

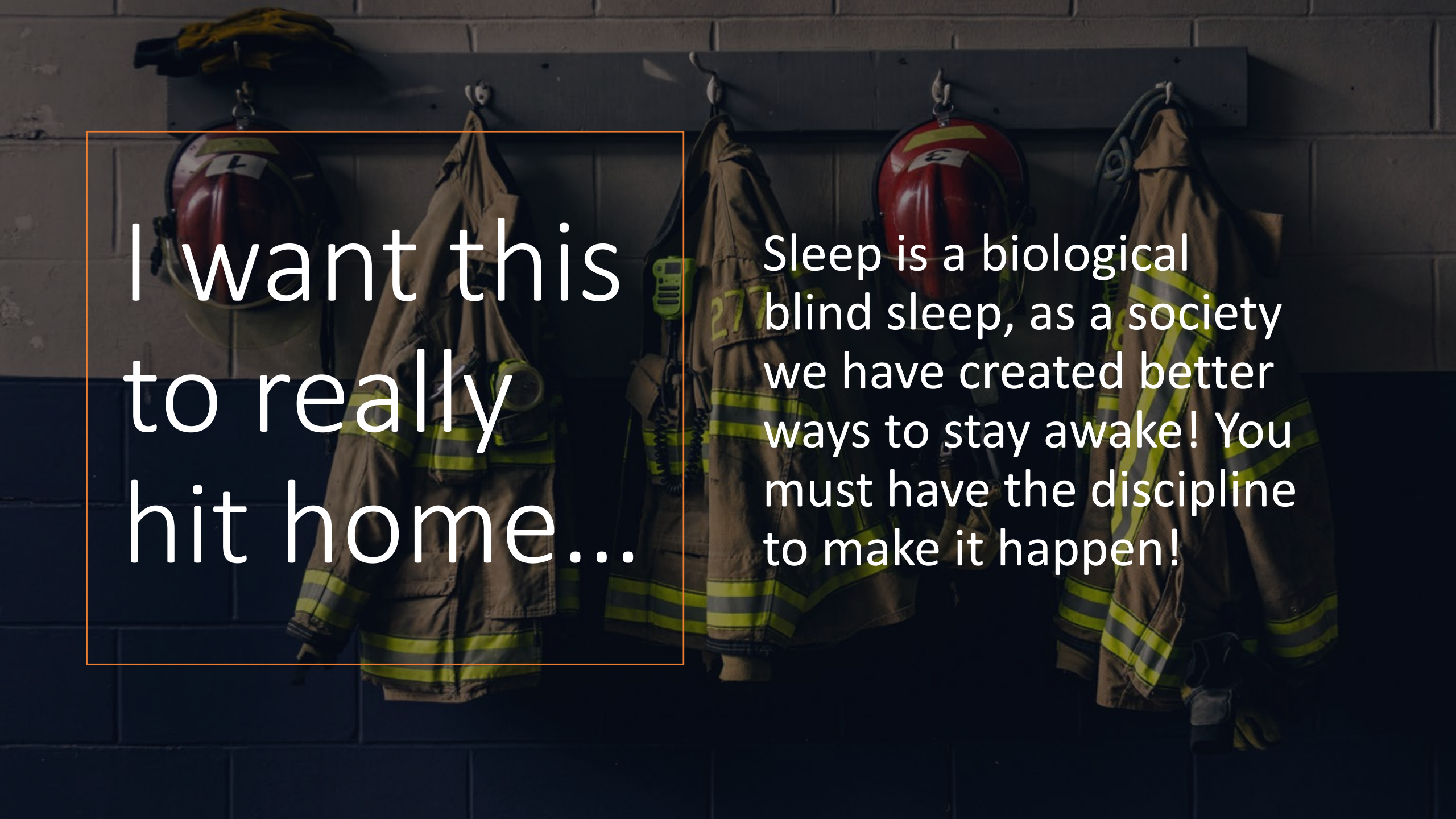
A photograph of firefighter gear hanging on a dark wooden rack against a light-colored brick wall. The gear includes three brown fire jackets with reflective yellow and silver stripes, two red helmets, and a pair of yellow gloves. The scene is dimly lit, with the text overlaid in the center.

You Wouldn't Go to Work
Intoxicated, Right?

Unpacking Fatigue in EMS

Objectives and Overview

- Let's try and get all the statistics out of the way
- Is this really a new problem?
- Unpacking a good night's sleep
- Sleep and our overall health
- Microsleep
- All I Really Need to Know I Learned in Kindergarten!
- If he mentions taking my caffeine, I am leaving...
- Changing your sleep habits
- 30 Day Sleep Challenge

A photograph of firefighter gear hanging on a dark wooden rack against a brick wall. The gear includes two red helmets with yellow accents, two tan fire jackets with reflective yellow-green stripes, and a pair of yellow gloves. The scene is dimly lit, with the gear being the primary light source.

I want this
to really
hit home...

Sleep is a biological
blind sleep, as a society
we have created better
ways to stay awake! You
must have the discipline
to make it happen!

What do people need to reach their full potential and thrive?

- According to psychologist Abraham Maslow, human beings' physiological needs for food, water, clothing, shelter, and sleep must be satisfied for them to address more complex needs like mental and physical health, relationships, sobriety, long-term housing, and employment.
-

Self-actualization

desire to become the most that one can be

Esteem

respect, self-esteem, status, recognition, strength, freedom

Love and belonging

friendship, intimacy, family, sense of connection

Safety needs

personal security, employment, resources, health, property

Physiological needs

air, water, food, shelter, sleep, clothing, reproduction



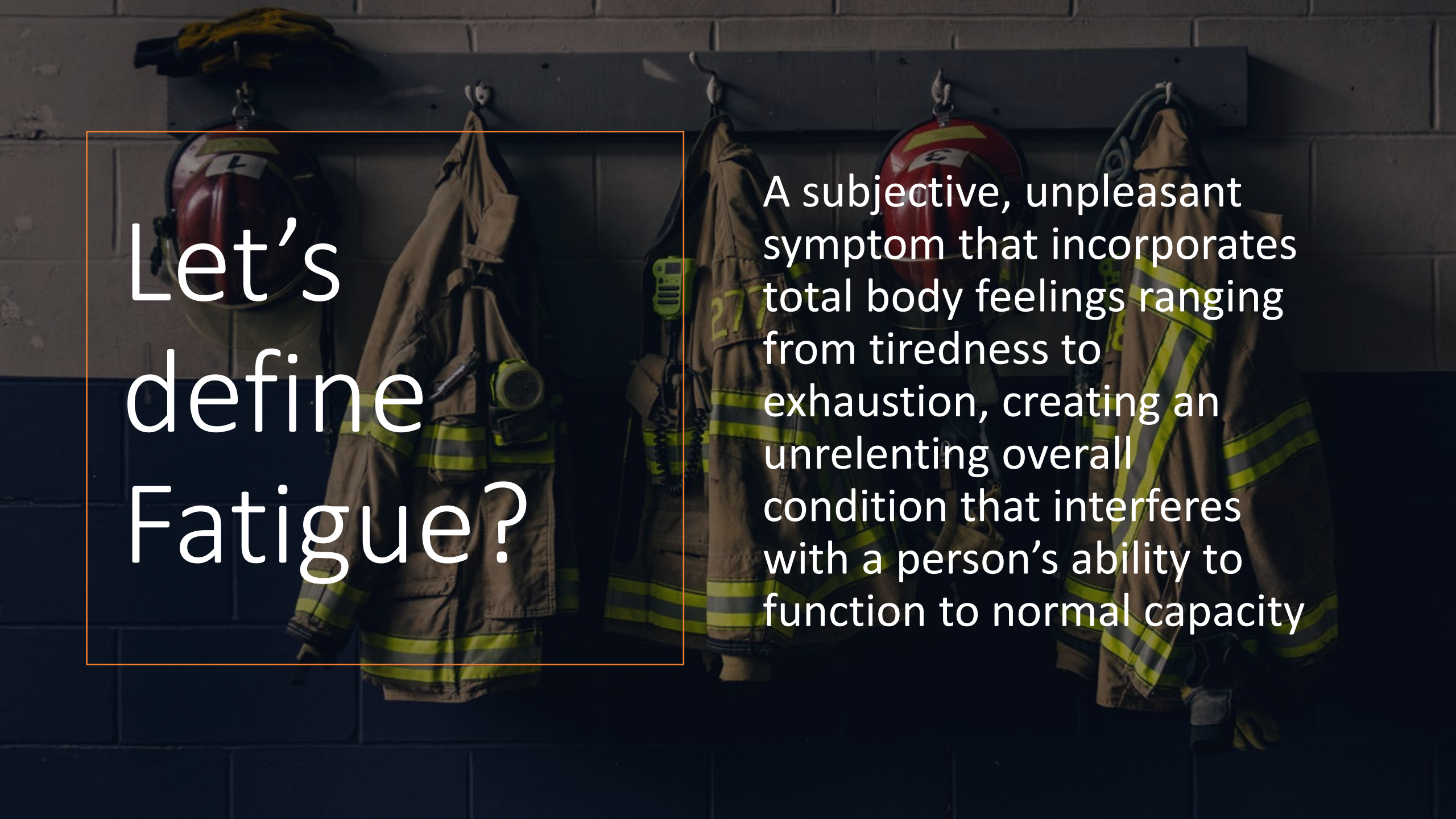
Everything is built off sleep...

- You can die from lack of sleep, faster than lack of food
- Most would say they wouldn't voluntarily have a dehydrated or malnourished life, why would you voluntarily lead a sleep-deprived one?

A photograph of firefighter gear hanging on a dark wooden rack against a brick wall. The gear includes two red helmets with yellow accents, two brown fire jackets with reflective yellow and silver stripes, and a pair of yellow gloves. The scene is dimly lit, with the primary light source coming from the left, casting shadows and highlighting the textures of the equipment. A thin orange rectangular border is superimposed over the left side of the image, framing the text.

