

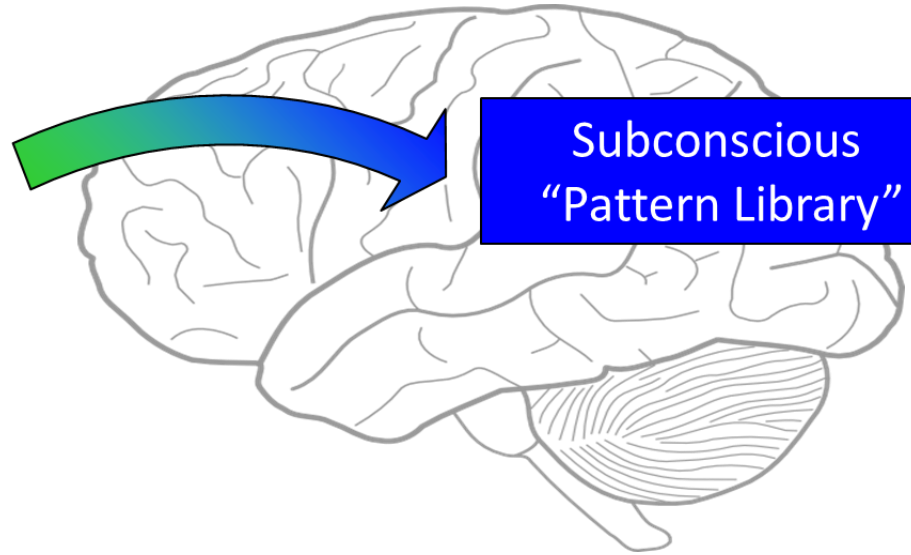
Thank you for your interest in the content slides from Don Wilson's presentation:

The Neuroscience of SafeStart to Improve Situational Awareness

In addition to the slides, an in studio video recording of this session as presented by Don is available at the link below that you can share or review with other leaders at your organization:

<https://event.on24.com/wcc/r/2141022/9F811BFBB8AFE6E2F2F07B08B34958BC>

Our Experiences
(Real, Vicarious or Imagined)



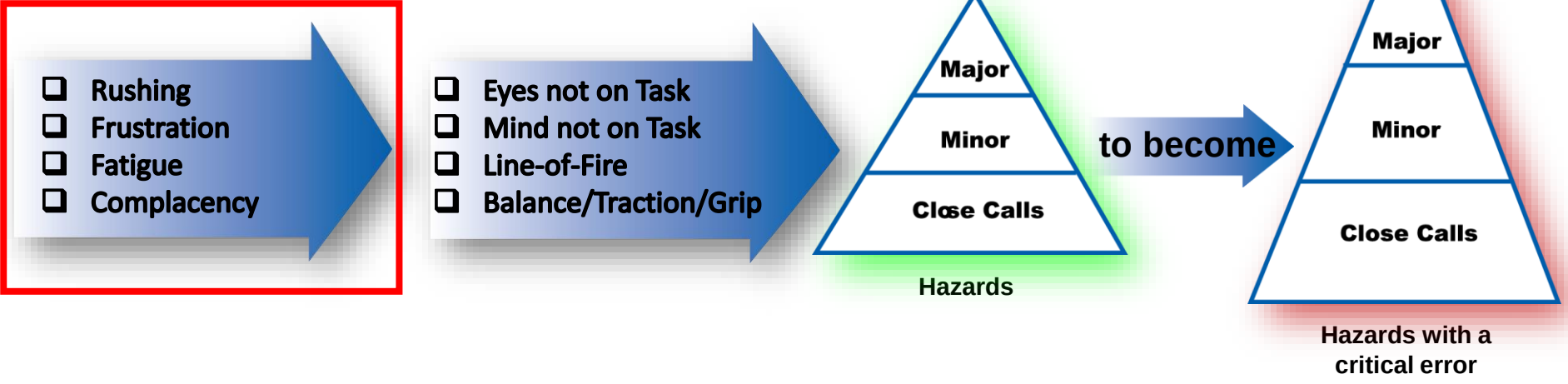
The Neuroscience of SafeStart to Improve **Situational Awareness**

Don Wilson, Chief Client Officer, SafeStart Division of Electrolab

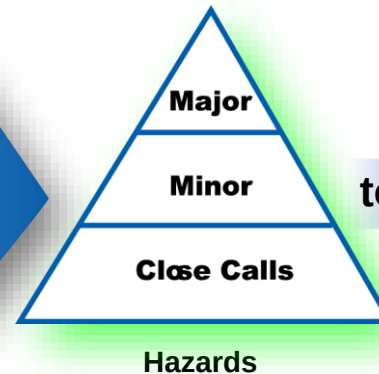
Email: don@safestart.com, Cell: 1-613-969-5644

The SafeStart 24/7 Injury Risk Pattern

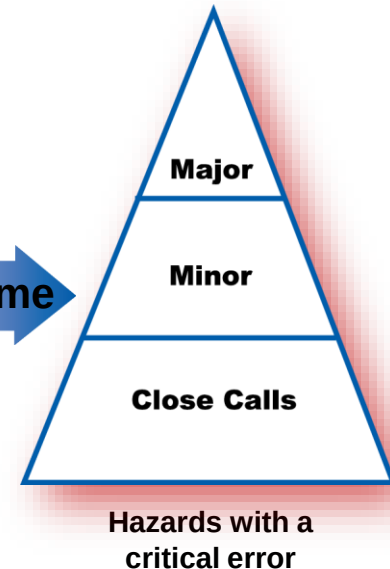
States (cause) **Errors** (which cause) **Less Risk** (to become) **More Risk**

- 
- ☐ Rushing
 - ☐ Frustration
 - ☐ Fatigue
 - ☐ Complacency

- ☐ Eyes not on Task
- ☐ Mind not on Task
- ☐ Line-of-Fire
- ☐ Balance/Traction/Grip



to become



This “State to Error” risk pattern is involved in over 95% of all accidental acute injuries

So It's Simple – Always Pay Attention to the States & Errors and You Won't Get Hurt !



Can People **Decide** to Always Pay Attention?

Who's *Really* Driving the Car?

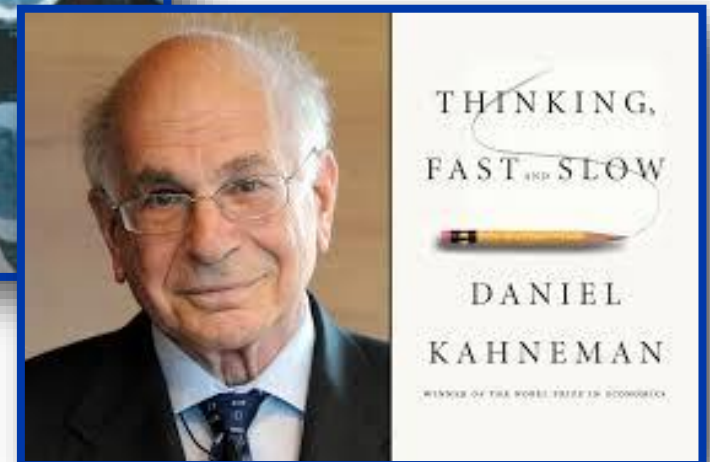
Your Conscious or Subconscious Mind



What Does Current Research in Psychology & Neuroscience Tell Us?

