

Optimizing Performance: Mental Skills Training to Make Average Performance Excellent

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Introductions



Lecture Objectives

1. ID barriers to healthcare providers' performance
2. Discuss the rationale, benefits, and applications of mental skills training with providers
3. Discuss the development of our novel, comprehensive mental skills curriculum and results of its effectiveness with trainees
4. Practice skills from our curriculum



Group Breakout

- Consider times when stress positively/negatively impacted your performance (clinical, teaching, presentation, etc)
 - Sources of stress?
 - Effects on performance?



Cognitive Demands

- Surgeons,^{1,2} Emergency Department Nurses and Physicians,³ Anesthesiologists,⁴ and other providers are required to:
 - Execute complex fine-motor skills
 - Sustain focus over long periods of time
 - Adapt to changing demands
 - Maintain sound clinical judgment
 - Effectively communicate



Additional Demands for Novices

- Novices are learning skills and performing them in high-pressure evaluative situations
- Novices may be easily overwhelmed during clinical performance and are uncertain of how to cope with it¹
- When situational demands exceed one's ability to manage them, the resulting response is cognitive overload and stress⁵

1. Arora et al. Surgery 2010

5. Mayer & Moreno, Edu Psych 2003



Cognitive Stress Appraisal

- Stress response is the interaction of ^{4,5}:
 - Physiological responses (arousal) to external stimuli
 - Cognitive appraisal of coping ability
- No inherent emotional component
- Perception/appraisal of external stimuli (ie, threat or challenge) and ability to cope with demands determine impact

6. Lazarus, 1966.

7. Smith, 1980.



Stress and Performance

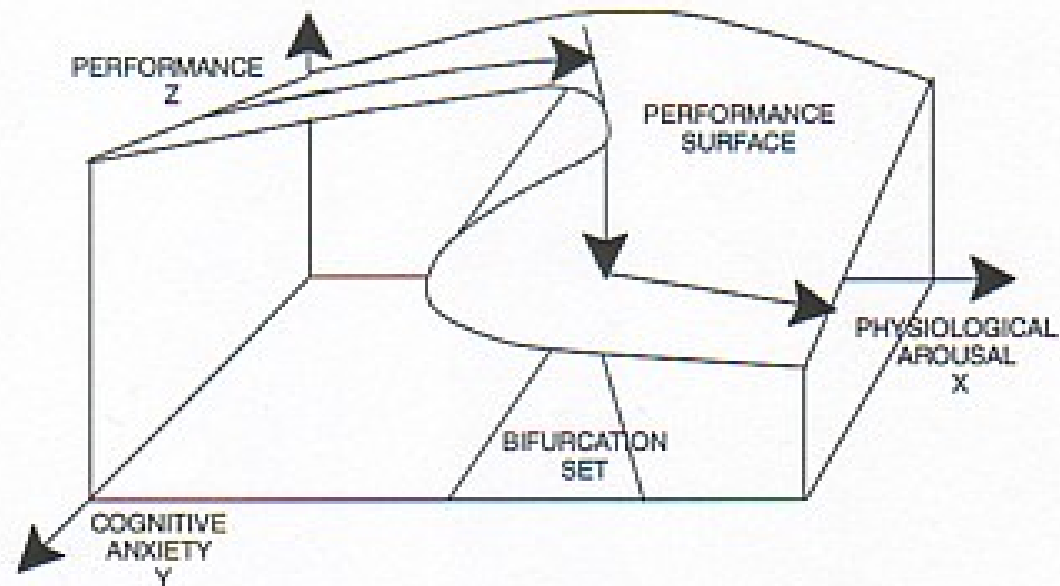


Fig. 3: Hardy & Fazey's (1987) Catastrophe Model demonstrating the association between anxiety and performance.