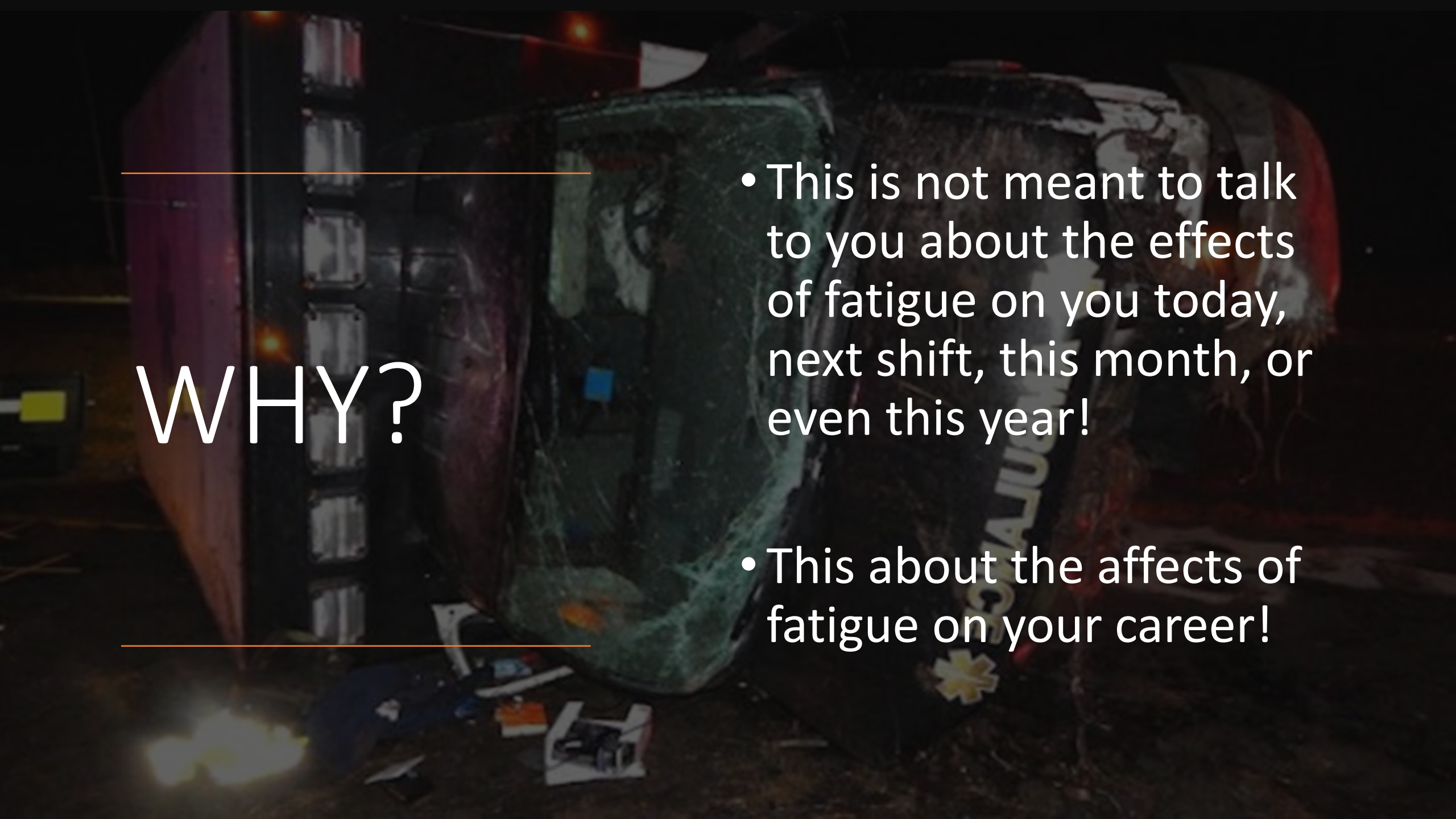
This is
“new”
right?

With current
advancements in
artificial lights, humans
can physically go for
days without sleep...But
the mind cannot!

The background of the slide is a photograph of firefighter equipment hanging on a dark wooden rack against a light-colored brick wall. On the left, a red helmet with the number '7' is visible. Next to it is a tan firefighter jacket with yellow reflective stripes. In the center, another jacket with the number '27' is hanging. To the right of that is another red helmet with the number '6'. On the far right, another tan jacket is hanging. The text 'Let's define Fatigue?' is overlaid on the left side of the image, enclosed in a thin orange rectangular border.

Let's define Fatigue?

A subjective, unpleasant symptom that incorporates total body feelings ranging from tiredness to exhaustion, creating an unrelenting overall condition that interferes with a person's ability to function to normal capacity



WHY?

- This is not meant to talk to you about the effects of fatigue on you today, next shift, this month, or even this year!
- This about the affects of fatigue on your career!



U drunk, bro?

- Losing even two hours of sleep is like the effect of having three beers
- 17 hours without sleep is comparable to a 0.05 BAC
- 21 hours without sleep is comparable to a 0.08 BAC
- 24 to 25 hours without sleep is comparable to a 0.10 BAC

Why is this such a big deal?

- Fatigued people are 3 times more likely to be in a car crash
 - Drowsy driving is responsible for more than 6,400 U.S. deaths annually
 - NHTSA links 100,000 MVAs per year to fatigue
- 59% of night shift **workers** sleep less than 7 hours a day
- The risk of injury on night shifts is 30% higher than on day shifts
 - Fatigued EMS workers have a 1.9 greater odds of injury and 3.6 greater odds of safety-compromising behavior compared to their non-fatigued colleagues
- 97% of fatigued workers have reduced cognitive performance
 - fatigued EMS workers had 2.2 times greater odds of medical errors or adverse events compared to their non-fatigued colleagues

Why is this such a big deal?

- Chronic sleep-deprivation causes depression, obesity, cardiovascular disease and other illnesses
- Obese firefighters who didn't get enough sleep on shift were twice as likely to report having had an on-duty injury in the past 6-12 months than those who felt like they received enough sleep
- Staying awake at night or lack of good sleep may increase the risk of suicidal thoughts and attempts, a new study has found.
- Sleep deprivation makes you 5 times more likely to take your own life!



OK, BUSTER,
LET'S TRY
THIS AGAIN.
MIRROR, MIRROR
ON THE WALL...



DT Walsh

The Epworth Sleepiness Scale

The Epworth Sleepiness Scale is widely used in the field of sleep medicine as a subjective measure of a patient's sleepiness. The test is a list of eight situations in which you rate your tendency to become sleepy on a scale of 0, no chance of dozing, to 3, high chance of dozing. When you finish the test, add up the values of your responses. Your total score is based on a scale of 0 to 24. The scale estimates whether you are experiencing excessive sleepiness that possibly requires medical attention.

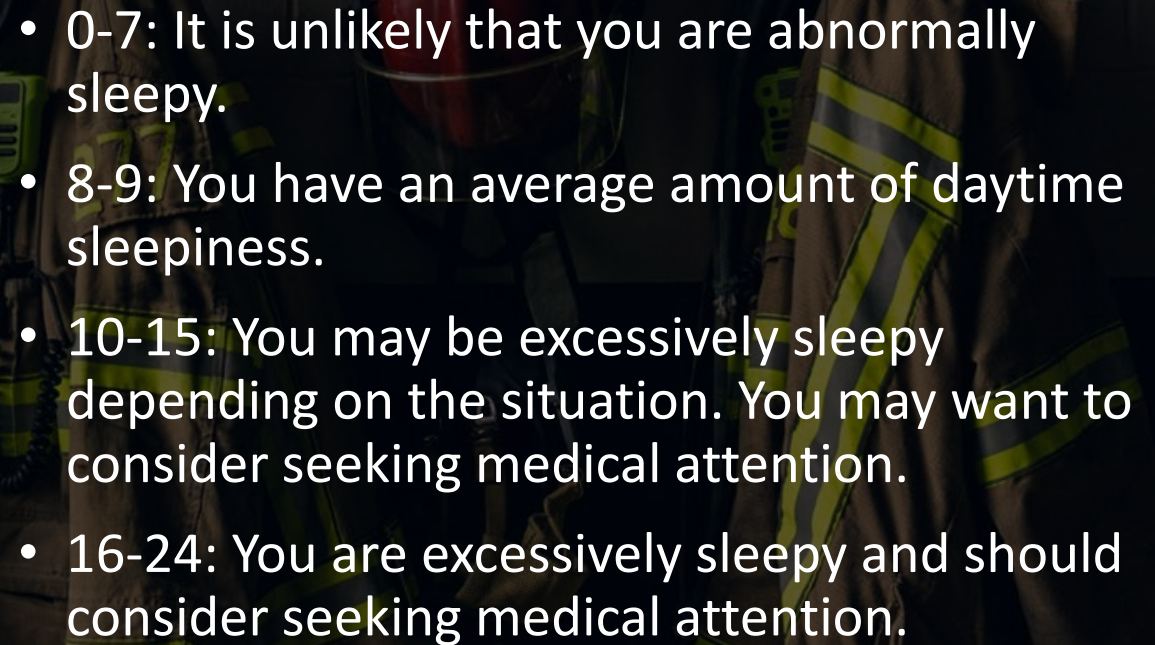
How Sleepy Are You? How likely are you to doze off or fall asleep in the following situations? You should rate your chances of dozing off, not just feeling tired. Even if you have not done some of these things recently try to determine how they would have affected you.