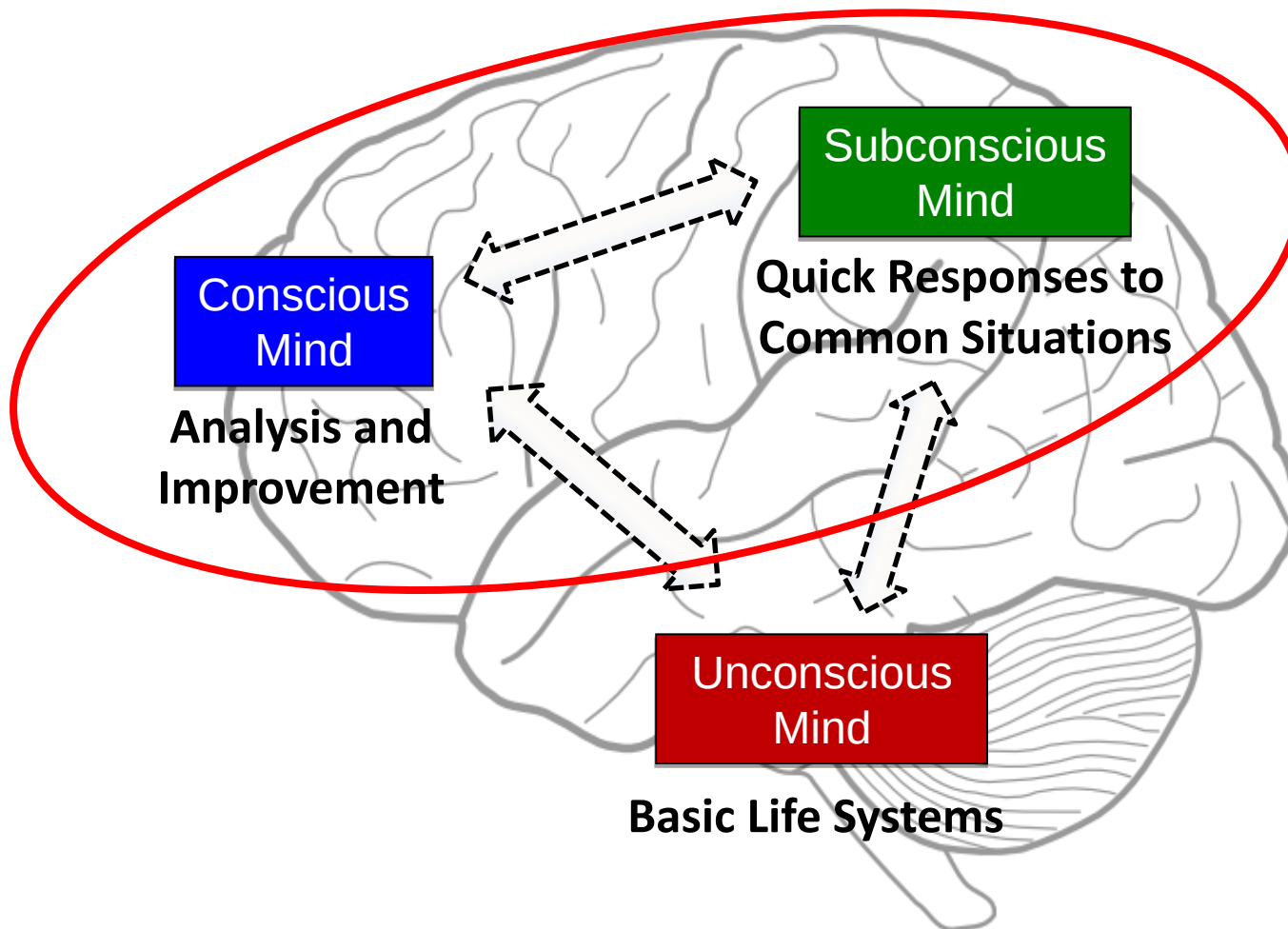


Daniel Kahneman
Author & Nobel Prize Recipient

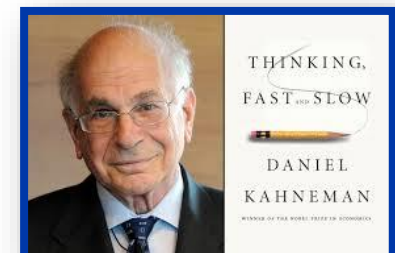


ONE BRAIN – THREE MINDS

(three different and competing cognitive functions)

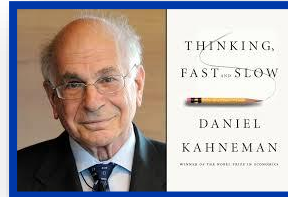


**Personal
Safety**



Conscious Mind (Slow)

- Center for “foresight, hindsight & insight”
enabling:
 - decision making
 - learning
 - flexibility
- Deliberate (effortful)
- Slow & high energy
- Has limited endurance (performance limits)
- Self-aware
- Determines 5% of what we do

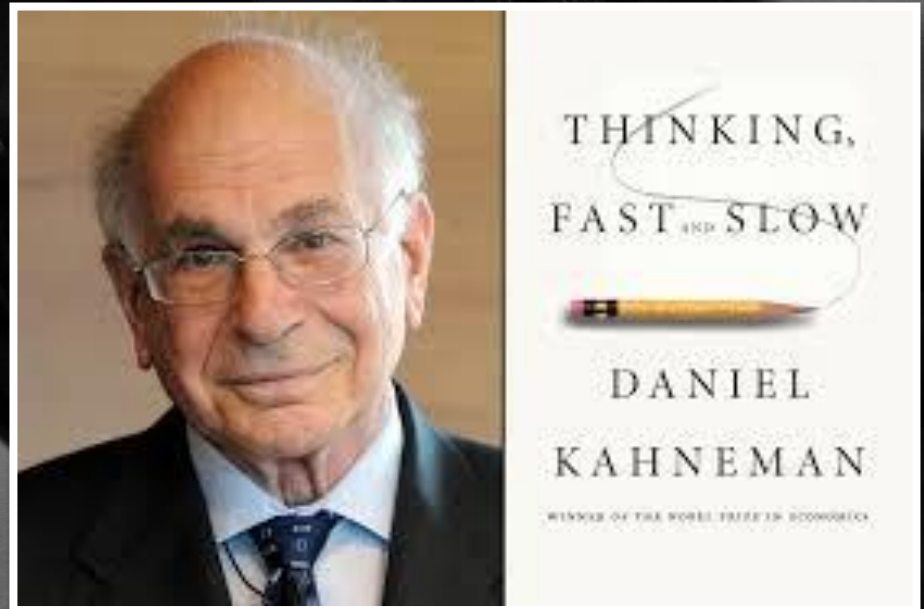
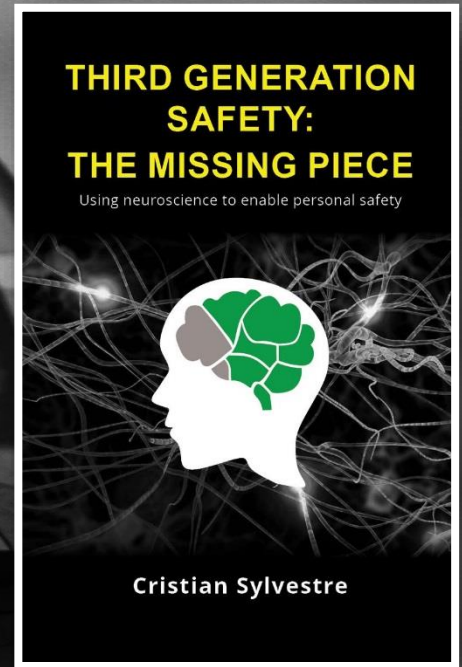


Subconscious Mind (Fast)

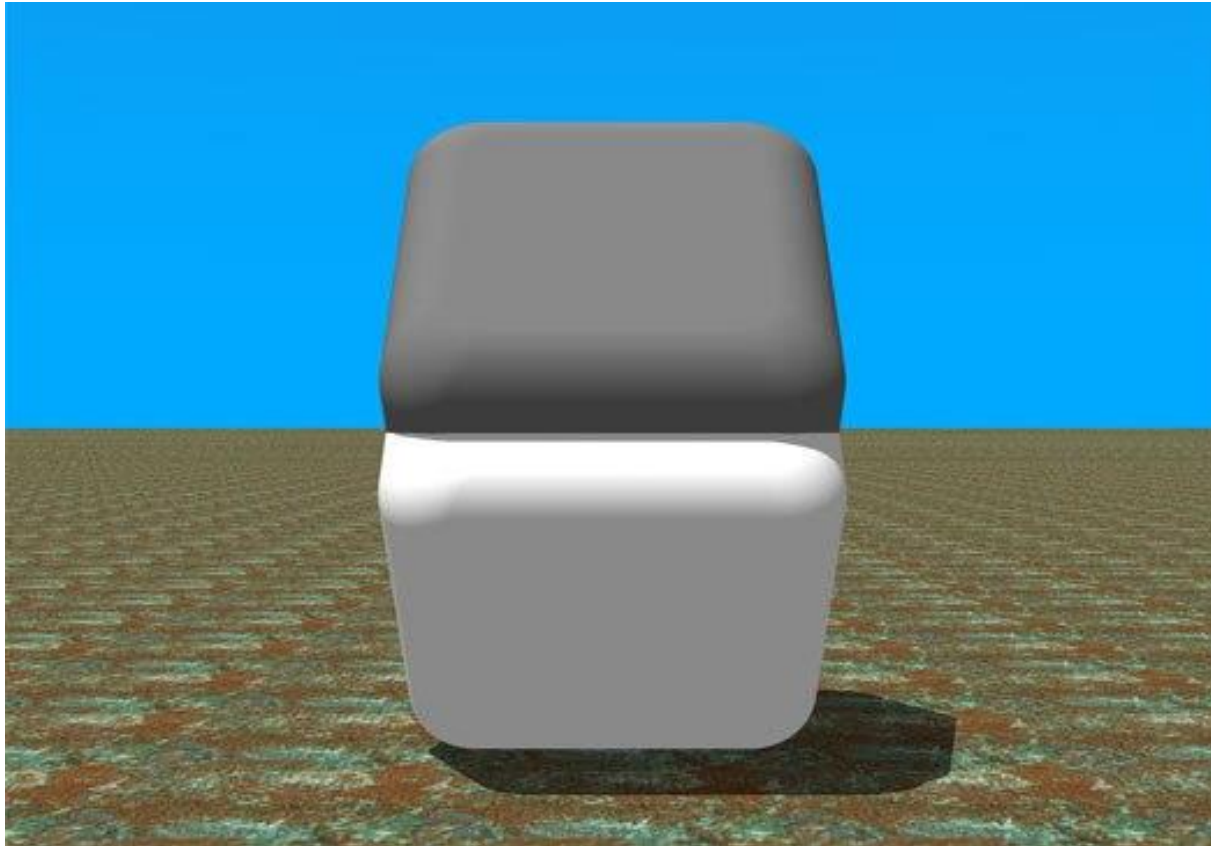
- Center for habits & skills
enabling:
 - intuition & instincts
 - judgements & emotions
 - prompt responses to common situations
- Automatic (effortless)
- Fast & energy efficient
- Works continuously 24/7 (always on in the background)
- Not self-aware
- Determines 95% of what we do

If we were doing a movie
about our brain,
our Conscious Mind would think
it was the star even though it
only appears in 5% of the film.

Daniel Kahneman
Author & Nobel Prize Recipient



Our Subconscious Mind Even Controls How We See the World!

