

# A Measure of the Relationship Between Pain Tolerability and Matters of Clinical Interest

John Mark Disorbio, EdD, Independent Practice • Daniel Bruns, PsyD, Health Psychology Associates • Dawn Jewell, PsyD, Health Psychology Associates • Alexander Bruns, Health Psychology Associates

The ability to tolerate pain is highly variable. Part of this variability relates to an ill-defined relationship between perceived pain severity and tolerability. Better understanding and assessment of the relationship between pain severity and tolerability may help provide new avenues for clinical intervention.

In an effort to determine whether a single metric can be developed that characterizes the relationship between pain severity and tolerability, the Pain Tolerance Index (PTI) was created. The PTI was initially defined using items included in the BBHI 2 and BHI 2 tests.<sup>1,2</sup> The BBHI 2 and BHI 2 both include a 0-10 numerical pain rating for most severe overall pain and separate 0-10 numerical pain ratings for each of 10 specific body areas. For calculation of the PTI, “Peak Pain” was defined as the highest rating among these 11 pain intensity items in the past month. The BBHI 2 and BHI 2 tests also ask the patient to identify the highest level of pain that could be tolerated and still permit functioning. This was described as “Maximum Tolerable Pain” level. The PTI was defined as Maximum Tolerable Pain minus Peak Pain.<sup>1,2</sup> Figure 1 graphically illustrates the conceptual basis for the PTI metric.

Thus, the PTI attempts to measure a construct linking perceived pain level and perceived pain tolerability. If valid, PTI may provide unique information about the relationship between pain and disability behaviors. The purpose of this study was to provide a preliminary assessment of the validity of PTI by comparing the relationships between this new metric and matters of clinical interest and by assessing if various at risk groups exhibited elevated levels of PTI.

## METHOD

777 adult patients with chronic, non-cancer pain, from pain clinics completed the Battery For Health Improvement 2 (BHI 2) test. The demographic characteristics of this group is listed in Table 1 Using 0-10 pain ratings from this test, PTI was defined as the patients’ perception of the maximum pain they could tolerate and still work, from which was subtracted the highest of all BHI 2 pain reports. This created a measure that ranged from -10 to +10, with higher numbers suggesting greater pain tolerance. IRB approval was received for this protocol.

## RESULTS

PTI scores were then assessed in relation to various risk factors using Chi-square. For patients with poor pain tolerance (defined as being below the PTI mean of -4), the odds ratio/significance level for other clinical concerns were as follows: perception of disability (6.100/.000), somatization (3.246/.000), depression (2.902/.000), suicidal ideation (2.632/.000), dysfunctional pain cognitions (2.533/.000), compensation focus (2.384/.000), anxiety (1.510/.043), and entitlement (0.922/.347) (Table 2).

## CONCLUSION

This study suggests that PTI is a meaningful construct, which is associated with higher risk of a number of matters of clinical concern. Possible treatment implications also exist for such individuals with a higher propensity for low pain tolerance and co-occurring health concerns.

FIGURE 1

Conceptual Definition of PTI

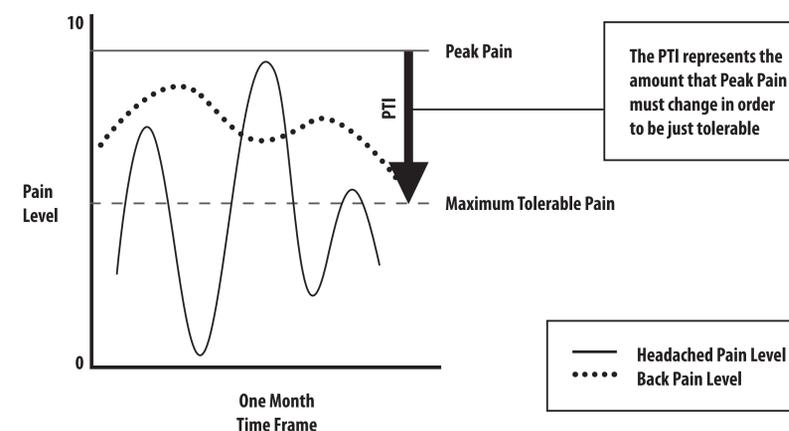


TABLE 1

### Demographics

|  | Pain Patients (n=777) |
|--|-----------------------|
| Percent White (vs. Nonwhite)           | 83.0                  |
| Percent Male                           | 43.8                  |
| Mean Age                               | 38.5                  |
| Percent High School Graduate or higher | 86.6                  |

TABLE 2

### Risk Factors Associated with Poor Pain Tolerance

| Group                         | Chi-square Likelihood Ratio | Odds Ratio | P    |
|-------------------------------|-----------------------------|------------|------|
| Perception of Disability      | 80.635                      | 6.100      | .000 |
| Somatization                  | 37.303                      | 3.246      | .000 |
| Depression                    | 28.440                      | 2.902      | .000 |
| Suicidal Ideation             | 16.607                      | 2.632      | .000 |
| Dysfunctional Pain Cognitions | 17.556                      | 2.533      | .000 |
| Compensation Focus            | 19.572                      | 2.384      | .000 |
| Anxiety                       | 3.339                       | 1.510      | .043 |
| Entitlement                   | 0.228                       | 0.922      | .347 |

## REFERENCES

1. Bruns D, Disorbio JM. *Battery for Health Improvement 2 Manual*. Minneapolis: Pearson; 2003.
2. Disorbio JM, Bruns D. *Brief Battery for Health Improvement 2 Manual*. Minneapolis: Pearson; 2002.