



4th INTERNATIONAL FORUM ON
HIV AND REHABILITATION RESEARCH & INTERSECTORAL POLICY DIALOGUE

**Translating Evidence on HIV, Aging, and Rehabilitation into Practice:
Advancing Research, Practice and Policy for Healthy Aging**

Research Panel Evidence Session 2B
Implementing HIV, Aging, and Rehabilitation Intervention
Research into Practice – Exercise and Wellness Interventions

Can Yoga Help Manage Chronic Pain in PLHIV?



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Chronic Pain in PLHIV

- Prevalence estimates of chronic pain in PLHIV range from 39% to 55%
- Concurrent psychiatric illness → 40% more likely to have pain
- Concurrent substance abuse → higher pain severity and disruption of daily function

Merlin, J. S., Zinski, A., Norton, W. E., Ritchie, C., Saag, M. S., Mugavero, M. J., . . . Hooten, W. M. (2013). A conceptual framework for understanding chronic pain in patients with HIV. *Pain Practice, 14*(3), 207-216.

Miaskowski, C., Penko, J. M., Guzman, D., Mattson, J. E., Bangsberg, D. R., & Kushel, M. B. (2011). Occurrence and characteristics of chronic pain in a community-based cohort of indigent adults living with HIV infection. *Journal of Pain, 12*(9), 1004-1016.

Tsao, J. C., & Soto, T. (2009). Pain in persons living with HIV and comorbid psychologic and substance use disorders. *Clinical Journal of Pain, 25*(4), 307-312

Tsao, J. C., Dobalian, A., & Stein, J. A. (2005). Illness burden mediates the relationship between pain and illicit drug use in persons living with HIV. *Pain, 119*(1-3), 124-132.

Chronic Pain in PLHIV

- Associated with decreased quality of life
- Often underestimated and undertreated
- PLHIV and pain → 87% less likely to be adherent to ART

Multifactorial Etiology of Chronic Pain in PLHIV

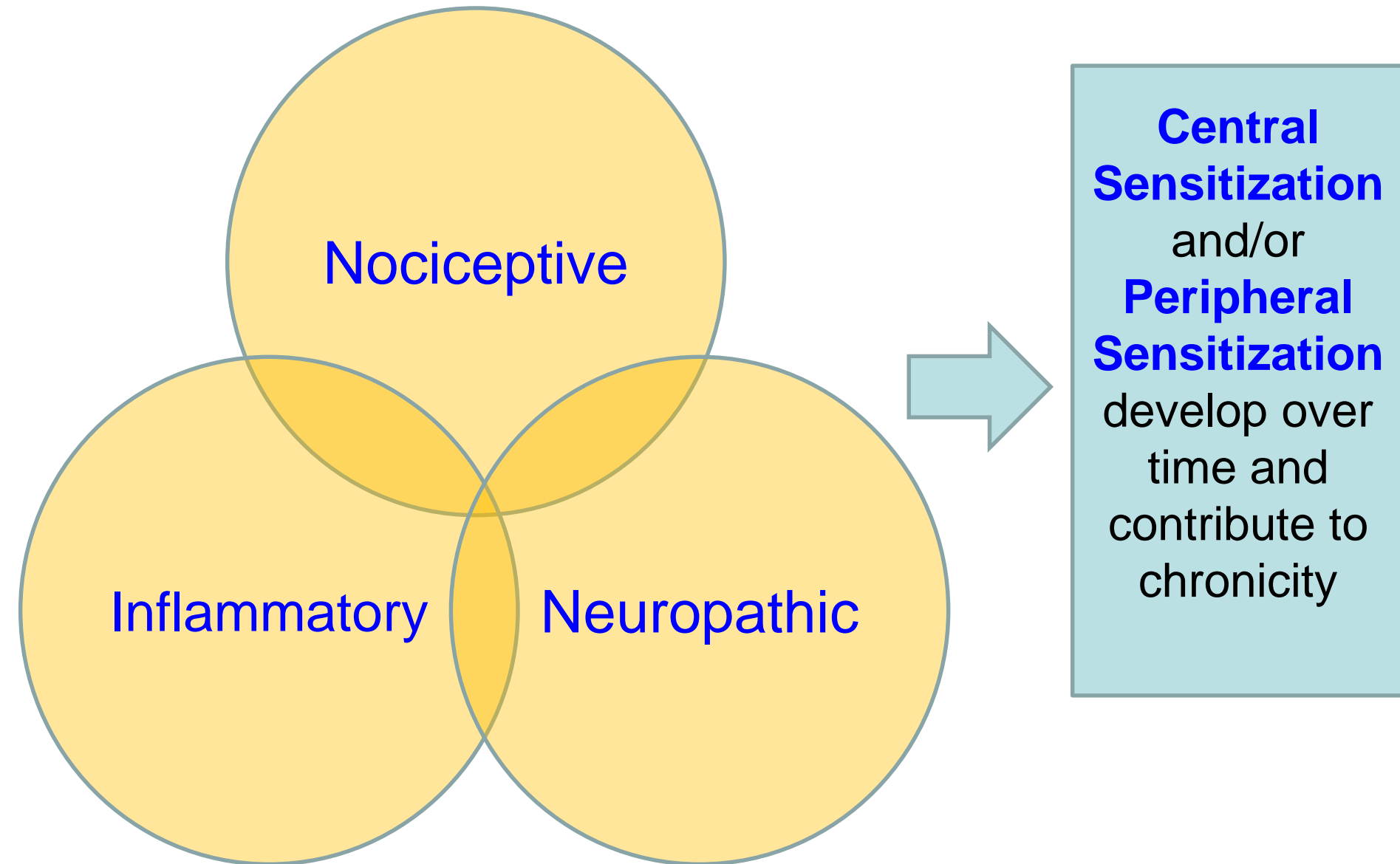
- **Aging / Frailty**
- Direct effects of HIV infection
- Chronic inflammation and immune activation
- Side-effects of ART drugs or other drugs
- Neurologic mechanisms
- Comorbidities / Multi-morbidity
- Opportunistic infections
- Psychosocial influences
- Prescription opioid misuse and heroin use
- Gender and ethnic differences in perception & expression of pain

