Integrating Patient Safety & Clinician Wellbeing

Budgeting clinician cognitive resources strategically in healthcare delivery

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AHA Webinar
April 15, 2021

The Questions We'll Answer Today

What problems continually occur in clinician brains across hospital systems that affects them personally and potentially their delivery of care?

What are the underlying – or *root* – causes of these issues?

How can hospital leadership and administrators address these issues within their scope of decision-making ?

Key Points

1. Clinician brain power (neural resources) is a limited, highly trained resource that should be budgeted for most effective use.
2. Emphasis in healthcare assessment of safety and quality has been quantifying end result metrics, missing opportunity to reduce root causes of end results further upstream.
3. Unnecessary mental (cognitive) load on clinicians can be mitigated or prevented by leadership knowledge of basic human factors/ergonomics concepts.
4. Clinician burnout and latent systemic causes for medical error can be reduced with use of tools discussed today.

WHO: Burnout Definition

"Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed.

It is characterized by 3 dimensions:

1. Feelings of energy depletion or exhaustion.
2. Increased mental distance from one's job or feelings of negativism or cynicism related to one's job and
3. Reduced professional efficacy"

https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases

Burnout is "usually related to mismatch between workload and resources needed to do the work in a meaningful way"

Christine Sinsky MD. Vice President of Professional Satisfaction at the AMA

https://www.ama-assn.org/practice-management/physician-health/who-adds-burnout-icd-11-what-it-means-physicians

The Impact of Clinician Burnout

Institutional & Patient Effects

- Increased risk of medical errors (200%)
- Increased malpractice claims
- Disruptive behavior
- Reduced empathy for patients
- Reduced patient satisfaction
- Reduced patient adherence to treatment regimens

Financial Effects

- 27% drop in patient satisfaction scores
- 40% of turnover costs attributed to work stress
- 114% increase of medical claims by employees.
- 30% of short-term and long-term disability costs

Personal Effects

- Higher Suicide Rate among physicians- 400/yr.
- Substance abuse
- Divorce
- Coronary Heart Disease:
  CHD 1.4 fold up to 1.79 at high burnout levels
- Reduced career satisfaction

Medical Error and Clinician Burnout have in common Systemic Contributions

- The Institute of Medicine (IOM) 1999 Report, *To Err is Human: Building a Safer Health System* emphasized that the majority of errors in healthcare are the result of systemic influences.[1]
- The majority of occupational stressors causing burnout are also the result of systemic factors.[2]
- **The quality paradox:** Many of the well-intended interventions to improve specific elements of quality, safety or value, *when taken in total,* are contributing to health system dysfunction by the cumulative impact on workload and burnout at the point of care.[3]
- Stress at work has been increasing over the last decades, as measured by the same instrument over time[4], yet we do not educate leaders and healthcare decision-makers to budget cognitive resource as they might money or personnel.
- The higher the cognitive load the higher the risk of Burnout[5]

1. Kohn, L.T., Corrigan, J., Donaldson, M.S. , *To err is human: building a safer health system.* 2000, Institute of Medicine. National Academy of Sciences: Washington, D.C
2. Privitera MR, Attalah F, et al . Physicians' electronic health record use at home, job satisfaction, job stress and burnout. 2018 Journal of Hospital Administration. Vol 7, No 4.. 52-58
3. Sinsky CA and Privitera MR. Creating a Manageable Cockpit: A Shared Responsibility. JAMA Int. Med . June 2018.; 178(6):741-42
4. Cohen S, Janicki-Deverts D. Who's Stressed? Distributions of Psychological Stress in the United States in Probability Samples from 1983, 2006, and 2009 Journal of Applied Social Psychology, 2012, 42, 6, pp 1320-1334
5. Harry E Sinsky C et al. Physician Task Load and Risk of Burnout in US Physicians in a National Survey. The Joint Commission Journal of Patient Safety 2020 000: 1-10.

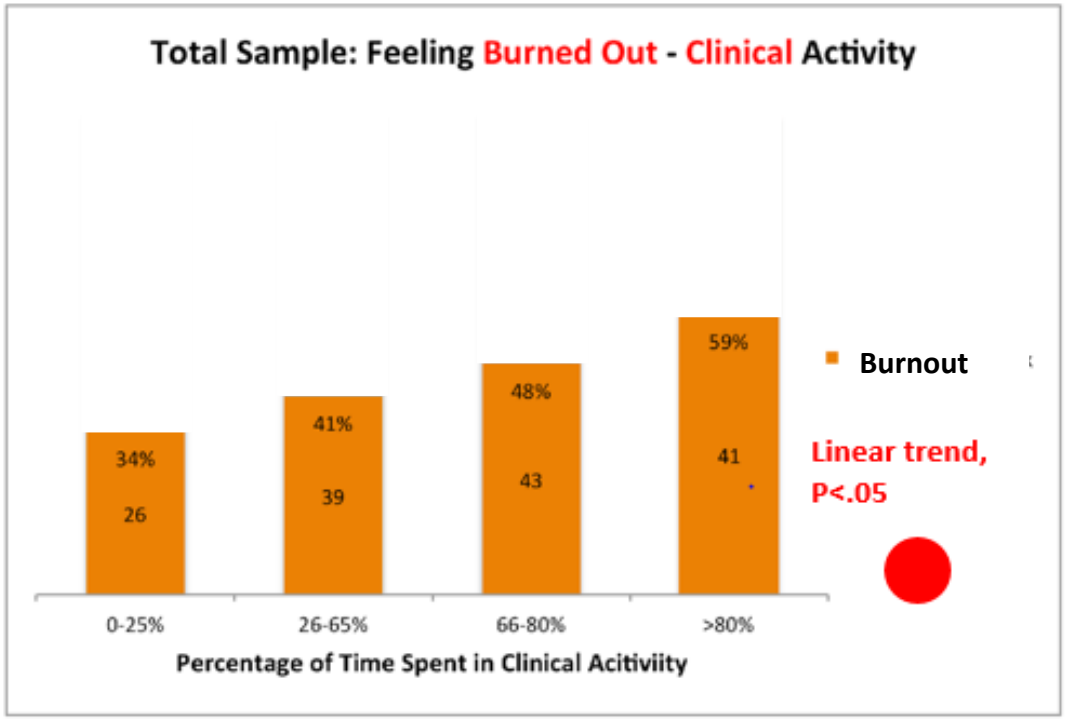
The Burnout and Care Paradox:

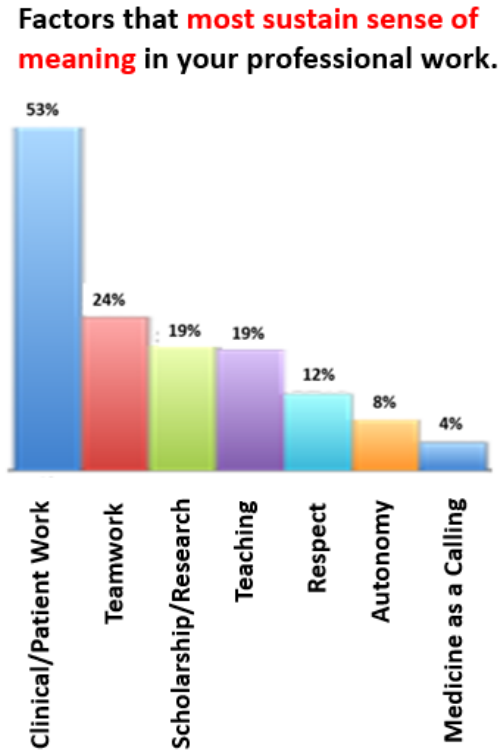
Higher the Clinical FTE of the position, the higher the Burnout, yet…….

clinicians report highest fulfillment from patient interactions.

Why? Write-in responses identified:

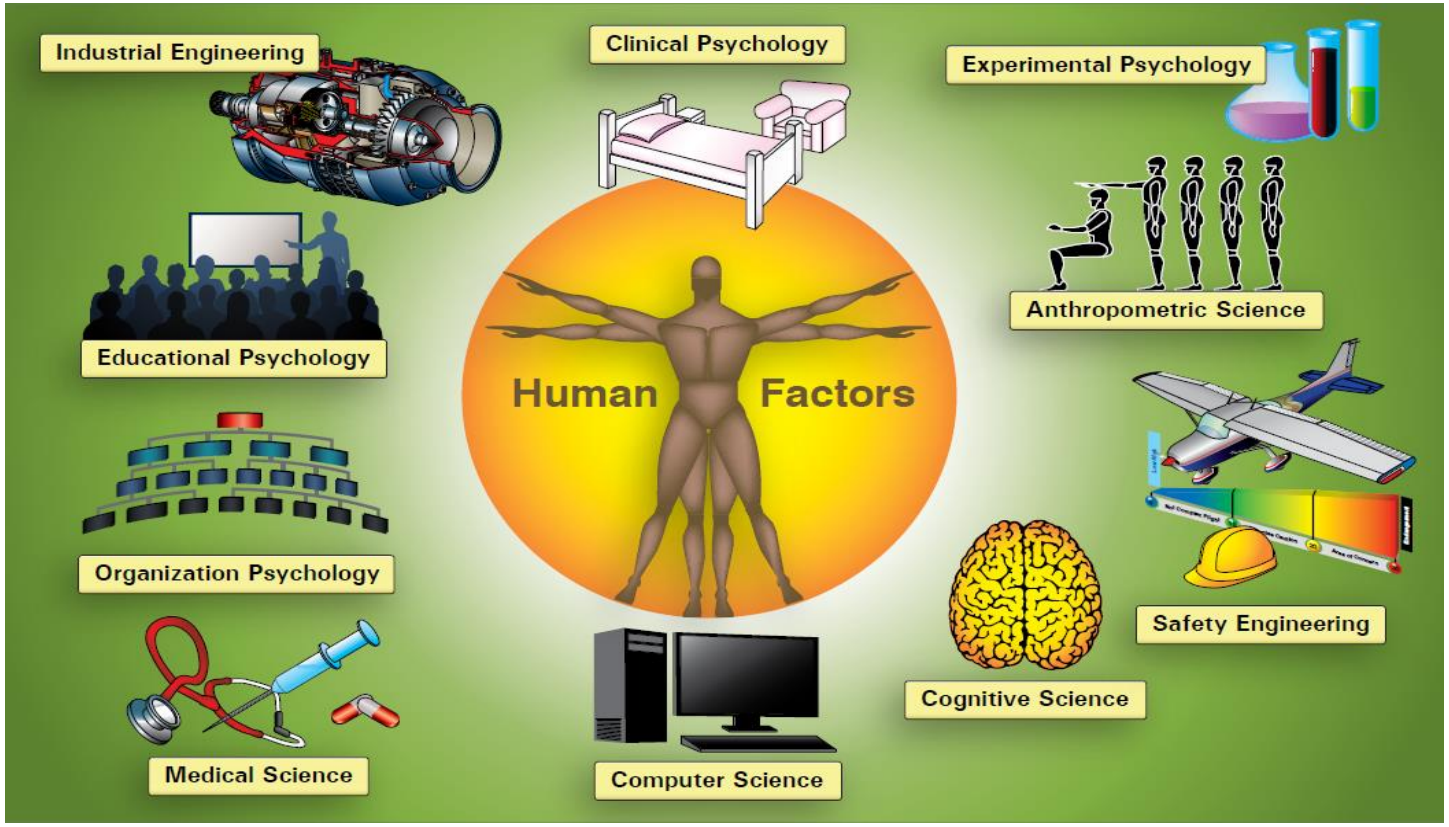
- Substantial volume of obstacles to delivering care
- Leadership was unaware of the burden clinicians experienced





Data from: Anandarajah A, Quill T, Privitera MR. Adopting the Quadruple Aim: The University of Rochester Medical Center Experience. Moving from Physician Burnout to Physician Resilience. American Journal of Medicine Aug 131 (8) 979-986. 2018

What Are Human Factors / Ergonomics (HFE)?



