Mental Training for Surgeons: Better, Stronger, Faster and Happier?

Carter Lebares, MD
UCSF Department of Surgery Grand Rounds
June 8th, 2016
Mental Training for Surgeons: Why and How?

- **The Problem(s):** Burnout, Mental Health and Medical Errors
- **The Cause:** Stress - the good and the bad
- **The Clue:** Resilience - the ability to thrive under stress
- **The Answer:** Mindfulness - mental training for resilience
- **The Outcome?:** Happier, Stronger, Faster and Better
- **The Study:** The Mindful Surgeon 2016
Burnout, Mental Health and Medical Errors

- Burn-out: syndrome of emotional exhaustion, cynicism, and decreased effectiveness stemming from work-related STRESS

- Depersonalization/cynicism and emotional exhaustion. Burnout is the loss of Physician - Pt connection. Burnout is a problem for us and our patients

- In MDs, B/O has been shown to correlate with decreased empathy, professionalism, pt compliance and quality of outcomes. Also with increased errors, depression, and distress.

MD B/O in literature since 1981, initially described in PCPs and front line physicians

DiMatteo, *Health Psychol*, 1993 - MD characteristics influence pt compliance
B/O in Surgeons

• 2001: UMich surgery grads, ~600, Maslach BOI and novel questionnaire. 32% high emotional exhaustion, especially younger surgeons, esp those with perception of ‘being overwhelmed’. Not related to caseload, practice setting or payer mix. Strong relation to desire to retire early

• 2005: US Transplant Surgeons, >200, 38% emo exh, 27% depersonalization. Predictors = questioning career choice, loss of personal life, reduced sense of control (known relationship to perceived stress)

Campbell, Surgery, 2001
Bertges, Transpl Proc, 2005
ACS 2008 Survey

- 24K Fellows surveyed, ~8K respondents (32%)
- 40% burn out
- OR time, and practice setting, protective
- B/O is an independent predictor of errors and depression on MV analysis
- Drill-downs showed relationship of B/O to distress, errors, and poor mental health.

Surgeon Burnout: A Systematic Review

- 39 studies of various quality examining B/O in surgeons
- Gen Surg, Surg Onc, ENT, Neurosurg, Ortho, Transplant, Plastics, Microvascular
- B/O rates range from 37-53%, with emotional exhaustion rating highest in all groups, cynicism a close second.

- To date burn-out found at every level of training: Medical Students, Residents and Attendings.
- Myriad other specialties: Anes, Emerg Med, Primary care, and Nursing.
Table 2. Characteristics of Mindful Practice

