


Mental Stress and Occupational Health

Ashok Nimgade, MD, MPH

Harvard School Public Health
(Occupational Health Services)

GOALS: FRAMEWORK for understanding chronic work stress

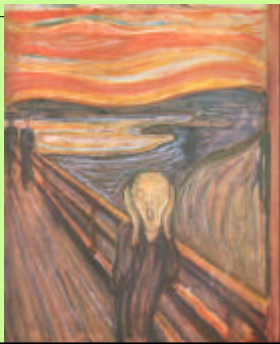
(Illustrated with research )

- (0) Background
- (1) magnitude of problem
- (2) health co-morbidities / work injuries
- (3) Theories of adverse mental stress
- (4) blue vs. white collar workers

(Not stress management!)

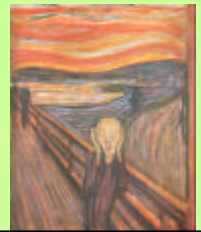
DEFINITION: MENTAL "STRESS"

- "Strictus" (Latin) = to tighten
- "The Scream" Edvard Munch (1893) ~
- 2 of versions 4 stolen. (one returned). This version stolen in 1994 valued at \$ 15 million.



DEFINITION: MENTAL "STRESS"

- Defining stress: operationally difficult
 - DSM-IV: only acute stress (eg PTSD)
- Problem: Stress = "X" or "Y" variable?



DICTIONARY DEFINITION (Merriam-Webster)

- **1** : **constraining force or influence**: as **a** : a force exerted when one body or body part presses on, pulls on, pushes against, or tends to compress or twist another body or body part **b** : the deformation caused in a body by such a force **c** : a physical, chemical, or emotional **factor** that causes bodily or mental tension and may be a factor in disease causation **d** : a **state resulting from a stress**; **especially** : one of bodily or mental tension resulting from factors that tend to alter an existent equilibrium

DEFINITION

Many researchers suggest standardizing terminology and avoiding term "stress"

X Y
"Stressor" → "Strain" (aversive consequence)

may consider using:

Stress_x → Stress_y

DEFINITION: "Mental Stress"

(Focus here is on chronic (not acute) stress!)



"Mental stress" =
the "mind's uneasiness brought about
by an adverse surprise or
invalidation of an 'obsession' such
as 'a constant desire to win'."

- Financial Analyst ("white collar")

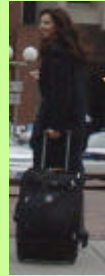
"Stress" = Y variable

DEFINITION: "Mental Stress"

"When there is not a balance
between mind and body... when
one is overwhelmed by even
normal everyday activities ...
mental clarity is lacking..."

- Flight Attendant ("pink collar")

"Stress" = X or Y variable



DEFINITION: "Mental Stress"



"...When all the weight
is on your shoulders...
You don't know how to
do something... and
then you start
snapping at others!"

- Kitchen Worker ("blue collar")

"Stress" = X and Y variable

DEFINITION

But 40% of literature uses
"Stress" as an X variable.

Even Hans Selye,
"The father of stress research"

"Stress*" = a "nonspecific
response of the body to a
demand."

* Really meant "strain"



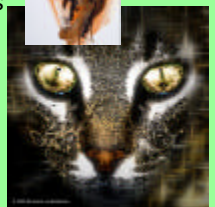
BUT...

"How can an abstraction kill?"

How can an abstraction kill?

Walter Cannon "Voodoo
Death" :

the voodoo victim "stands
aghast, with his eyes
staring ... hands lifted as
though to ward off the
lethal medium... His
cheeks blanch and his
eyes become glassy... his
face becomes horribly
distorted."ⁿ (1942, *American
Anthropologist*)



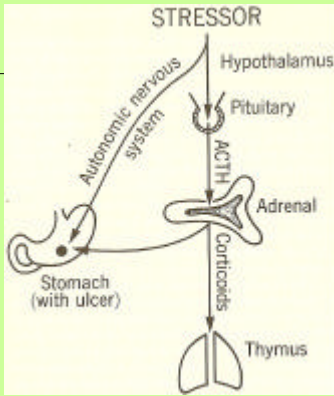
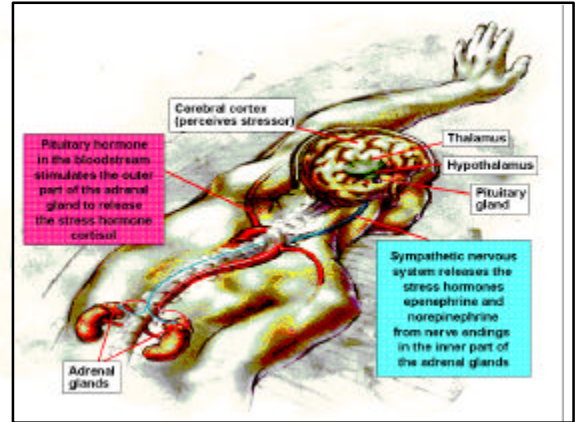
How can an abstraction kill?

