# Evidence-Based Education: We’ve Talked the Talk, Now Let’s Walk the Walk

**American College of Osteopathic Internists Annual Convention and Scientific Sessions**
**October 19, 2018**
**Orlando, FL**

# Your partner in learning

Donald S. Nelinson, PhD

Chief Science and Education Officer

American College of Osteopathic Internists

Rockville, MD

Why are you here?

What do you hope to get from today's session?


The best CME activity I ever participated in……..??

If only live CME……..?

If only online CME……..?

# Objectives

After actively participating in this activity, learners will be able to:

- Integrate educational strategies that have been empirically shown to have an impact on physician, knowledge, attitudes and behavior
- Design educational activities that are informed by the learners' stages of readiness to change
- Describe the use of influencers versus experts to efficiently diffuse change within a community/institution
- Summarize key elements of confidence-based learning

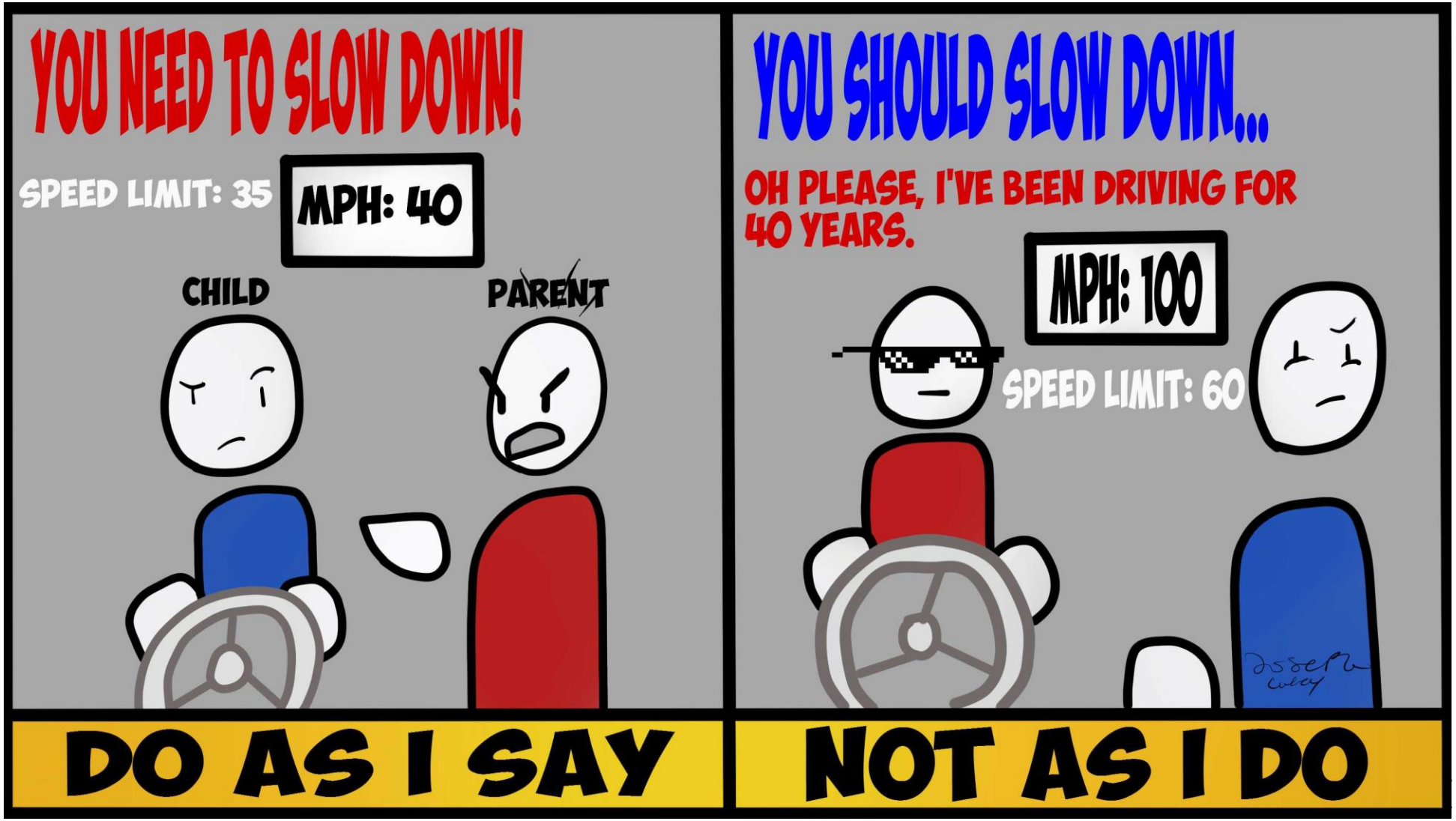
# Disclosure

I have no significant interest in any product or company to disclose.

# Educator vs. presenter, faculty, etc

Active learning: Engaged learner vs engaged faculty

# Do as I say not as I do!!!



# Setting the stage

## Why do we do CME?

# What are the “buzz phrases” we use to discuss physician learning?

Knowledge

Skills

Attitudes

Moore DE Jr, Green JS, Gallis HA. *J Contin Educ Health Prof*. 2009.