HFE Definition: The scientific discipline concerned with the understanding of interactions among humans and other elements of a system.

Applies theory, principles, data, and methods to design in order to:

- **Optimize human well-being and overall system performance.**
- **Patient safety** is a component of system performance.

Goal:

- **Fit the system to the people instead of fitting people to the system**

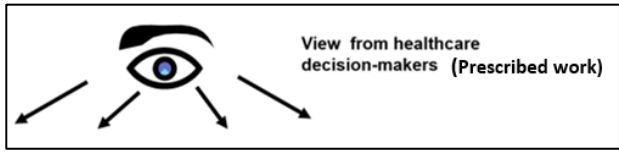
https://www.faasafety.gov/files/gslac/courses/content/258/1097/AMT_Handbook_Addendum_Human_Factors.pdf

Chapter 14 Human Factors FAA Safety

International Ergonomics Association www.iea.cc

Examples of Systemic Contributors to Burnout and Latent Error

Prescribed Work Looks Manageable “on Paper”



1. Office Start up

2. W arm up computer Software booting EMR booting

3. Patient Arrive On time, right location

4. Financial Pre-meeting

5. Waiting Room receptionists Clinical based forms given to patient

6. Nursing vs taken and documented

7. EMR record review preparation

8. Patient Interview/ Evaluation/ Procedures

9. Writing Orders and Labs

10. Writing Notes and Diagnosis Billing

Lambert C. Shadow Work: The unpaid Unseen jobs that fill your day. Counterpoint Press 2015

But "Shadow Work" -unseen, unpaid jobs that fill the day- creates additional mental effort and infiltrates the workflow in practice

Prescribed Work

1. Office Start up

Shadow Work

Office environment
- Temperature too warm, too cold
- Window crack- draft,
- Noise outside Grass cutting and trimmer
- Lighting, bulb flickering

Prescribed Work

2. Warm up computer Software booting EMR booting

Shadow Work
- New security restrictions longer warm up
- Shortcut to EMR not working
- Password expired, think of new one
- New EMR software roll outs, learning curve time
- Software not working, need time on phone with IT support.

Prescribed Work

3. Patient Arrive On time, right location

Shadow Work
- Intro letter to patient about visit printed wrong clinic address
- E mail list serve, missed informing of parking lot problem-> delay in patient parking

Prescribed Work

4. Financial Pre-meeting

Shadow Work
- Wrong letter electronically selected from drop down menu about what financial information to bring-> delay with financial counsellor

Prescribed Work

5. Waiting Room receptionists Clinical based forms given to patient

Shadow Work
- Pre-visit clinical rating scales were not given to patient to fill out, as substitute secretary not familiar with customized EMR screen interface for this location.

Prescribed Work

6. Nursing vs taken and documented

Shadow Work
- Different budget line clinics co-located physically.
- Substitute nurses think not allowed to help on clinic as EMR interface reflected different budget line clinic.
- Vital Signs not obtained before visit

Prescribed Work

7. EMR record review preparation

Shadow Work
- EMR focus on billing, not clinical efficiency.
- Decreased productivity to pre-EMR.
- Old records received but cant find as scanned into non intuitive file tab name coined by EMR vendor.
- Specialized support staff use this file tab regularly, so not occur to them or administrator that clinicians may not understand its purpose.
- Have to call HIM to find it, if time.
- Outside lab and radiology results: Are paper results scanned in somewhere?

Prescribed Work

8. Patient Interview/ Evaluation/ Procedures

Shadow Work
- Meaningful use criteria to be met (regardless of reason for visit)
- Smoking cessation
- Send for old records
- Pain score
- Multiple screening questions

Remember to focus closely on why the patient is here despite these competing demands.

Prescribed Work

9. Writing Orders and Labs

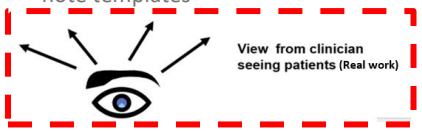
Shadow Work
- EMR vender builder decisions on narrow requirement on lab order name.
- No drug synonyms allowed to get to the right order.

E.g.: Patient on Depakote, want to order blood level.
[Depakote= divalproex sodium = sodium valproate + valproic acid]
- Cannot type in "Depakote" level, "divalproex sodium" level, or "sodium valproate" —not recognized.

Prescribed Work

10. Writing Notes and Diagnosis Billing

Shadow Work
- ONLY recognizes "Valproic Acid" Level.
- Hunt, trial and error to find out what works.
- Ordering controlled substance: (e.g. NYS Health Commerce System controlled substance check)
- Password expired without warning.
- While patient is with you, must make up new password, never used within the last 50 passwords, complex security requirements. Do not make mistake writing prescription despite these competing demands.
- Choose correct template type (multiple, budget line driven).
- Template operation: F2 to next section, which can be ***, multiple choice drop downs, single choice drop down, or need to access *** wild card & write in.
- Compliance Creep- more documentation expected locally than required by regulation built into electronic note templates



- Voice recognition dictation software not working.
- If I call support will be on phone loosing time to do work. Type without it.
- "Best Practice Alerts", 'Hard stops' —demands an answer before can proceed.
- Interrupts thought while thinking of DDx and Treatment plan.
- Software "Autocorrect" function is working against you.
- Will not stop changing to incorrect word.
- Correct ICD-10 diagnosis with "hard stop" demanding specificity of dx out of fear that may not be covered by insurance.
- Interrupts your train of thought.
- Don't make a mistake that may hurt patient.
- You will be blamed, not the system, if it happens.

Lambert C. Shadow Work: The unpaid Unseen jobs that fill your day. Counterpoint Press 2015

Need to augment the triple aim and establish a National Healthcare Delivery Framework that can be followed by all stakeholders.

Triple Aim

Quadruple Aim

Quadruple Aim especially important to guide technical device companies, regulators, legislature and other decision-makers who may not have direct experience of providing care to patients.

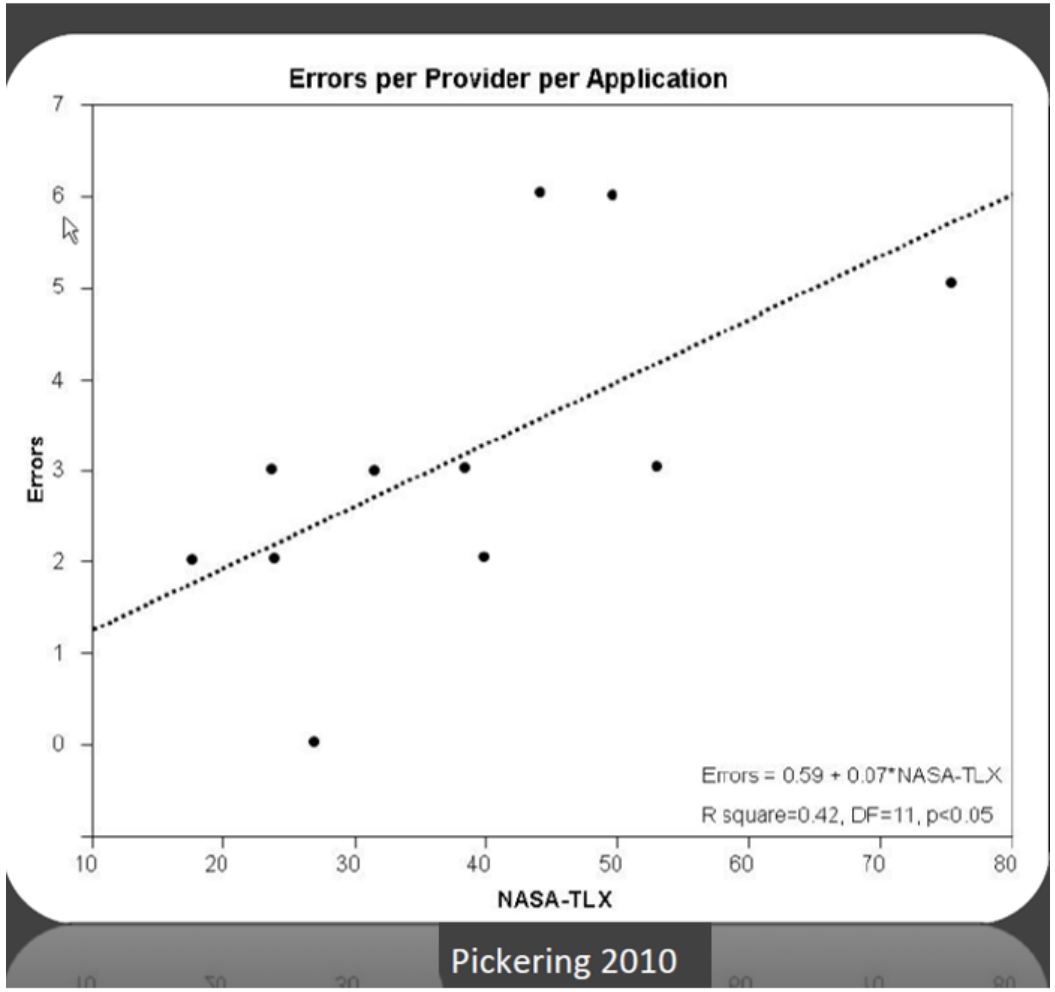
NASA TLX Cognitive Load and Medical Error

Demand	Rating Question	Rating 0 (very low) - 100 (very high)	X Weight	= Product
Mental Demand	How mentally demanding was the task?		3	
Physical Demand	How physically demanding was the task?		0	
Temporal Demand	How hurried or rushed was the pace of the task?		5	
Performance	How successful were you in accomplishing what you were asked to do?		1	
Effort	How hard did you have to work to accomplish what you were asked to do?		3	
Frustration	How insecure, discourages, irritated, stressed, and annoyed were you?		3	
			Total Weights = 15	Subtotal
				÷ 15
				Mean Score =

