

The Effects of Therapeutic Exercise on Pain Experienced with Parkinson's Disease: A Systematic Review

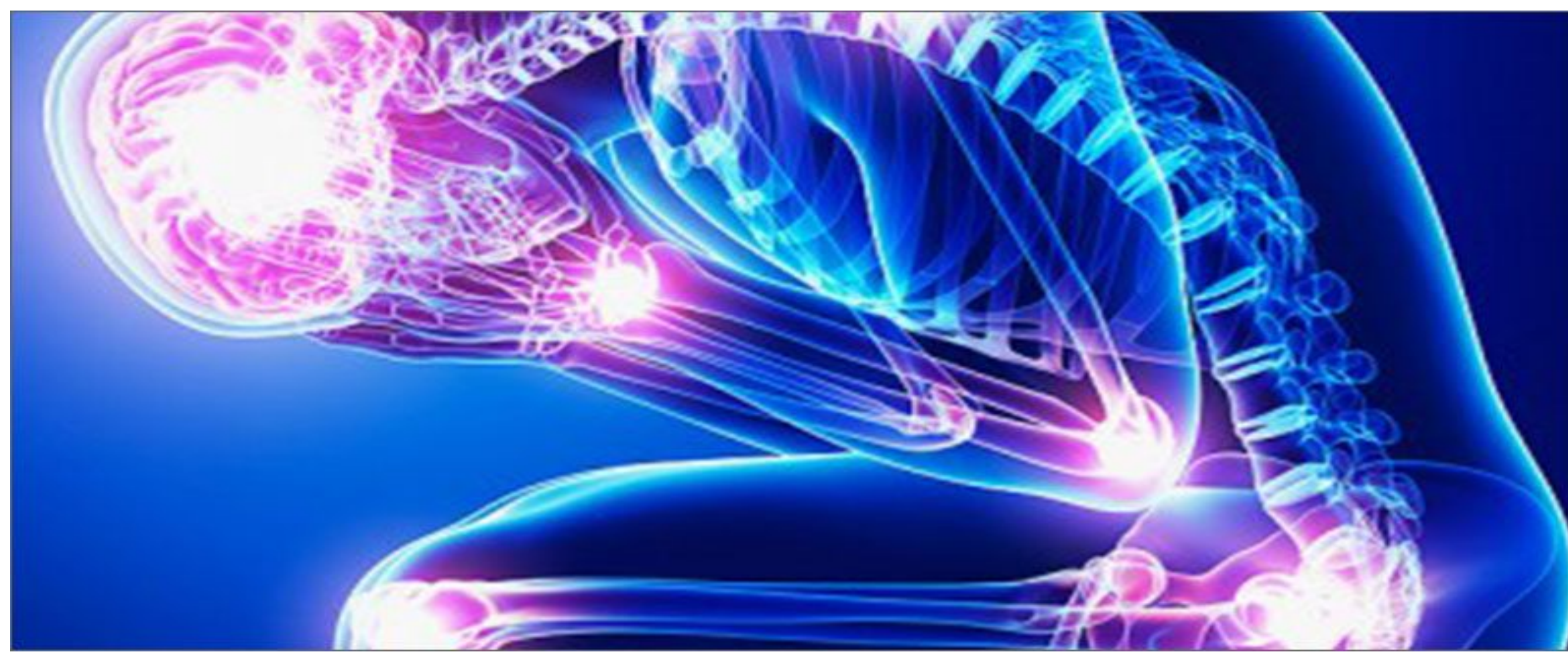
Erin Carroll, SPT, Emily Duncan, SPT, Scott Gravatt, SPT, Sarah McDonnell, SPT, Erica Brady, SPT, Corey Simon, DPT, PhD, Jeffrey Hoder, PT, DPT, NCS

Background

Parkinson's disease (PD) is the second most prevalent neurodegenerative disease globally and is characterized by incapacitating motor and cognitive symptoms. Along with these symptoms, roughly 30-70% of individuals diagnosed with Parkinson's disease experience **pain**. However, despite it's high prevalence, a paucity of research exists for pain in this population; including the efficacy of exercise interventions for pain.

Purpose

To systematically appraise available PD research on exercise for pain relief, and to subsequently identify gaps to inform future study.



<https://herb.co/marijuana/news/better-pain-relief-thc-cbd>

Methods (Eligibility)

- Inclusions**
 - Exercise intervention was performed on patients with PD
 - Exercise group was compared to no exercise or standard of care
 - Outcome of reduced pain following exercise
- Exclusions**
 - Animal studies
 - Studies not in the English language
 - Studies other than randomized control trials
- Further Effects**
 - Improved motor symptoms of PD
 - Cognitive performance
 - Apathy, motivation
 - Sleep
- Systematic Search**
 - MEDLINE
 - Embase
 - Scopus
 - CINAHL
 - Web of Science

Methods (Extraction)

- Two authors independently reviewed titles, abstracts, and full text articles for study eligibility. A third blinded author reviewed the data from both authors to determine study inclusion or exclusion.
- Included studies were then assessed using the Modified Downs and Black checklist (MDB), which determines methodological quality of reporting, external validity, internal validity, and statistical power. Based on the MDB, studies were classified as poor, fair, good, or excellent.

