

## Pseudoscience in Mental Health

*What it is and how to spot it*

Caleb W. Lack, Ph.D.

University of Central Oklahoma

---

---

---

---

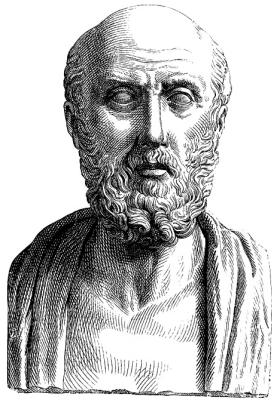
---

---

---

There are in fact  
two things, science  
and opinion;  
the former begets  
knowledge, the  
latter ignorance.

Hippocrates of Kos



---

---

---

---

---

---

---

## A Big Chunk of Change

- In the U.S. approximately \$3 *trillion* are spent on healthcare each year, or \$10,000 per person
- Other countries worldwide often spend up to 10% of their GDP on healthcare
- We should know if it's being spent wisely or poorly



---

---

---

---

---

---

---

### Operational Definitions

- Alternative and complementary medicine are “health care approaches developed outside of mainstream Western, or conventional, medicine”
- Integrative health care describes “conventional and complementary approaches together in a coordinated way”

(NCCIH, n.d.)

---

---

---

---

---

---

---

### Operational Definitions

- Evidence-based practice is
  - “...the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.”
  - “...healthcare practice that is based on integrating knowledge gained from the best available research evidence, clinical expertise, and patients’ values and circumstances.”

(Sackett et al., 1996)  
(Dickersin et al., 2007)

---

---

---

---

---

---

---

### Evidence-based Practice

- Uses those medicines, therapies, or diagnostic assessments that have been demonstrated to be effective via well-controlled trials
- A new term with a long history, including large amount of push back from physicians of times past (and even currently)

---

---

---

---

---

---

---

### EBP vs. CAM

- EBP is a method of making decisions, while CAM refers to a type of treatment
- EBP starts with the patient and asks what is the best evidence to achieve an outcome
- In EBP, there is not “alternative” or “conventional” treatments, but...

---

---

---

---

---

---

---

### Levels of Evidence

- Evidence-based treatments
- Poorly studies treatments
- Non-evidence-based treatments

---

---

---

---

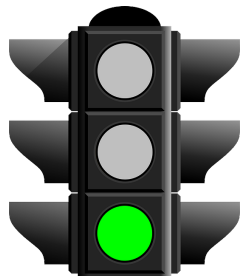
---

---

---

### Evidence-Based Treatments

- Those procedures, medications, and the like which have been reliably shown to cause improvement in various symptoms




---

---

---

---

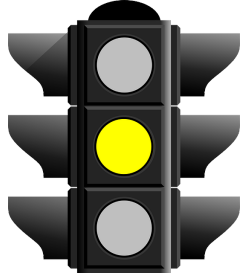
---

---

---

### Poorly Studied Treatments

- Those procedures, medications, and the like which have not been studied well enough to determine their impact on various symptoms, or for which there is conflicting evidence regarding their effectiveness




---

---

---

---

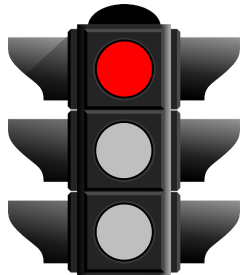
---

---

---

### Non-Evidence-Based Treatments

- Those procedures, medications, and the like which have been reliably shown *not* to cause improvement in various symptoms




---

---

---

---

---

---

---

### No Panaceas

- No treatments will cure all disease or illness
- The same treatment can be EBT for one problem, but non-EBT or PST for another
- E.g., antibiotics are EBT for bacterial infections, but non-EBTs for viral ones

---

---

---

---

---

---

---

### Non-Static Categories

- As in all science, our understanding of health treatments is constantly evolving
- This means that treatments can move from “mainstream” to “alternative” *and vice versa*
  - Various herbal supplements
  - Deep breathing