- For each situation, decide whether or not you would have:
- No chance of dozing = 0
- Slight chance of dozing = 1
- Moderate chance of dozing = 2
- High chance of dozing = 3

Situation	Chance of Dozing
Sitting and reading	•
Watching TV	•
Sitting inactive in a public place (e.g., a theater or a meeting)	•
As a passenger in a car for an hour without a break	•
Lying down to rest in the afternoon when circumstances permit	•
Sitting and talking to someone	•
Sitting quietly after a lunch without alcohol	•
In a car, while stopped for a few minutes in traffic	•

A firefighter's helmet and jacket hanging on a wall. The helmet is red with a white label featuring the number '7'. The jacket is brown with yellow reflective stripes. The background is a dark, textured wall.

Analyze Your Score

- 
- A firefighter's helmet and jacket hanging on a wall. The helmet is red with a white label featuring the number '6'. The jacket is brown with yellow reflective stripes. The background is a dark, textured wall.
- 0-7: It is unlikely that you are abnormally sleepy.
 - 8-9: You have an average amount of daytime sleepiness.
 - 10-15: You may be excessively sleepy depending on the situation. You may want to consider seeking medical attention.
 - 16-24: You are excessively sleepy and should consider seeking medical attention.



ARE YOU AT RISK?

If I am up here being honest....

Shift Start Time

07:00

Shift Duration (Hours)

24

▼

Days On

1

▼

Days Off

2

▼

Commute Time (Minutes)

30 or less

▼

Napping

No

▼

Pattern Repeats

4

▼

High Risk

Show Analysis Details

Pattern Repeat	Average Effectiveness	Minimum Effectiveness	Risk Level
1 (Day 1-1)	88.2	67.1	Moderate Risk
2 (Day 4-4)	84.6	63.3	High Risk
3 (Day 7-7)	83.3	62	High Risk
4 (Day 10-10)	82.9	61.5	High Risk
Overall	84.8	61.5	High Risk

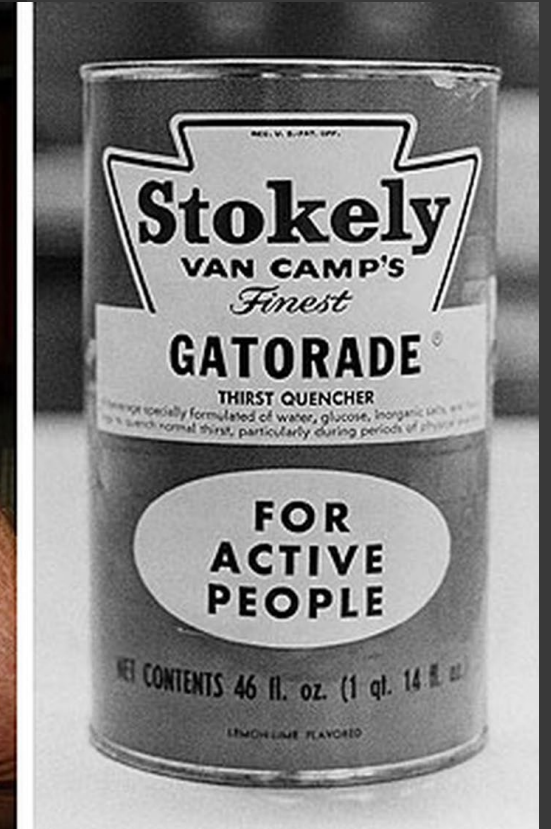
WHEN PEOPLE COMPLAIN ABOUT THEIR 9-5 JOB...

I'VE BEEN HERE FOR TWO DAYS



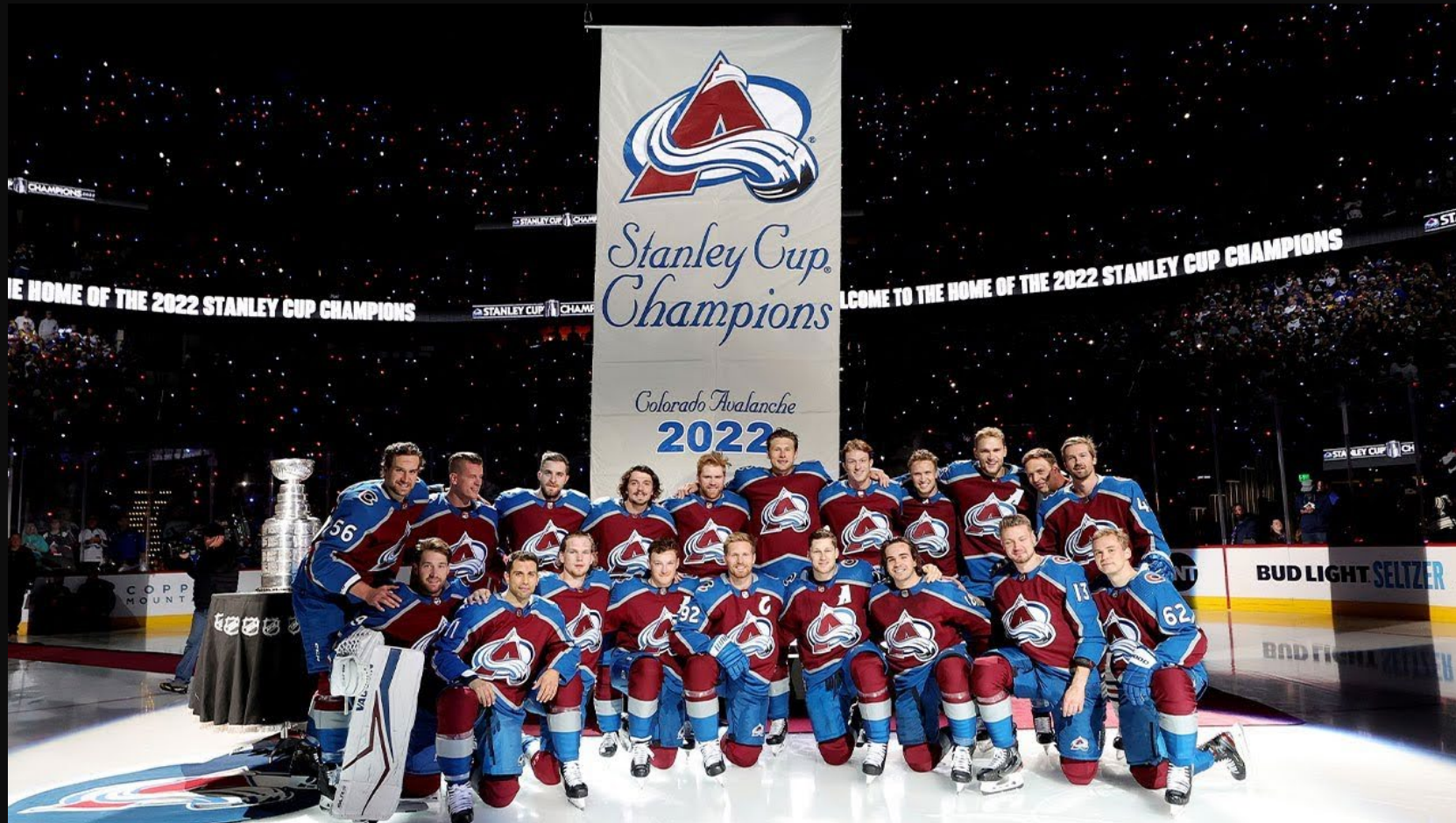
Train like the Pros

- The capacity to make fewer mistakes.
- Faster reaction times.
- Accuracy – for example, as the baseball season progresses and tiredness levels increase, pitching and batting accuracy levels tend to fall. Good sleeping habits can minimize this deterioration.
- Serena Williams, 39 times Grand Slam tennis winner reached her tenth Wimbledon final only 10 months after giving birth – a fact she partly puts down to her unwavering commitment to regular sleep routines, high quality mattresses and pillows and regular daytime naps.
- From the world of team sports, football legend Tom Brady likes his 8 hours, going to bed during the season at 830pm (often before his kids) and rising at 530 am – and at 39 years of age and still at the peak of his powers, he would seem to have found the perfect sleeping method.



