



***Biomarkers & Chronic Pain –  
A Patient’s Perspective***

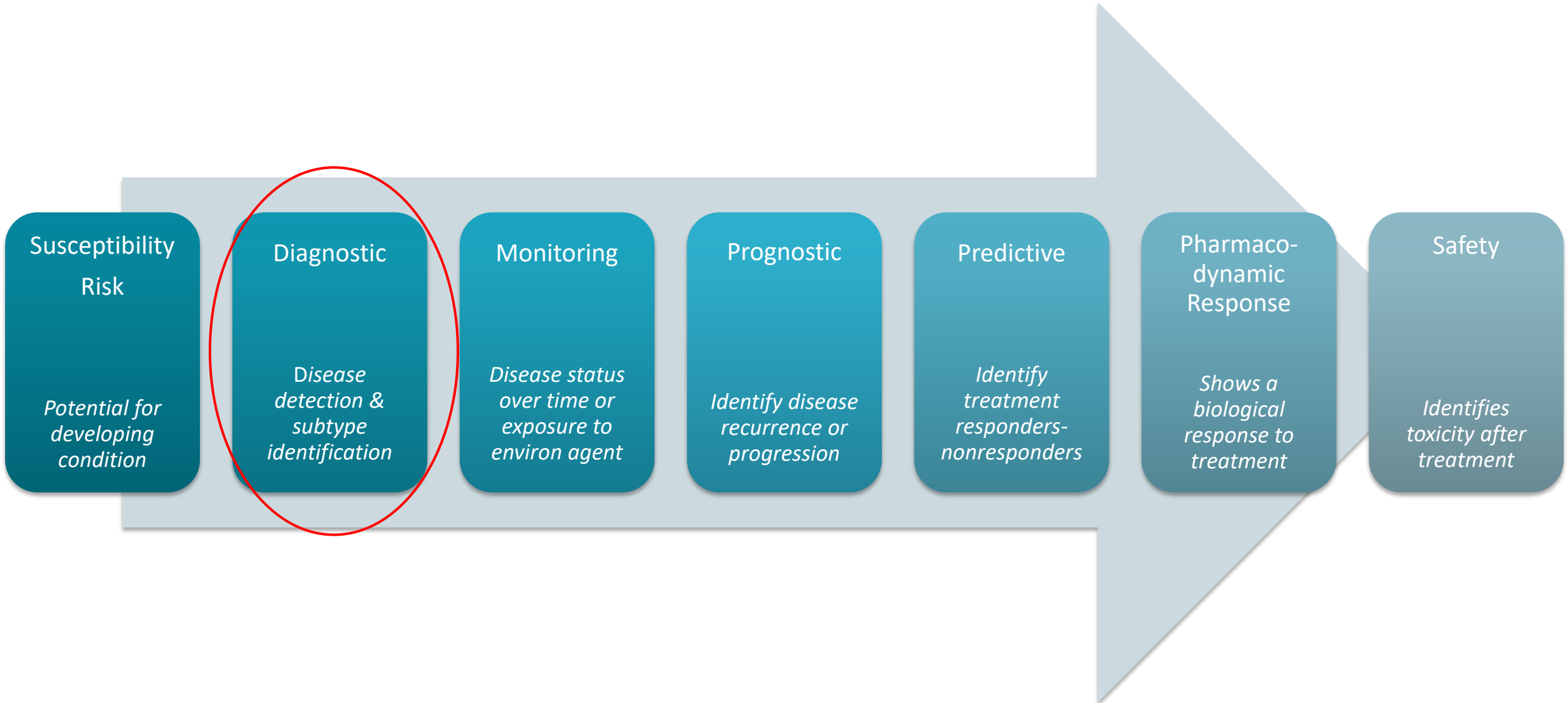
**Christin Veasley, BS  
Co-Founder & Director**



[www.ChronicPainResearch.org](http://www.ChronicPainResearch.org)