---

---

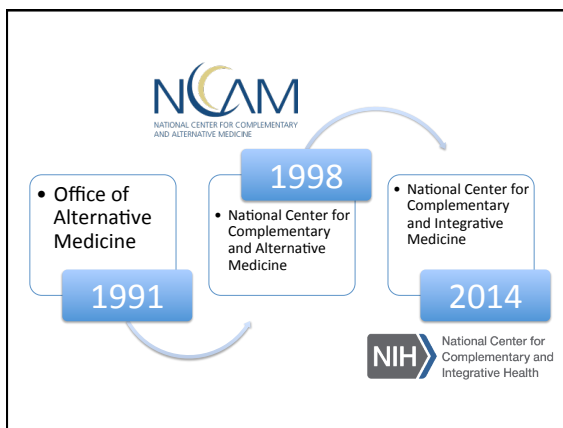
---

---

---

---

---




---

---

---

---

---

---

---

### Why the Change?

- “True alternative medicine is uncommon. Most people who use non-mainstream approaches use them along with conventional treatments.”
- The name shifts seem designed to help obscure some points, though

(NCCIH, n.d.)

---

---

---

---

---

---

---

### Purposeful Confusion?

- There are increasingly negative connotations for the term “alternative med” among many
- The NCCIH also describes numerous treatments that are non-EBT as being either EBT or PST
  - Homeopathy, acupuncture

---

---

---

---

---

---

---

### Purposeful Confusion?

- Currently, the NCCIH puts CAM into three groups
  1. Natural products
    - Herbs, vitamins, minerals, probiotics, and other dietary supplements
  2. Mind and body practices
    - Yoga, chiropractic manipulation, massage, meditation, acupuncture, relaxation, hypnotherapy, movement therapies
  3. Other complementary health approaches
    - Naturopathy, homeopathy, traditional Chinese medicine, Ayurvedic medicine, and anything else that doesn't fit in the above two categories

---

---

---

---

---

---

---

### Purposeful Confusion?

- This grouping obscures that each category contains a mixture of treatments with very differing LoE
- Well-supported EBTs (relaxation) are mixed with non-EBTs (acupuncture) and PSTs (probiotics)