- Active observation of oneself, the patient, and the problem
- Peripheral vision, Preattentive processing, Critical curiosity
- Courage to see the world as it is
- Willingness to examine and set aside prejudices
- Adoption of a beginner’s mind
- Humility to tolerate awareness of one’s shortcomings
- Compassion based on insight, Presence
<table>
<thead>
<tr>
<th>Statement</th>
<th>Not Important to Me (0), n (%)</th>
<th>Minimally Important (1), n (%)</th>
<th>Moderately Important (2), n (%)</th>
<th>Essential (3), n (%)</th>
<th>Mean Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find meaning in my work</td>
<td>46 (0.7)</td>
<td>347 (4.9)</td>
<td>2196 (30.9)</td>
<td>4521 (63.6)</td>
<td>2.6</td>
<td>1</td>
</tr>
<tr>
<td>I protect time away from work with my spouse, family, and friends</td>
<td>108 (1.5)</td>
<td>564 (7.9)</td>
<td>2416 (34.0)</td>
<td>4011 (56.5)</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>I focus on what is most important to me in life</td>
<td>46 (0.7)</td>
<td>509 (7.2)</td>
<td>3076 (43.4)</td>
<td>3463 (48.8)</td>
<td>2.4</td>
<td>3</td>
</tr>
<tr>
<td>I try to take a positive outlook on things</td>
<td>114 (1.6)</td>
<td>771 (10.8)</td>
<td>3113 (43.7)</td>
<td>3128 (43.9)</td>
<td>2.3</td>
<td>4</td>
</tr>
<tr>
<td>I take vacations</td>
<td>222 (3.1)</td>
<td>1168 (16.4)</td>
<td>2327 (32.7)</td>
<td>3397 (47.8)</td>
<td>2.3</td>
<td>5 (tie)</td>
</tr>
<tr>
<td>I participate in recreation/ hobbies/exercise</td>
<td>167 (2.4)</td>
<td>1076 (15.1)</td>
<td>2637 (37.1)</td>
<td>3233 (45.5)</td>
<td>2.3</td>
<td>5 (tie)</td>
</tr>
<tr>
<td>I talk with family, significant other, or friends about how I am feeling</td>
<td>324 (4.6)</td>
<td>1002 (14.1)</td>
<td>2569 (36.1)</td>
<td>3227 (45.3)</td>
<td>2.2</td>
<td>7</td>
</tr>
<tr>
<td>I have developed an approach/ philosophy to dealing with patients' suffering and death</td>
<td>298 (4.2)</td>
<td>1019 (14.4)</td>
<td>3306 (46.8)</td>
<td>2448 (34.6)</td>
<td>2.1</td>
<td>8</td>
</tr>
<tr>
<td>I incorporate a life philosophy stressing balance in my personal and professional life</td>
<td>468 (6.6)</td>
<td>1488 (21.0)</td>
<td>2904 (41.1)</td>
<td>2214 (31.3)</td>
<td>2.0</td>
<td>9</td>
</tr>
<tr>
<td>I look forward to retirement</td>
<td>1130 (16.0)</td>
<td>1877 (26.6)</td>
<td>2065 (29.3)</td>
<td>1986 (28.1)</td>
<td>1.7</td>
<td>10</td>
</tr>
<tr>
<td>I discuss stressful aspects of work with colleagues</td>
<td>898 (12.7)</td>
<td>2079 (29.3)</td>
<td>2824 (39.8)</td>
<td>1289 (18.2)</td>
<td>1.6</td>
<td>11</td>
</tr>
<tr>
<td>I nurture the religious/spiritual aspects of myself</td>
<td>1495 (20.9)</td>
<td>1936 (27.1)</td>
<td>1900 (26.6)</td>
<td>1817 (25.4)</td>
<td>1.6</td>
<td>12</td>
</tr>
<tr>
<td>I am involved in nonpatient care activities (eg, research, education, administration)</td>
<td>1527 (21.4)</td>
<td>1989 (27.9)</td>
<td>2319 (32.6)</td>
<td>1288 (18.1)</td>
<td>1.5</td>
<td>13</td>
</tr>
<tr>
<td>I engage in contemplative practices or other mindfulness activities such as meditation, narrative medicine, or appreciative inquire, etc.</td>
<td>4500 (63.5)</td>
<td>1495 (21.1)</td>
<td>742 (10.5)</td>
<td>352 (5.0)</td>
<td>0.6</td>
<td>14</td>
</tr>
<tr>
<td>I engage in reflective writing or other journaling technique</td>
<td>4832 (68.6)</td>
<td>1400 (19.98)</td>
<td>546 (7.75)</td>
<td>264 (3.75)</td>
<td>0.5</td>
<td>15</td>
</tr>
<tr>
<td>I have regular meetings with a psychologist/psychiatrist to discuss stress</td>
<td>6164 (86.6)</td>
<td>593 (8.33)</td>
<td>222 (3.12)</td>
<td>137 (1.93)</td>
<td>0.2</td>
<td>16</td>
</tr>
</tbody>
</table>
1) The most protective elements in this study involve the development of philosophies or meta-cognition regarding our work.

How often do we model, discuss or even consider these kinds of things as useful professional tools?

Shanafelt, Arch Surg, 2012
2) Factors that enhance QOL DO NOT necessarily protect against burnout (e.g. exercise, protected personal time).
3) Factors that protect against burnout DO enhance QOL.