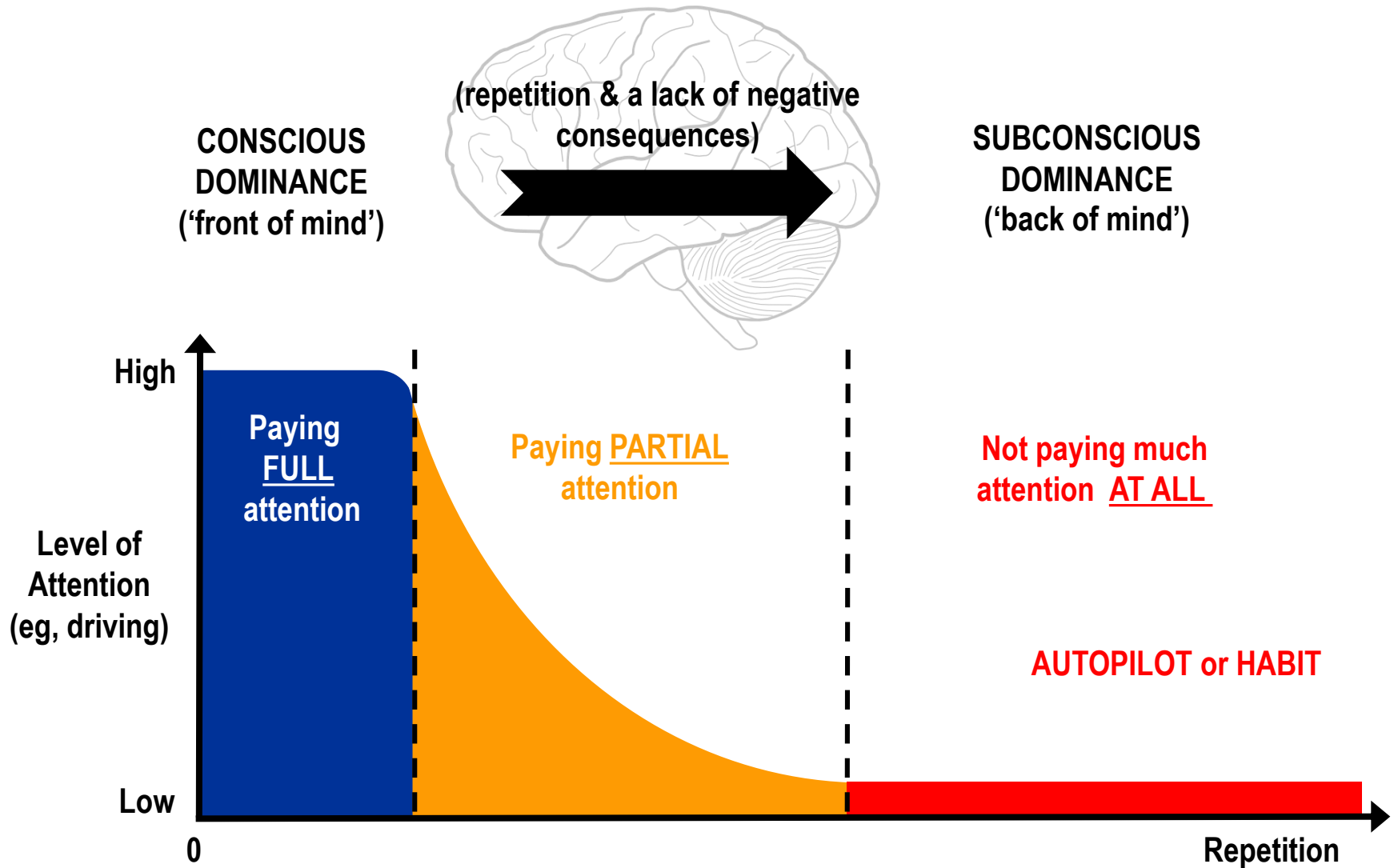


We Can't Consciously Decide to Override this Effect



How Does
Subconscious
Habitual Behavior
(Good or Bad)
Develop from
Conscious
Behavior?

The Route from Conscious to Subconscious

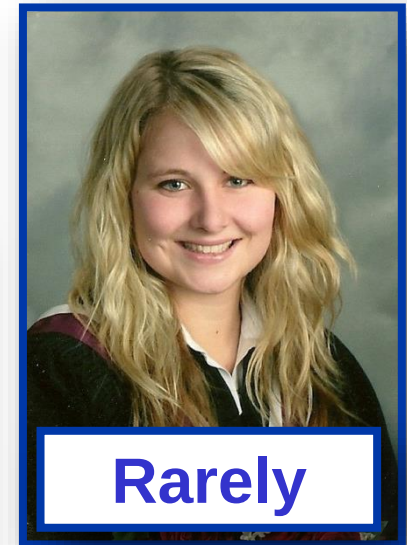
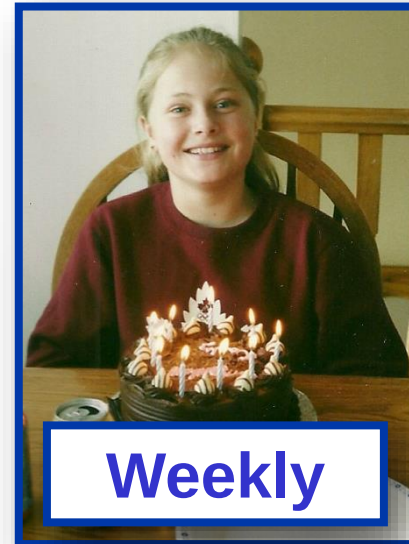


SafeStart & Subconscious Skills

- People can dramatically improve their “Subconscious” safety awareness skills & habits
- Teach them improvement strategies beyond the “School of Hard Knocks”

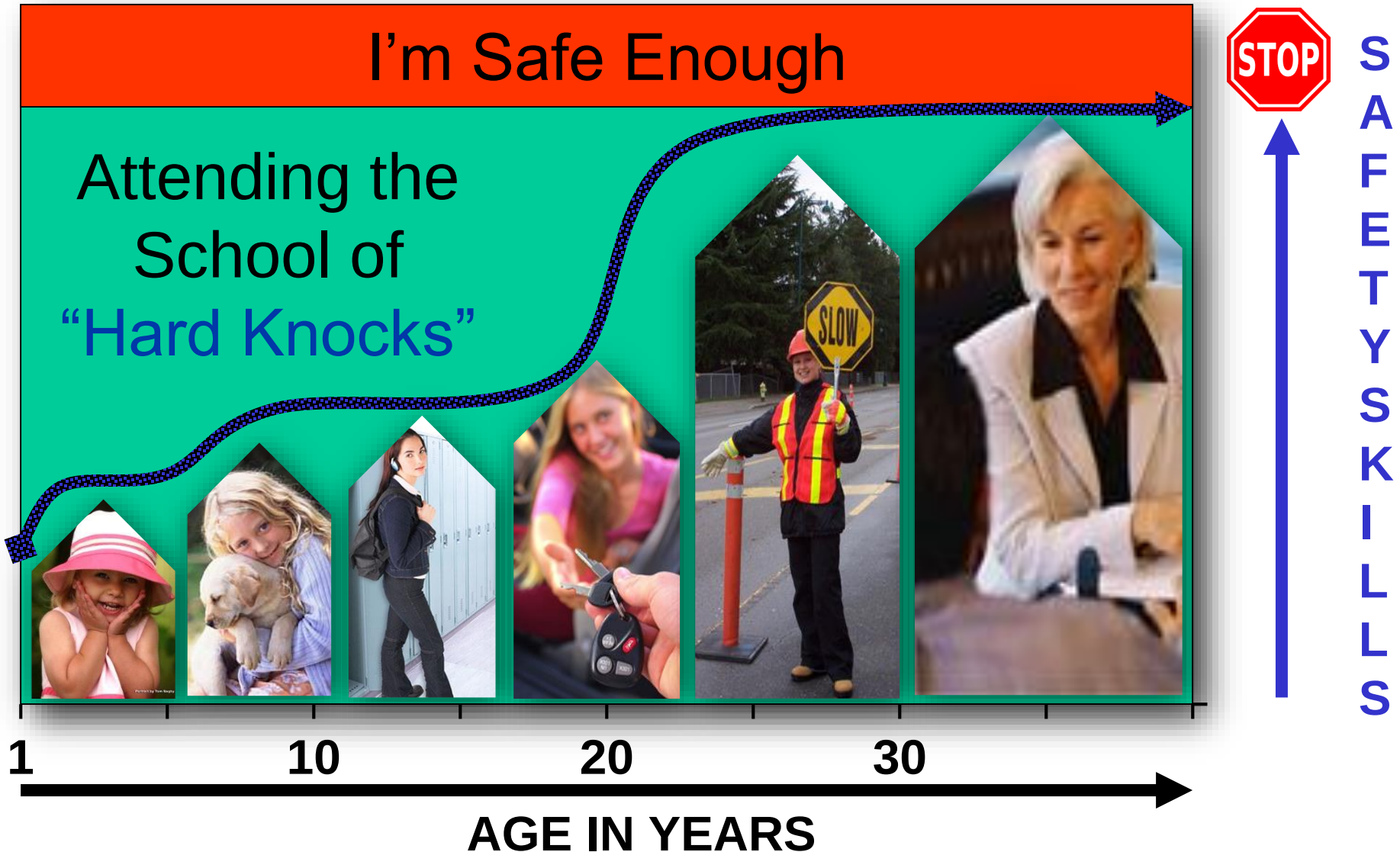


As We Grow From
Children into
Adults

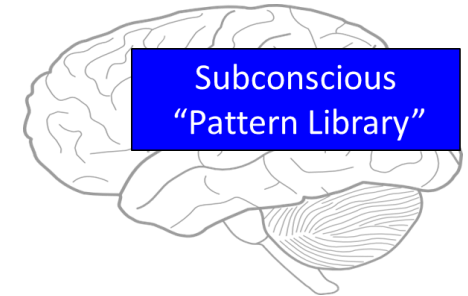


Everyone's
Personal Injury
Frequency **Decreases**

Natural Increase in Subconscious Skills



How is the Subconscious Function of Our Brain “**Wired**” and How Does It Communicates “**Danger**” to Us?



- Our repeated experiences “wire” our subconscious brain
- This “wiring” happens without our knowledge, awareness or permission
- “Patterns” of response are established to deal automatically with common situations in a quick and effective manner
- Repetition (without negative consequences) lays down **preferential** neural pathways that create automatic “patterns” of response (a “Library” of reactions & habits)
- Subconscious recognition of situations associated with negative consequences are communicated via “a **gut feeling**”

I've Got a Bad Feeling About This!