---

---

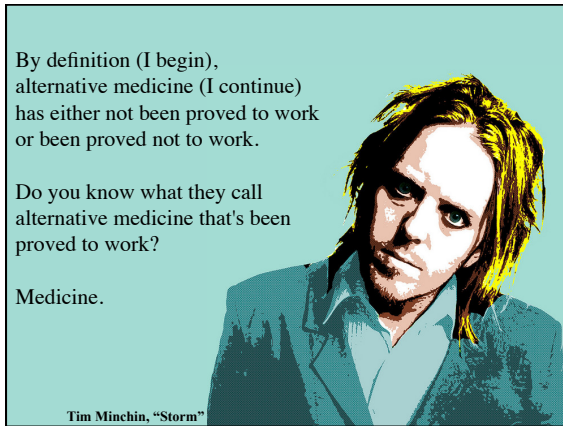
---

---

---

---

---




---

---

---

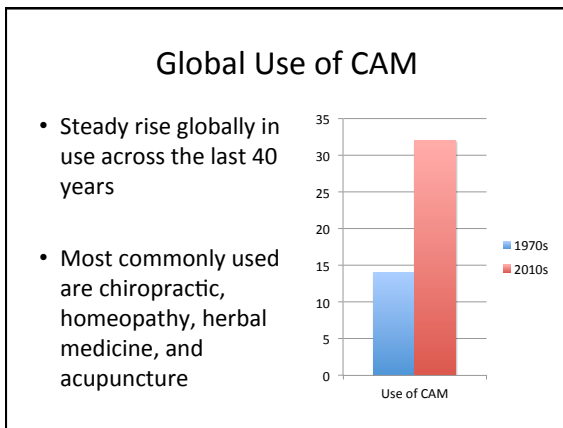
---

---

---

---

---




---

---

---

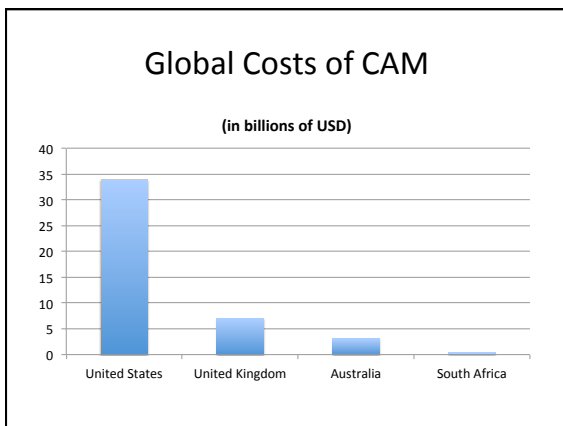
---

---

---

---

---




---

---

---

---

---

---

---

---

Why would people spend so much money  
on things that don't work?

Wouldn't they realize these treatments were  
ineffectual and turn to something else for help?

The answer is **"Because they do work, just not  
for the reasons people think they do."**

---

---

---

---

---

---

---

### Importance of Research

- Healthcare providers who use EBT rely heavily  
on valid and reliable research studies
- Such research is critical because of
  - a) how easily bias can creep into our everyday  
decision making
  - b) how influenced we are by powerful social forces,  
such as advertising
  - c) the strength of the **placebo effect**

---

---

---

---

---

---

---

### The Placebo Effect

- People's beliefs have a powerful impact not  
only on how they process information, but  
also on their body
- A *placebo* is any type of sham or inactive  
medical treatment or procedure
  - Sugar pills
  - Fake infusions
  - Fake surgeries

---

---

---

---

---

---

---



## The Placebo Effect

- "...the measurable, observable, or felt improvement in health or behavior not attributable to a medication or invasive treatment that has been administered."
- In other words, someone gets a placebo and then shows improvement, *even with no active treatment*

(Carroll, 2015)

---

---

---

---

---

---

---

## "I will please"

- Decades of research have shown how powerful the placebo effect can be
- Better in subjective, as opposed to objective, tests
  - People with asthma report feeling better with sham inhalers, even though there is not a measurable change in lung functioning

---

---

---

---

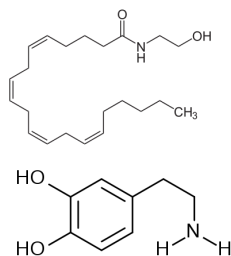
---

---

---

## Biology & the Placebo

- Taking a placebo can cause
  - Production of cannabinoids and opioids
  - Release of dopamine
  - Increased prefrontal cortex activation




---

---

---

---

---

---

---

### Psychology & the Placebo

- Expectations color our perception of both how we feel and how we behave
- Even when given non-alcoholic beer, people feel and act as if they are intoxicated, as long as they were told it was alcoholic




---

---

---

---

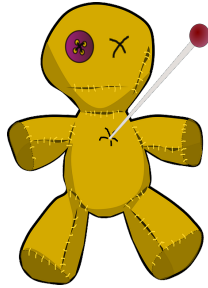
---

---

---

### Nocebo Effect

- When something negative happens or you feel worse after receiving a sham treatment because you expect to feel worse




---

---

---

---

---

---

---

### How to Make a Placebo Stronger

- Be friendly, comforting, and interested
- Injection works better than a capsule, which works better than a pill
- Be more expensive and in fancy packaging

---

---

---

---

---

---

---

### Regression to the Mean

- RTM is a major issue we face in healthcare research
- When you measure something which has moved in an extreme direction, it will most likely move back (regress) towards normal (the mean) across repeated measurements

---

---

---


---

---

---

---

### RTM Example

1. You begin to develop a headache
2. It starts small (not far from the “no headache” mean)
3. It builds over time, becoming unbearable (an extreme value from the mean)
4. You take an aspirin 
5. Soon, your headache is decreased (RTM)

---

---

---

---

---

---

---

### RTM Example

- Three possible reasons why your headache went away
  - Aspirin truly worked to decrease pain
  - Aspirin had a placebo effect
  - Pain may have decreased naturally regardless of what you did (RTM)
- Each is possible and plausible, which is why we need well-controlled research to sort it out

---

---

---

---

---

---

---

### “Does this treatment work?”

- Instead of that, we have to ask both:
  1. “Does this treatment work better than a placebo?”
  2. “Would this condition naturally improve over time, even with no intervention?”