Frich, L. M., & Borgbjerg, F. M. (2000). Pain and pain treatment in AIDS patients: a longitudinal study. *Journal of Pain & Symptom Management*, 19(5), 339-347.

Knowlton, A. R., Nguyen, T. Q., Robinson, A. C., Harrell, P. T., & Mitchell, M. M. (2015). Pain Symptoms Associated with Opioid Use among Vulnerable Persons with HIV: An exploratory study with implications for palliative care and opioid abuse prevention. *Journal of Palliative Care*, 31(4), 228-233.

Merlin, J. S. (2015). Chronic Pain in Patients With HIV Infection: What Clinicians Need To Know. *Topics in Antiviral Medicine*, 23(3), 120-124.

Types of Chronic Pain (Biological Sources)



Merlin et al. (2013) Prospective cohort, N=1,903

Pain independently associated with increased odds of impairment in 3 domains of physical function

- **Mobility** (aOR 10.5)
- **Self-care** (aOR 4.1)
- **Usual activities** (aOR 5.4)



Risk Factors for *Disability* Associated with Chronic Pain

- **Age**
- Anxiety
- Catastrophizing
- Compensation dependency
- Functional limitations
- Depression
- Fear-avoidance behaviors
- High levels of initial pain
- Poor Health

Chronic Pain in PLHIV:
10X > odds of impaired
physical function and
disability

Hanass-Hancock, J., Myezwa, H., & Carpenter, B. (2015). Disability and living with HIV: Baseline from a cohort of people on long term ART in South Africa. *PLOS ONE*. DOI:10.1371/journal.pone.0143936.

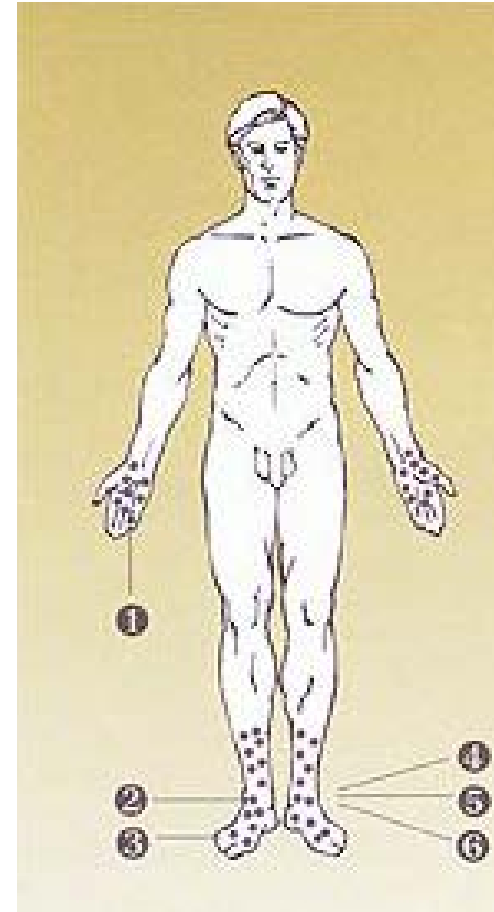
Lucey, B. P., Clifford, D. B., Creighton, J., Edwards, R. R., McArthur, J. C., & Haythornthwaite, J. (2011). Relationship of depression and catastrophizing to pain, disability, and medication adherence in patients with HIV-associated sensory neuropathy. *AIDS care*, 23(8), 921-928.