How’s all this working for us?
The Problem is Growing

- Re-evaluation of burnout in MDs and general US working population. (n=7,000 in each group)

- From 2011 —> 2014, burnout among MDs increased 10% (45% to 54%, p < 0.001)

- On MV analysis risk of burnout for MDs vs general population had OR = 1.97.

Burnout, Mental Health and Medical Errors

Compared to age-matched peers:

SI is 3x higher in surgeons, suicide 2.3x higher in MDs, depression is nearly dbl in Medical Student and B/O in trainees is 30% more common.

“Male sex, having children, and working for the Department of Veterans Affairs were associated with a lower likelihood of alcohol abuse or dependence.”

25K ACS fellows, 29% response
15% EtOH abuse or dependence
M: ~13%, F: ~25%, Gen Pop: 9%
Medical Errors — OR 1.45
BurnOut — OR 1.25
Depression — OR 1.48

Shanafelt, Arch Surg, 2011
Devi, Lancet, 2011
Center, JAMA, 2003
Dyrbye, Ann Int Med., 2008
Dyrbye, Acad Med, 2014
Oreskovich, Arch Surg, 2012
Burnout, Mental Health and Medical Errors

Cultural stigma and stoicism act as significant barriers.

Culturally, psychological health is still seen as a static character trait rather than a skill to be developed.

Result: technical and intellectual experts with little or no formal preparation for the inherent stressors of their work.

Result: 400 MD suicides in 2015 - double the population average

Thompson, Enhancing Mental Readiness in Military Personnel, 2006
http://www.rto.nato.int/abstracts.asp.

American Fndn for Suicide Prevention. Facts about MD depression and suicide, 2016
http://afsp.org/our-work/education
Burnout, Mental Health and Medical Errors


Of course, pts are not planes and biology is far more complex than flight.

To Err is Human, Inst of Med, 1999
Prevention/Intervention?

- Work-hour reform: Fewer hours, Structured breaks

Regulated duty hours highlight work-life balance but failed to change the overall magnitude of stress.

FIRST trial showed that flexibility had no impact on patient care or outcomes. Flexibility shifted the source of stress back to personal life while alleviating the component derived from interrupted pt care.

- Reporting, QI, Time-outs, Check-lists and Bundles

How’s all this working for us?

Bilimoria, *NEJM*, 2016
BMJ, 2016: Hopkins, Reanalysis
Calculated Rate x 2013 Admissions

- Subsequent studies of lethal adverse events
- ~250K/yr
- 3rd leading COD


Based on our estimate, medical error is the 3rd most common cause of death in the US

- Cancer 585k
- Heart disease 611k
- COPD 149k
- Suicide 41k
- Motor vehicles 34k
- Firearms 34k
- All causes 2,597k
The Culprit: STRESS

- What Stress? : exhaustion, decision-fatigue, death, personalities, perceptions, complications, surgery

- Many of our stressors are inherent, but inherent doesn’t mean immutable

- Can ‘stressors’ really impact mental and physical health, much less performance to such a degree?

Baumeister, Neuropsychol, 2014
Pinto, Am J Surg, 2014
Good, Bad and Toxic Stress

Nature of Stress + Individual Perception

Stress can prompt adaptation or survival

"Reflection vs. Reflexes"

Stress that is manageable can promote development

Stress that is threatening can put us in survival mode

Stress that is chronic, or overwhelming can be toxic

Too toxic to ignore
A stark warning about the societal costs of stress comes from links between shortened telomeres, chronic stress and disease, say Elizabeth H. Blackburn and Elissa S. Epel.

Good Stress $\rightarrow$ Adaptation

We have all experienced it

- Pimping
- Emergencies
- A heart-breaking patient
- A passionate attending

Some of the most indelible (and important) lessons of our training

Certain instances of stress enhance memory and learning and stimulate the mastery of new behaviors and skills - fundamental to our optimal development.
Data backs that up: Motor skill learning requires the natural oscillations of cortisol to optimize acquisition and maintenance of skills.

