The Intern Health Study

Insights into Depression during Medical Training and the Biology of Stress and Resilience

Srijan Sen MD PhD
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3/21/18 Baldwin Seminar Series
Presentation

Srijan Sen, MD, PhD (Speaker)

Planners:

Timothy P. Brigham, MDiv, PhD
DeWitt C. Baldwin, Jr., MD
Paul Rockey, MD
Jessalynn Watanabe

Disclosure

• None of the above speakers or planners have any conflicts of interest to report
Stress and Intern Year

• High work volume
  – 80+ hrs/week
  – extended shifts
  – sleep deprivation

• High responsibility/Low control

Shem 1978; Jauhar 2008; Duffy 2005; Eyes et al 2006; Shanafelt et al
Outline

• Levels of depression in training physicians
• Factors that associated with depression
  • Individual, program and policy factors
• Objective markers of stress
  • Biological, mobile technology
• Barriers to treatment
• Interventions to reduce depression
  • Mobile intervention, prevention
Sample

- 11 Cohorts
- 15,840 subjects (61% participation)
  - 2920 in 2017 cohort to date
- 80+ Sites
- Across Specialties
  - Internal Medicine, Surgery, Pediatrics, OB-GYN, Psychiatry, Emergency Medicine, Family Medicine
# Patient Health Questionnaire

## General Health

For each statement, please mark the response which best represents how often you have been bothered by any of the following problems over the PAST 2 WEEKS.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all</th>
<th>Less than half the days</th>
<th>More than half the days</th>
<th>Nearly Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little interest or pleasure in doing things</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Feeling down, depressed or hopeless</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Trouble falling asleep, staying asleep or sleeping too much</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Feeling tired or having little energy</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Poor appetite or overeating</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Feeling badly about yourself, or that you are a failure, or that you have let yourself or your family down</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Trouble concentrating on things such as reading the newspaper or watching TV</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Moving or speaking so slow that others could have noticed or the opposite, being so fidgety or restless that you have been moving around a lot more than usual</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Thoughts that you would be better off dead or hurting yourself in some way</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
A Prospective Cohort Study Investigating Factors Associated With Depression During Medical Internship

Srijan Sen, MD, PhD; Henry R. Kranzler, MD; John H. Krystal, MD; Heather Speller, MD; Grace Chan, PhD; Joel Gelernter, MD; Constance Guille, MD
Residents
Summary estimate: 28.8%
• Higher than age-similar norms
• 4.5x increase in prospective studies
• 0.5% per year increase in depression over time

Medical students
Summary estimate: 27.2%
• Higher than age-similar norms
• Few seek help
• Pooled prevalence of SI: 11.1%
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High Neuroticism
Low Subjective Well-Being
Childhood Stress
History of Depression
Female Gender
Sleep Quality
US Medical School
Work-Family Conflict and the Sex Difference in Depression Among Training Physicians

Constance Guille, MD; Elena Frank, PhD; Zhuo Zhao, MS; David A. Kalmbach, PhD; Paul J. Nietert, PhD; Douglas A. Mata, MD, MPH; Srijan Sen, MD, PhD
Work-Family Conflict and the Sex Difference in Depression Among Training Physicians

Constance Guille, MD; Elena Frank, PhD; Zhuo Zhao, MS; David A. Kalmbach, PhD; Paul J. Nietert, PhD; Douglas A. Mata, MD, MPH; Srijan Sen, MD, PhD

**Diagram:**

- **M** (Work-Family-Conflict (6 Mon Internship))
  - **a** = 0.61, **p** = 0.01
  - **b** = 0.37, **p** < 0.0001

- **X** (Gender (Female))
  - **C'** = 0.69, **p** < 0.0001

- **Y** (PHQ-9 Depression (6 Mon Internship))