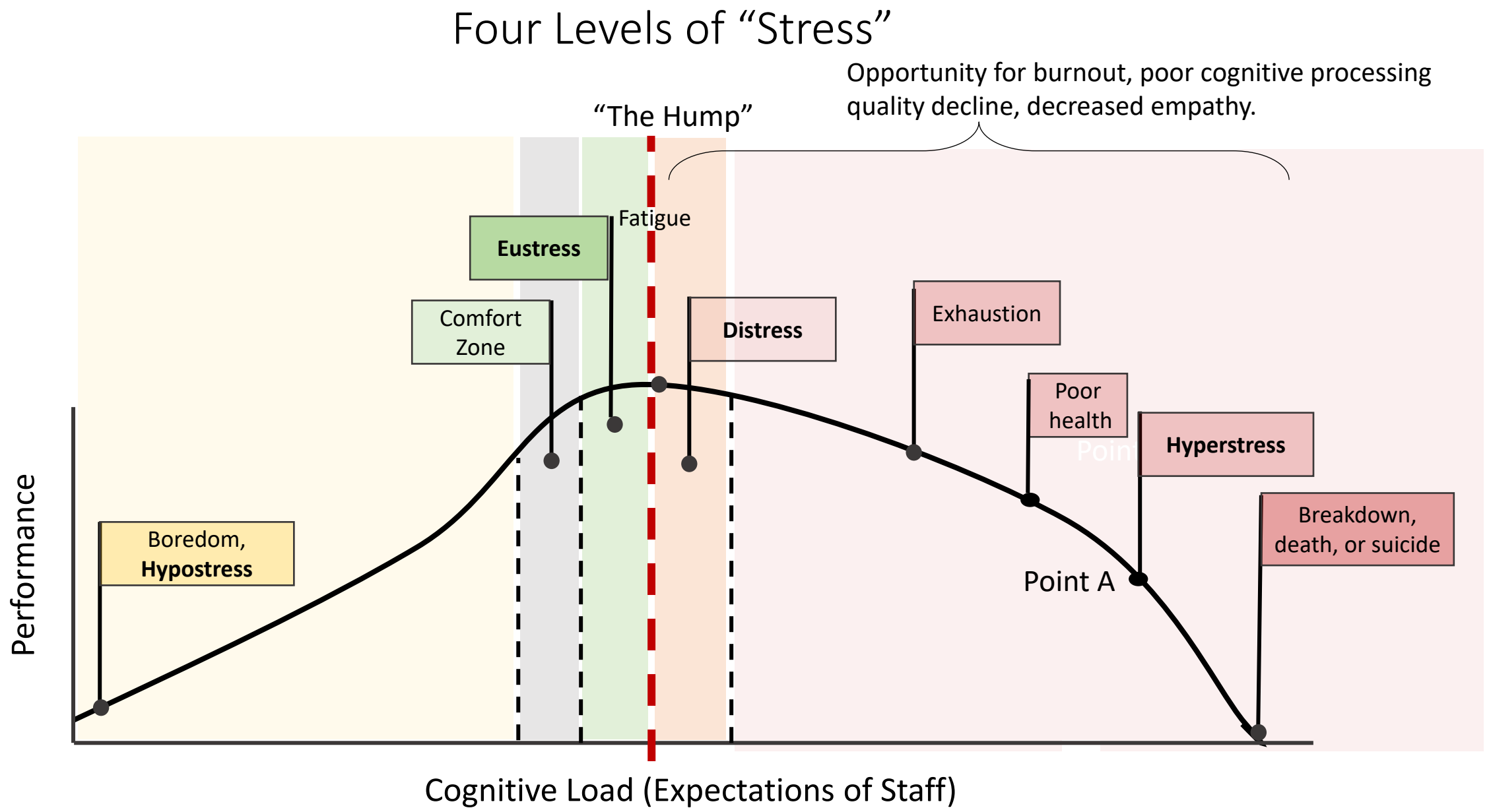
Cognitive capacity has little to do with intelligence or skill.

- Even highly intelligent people can reach their cognitive load threshold very quickly, and your best staff can create medical error as a result.

Cognitive Load and Medical Error



Human Function Curve for Average Clinician



Electronic Medical Record (EMR) connectivity blurs boundary between work and home intruding into "off time"

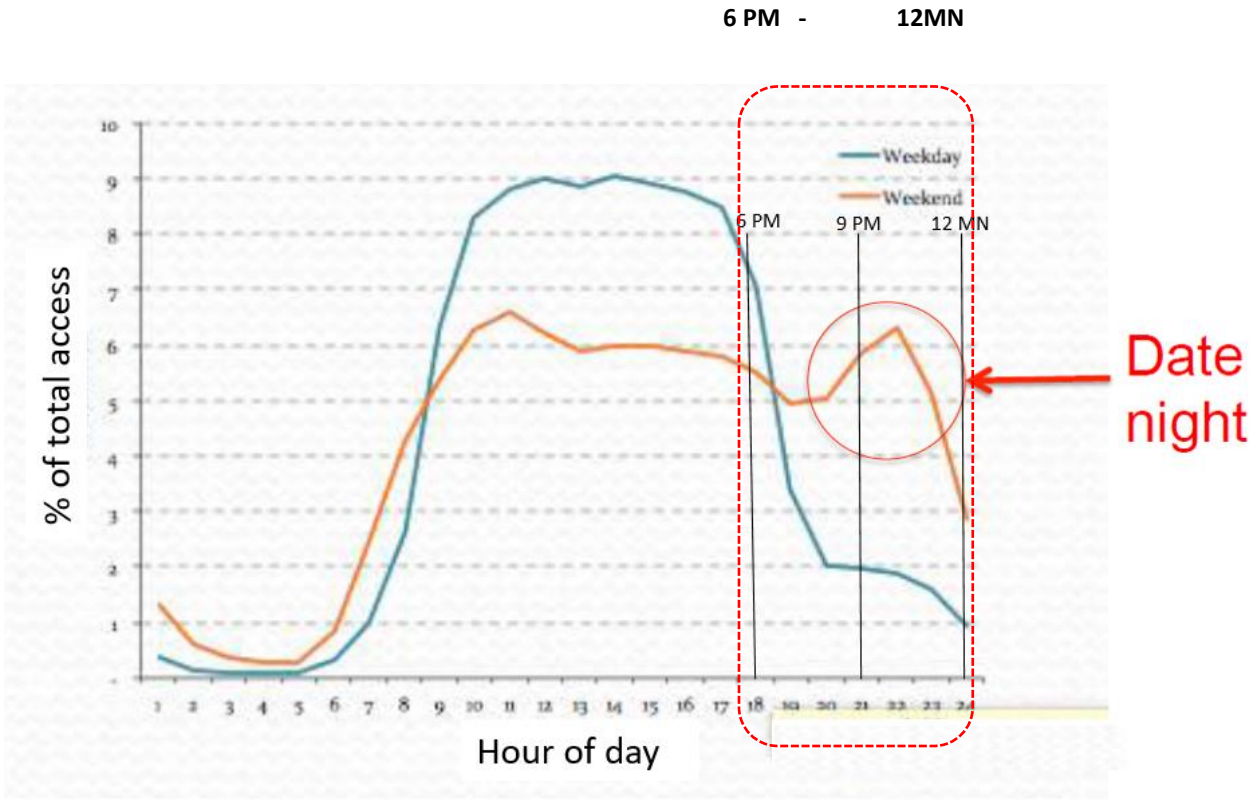
- Physicians spend 10+ hours per week interacting with EMR on night and weekends+

- **EMR documentation, phone calls, e-mails at home:**
  ↓Job satisfaction (r = -0.155, $p < 0.001$)
  ↑Job stress (r = 0.252, $p < 0.001$)
  ↑Burnout (r = 0.230, $p < 0.001$).*

- **Excessive/ moderately high time on the EMR at home***
  ↑ odds of burnout by 46% ($p < 0.05$)

- **If working over 40 hrs. work/week:**
  Brain Efficacy= 35% - Takes 3 times as long to do the same work that would have been done earlier in the work day#.

EMR Usage by Time of Day



EMR Usage Courtesy of: Christine Sinsky MD, VP for Clinician Satisfaction, AMA & Brian Arndt MD University of Wisconsin.

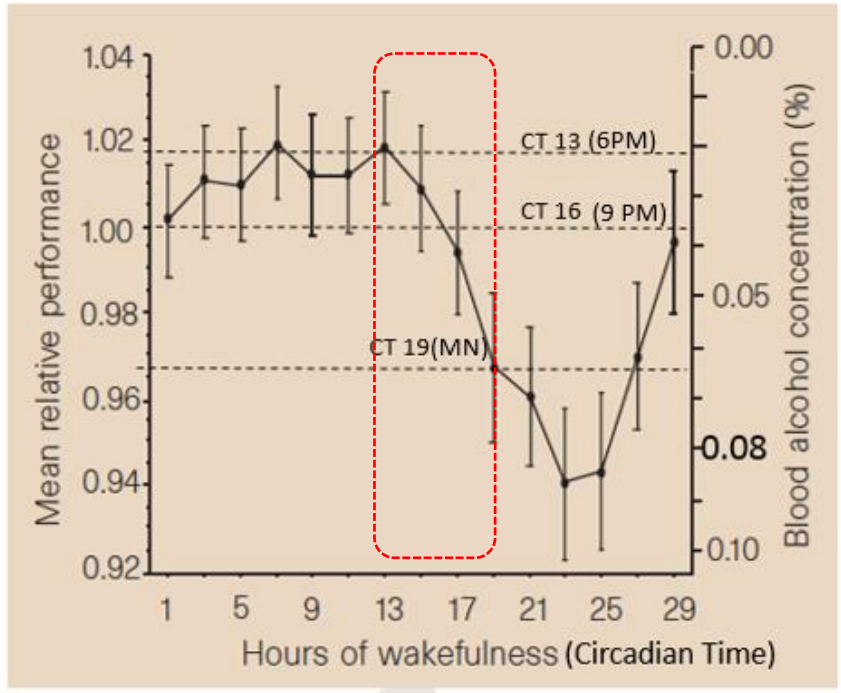
+Arndt BG, Beasley JW, et al. The Annals of Family Medicine. September 2017, 15 (5) 419-426;

*Privitera MR, Atallah F, et al. Journal of Hospital Administration. Vol. 7(4) 52-59. 2018

Levitin DJ. The Organized Mind. Plume Press 2014

Increased Intrusion Leads to More Burnout and Decreased Cognitive Function

- If clinician salaried, institution may only be aware of work units completed, unaware of when or how long they take to get done.
- Without managerial pressure to suppress working during “off time”, clinician performance and personal lives continue to suffer.

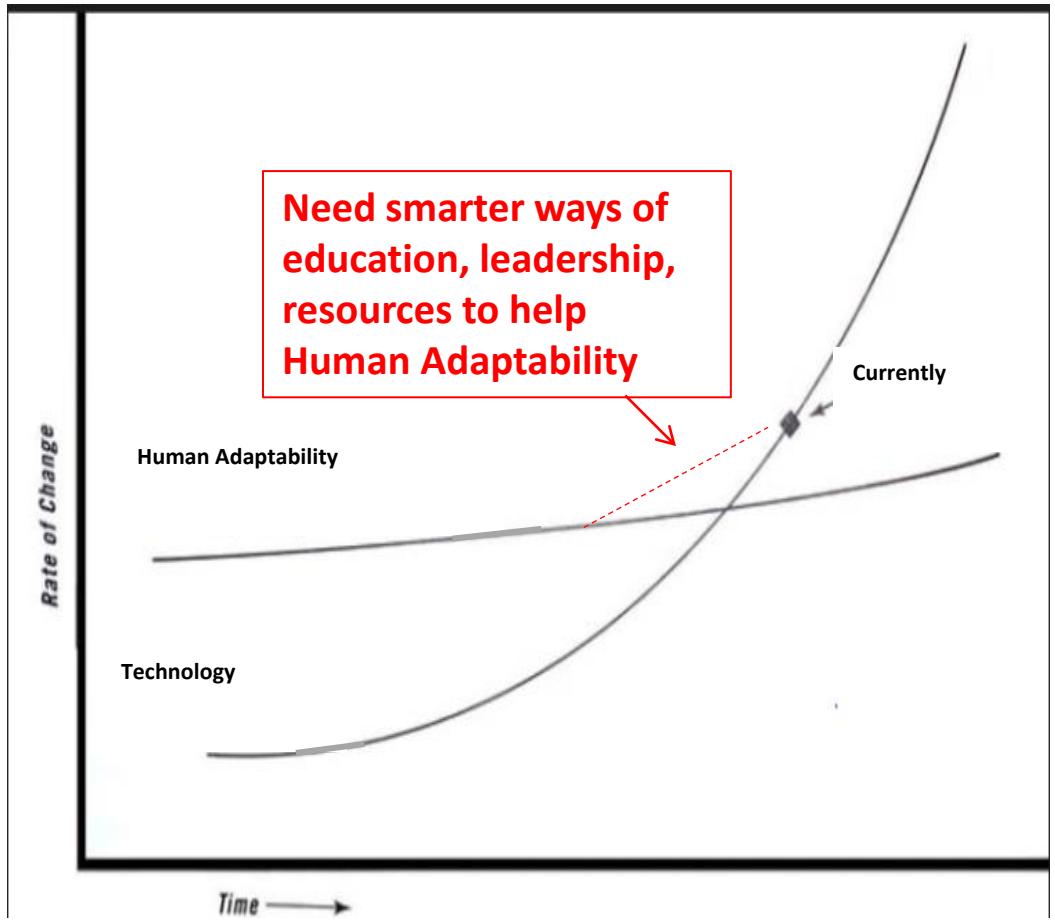


	Recent Work-Home Conflict	No Recent Conflict
Burnout	41.7%	24.0%
Depression	50.4%	26.6%
Seriously Considering Divorce	14.0%	8.6%