Cannon voodoo victim:

- tachycardia
- increase muscle tension
- hyperglycemia
- "adrenaline" release
- (With prolonged threat) low BP → shock.

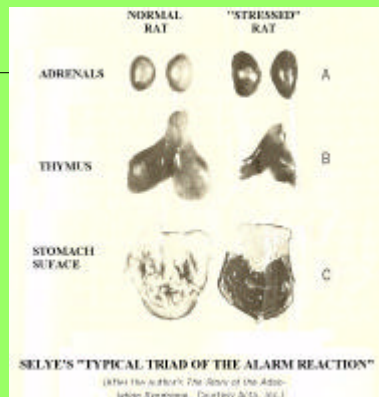


Cannon experiments with restrained animals (could not fight nor flee from "danger") → digestive problems



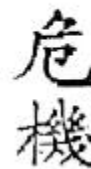
STRESS-RELATED DISORDERS

- DERM: Acne, hives, eczema, rosacea
- Headache, neck pain, Bruxism TMJ
- GI: colitis, IBS.
- CV: Angina, HTN,
- asthma & allergies
- Alopecia
- Psych: CFS, PTSD, Depression, Insomnia
- Hyperhydrosis.
- Urinary incontinence
- Herpes
- ETC...



Some stress is good:

CRISIS



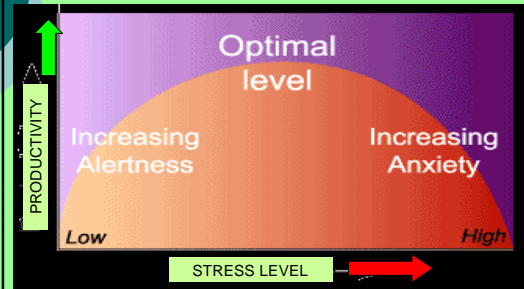
OPPORTUNITY

"Complete freedom from stress is death"



Hans Selye

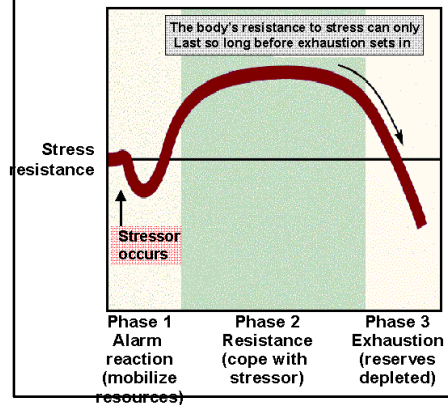
Yerkes-Dodson Law (1908)



(3) How does stress differ between blue vs. white collar workers?

potential confounders:

- Wealth, access to health care
- Differential smoking, fitness, etc
- Home environment



(1) magnitude of work stress

Is work stress rising?

- **UK** (2001-2) survey:
 - "stress, depression, or anxiety" afflict half-million workers, prevalence doubling over the 1990s = working days lost from musculoskeletal disorders.
 - (Jones, Huxtable, Hodgson, & Price, 2003)
- **Finland** > 50% workforce have "burnout" symptoms
 - Gabriel & Liimatainen, 2000).
- **Korea:** > half of MI's attributed to work stress! -- Colleague Jong Won

○ **USA**

- California, 1980s: 540% rise in WC "mental stress" claims (while other claims were dropping). 1987: \$383 million.
 - Corey & Wolf, 1992.
- "Job stress is whatever the courts decide it is."
 - (Marcus (1991), Defense Counsel Jnl, p 250-53.)

Work Stress: a growth industry!

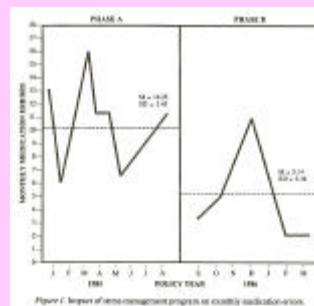


Figure 2.1 Annual rates under "occupational stress" in the index of Psychological Abstracts from 1970 to 1989 (updated from Bush, 1987, Figure 4.1).

(2) Can mental stress → health?