# What are the “buzz phrases” we use to discuss physician learning?

ACCME

Competence (strategies for practice)

Performance (actual practice)

Moore DE Jr, Green JS, Gallis HA. *J Contin Educ Health Prof*. 2009.

# What are the “buzz phrases” we use to discuss physician learning?

## ACCME

Awareness (residing in consciousness)

Knowledge (possession of information or facts)

Competence (strategies for practice)

Performance (actual practice)

Moore DE Jr, Green JS, Gallis HA. *J Contin Educ Health Prof*. 2009.

# HUGE ASSUMPTIONS…

Your learners want to learn

Your learners are ready to learn

Your learners are competent (have strategies) to learn

# HUGE ASSUMPTIONS…

Your learners want to change their practice behavior

Your learners are ready to change their practice behavior

Your leaners are competent (have strategies) to change their practice behavior

# HOW TO **CHANGE THE COURSE** OF BEHAVIOR

# Advancing physician self-efficacy allows for changes in knowledge, skills and attitudes

## Confidence and competence

Nelinson DS, Meldrum H. In Search of a Perfect Storm: Provider Self-efficacy, Patient-Centered Care, and Medical Education. WONCA; Vienna, AT, 2012.

# HOW DO WE ENGAGE WITH **EVERY GROUP** OF TREATER?

# Multiple models fuel more effective behavior change

### Prochaska's Transtheoretical Model/Stages of Change

While all treaters will not start at the earliest stage, sequential progression is inevitable and differentiated communication is essential.