Merlin, J. S., Westfall, A. O., Chamot, E., Overton, E. T., Willig, J. H., Ritchie, C., . . . Mugavero, M. J. (2013). Pain is independently associated with impaired physical function in HIV-infected patients. *Pain Medicine*, 14(12), 1985-1993.

O'Brien, K. K., Solomon, P., & Bayoumi, A. M. (2014). Measuring disability experienced by adults living with HIV: assessing construct validity of the HIV Disability Questionnaire using confirmatory factor analysis. *BMJ Open*, 4(8), e005456.

Distal Sensory Polyneuropathy (DSP)

- The most common neurological comorbidity in PLHIV
- Prevalence: 30-60% in PLHIV
- Bilateral involvement of the extremities
- Clinical presentation:
 - **Painful night cramps**
 - **Burning pain**
 - **Paresthesias and/or numbness**
 - Decreased deep tendon reflexes at the ankle
 - Decreased sensation
 - Usually without significant strength loss
 - No significant range of motion deficits



Dworkin, R. H., et al. 2003. *Arch Neurol*, 60(11), 1524-1534.

Martin, C., Pehrsson, P., Osterberg, A., Sonnerborg, A., & Hansson, P. (1999). *CMA*, 10(3)101-106

Moore, R. D. et al. (2000). *AIDS*, 14(3), 273-278.

Wulff et al. HIV: Advances in research and therapy, Dec 1998. http://www.iapac.org/clinmgt/cns/wulff_hart83.html. Accessed, Nov. 1999

What **DOESN'T** work for management of chronic pain



Opioid “Pain Killers” are NOT efficacious for chronic pain, and pose a risk of:

Side-effects

Dependency

Addiction

Overdose

Paradoxical hyperalgesia

Synergistic effect with ETOH

Drug-drug interactions

YOGA FOR PERSONS WITH HIV-RELATED NEUROPATHY: A CASE SERIES

Kietrys, Galantino, Logan, Gould-Fogerite, O'Brien, Cohen, Jermyn, & Parrott
(2018). *Rehabilitation Oncology*, 36(2), 123-131.



Inclusion Criteria

- Age 18-65 years, HIV+ with controlled HIV disease status
- Clinical diagnosis of DSP in the feet
- Average foot pain at least 4/10
- Stable pharmacologic management of pain
- Able to ambulate independently for 6 minutes

Exclusion Criteria

- Current opportunistic infection
- Dementia
- Diabetes
- Open wounds or sores on feet
- Medical conditions that would impair ability to participate in yoga
- Unable to read or write in English
- Pregnancy
- Practice of yoga within past 6 months

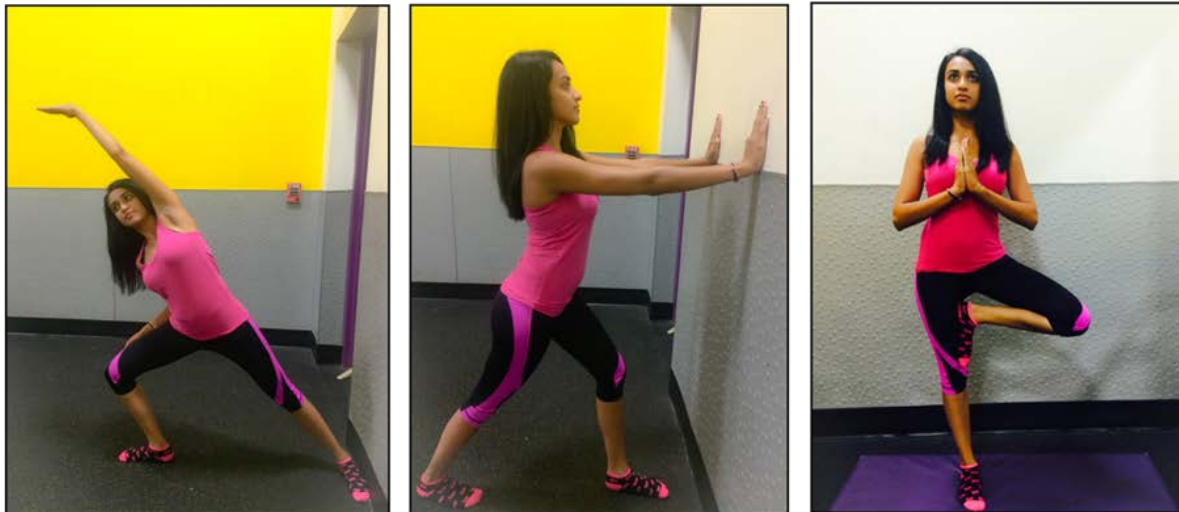
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Yoga Intervention