Results

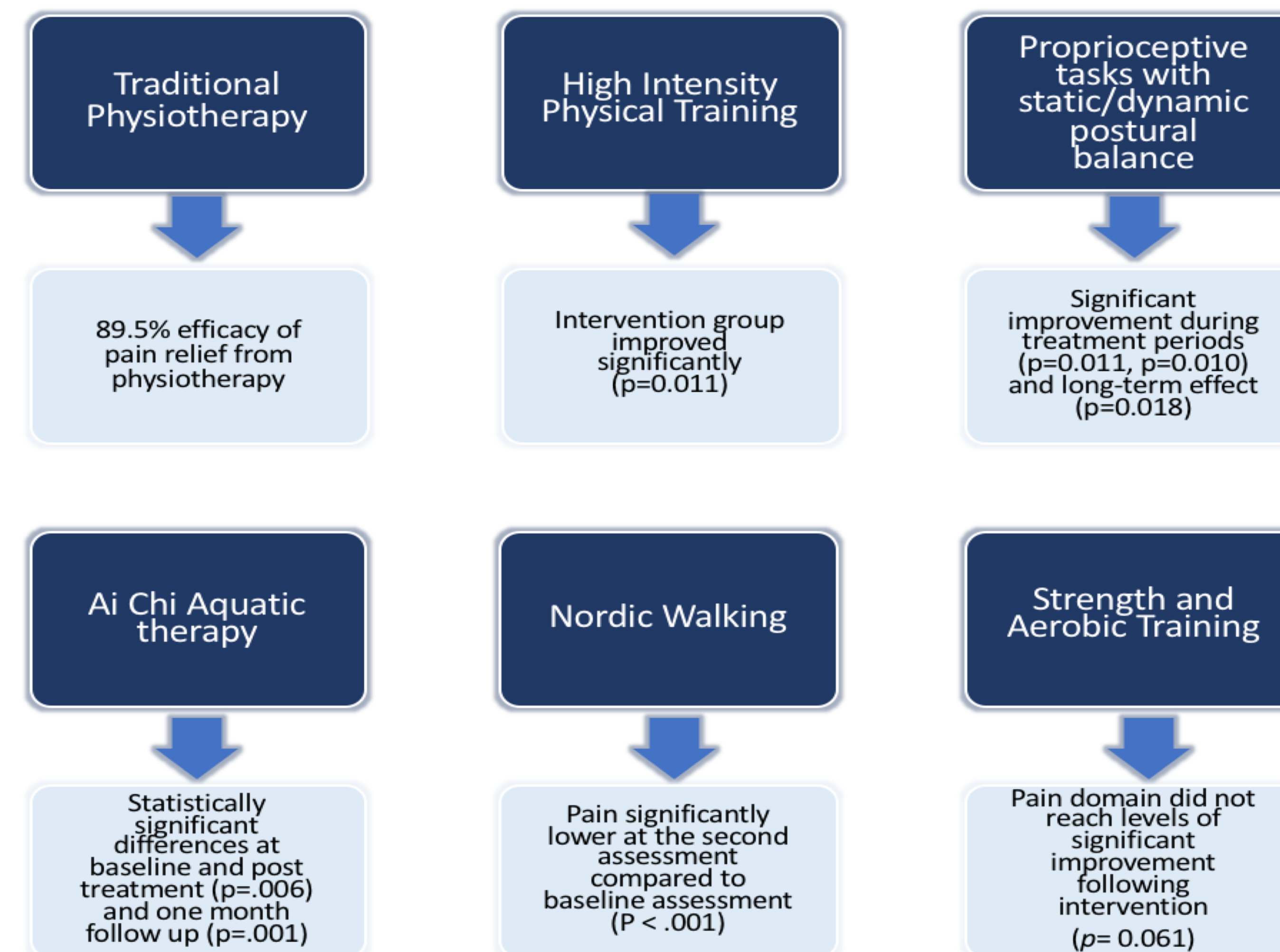


Figure 1: Mode of intervention and results of 6 eligible studies.

- Of the 638 articles extracted, **6** met study eligibility (Fig.1).
- 4/6 studies showed improvements ($p < .05$) in pain reduction after interventions (within group), or compared to a control group (between group).
- Studies primarily investigated immediate and short-term effects.
- Across studies, types of PD pain was not specified (Fig. 2).
- Studies also demonstrated lack of uniformity in exercise parameters and pain outcome measures; with only 2/6 studies using pain as the primary outcome measure.
- Qualitative assessment revealed one study to be rated as fair while the remainder were rated as poor. Primary limitations were lack of internal validity and poor statistical power.