# Biomarker Types & Potential Uses in Chronic Pain

FDA “BEST”: Biomarkers, EndpointS and other Tools



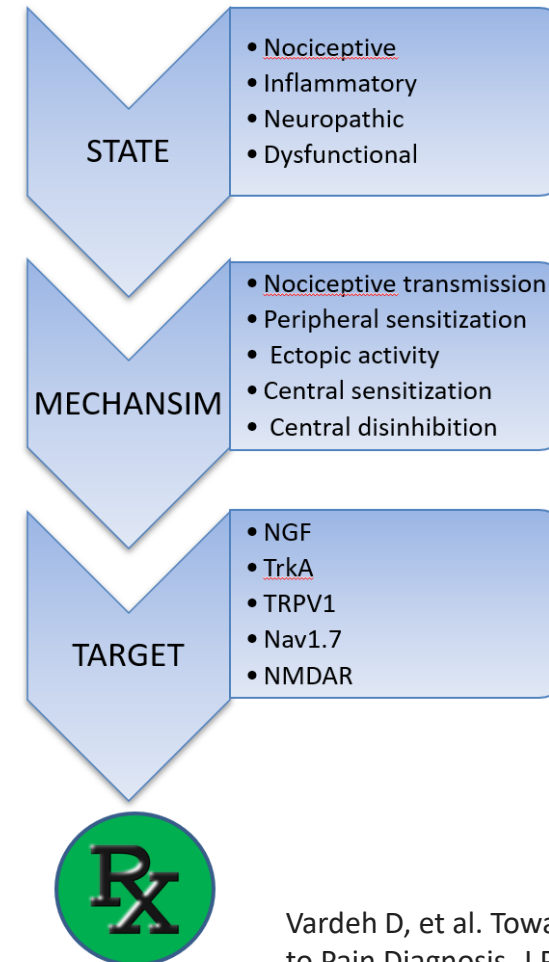
# Diagnostic Biomarkers

## Differentiating Pain Diagnoses & Pain Types

*“The classification of most chronic pain disorders gives emphasis to anatomical location of the pain to distinguish the disorder from another, or to define subtypes. However, anatomical criteria overlook etiology, potentially hampering treatment decisions.” (Bair E, et al. Pain. 2016 Jun;157(6):1266-78.)*

### Pain “Diagnoses”

Occipital Neuralgia  
 Chronic Migraine  
 Tension Type Headache  
 Temporomandibular Disorder  
 Orofacial Pain  
 Myofascial pain syndrome  
 Chronic back pain  
 Endometriosis  
 Pelvic Congestion Syndrome  
 Vulvodynia  
 Chronic Pelvic Pain Syndrome  
 Irritable Bowel Syndrome  
 Interstitial Cystitis / Painful Bladder Syndrome  
 Premenstrual Syndrome  
 Chronic Fatigue Syndrome



Vardeh D, et al. Toward a Mechanism-Based Approach to Pain Diagnosis. J Pain. 2016 Sep;17(9 Suppl):T50-69.