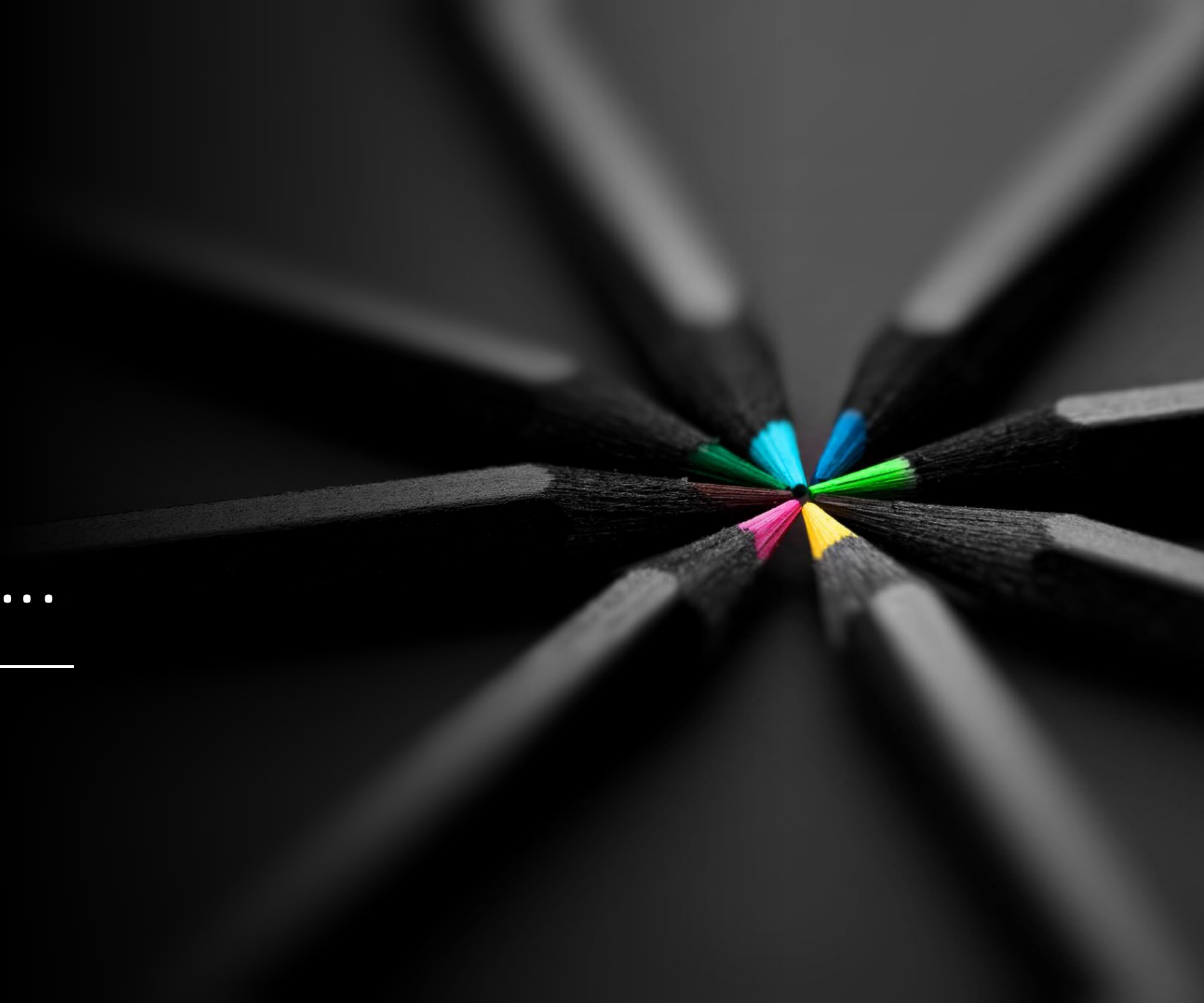
The Big Game

If we lose,
someone dies





A Cool Study....

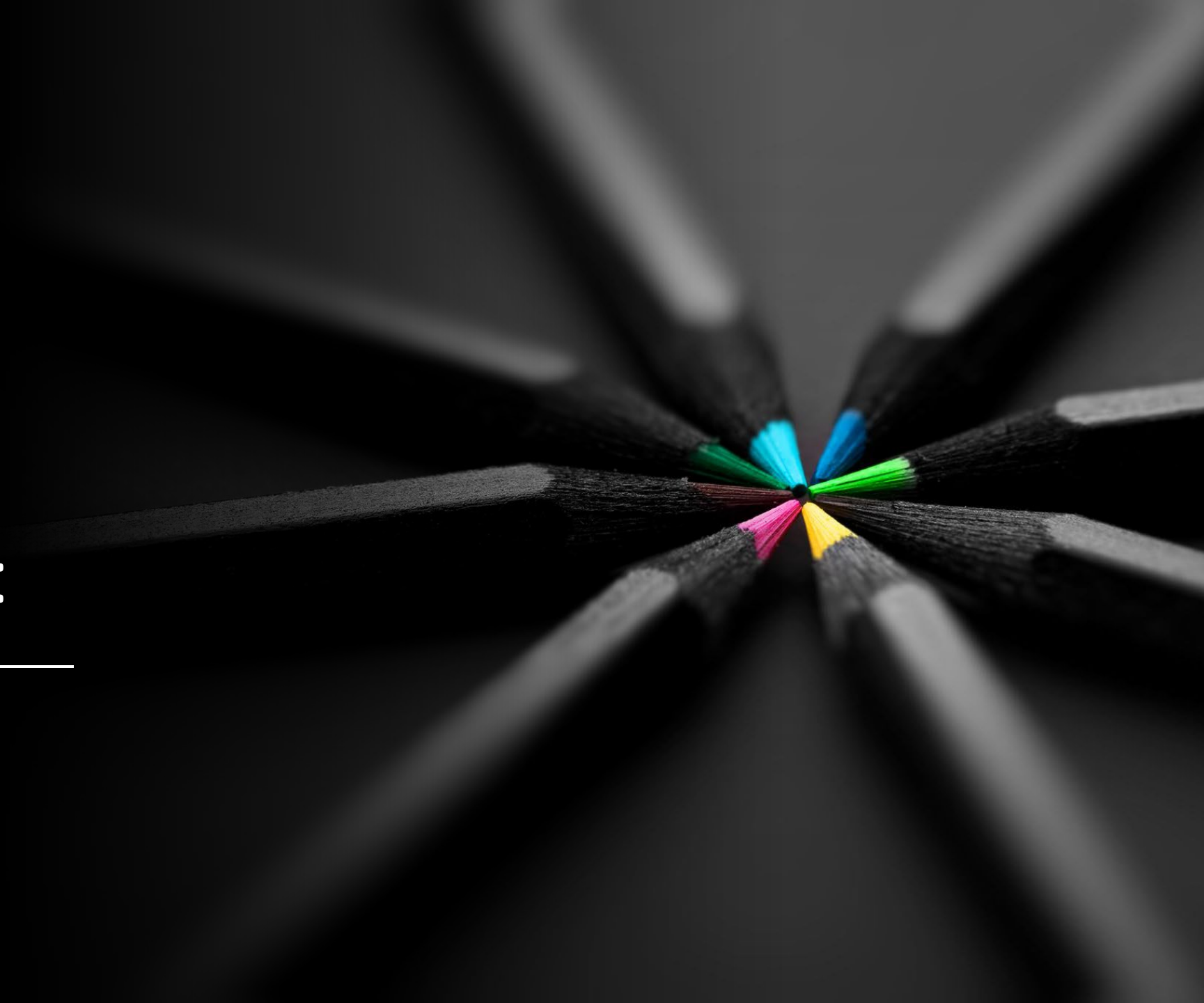




The soccer team from England identified the importance of quality rest. By carefully analyzing everything from bedroom temperature to body positions when sleeping, each player was given an individual rest plan. The club also went to the expense of having special mattresses and pillows made for each player with their individual characteristics in mind. As a result, recovery after matches improved exponentially as did decision-making during games. The new strategy also improved the player's stamina levels which led to positive results on the field. The culmination of this being when the team managed to turn a 0-3 deficit 15 minutes from full-time into a 4-3 win. Luck? These players and staff might tell you otherwise.



Another One:





Group 1: 7 hours of sleep:

98%

Group 2: 6 hours of sleep:

50%

Group 3: 5 hours of sleep:

28%

Group 4: 4 hours of sleep:

15%

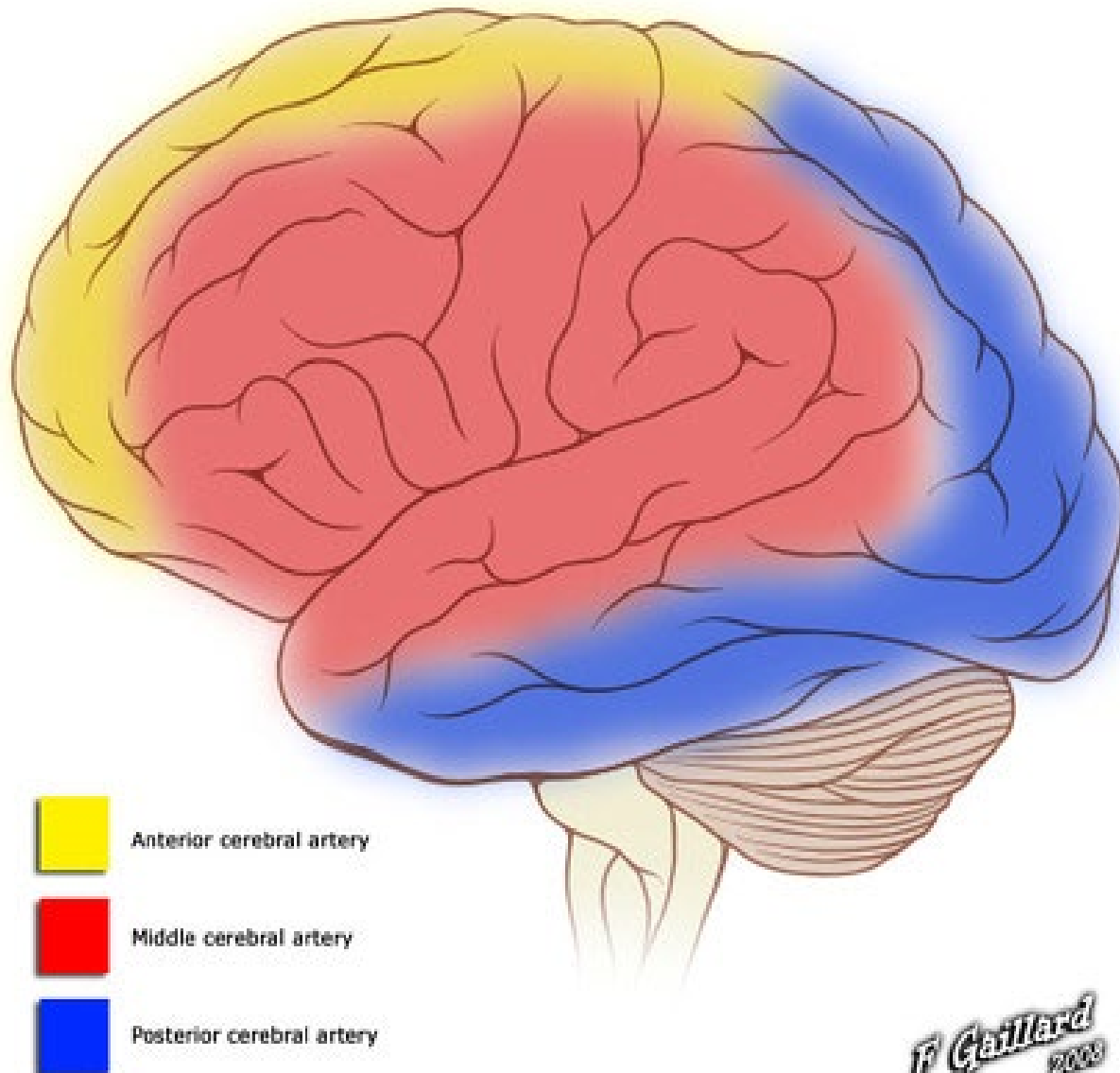
$$\begin{aligned}\frac{10 \text{ mg}}{1 \text{ mL}} &= \frac{20 \text{ mg}}{x \text{ mL}} \\ (10) \times (x) &= (20) \times (1) \\ 10x &= 20 \\ x &= \frac{20}{10} \\ x &= 2 \text{ mL}\end{aligned}$$

“I slept like a baby!”