FIREXTalk
Talks on Fire!
PDX 12/19/2015

Captain Wayne Morris
Eugene-Springfield Fire

Trust Your Instincts

Your Subconscious **Warns** You With a **Feeling!**

<https://youtu.be/cb-bzKD2nu8>

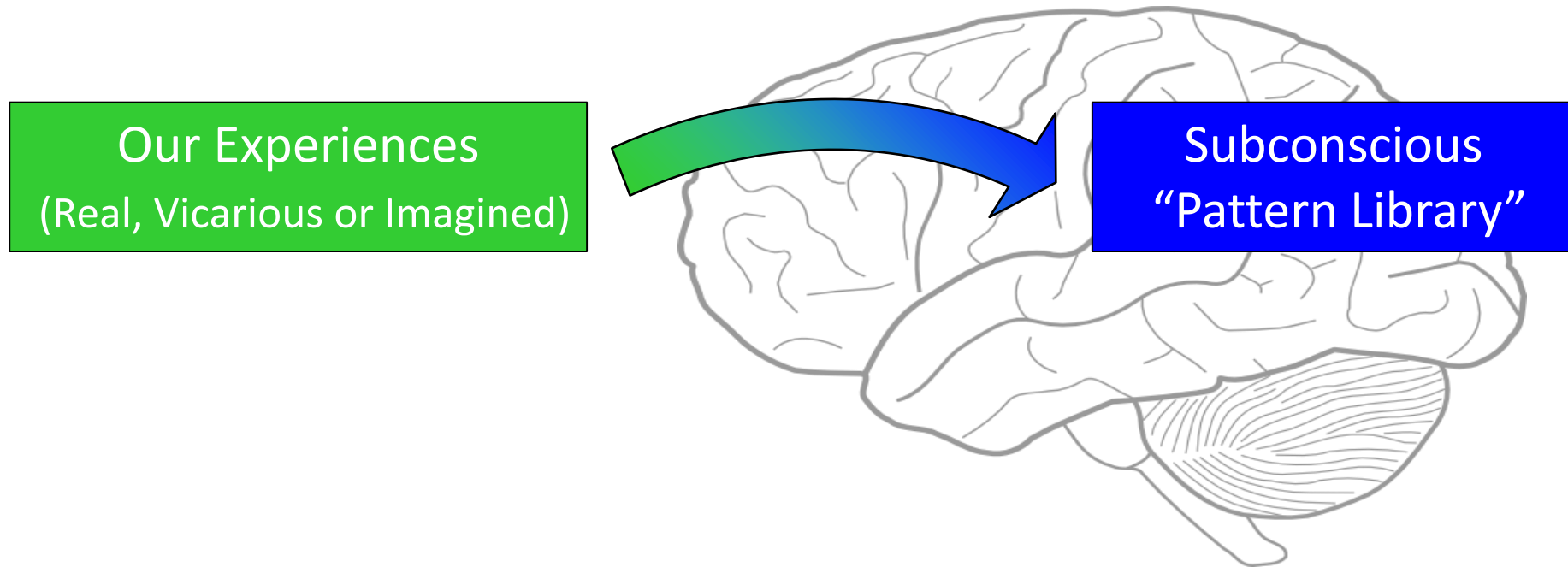
Good News! - Your Subconscious Mind Can't Distinguish Between Real & "Imagined" Experiences



Are You Afraid of Sharks?

(Even Though You Have Never “Actually” Been Hurt By One)



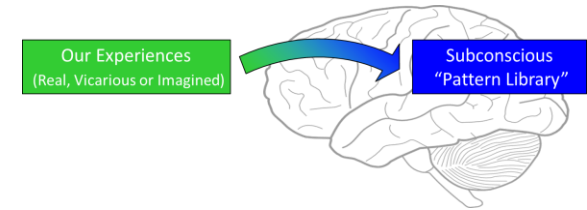


The “Subconscious” functions of our brain can’t distinguish between real and imagined events so they can be **“Re-Wired”** three ways:

1. **Real Experiences** - the school of **“Hard Knocks”**
2. **Vicarious Experiences** - learning from the **“War Stories”** of others
3. **Imagined Experiences** – thinking about and **“Picturing”** the possible severe negative outcomes after a minor injury or close call when serious injury potential exists

- # SafeStart Classroom Training Components (Followed By Workplace Reinforcement Tools)

The Neuroscience of SafeStart in the Classroom



New 24/7 Concepts & Techniques - Teaching participants new concepts like the “State to Error” pattern and CERTs. Cementing new learning through repetition, spaced retrievals and application of newly acquired knowledge.

Real Experiences - Getting participants to analyze close calls and injuries from their lifetime “School of Hard Knocks” experiences using the newly learned concepts and techniques. This repeated analysis “reframes” those past event in their subconscious “Pattern Library”.

Vicarious Experiences - Building each participant’s subconscious “Pattern Library” through exposure to the “War Stories” of others in video, workbook and table group exercises.

Imagined Experiences - Teaching participants how to expand their subconscious “Pattern Library” in the future by using CERTs to think about and “Picture” the possible severe negative outcomes after a minor injury or close call when a more serious injury potential exists

SafeStart Core Units – Spaced Learning



 SAFESTART®

These four states...

- ✓ Rushing
- ✓ Frustration
- ✓ Fatigue
- ✓ Complacency

can cause or contribute to these critical errors...

- ✓ Eyes not on Task
- ✓ Mind not on Task
- ✓ Line-of-Fire
- ✓ Balance/Traction/Grip

...which increase the risk of injury.

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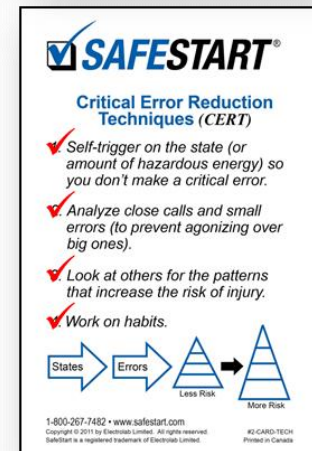
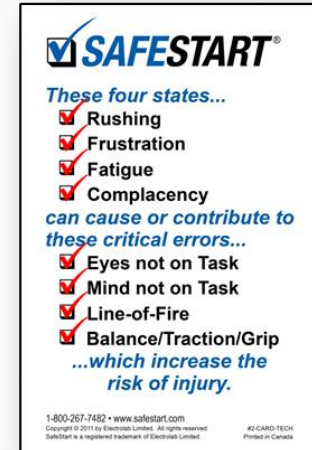
Critical Error Reduction Techniques (CERT)

- ✓ Self-trigger on the state (or amount of hazardous energy) so you don't make a critical error.
- ✓ Analyze close calls and small errors (to prevent agonizing over big ones).
- ✓ Look at others for the patterns that increase the risk of injury.
- ✓ Work on habits.

States → Errors →  Less Risk → More Risk

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Spaced Repetition in Learning

<https://youtu.be/cVf38y07cfk>

The Power of Three in Learning Retention

“In learning retention, research has shown that it is most effective to get to at least three **retrievals**. Memory studies have shown that three retrievals yield the best accuracy and retention.”

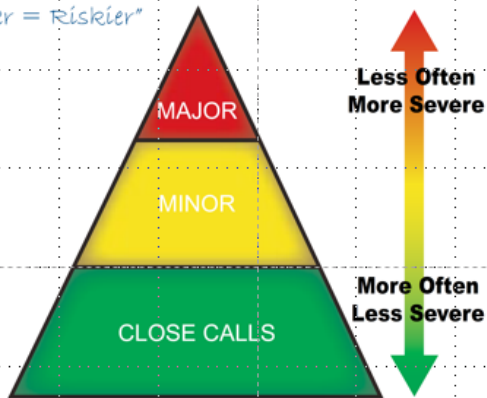


SafeStart Unit 1 - Tool Box Talks for Key Learning Points & Skill Development - Copyright © 2018 Electrolab Limited

Injury Risk Pyramids (or Triangles) Are a Simplified Way to Visualize the Amount of Risk in Any Situation (review pages 7-11 in the Unit #1 Introduction & Overview Workbook)

For most activities, the likelihood is that if something goes wrong, you'll have more close calls than minor injuries, more minor injuries than major injuries and more major injuries than fatalities. The relationship looks like a triangle. The steeper (and taller) the triangle, the more risk of injury at all levels of severity.

"Taller & Steeper = Riskier"



How would you explain this concept to your family, friends, or work colleagues?

Where have you seen this pattern of more close calls than injuries/more minor injuries than major injuries in the routine activities from your work or life experiences?

Notes for Tool Box Talk Leader

The first key concept you need to make sure everyone understands from Unit 1 is the idea of using Injury Risk Pyramids (or triangles) as a visual simplification for the injury risk (severity and frequency) in most everyday situations—like driving a car, for example. Review workbook pages 7-11 for more information and examples on this concept.

Group questions to measure understanding and application of this concept :

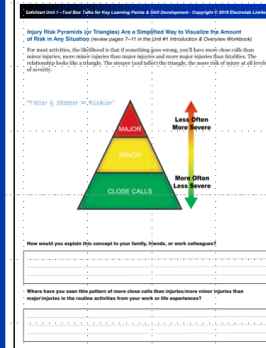
1. "How would you explain this concept to your family, friends, or work colleagues?"
2. "Please give me an example from your own experience of an activity where you have seen this pattern of more close calls than injuries, more minor injuries than major injuries."
3. "Can anyone think of situations that don't follow this pattern – if something goes wrong it's always going to be bad" (e.g. falls from great heights, contact to ground from very high voltages, etc.)

Your Work/Department specific questions/comments related to this concept:

1.

2.