- 4 weeks of twice-weekly 90 minute yoga classes
 - Yoga philosophy (10 minutes)
 - Pranayama (breathing exercises) (10 minutes)
 - Asana (postures) (50 minutes)
 - Relaxation (10 minutes)
 - Meditation (10 minutes)
- home practice on non-class days



Examples of asanas used: Extended Side Angle Pose (left); Runner's Stretch (center); Tree Pose (right)

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Outcomes

(measured at baseline, after 4 weeks of intervention and at 4 week follow up)

- **Brief Pain Inventory**
 - Pain Severity
 - Pain Interference
- **MOS-HIV** (QOL self-report questionnaire)
 - Physical Health Summary Score
 - Mental Health Summary Score
 - Pain-related QOL sub-score
- **Lower Extremity Functional Scale**
- **WHO-DAS** (self-reported disability questionnaire)

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Outcomes

(measured at baseline, after 4 weeks of intervention and at 4 week follow up)

- **5 Time Sit-to-Stand test** (lower extremity strength)
- **Multi-directional Reach Test** (balance)
- **Six-Minute Walk Test** (endurance)
- **GAITRite data** (temporal and spatial characteristics of gait)

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Case 1: 56 yo male; HIV+ for 15 years; DSP for 7 years

Case 2: 64 yo male; HIV+ for 30 years; DSP for 10 years

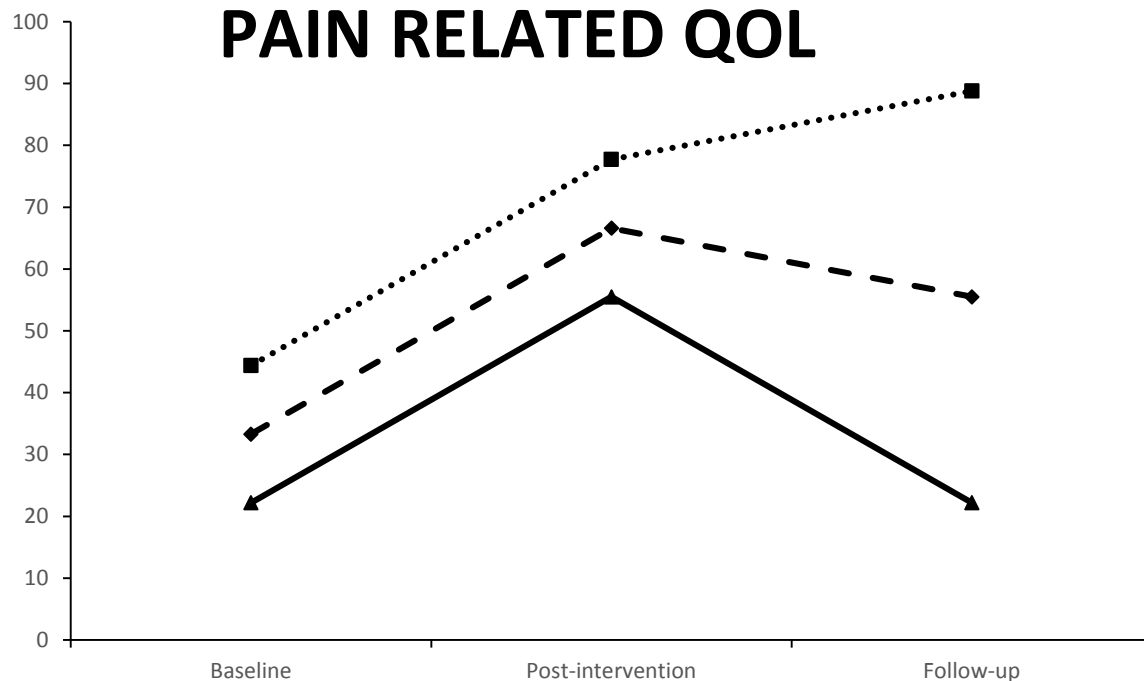
Case 3: 56 yo male; HIV+ for 28 years; DSP for 15 years

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- Case 1: dashed line**
- Case 2: dotted line**
- Case 3: solid line**



All cases improved by >10% after 4 weeks of yoga

Sustained improved at follow up in 2 cases.