### Roger's Theory of Diffusion of Innovation

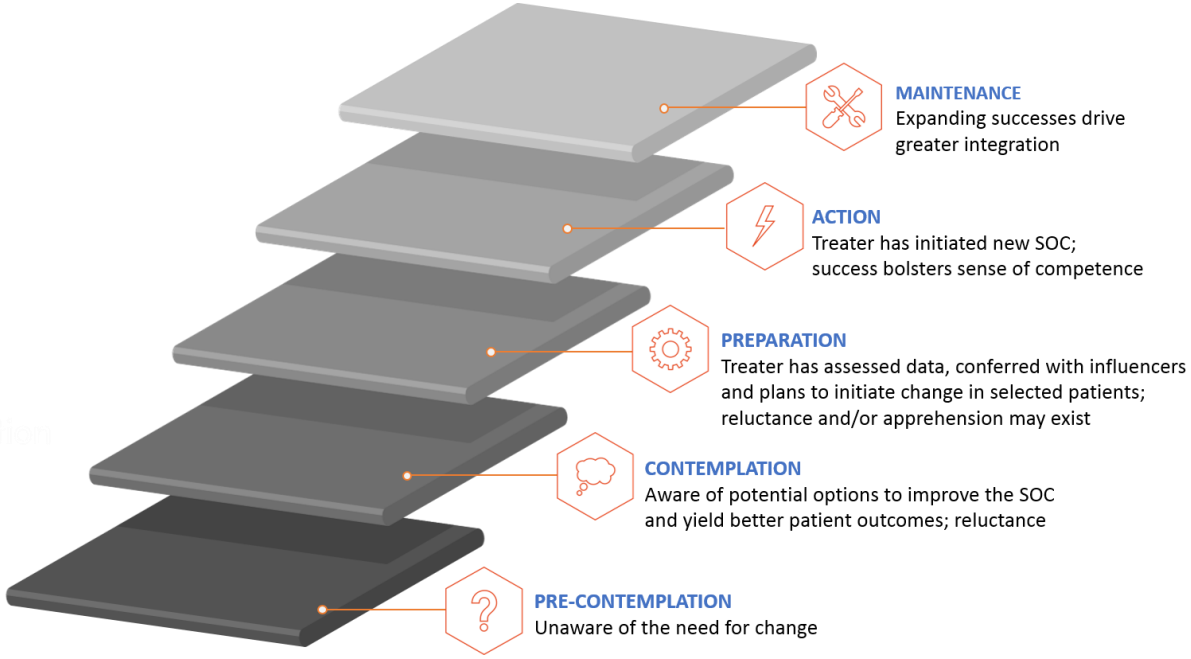
Roger's theory reveals how innovation occurs within a community by agents of change and resistance. Leveraging this knowledge in combination with the stages of change will further our ability to communicate in a customized fashion and accelerate adoption of innovation.

### Physician Self-Efficacy

### (Krupat, Frankel, Nelinson and Meldrum, et al)

Self-efficacy is referred to as the confidence (emotional) and competence (rational) to effect a change. As we move our treaters through the roles and stages referenced above, enhancing self-efficacy should be a guiding objective

### Prochaska's Transtheoretical/Stages of Change Model




Parker K, Parikh SV. ***J Eval Cl Prac,*** 2001.
Valente TW. Network models of the diffusion of innovations, 1995.
Nelisnon DS & Meldrum H. In search of a perfect storm: Provider self-efficacy, patient centered care, and medical education. Poster presented at WONCA; July 5, 2012; Vienna, AT.

# PRE-CONTEMPLATION

Unaware of the need for change or options

- **Objective:** drive physician self-efficacy
  - Connect clinical innovation/change attributes that are most closely tied to the reasons behind the inertia/resistance (eg, dosing frequency, inevitable anatomic changes)
- **No change is possible until the need is established**
- **Laggards/late majority: ~50% of treaters at pre-launch/launch**
- **Emotional drivers (+/-)**
  - Denial/unaware of need for change (-)
  - Inertia (-)
  - Resistance/aversion to change (-)
  - Skeptics (-)
  - Drive confidence (+)
  - Utilize early majority/adopters to drive change (too removed from innovators) (+)
  - Appeal to scientists within (+)
- **Rational drivers**
  - Knowledge: belief-based thinkers, therefore entrenched
  - Audit and feedback (+)
  - Peer influence and success (+)
  - “The patient with whom I wish I had another option” (+)

## Goal:

Move from pre-contemplation to contemplation. Have treaters identify unmet need in their practice. This will drive contemplation of change.