Mechanisms behind Burnout and Latent Medical Error

Technological advancements have already surpassed human cognitive adaptation

- Technological change will continue to out-pace human adaptability
- Technology results in increased connectivity, tracking, accountability, and expectations beyond work hours
- Technology costs are low, personnel costs high, which leads to a decrease in staffing
- Functional, but not usable, technology that replaced people spins off more “shadow work” on remaining employees
- Surrounding culture “normalizes deviance”, dulls internal feedback that we are living in dangerous and unsustainable circumstances



*Adapted from Teller E. and Moore G. in Friedman T. Thank you for being Late. Farrar, Straus Giroux Publishers 2016

Lambert C. Shadow Work. The unpaid, unseen jobs that fill your day. Counterpoint. Berkley. 2015

Cognition can be Controlled or Automatic

- Controlled thought uses up cognitive resources (glucose)
- Automatic thought conserves resources, burning far less glucose
- The brain leverages automatic thought more when resources are low
- HOWEVER automatic thought is not appropriate in dynamic, complex situations. When incorrectly applied, leads to errors

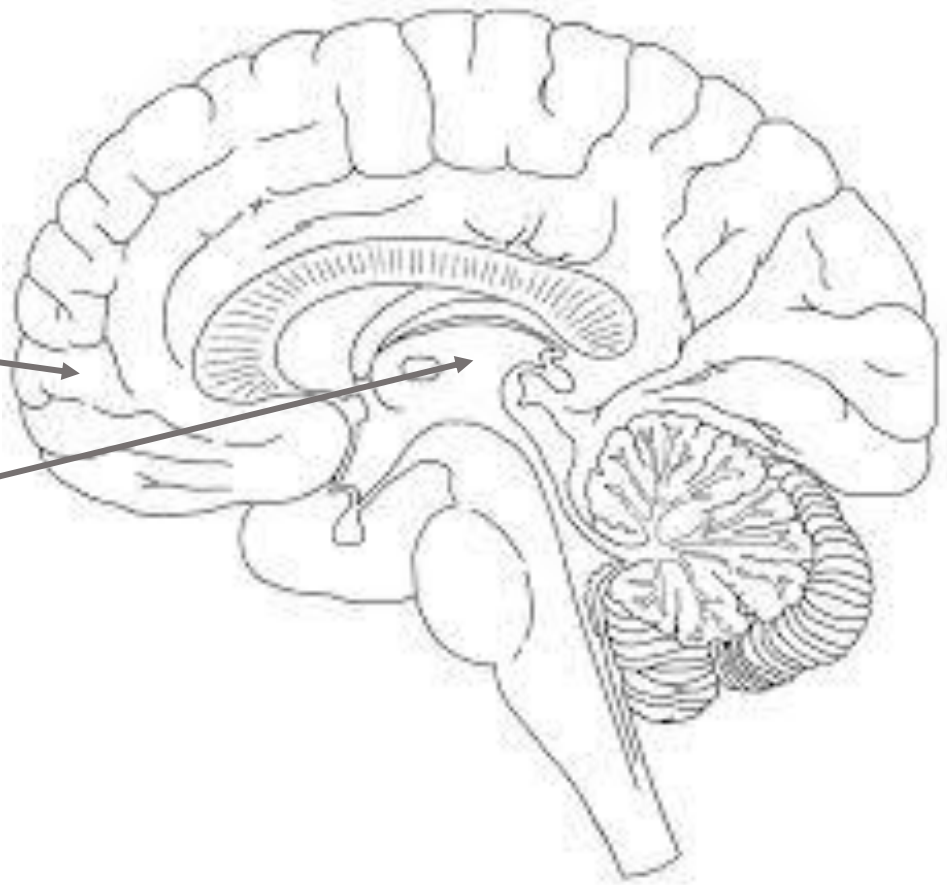
These aren’t abstractions; we are talking about neural structures and cellular functions

Controlled Thought in the prefrontal cortex:

- limited and expensive neural resource
- used for high level functions
- needs restoration, uses glucose

Automatic Thought in the basal ganglia:

- habitual memory
- low neural resource utilization
- energetically inexpensive



Think of your brain as a car, and glucose is the gas

Tasks that Drain Resources

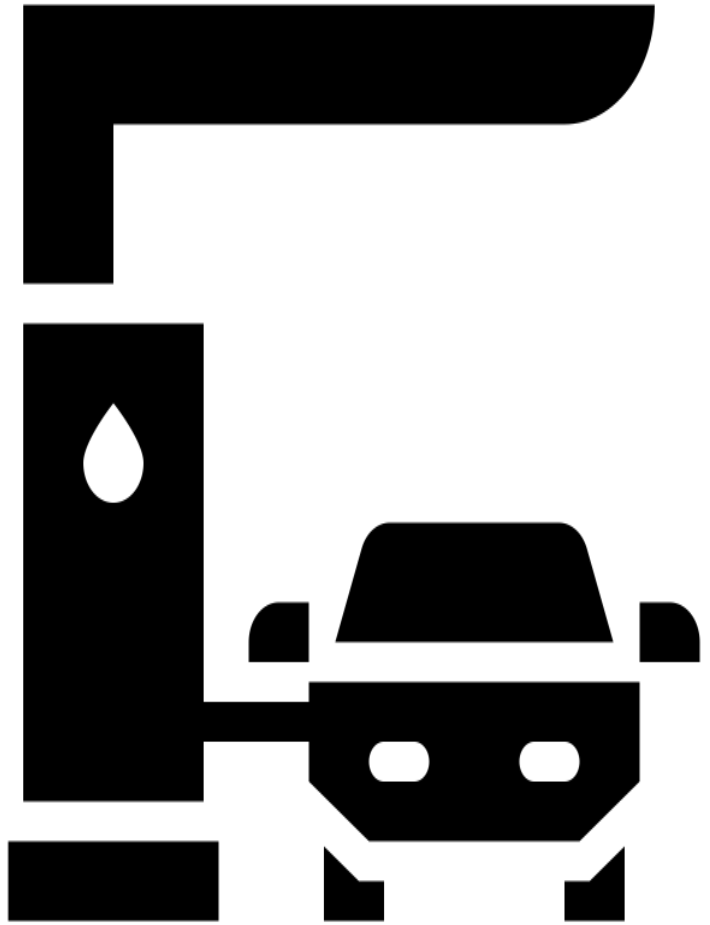
Excessive workload: physical, cognitive, or emotional

Goal maintenance: updating working memory, self-regulation, inhibiting fear and anger, coping with bad outcomes and grief

Focusing attention: decision-making at any scale, sorting and classifying, task switching and interruption, working with ambiguous interfaces (bad design)

Resolving cognitive dissonance: lack of organizational resources and feelings of low justice, value conflicts in the face of necessary deviance

Guilt or argument with family during work/home conflicts

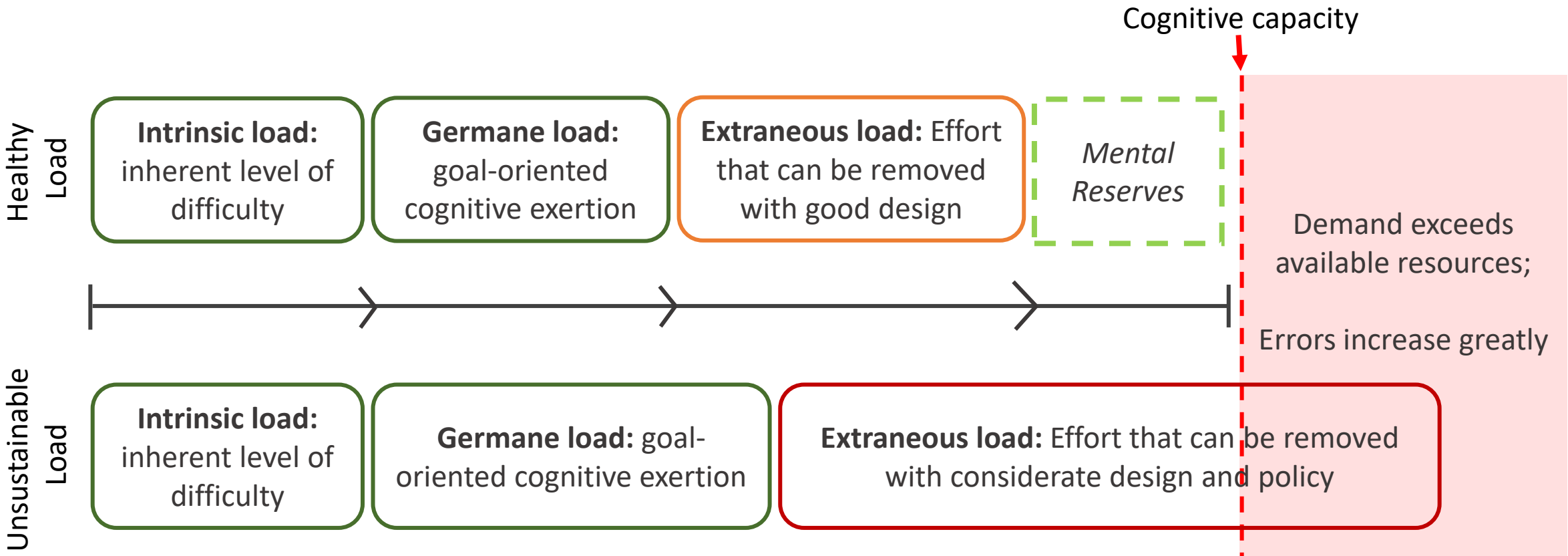


Tasks that Replenish Resources

Cognitive restoration

- Sleep
- Snacks and meals
- Time away from screens
- Walks, particularly in nature
- Environmental change
- Mindfulness and meditation
- Rewarding or satisfying work, including positive patient outcomes
- Appreciation from institution and/or patients and their families
- Time with friends/family and positive socializing
- Spirituality practices
- System-level acknowledgement of contribution or struggle

Like Gas, Controlled thought is a finite resource



Once cognitive capacity is reached, the brain is depleted of resources required for controlled thought. Then automatic thought, load shedding and goal shielding occur.