- injuries
- health co-morbidities
- cascade of health effects?

DOES MENTAL STRESS AFFECT INJURIES?



Higher rates malpractice in hospitals with higher "composite stress level" Jones (1988), J.Appl. Psych, 73, 727-35.

Figure 2. Impact of stress management program on monthly accident rates.



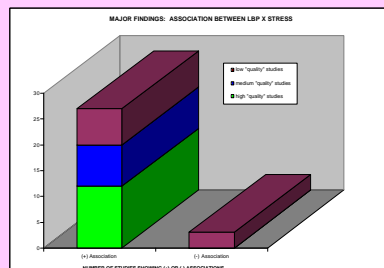
"LBP AND MENTAL STRESS"

(A. Nimgade, T Courtney, R Goldberg. Poster: European Conference on Psychosomatic Research, June, 2000, Oslo, Norway)

- Method: Lit review: 32 studies (1974-99)
- X measures : "control over work pace," "resignation to job," "support," "time pressure," "competition," "feeling of stress," etc
- Y Measures: LBP, BP, sciatica




○ Results: 27 (of 32) studies showed association between LBP and mental stress / depression, etc.




Conclusions: LBP is associated with mental stress. LBP – marker for mental issues?


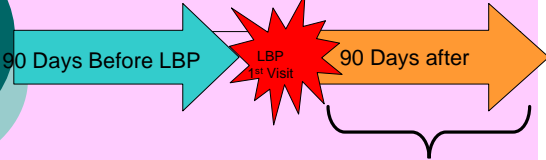
FALLON STUDY (A. Nimgade, E. McNeely)



- Database Study of LBP in Community Health Center (~1999-2003)
- Eligible: uncomplicated LBP onset in 1999 (no LBP visits in 1998) N= sample 657 LBP cases




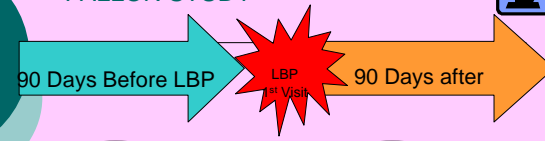
FALLON STUDY

- Total **Non-LBP** Per Patient charges Up ~ 60 %
- Median **Non-LBP** Per Patient charges Up ~ 40 %

(Note: radiology Costs do not account for this Spike in "non-LBP" charges)

FALLON STUDY






"Old Cohort":
already being seen 90 Days before LBP onset

"New Cohort":
entering/re-entering system 90Days after

- higher Non-LBP charges
- higher Psych Dx'es

FALLON STUDY

SUMMARY:
LBP onset → cascade of non-LBP expenses. Esp. in "old" cohort (higher psych morbidity)

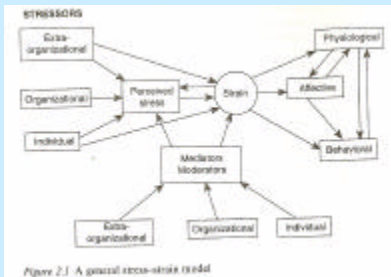
⚡
Mental stressors?

(3) What causes adverse mental stress?

- classic models of stress:
- Effort-reward mismatch (Siegrist)
 - Person-environment mismatch
 - Demand-control (Karasek)
 - Inadequate social support

WARNING

Also, some complex, all-encompassing "taxonomic models"!!



SOCIAL SUPPORT THEORY

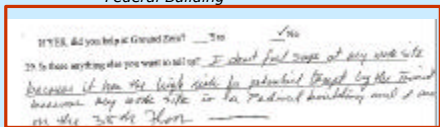


TROUD, A. Nimgade, C. Mueller, R. Hall, GS Earnest. Health complaints and organizational exposures among office workers near the WTC disaster site. *J Occup Environ Hygiene*. 2011; 8(10): 507-514.



FED BUILDING Hx:

- o FBI offices Targeted by "Blind Sheikh"
 - convicted 1993 for plot to bomb U.N., etc, & NY Federal Building



Interesting theme for post 9/11 era (little studied): how do chronic stressors intensify effects of acute stressors?