Liston, Nat Neurosci 2013
Bad and Toxic Stress: Chronic, Overwhelming, Severe

When fight-or-flight becomes chronic, the HPA axis and the ANS disregulate

The hippocampus and PFC have a high concentration of GC receptors.

Hippocampus: Learning and Memory

PFC: Executive Functions - attention, short-term memory, planning, self-control

McEwen *Nat Neurosci* 2015
Stress is a Double-Edged Sword

Hippocampus and PFC: ADAPTATION
problem-solving
decision-making

Amygdala: SURVIVAL
reflexes, reactions
Stress changes the brain which regulates biosystems and determines behavior

The brain is the master switch

- Whether we employ reflection or reflexes depends upon the brain’s PERCEPTION of what we face: is it a challenge? or is it a threat?

Do we engage and explore or fight and flee?

McEwen Nat Neurosci 2015
Stress Effects Performance

20 medical students, 1 mo of psychosocial stress (Step 1 prep), underwent neuroimaging while performing a PFC-dependent ‘attention shifting’ task. 1 mo later repeat. Compared to unstressed controls.

Did worse on the task and showed changes in brain architecture:
Decoupling the PFC from areas involved in planning and problem solving
Coupling the PFC to areas promoting visual processing (vigilance, survival)

Liston, *PNAS*, 2009
Good Stress → Inoculation

Stress inoculation (aka ‘stress resilience’) is the development of a tendency for the brain to perceive CHALLENGES rather than threats.

In some literature, referred to as coping skills: seen as the major determinant of how an event impacts mental health and performance outcomes.

The prevailing model of resilience emphasizes that the initial appraisal of stress - not the presence or nature of the stressor itself - is critical to downstream coping.

Thompson, Enhancing Mental Readiness in Military Personnel, 2006
Lyons, Front Behave Neurosci, 2009
What is Resilience?

Resilience is the ability to **thrive** in spite of adversity; to **reframe stressor as challenges** and to face stressors in a **regulated rather than reactive** way.

Resilience is subserved by a remarkable psychobiology

It manifests as people who **triumph** when everything suggests they should fail

*Simply put resilience is resistance to stress*

Masten, Ann NYAS, 2006
Cohn, Emotion, 2009
Psychobiology of Resilience

PFC controls the balance of appraisal

Through the Lateral Amygdala

Locus Coeruleus = NE

or the Nucleus Accumbens

NAc = dopamine

Feder, Nat Rev Neurosci, 2009
Wager, Neuron, 2008
What fires together wires together
Cognitive Appraisal = Emotional Control

Cognitive appraisal: What is this experience I’m having?
Emotional control: (AAAAAAAAAHHHHHHHH!!!!)
Resilient outcome: We got this.

The pause between an event and one’s reaction is key.
This is really hard!

Because our reflexes protect us. They are hard-wired for a reason. Because we don’t like discomfort. And because we’re surgeons.

How do we train our minds to do things a different way?
Mindfulness By Definition...

“Non-judgemental awareness of the present moment”

...is cognitive appraisal and emotional control

- Training one’s mind to be aware of each moment and to create a pause before reacting (or not reacting).

The goal of mindfulness is to maintain awareness moment by moment, disengaging oneself from strong attachment to beliefs, thoughts, or emotions, thereby developing a greater sense of emotional balance and well-being.
- SIT AND COUNT YOUR BREATHS FOR 1 MIN
- notice your thoughts, but don’t follow them
- try to let your mind be ‘empty’
For most of us; a lot of NOISE
- Groceries, resentments, to do lists, physical irritations, worries, music, plans, memories.
- Very little of what we think about pertains to NOW.

For most of us, sitting (in that noise) is really uncomfortable.
Habits of Mind

• Pausing to evaluate thoughts and events before ascribing meaning or significance *is* Cognitive Appraisal. And developing this ability enhances our resilience.

