.37</td>
<td>1.73</td>
<td>2.13</td>
</tr>
<tr>
<td><strong>Change in Mean BDI scores</strong> = 11.10</td>
<td></td>
<td><strong>Change in Mean HRSD scores</strong> = 11.22</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>95% confidence interval: 1.41 to 20.79</td>
<td>95% confidence interval: 4.46 to 17.99</td>
<td></td>
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<tr>
<td></td>
<td>Paired t-test, 2-tailed α=0.05: P value = 0.029</td>
<td>Paired t-test, 2-tailed α=0.05: P value = 0.005</td>
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</tbody>
</table>
# TREATING DEPRESSION WITH YOGA BREATHING: AN OPEN-LABEL FEASIBILITY STUDY

<table>
<thead>
<tr>
<th>Breathing Practice</th>
<th>Instructions</th>
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</thead>
</table>
| **ALTERNATE NOSTRIL BREATHING** (Nadi Shodana) | 1. Sit upright on a straight-back chair, with both feet planted firmly on the ground. Rest your left hand on your belly and your right hand on your leg. Close your eyes.  
2. Bring your right hand to your face and gently press the right nostril shut with your thumb.  
3. Take a deep breath in, feeling the flow of air through your left nostril. As you inhale, count to 4, allowing your belly to expand first, and then your chest.  
4. Pause for a count of 2  
5. Release the right nostril, pressing the left nostril shut with your index finger. Exhale through right nostril, counting to 4 and allowing your chest to relax first, and then your belly.  
6. Pause for a count of 2  
7. Now take a deep breath in through right nostril. As you inhale, count to 4, allowing your belly to expand first, and then your chest.  
8. Pause for a count of 2  
9. Release your left nostril, pressing the right nostril shut with your thumb. Exhale through left nostril, counting to 4 and allowing your chest to relax first, and then your belly.  
10. Pause for a count of 2  
11. Continue to breathe in this manner for 3 minutes, until you hear the bell ring. |
| **VICTORIOUS BREATH** (Ujjayi)          | 1. Sit on a straight-back chair. Back and neck should be upright and both feet planted on ground. Close your eyes. Clasp your hands in front of your chest, pointing the index fingers upward.  
2. Exhale through the nostrils emptying your lungs and abdomen of air.  
3. Slightly contract the throat (glottis) and breathe in deeply through the nostrils. This will make a gentle snoring sound. You may feel some vibration in the back of your throat.  
4. As you inhale, move your clasped hands above your head, counting to 4 as you belly and chest to fill with air.  
5. Pause for a count of 2  
6. Exhale slowly through your nostrils, continuing to contract the throat slightly.  
7. As you exhale, lower your clasped hands back to chest, counting to 4 as belly and chest relax.  
8. Pause for a count of 2  
9. Breathe as slowly as you can in this manner for 8 minutes, until you hear the bell ring. |
| **BELLOWS BREATH** (Bhastrika)         | 1. Sit on a straight-back chair. Back and neck should be upright and both feet planted on ground. Close your eyes. Curl fingers into fists and place fists next to shoulders, thumb-side to shoulder.  
2. Take a deep breath in through your nostrils, counting to one and moving hands straight up and unfurling your fingers.  
3. Exhale rapidly, counting to one and moving hands back alongside the shoulders and curling fingers back into a fist.  
4. Continue to breathe forcefully in this manner for 8 minutes, until you hear the bell ring. |
| **BUMBLEBEE BREATH** (Bhramari)        | 1. Sit on a straightback chair. Back and neck should be upright and both feet should be planted firmly on the ground. Close your eyes, resting your hands on the legs.  
2. Gently bring your hands to your face, placing the index fingers over each eyebrow and gently resting the remaining fingers over each eye.  
3. Block your ears by using the thumbs to close the flap in front of each ear.  
4. Inhale deeply through both nostrils, allowing your belly to expand first, and then your chest. Count to 4 as you inhale.  
5. Pause for a count of 2  
6. Exhale smoothly through the nostrils and produce a gentle, continuous humming sound until the exhalation is complete. Count to 8 as you exhale.  
7. Pause for a count of 2 after you exhale.  
8. Continue to breathe in this manner for 8 minutes, until you hear the bell ring. |