Automatic thought- learned response from stimulus. No differential diagnosis
Load shedding- offload information, first low risk, then random shedding
Goal shielding- not allow new information into brain processing

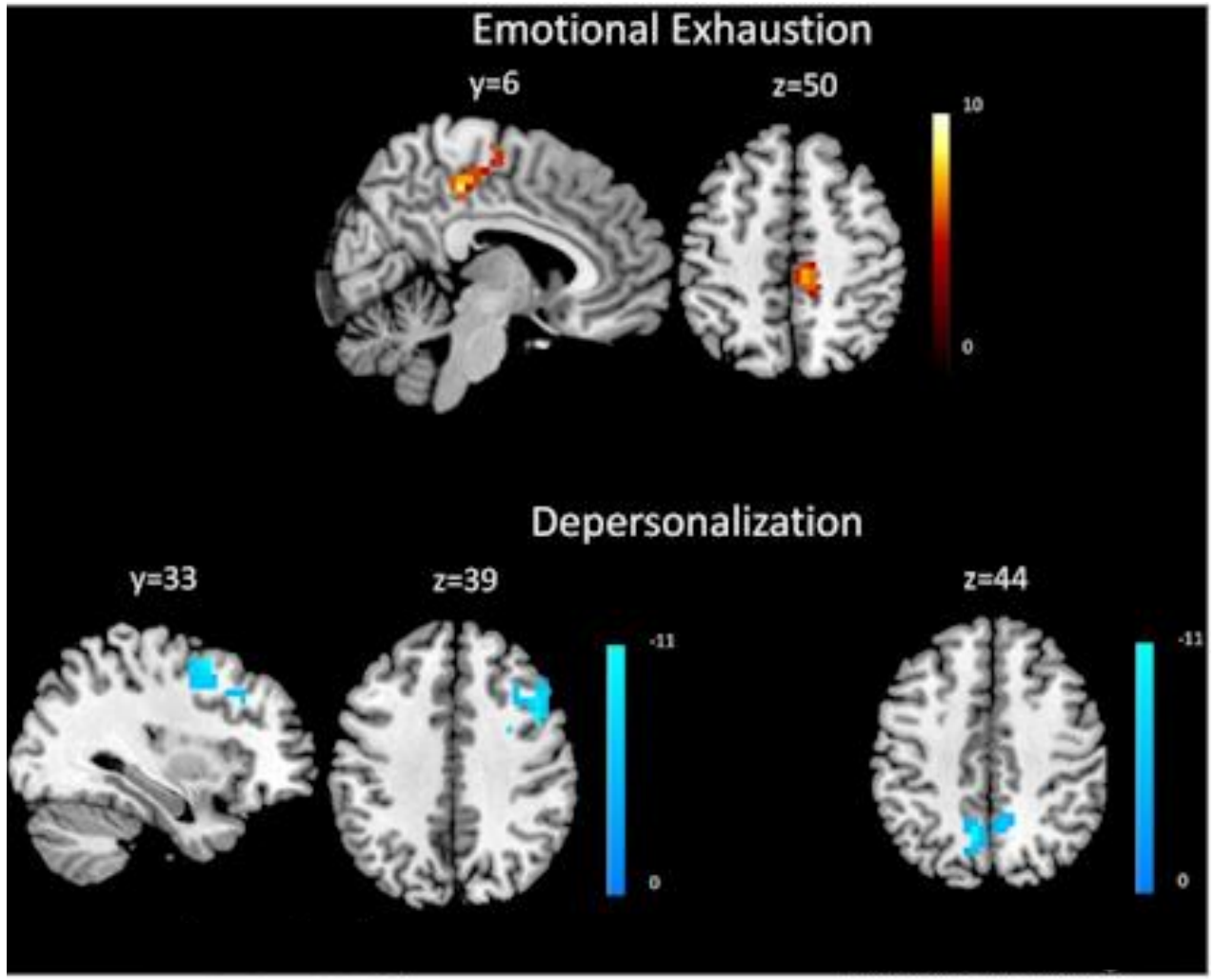
Burnout Effect on Cognitive Function

Cognitive Function Effect on Burnout	Effect Size (Cohen's d)	Definition
Task Switching	[1] Large	Cognitive flexibility that involves the ability to shift attention between one task and another
Updating	[2] Medium	Keep up with the changes in the environment
Inhibition	[3] Medium	Tune out stimuli that are irrelevant to the task/process at hand or to the mind's current state
Sustained Attention	[4] Large	Detect rarely and unpredictably occurring signals over prolonged periods of time
Control Attention	[5] Medium	Choose what they pay attention to and what they ignore (concentration).
LT Memory	[2] Large	Information stored in the brain and retrievable over a long period of time, often over the entire life span of the individual
ST Memory	[6] Medium	Temporarily storing and managing information required to carry out complex cognitive tasks such as learning, reasoning, and comprehension.
Working Memory	[7] Small	Especially refers to attentional component of ST memory. Combination of multiple components working together used for planning, cognitive processing and carry out behavior

1. Oosterholt et al 2012
2. Sandstrom et al 2011
3. Diestel et al 2013
4. Orena et al 2013
5. Morgan et al 2011
6. Ohman et al 2007
7. Johnsdottir et al 2013
8. Pavlos Deligkaris, Efharis Panagopoulou, Anthony J. Montgomery & Elvira Masoura (2014) Job burnout and cognitive functioning: A systematic review, Work & Stress: An International Journal of Work, Health & Organisations, 28:2, 107-123

Burnout is associated with biologic changes

- Hormonal
  - Cortisol fluctuations (high then low over time)
  - Coronary artery plaques
- Genetic
  - Telomere shortening (hastened cellular aging)
- Neurochemical
  - Excess glutamate leading to decreased grey matter in basal ganglia (decreasing fine motor control)
- Neuroanatomical
  - Thinning pre-frontal cortex (lowers attention span, poorer quality decision making)
  - Enlarged amygdala (increased reactivity to stress)
  - Hippocampal shrinking (memory reduction – short and long term)



Durning S. Costanzo M, et al. Frontiers in Psychiatry. 2013. 4:(131) 1-7.

Michel A. (February 2016) Burnout and the Brain. Association for Psychological Science. http://www.psychologicalscience.org/index.php/publications/observer/2016/february-16/burnout-and-the-brain.html

Savic, I. (2015). Structural changes of the brain in relation to occupational stress. *Cerebral Cortex, 25*, 1554–1564. doi:10.1093/cercor/bht348

Alkadhi K. (2013) Brain physiology and pathophysiology under mental stress. ISRN Physiology. Vol 2013. Article 806104 pp 1-23.

Golkar A et al.(2014) The influence of work related chronic stress on the regulation of emotion and functional connectivity in the brain. PLoS ONE 9(9): e104550. doi:10.1371/journal.pone.0104550

Ridout KK, Ridout SJ, et al. Physician Training Stress and Accelerated Cellular Aging. *Biological Psychiatry*, 2019; DOI: 10.1016/j.biopsych.2019.04.030

Burnout severity correlated with Major Depression

Burnout Level	None	Mild	Moderate	Severe
Odds ratio for having Major Depression	2.99 (95% CI: 2.21-4.06)	10.14 (95% CI: 7.58-13.59)	46.84 (95% CI: 35.25-62.24)	92.78 (95% CI: 62.96-136.74)

CI = confidence interval

- **Burnout** [1,2] is a work-related condition. Combines job strain and high occupational stress.
- **Major Depression**[1] is a clinical condition, is considered Personal Health Information (PHI) and is confidential.

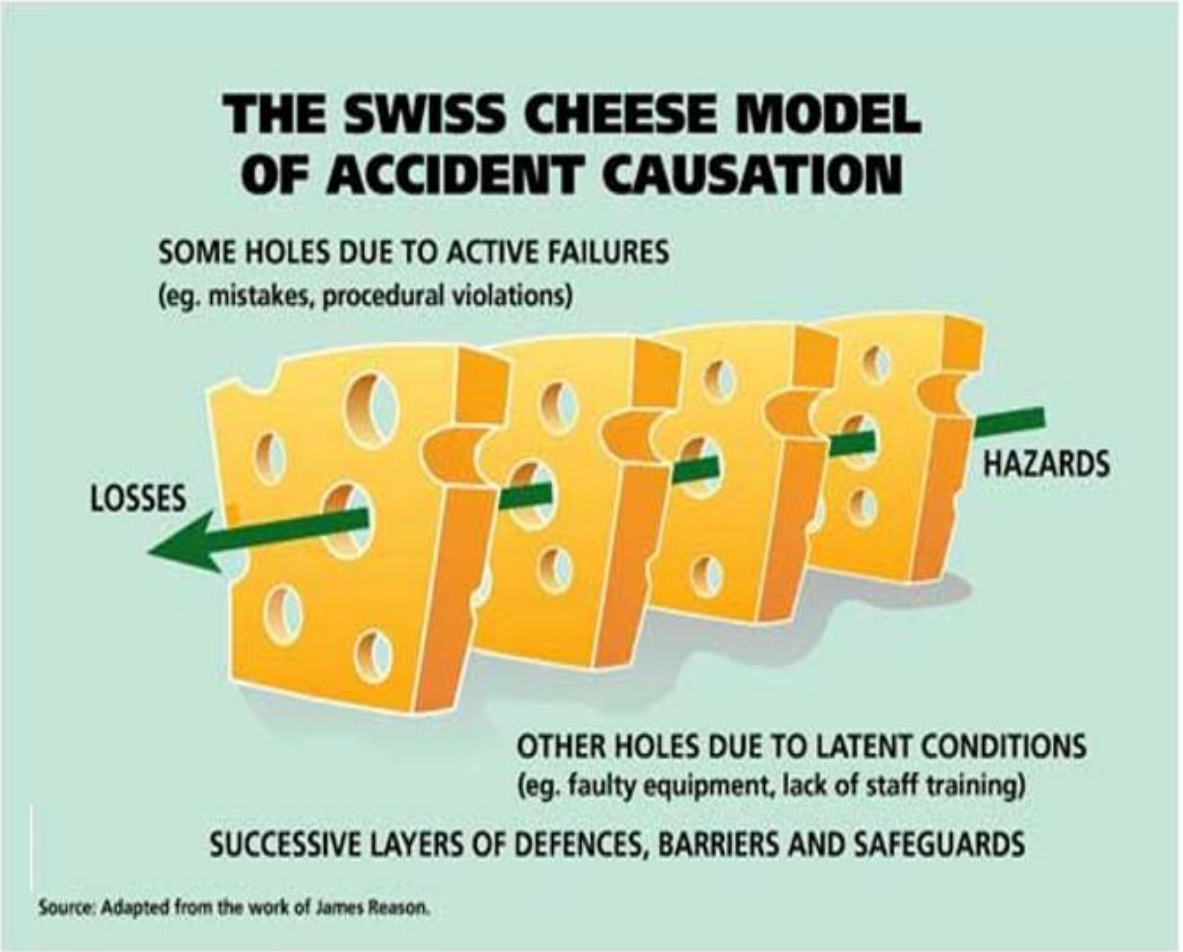
Major Depression effect on Cognitive Functioning [3]

- Attention
- Verbal and non verbal learning
- Short term and working memory
- Visual and auditory processing
- Problem solving
- Processing speed
- Motor functions.

1. From: Privitera MR. Is Burnout a form of Depression? It's not that simple. Medscape Psychiatry. May 16, 2018. Table built from data in: Wurm W, Vogel K, Holl A, et al. Depression-burnout overlap in physicians. PLoS One. 2016;11:e0149913.
2. Exposure to stress: occupational hazards in hospitals. Centers for Disease Control and Prevention. July 2008. Source Accessed April 12, 2018.
3. Ramsey D. Depression Related Cognitive Dysfunction. Medscape. August 26, 2019.