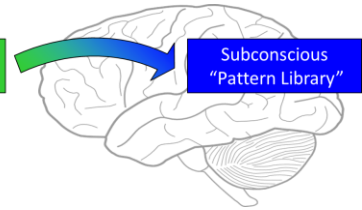
Discuss each response as a group.



SafeStart
Between Units
Tool Box Talks to Help
Employees
Retrieve & Apply
Key Learning Points &
Techniques

The Neuroscience of SafeStart in the Classroom

Our Experiences
(Real, Vicarious or Imagined)



Subconscious
"Pattern Library"

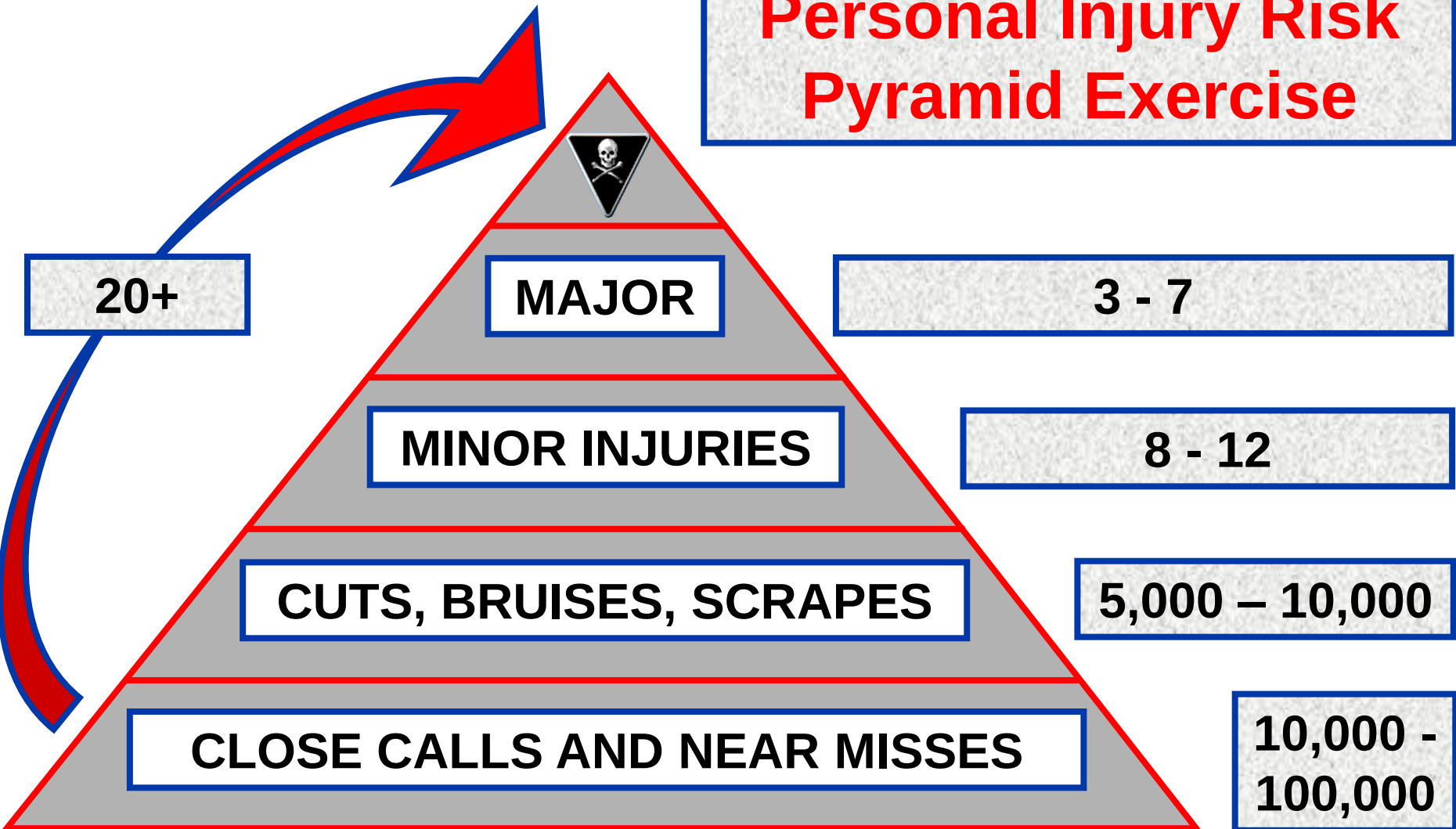
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Personal Injury Risk Pyramid Exercise





**People Learn From
Their “Big” Injuries**



3 - 7

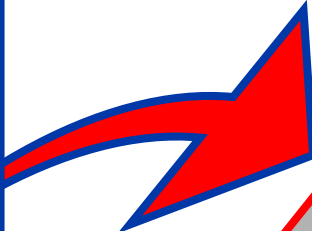
+

8 - 12



**Lifetime Total
“Only” 11 - 19**

Personal Injury Risk Pyramid Exercise

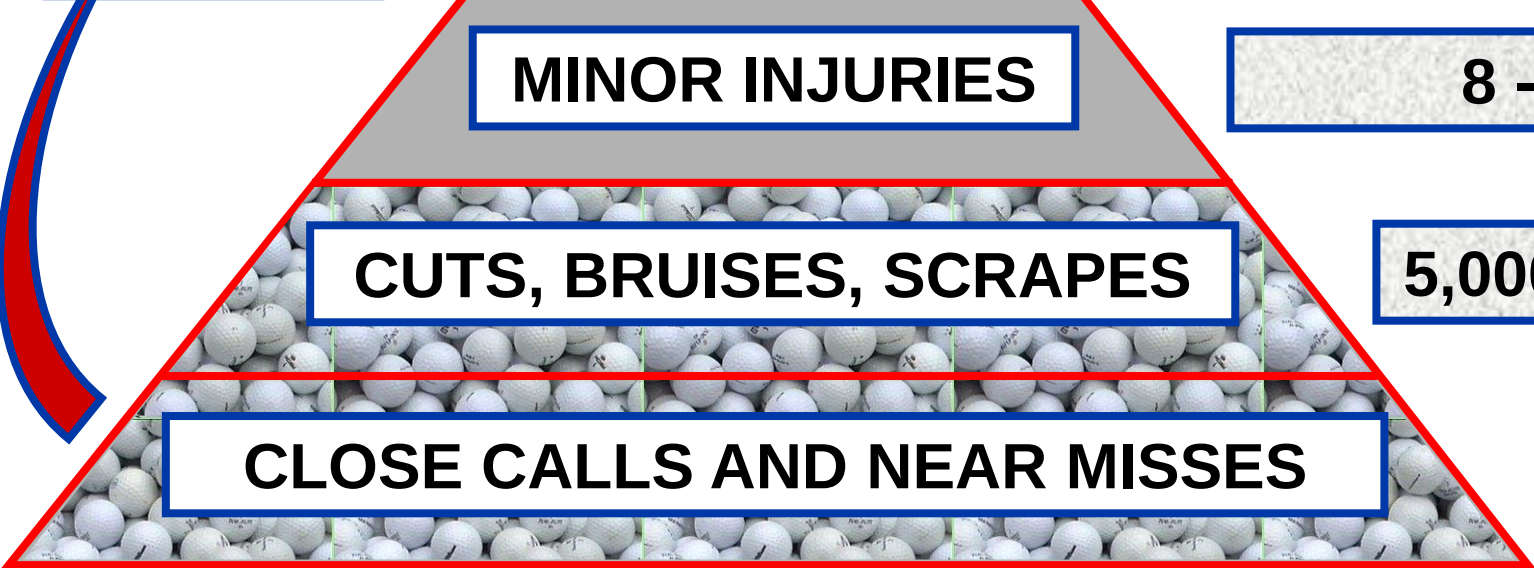


MAJOR

3 - 7

MINOR INJURIES

8 - 12



CUTS, BRUISES, SCRAPES

5,000 – 10,000

CLOSE CALLS AND NEAR MISSES

10,000 -
100,000

Reframing Past Real Experiences

The SafeStart Analysis Technique



These four states...

- ☐ Rushing
- ☐ Frustration
- ☐ Fatigue
- ☐ Complacency

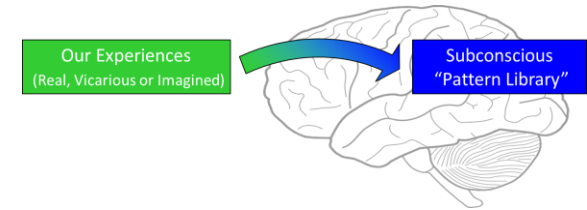
can cause or contribute to these critical errors...

- ☐ Eyes not on Task
- ☐ Mind not on Task
- ☐ Line-of-Fire
- ☐ Balance/Traction/Grip

...which increase the risk of injury.

1. What precursor states were negatively influencing me at the time?
2. What critical errors did those states cause that contributed to the event?
3. What's the worst thing that could credibly have happened given the circumstances (in addition to what actually happened)?