8. Hardy & Fazey, 1987.



The Body's Reaction to Sympathetic Nervous System Activation

SNS

BRAIN

- *Perceptual Narrowing*
- *Loss of Cognitive Processing*
- *Increased Reaction Time*
- *Hypervigilance*

EYES

- *Loss of Peripheral Vision (Tunnel Vision)*
- *Loss of Night Vision*
- *Loss of Depth Perception*
- *Impaired Near Vision*

HANDS

- *Loss of Fine Motor Skills*
- *Loss of Complex Motor Skills*

LIVER

- *Begins Breaking Down Glycogen for Energy*

HEART

- *Increased Heart Rate*
- *Increased Blood Pressure*

EARS

- *Auditory Exclusion*

ADRENAL GLAND

- *Release of Adrenaline*
- *Release of Noradrenaline*

SKIN

- *Vessels Constrict (Cool and Clammy)*

SPLEEN

- *Releases White Blood Cells and Platelets for Possible Injury*

LUNGS

- *Dilated Bronchioles*
- *Increased Respiratory Rate*

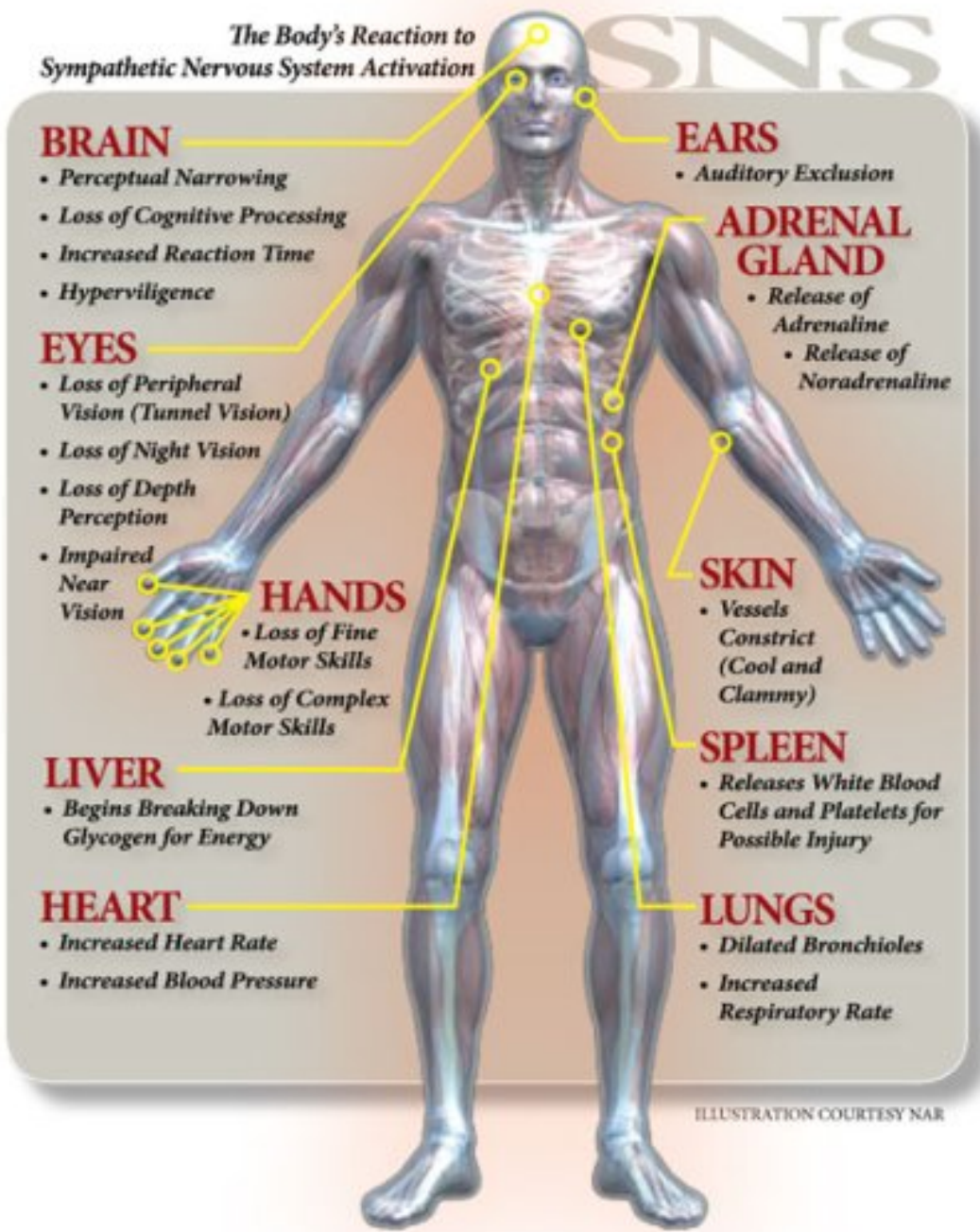


ILLUSTRATION COURTESY NAR



WORKING MEMORY