Models for incident and error prevention need to account for **the burden of non-strategic barriers placed on clinicians** which can **thwart good care.**

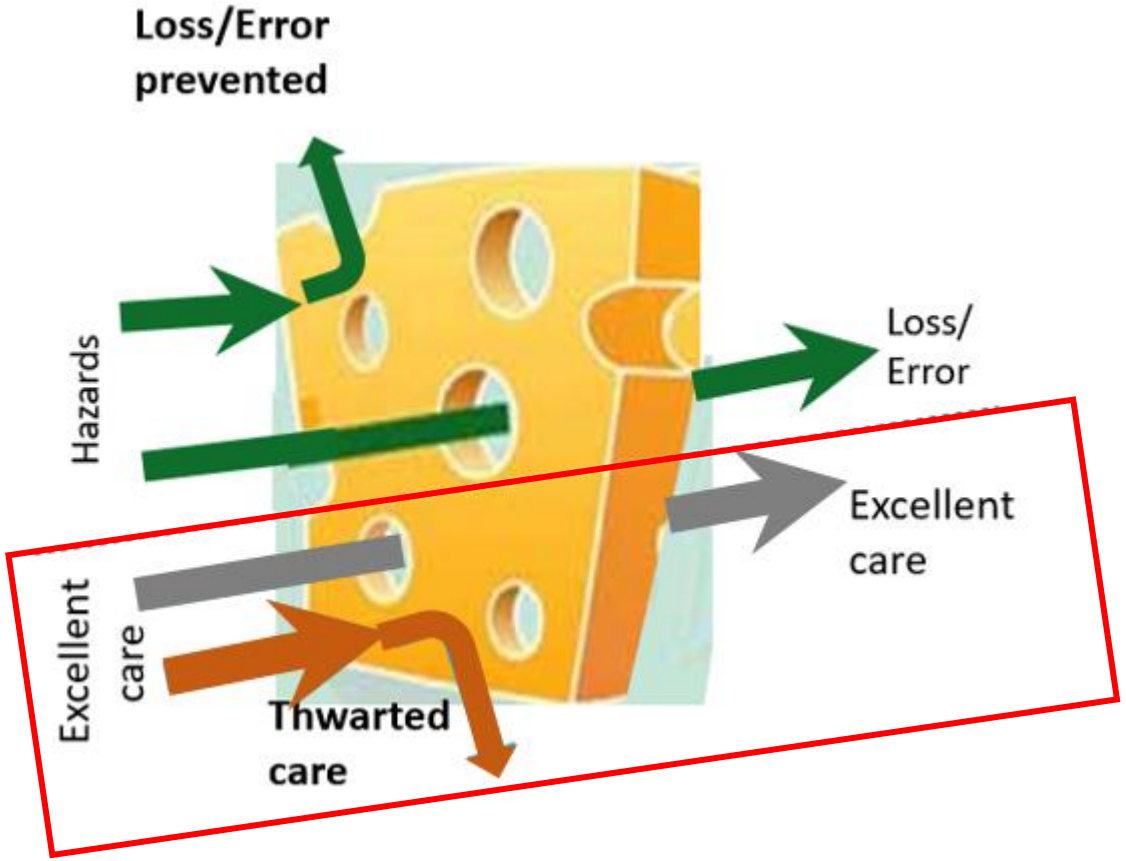
Traditional models of error prevention include a system of protective barriers and “holes” that prevent the barrier from being effective.

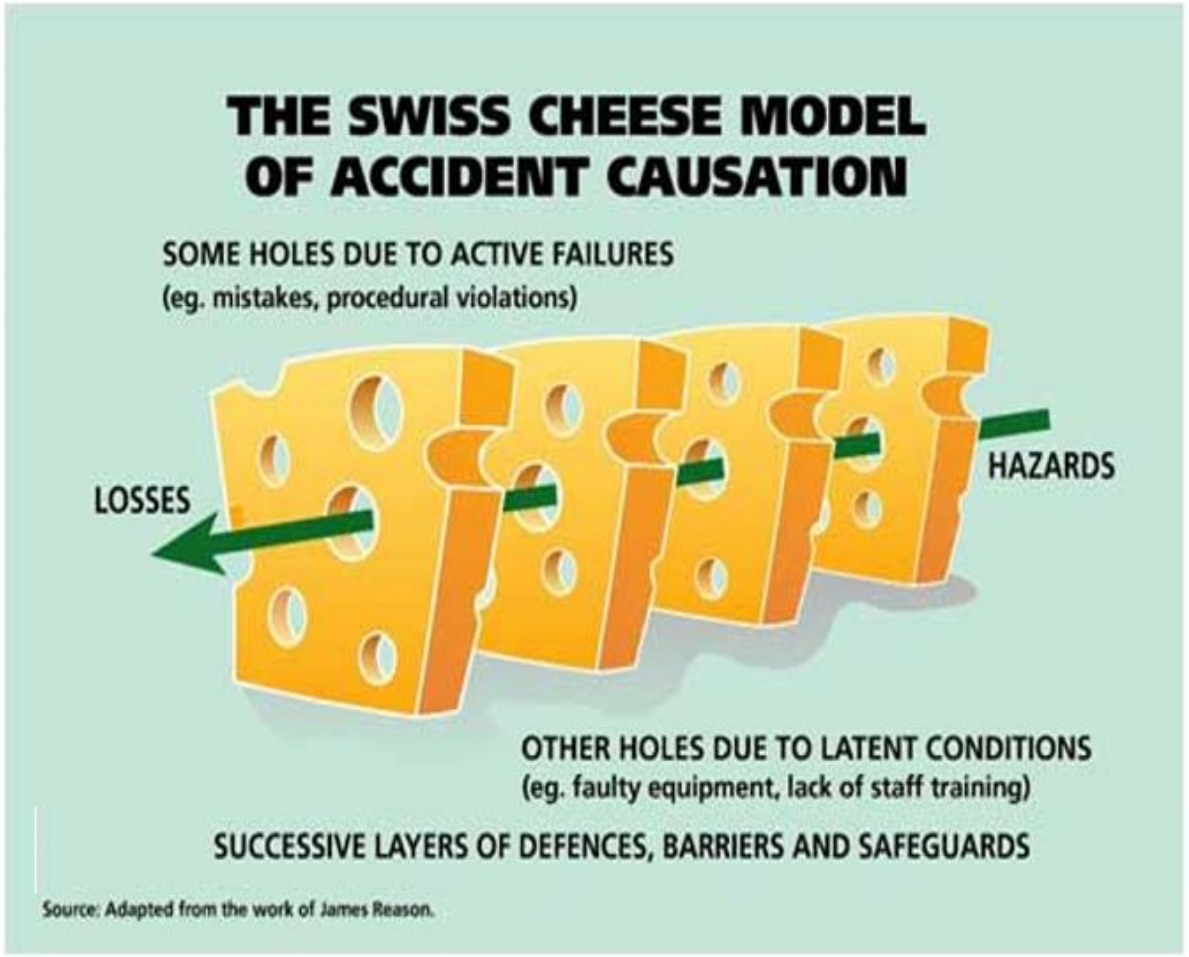


https://cursos.campusvirtualsp.org/repository/coursefilearea/file.php/19/Content2015/12_Patient_Safety/Patient_safety2015.html

Swiss Cheese Layers (barriers) need to be <u>strategic</u> and well designed.

Potential unintended negative consequences (thwarted care) to be avoided





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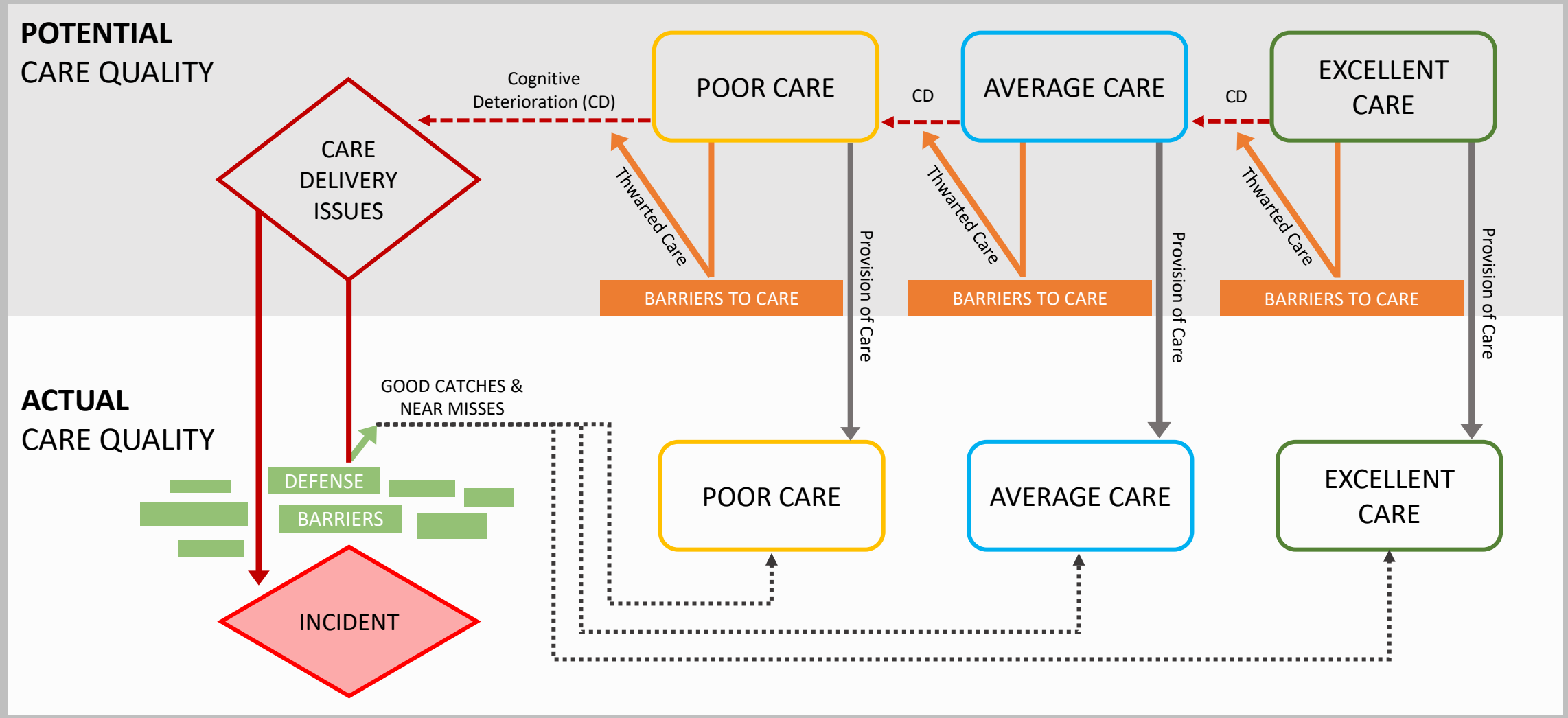
Non-strategic incident barriers increase cognitive load and cause incidents

Systemic Influences: Administrative Policy, Regulatory Bodies, Hospital Infrastructure



Privitera M MacNamee K. Physician Leadership Journal 2021

Most safety interventions focus on training clinicians

Individual-level causes	% of Errors	System-level causes	% of Errors
Knowledge and skill	12.8%	Structure	12.2%
Attention on task	14.5%	Culture	57.7%
Information processing	6.1%	Process	18.0%
Critical thinking	34.3%	Policy and Protocol	6.6%
Non-compliance	26.5%	Technology and Environment	5.6%
Normalized deviance	5.7%		

Suggests a vast number of medical errors are preventable, given that extraneous load is inherently reducible.