---

---

---

---

---

---

---

### The Blind Researching the Blind

- The best way to conduct research on treatment outcomes is through the use of randomized, placebo-controlled, double-blind procedures (RPCDB)
- These types of high quality clinical trials are what need to be relied on, in order to determine if something is an EBT

---

---

---

---

---

---

---

### RPCDB in Action

1. Divide the entire group of people in the study randomly into the treatment and control arms
2. Compare the treatment to a matched type of placebo, rather than nothing
3. Participants should not know what treatment arm they are in (being *blinded*)
4. The researchers should also not know what arm a participant is (being *double-blinded*)

---

---

---

---

---

---

---

### The Gold Standard

- This type of trial is critical, as it controls for bias and placebos
- Studies that don't meet these criteria can show treatments to work, when they actually don't




---

---

---

---

---

---

---

### Why is CAM So Popular?

- Huge numbers of people spend huge amounts of money each year on CAM, even though most is non-EBT
- Exact reasons differ based on the individual, but here are some of the most commonly seen reasons

---

---

---

---

---

---

---

### Why is CAM So Popular?

- No surgery, no "drugs"
- They are seen as "natural"
- Many are cheaper and easier to access
- Reaction to the failings of conventional med

(Carroll, 2003)

---

---

---

---

---

---

---

### Why is CAM So Popular?

- Political lobbying and the air of approval via state licensure
- Misunderstanding of how science self-corrects across time
- It works, thanks to placebo effects!

(Carroll, 2003)

---

---

---

---

---

---

---

### Tips for Avoiding Non-EBT

- The product is advertised as a quick and effective cure-all for a wide range of ailments
- The promoters use words like scientific breakthrough, miraculous cure, exclusive product, secret ingredient, or ancient remedy
- The text is written in "medicalese"

(FTC, 1999)

---

---

---

---

---

---

---

### Tips for Avoiding Non-EBT

- The promoter claims the government, the medical profession, or research scientists have conspired to suppress the product.
- The advertisement includes undocumented case histories claiming amazing results.
- The product is advertised as available from only one source.

(FTC, 1999)

---

---

---

---

---

---

---

### Typical CAM User

- Middle-aged, female, and of higher than average education and income
- Likely to have multiple medical conditions, especially ones conventional medicine often fails at treating
- Desperate for help and relief, willing to try anything

---

---

---

---

---

---

---

### Shifting Tides in Psychology

- Huge push today for mental health practitioners to utilize evidence-based practice
- EBP is “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.”

Sackett et al., 1996

---

---

---

---

---

---

---

### EBP in Psychology

- Major movements began in mid-1990s
- APA task force released statement in 1995 that EBP interventions must show
  - Efficacy (does research show they work?)
  - Clinical utility (are they applicable in the real world?)

---

---

---

---

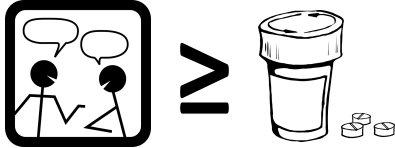
---

---

---

### EBP in Psychology

- Chambless' 1996 report reviewed the research and compiled the first list of *empirically supported treatments*
  - Psychotherapies that were effective for particular disorders, at least or more so than medications




---

---

---

---

---

---

---

### EST Examples

- CBT for panic disorder
- CBT for generalized anxiety
- EX/RP for obsessive-compulsive disorder
- Cognitive therapy for depression
- IPT for depression
- PMT for child oppositional behavior
- CBT for bulimia
- CBT for chronic pain

Chambless et al. (1996)

---

---

---

---

---

---

---

### EBP in Psychology

- Response to the Chambless report was varied
- It definitely raised awareness of efficacy of psychological treatments
- Some, though, decried the emphasis on manualized, brief treatments and lack of emphasis on common therapeutic factors

---

---

---

---

---

---

---



### EBP in Psychology

- In 2006, APA's Presidential Task Force on Evidence-Based Practice issued guidelines on confirming a commitment to EBP
- EBP is "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences."