A cognitive system that temporarily holds a limited amount of information in an active state so that it may be quickly accessed, integrated with other information, or otherwise manipulated.

9. Drew & Vogel Encyc of Neuros 2009



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Cognitive Overload

“The processing demands exceeds the processing capacity”

5. Mayer & Moreno, 2003



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Decreased Sensitivity to relevant information



10. Lavie, et. al J of Exp Psych 2004
11. Zanto & Gazzaley J of Neurosc 2009

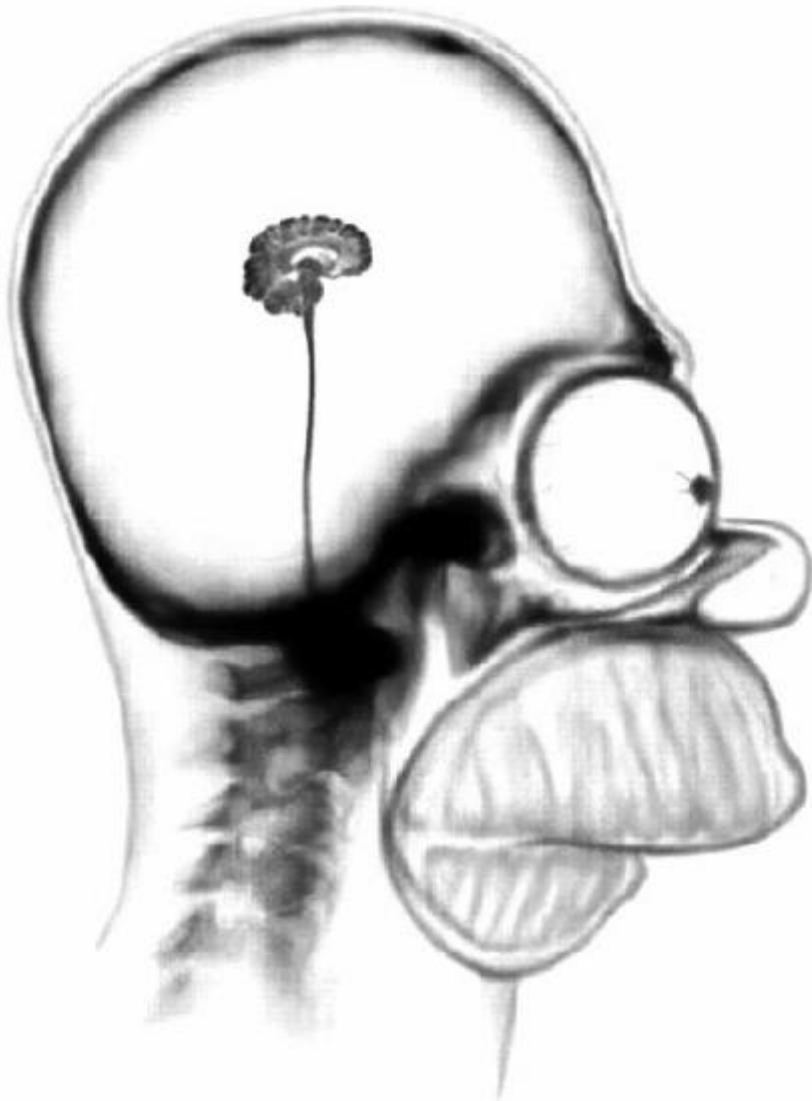


Slowed Decision Making



- 12. Jaeggi et al. 2008
- 13. Keinan J of Pers & Soc Psych 1987
- 14. Speier et al. Dec Sciences 1999





Decreased WMC for Verbal Information

15. Beilock & Carr Psych Sci 2005
16. Gimmig et al. Psych Bulle & Rev 2006
17. Wiley & Jarosz Psych of Learn and Mot 2012



Reflection

- What are your go-to strategies for managing stress during performance?
- How do these techniques benefit performance?