The Neuroscience of SafeStart in the Classroom



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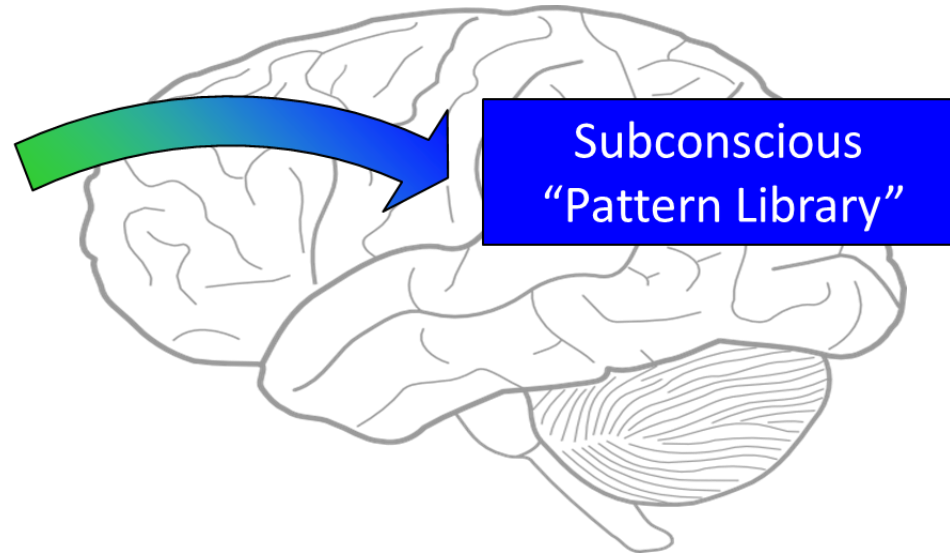
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The Science of Vicarious Learning



Christopher Myers - <https://youtu.be/G9B6UCP9RU0>

Our Experiences
(Real, Vicarious or Imagined)



Subconscious
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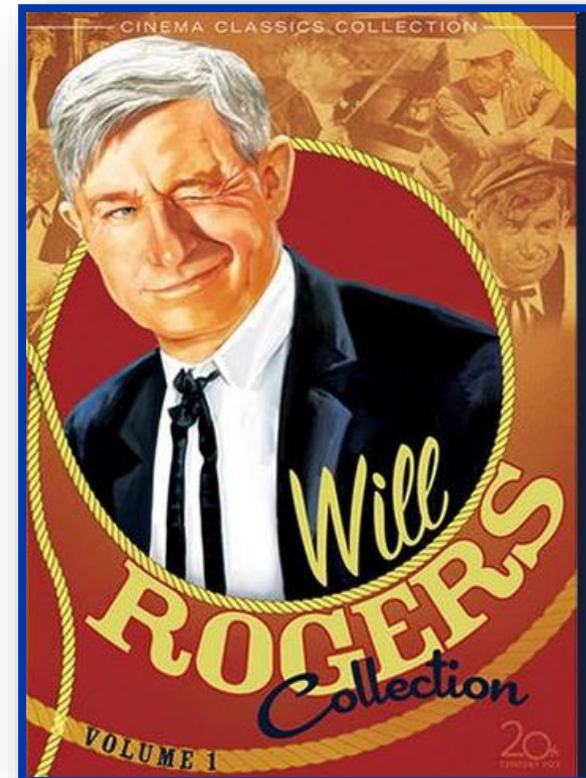
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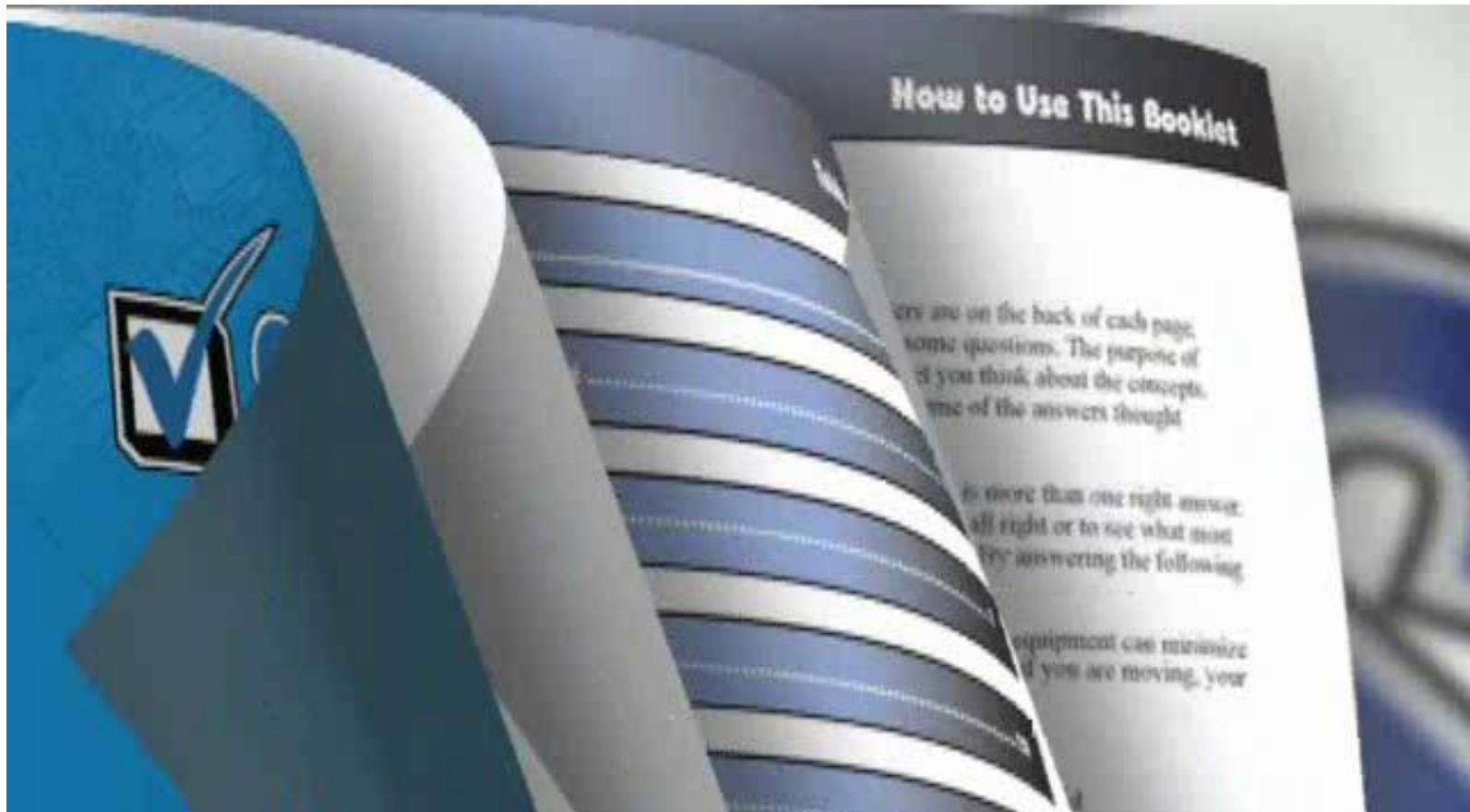
- **Vicarious Experiences** - learning from the **"War Stories"** of others (video, workbook, and table group exercises)



There are Three Kinds of Men:

- Ones that learn by reading
- A few who learn by observation
- The rest of them have to “**water**” the electric fence and find out for themselves
- Or by learning from the stories and past experiences of others - storytelling





Alex Stanley's SafeStart Story & Classroom Video Exercise

SafeStart Story Analysis Technique

3Qs



SafeStart Story

Storyteller: ALEX STANLEY

Summary: CONCUSSION
AND FRACTURED RIBS IN
COLLISION WITH FORKLIFT

Elements:

- ☐ What activity/What happened?
- ☒ What state or states?
- ☒ What critical errors?
- ☒ What injury or close call/How could it have been worse?

1. What precursor states were negatively influencing the person at the time?
2. What critical errors did those states cause that contributed to the event?
3. What's the worst thing that could credibly have happened given the circumstances (in addition to what actually happened)?

Classroom Table Group Story Exercises

Trainer leads off with some of their own accident & injury stories and then participants share, analyze & learn from each other's past experiences in small groups (4 - 6)

Good SafeStart Stories Can Come From Anywhere or Anytime

- | | |
|---|--|
| ☒ Driving | ☒ Farm |
| ☒ Home | ☒ Sports |
| ☒ Work | ☒ Youth |





Sharing Stories - Vicarious Experiences

Mike, a retired lineman shares his life changing injury story with others (so that hopefully they won't actually have to go through the same pain & suffering that he did).

What States & Errors Affected Mike?

3Qs



These four states...

- ☒ Rushing
- ☒ Frustration
- ☒ Fatigue
- ☒ Complacency

can cause or contribute to these critical errors...

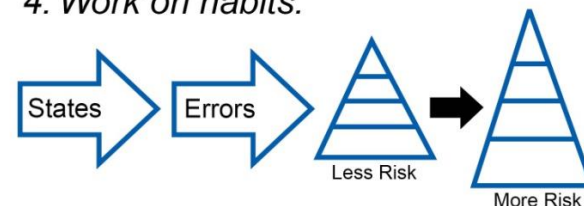
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- ☐ Balance/Traction/Grip

...which increase the risk of injury.



Critical Error Reduction Techniques (CERT)

1. Self-trigger on the state (or amount of hazardous energy) so you don't make a critical error.
2. Analyze close calls and small errors (to prevent agonizing over big ones).
3. Look at others for the patterns that increase the risk of injury.
4. Work on habits.





What States & Errors Affected Mike?

3Qs



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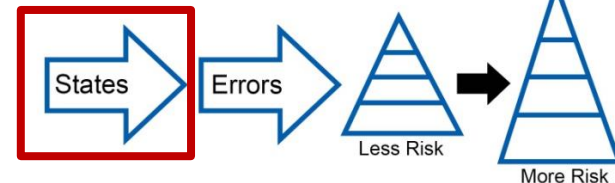
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SIF Events That Most People Have Experienced



1. Car, motorcycle or bicycle accidents or "slammed on the brakes" close calls
2. Falling asleep (or almost falling asleep) at the wheel
3. Going through a red light or a stop sign you just didn't see
4. Losing your balance or grip and falling from height (ledge, roof, ladder, tree, flight of stairs, etc.)
5. Falling on wet, icy or slippery surfaces and hitting your head hard
6. Caught in a strong current or getting too far from shore and almost drowning
7. Improper use of flammable or explosive substances (lighter fluid, gasoline, etc.)
8. Being struck (or nearly hit) as a pedestrian by a vehicle (car, truck, forklift, etc.)
9. Making contact with high voltage (household voltage levels or above)
10. Being struck (or almost struck) from above by a heavy falling object



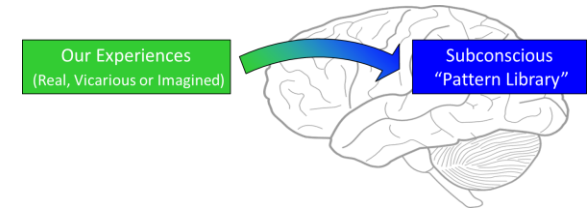
A Traditional Teaching Folktale from “The Story Factor” by Annette Simons

“Truth, naked and cold, had been turned away from every door in the village. Her nakedness frightened the people. When Parable found her she was huddled in a corner, shivering and hungry.