APA (2006)

---

---

---

---

---

---

---

### EBP in Psychology

- The purpose of EBP is "to promote effective psychological practice and enhance public by applying empirically supported principles of psychological assessment, case formulation, therapeutic relationship, and intervention."
- The research is quite clear: psychology works

APA (2006)

---

---

---

---

---

---

---

### The Big Picture

- Large body of research on children, adults, and seniors finding that therapy
  - Is safe and effective for these groups
  - Can impact a wide range of problems
  - Is more enduring in impact than medications
  - Pays for itself in terms of medical cost offset, increased productivity, and QoL



Lambert & Ogles (2003)

---

---

---

---

---

---

---

### Now, the Bad News

- Huge numbers of MHPs have little to no training in using evidence-based therapy and assessment
- Traditionally, clinical psychology doctoral programs have been primary place to get training in EBP

---

---

---

---

---

---

---

### Now, the Bad News

- A growing number of master's-level programs emphasize EBP, they are still a minority
- This is a problem because the majority of MHPs in the U.S. are master's-level, and thus not well-trained in EBP

---

---

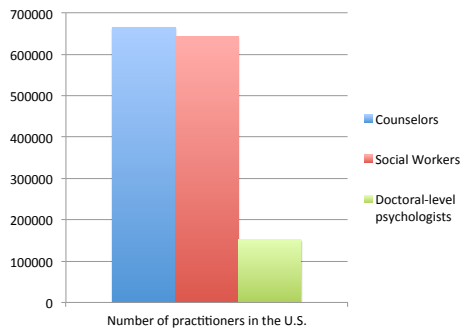
---

---

---

---

---




---

---

---

---

---

---

---

### More Bad News

- Many consumers of mental health services also do not know how to differentiate EBP from non-EBP in psychology
- Given the wide range of non-EBT practiced, this opens the door to a large number, a majority, of people not getting effective psychological services

---

---

---

---

---

---

---

### Most Common Non-EBP in Psych

- Therapies with little to no support for
  - Autism spectrum disorder
  - Post-traumatic stress disorder
  - Substance abuse
- Projective assessments

---

---

---

---

---

---

---

### Autism Spectrum Disorder

- ASD is characterized by
  - Impairments in social interaction and communication (verbal and non-verbal)
  - Repetitive self-soothing behavior
  - Difficulty connecting to others in social situations
  - Difficulty experiencing empathy
  - Issues with impulsive behavior and self-regulation

---

---

---

---

---

---

---

### Autism and Vaccines

- The single most dangerous myth surrounding ASD is that it can be caused by vaccinations
- Idea began primarily with a 1998 study out of the UK by a physician Andrew Wakefield
- Claimed to observe GI disease and developmental regression in 12 kids within 2 weeks of getting MMR vaccine

---

---

---

---

---

---

---

### Autism and Vaccines

- He called a press conference, in which he questioned the safety of the MMR vaccine




---

---

---

---

---

---

---

### Autism and Vaccines

- Began concerns over possible link between vaccines and autism (among other problems)
- This was picked up by numerous parents groups and celebrities




---

---

---

---

---

---

---

### Wakefield's Study

- By 2004, 10 of the 12 co-authors of the study had retracted their names
- This was largely due to investigative reporting which found that numerous ethical and scientific problems with the manuscript

---

---

---

---

---

---

---

### Wakefield's Study

- The parents had been recruited by a lawyer involved in a lawsuit against MMR manufacturers
- The same lawyer had given over £400,000 to Wakefield for doing the study
- Wakefield, *prior* to the study, had applied for a patent on a single-jab measles vaccine to "prevent" the autism "caused" by the MMR

---

---

---

---

---

---

---

### Wakefield's Study

- As a result of this information, he was investigated by the General Medical Council
- Aside from conflict of interest charges, it turns out the children in the study had been subjected to numerous painful medical tests, *without the approval of an ethics board*

---

---

---

---

---

---

---

### Wakefield's Study

- Wakefield lost his license to practice medicine in 2010, and the *Lancet* retracted the study as being "fatally flawed"
- The damage was already done, with measles outbreaks becoming problems in U.S. and U.K., including first death in over a decade