There are two basic types of sleep: rapid eye movement (REM) sleep and non-REM sleep (which has three different stages).

- **Stage 1** non-REM sleep is the changeover from wakefulness to sleep.
 - 0-9%
- **Stage 2** non-REM sleep is a period of light sleep before you enter deeper sleep.
 - 44-59%
- **Stage 3** non-REM sleep is the period of deep sleep that you need to feel refreshed in the morning.
 - 10-12%
- **REM sleep** first occurs about 90 minutes after falling asleep.
 - Memory consolidation most likely requires both non-REM and REM sleep.
 - 19-27%

Cortical vascular territories



F. Gaillard
2008
©Radiopaedia.org

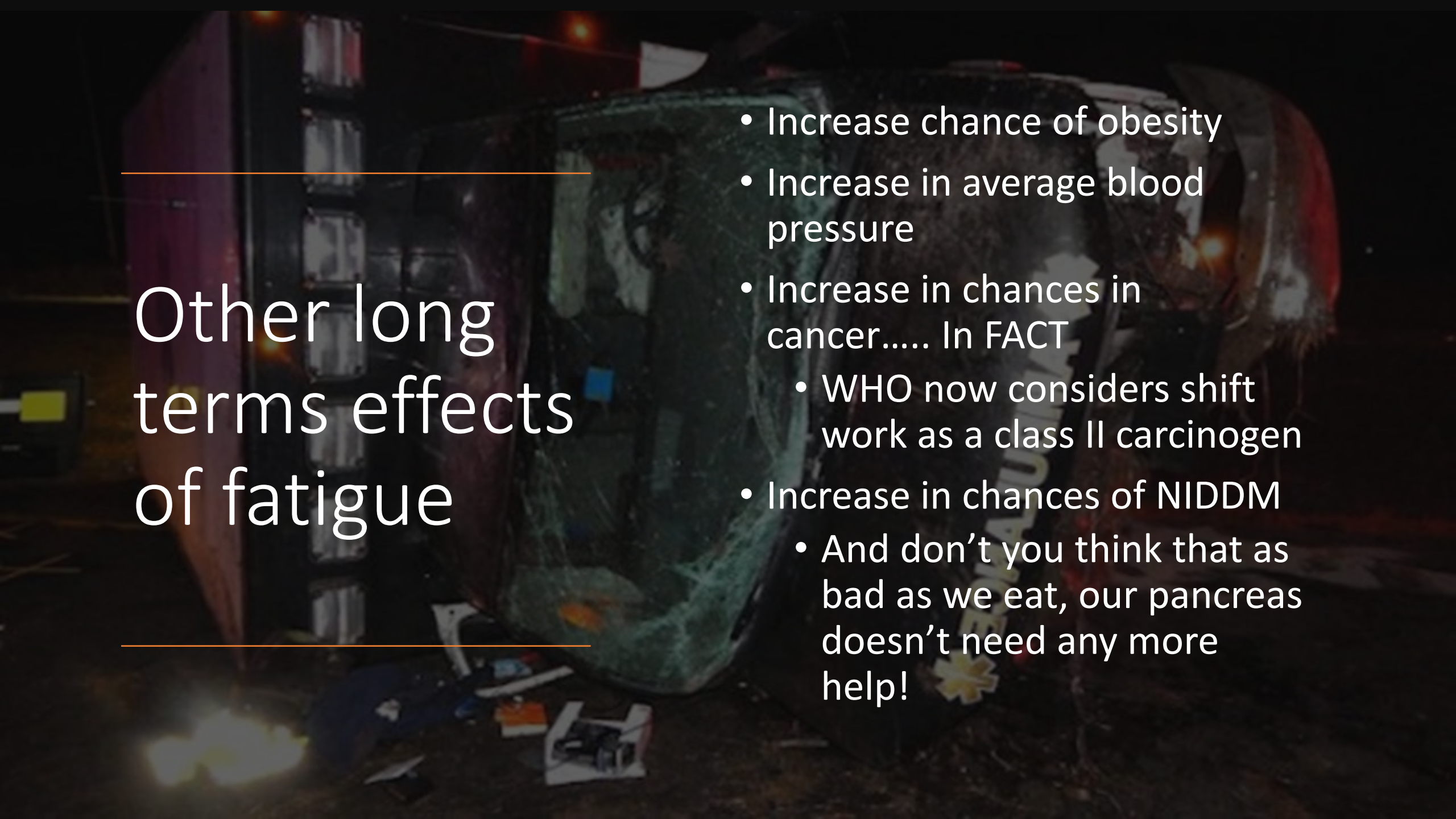
Line drawing of brain by Patrick Lynch (patricklynch.net)

I know being sleepy sucks,
but is it really BAD for you?

- Normal sleep
 - Normal blood flow
- Up all night!
 - Slight increase blood flow!
 - Every pulled ONE all night-er for a test?
- Every time the person went into REM, then woke them up with a annoying sound....
 - Severe drop in blood flow
 - Comparable to damage from CVA

The Dangers of “Microsleep”

- Simply put, microsleep is when you fall asleep for a period of several seconds.
- Microsleep can occur at any time of day, not just at night. During an episode, you may appear to be awake, and even have your eyes open, but your brain does not process information.
- The best way to prevent microsleep is prioritizing sleep and making sure you get the right amount of sleep you need to feel refreshed and alert .



Other long terms effects of fatigue

- Increase chance of obesity
- Increase in average blood pressure
- Increase in chances in cancer..... In FACT
 - WHO now considers shift work as a class II carcinogen
- Increase in chances of NIDDM
 - And don't you think that as bad as we eat, our pancreas doesn't need any more help!

Shift Work and Cancer

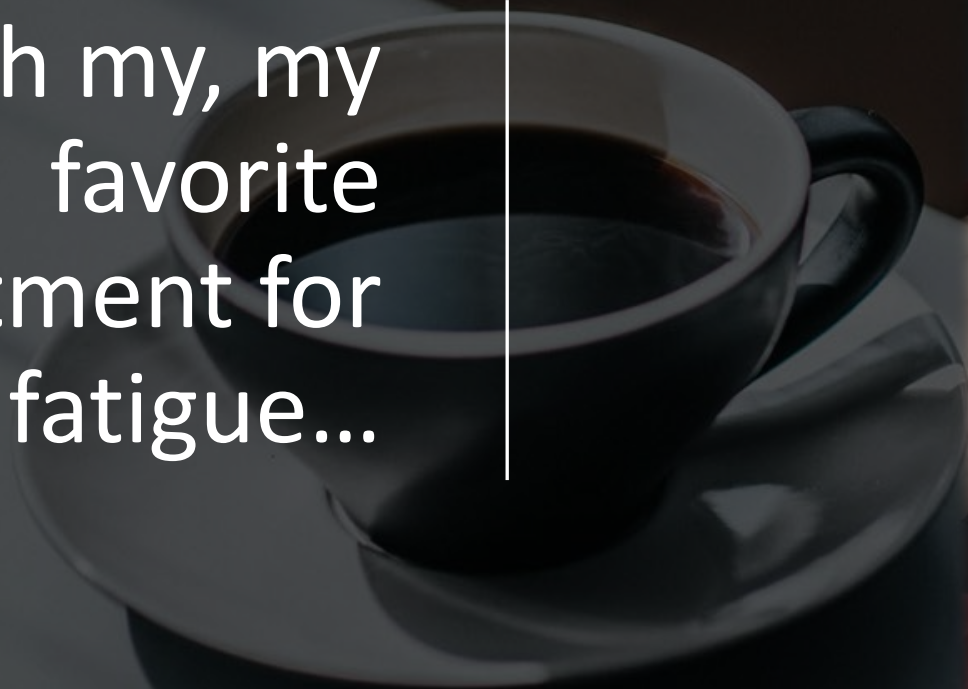
The background of the slide is a faded, grayscale image of firefighter equipment. It shows two red helmets with reflective yellow stripes, and two yellow fire jackets with reflective silver and yellow stripes, hanging on a dark metal rack against a light-colored brick wall.

- In 2007, the International Agency for Research on Cancer (IARC) classified shift work with circadian disruption or chronodisruption as a probable human carcinogen. Short-term disturbances of biological 24-hour-rhythms following exposures to light and darkness at unusual times are well-known as “jet-lag” and “shift-lag” symptoms.
- However, that chronic disturbances or disruptions of timely sequenced circadian rhythms (chronodisruption) should contribute to long-term developments of cancer is a relatively new concept. This review provides background and practical information with regard to the open question „does shift-work cause cancer?



All nighters
are like cup
cakes....

Oh my, my
favorite
treatment for
fatigue...



When you dump Bang
in your coffee and
now your GCS is 16.



My goals are beyond your understanding.