# Biomarker Types & Potential Uses in Chronic Pain

FDA “BEST”: Biomarkers, EndpointS and other Tools

Susceptibility  
Risk

*Potential for  
developing  
condition*

Diagnostic

*Disease  
detection &  
subtype  
identification*

Monitoring

*Disease status  
over time or  
exposure to  
environ agent*

Prognostic

*Identify disease  
recurrence or  
progression*

Predictive

*Identify  
treatment  
responders-  
nonresponders*

Pharmaco-  
dynamic  
Response

*Shows a  
biological  
response to  
treatment*

Safety

*Identifies  
toxicity after  
treatment*

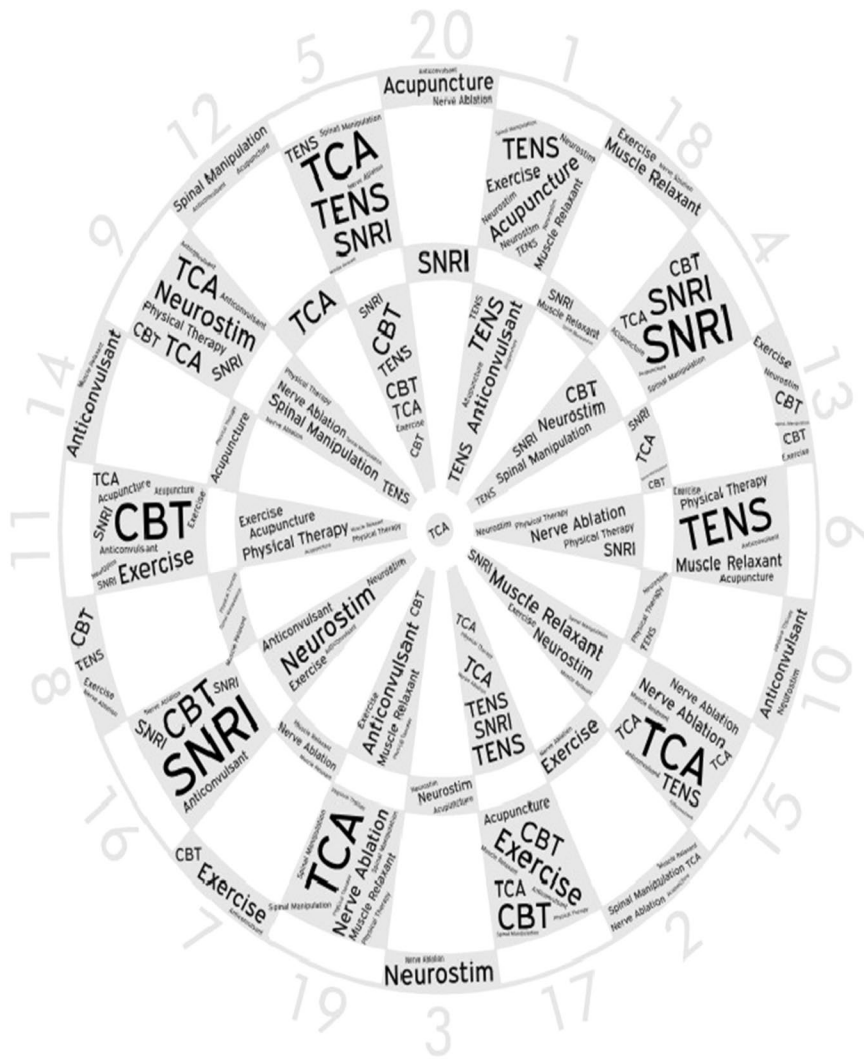
# Many Chronic Pain Treatments

*But ... what works for whom? At what risk? At what cost?*

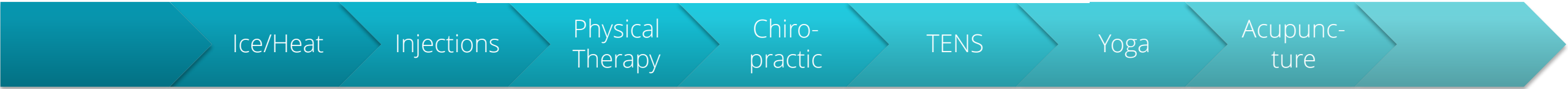
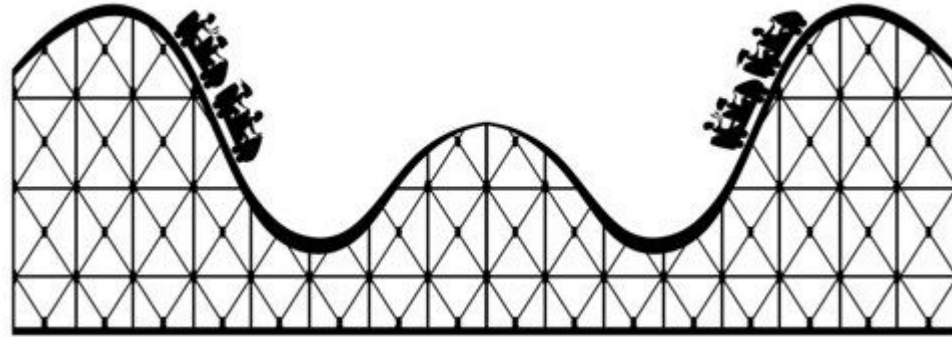


*“Unfortunately, the field of chronic pain treatment is strikingly deficient in high-quality scientific evidence.”  
~ FDA Commissioner Dr. Robert Califf*

# Current Treatment of Chronic Pain: “Blindfolded Darts”



# How This Plays Out in Real Life



6



6



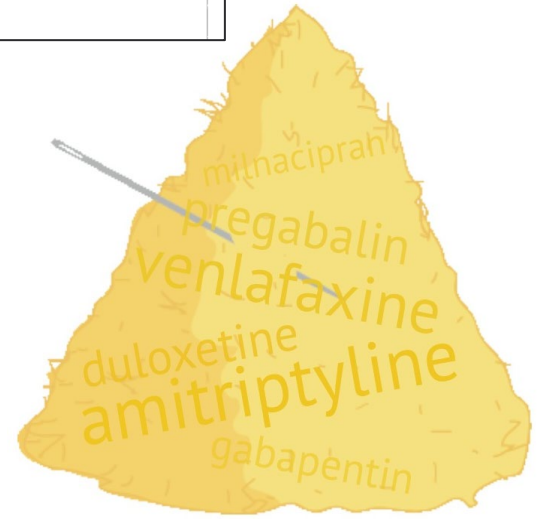
25



10,000s



# An Example ... Pharmacogenetic Testing



| ANTIDEPRESSANTS             |                                |                                   |
|-----------------------------|--------------------------------|-----------------------------------|
| USE AS DIRECTED             | MODERATE GENE-DRUG INTERACTION | SIGNIFICANT GENE-DRUG INTERACTION |
| desvenlafaxine (Pristiq®) ← | sertraline (Zoloft®) 1         | citalopram (Celexa®) 1,6          |
| levomilnacipran (Fetzima®)  | vilazodone (Viibryd®) 1        | escitalopram (Lexapro®) ✗ 1,6     |
| selegiline (Emsam®)         | bupropion (Wellbutrin®) 1,6    | fluoxetine (Prozac®) 1,6          |
|                             | mirtazapine (Remeron®) 3,7     | venlafaxine (Effexor®) 1,6        |
|                             | trazodone (Desyrel®) 3,7       | amitriptyline (Elavil®) 1,6,8     |
|                             | duloxetine (Cymbalta®) 3,7,8   | clomipramine (Anafranil®) 1,6,8   |
|                             | fluvoxamine (Luvox®) 3,7,8     | desipramine (Norpramin®) 1,6,8    |
|                             |                                | doxepin (Sinequan®) 1,6,8         |
|                             |                                | imipramine (Tofranil®) 1,6,8      |
|                             |                                | nortriptyline (Pamelor®) 1,6,8    |
|                             |                                | paroxetine (Paxil®) 1,6,8         |
|                             |                                | vortioxetine (Trintellix®) 1,6,8  |