Taking pity on her, Parable gathered her up and took her home. There, she dressed Truth in story, warmed her and sent her out again.

Clothed in story, Truth knocked again at the doors and was readily welcomed into the villagers’ houses. They invited her to eat at their tables and warm herself by their fires.”

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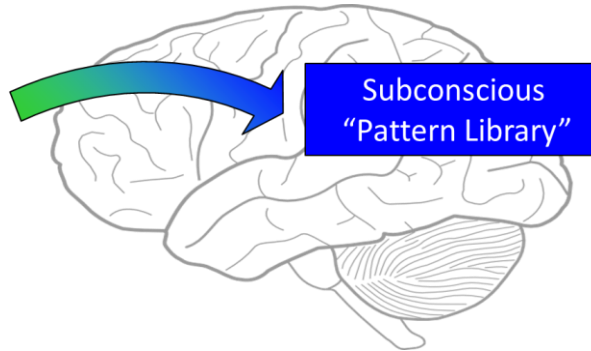
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The Science of Imagined Learning



Dr. Melissa Hughes - https://youtu.be/po0P_C-XF3Y

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Subconscious
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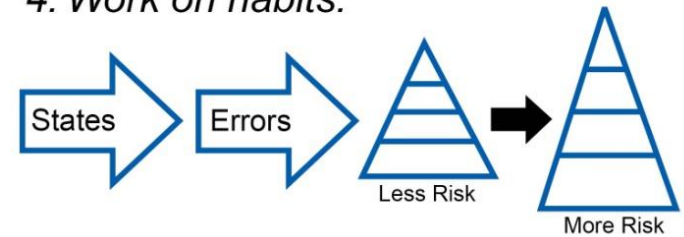
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- **Imagined Experiences** – thinking about and **"Picturing"** possible severe negative outcomes after a minor injury or close call when serious injury potential exists



Critical Error Reduction Techniques (CERT)

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2. Analyze close calls and small errors (to prevent agonizing over big ones).
3. Look at others for the patterns that increase the risk of injury.
4. Work on habits.



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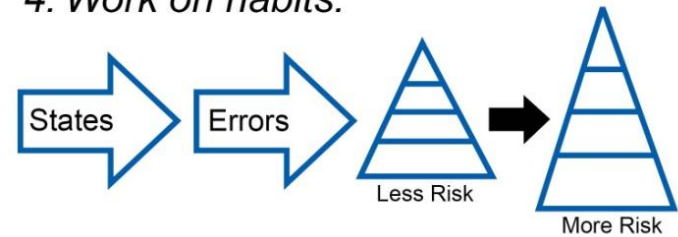
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1. Self-trigger on the state (or amount of hazardous energy) so you don't make a critical error



Critical Error Reduction Techniques (CERT)

1. Self-trigger on the state (or amount of hazardous energy) so you don't make a critical error.
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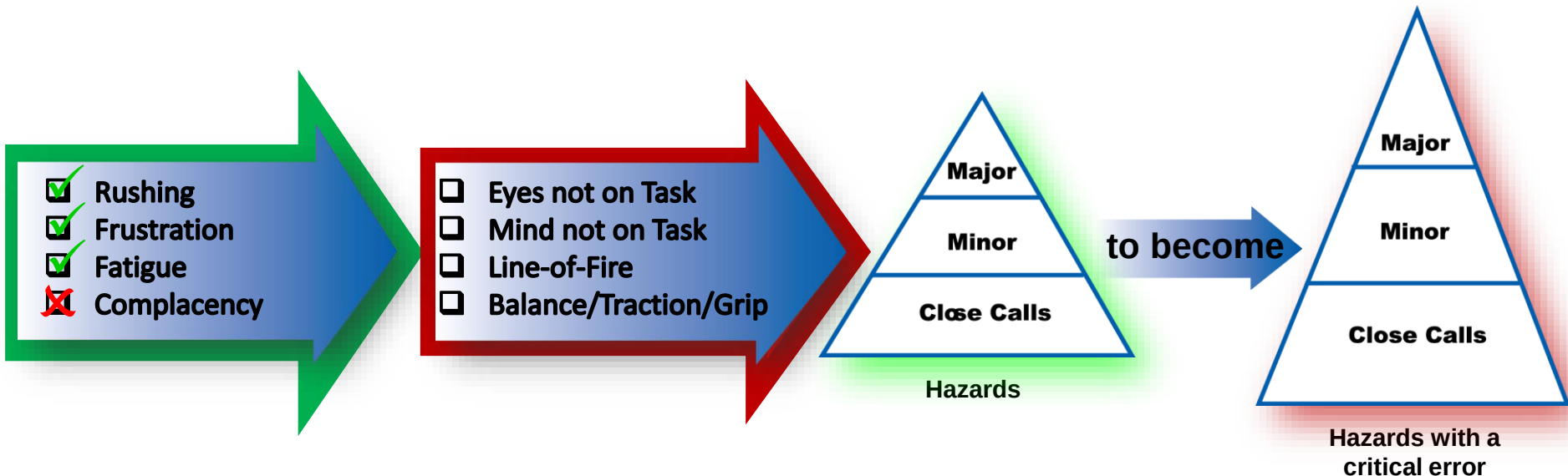
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Recognizing the Danger “In the Moment”

3Qs

States (cause) Errors (which cause) Less Risk (to become) More Risk



Self-Triggering on the State & Stopping to Think
Makes a Better Safety Decision More Likely

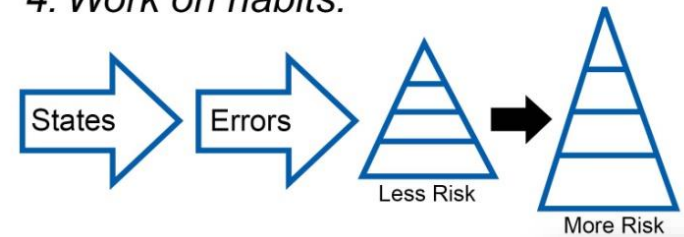
It's Hard to “Self-Trigger” on Complacency

2. Analyze close calls and small errors (to prevent agonizing over the big ones)



Critical Error Reduction Techniques (CERT)

1. Self-trigger on the state (or amount of hazardous energy) so you don't make a critical error.
2. Analyze close calls and small errors (to prevent agonizing over big ones).
3. Look at others for the patterns that increase the risk of injury.
4. Work on habits.



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3Qs



Analyzing Close Calls & Errors

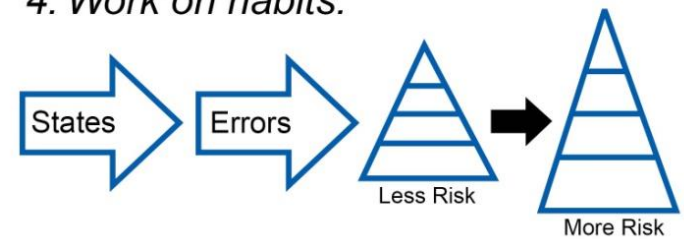


3. Look at others for the patterns that increase the risk of injury



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States

Errors



These four states...

- ☒ Rushing
- ☐ Frustration
- ☐ Fatigue
- ☒ Complacency

can cause or contribute to these critical errors...

- ☒ Eyes not on Task
- ☒ Mind not on Task
- ☒ **Line-of-Fire**
- ☐ Balance/Traction/Grip

...which increase the risk of injury.

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3Qs

3Qs

Analyzing Close Calls & Errors

(Your Own & Those You See While “Looking at Others”)



Q1

- How Could it Have Been Worse?

(or What Could Have Happened to “That Guy”)

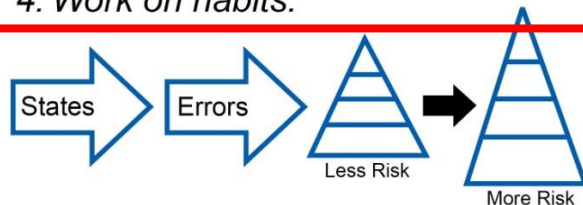
Mentally **Paint** the Picture - Sights, Sounds, Smells

Analyzing Close Calls & Errors



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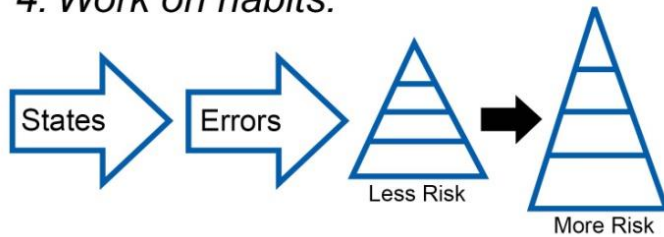
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SafeStart Classroom
Training Teaches the Use
of Easy, Portable &
Efficient Tools

Critical Error Reduction Techniques

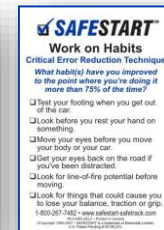
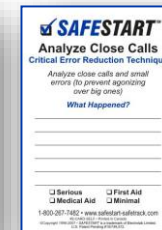
Repeatedly **Using** the
Tools Improves 24/7 Safety
and Human Performance

SafeStart Classroom Training Components (Followed By Workplace Reinforcement Tools)

1. Tutorial PowerPoints, Workbooks & Videos
2. Video Story Exercises
3. Workbook Story Exercises
4. Table Group Story Exercises & Discussions



5. Assignment of Deliberate Practice of New CERT Skills & Habits using “Practice Cards”



Using CERT Practice Cards



Self-Trigger

Critical Error Reduction Technique

Self-trigger on the state (or amount of hazardous energy) so you don't make a critical error

States...