**Indirect effect** = **c** - **c'** = 0.91 - 0.69 = 0.22

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**The Upshot**

**Being a Doctor Is Hard. It’s Harder for Women.**

Female medical residents and physicians endure bias and a larger burden with home duties. They also face a greater risk of depression.
• Women vs. Men Post-training
  – 23% part-time (vs. 0.2% of men)
  – 76% consider part-time (vs. 18% of men)
  – work 9 fewer hrs/week (10 more hrs/home)
Need

Money

Family

Job

Life

Income

Less

Financial

Men
Comparison of Hospital Mortality and Readmission Rates for Medicare Patients Treated by Male vs Female Physicians

Yusuke Tsugawa, MD, MPH, PhD; Anupam B. Jena, MD, PhD; Jose F. Figueroa, MD, MPH; E. John Orav, PhD; Daniel M. Blumenthal, MD, MBA; Ashish K. Jha, MD, MPH
A Prospective Cohort Study Investigating Factors Associated With Depression During Medical Internship

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High Neuroticism
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Sleep Quality
US Medical School

Longer Duty Hours
Medical Errors
Stressful Life Events
## Sleep Disturbance and Short Sleep as Risk Factors for Depression and Perceived Medical Errors in First-Year Residents

David A. Kalmbach, PhD; J. Todd Arnedt, PhD; Peter X. Song, PhD; Constance Guille, MD; Srijan Sen, MD, PhD

<table>
<thead>
<tr>
<th>Depression</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never-depressed</td>
<td>13.6%</td>
</tr>
<tr>
<td>Acutely depressed</td>
<td>26.2%</td>
</tr>
<tr>
<td>Chronically depressed</td>
<td>32.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sleep duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient sleepers</td>
<td>20.6%</td>
</tr>
<tr>
<td>Sufficient sleepers</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duty hours ≥ 70 hours</td>
<td>22.0%</td>
</tr>
<tr>
<td>Duty hours &lt; 70 hours</td>
<td>14.6%</td>
</tr>
</tbody>
</table>
Sleep Disturbance and Short Sleep as Risk Factors for Depression and Perceived Medical Errors in First-Year Residents

David A. Kalmbach, PhD; J. Todd Arnedt, PhD; Peter X. Song, PhD; Constance Guille, MD; Srijan Sen, MD, PhD

$\text{b} = -0.27$, $p < 0.01$

Mediation accounts for 8-22% of direct effect
Sobel test: $z = 2.51$, $p = 0.01$

OR$^1 = 1.59$, $p < 0.001$

Sleep Duration
3 MONTHS

Depression
3 MONTHS

Sleep Disturbance
BASELINE

OR$^1 = 1.27$, $p = 0.01$

Sobel test: $z = 2.19$, $p < 0.01$

OR$^1 = 1.09$, $p = 0.71$

(Direct effect)

OR$^2 = 1.01$, $p = 0.98$

(Controlling for Sleep Duration)

Medical Errors
3 MONTHS

Sleep Disturbance
BASELINE

OR$^1 = 2.33$, $p < 0.001$

(Direct effect)

OR$^2 = 2.02$, $p < 0.01$

(Controlling for Sleep Duration)
Institution and Specialty Contribute to Resident Satisfaction With Their Learning Environment and Workload

Larry D. Gruppen, PhD, R. Brent Stansfield, PhD, Zhuo Zhao, MS, and Srijan Sen, MD, PhD
A Prospective Cohort Study Investigating Factors Associated With Depression During Medical Internship

High Neuroticism
Low Subjective Well-Being
Childhood Stress
History of Depression
Female Gender
Sleep Quality
US Medical School

Individual Factors
- Longer Duty Hours
- Medical Errors
- Stressful Life Events

Program Factors
- Low Quality Faculty Feedback
- Higher Doximity Research Ranking
- Lower Ethnic Diversity
The New Recommendations on Duty Hours from the ACGME Task Force

Thomas J. Nasca, M.D., Susan H. Day, M.D., and E. Stephen Amis, Jr., M.D., for the ACGME Duty Hour Task Force