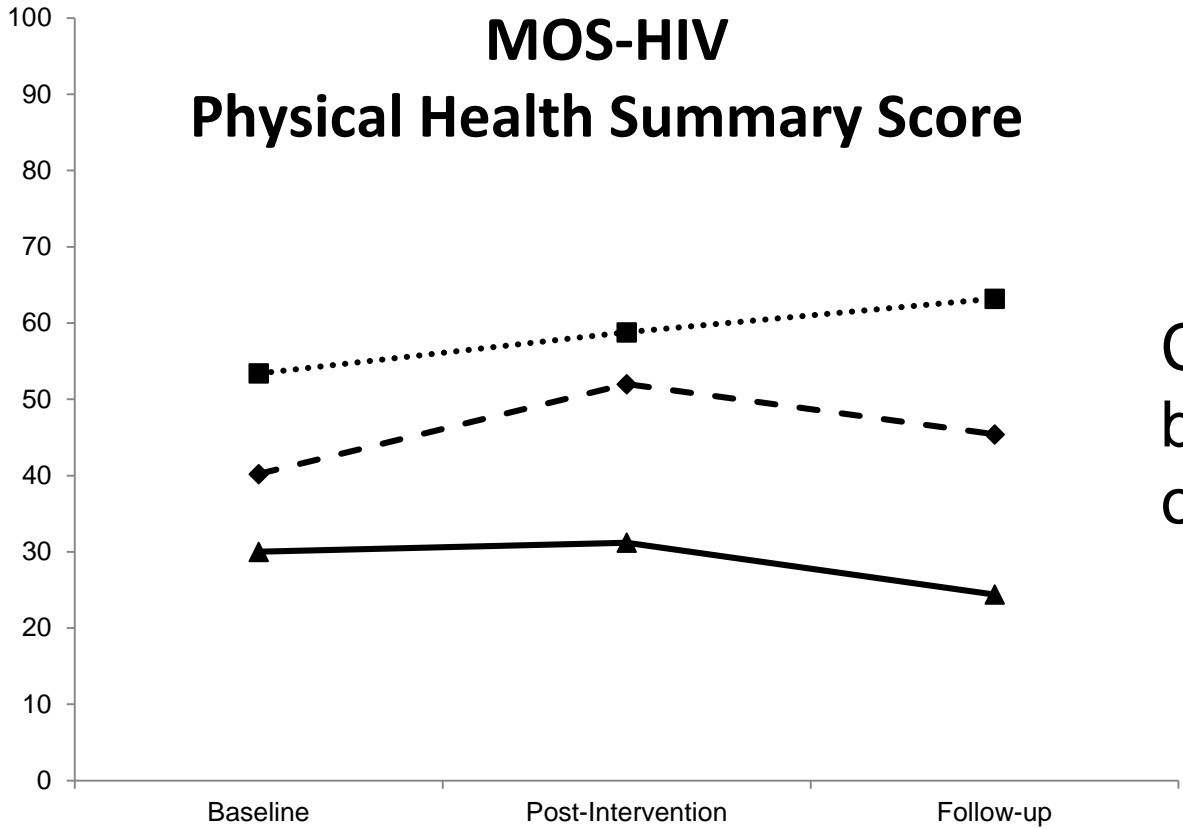
Only Case 2 had meaningful decreases in pain severity and pain interference.