- ☐ Rushing
- ☐ Frustration
- ☐ Fatigue
- ☐ Complacency

Hazardous energy...

- ☐ Mechanical
- ☐ Thermal
- ☐ Chemical
- ☐ Electrical
- ☐ Other

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Analyze Close Calls

Critical Error Reduction Technique

Analyze close calls and small errors (to prevent agonizing over big ones)

What Happened?

- | | |
|--------------------------------------|------------------------------------|
| ☐ Serious | ☐ First Aid |
| ☐ Medical Aid | ☐ Minimal |

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Work on Habits

Critical Error Reduction Technique

What habit(s) have you improved to the point where you're doing more than 75% of the time?

- ☐ Test your footing when you get out of the car.
- ☐ Look before you rest your hand on something.
- ☐ Move your eyes before you move your body or your car.
- ☐ Get your eyes back on the road if you've been distracted.
- ☐ Look for line-of-fire potential before moving.
- ☐ Look for things that could cause you to lose your balance, traction or grip.

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Look for Risk Patterns

Critical Error Reduction Technique

Look at others for the patterns that increase the risk of injury.

Who?

- ☐ Family Member
- ☐ Friend
- ☐ Stranger

Where?

- ☐ At Home
- ☐ On the Road
- ☐ On TV

What States and Errors do you think may have been involved?

- | | |
|--------------------------------------|--|
| ☐ Rushing | ☐ Eyes not on Task |
| ☐ Frustration | ☐ Mind not on Task |
| ☐ Fatigue | ☐ Line-of-Fire |
| ☐ Complacency | ☐ Balance/Traction/Grip |

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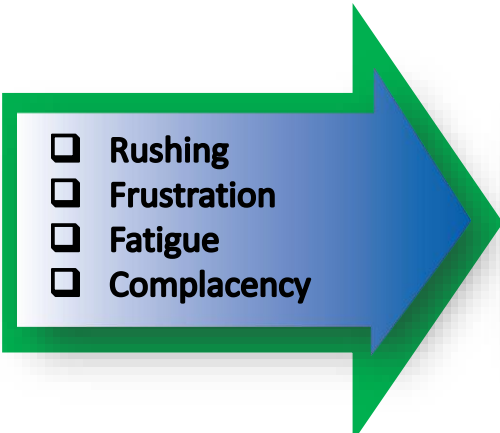
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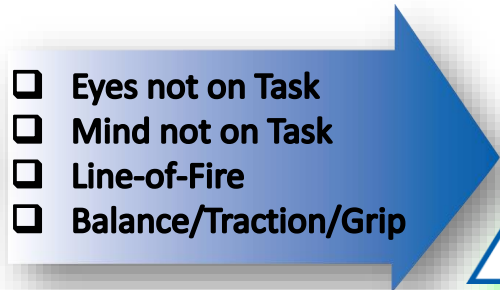
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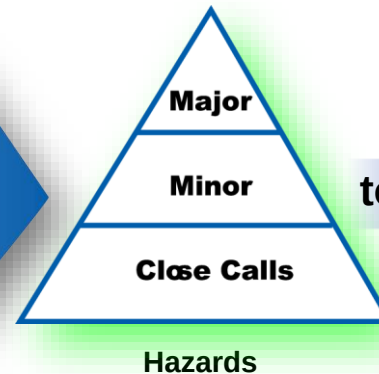


Recognizing the Danger “In the Moment”

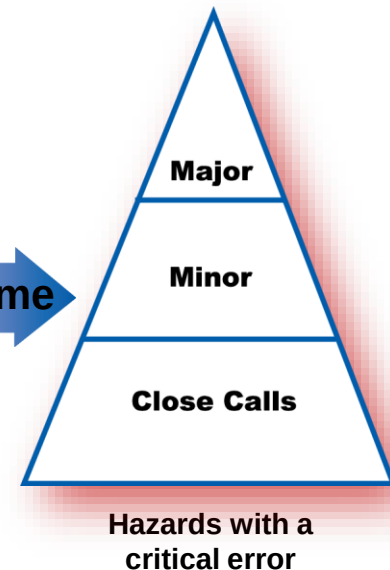
States (cause) **Errors** (which cause) **Less Risk** (to become) **More Risk**

- 
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 - ☐ Frustration
 - ☐ Fatigue
 - ☐ Complacency

- 
- ☐ Eyes not on Task
 - ☐ Mind not on Task
 - ☐ Line-of-Fire
 - ☐ Balance/Traction/Grip



to become



“Self-Triggering” is Not Conscious
It Becomes Automatic through Deliberate Course
Repetition, Workplace Reinforcement & 3Qs

How Much Repetition is “Enough” to Establish a New Habit (Like the 3Qs)?

- 20 Repetitions – before any start of habit formation
- 40 Repetitions – habits begin to be “established”
- 66 Repetitions – thickening of neural pathways/connections can actually be seen using current medical imaging technology



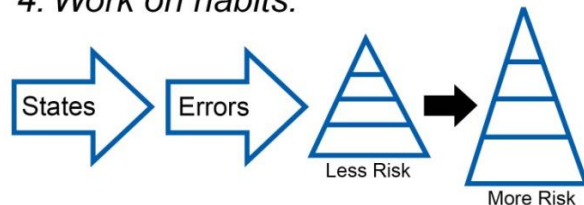
Hebb's Law: Neurons that fire together wire together!

Teach Your Family to Start “Watching for the Patterns”



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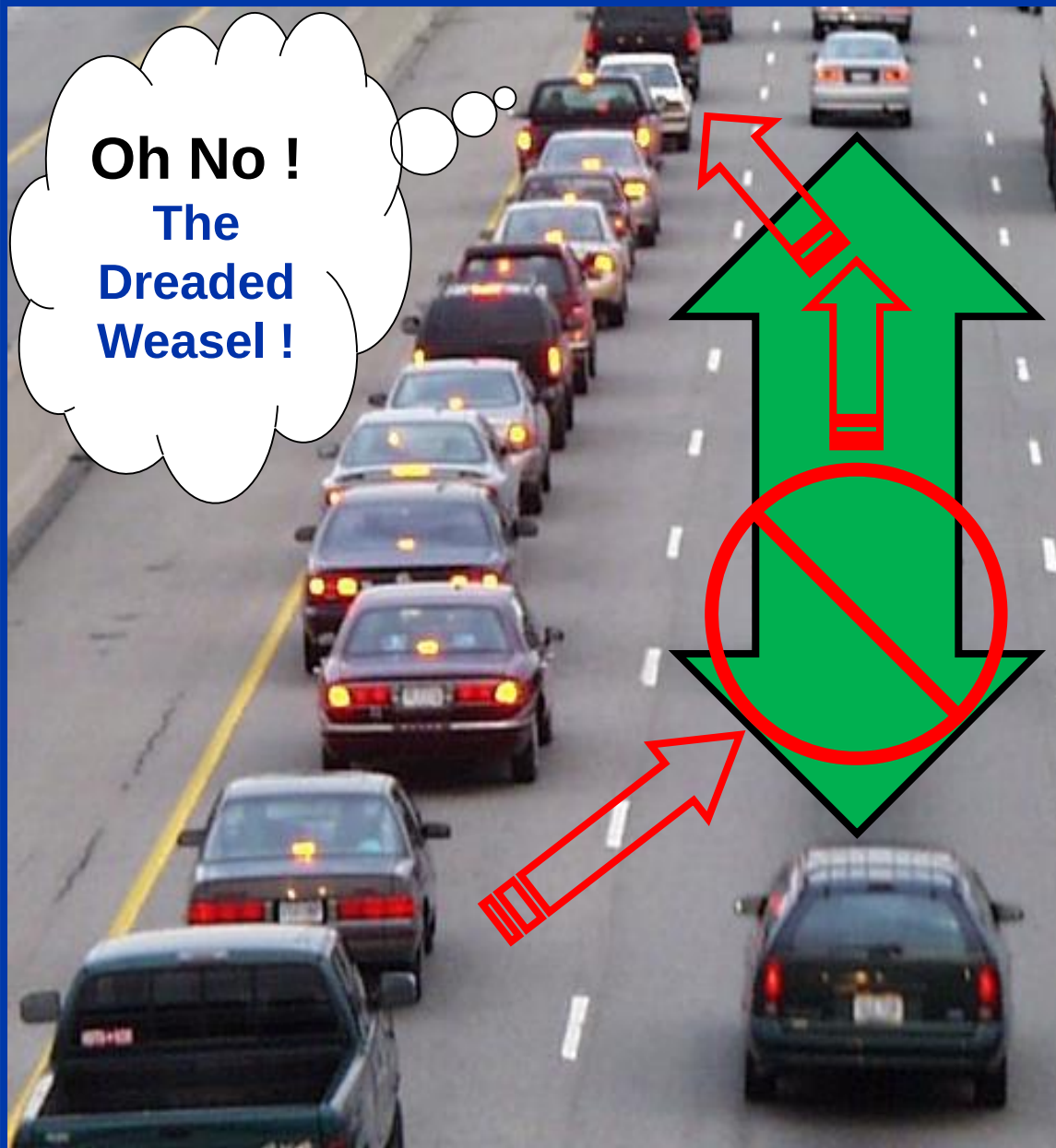
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