Caffeine Can Be Your Friend

- If not overused...
- Use it only when you need it
 - Right when you wake up
 - Right after lunch
 - NOT within 5 hours of bedtime



What works better than caffeine?

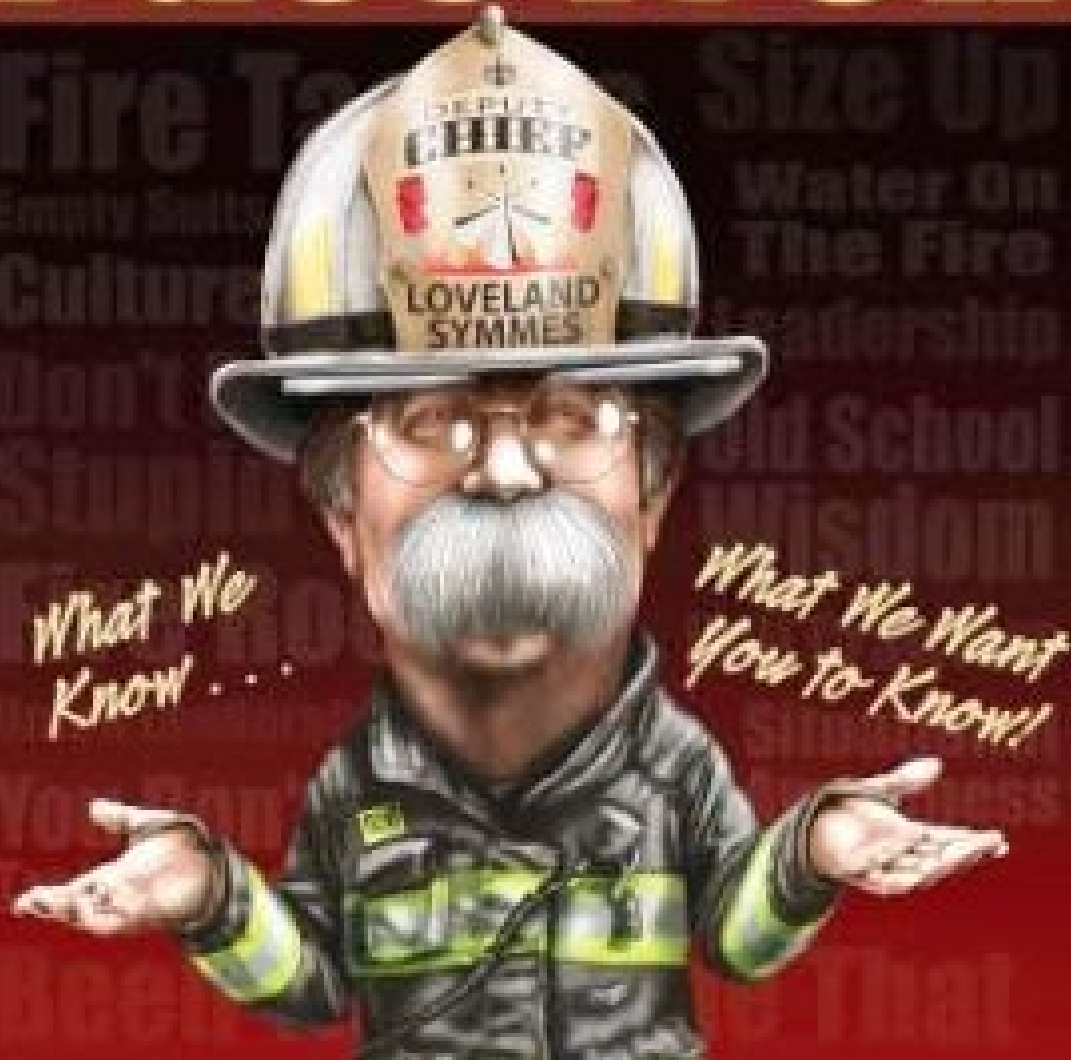
Naps: The Good and Bad Solution

- Naps are for efficient sleepers only!
 - If you struggle to fall asleep, then don't nap during the day!
- Naps doesn't mean unconsciousness for 3-4 hours!
 - 10–20-minute naps are also referred to as power naps. These short naps allow you to wake up feeling refreshed, energized, and alert.
 - 90-minute naps allow you to cycle through all sleep stages while avoiding sleep inertia
- A good midday snooze session can increase alertness, reduce stress, sharpen cognitive skills, improve your mood and help you figure out how to stop being a night owl.

EMS = Earn Money Sleeping?

- A nap—no longer than 30 minutes helps your body recharge and refocus on the task at hand. Night-shift napping has been shown to decrease sleepiness on the job and improve workplace outcomes. Plus, taking 1–2 naps a week can reduce your chances of stroke, heart attack, or heart failure
- **Google**
- **Huffington Post**
- **Cisco**
- **Ben & Jerry's**
- **Facebook**
- **Uber**
- **Zappos**

Pass It On



I don't think my Chief will like this....

- Administrators of Emergency Medical Services (EMS) operations lack guidance on how to mitigate workplace fatigue, which affects greater than half of all EMS personnel.
 - If you got a call while eating breakfast, what would you tell your crews when they came back?
 - How is getting a call, in the middle of the night any different?
-



The Bad:

They also found that performance increased as time from a nap to the test increased. For example, if prehospital personnel had napped in the hour before the test, they were more likely to do worse than if they had napped 3 hours before the test. The authors hypothesized this is likely due to sleep inertia, or grogginess upon waking.



#1: Keep it short



#2: Set an alarm



#3: Nap during the
early afternoon



#4: Pick a comfortable
environment

Napping 101!

Don't measure the quality of the nap by being unconscious, just by resting, helps you relive stress, improve effectiveness, and decrease fatigue.



Shut up! I'm trying to sleep.

Changing the Stations!



Have other medical divisions changed?

- In 2002, the medical community started requiring doctors and interns to get enough sleep, because the legal liability of having “zombie-like” providers providing medical care was too great

“I am not paying you to sleep”

Researchers suggest that employers look at the cost of not allowing naps. Insufficient employee sleep leads to:

- Less productivity
- More absences at work
- Greater risk of errors
- Increased chance of workplace accidents and injuries
- Higher health care costs
- Company financial loss

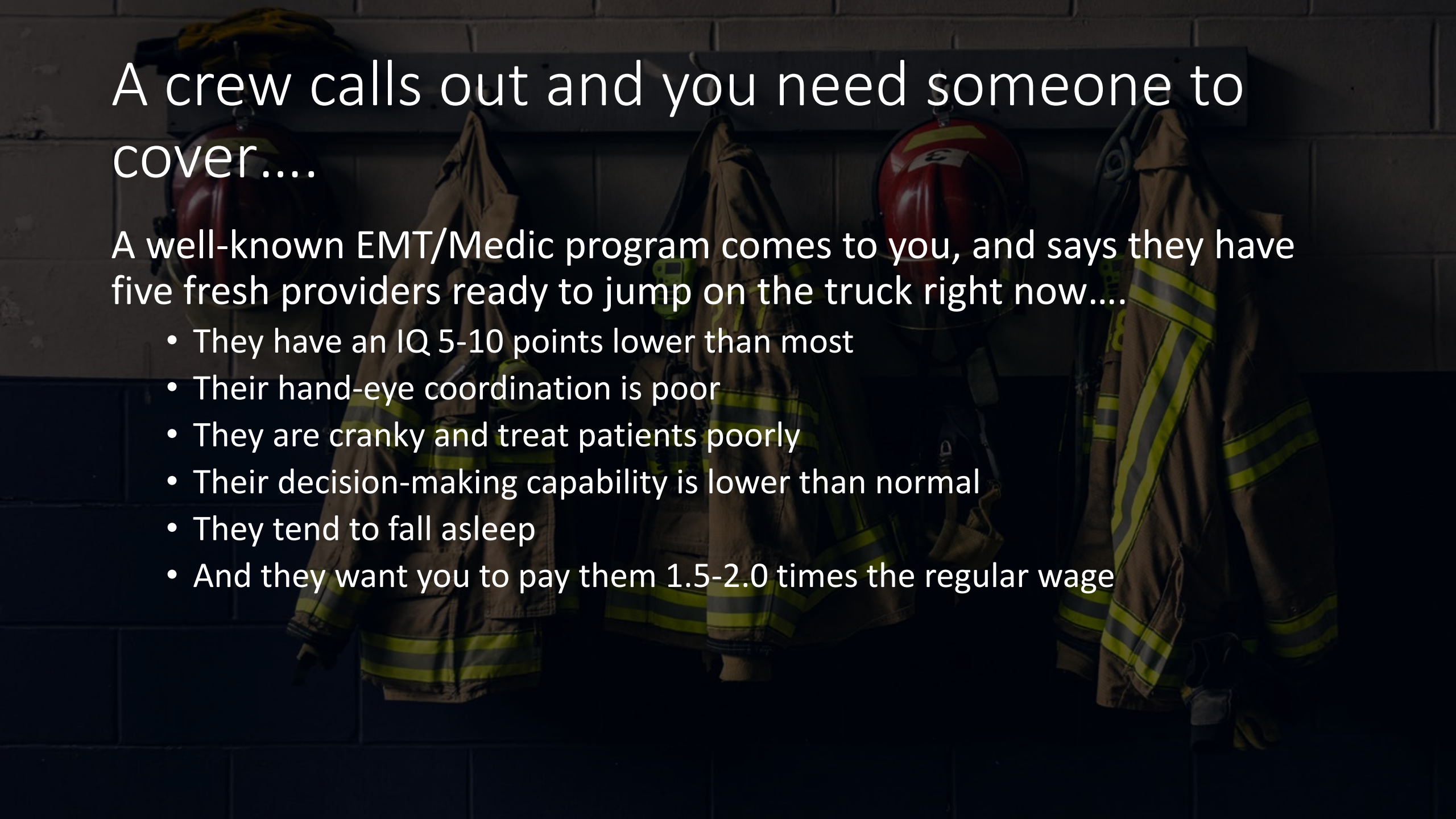
Anybody see what changed with me?