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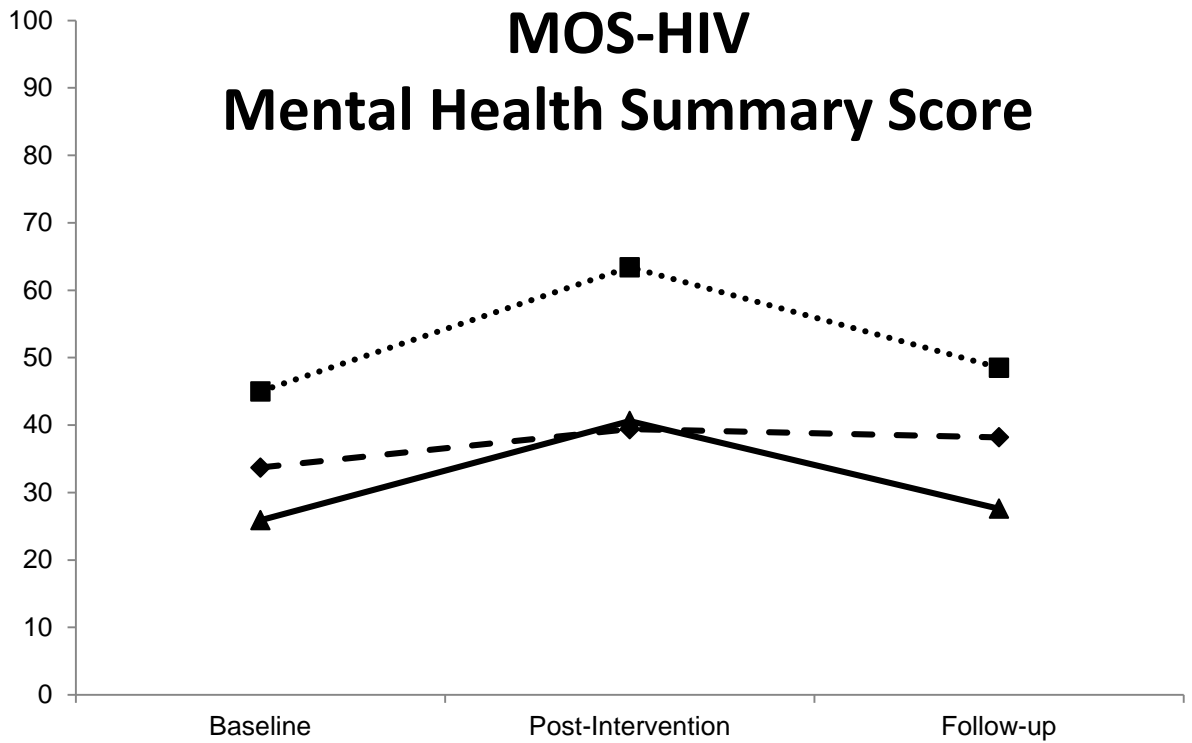
Case 1 improved by >10% after 4 weeks of yoga.

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Case 2 and Case 3 improved by >10% after 4 weeks of yoga.

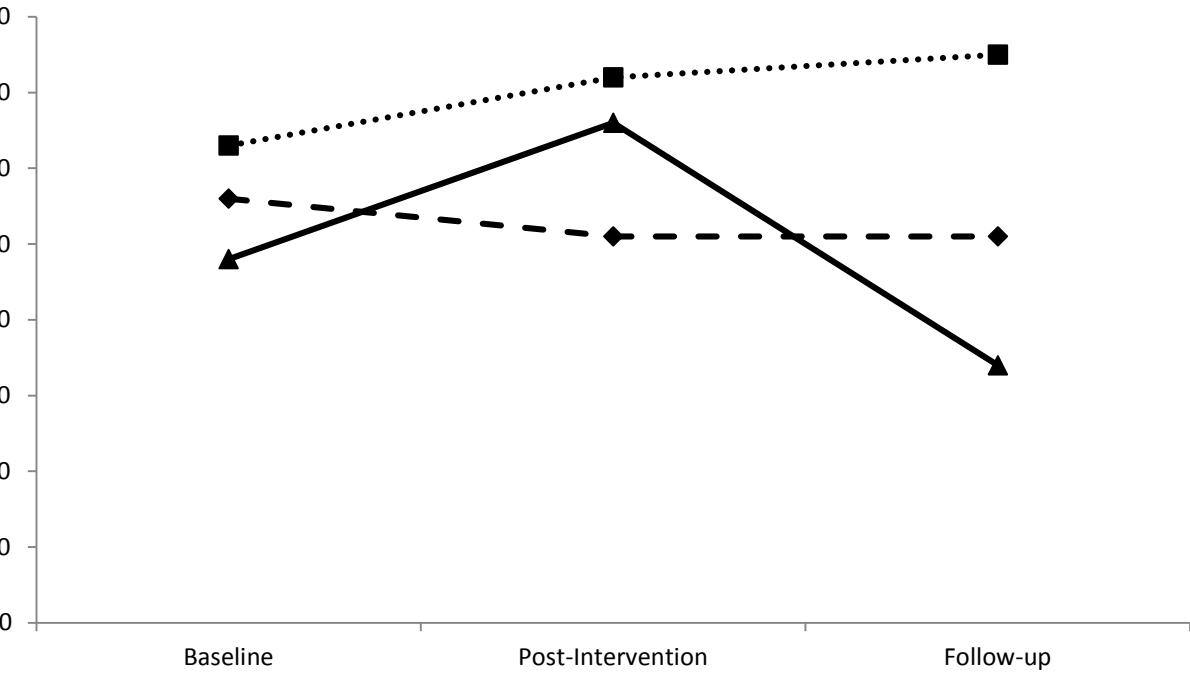
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Lower Extremity Functional Scale Score