Russell B, Maher G, et.al. CE Meas. 2012

# CONTEMPLATION

Aware of potential options to improve the SOC and yield better patient outcomes; reluctance

- **Objective:** drive physician self-efficacy
- **See potential value conferred by innovation, but reluctance is still engrained due to success with existing SOC**
- **Early majority: 34% at pre-launch/launch**
- **Emotional drivers (+/-)**
  - Reluctance driven by fear to act too soon: do no harm (-)
  - Want to do right by my patients (+)
  - Desire to be seen as current (+)
- **Rational drivers**
  - Persuasion: seeks data/information – safety emphasis
  - Testimonials/documented success by early adopters
  - Clearly identifying potential patients

## Goal:

Move from contemplation to preparation/readiness. Leverage successes from early RWE enjoyed by early adopters and innovators. Demonstrate consistency between RWE and trials.

Russell B, Maher G, et.al. CE Meas. 2012

# PREPARATION/READINESS

Treater has assessed data, conferred with influencers, and plans to initiate change in selected patients; reluctance and/or apprehension may exist

- **Objective:** drive physician self-efficacy
- **Early adopters: 13.5% at pre-launch/launch**
- **Greatest network of influence and highest degree of opinion leadership within category and across all lower categories**
- **Emotional drivers**
  - Confident
  - Reluctance less, but often still a factor
- **Rational drivers**
  - More discreet in adoption choices than innovators
  - Judicious adoption habits keep them as key players within communication networks (communities) – highly engaged with community of treaters
  - Driven by clinical data over basic science
  - Influenced by innovators

## Goal:

Move from preparation/readiness to action. Drive trial with identification of potential “high success” patients

Russell B, Maher G, et.al. CE Meas. 2012

# ACTION

Treater has initiated new SOC; success bolsters sense of competence

- **Objective:** nurture innovation stewardship – strong existing self-efficacy
- **Innovators: 2.5% at pre-launch/launch**
- **Academic clinical researchers**
- **Emotional drivers**
  - Risk-takers
  - Tolerance for uncertainty
  - Self-image tied to status as innovator
- **Rational drivers**
  - Deep data divers – like to be close to data and part of the crafters of the story

## Goal:

Move the treater to a maintenance status where multiple treatment successes result in ongoing integration of the innovative approach. Become resources for peer influence

Russell B, Maher G, et.al. CE Meas. 2012

# What makes an educator effective?

- Expert vs influencer
  - Falsely believed “truths”: “So it is written, so it shall be done!”
    - Cause I said so and I’m important!
- Networks of influence within the community
  - Efficient and expedient dissemination
- Trust vs expertise

Valente TW. Network models of the diffusion of innovations, 1995.

# Interactivity and other behavior change insights: However do we get there?

## Active learning

# Evidence-based medical education: What changes behavior

- Interactivity
- Turn-key pearls (enabling educational interventions)
- Longitudinal activities (prelearning, onsite, follow-up)
  - One-off activities don’t work

Davis D, JAMA, 1995.

# Group Exercise

# Interactivity/active learning

- Learners engaged and interact with
  - Faculty
  - Content
  - One another
- How?
  - Ongoing Q&A: careful of ARS
  - Gaming: Jeopardy
    - Stimulates dopamine, ↑ adoption, retention
  - Case studies with pathway questions (ACOI OCC)
  - Panels
    - Bring in audience
  - How do you do it?

McMahon GT and Skocelak, SE. *JAMA,* 2018
Davis D, JAMA, 1995

# Enabling interventions

- Classroom to clinic
- How?
  - Case-centric learning
  - Meaning and relevance to the clinician: Efficacy
    - Base your presentation on case(s): ACOI OCC
    - NOT AT THE END!!!!!!!!!!!!!
  - Didactics support clinical decision-making vs
    - Traditional: Epidemiology→pathophysiology→new stuff→case….if there's time
  - Invite learners to offer their own ideas about the case
    - Ensures relevance and interactivity
  - Small groups/pairs
  - How do you do it?



Davis, *JAMA*, 1995
Nelinson DS & Meldrum, WONCA, 2012

# Longitudinal learning

- One-off activities have little impact
- Pre-work
  - Case to be discussed during activity
  - Controversial review or study
  - Guideline changes
- Post-activity follow-up
  - Thank you with summary of key points
  - Further reading
  - Invitation to a blog etc.
- How do you do it?

