

Pain Neuroimager Manifesto (v1.0)

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All pain is real, deeply personal, and profoundly complex. It transcends what can be seen and expressed. As neuroimaging scientists, our highest priority is understanding and alleviating the suffering of each individual. While we strive to listen to patients through every possible channel, neuroimaging allows us to hear their pain even when words fall short, but we must never forget that it offers only a partial glimpse into the intricate personal experience of pain and suffering.

1. Person-Centered Approach

- *All pain is real.* Every individual's expression of pain—whether verbal, behavioral, or otherwise—must be respected as the gold standard of their experience. Pain biomarkers, derived from neuroimaging, should enhance and complement personal reports, never override or replace them.
- Language and behavior can sometimes fall short in capturing pain, especially in cases of severe suffering. Neuroimaging-based biomarkers can help fill this gap, providing additional insights when patients struggle to express their pain.

2. Embracing Complexity

- *All pain is unique.* We acknowledge the degenerate nature of the brain's pain mechanisms, wherein multiple neural circuits can contribute to the experience of pain. This variability, combined with numerous internal, social, and environmental factors—both measurable and immeasurable—renders pain multifaceted and complex.
- Consequently, no single biomarker will ever serve as the "holy grail" of pain measurement. Instead, our objective is to develop multiple biomarkers that can complement and enrich subjective pain reports, providing a more comprehensive and nuanced understanding of the pain experience.

3. Rejecting Reductionism

- *All measures of pain are poor and impoverished representations of pain.* Pain is more than what any measure, be it a self-report or a neuroimaging scan, can capture. Therefore, our aim is not to reduce pain to a singular measurement but to enhance understanding through a *pluralistic* approach.
- What we object to is "reduction." Instead, we advocate for "addition" and "enrichment." By integrating language, behavior, neuroimaging, physiological, and genetic data, we seek to obtain more comprehensive and useful information, not to disprove or diminish anyone's pain.

4. Pursuing Pragmatism

- We believe that the extent to which we can measure pain from brain activity is an empirical question. By leveraging empirical findings, we pursue a pragmatic goal of developing clinically useful tools.
- While we recognize their limitations and acknowledge that pain cannot be fully reduced to what we measure, we also acknowledge the potential of using some pain measurements as a guide in our pragmatic approach to improving patient care.

5. Towards a Holistic Understanding

- We study pain to help those who suffer from it, yet each individual is always more than what we study.
- While our research often focuses on specific levels of analysis, we must remain mindful of the limitations inherent in each approach.
- To capture the multidimensional nature of pain, we must develop multiple biomarkers that reflect its many facets.
- Under no circumstances should pain biomarkers be used to dismiss, undermine, or replace an individual's self-report.