---

---

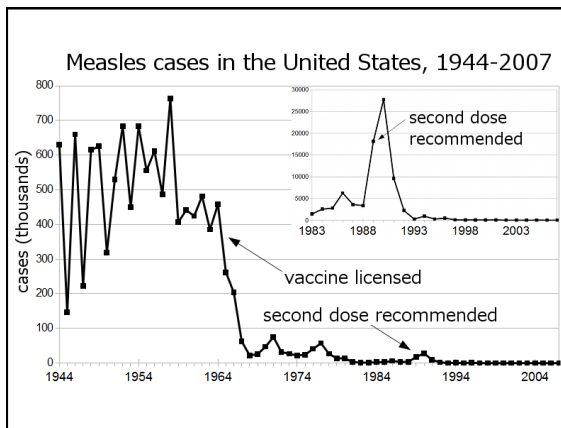
---

---

---

---

---




---

---

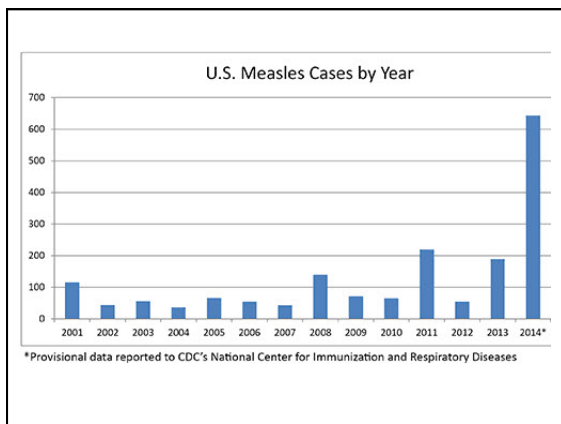
---

---

---

---

---




---

---

---

---

---

---

---

### Actual Research

- Dozens of studies in past 15 years have shown no link between vaccinations and autism
- A recent large-scale study of 96,000 children found no increased chance of ASD in those who were vaccinated
  - Held true *even when* an older sibling had ASD

---

---

---

---

---

---

---

### Treatments for ASD

- Research has shown that applied behavioral analysis (ABA) is the single most effective treatment for ASD
- Early, intensive ABA intervention shows gains in intelligence, academic skills, language, and adaptive functioning

---

---

---

---

---

---

---

### Treatments for ASD

- ABA is severely underused for several reasons
- This has led to a number of pseudoscientific ASD therapies being widely used
  - Facilitated communication
  - Sensory integration therapy
  - Biological treatments

---

---

---

---

---

---

---

### Facilitated Communication

- Based on the idea that communication problems in ASD are the result of motor coordination issues
- Therefore, people with ASD need special physical, communicative, and emotional support to communicate

---

---

---

---

---

---

---

### Facilitated Communication

- A facilitator supports the person with ASD's wrist physical and provides communicative/emotional support as well




---

---

---

---

---

---

---

### Facilitated Communication

- As a result of this, many children and adolescents began communicating in amazing ways
- Children who had never spoken aloud were typing sentences, poetry, and more
- [Watch it in action](#)

---

---

---

---

---

---

---



### Evaluating FC

- Violates many critical thinking principles
- Extraordinary claims of ASD as motor-based are not supported, as they can do other complex motor tasks just fine
- There are rival hypotheses that must be ruled out to explain how the communication is done

---

---

---

---

---

---

---

### Evaluating FC

- A simple blinded trial is all that's needed to test the hypothesis that the facilitator is guiding the communication
- Put headphones on both, play questions in and have the answer typed out
  - On half of the questions, though, give them different questions, and see what answer is typed

---

---

---

---

---

---

---

### Evaluating FC

- Repeated trials using blinded protocols (of different types) show the answers given are those of the facilitator, not the person with ASD
- The American Academy of Pediatrics and American Psychological Association both label FC as being harmful and pseudoscientific