<https://www.consumerreports.org/exercise-fitness/tai-chi-benefits-your-heart/>

Conclusions

- The majority of appraised studies found pain reduction immediately following exercise interventions for participants with PD pain.
- However, limitations in current evidence include variability in exercise parameters and pain outcomes, as well as suboptimal study quality.
- Recommendations for future studies:
 - Specificity to PD pain types (Fig. 2)
 - Standardized exercise parameters
 - Standardized, primary pain outcome measures

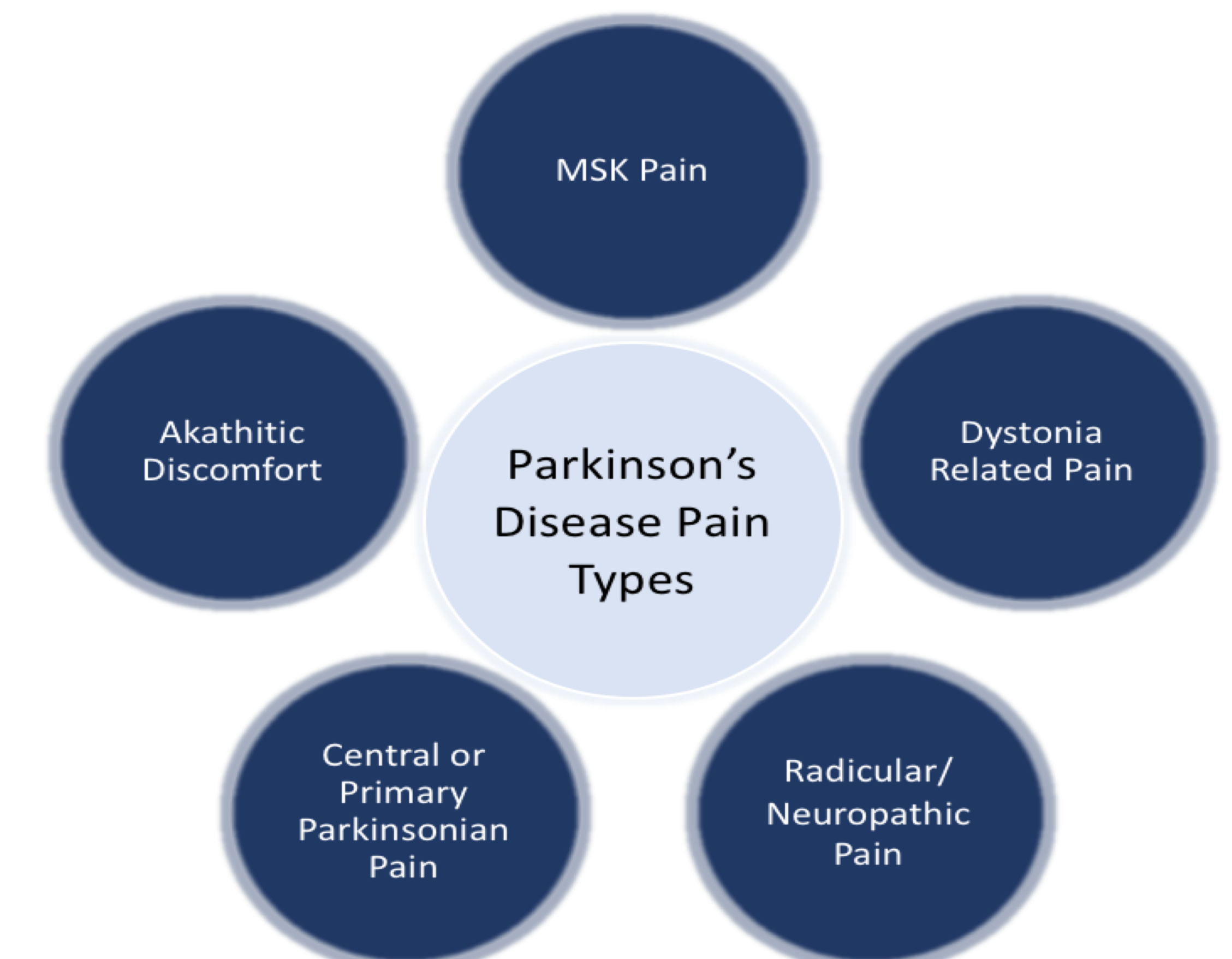


Figure 2: PD Pain Types (Adapted from Ford 2010, Mov Dis 25(S1))

Clinical Relevance

Current research suggests the potential for immediate pain reduction among patients with PD pain. However, clinicians should scrutinize the current literature based on the high variability in exercise parameters. Moreover, clinicians need to closely monitor patients for longer-term effects, which have not been substantiated scientifically.

*References available upon request.