Table 1. Changes in Accreditation Council for Graduate Medical Education (ACGME) Work-Hour Requirements, and Comparison with Institute of Medicine (IOM) Recommendations.*

The 2017 ACGME Common Work Hour Standards: Promoting Physician Learning and Professional Development in a Safe, Humane Environment

Kim J. Burchiel, MD, FACS  
Rowen K. Zetterman, MD  
Kenneth M. Ludmerer, MD  
Ingrid Philibert, PhD, MBA  
Timothy P. Brigham, MDiv, PhD  
Kathy Malloy, BA  
James A. Arrighi, MD  
Stanley W. Ashley, MD  
Jessica L. Bienstock, MD, MPH  
Peter J. Carek, MD, MS, CAQSM, FAAFP, DABFM  
Ricardo Correa, MD  
David A. Forstein, DO  
Robert R. Gaiser, MD  
Jeffrey P. Gold, MD  
George A. Keepers, MD  
Benjamin C. Kennedy, MD  
Lynne M. Kirk, MD  
Anai Kothari, MD  
Lorrie A. Langdale, MD  
Philip H. Shayne, MD  
Steven C. Stain, MD  
Suzanne K. Woods, MD  
Claudia Wyatt-Johnson, BA, MA  
Thomas J. Nasca, MD, MACP
National Cluster-Randomized Trial of Duty-Hour Flexibility in Surgical Training


Education Outcomes in a Duty-Hour Flexibility Trial in Internal Medicine

Effects of the 2011 Duty Hour Reforms on Interns and Their Patients

A Prospective Longitudinal Cohort Study

Srijan Sen, MD, PhD; Henry R. Kranzler, MD; Aashish K. Didwania, MD; Ann C. Schwartz, MD; Sudha Amarnath, MD; Joseph C. Kolars, MD; Gregory W. Dalack, MD; Breck Nichols, MD, MPH; Constance Guille, MD

Methods
– Pre-Post Design
– 11 institutions
– 44 programs
  • 6 specialties
  • 1955 subjects

Possible Causes
– Handoffs
– Work compression
– System adjustment

[Bar chart showing changes in measures with duty hour changes]
Proportion of Interns Reporting Medical Errors

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Quarter 1</th>
<th>Quarter 2</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>21.43</td>
<td>19.57</td>
<td>18.98</td>
<td>17.82</td>
<td>19.45</td>
</tr>
<tr>
<td>2010</td>
<td>17.78</td>
<td>22.67</td>
<td>23.2</td>
<td>18.46</td>
<td>20.53</td>
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<tr>
<td>2011</td>
<td>22.18</td>
<td>24.03</td>
<td>22.41</td>
<td>23.19</td>
<td>22.95</td>
</tr>
<tr>
<td>2012</td>
<td>17.69</td>
<td>20.02</td>
<td>17.51</td>
<td>17.87</td>
<td>18.27</td>
</tr>
<tr>
<td>2013</td>
<td>19.21</td>
<td>19.8</td>
<td>20.14</td>
<td>18.78</td>
<td>19.48</td>
</tr>
<tr>
<td>2014</td>
<td>19.34</td>
<td>17.67</td>
<td>17.61</td>
<td>15.33</td>
<td>17.49</td>
</tr>
<tr>
<td>2015</td>
<td>18.18</td>
<td>18.73</td>
<td>16.58</td>
<td>14.7</td>
<td>17.05</td>
</tr>
<tr>
<td>2016</td>
<td>19.43</td>
<td>19.32</td>
<td>20.34</td>
<td>17.28</td>
<td>19.09</td>
</tr>
<tr>
<td>2017</td>
<td>18.68</td>
<td>26.8</td>
<td></td>
<td></td>
<td>22.74</td>
</tr>
</tbody>
</table>
The Business Case for Investing in Physician Well-being

Tait Shanafelt, MD; Joel Goh, PhD; Christine Sinsky, MD

**IMPORTANCE**  Widespread burnout among physicians has been recognized for more than 2 decades. Extensive evidence indicates that physician burnout has important personal and professional consequences.