 Davis, *JAMA*, 1995

# Evidence-based CME: Brain science and CME

**Neuroscience, cognitive psychology, gaming theory**

# Have you seen the ACOI online modules?

# WE NOW LIVE IN A HEALTHCARE PERFORMANCE ECONOMY

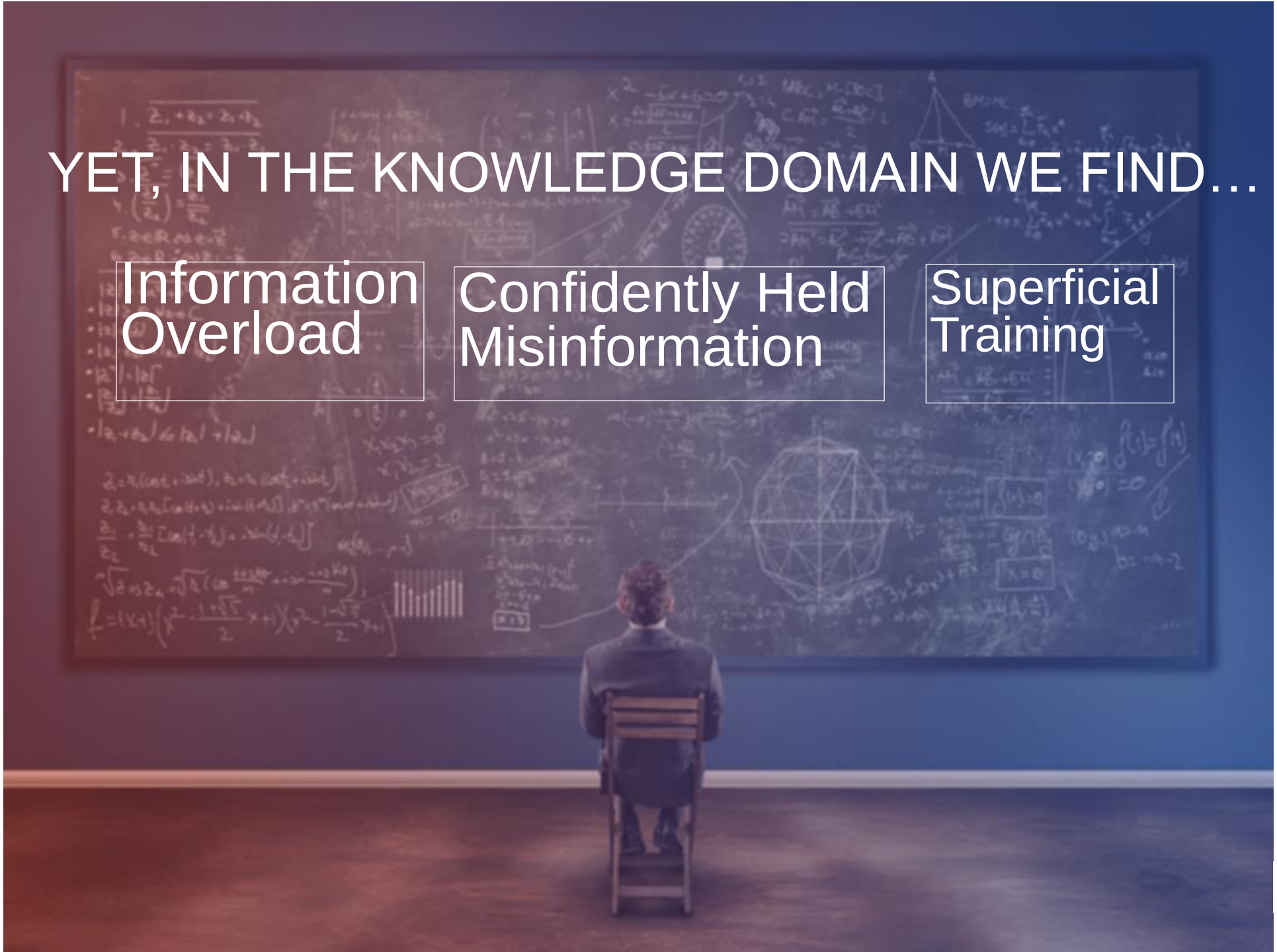
Where human knowledge and data can be key to success or failure