• Practicing ‘non-judgemental awareness’ enhances our ability to ‘pause’.

• The mental training for this is meditation. Creating new habits for your mind.

• Habits of mind are no different than habits of the wrist - they take reinforcement and practice.
• Cognitive Load: the mental effort required to learn in the context of the limited capacity of short term/working memory

• Cognitive Load Theory: germane (the point), intrinsic (the work), extrinsic (the noise)

Young, Med Teach, 2014
Mental training is a process-oriented skill, and because it changes the brain, it impacts many domains.

Epel, Ann NYAS 2009
MBSR: Mindfulness-Based Stress Reduction

Highly codified, non-religious, heavily studied

8 weeks
2.5h/week
45min/day
8h retreat

What Can MBSR/MFI Do?

Biologically & Psychologically

- **Chronic pain:** MBSR, subjective report, cohort, 50% reduction.

- **Inflammatory illness:** Psoriasis, n=37, RCT, UVB +/- MBSR, plaque evaluation (Nurses (ub), Direct MD (b), Photo MD (b). *Faster clearing of plaque by 10d and improved subjective stress.*

- **Immune fnc:** HIV, n=48, RCT, found CD4+ Tcell counts remained stable in intervention groups but declined in controls over a 3mo period. (p=.02)

- **Burnout:** 70 PCPs, pre/post CME, evaluated well-being, distress, B/O and pt relations. F/u at 2, 12 and 15mo by survey. Sustained improvement in B/O at 15mo.

  Ludwig, JAMA, 2008
  Krasner, JAMA, 2009
  Creswell, Brain Behave Immun, 2009
  Kabat-Zinn, Psychosom Med, 1998
What Can MBSR/MFI Do?

Biologically & Psychologically

- **Telomeres:** 4 RCTs to date, Obese, Chronic fatigue, experienced meditators and dementia caregivers. Total n = 190, indicate that MF leads to increased telomerase activity (i.e. increased telomere length). Combined weighted effect size was significant with d=0.46, p = .001

- **PTSD in Veterans:** RCT longitudinal, n=21, eye-blink startle, RR, and self-report. Pre-post and 1yr f/u. Breathing-based meditation, 7d x 3h/d. Improvements on all measures (r = 0.93 post & r = 0.77, 1yr). 7:11 continued to practice intervention.

Seppala, *J Traum Stress*, 2014
Schutte, *Psychoneuroendo*, 2014
What Can MBSR/MFI Do?

Neuropsych and Neurocognition

- Flook & Davidson, 2015 showed enhanced cognitive function, (self-control) in preschoolers after MFT. Also demonstrated objectively increased kindness and helpfulness to classmates.

- Jha, RCTs in 2010 & 2013, respectively, showed protection of WMC in pre-deployment Marines and maintenance of both self-control and attention performance in incarcerated youth.
MBSR Changes the Structure of Your Brain

Cohort, n=26
Pre/Post fMRI
Validated measures of stress MBSR

Reductions in perceived stress correlated with decreased amygdala gray matter density

Holzel, *Scan*, 2010
MBSR Changes the Structure of Your Brain

Cohort comparison n=16/17
MBSR  
Pre/Post fMRI  
Five Facet Mindfulness Q

Increased HipC GMC  
Improved awareness, observing, non-judging  
(p=0.003)

“MBSR is associated with changes in gray matter concentration in brain regions involved in learning and memory, emotion regulation, self-awareness, and perspective taking.”

MBSR Changes the Structure of Your Brain

Systematic review and meta-analysis of MRI-neuroanatomic changes in meditation practitioners
21 studies, ~300 practitioners
8 regions consistently altered

<table>
<thead>
<tr>
<th>Meta-awareness</th>
<th>Intero- and Exteroceptive body awareness</th>
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<tbody>
<tr>
<td>Memory consolidation</td>
<td>Self and emotional regulation</td>
</tr>
<tr>
<td>Inter- and Intra-hemispheric communication</td>
<td></td>
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</tbody>
</table>

Fox, Neurosci Behav Rev, 2014
The Outcome: HAPPIER

- Psychological benefits
- Helps B/O in MDs, in others protects from depression and relapse
- Reduces perceived stress by training cognitive appraisal - the pause between an event and one's response
- Creates new habits of mind

Sound crazy? think about how you react to blood
The Outcome: STRONGER

- MF bolsters physiological health but how will it help us? We don’t really know if/how much we’re ailing.