**OBSERVATIONS**  A lack of awareness regarding the economic costs of physician burnout and uncertainty regarding what organizations can do to address the problem have been barriers to many organizations taking action. Although there is a strong moral and ethical case for organizations to address physician burnout, financial principles (eg, return on investment) can also be applied to determine the economic cost of burnout and guide appropriate investment to address the problem. The business case to address physician burnout is multifaceted and includes costs associated with turnover, lost revenue associated with decreased productivity, as well as financial risk and threats to the organization’s long-term viability due to the relationship between burnout and lower quality of care, decreased patient satisfaction, and problems with patient safety. Nearly all US health care organizations have used similar evidence to justify their investments in safety and quality. Herein, we provide conservative formulas based on readily available organizational characteristics to determine the financial return on organizational investments to reduce physician burnout. A model outlining the steps of the typical organization’s journey to address this issue is presented. Critical ingredients to making progress include prioritization by leadership, physician involvement, organizational science/learning, metrics, structured interventions, open communication, and promoting culture change at the work unit, leader, and organization level.

**CONCLUSIONS AND RELEVANCE**  Understanding the business case to reduce burnout and promote engagement as well as overcoming the misperception that nothing meaningful can be done are key steps for organizations to begin to take action. Evidence suggests that improvement is possible, investment is justified, and return on investment measurable. Addressing this issue is not only the organization’s ethical responsibility, it is also the fiscally responsible one.
The Cost of Depression-Related Presenteeism in Resident Physicians

Tracey Rosen¹ · Kara Zivin¹² · Daniel Eisenberg³ · Constance Guille⁴ · Srijan Sen²

Presenteeism related costs = $11,000/resident or $1B across all US residents
Residents
Summary estimate: 28.8%
• Higher than age-similar norms
• 4.5x increase in prospective studies
• 0.5% per year increase in depression over time

Medical students
Summary estimate: 27.2%
• Higher than age-similar norms
• Few seek help
• Pooled prevalence of SI: 11.1%
Slides Removed Pending Verification and Publication
Sparse whole-genome sequencing identifies two loci for major depressive disorder

CONVERGE consortium*

Identification of 15 genetic loci associated with risk of major depression in individuals of European descent

Craig L Hyde¹, Michael W Nagle², Chao Tian³, Xing Chen¹, Sara A Paciga², Jens R Wendland², Joyce Y Tung³, David A Hinds³, Roy H Perlis⁴ & Ashley R Winslow²,⁵
MDD Genomic Risk Score and Depression with Internship Stress
WHAT WE DO TODAY

• Subjective
• Episodic
• Clinic-based
• Effortful

WHAT WE NEED

• Objective
• Continuous
• Ubiquitous
• Passive

Thomas R. Insel, MD
Mindstrong Health,
Palo Alto, California.
Welcome to the Intern Health Study

Thank you for choosing to participate in this study!

Participants should enter their access code to begin.

On a scale of 1-10 how was your mood today?

1  
2  
3  
4  
5  
6  
7  
8  
9  
10

lowest

Done

Cancel

Verily
Effects of Sleep, Physical Activity, and Shift Work on Daily Mood: a Prospective Mobile Monitoring Study of Medical Interns

David A. Kalmbach, PhD¹, Yu Fang, MSE², J. Todd Arnedt, PhD¹, Amy L. Cochran, PhD³, Patricia J. Deldin, PhD¹, Adam I. Kaplin, MD PhD⁴, and Srijan Sen, MD PhD¹,²
• Lack of time (92%)
• Preference for self-management (75%)
• Lack of convenient access (62%)
• Concerns regarding confidentiality (57%)
• Concerns about stigma (52%)
• Concerns about cost (50%)
• Belief that treatment does not work (25%)
Association Between Learning Environment Interventions and Medical Student Well-being: A Systematic Review