# YET, IN THE KNOWLEDGE DOMAIN WE FIND…

Information Overload

Confidently Held Misinformation

Superficial Training



# High Impact Areas of Harm and Loss

Can better education and training reduce the human error that leads to preventable harm and loss for more than 400,000 Americans each year. These focus areas are also nationally measured and financially incentivized.

| Patient Safety Event (Source: AHRQ and CDC) | Rate of Occurrence (per 1000 pts) | Excess Mortality Rate (per event) | Excess Hospital Stay (patient days) | Excess Hospital Costs (per event) |
|---|---|---|---|---|
| Pressure Ulcers | 5.18 | 7.20% | 4 | $10,845 |
| Iatrogenic Pneumothorax | 0.67 | 7.70% | 4.4 | $17,312 |
| Central Venous Catheter-Related Blood Stream Infection | 0.75 | 4.30% | 9.6 | $38,656 |
| Postoperative Hip Fracture | 0.03 | 4.50% | 5.2 | $13,441 |
| Perioperative Hemorrhage or Hematoma | 2.35 | 3.00% | 3.9 | $21,431 |
| Postoperative Physiologic and Metabolic Derangement | 0.48 | 19.80% | 8.9 | $54,818 |
| Postoperative Respiratory Failure | 8.23 | 21.80% | 9.1 | $53,502 |
| Perioperative Pulmonary Embolism or Deep Vein Thrombosis | 7.33 | 6.60% | 5.4 | $21,709 |
| Postoperative Sepsis | 10.67 | 21.90% | 10.9 | $57,727 |
| Postoperative Wound Dehiscence | 1.11 | 9.60% | 9.4 | $40,323 |
| Accidental Puncture or Laceration | 2.83 | 2.20% | 1.3 | $8,300 |
| Central Line-Associated Bloodstream Infection (CLABSI) | 1.14 | 12-25% | N/A | $16,550 |
| Catheter-Associated Urinary Tract Infection (CAUTI) | *560,000 annually* | *13,000 deaths / yr.* | *2.0-4.0* | *$400-500 million / yr.* |

# Human Error and Knowledge

Joint Commission data revealed that *"staff knowledge" is a primary root cause in more than 50% of Sentinel Events**