Shift Start Time	Shift Duration (Hours)	Days On	Days Off	Commute Time (Minutes)	Napping	Pattern Repeats
07:00	24	1	2	30 or less	Yes	4

Minimal Risk

Show Analysis Details

Pattern Repeat	Average Effectiveness	Minimum Effectiveness	Risk Level
1 (Day 1-1)	92.9	81.5	Minimal Risk
2 (Day 4-4)	91.6	80.4	Minimal Risk
3 (Day 7-7)	91.2	80.1	Minimal Risk
4 (Day 10-10)	91.1	80	Minimal Risk
Overall	91.7	80	Minimal Risk

The background of the slide is a photograph of firefighter gear hanging on a dark wall. Three brown fire jackets with reflective yellow and silver stripes are hanging vertically. Between the jackets are two red fire helmets. The text is overlaid on the top left of the image.

A crew calls out and you need someone to cover....

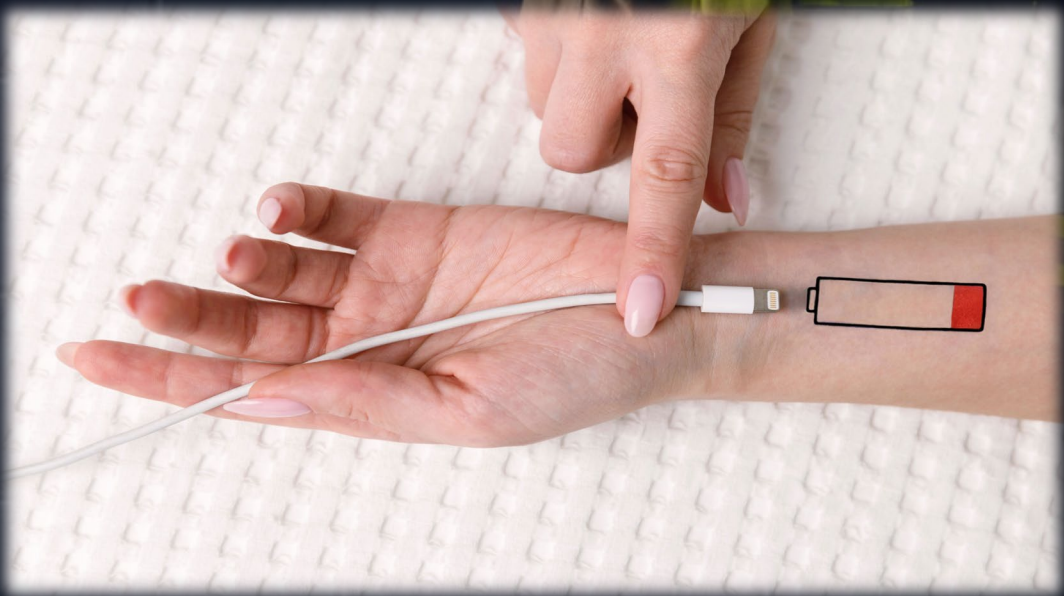
A well-known EMT/Medic program comes to you, and says they have five fresh providers ready to jump on the truck right now....

- They have an IQ 5-10 points lower than most
- Their hand-eye coordination is poor
- They are cranky and treat patients poorly
- Their decision-making capability is lower than normal
- They tend to fall asleep
- And they want you to pay them 1.5-2.0 times the regular wage

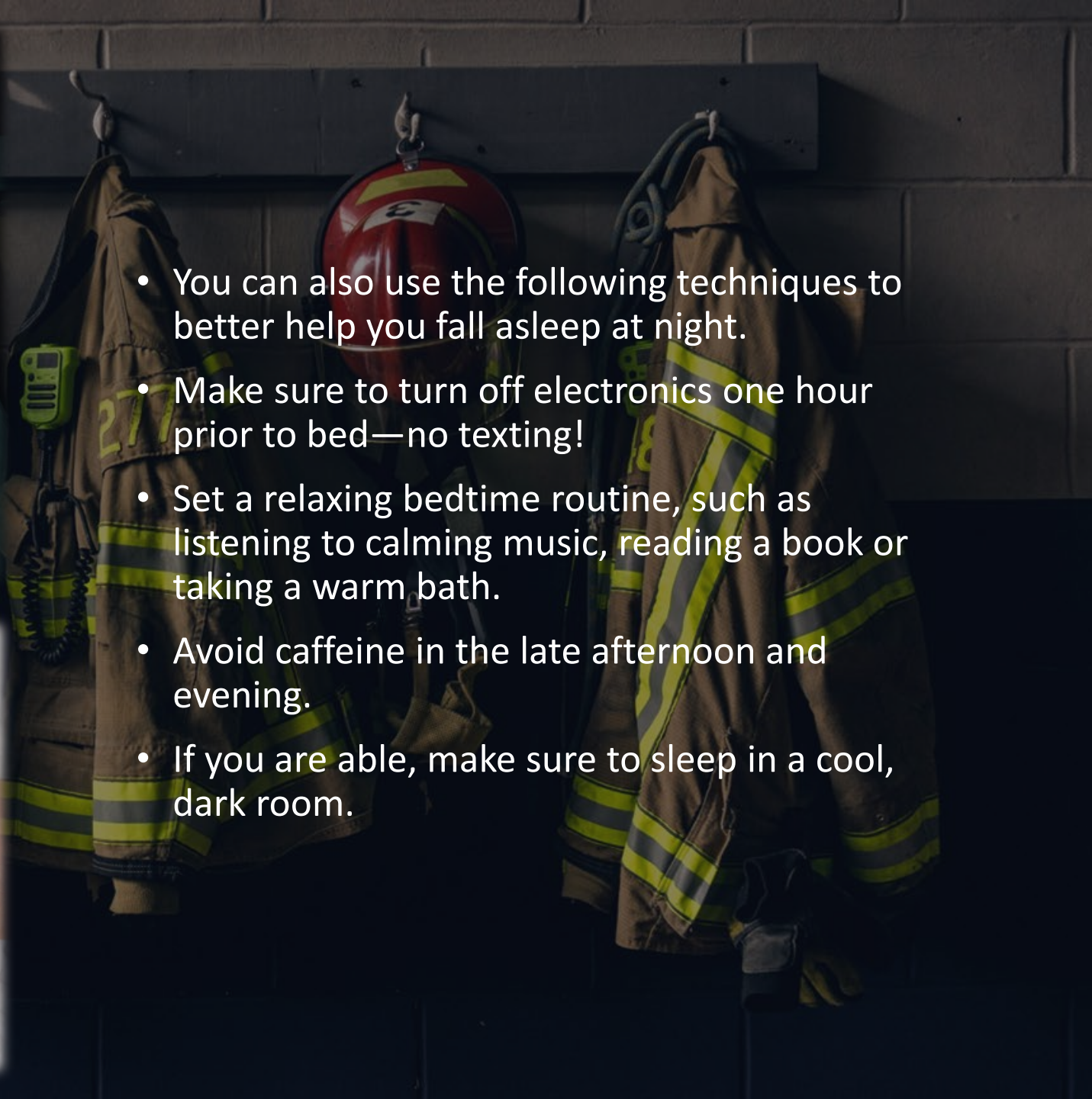


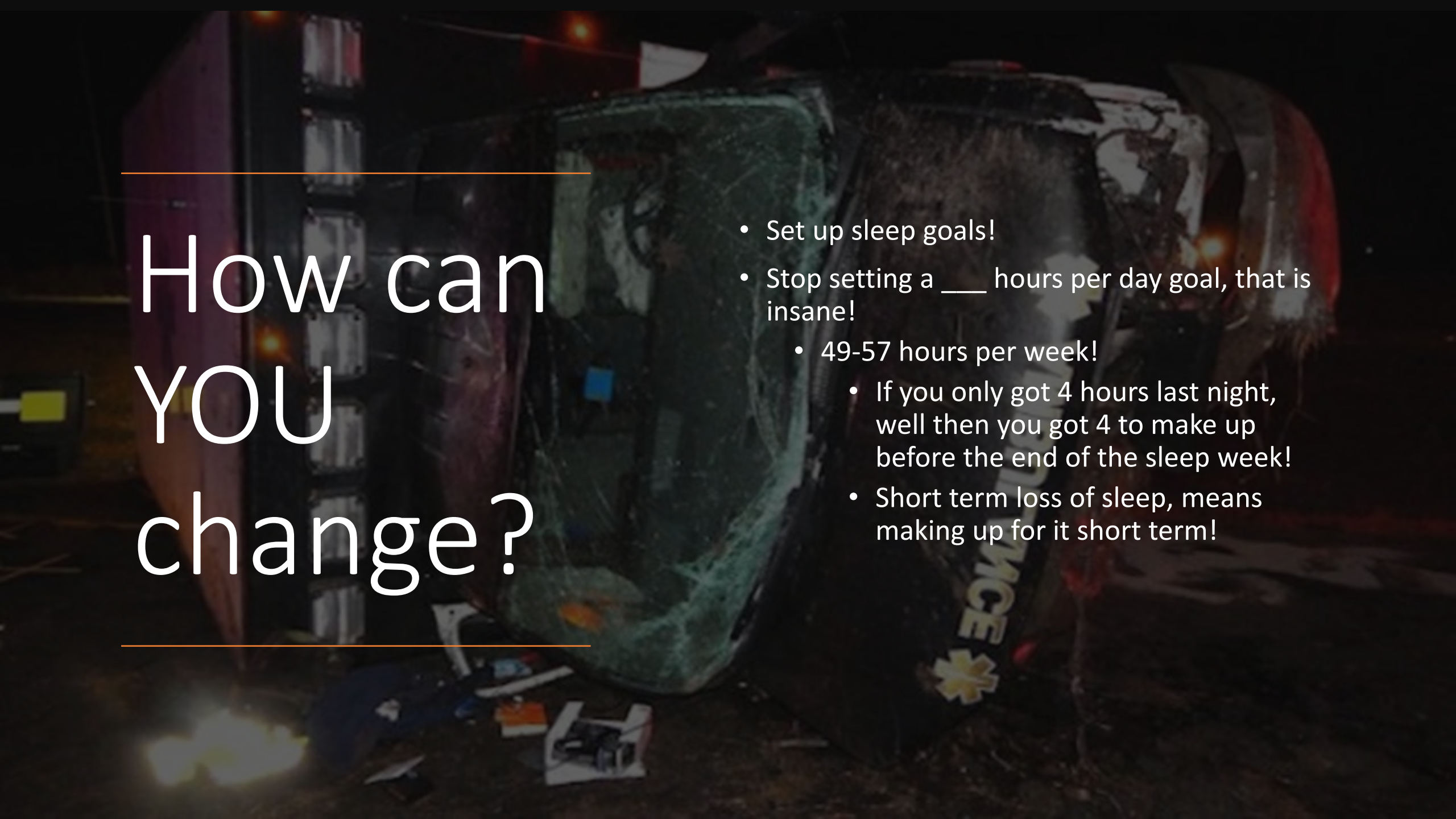
Clocking out tired?