Case 2 had clinically meaningful improvement at follow up.

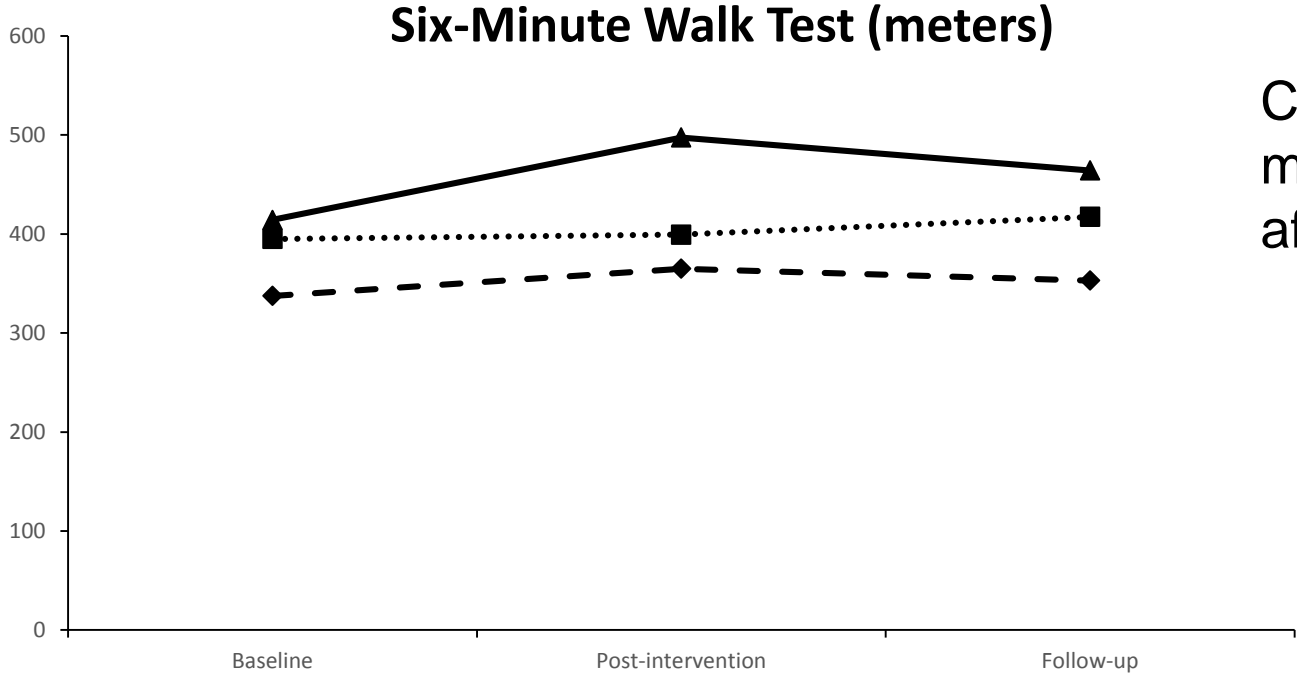
Case 3 had clinically meaningful improvement after 4 weeks of yoga.

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- Case 1: dashed line**
- Case 2: dotted line**
- Case 3: solid line**



Case 3 had clinically meaningful improvement after 4 weeks of yoga.

