I, Laura Hill, PhD, have no commercial relationships to disclose.
Brain-Based Eating Disorder Treatment Applications

Laura Hill, PhD
Neurons require imbalance to function

For Action

...Potential to take place.
People require imbalance to function...Potential to take place.
Neural Cell Membranes:
Outer layer substance

2 layers of fat

Embedded in the fat = ion channels = pores = openings.
Ion Channels

Most ions are in dendrites and cell bodies: **chemical gated** = *open and close* to neurotransmitters

Those in axons = **voltage gated** = *open based on intensity of the charge*
Signal Proteins

• Molecules go back and forth 7 X and associate with G-Proteins (guanine-sensitive).
  • G-Proteins initiate change internally over time.
  • More G-Proteins associated with longer lasting change.

One time change vs.
Longer term change rewire brain

- **Ionotropic receptors** = fast in.

- **Metabotropic receptors** = slow and steady change over time in neuron.
Glial Cells

• Used for myelination for neuronal conduction.
• 15 X more glial cells than neurons.
Glial Function Informs Intervention

• Protects the brain from "foreign substances."

• Protects the brain from hormones and neurotransmitters in the rest of the body.

• Maintains a constant environment for the brain.

• Forms blood brain barrio.
What’s on the Therapeutic Table for Eating Disorders?

• CBT
• DBT
• ITP
• ICAT
Brain-Basis
of eating disorders

IS the Table
Brain-Based Treatment becomes basis

Upon which

• CBT
• DBT
• ITP
• ICAT

Can offer more comprehensive impact.
Blood Brain Barrier
Application to Treatment

Glial = Supports

- Nonnegotiable/Blood brain barrier.
- Picks up on food accountability.
- Stops and reboots the impulse.
- Assists in carrying out the meal plan.
- Present to hold and support structure.
- Keeps the momentum going.
- Aids in transitions/synapses.
5-Day Treatment for ED: Preliminary Findings

Christina E. Wierenga, Ph.D.
Associate Professor of Psychiatry

Eating Disorder Treatment and Research Program
University of California San Diego
eatingdisorders.ucsd.edu
Preliminary acceptability data (n=37)

Client

I would recommend NEWFED TR to others
- 70% agree
- 22% strongly agree
- 5% neither disagree nor agree
- 3% disagree

I enjoyed learning about the neurobiology of AN through group exercises
- 76% agree
- 21% strongly agree
- 3% neither disagree nor agree
- 0% disagree

The exercises on neurobiology improved my understanding of AN
- 78% agree
- 19% strongly agree
- 3% neither disagree nor agree
- 0% disagree

My supports are equipped with better tools to support me
- 65% agree
- 30% strongly agree
- 5% neither disagree nor agree
- 0% disagree

Did this treatment meet your expectations?
- 91% yes
- 9% somewhat
Support

Preliminary acceptability data (n=60)

Hill et al., (2016) J of ED
Demographics for Full Sample

**Inclusion Criteria for Adult AN:** At time of study entry:
1) Lifetime DSM IV diagnosis of AN; of 5-Day Tx Completers: 26 AN-R, 12 AN-BP, 2 OSFED, 10 AN pr
2) Current BMI $< 22$ kg/m$^2$.
3) Current age between 16 and 60 years old.
4) Willingness to have identified Support participate in treatment.
5) Medically stable including normal vital signs and lab values.

**Exclusion Criteria for Adult AN & Support:** 1) Developmental, intellectual, or psychotic disorder, or a diagnosis of alcohol or drug abuse or dependence in the 3 months prior to the study 2) Presence of other psychopathology that might interfere with ability to participate in the study 3) Currently in any form of psychotherapeutic treatment unless the participant is willing to discontinue treatment.

<table>
<thead>
<tr>
<th></th>
<th>Tx Completers (n=50)</th>
<th>Completed Follow-up (n=39)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline BMI</td>
<td>18.1</td>
<td>2.0</td>
</tr>
<tr>
<td>Age</td>
<td>24.5</td>
<td>8.8</td>
</tr>
<tr>
<td>Illness Duration (yrs)</td>
<td>9.1</td>
<td>8.6</td>
</tr>
<tr>
<td>Length of F/U Survey (days)</td>
<td>142.4</td>
<td>81.5</td>
</tr>
<tr>
<td>Length of F/U BMI (days)</td>
<td>228.0</td>
<td>177.7</td>
</tr>
</tbody>
</table>
### Demographics for Full Sample

**Inclusion Criteria for Adult AN:** At time of study entry:
1. Lifetime DSM IV diagnosis of AN; of Follow-up Completers: 20 AN-R, 12 AN-BP, 1 OSFED, 6 AN pr
2. Current BMI $< 22 \text{ kg/m}^2$.
3. Current age between 16 and 60 years old.
4. Willingness to have identified Support participate in treatment.
5. Medically stable including normal vital signs and lab values.

**Exclusion Criteria for Adult AN & Support:** 1) Developmental, intellectual, or psychotic disorder, or a diagnosis of alcohol or drug abuse or dependence in the 3 months prior to the study 2) Presence of other psychopathology that might interfere with ability to participate in the study 3) Currently in any form of psychotherapeutic treatment unless the participant is willing to discontinue treatment.