Root cause analyses show extraneous cognitive load accounts for **87.1%** of medical errors

Individual-level causes	% of Errors	System-level causes	% of Errors
Knowledge and skill	12.8%	Structure (job design)	12.2%
Attention on task	14.5%	Culture (decisions and interactions)	57.7%
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Critical thinking	34.3%	Policy and Protocol	6.6%
Non-compliance	26.5%	Technology and Environment	5.6%
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Directly caused by Cognitive Load

Indirectly Caused by Cognitive Load

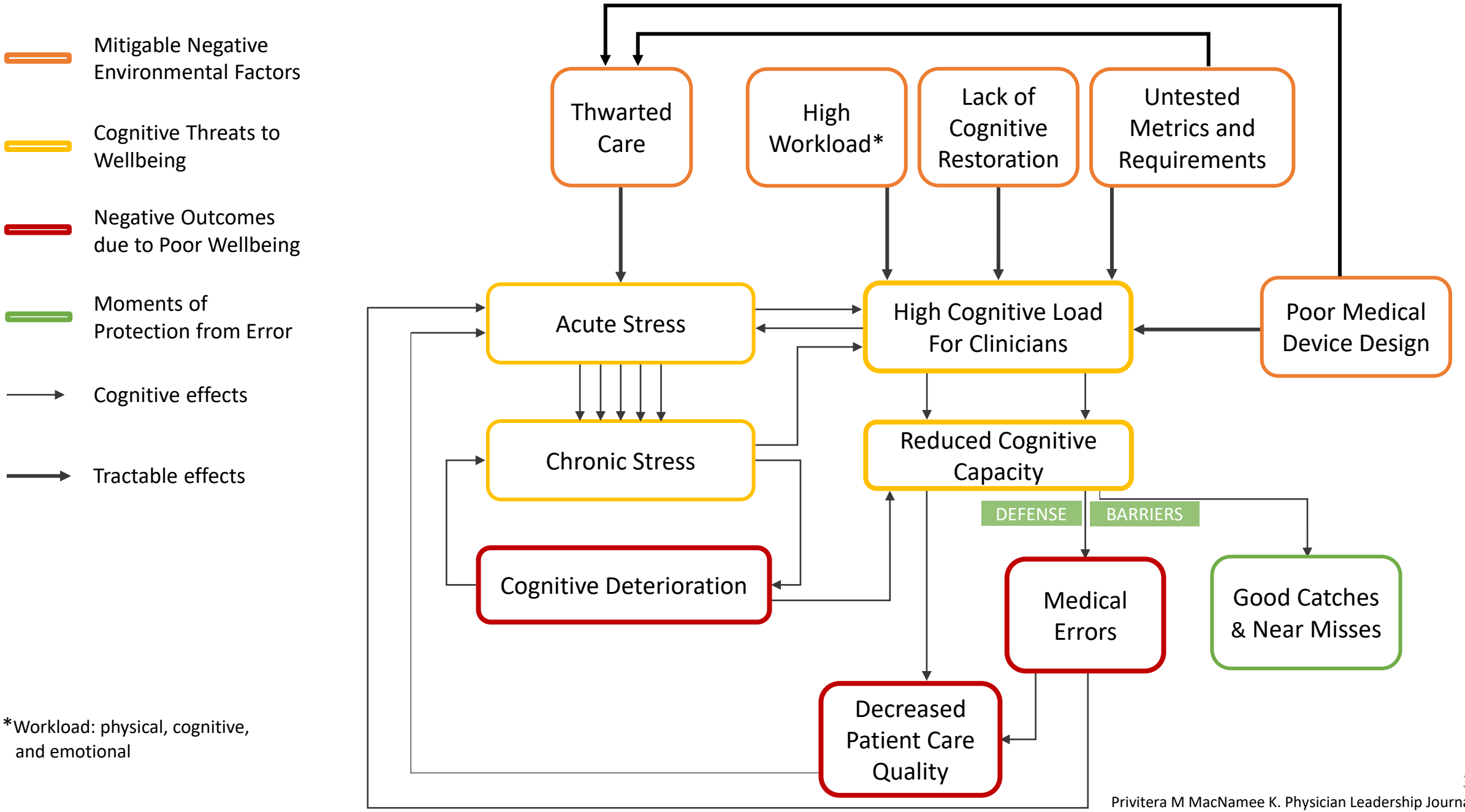
Suggests a vast number of medical errors are preventable, given that extraneous load is inherently reducible.

Leadership has the potential to change a majority of system-level causes to improve individual-level rates

Individual-level causes	% of Errors	System-level causes	% of Errors
Knowledge and skill	12.8%	Structure	12.2%
Attention on task	14.5%	Culture	57.7%
Information processing	6.1%	Process	18.0%
Critical thinking	34.3%	Policy and Protocol	6.6%
Non-compliance	26.5%	Technology and Environment	5.6%
Normalized deviance	5.7%		

Suggests a vast number of medical errors are preventable, given that extraneous load is inherently reducible.

Relationship between mitigable environmental/systemic factors, cognitive decline, and decreased quality of care



*Workload: physical, cognitive, and emotional

Privitera M MacNamee K. Physician Leadership Journal 2021

How Can Leadership Make a Difference?

Comparative Decision Making

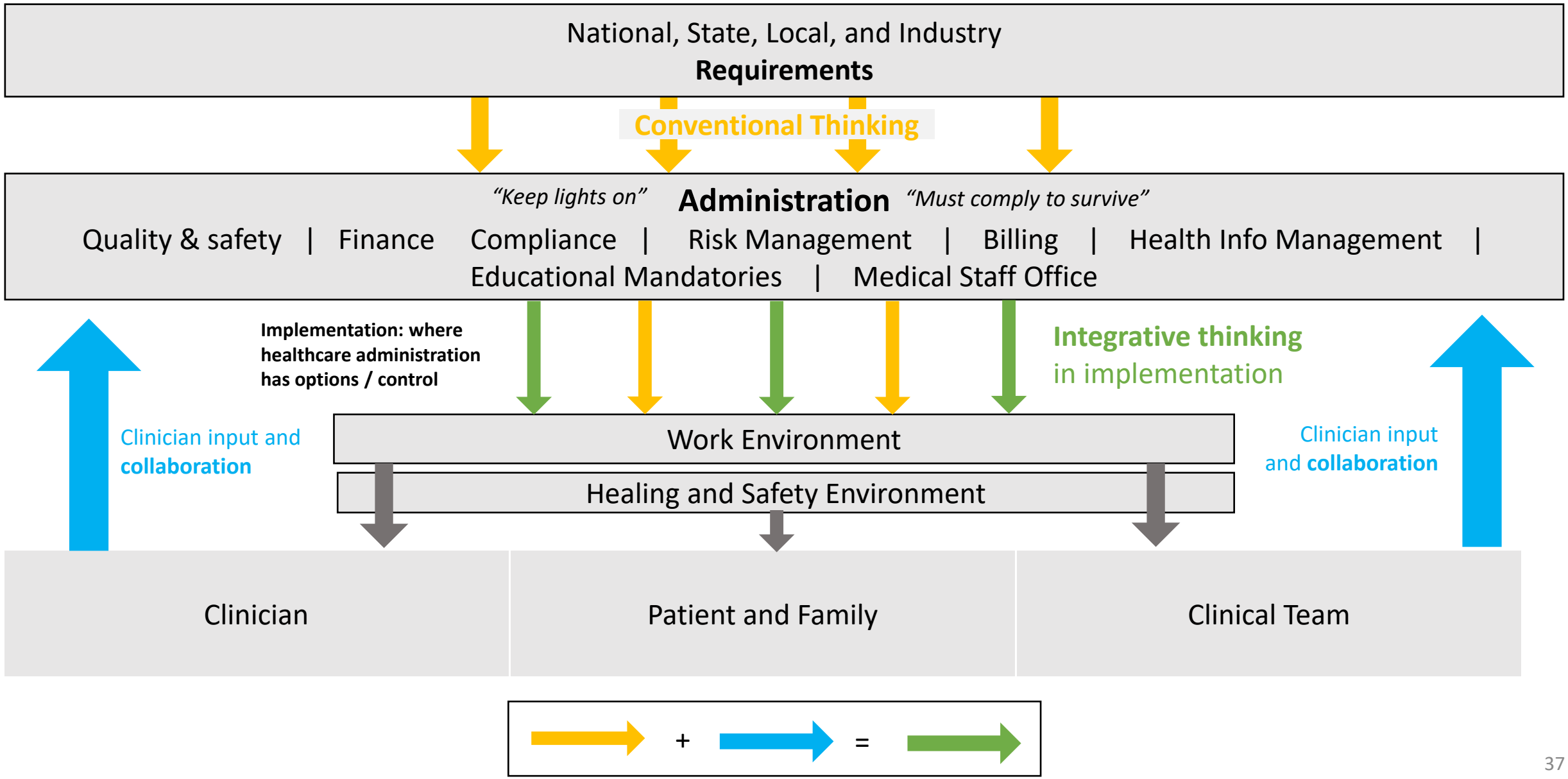
- We often try to emulate what effective leaders do.
- A more productive approach is to look at how successful leaders **think**.
- Most successful leaders studied are **integrative thinkers.**

Decision Making Type	1. Determining Salience	2. Analyzing Causality	3. Envisioning the Decision Architecture	4. Achieving Resolution	Example in Healthcare
Conventional Thinkers	**Focus only on obviously relevant features.**	**Consider one-way linear relationships between variables. More of "A" produces more of "B".**	**Break problems into pieces and work on the separately.**	**Make "either-or" choices; settle for best available options provided.**	**Continually adding more metrics, mandates, laws, thinking if some touted to improve safety then increasingly more thought must be better.**
Integrative Thinkers	**Seen less obvious but potentially relevant factors.**	**Consider multidirectional and nonlinear relationships among variables.**	**See problems as a whole, and understand how parts fit together. See how decisions affect one another. Consider two, opposing ideas at once.**	**Creatively resolve tensions among opposing ideas: generate innovative outcomes. New idea may have elements of each, but is superior to the original options.**	**Creatively implement patient safety metrics, mandates, and laws in the context of preserving clinician wellbeing and functioning. Better weighing of risks/benefits.**

Adapted from Martin R. How Successful Leaders Think. Harvard Business Review. June 2007:60-67

Experience of Providing Care

(Human Factors and Ergonomics in Care Provision)



Broad-stroke interventions to reduce cognitive load

Evaluate processes and metrics currently in place, as well as those to be implemented. Better understand system-level effects of policies and processes

Standardization—across processes, teams, units. Allow for routines. Tension with customization.

Don’t standardize at the cost of safety; standardize deliberately

Consolidate information. Reducing split attention. Bring data together needed for workflows. Process coupling.

Decrease redundancy in communication of data

Prioritize Design – Procure equipment and implement layouts with deliberate designs that consider HFE.

Collaborate with Human Factors professionals and your clinical staff to identify opportunities for lowing cognitive load.

Adapted from Elizabeth Harry MD. Steps Forward AMA Webinar 3/2/21.

“Cognitive workload: a modifiable contributor to physician burnout ?”

Source	Requirement
HHS	HIPAA training
CMS, TJC	Safety Survey
SMH Policy	Sedation Privileging training
NYSDOH	Health report
NYSDOH	PPD
NYSDOH	Mask Fitting
OSHA	Infection Control
NYSDOH	Sepsis Training
NYSDOH	Flu Shot
Federal	NPI
Medicare	Time and Effort Survey
NYSDOH	Opiate Training
NYSDOH	Antibiotic Stewardship
SMH Policy	ICD-10 Training
SMH Policy	EMR Training
SMH Policy	EMR Update Training
SMH/Dept	Cultural Competence
Multiple	Yearly Mandatory In-Service Training
Private Payer/SMH Bylaws & Policy	Board Certification
Private Payer/SMH Bylaws & Policy	Maintenance of Certification
SMH/Dept	Code of Conduct
SMH Policy	ICARE Training
TJC	Attestation of Skill Demonstration- Restraints
U of R/ NYS	Sexual Harassment
Federal	Bullying/Implicit Bias/Diversity
SMH Policy/Specialty	ACLS Training/Updates
SMH Policy/ Specialty	Laser Training
SMH Policy/ Specialty	Radiation Training
SMH/ Policy/Specialty	Ultrasound Training
NYSDOH	Child Abuse Mandatory Reporter Training
U of R	Unconscious Bias Training
Dean	Annual Financial Disclosure
Career: RSRB	**Human Research Patient Protection**
Career: GME/UME	**Student evaluations**
Career: Clinic Trial Sponsor	**Clinical Trial training modules.**
Career related Payer/SMH Policy/ Bylaws Federal/NYS Education	**CME, Productivity reports, Teaching, Research/scholarly, career advancement DEA renewal, NYS License**
Career related: Funding Sources	**Career advancement Grant writing**

Prevention of Surgical Site Infections

Patient Interactions - Everyone

Care of Patient Personal Belongings and Valuables
Fall Prevention
Health Care Proxy
Interpreter Services
Lifting and Transfers
Management of Suspected Abuse and Neglect
Patient Self-Determination Rights
Providing Better Care for People with IDD
Rapid Response Team
Stroke Recognition