---

---

---

---

---

---

---

### Sensory Integration Therapy

- SIT is often used by occupational therapists in their work with the ASD population
- Reportedly addresses “sensory processing problems” via stimulating activities
  - Vestibular, proprioceptive, and tactile

---

---

---

---

---

---

---

### Sensory Integration Therapy




---

---

---

---

---

---

---

### Sensory Integration Therapy

- Core theories have no empirical support
- Sensory processing disorders not recognized by American Medical Association or American Psychological Association
- “...no objective, scientific evidence to suggest that SIT is more effective than alternative treatments or even *no treatment at all.*”

(Polenick & Flora, 2012)

---

---

---

---

---

---

---

### Biological Treatments for ASD

- Two of the most dangerous alternative ASD therapies are two of the most ineffective
  - Chelation therapy
  - Mega-doses of vitamins
- Both can result in serious side effects, from kidney damage to death

---

---

---

---

---

---

---

### ASD Conclusions

- There is no “magic bullet” for ASD
- ABA is the most well-supported treatment, and can improve many areas of functioning
- Parents searching for help need to be careful to avoid the non-EBT pseudoscience

---

---

---

---

---

---

---

### Trauma-Focused Therapies

- Both natural disasters and man-made traumas can sometimes result in long-term mental health problems
- Most commonly this is some form of anxiety, such as posttraumatic stress symptoms
- PTSD has many negative effects, for both children and adults

---

---

---

---

---

---

---

### EBT for PTSD

- There is a huge and very strong evidence base for the use of cognitive-behavioral therapy
  - Prolonged exposure therapy
  - Cognitive processing therapy
  - Trauma-focused CBT
- But, there are many proponents of pseudoscientific, non-EBT treatments

---

---

---

---

---

---

---

### Pseudoscientific PTSD Therapies

- Critical incident stress management (CISM)
- Eye movement desensitization and retraining (EMDR)
- Emotional freedom technique (EFT), and thought field therapy (TFT)

---

---

---

---

---

---

---

### Critical Incident Stress Management

- CISM (“psychological debriefing”) was developed in early 1980s to *prevent* development of PTSD symptoms
- Based on two assumptions
  1. Trauma exposure alone is enough to cause a person to experience long-term psychological difficulties
  2. Early interventions can prevent such problems from developing




---

---

---

---

---

---

---

### Critical Incident Stress Management

- Assumptions are not supported by research
- Most people do not develop PTSD and show little distress at 3 months after a trauma
- Numerous studies have actually shown CISM and it's derivatives to *increase* the chance that someone will develop PTSD

---

---

---

---

---

---

---

### Critical Incident Stress Management

- All evidence supporting CISM is anecdotal and most is from the developer of it
- World Health Organization and British National Health Service implemented policies against its use
- "Although [CISM] is widely used throughout the world to prevent PTSD, there is no convincing evidence that it does so."

(McNally et al., 2003)

---

---

---

---

---

---

---

### EMDR

- One of the most promoted, most commercialized pseudoscientific treatments of the past 30 years
- Developed in late 1980s by Francine Shapiro




---

---

---

---

---

---

---

### EMDR Steps

- Taking detailed history of the trauma(s) and symptoms
- Therapist then has client vividly imagine the trauma, including how they felt
- While holding those memories in mind, client engages in "[bilateral stimulation](#)" (BS)

---

---

---

---

---

---

---

### EMDR Steps

- This BS reportedly "unlocks" the brain via a "dual attention" procedure, resulting in decreased PTSD symptoms
- This is then repeated for other traumas or problematic events




---

---

---

---

---

---

---

### EMDR Research

- Large body of research showing that EMDR is about as effective as CBT in reducing PTSD
- American Psychiatric Association has stated "EMDR appears to be effective in ameliorating symptoms of both acute and chronic PTSD"

(Work Group on ASD and PTSD, 2004)

---

---

---

---

---

---

---

### EMDR Research

- However, the same APA report concludes that “Despite the demonstrable efficacy of EMDR, these studies call into question EMDR’s theoretical rationale.”
- EMDR appears to be a ‘purple hat therapy’

(Work Group on ASD and PTSD, 2004 )