Mental Skills Definition

- Mental skills are trainable mental abilities that underpin successful learning and performance ¹⁸
- These psychological tools aim to help performers achieve their ideal mental state to consistently perform their best¹⁹
 - Mental Imagery
 - Arousal Regulation Skills
 - Attention Management Skills
 - Goal Setting
 - Refocusing Strategies
 - Pre-performance routines

18. Livingstone, C. Dictionary of Sport and Exercise Science and Medicine

19. Williams, JM. *Applied Sport Psychology* 2010



Is Mental Skills Training Effective?

- Mental skills have been shown to improve performance of:
 - US Navy SEALs²⁰
 - Military pilots²¹
 - Police special forces²²
 - Elite athletes²³
- Mental skills, while typically applied in isolation, have shown promise in surgery^{24,25}
- Comprehensive mental skills curricula have incremental benefits to performers^{22,23}



20. Selder et al. U.S. Navy Technical Report 1989

21. McCrory et al. Military Psychology 2013

22. Le Scanff, C, Taugis, J. J Applied Sport Psych 2002

23. Guenther et al J Sport and Behavior 2010

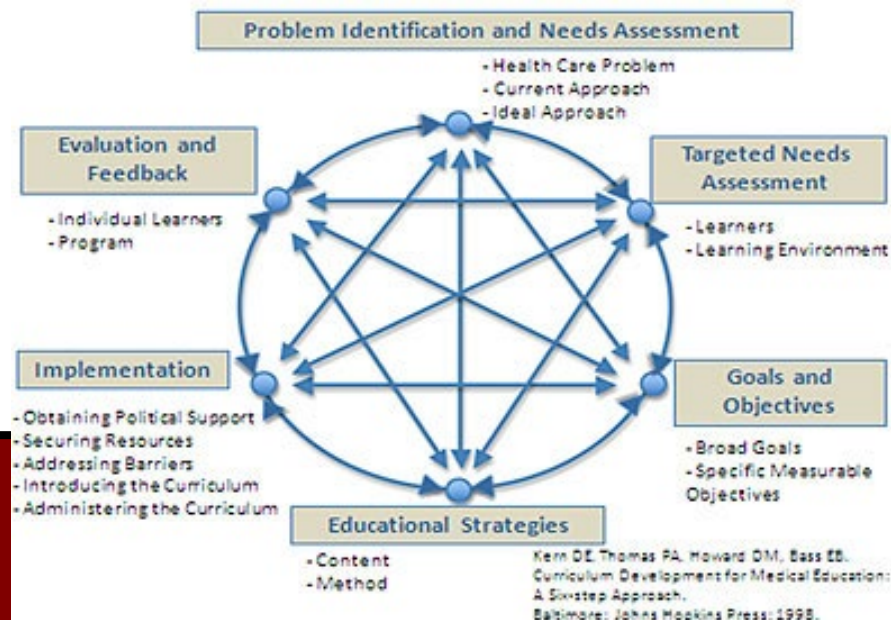
24. Arora S et al Ann Surg. 2011

25. Louridas M et al. Br J Surg. 2015

Comprehensive Mental Skills Curriculum Development for Surgeons

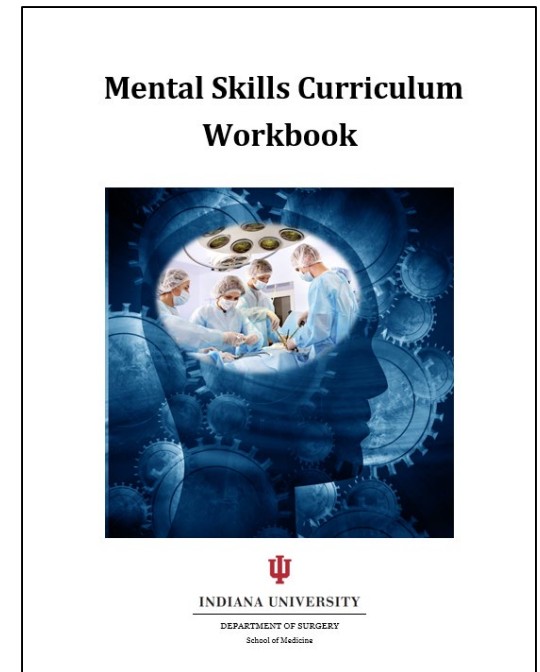
- Collaborative work among
 - surgical educator
 - curriculum expert
 - performance psychologists with expertise in mental training
 - mental skills coach
 - instructional designer
 - video editor
 - study coordinator(s)

- Curriculum development process (Kern's 6 steps)



Comprehensive Mental Skills Curriculum

- Comprised of video education modules, workbook and applied practice during simulation training (individually tailored)