Patient Interactions - Clinical

Anticoagulation Safety
End of Life Care
Ensuring Comprehensive Handoffs
eRecord/EMR Downtime Procedures
Health Literacy
Information for Clinical Decision Making
Medical Orders for Life-Sustaining Treatment (MOLST)
Medication Reconciliation
Multidrug-Resistant Organisms
Organ, Eye, and Tissue Donation
Pain Management
Restraint Use
Sepsis Management

UR at Work - Everyone

Code of eConduct
Code of Organizational and Business Ethics
Diversity and Inclusion
Interactions Between UR Medicine & Industry
Meal Periods and Rest Breaks
Policy Against Discrimination and Harassment
Professional Conduct Event Education
Professional Misconduct Reporting and the Impaired Professional
Smoke-Free Campus, Inside and Out

UR at Work - Clinical

Conflict of Care

Compliance – Everyone

Compliance (Fraud, Waste, and Abuse)
HIPAA Privacy, Security, and Confidentiality of Information
HIV/AIDS Confidentiality
Joint Commission Readiness
Occurrence & Claim Reporting
Patient Identification
Patient Rights/Ethics/Complaint Process
Patient Safety, Team Communication, and Medical Health Care Error Reduction
Quality, Safety, and Performance Improvement

Compliance – Clinical

Continuity of Care Through Interdisciplinary Communication
Medical Record Documentation for Clinical Staff
Write Down, Read Back

Environment of Care – Everyone

Active Shooter
Amber Alert
Disaster Preparedness
Electrical Safety
Emergency Page Codes
Fire Safety
Firearms/Weapons
Hazard Communication
MRI Safety
Obtaining Public Safety/Security
Radiation Safety
Waste Management
Workplace Violence/De-escalating Potential Violence

Environment of Care – Clinical

Medical Equipment

Infection Prevention – Everyone

Bloodborne Pathogens Standard
Hand Hygiene
Infection Prevention – Ebola
Influenza - What You Should Know

Infection Prevention – Clinical

Prevention of Central Line Infections

Highland Hospital Employee General Modules

Access to Medication Storage
Bariatric Sensitivity
Employee Use of Social Media
Forensics
Highland Code of Conduct & Compliance Statement
Highland Promise

Jones Memorial Hospital Employee General Modules – Everyone

Patient Prisoner Population

Thompson Health Employee General Modules – Everyone

Incident Reporting
Non-Discrimination
Policies and Procedures
Public Relations
Quality Improvement
SBAR
Service Excellence

University of Rochester Employee General Modules – Everyone

Minimum Standards Programs for Minors
Patient Prisoner Population
Staff Handling of Unknown Substances
The ICARE Commitment

University of Rochester Employee General Modules – Clinical

Clinical Alarm Management

Clinician Mandatories Overwhelm

- No single mandate is problematic, but taken together, the sum of the required effort places undue burden on clinicians' cognitive functioning
- Organizational intervention could **filter, manage and streamline** mandatories to lessen the burden and improve clinician performance
- Standardize process of addressing new laws, regulations, use same software reduce learning curves of what needs to be done, who it goes to, when it is due, etc., minimize redundancy of communications, redundancy of content, bring together in one place optimize time to do them, satisfice content.

Intervention Case Study

Initial Steps in Wellness Program

Overall structure

- **Coping**
  - **Primary Control**— fix the problems causing stress
  - **Secondary Control**— ways to adjust to remaining situation
- **Interventions**
  - **Individual-** multiple- such as mindfulness based practice, 3 good things, gratefulness journaling, etc. Wellness seminars 11/year. Count for CE and malpractice reduction
  - **Organizational-** bottom up or top down, but combination best as participatory management.
    - New leadership skills needed to work with work environment of high stress, rapid change, information overload, increasing expectations (Human Factor Based Leadership)
    - New structures to process input from those closest to the problems (clinicians)
    - Wellness Strategic Planning Work Group (WSPWG)-clinicians and administration.

Light blue: Contact MRP if more information desired

- **Senior Leadership** needed in beginning and strategic times. Harness power of leadership
- **Brief presentation** on issues involved in burnout, help align understanding, language, awareness of consequences of no action.
- **Assessment**
  - Leader's cover letter to survey: Commitment to action and encourage honesty, and what plan to do with the information.
  - Good to have a validated tool if measure burnout. However the most rich data will be write in responses. Ask for two answers for each:

    1. What gives most meaning in work?
    2. What are major stressors ?
    3. What are reasonable suggestions?
- First information must be anonymous answers
- Share aggregate data findings to constituents to demonstrate transparency
- After aggregate data, can present in open forum and get more input with Vegas rules:

  a. Forgive hierarchy relationships.
  b. What happens in Vegas stays in Vegas,
  c. One can later say what was discussed but not trace back to person who said it.
  - WSPWG is ongoing structure to address work/life integration, solve hospital level organizational issues. Departments have wellness representatives. Impact vs. Feasibility study to prioritize roll outs.

Assessment: Example of Survey Results

What are clinicians' major stressors?

- Required screening questions are unrelated to the patient's reason for their visit.
- Medical device not purposefully designed, requires large number of disjointed actions to achieve goals.
- Software design requires multiple pages and pop-ups to complete task.
- Clinical data stored in unintuitive locations.
- Poorly labeled storage systems for ancillary tools requiring hunting through storage that is without schema or order.
- Nurse interrupted passing meds.
- Clinicians asked question from other during procedures.
- Patient or family member threatening towards clinician.
- Series of many patients with severe injury or illness
- Death in Operating Room (OR), next case wheeled in
- Giving support to grieving families.
- Busywork conflated with virtuous work expected in the calling of going into Medicine.
- Shortened patient visits to increase through-put, push for high Relative Value Units (RVUs) in clinical time.
- Writing clinical notes in the evening or on weekends when home, unable to engage with significant other, children, friends or hobbies.
- Maintenance of Certification (MOC) requirements that require activities over and above what occurs in daily clinical practice.

Comparing Lean and HFE

Senior Sponsor's Roles

Ability to make directional decisions, remove barriers, minimize risks, dedicate resources, prioritize efforts. Strategic use of presence, influence and recognition of successes

	Lean Process **Continuous System Improvement**	**Human Factors/Ergonomics (HFE)** **Continuous System Improvement**
Focus	"Customer" (Patient) Experience, satisfaction. Quality Safety, Costs (Triple Aim). Improve efficiencies, and work satisfaction	Experience of providing care Fourth Aim of Quadruple Aim-will improve Triple Aim measure. Both system efficiency **and** clinician wellbeing. Patient safety and quality are a result of system efficiency
Ease of discussion	Open, "mainstream" medicine	Culture of medicine to overcome: Endurance, silence, fear of negative effect on career, and not want to be seen as "weak". Need deliberate efforts to normalize this process for clinicians and administrators, weave into hospital structures to address. **Start with anonymous input and move to open discussion.**
Value of employee input	Includes Participatory Management Employee= closest to the problem	Includes Participatory Management Employee = closest to the problem and **lives the problem**
Application	To mitigate existing problems	To mitigate existing problems. Leaders can also apply concepts to prevent problems.

Application of HFE in Healthcare Environments

"Expensive" Cognitive Activity	Definition of Expensive Activity	Situation(s) Forcing Expensive Activity	Solution(s) to Avoid Expensive Activity
Extraneous information processing	Responding to or processing information unrelated to primary diagnostic or procedural goals.	Required screening questions are unrelated to the patient's reason for their visit.	Patient entered data via website or waiting room to help save clinician cognitive resource for key clinical issue.
Unintuitive interface navigation	Resolving conflict between expectation and outcome, regulating frustration, working through confusion and ambiguity.	Medical device not purposefully designed, requires large number of disjointed actions to achieve goals.	Create multiple pathways for clinician input on technology design, workflow problems and purchasing decisions (e.g. Provider Advisory Council or PAC). Clinician builder program to collaborate with non-clinician builders to optimize architecture and workflows.
Goal maintenance and working memory	Maintaining and manipulating information in your head while performing other tasks.	Software design requires multiple pages and pop-ups to complete task. _____ Clinical data stored in unintuitive locations.	Implement software with dashboards that create action pathways accessible from a single location. _____ Health information management team in direct collaboration with active clinician team.
Controlled processing	Cognitive functions associate with paying attention, filtering, and organizing	Poorly labeled storage systems for ancillary tools requiring hunting through storage that is without schema or order.	Organize storage by tool type, brand, models, etc. Label the outside of drawers/containers to prevent the need to open them during search.
Multitasking/ Interruptions	Attempting to perform two tasks in parallel, resulting in rapid switching between tasks, and decreasing either accuracy or efficiency.	Nurse interrupted passing meds. _____ Clinicians asked non urgent question from other during procedures.	Nursing medication room policy implemented to prevent intrusions. System implemented to ensure pended questions for clinician to be addressed between tasks or cases.

Application of HFE in Healthcare Environments

"Expensive" Cognitive Activity	Definition of Expensive Activity	Situation(s) Forcing Expensive Activity	Solution(s) to Avoid Expensive Activity
Inhibition and self-control	The brain self-regulating, making an effort to prevent unwanted signals from becoming behavior. Emotion may be triggered but need to stay logical and on task.	Patient or family member threatening towards clinician. _____ Series of many patients with severe injury or illness.	Close collaboration with Public Safety or Security team coupled with de-escalation training to empower clinician to avoid further violence. _____ Establishing formal culture of esprit de corps, clinicians supporting each other tangibly, emotionally, and informationally.
Emotional labor	Regulating one's own emotions while also counseling grieving families or anxious patients.	Death in Operating Room (OR), next case wheeled in. Giving support to grieving families.	Establish debriefing routines (provide effective communication framework), create peer support groups, build institutional culture of expecting clinician to be able to take a break to recuperate.
Prioritization	The act of determining the importance and value of one or more elements compared to a series of others. Requires deep engagement with concepts/material.	Busywork conflated with virtuous work expected in the calling of going into Medicine.	Acknowledge halo bias on how some requirements may need to be done and termed safety related, but not to lose big picture on what is foremost importance. Leaders and clinicians cooperate to identify effective and ineffective metrics. Organize the increasing number of educational mandates in one place to keep track of total mandatory load. Determine what is satisfactory and sufficient to meet requirement, then other material as voluntary if clinician interested to learn more. Consider enduring material repository to pull up information when clinically needed. Employ human factors experts as part of full-time hospital staff or as consultants collaboratively with clinicians.

Application of HFE in Healthcare Environments

"Expensive" Cognitive Activity	Definition of Expensive Activity	Situation(s) Forcing Expensive Activity	Solution(s) to Avoid Expensive Activity
High stimulus density	Constant information processing and constant need to respond to people or the environment.	Shortened patient visits to increase through-put, push for high Relative Value Units (RVUs) in clinical time.	Leadership work with clinicians to create 'credit' for all missions of the institution: Teaching, patient care, research. Hire additional staff to increase patient volumes, rather than increase load of current staff.
Negative transfer	Incorporating previously learned behaviors while learning new procedures.	Hospital purchased IV pumps from multiple vendors, and key elements of their interfaces conflict.	Standardization of IV pump equipment across the institution. Participatory management of clinician input into device purchasing.
Lack of cognitive restoration	An individual is unable to eat, sleep, or create a restorative cognitive environment between draining events, leaving them less equipped to perform at their peak during the second of the two events.	Writing clinical notes in the evening or on weekends when home, unable to engage with significant other, children, friends or hobbies. Maintenance of Certification (MOC) requirements that require activities over and above what occurs in daily clinical practice.	Implement culture change campaign explicitly discouraging work outside of Work (WOW). Work with Risk Management, Billing, Compliance and Patient Safety efforts to eliminate "note bloat" which adds no clinical value to documentation. As an institution, coordinate activities that count for MOC requirements for conservation of energy, economy of scale.

Thank you !

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