Lauren T. Wasson, MD, MPH; Amberle Cusmano, MA; Laura Meli, MSEd; Irene Louh, MD, PhD; Louise Falzon, PGDipInf; Meghan Hampsey; Geoffrey Young, PhD; Jonathan Shaffer, PhD, MS; Karina W. Davidson, PhD, MASc

Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis

Colin P West, Liselotte N Dyrbye, Patricia J Erwin, Tait D Shanafelt
Barriers to Treatment Among Depressed Interns

- Lack of time (92%)
- Preference for self-management (75%)
- Lack of convenient access (62%)
- Concerns regarding confidentiality (57%)
- Concerns about stigma (52%)
- Concerns about cost (50%)
- Belief that treatment does not work (25%)
**Smartphones**

*A medical tool for global health – improving diagnosis and connecting care*

Over 3 billion globally and 6 billion by 2020

Over 70 daily checks

Over 2600 daily “.touches”

More ubiquitous than clean water, indoor plumbing, and stable electricity
Original Investigation

Web-Based Cognitive Behavioral Therapy Intervention for the Prevention of Suicidal Ideation in Medical Interns: A Randomized Clinical Trial

Constance Guille, MD; Zhuo Zhao, MS; John Krystal, MD; Breck Nichols, MD; Kathleen Brady, MD, PhD; Srijan Sen, MD, PhD

320 Incoming interns assessed for eligibility

- 32 unable to contact via email
- 74 did not respond to email invitation
- 15 not interested in participating

199 interns randomized

100 Randomized to receive intervention
- 88 Completed at least 1 CBT module
- 12 Did not complete any CBT modules

- 19 Lost to Follow-up
  - Did not complete any follow-up assessments
  - 0 Discontinued Intervention

- Analyzed
  - 81 participants included in the analysis
  - 0 participants excluded from analysis

99 Randomized to receive attention-control
- 99 Received attention-control as assigned

- 15 Lost to Follow-up
  - Did not complete any follow-up assessments
  - 0 Discontinued Intervention

- Analyzed
  - 84 participants included in the analysis
  - 0 participants excluded from analysis
Web-Based Cognitive Behavioral Therapy Intervention for the Prevention of Suicidal Ideation in Medical Interns: A Randomized Clinical Trial

Constance Guille, MD; Zhuo Zhao, MS; John Krystal, MD; Breck Nichols, MD; Kathleen Brady, MD, PhD; Srijan Sen, MD, PhD

Figure 3. Number of Interns Endorsing Suicidal Ideation During Internship Year

wCBT indicates web-based cognitive behavioral therapy.
7 Cups – an online global peer support system

2M monthly users -- 220K listeners
189 countries providing support in 140 languages.

HEADSPACE

Learn to meditate and live mindfully

The MoodGYM
Training Program / Mark III

Learn cognitive behaviour therapy skills for preventing and coping with depression
Welcome to the Intern Health Study

Thank you for choosing to participate in this study!
Participants should enter their access code to begin.

On a scale of 1-10 how was your mood today?

lowest 10 highest

Enter Access Code
Done
Cancel

MOOD 24/7

mindstrong

verily
Monitoring or Intervention?

Mean Change PHQ Score
Control (2.95) > Monitoring Biomarker (1.50); p=0.01

Mobile Monitoring Complete
Buying time promotes happiness

Ashley V. Whillans,1 Elizabeth W. Dunn,1 Paul Smeets, Rene Bekkers, and Michael I. Norton

aHarvard Business School, Harvard University, Cambridge, MA 02163; bDepartment of Psychology, University of British Columbia, Vancouver, BC, Canada V6T 1Z4; cDepartment of Finance, Maastricht University, 6200 MD Maastricht, The Netherlands; and dCenter for Philanthropic Studies, Vrije Universiteit Amsterdam, 1081 HV Amsterdam, The Netherlands

Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and approved June 13, 2017 (received for review April 19, 2017)

Around the world, increases in wealth have produced an unintended consequence: a rising sense of time scarcity. We provide evidence that using money to buy time can provide a buffer sample of working Americans living in the United States (n = 1,260), adults in Denmark (n = 467), and Canada (n = 326), and both a nationally representative sample (n = 1,232) and a sample

Academic Medicine

DOI: 10.1097/ACM.0000000000002121

An Integrated Career Coaching and Time Banking System Promoting Flexibility, Wellness, and Success: A Pilot Program at Stanford University School of Medicine

Magali Fassiotto, PhD, Caroline Simard, PhD, Christy Sandborg, MD, Hannah Valantine, MD, and Jennifer Raymond, PhD
An Ounce of Prevention: A Public Health Approach to Improving Physician Well-Being

Deanna Chaukos¹ · Heather S. Vestal² · Carol A. Bernstein³ · Richard Belitsky⁴ · Mitchell J. Cohen⁵ · Lucy Hutner⁶ · Julie Penzner⁷ · Stephen Scheiber⁸ · Marika I. Wrzosek⁹ · Edward K. Silberman¹⁰

**Tertiary Treatment**
Provide mental health treatment

**Secondary Screening**
Identify individuals who are at-risk, or experiencing early signs of distress, burnout, or mental health problems

**Primary Prevention**
Preserve and promote mental and physical health and wellness

**Examples:**
- Improve access to existing mental health treaters in the community
- Dedicated mental health treatment programs for physicians/trainees
- Check-ins with program directors, chief residents, supervisors
- Peer recognition
- Formal screening tools
- Curricula/trainings
- Emotional and social support
- Improve the learning environment
Take Home Points

• Dramatic increase in depression with residency
  – Effects on physicians and patients
  – Subjective and objective sequelae

• Multiple levels of factors are involved

• Tailored interventions can help
  – More innovation and study needed

• Specific stressor models useful for identifying biology of psychopathology under stress
Acknowledgements

• Participating interns and program directors

• Key Personnel
  – Elena Frank
  – Joan Zhao
  – Douglas Mata
  – Yu Fang
  – David Kalmbach
  – Misty Periard
  – Arbormoon App Development

• Key Collaborators
  – Connie Guille
  – Kathryn Ridout
  – Jess Fiedorowicz
  – Danny Forger
  – Maureen Walton
  – Margit Burmeister
  – Zhenke Wu
  – Laura Scott

Funding: NIMH (R01 MH101459, K23 MH095109), Alfred A. Taubman Medical Institute, American Foundation for Suicide Prevention, Pritzker Foundation, Mindstrong Health
Suicidality and Internship

Before Internship 3 Months 6 Months 9 Months 12 Months
Predictors of Suicidality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline Factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (Male vs. Female)</td>
<td>1.67</td>
<td>(1.22, 2.28)</td>
</tr>
<tr>
<td>Suicidal Ideation (Yes vs. No)</td>
<td>8.58</td>
<td>(4.59, 16.07)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.79</td>
<td>(0.68, 0.93)</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>1.26</td>
<td>(1.05, 1.51)</td>
</tr>
<tr>
<td><strong>Internship Factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicidal Ideation, 3-month lag (Yes vs. No)</td>
<td>7.54</td>
<td>(5.19, 10.94)</td>
</tr>
<tr>
<td>Increase in Work Hours</td>
<td>1.20</td>
<td>(1.04, 1.37)</td>
</tr>
<tr>
<td>Concurrent Anxiety</td>
<td>1.41</td>
<td>(1.19, 1.67)</td>
</tr>
<tr>
<td>Concurrent Depression</td>
<td>2.92</td>
<td>(2.37, 3.61)</td>
</tr>
</tbody>
</table>

Training data: 2013-2014 cohorts
Test data: 2015 cohort
AUC: 0.86