 - Neurology of Focus
 - Mental Imagery (Practice or Rehearsal)
 - Goal Setting (Action Plans)
 - Energy Management (Relaxation)
 - Attention Management
 - Refocusing Strategies
 - Performance Routines



Evidence of Effectiveness

- Our evaluation of this curriculum so far has demonstrated:
 - Enhanced participants' use of mental skills in performance situations and laparoscopic simulator performance²⁶
 - Reduced novices' perceived stress during two validated stress tests²⁷
 - Improved surgical skill retention compared to controls²⁸
 - Mitigated complete performance collapse under heightened stress compared to controls²⁹

26. Stefanidis, Anton, McRary et al. Am J of Surg 2016.

27. Anton, Howley, Pimentel et al. J of Surg Res 2016.

28. Stefanidis, Anton, Howley et al. Am J of Surg 2016.

29. Anton et al. Surgery, 2019.



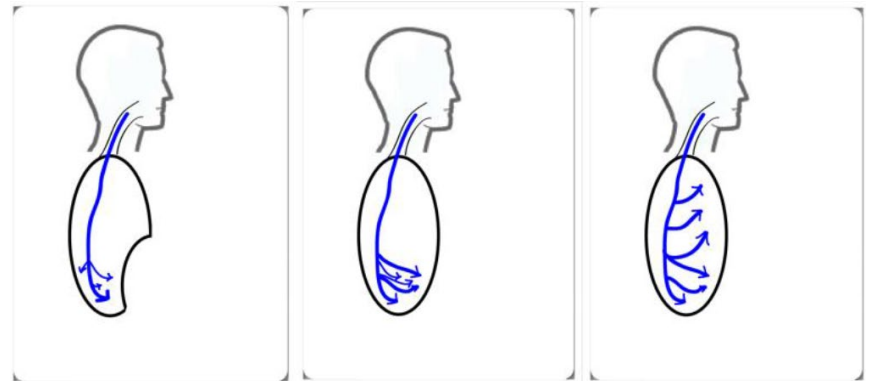
Energy Management

- Goal of these skills: manage physiological and mental states
- Can **rapidly** mitigate negative impact of over/under-arousal (very effective for acute stressful events in the OR)
- Recovery from over-arousal is more difficult, this will be our focus



Energy Management Skills

- Centered breathing/relaxation
 - Lowers physiology to optimal level
 - Centers attention and emotions to IPS
 - Can control breathing, which can counter adrenaline surge



Centered Breathing

1. Trigger Breath-

- Deep breath
- Pause
- Push all air out rapidly and tighten diaphragm

2. Deep Breathing-

- Inhale for 5 seconds Pause
- Exhale for a slow 7 count

3. Focus-

- ‘Park’ attention on target (e.g., counting out the rhythm)
- Select and say cue word silently (e.g., “center” or “calm”)