<table>
<thead>
<tr>
<th></th>
<th>Lost to Follow-Up (n=11)</th>
<th>Completed Follow-up (n=39)</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
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<tr>
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<td>18.6</td>
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<tr>
<td>Age</td>
<td>19.1</td>
<td>1.7</td>
<td>25.8</td>
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<tr>
<td>Illness Duration (yrs)</td>
<td>4.7</td>
<td>2.8</td>
<td>10.4</td>
</tr>
</tbody>
</table>
**Post 5-Day Outcome for Full Sample (n=50)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-Tx</th>
<th>Post 5-Day</th>
<th>( P )-value</th>
<th>Cohen’s ( d )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td>18.1</td>
<td>18.3</td>
<td>.001</td>
<td>.10</td>
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<tr>
<td><strong>STAI State</strong></td>
<td>56.2</td>
<td>47.8</td>
<td>&lt;.001</td>
<td>.67</td>
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<tr>
<td><strong>FAD Problem Solving</strong></td>
<td>2.4</td>
<td>2.1</td>
<td>.006</td>
<td>.39</td>
</tr>
<tr>
<td><strong>FAD Communication</strong></td>
<td>2.4</td>
<td>2.2</td>
<td>.01</td>
<td>.42</td>
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<tr>
<td><strong>FAD Affective Involvement</strong></td>
<td>2.3</td>
<td>2.1</td>
<td>.04</td>
<td>.21</td>
</tr>
<tr>
<td><strong>FAD General Family Fxn</strong></td>
<td>2.2</td>
<td>2.0</td>
<td>.02</td>
<td>.34</td>
</tr>
<tr>
<td><strong>MAIA Self Regulation</strong></td>
<td>1.9</td>
<td>2.4</td>
<td>.01</td>
<td>.37</td>
</tr>
<tr>
<td><strong>MAIA Body Listening</strong></td>
<td>1.3</td>
<td>1.8</td>
<td>.02</td>
<td>.43</td>
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<tr>
<td><strong>EDE-Q Restraint</strong></td>
<td>2.7</td>
<td>1.8</td>
<td>.002</td>
<td>.51</td>
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<tr>
<td><strong>EDE-Q Eating Concern</strong></td>
<td>3.1</td>
<td>2.6</td>
<td>.005</td>
<td>.34</td>
</tr>
<tr>
<td><strong>EDE-Q Total</strong></td>
<td>3.5</td>
<td>3.1</td>
<td>.01</td>
<td>.27</td>
</tr>
</tbody>
</table>

*temperament measures of harm avoidance, sensitivity to reward/punishment, intolerance of uncertainty & alexithymia did not change*
Follow-up Clinical Symptoms for Full Sample

BMI (n=39)

<table>
<thead>
<tr>
<th></th>
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<th>Post-Tx</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>18.2</td>
<td>19.6</td>
<td></td>
</tr>
</tbody>
</table>

F(2, 41.7)=26.6, p<.001, \( \eta^2=.41 \)

Note: Post-Tx to Follow-up results hold after controlling for length of follow-up, illness duration, age
Follow-up Clinical Symptoms for Full Sample

EDE-Q (n=27)

- Restraint: $p < .001, \eta^2 = .28$
- Eating Concern: $p = .04, \eta^2 = .13$
- Shape Concern: $p < .02, \eta^2 = .15$
- Weight Concern: $p < .001, \eta^2 = .37$
- Global Score: $p < .001, \eta^2 = .23$

Pre-Tx, Post-Tx, Follow-up
Client Feedback

“The activities/illustrations were very helpful in more clearly understanding EDs and how they work in the brain. Working on the contract cleared up roles and goals.”

“Learning about the neurobiology of EDs was fascinating and extremely helpful.”

“I thought the exercises and activities were amazing in demonstrating to care givers just a little bit of what their loved one is going through.”
Support Feedback

“The entire treatment experience was magnificent! At the end of the week, it was mind boggling to realize how much information was presented and the array of formats utilized. The intimate setting was particularly helpful.”

“Neurobiology - really understanding why our daughter is stuck and what it will take to help her get unstuck. This understanding makes my support efforts more effective because I now know why and how the skills that I learned can be targeted and helpful. I knew before coming why restoration and maintenance of a healthy weight is critical - without this recovery can't happen. Now, I really ‘get it’.”

“The powerful use of science in a concise and illustrative way to explain the disease that brings both the carer and client together.”
The Brain has the Answers:

to Inform and Guide Treatment

Truth is in the details
Acknowledgements

Collaborators:

University of California San Diego
- Stephanie Knatz Peck, Ph.D.
- June Liang, Ph.D.
- Brittany Matheson, M.S.
- Laura Greathouse, M.P.H.
- Mary Ellen Trunko, M.D.
- Kerri Boutelle, Ph.D.
- Grace Rasmusson, B.S.
- Raseana Williams, B.S.
- Danika Peterson, B.S.
- Walter Kaye, M.D.

The Center for Balanced Living
- Laura Hill, Ph.D.
- Sonja Stotz, R.D., L.D.
- Jason McCray, Ph.D.
- Jennifer Beck, LPCC-S
- Lindsay Varkula, Ph.D.
- Summer Lawson, NP-BC, LISW
- Alex Lewis, R.D., L.D.
- Jennifer Takats, M.D.
- Amber Scott, B.A.

Support provided by the NEDA Feeding Hope Fund