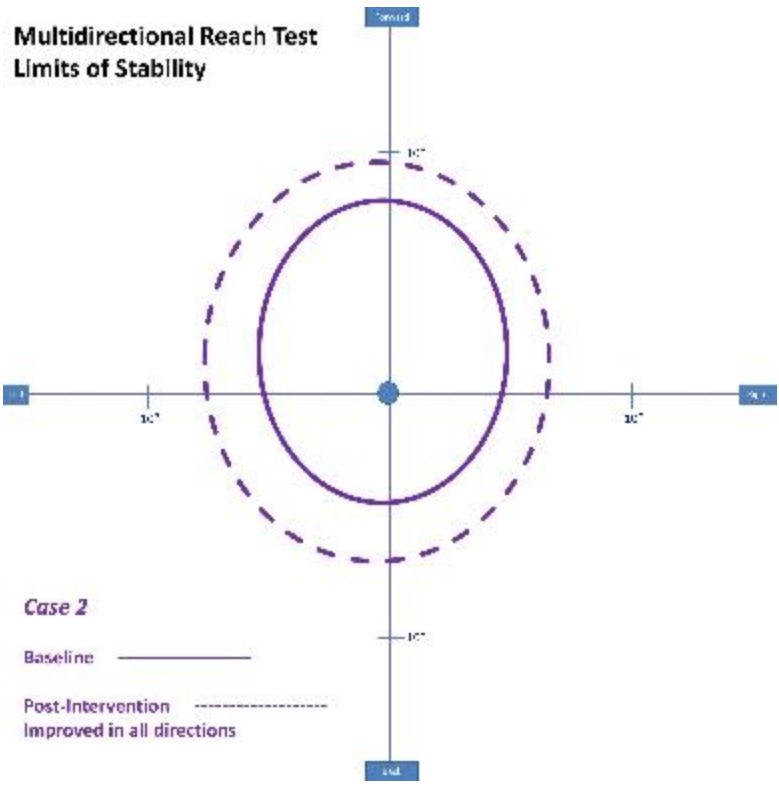
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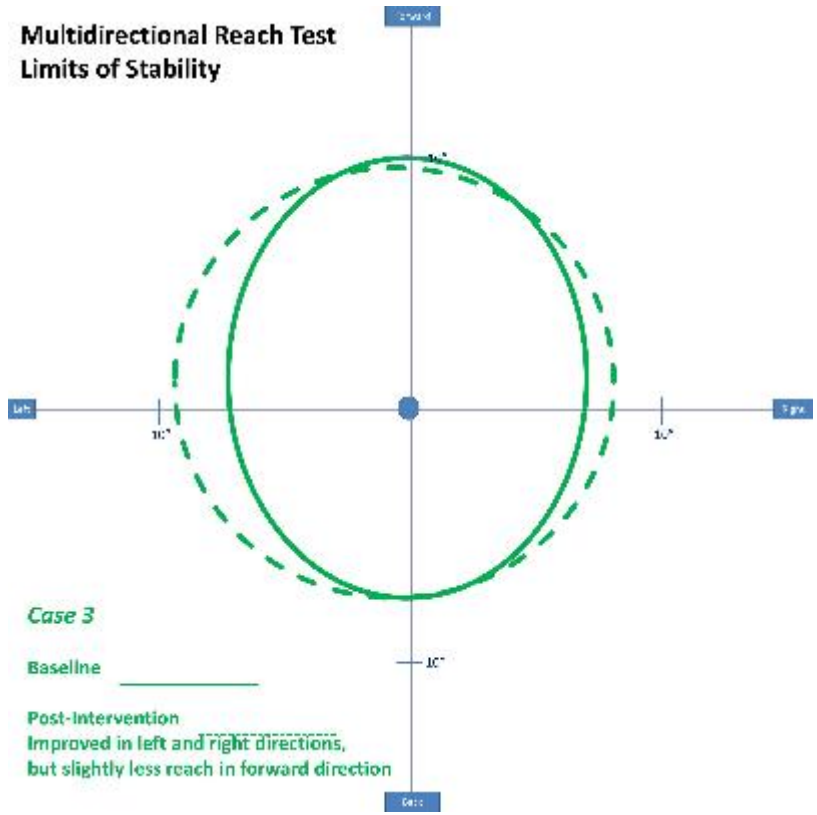


Case 1: No improvement (not shown)

Case 2: Improved in all directions



Case 3: Improved in left and right directions



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All cases improved in several gait parameters
after 4 weeks of yoga

Percent change:

| | Stride Length | Walking Velocity | Double limb support time |
|--------|----------------------|-------------------------|---------------------------------|
| Case 1 | 7.0% | 7.3% | -5.6% |
| Case 2 | 3.7% | 2.6% | -2.9% |
| Case 3 | 11.6% | 20.8% | -2.3% |



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Conclusions

The yoga program appeared to be safe and feasible for the 3 participants.

Participants viewed it as a favorable experience.

Outcomes were inconsistent across cases, but all experienced improvements in:

- pain-related QOL
- certain gait characteristics