- You need to recover!
- Maybe nap PRIOR to leaving the station
- I know it sucks when you come home from work and you have been up all night or up and down all night, and you want to do fun things! Movies, family time, etc. But you need sleep! A nap even!



- You can also use the following techniques to better help you fall asleep at night.
- Make sure to turn off electronics one hour prior to bed—no texting!
- Set a relaxing bedtime routine, such as listening to calming music, reading a book or taking a warm bath.
- Avoid caffeine in the late afternoon and evening.
- If you are able, make sure to sleep in a cool, dark room.





How can YOU change?

- Set up sleep goals!
- Stop setting a ____ hours per day goal, that is insane!
 - 49-57 hours per week!
 - If you only got 4 hours last night, well then you got 4 to make up before the end of the sleep week!
 - Short term loss of sleep, means making up for it short term!

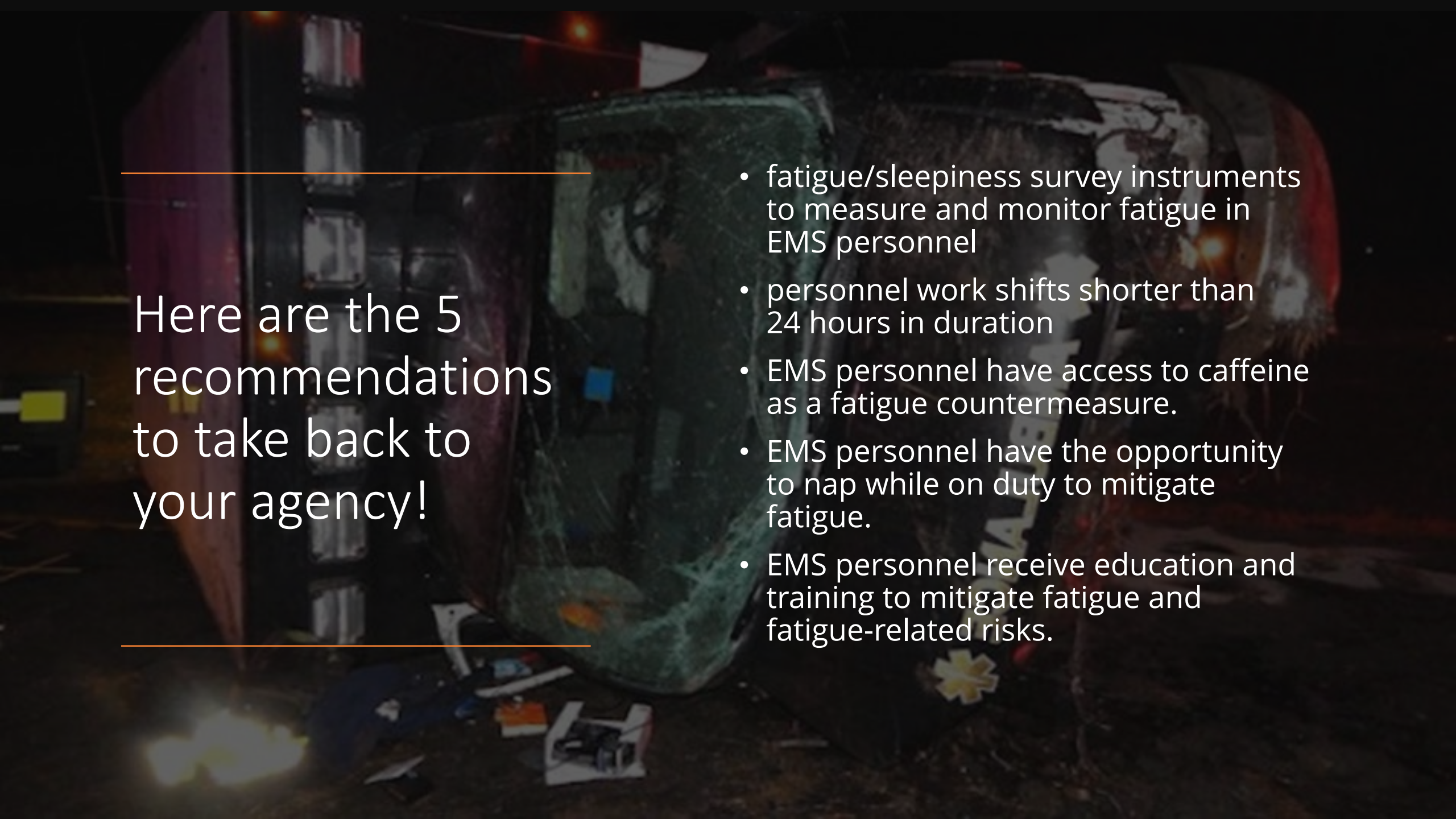
Let This Sink In...

- We require our pilots and semi-truck drivers to track sleep. There are agencies that oversee the number of hours worked vs the number of hours slept. Yet, we don't have the same standards for our workforce carrying guns or making drug calculations to save our loved ones.

01022008 (Month) (Day) (Year)			USA Truck, Inc. 3200 Industrial Park Rd. Van Buren, AR 72956			DOE (Driver's LAST name - Printed)					
If multiple off-duty days, enter the end date here: 20 (Month) (Day) (Year)			123456789 (Employee Number)			(Co-Driver's LAST name - Printed)					
MID-NOIGHT 1 2 3 4 5 6 7 8 9 10 11 NOON 1 2 3 4 5 6 7 8											
1: OFF DUTY											
2: SLEEPER											
3: DRIVING											
4: ON DUTY (NOT DRIVING)											
REMARKS											
LITTLE ROCK, AR PTI											
DALLAS, TX LUNCH											
CORSICANA, TX LOADING											
HOUSTON, TX DINNER											
ORANGE, TX OFF DUTY											
123456789 (Pro or Shipping Number)			651 (Pro or Shipping Number)			651 (Total Miles Driving Today)			JOHN DOE (Driver's Signature)		
6788 (Tractor Number)			54321 (Trailer Number 1)			54321 (Trailer Number 2)			I certify these entries		
● Driver's Daily Vehicle Inspection Report ●											
DATE 1-2-08			(Tractor Number) 6788			(Trailer Number 1) 54321					
<input checked="" type="checkbox"/> I detect no defect or deficiency in this motor vehicle as would be likely to affect the safety of its operation or result in its mechanical breakdown.											
<input type="checkbox"/> I detect and list defects or deficiencies in this motor vehicle as would be likely to affect the safety of its operation or result in its mechanical breakdown.											
Remarks											
Driver Making Report											
<input type="checkbox"/> Defects corrected.											

How many of you
are this person?!?





Here are the 5
recommendations
to take back to
your agency!

- fatigue/sleepiness survey instruments to measure and monitor fatigue in EMS personnel
- personnel work shifts shorter than 24 hours in duration
- EMS personnel have access to caffeine as a fatigue countermeasure.
- EMS personnel have the opportunity to nap while on duty to mitigate fatigue.
- EMS personnel receive education and training to mitigate fatigue and fatigue-related risks.

30-Day Sleep Challenge!

- Track your sleep!
- Create a better sleeping area at home and in the station!
 - Black out curtains
 - DARK room!
 - Set up a routine
- Dump the 5-10 snooze alarms!

What did I learn?

- Average sleep: 7 hours 9 mins
- 5 min snooze alarms have got to go! 20-25 min snooze alarms!
- At home:
 - Efficiency: >95%
 - Stages: (average)
 - More depth sleep than light sleep
 - Normal REM cycle
- On shift:
 - Efficiency: 90-93%
 - Stages:
 - More light sleep than deep sleep
 - Low, below-average REM cycle
 - “Naps”:
 - <90 mins no REM cycle, but woke up feeling rested
 - >90mins got into REM cycle, felt like SHIT!



Do not let this happen at your agency

A photograph of firefighter gear hanging on a dark wooden rack against a light-colored brick wall. The gear includes three brown fire jackets with reflective yellow and silver stripes, two red helmets, and a pair of yellow gloves. The scene is dimly lit, with the text overlaid in the center.

You Wouldn't Go to Work
Intoxicated, Right?

Unpacking Fatigue in EMS

Contact

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- Social Media: EMSconnect
- Podcast: EMSconnect On Shift
- Website: www.emsconnect.org