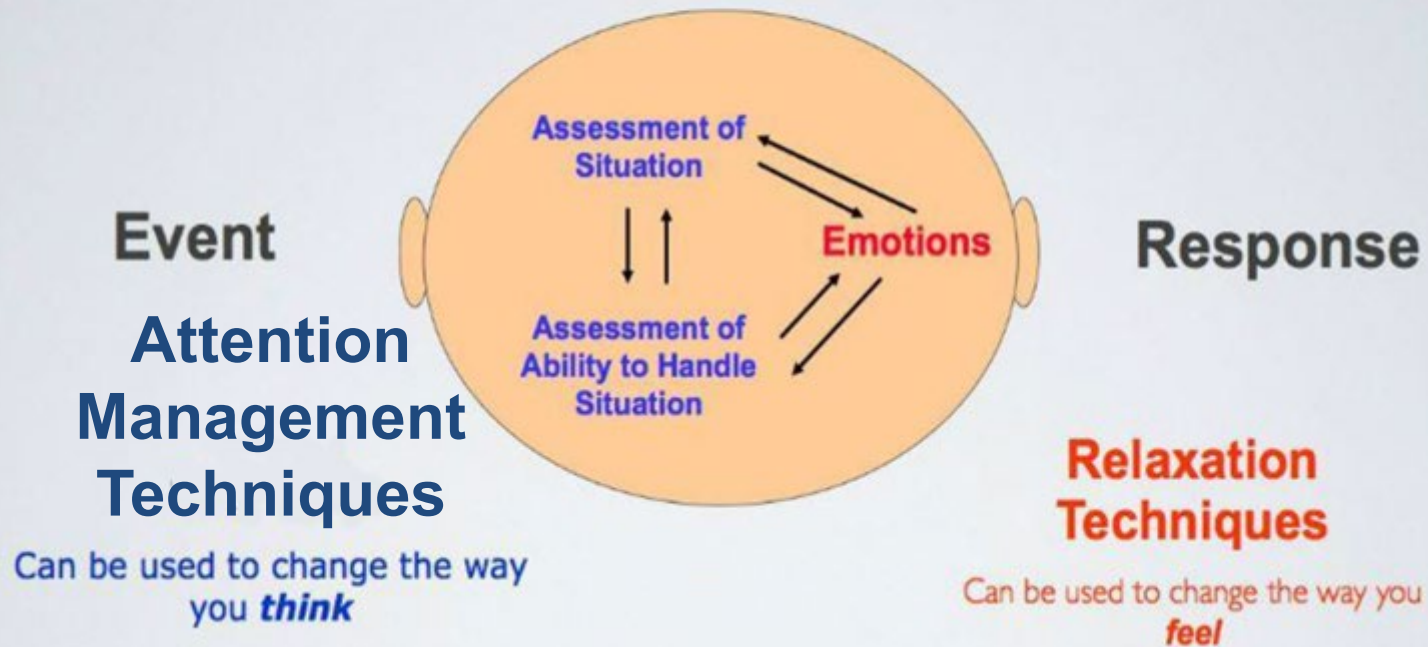
4. Your turn!



Attention Management

MANAGING STRESS


“There is nothing good nor bad; but thinking makes it so.”



Believable Counters to Negative Thoughts

- Negative trance (cycle of negative self-talk)
- Need to break trance (trigger breath) and direct thoughts to optimize performance
- Cannot discount negative self-talk with a positive platitude
- It must be believable and realistic





I have to be at the board meeting in 30 minutes. I have to rush to get this lap chole finished before then!
There's no way I can do this in time!

Maybe, maybe not. Freaking out isn't going to help. Take it one step at a time as smoothly and rapidly as possible and let's see what happens.

Ascertain that the critical view is obtained appropriately (ie identify the cystic duct and artery, not mistaking them for the right hepatic or the common bile duct).



Cognitive Reframing

- Beware of these negative thought patterns:
 - All or nothing thinking
 - Personalizing blame
 - Catastrophizing
 - Selective pessimism
- Ask good questions of yourself to expose negative thoughts



Rational Optimism- Cognitive Reframing

Pessimism	Optimism
Stable “This always happens”	Unstable “This is a one-time event”
Global “I can’t do anything about this”	Specific “This happened for a specific reason that is modifiable”
Internal “It’s all my fault”	External “Things didn’t turn out so well because of circumstances that were beyond my control”



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