*How do we diagnose and remediate misinformation and knowledge gaps?*

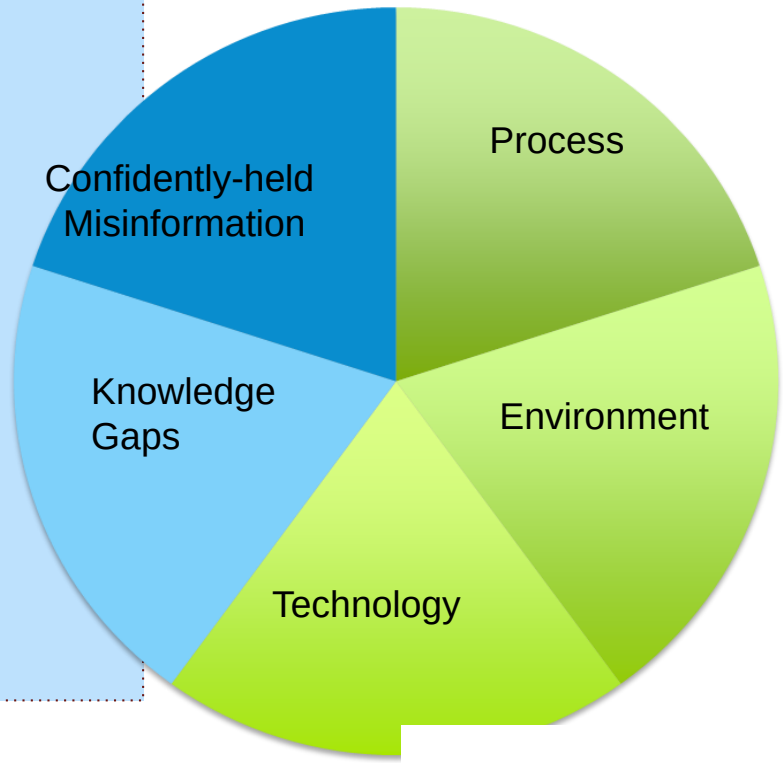
## Human Error

Quickly and reliably diagnose Misinformation and Knowledge Gaps

Proven and Efficient tools for remediating them

Analytics and Reporting around human error can also
help to clarify the scope of system issues and
highlight the highest-leverage targets
for systemic interventions

**Factors Contributing to Risk**




System/Process Factors

*Any unanticipated event resulting in death or harm unrelated to natural course of illness
The Joint Commission

# Risk that can be addressed via education THAT WORKS!

- “I know I’m right” ….but you’re not!
  - Confidently held misinformation
  - Consequence?
- “I’m not really sure”
  - Consequence?