- But we know a few things:
  - Chronic pain
  - CV in Swiss study of MDs
  - Aging (allostatic load predicts functional decline)

Voss, SSO, 2016
Davis, J Surg Res, 2014
Karlamangla, J Clin Epi, 2002
Domenighett, Schweiz Med Wachenschr, 1984
The Outcome: FASTER

- With enhanced executive functions that subserve more efficient learning, problem-solving, diagnosis and decision-making.

Groopman, *How Doctor’s Think*, 2007
The Outcome: BETTER

• We’re **happier**, potentially kinder, more connected.

• We’re **healthier**, not just through exercise and appearance, but in our CV, metabolic and NE systems.

• We’re **sharper**, with more efficient and less taxed cognition.

• We’re **TECHNICALLY improved**

• Is that possible? Drill down on the numbers
Surgeon reviewers analyzed 444 surgical malpractice claims - random sampling form 4 liability insurers:

“Surgical safety research should focus on IMPROVING DECISION-MAKING AND PERFORMANCE particularly in complex patients and circumstances” (i.e. under stress)

65% manual errors; 73% experienced surgeons; 84% routine operations

61% pt complexity (emergency, tough anatomy or prior surgery)

Regenbogen/Gawande, Ann of Surg., 2007
Can MF help us become better in this regard?

Surgery is 1/4 technical and 3/4 intellectual

- Protects and enhances executive function:
  - Attention, WMC, endurance, and precision
- Changes the structure and connections of the brain:
  - Decreases reflexive amygdala
  - Growing the hippocampus - critical to consolidation of motor sequences, the seat of intrinsic learning and memory.
  - PFC enhanced dendritic branching and connectivity to hippocampus.

Albouy, Neuron, 2008
The Mindful Surgeon, 2016

- Works in others, how about in us?
- Pilot efficacy
  - 2016 in-coming interns (max n=44)
  - Randomized to MBSR or active control
  - Assessment at baseline, post and 1 year follow-up
- Parallell feasibility
<table>
<thead>
<tr>
<th>PHYSIO</th>
<th>Collaborator/contact</th>
<th>Specimens</th>
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<tbody>
<tr>
<td><strong>Telomeres/TA</strong></td>
<td>Jue Lin</td>
<td>Peripheral Blood Cells (PBC) 8ml whole blood draw</td>
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<td>Lab UCSF (cell)</td>
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<td>Blackburn</td>
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<td><strong>RNA/Epigenetics</strong></td>
<td>Steven Cole</td>
<td>RNA 5-8ml whole blood</td>
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<td>UCLA (office)</td>
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<td><strong>SNIPs</strong></td>
<td>Cole/Jue Lin</td>
<td>DNA rs53576 (oxytocin receptor)</td>
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<td><strong>Allostatic Battery</strong></td>
<td>Teresa Seeman</td>
<td><strong>Overnight Urine</strong></td>
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<td>UCLA</td>
<td>SNS &quot; = Epi, NE Plasma CRP</td>
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<tr>
<td><strong>HRV</strong></td>
<td>NOT DATA</td>
<td>ad lib use during study</td>
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<td><strong>Cortisol</strong></td>
<td>[<a href="mailto:Mark.Laudenslager@ucdenver.edu">Mark.Laudenslager@ucdenver.edu</a>] + (s)</td>
<td>Hair 2cm closest to base/follicle</td>
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<tr>
<td></td>
<td>Clemens Kirschbaum ( clemens.kirschbaum @tu-dresden.de )</td>
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<thead>
<tr>
<th>PSYCH</th>
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<tbody>
<tr>
<td><strong>Composite Survey</strong></td>
<td>Elissa Epel</td>
<td>Includes: CAMS-R, Grit, PHQ-9, Block Ego Resilience, PSS, Maslach</td>
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<td><strong>NEUROCOG</strong></td>
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<tr>
<td><strong>WASI-II</strong></td>
<td>Jessica Foley</td>
<td></td>
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<tr>
<td><strong>Digit-Symbol Test</strong></td>
<td>Katherine Possin</td>
<td></td>
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<tr>
<td><strong>EXAMINER</strong></td>
<td>Joel Kramer / Jordan Stiver</td>
<td><a href="https://ucsf.app.box.com/">https://ucsf.app.box.com/</a> files</td>
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<tr>
<th>FUNCTIONAL NEUROANATOMY</th>
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<tbody>
<tr>
<td><strong>rs-fMRI</strong></td>
<td>Andy Kayser</td>
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<td></td>
<td>Chris Hess</td>
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<td>Lara Stables</td>
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<td>Chad Smiddy</td>
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| **BOLD**                |                                |                                                |
| **BOLD + Emotional Reappraisal** |                                |                                                |

