The Physiology and Psychology of Emergency Response

Reimagining How to Train Emergency Teams
The Human Factor - Agenda

- Reconsidering the “fight or flight”
- Fear circuit coping methods
- Stress inoculation training
- Coping strategies for first responders
Human Factor – The Physiology of Disaster

The Fear Circuit

Freeze

Fright

Flight

Fight
What Really Happens During the Initial Emergency

- Within $\frac{1}{20}$th of a second, hormones begin pumping into the body before the conscious brain has even registered the event.
- Occurs during actual events or even when someone simply perceives a threat.
Freeze, Flight, Fight or Fright Hormone Surge

<table>
<thead>
<tr>
<th>Amygdala takes charge</th>
<th>Adrenaline floods the brain to allow for faster thinking</th>
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<tr>
<td>Areas of the brain concerned with rational thought are suppressed</td>
<td>Increases anxiety so you will act</td>
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<td>Muscles tense and blood flow increases 300% to provide energy</td>
<td>Pupils dilate to let in more light</td>
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<tr>
<td>Breathing becomes rapid and shallow</td>
<td>Heart rate/blood pressure increases</td>
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<td>Impairs short term memory, but stores event in long term memory</td>
<td>Interferes with ability to handle social or intellectual tasks and behaviors</td>
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<td>Changes to lessen blood loss if you get injured</td>
<td>Pain is temporarily lessened or forgotten</td>
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Heart rate is a good indicator of the level of affect

- 115 bpm - lose fine motor skills
- 145 bpm - lose complex motor skills, hearing shuts down
- 175 bpm - get tunnel vision, critical stress amnesia kicks in, gross motor skills increase
- 185-220 bpm – “fright” mode takes over
You Must Actively Manage the Heart Rate

- Heart rate can go from 70 to 220 in less than ½ a second.
- 115 – 145 bpm is optimal
  o Takes advantage of additional strengths.
  o Still in range to limit cognitive impairment.
The Mind/Body Connection

- The higher the heart rate, the higher the perception of the threat is.
- The higher the perceived threat, the more the body simply reacts and the mind can’t respond.
- As the physical symptoms appear, we (literally) start freaking out about freaking out!
Human Factor – The Physiology of Disaster

What the Hormone Surge Can Mean Mentally

- Time slows down and it takes awhile for an event to consciously register.
- People get stupid or go on auto-pilot.
- Take irrational or nonsensical actions.
- Sociologically, we would rather underreact than overreact and risk social embarrassment.
Human Factor – The Physiology of Disaster

What the Hormone Surge can Mean Physically

- **Tunnel hearing** can occur (145 bpm)
  - Good in that it lessens distractions.
  - Bad in that people may not hear instructions, or only hear part of them.
  - Critical to incorporate hand gestures into evacuations or shelter in place protocols.

- **Tunnel vision** (175 bpm)
  - Literally lose a portion of the peripheral vision – up to 70%.
  - Laser focusing on certain items.
  - Can lose sight of the bigger event.
The Body Follows the Mind

- The body reacts, the mind responds.
- You can learn to control your fear, but only through awareness and consciousness of what you are experiencing and feeling.
- Teach people coping skills through the fear.
Human Factor – Survival Circuit

- Perceive Threat
- Analyze Threat
- Evaluate Threat Level
- Formulate Plan
- Initiate Action

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Perceive Threat

Don’t see or perceive threat

Analyze Threat

Can’t identify threat

Evaluate Threat

Mis-interpret the level of threat

Formulate Plan

Can’t formulate plan - no training or experience

Initiate Action

Leads to slow reaction time

Where it Breaks Down
Training - Coping Strategies

So How do you “Train” Out of This?

• Recognize that regular training is for skills acquisition
• Stress training is to teach
  o Improved stress tolerance
  o Maintain effective functioning in high stress environment

Increased predictability = increased confidence/decreased distractions = effective response
Training – Coping Strategies

So How do you Accomplish That?

Perception of Threat Level

Survival Stress Mgmt

Experience through Training

Skills Confidence
Training – Perception of the Threat Level

Train People to

- Recognize the symptoms leading to the fear circuit
- Discuss “threat cues” to make them aware of realistic sources of threats
- Apply stress management techniques to reduce heart rate
- Add outside stimuli to teach adaptive behaviors
Reduce Heart Rate Through Tactical Breathing

- Breathe in for 3 counts
- Hold for 3 counts
- Breathe out for 3 counts
- Hold it out for 3 counts
- Repeat for at least 3 rounds
  - Actually count to create the distraction.
  - Breathing creates a bridge between both sides of your brain – increasing cognitive abilities under duress.
  - Can decrease heart rate by 20%.
Training – Perception of the Threat Level

Turn Fear to Action

- Talk to yourself!
- Am I threatened, or am I challenged?
- The longer you stay threatened, the more likely you are to go into fright mode.
- Change threatened to challenged by asking “BUT...”
  - A challenged brain is a working brain
  - A working brain can develop and implement a plan
Visualization

- Very effective in conditioning to circumvent the fear circuit.
  - Be very specific and tie in physiological response issues
  - Predict the potential threat cues
  - Pre-program the proper survival response
  - Pre-program a Plan B “failure factor”
Training – Experience and Confidence

Stress Inoculation for Survival Stress Management

• Practice, Practice, Practice
  o Increase confidence in a skill at a subconscious level
  o Increase situational confidence
• Use visualization principals to mentally prepare for potential threat stimulus and correct response
• Train on using breath control to slow heart rate
Training – Scenario Based Training Summary

- Identify the predictable level of stress during application of the skill being trained on
- Discuss techniques/protocols segmented into beginning/middle/end
- Develop dynamic training exercises
  - Introduce fundamentals
  - Slow walkthrough
  - Practice
  - Train on developing student survival stress checklist
    - ID where threats may develop
    - Primary response option
    - Secondary response option
Reference Materials

- The Warriors Edge - J. Alexander, R. Groller, J. Morris
- Sharpening the Warriors Edge: The Psychology and Science of Training - B. Siddle
- The Anatomy of Fear and How it Relates to Survival Skills Training - D. Laur
- Performance Under Stress - P. Hancock, J. Szalma
- Deadly Force Encounters - A. Artwhol and L. Christensen
- Stress Training and the New Military Environment – R. Delahaij, A. Gaillard, Soeters
- Stress Exposure Training – J. Driskell, J. Johnston
- FEMA Community Emergency Response Team Training 2011
- The Unthinkable – Amanda Ripley
That’s it!

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- Listen to me on my new talk show on Voice America – Business Channel
  - *Fear is Negotiable: Business Survival Skills 101*
  - Coming March 19th!