# Advances in the Science of Learning and Memory

2000 Nobel Prize Winner Eric Kandel

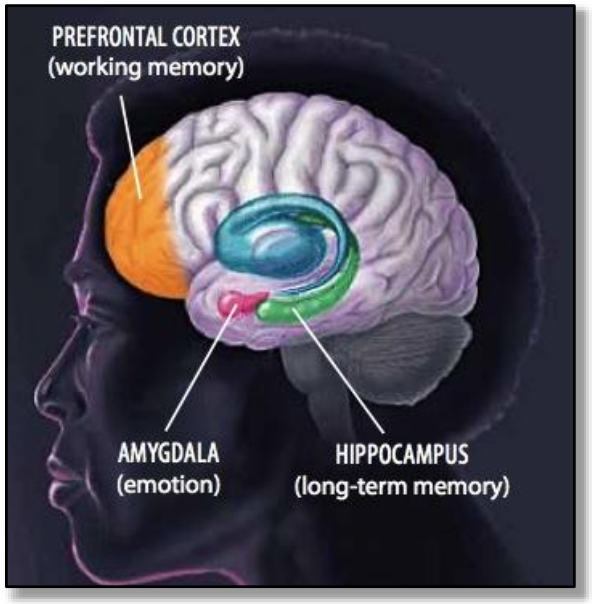
Learning & Memory are…

1) Subconsciously controlled

2) Centrally controlled

3) Massively distributed

4) Variable retrieval strength

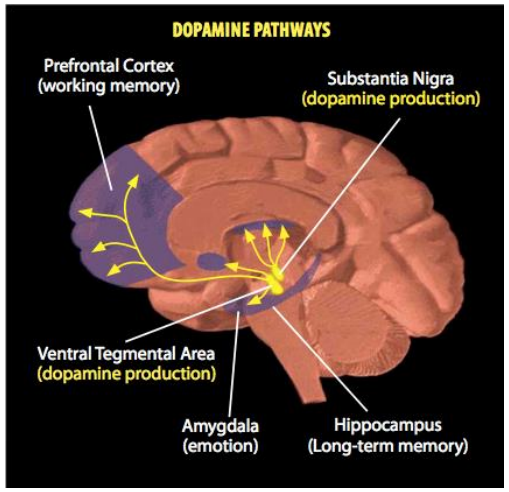



$100{,}000{,}000^{10}$ Synapses

# The Key to Learning and Memory

## The Dopamine Effect

Sensory “Tunnel Vision” and Hyper Learning




The New York Times

June 9, 2012

**Risky Rise of the Good-Grade Pill**

By ALAN SCHWARZ

He steer
chip bags
had been

The boy
arranged

Through

The drug
that the
grades w
them aw
break co

“Everyon

21 Dec 2011 at 6:06 PM DISABILITY LAW, DRUGS, EDUCATION / SCHOOLS, HEALTH CARE / MEDICINE, LAW SCHOOLS, READER POLLS

**Is Using Adderall to Get Through Exams the Worst Thing in the World?**

By ELIE MYSTAL

A little while back, we
drug that some stude
30% of you said you

It's a figure that shou
know, if they weren't
for an education that

But now let's ask the

Some people feel like
Pynchon writes the S
response to the last A

**How Many Students Use PEDs**

Posted: Sunday, June 17th, 2012 | Filed under: SAT prep, SAT strategy, Specialized High School Admissions Test, college education, college prep | author: By Chris Ajemian

Like 1

The recent article in
intense pressure to
enhancing drugs (PE
York City, with office
worked with hundred
York area and all ov
the SAT test, and st
enrolled in Envision
for Adderall, Ritalin,
about the advisability
with similar students
concerns that promp
really use PEDs like

THE ETHICIST

**Test Prep or Perp?**

By RANDY COHEN
Published: September 30, 2007

*A friend and I will soon take the*
*gave him Adderall to help him ta*
*some with me, and he said that u*
*dad's giving him the Adderall un*
*Tex.*

Drawing by Christoph Niemann

LETTERS

**When Children Take Drugs to Succeed**

Published: June 11, 2012

**To the Editor:**

Enlarge This Image

That The New York Times gave front-page coverage to “Risky Rise of the Good-Grade Pill” (June 10), about the diversion and misuse of stimulants, speaks both to the rise and, frankly, the sensational aspect of this practice among teenagers.

This practice is not new: it's been a problem for years. But perhaps what is somewhat new is the type of youth

# The Implications for CME and Education

1. Education becomes about measured learning and integration, not completion (Levels of outcomes)
2. Learner confidence is appreciated, measured, and reinforced as a predictor of behavior and action.
3. Learning time is reduced (by 50%) by focusing on how learners learn instead of what teachers teach.
4. Competency and capability are simultaneously personal and scalable and visual across organizations.
5. Knowledge can be expressed in terms of clinical risk and cost using predictive analytics.
6. CME and Education become a core operating asset of any healthcare organization and a critical success factor in the new Performance Economy.

# References


- McMahon GT and Skocelak, SE. February 13, 2018. Evolution of continuing medical education: Promoting innovation through regulatory alignment. *JAMA*. Vol 319 (6).
- Valente TW. Network models for the diffusion of innovations. Cresskill, NJ: Hampton Press; 1995.
- Parker, K, & Parikh, S V. 2001. Applying Prochaska's model of change to needs assessment, programme planning and outcome measurement. *J Eval Clin Prac*, 7(4), 365- 371.
- Davis DA et. al. September 6, 1995. Changing physician behavior: A systematic review of the effect of continuing medical education strategies. *JAMA.* Vol. 274(9): 700-705.
- Russell B, Maher G, et. al. 2012. Strategic approaches to continuing medical education: Applying the transtheoretical model and diffusion of innovation theory. *CE Meas*: 6; 27-31.
- Nelisnon DS & Meldrum H. July 5, 2012. In search of a perfect storm: Provider self-efficacy, patient centered care, and medical education. Poster presented at *WONCA*; Vienna, AT.
- Moore DE Jr, Green JS, Gallis HA. 2009. Achieving desired results and improved outcomes: integrating planning and assessment throughout learning activities. *J Contin Educ Health Prof* ;29(1):1-15

# Questions, comments, crtitiques…