| DTI/Connectivity        | Conor Liston                   |                                                |
|                        |                                |                                                |

| PERFORMANCE             |                                |                                                |
| **PATRIOT**             | Polhemus                       |                                                |
| **Electromagnetic Tracking** | Neil Schell                  |                                                |
US Army Chief of Staff
Post-middle-east conflict —> devastating PTSD and suicide rates
Unprecedented mandate to “Equip their minds”

Collaborated with Penn, pursued the evidence
Developed a system of mental training for resilience
First pilot in 2008, first longitudinal cohort 2009

Cornum, *Amer Psychol* 2011
Lester, *Amer Psychol* 2011
Longitudinal, mandatory, recruits, NCO and Brass
Convergence

STRESS IS CAUSED BY GIVING A [DAMN].
<table>
<thead>
<tr>
<th>Thanks</th>
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<tbody>
<tr>
<td>Hobart Harris</td>
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<tr>
<td>Elissa Epel</td>
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<td>Bruce McEwen</td>
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<td>Pamela Derish</td>
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Motorskill Mastery Depends on Decision Making

- How do we gauge this?
  - “Economy of motion”: shorter path length, fewer moves, not faster but more economic so the overall procedure takes less time.

- What underlies this?
  - Appraisal: experience - sifting; memory; extrapolation; adaptation —> all underlie decision-making

Wolpert, Curr Op Neurobio 2012
studies linking stress and MDs have been around for awhile..

- As early as the 1980s, reports published examining illness and disability in MDs in US and UK found strong relationship to stress and new mental illness.

- Study of UK House Officers found remarkably high emotional distress.

- Swiss study, 1984, found CV pathology sig higher than average population.

- ‘Stress in Surgeons’ brought into focus with 1990 survey of nearly 700 Irish and British surgeons: diminished personal life #1 stressor, higher MHI subscale scores for ‘free-floating anxiety’ and ‘hysterical anxiety’ (all men).

Rawnsley, J R Soc Med 1988
Firth-Cozens, BMJ, 1987
Domenighett, Schweiz Med Wachenschr, 1984
Green, BJS 1990
Allostasis: our buffering capacity to events and insults
(rather than to O2 and HCO3 as in homeostasis)

Allostasis is adaptation, our ability to change in response to our environment. Allostatic load is the cumulative cost of adaptation

- Allostasis: ability to achieve stability through change - is critical to survival.

- ANS, HPA, CV, metabolic and immune systems respond to stressors and then return to baseline - ideally.

- Allostatic load is the wear and tear over time - especially with chronic overactivity.
We propose that stress prophylaxis and intervention should be as commonplace as technical proficiency and clinical best practices, in recognition of the occupational hazard of stress.

**Internal vs External Resources**

**Process-Focused Training**

Meaning it applies in myriad domains