HOPE FOR DEPRESSION
RESEARCH FOUNDATION

• Lecture: “Depression - The Cancer of the 21st Century

• Event: HOPE Scientific Seminar & Luncheon
Palm Beach - February 20th, 2009

• Speaker: J. Raymond DePaulo, Jr., M.D.
Henry Phipps Professor
Director, Department of Psychiatry and Behavioral
Sciences, The Johns Hopkins University School of
Medicine

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DEPRESSION
The Cancer of the 21st Century

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What is Depression?

Depression: When your dog dies and you feel sad. (an emotion)

Depression: Pessimism (personality trait)

Depression: Clinical depression
(emotional disorder, brain disease or both?)

Features of Clinical Depression

Pervasive Change in Mood:
Sad, anxious, aphantic

Low Self-Worth:
Hopeless, worthless

Low Energy-Vitality:
Fatigue, poor concentration

Remissions and relapses are typical course

“I’m falling down in my head, I no longer wish to live, to see anything, hear anything, feel anything...I’m fed up with life. I’ve had enough...I don’t want to live any more”
**Disease Burden by Illness - DALY**

High Income Countries | All Ages | 2004

% of total DALYs

- Unipolar depression disorders: 15.2%
- Ischemic heart disease
- Cerebrovascular disease
- Alzheimer's and other dementias
- Alcohol use disorder
- Hearing loss, adult onset
- Chronic obstructive pulmonary disease
- Diabetes mellitus
- Trachea, bronchi, lung cancers
- Road traffic accidents

DALY = Disability-Adjusted Life Year (measures healthy life years loss to premature death and disability)


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**Ten Leading Causes of Burden of Disease**

**World | 2004 and 2030**

<table>
<thead>
<tr>
<th>Disease or injury</th>
<th>As % of total DALYs</th>
<th>2004 Rank</th>
<th>As % of total DALYs</th>
<th>2030 Rank</th>
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</thead>
<tbody>
<tr>
<td>Lower respiratory infections</td>
<td>6.2</td>
<td>1</td>
<td>6.2</td>
<td>1</td>
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<tr>
<td>Diarrheal diseases</td>
<td>4.8</td>
<td>2</td>
<td>5.5</td>
<td>2</td>
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<tr>
<td>Unipolar depression disorders</td>
<td>4.3</td>
<td>3</td>
<td>4.9</td>
<td>3</td>
</tr>
<tr>
<td>NCHADS</td>
<td>4.1</td>
<td>4</td>
<td>5.0</td>
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<tr>
<td>Hypertensive disease</td>
<td>3.8</td>
<td>5</td>
<td>3.8</td>
<td>5</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>3.1</td>
<td>6</td>
<td>3.2</td>
<td>6</td>
</tr>
<tr>
<td>Prematurity and low birth weight</td>
<td>2.9</td>
<td>7</td>
<td>2.8</td>
<td>7</td>
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<tr>
<td>Birth asphyxia and birth trauma</td>
<td>2.7</td>
<td>8</td>
<td>2.7</td>
<td>8</td>
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<tr>
<td>Road traffic accidents</td>
<td>2.7</td>
<td>9</td>
<td>2.5</td>
<td>9</td>
</tr>
<tr>
<td>Neonatal infections and other</td>
<td>2.7</td>
<td>10</td>
<td>2.3</td>
<td>10</td>
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<tr>
<td>COPD</td>
<td>2.0</td>
<td>13</td>
<td>1.9</td>
<td>13</td>
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<tr>
<td>Refractive errors</td>
<td>1.8</td>
<td>14</td>
<td>1.8</td>
<td>14</td>
</tr>
<tr>
<td>Hearing loss, adult onset</td>
<td>1.6</td>
<td>15</td>
<td>1.6</td>
<td>15</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1.3</td>
<td>19</td>
<td>1.5</td>
<td>19</td>
</tr>
</tbody>
</table>

DALY = Disability-Adjusted Life Year (measures healthy life years loss to premature death and disability)


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**Economic Burden of Depression in U.S.**

**1990 and 2000**

- Workplace Costs
- Suicide Related Costs
- Direct Costs

<table>
<thead>
<tr>
<th>Year</th>
<th>Workplace Costs</th>
<th>Suicide Related Costs</th>
<th>Direct Costs</th>
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</thead>
<tbody>
<tr>
<td>1990</td>
<td>$77.4</td>
<td>67.1%</td>
<td>25.7%</td>
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<tr>
<td>2000</td>
<td>$83.1</td>
<td>62.0%</td>
<td>31.4%</td>
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*Source: Swenberg PE et al, J Clin Psychiatry 64/2; Dec 2003*
Suicide Rates in Males from Lundby, Sweden 1947-1972

<table>
<thead>
<tr>
<th></th>
<th>Number of people interviewed</th>
<th>Suicides per 100,000 people per year</th>
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<tr>
<td>No Psychiatric Diagnosis</td>
<td>29,809</td>
<td>8.34</td>
</tr>
<tr>
<td>Non-Depressive Mental Disorder</td>
<td>4,735</td>
<td>83.40</td>
</tr>
<tr>
<td>Depressive Disorder</td>
<td>1,475</td>
<td>654.00</td>
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<tr>
<td>Total Interviews</td>
<td>36,019</td>
<td></td>
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</table>

SOURCE: Hagell, Larke, and Rorsman 1981

DEPRESSION: Cancer of the 21st century

1966 – Breaking the genetic code (Nirenberg) created a new molecular biology

1968

- Cancer stigmatized, common, and costly
- Enormous emotional impact on families;
- Little research … thought to be hopeless
- Cytotoxic drugs and radiation had little benefit in survival or quality of life

DEPRESSION: Cancer of the 21st Century

1971 - U.S. Congress declares ‘War on Cancer’

1971-2007 - Molecular biology illuminates genetic and environmental pathways to cancer

1980-2007

- Multiple rational approaches to cancer emerge to target cell divisions, hormone receptors, angiogenesis, and immunologic pathways.
- Federally-funded Cancer Centers conduct largest, most successful clinical trials in history of medicine.
Depression in the 21st Century

- Depression and bipolar disorder are prevalent, costly, and stigmatized.
- Families hide their illness history.
- Diagnoses are clinical and treatments are empathic and empirical (effective but poorly understood).

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Depression in the 21st Century

- Genetics, neurobiology, neuropharmacology, and brain imaging create potential to illuminate pathways to depression.
- Translating these will enable surer and faster diagnosis and lead to treatments that are rational and more effective.
- Understanding these disorders will change fundamentally the experience of patients and families.

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Mood Changes in Patient During Brain Stimulation for Treatment of Parkinson's Disease

Before stimulation

A

B

17 seconds into stimulation

C

D

4 minutes and 16 seconds into stimulation

140 seconds after the stimulator is turned off
Brains of Depressed Patients
Before and After Successful Treatment
Region CG 25


Influence of Life Stress on Depression
Moderated by Variant Form of Gene for Serotonin Transporter

Caspil et al. Science, 2003

Typical Double Blind Randomized Clinical Trials of Antidepressant-Placebo

- Placebo Group
- Medication Group