INITIAL COMPLAINTS

HEALTH COMPLAINTS:

- Mostly respiratory (cough), bad "taste in mouth", headache, nausea.
- Feeling "UNSAFE"
- Feeling "UNSUPPORTED"
 - o Inadequate mgt-worker communications?
- But Sx'es improving slowly over time



RESULTS: SURVEY

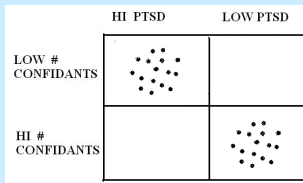
- NYC Fed Bldg (vs. Dallas control bldg)
 - o hi stress scores → hi risk [O.R.] for all somatic Sx'es
 - o hi depressive Sx'es scores → hi risk [O.R.] for most somatic Sx'es



SOCIAL SUPPORT: WTC

confidants inversely related to PTSD

Prevalence ratio: 2.3 [1.4-3.8] – low vs. high social support



Impact of # confidants on PTSD score - NYC only*

# confidants	HI PTSD	Low PTSD
0	4 (8.6)	4 (2.8)
1-2	17 (37.0)	25 (17.5)
several	14 (30.4)	75 (52.4)
many	11 (23.9)	39 (27.2)

* Chi Square probability = 0.0058



(3) How does stress differ between blue vs. white collar workers?

potential confounders:

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Higher Stress /Strain in White Collar/ Financial Sector

- USA: (BLS) white collar have highest RR (cf. blue collar) for severe mental stress than for other injuries/illnesses (Webster & Bergman, 1999).
- UK: annual "severe mental stress" IR ~ 2% in financial workers = double of other workers (Jones et al., 2003).
- UK: high alcohol consumption among London financial traders (Kahn & Cooper, 1990).
- Australia: finance among top 7 industries in one state for "mental disorder" WC claims filed; such claims up 37% ~1990-95 (Dias, 1997).

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Why higher stress in White Collar

- bonus incentive schemes.
- piece-rate compensation → more stress and injuries than traditional fixed-rate compensation (Levi, 1972).
- Animal models: increased stress from from variable-ratio reinforcement (Naruo, Hara, Nozoe, Tanaka, & Ogawa, 1993).

STUDY:



"Work stress and performance among financial traders" *Stress & Health*, (in press, 2005) T. Oberlechner, A.Nimgade.



THE FINANCIAL TRADERS SURVEY STUDY

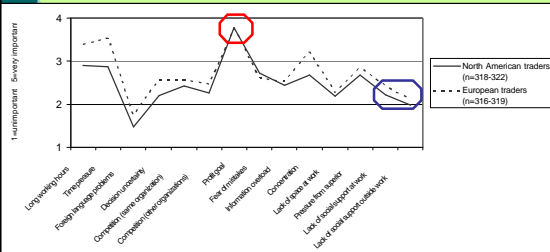


326 financial traders (59% response rate) at 21 America banks

32% traders report "very high +" stress levels



importance of various stressors: American vs. European traders

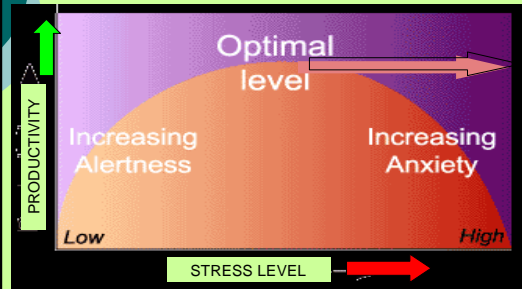


"profit goal" = highest stressor.

"Pressure from Superior" & "Poor social support" = low stressor.

High stress levels → do not impact performance.

Do traders defend performance levels despite stressors?



- Support for Effort-reward, Social support, and Demand-control models also seen
- But sometimes only in a subgroup.
 - E.g., Social support more important in Sales traders, not proprietary traders.



- **Informal observation:** Traders resistant to talking about own stress.
- **Therefore:** Among "tough," "macho" work populations, may use somatic symptoms – eg LBP, headaches, TMJ, rashes, etc – as a hook for entry into stress counseling?

IN CLOSING...

TAKE HOME MESSAGES

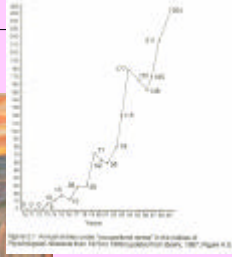
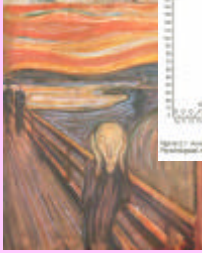
STRESSORS → co-morbidities/ work injuries

WHITE COLLAR: highly self-motivated
○ no tailing off inverted U curve?

- FOR BETTER WORK ENVIRONMENT?:
- social support
 - balanced demands/ autonomy
 - good effort-reward matching
 - Person-environment matching

SOMATIC SX'es as MARKER FOR STRESS?

- *A fake version!*
- *2004 another version stolen!*



THE END?