---

---

---

---

---

---

---

### Purple Hat Treatments

- Takes something that is known to work for a particular problem and add on another element
- When the treatment works, they attribute the success to the added element




---

---

---

---

---

---

---

### EMDR’s Purple Hat

- In EMDR, the active ingredients causing change are CBT techniques such as EX/RP, not the the bilateral eye or body movements
- The BS are, though, still considered a “key” component of the treatment package
- Dismantling research shows that removing the BS makes the treatment no less effective at treating PTSD

---

---

---

---

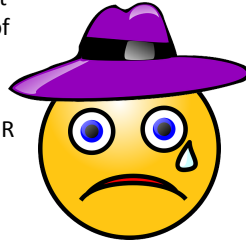
---

---

---

## EMDR Conclusions

- In short, EMDR works, but it doesn't work because of why it purports to work
- "What is effective in EMDR is not new, and what is new is not effective."



(McNally, 1999)

---

---

---

---

---

---

---

## "Energy" Therapies

- Thought Field Therapy (TFT) is based on the idea of an invisible energy field that surrounds the human body
- One can these [repeatedly tap on places](#) in the body where these fields intersect, releasing negative emotions
- Similar to acupuncture's ideas, but for PTSD

---

---

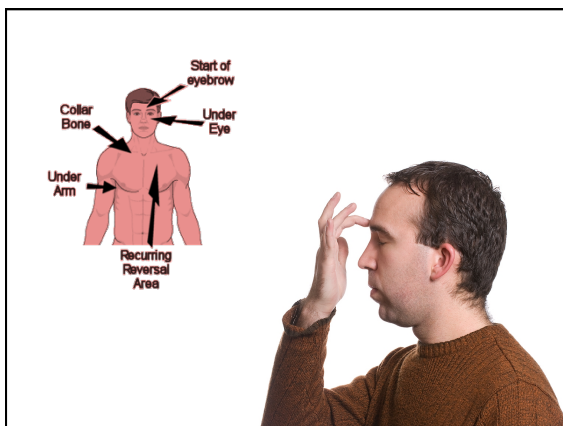
---

---

---

---

---




---

---

---

---

---

---

---



### Thought Field Therapy

- "...often works when nothing else will... It has been used for weight loss, stop smoking [sic], phobias, trauma relief, love pain, and much, much more."

"When applied to problems TFT addresses their fundamental causes, providing information in the form of a healing code, balancing the body's energy system and allowing you to eliminate most negative emotions within minutes and promote the body's own healing ability."

(rogercallahan.com, n.d.)

---

---

---

---

---

---

---

### "Energy" Therapies

- No support for such "energy"
- No sound outcome research, and no theoretical reason to think it might work
- Emotional Freedom Techniques (EFT) are very similar, with equally little evidence

---

---

---

---

---

---

---

### "Energy" Therapies

- Critical thinking principles go on high alert with TFT and EFT
  - Inability to falsify claims
  - Reliance on anecdotal evidence
  - Claims of miraculous success
- These are all hallmarks of pseudoscience

---

---

---

---

---

---

---

### Conclusions

- Psychological science has progressed enormously in the past 130 years
- Still, many practitioners may not use EBP and methods
- Take efforts to make sure that you do, and use your critical thinking skills

---

---

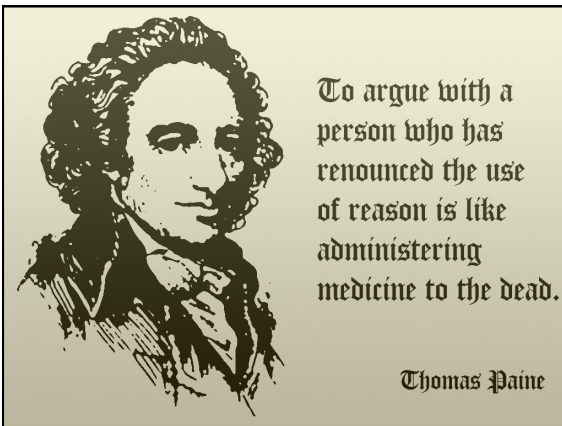
---

---

---

---

---



---

---

---

---

---

---

---