

# Optical Coherence Tomography (OCT) Measures are Associated with Patient Self-reported Vision Scores in

## Persons with Multiple Sclerosis (MS)

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### Objective:

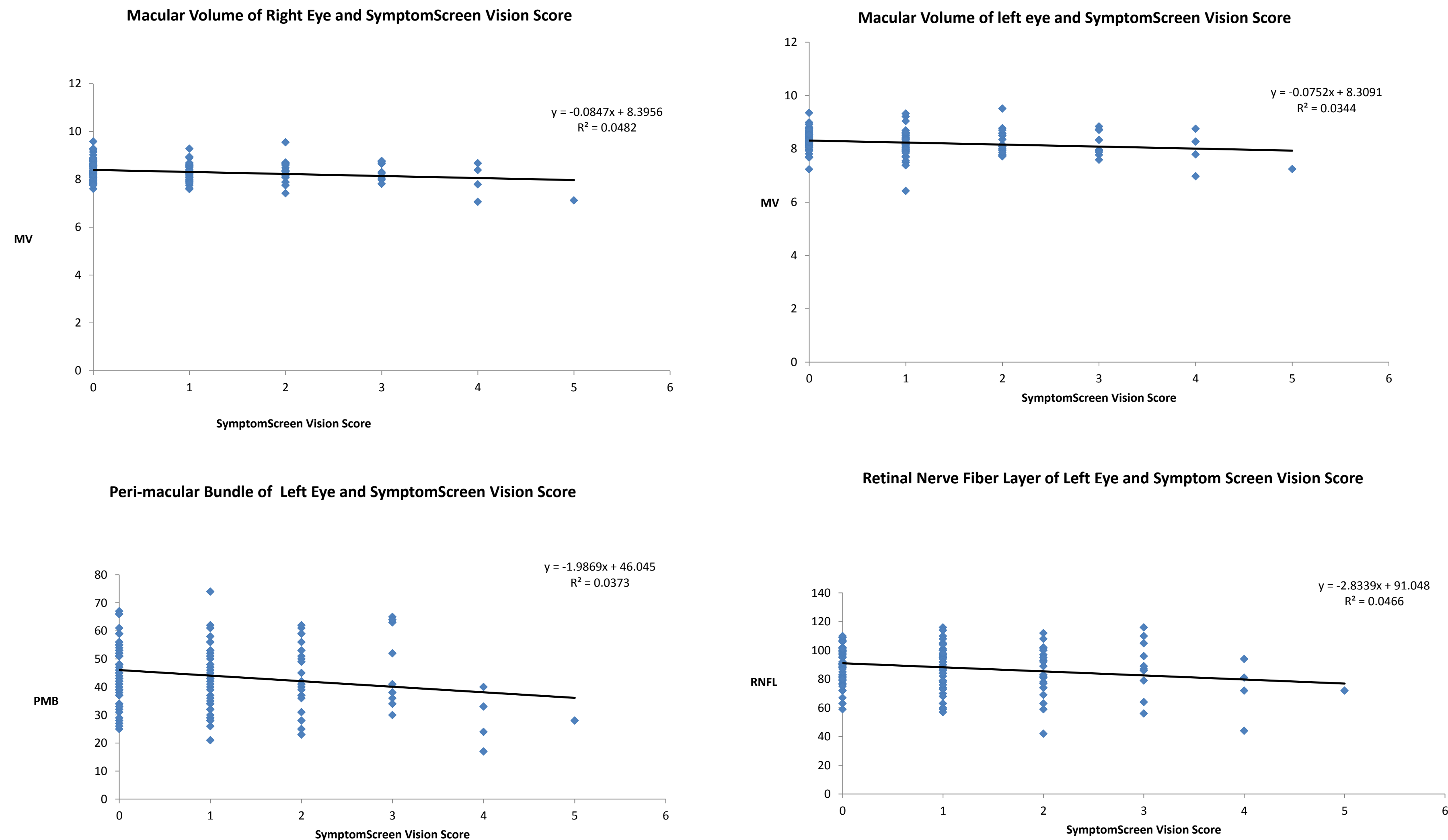
To assess for a relationship between an objective measure such as optical coherence tomography (OCT) and patient-reported vision scores extracted from symptoMScreen, a novel and validated MS symptom severity scale.

### Background:

Thinning of the Retinal Nerve Fiber Layer (RNFL)<sup>1</sup> and Peri-Macular Bundle (PMB), and a decrease of Macular Volume (MV)<sup>2</sup> are seen on OCT measure in patients with multiple sclerosis (MS). However OCT is not readily available. It would be helpful to have a self report measure that correlates with an objective measure such as the OCT.

### Results:

139 patients with clinician-confirmed MS participated in this study. MV of the right eye and left eye, and RNFL and PMB of the left eye were significantly predicted by self-reported vision.



### Demographics

Characteristic	Result
N	139
Percent female	77
Age Avg (St. Dev)	45.4 (10.92)
Disease Duration Avg (St. Dev)	11.50 (8.50)
Percent RRMS	85
Average SymptomScreen Vision Score	0.96

Please circle one number that best describes how each MS symptom has affected your everyday life activities. For example, if it takes you longer to type or text, your hand function may have a 'mild limitation' (circle '2'), but if you gave up typing or texting completely, your hand function may have a 'severe limitation' (circle '4').

	0 - not affected at all	1 - very mild limitation/ I make minor adjustments	2 - mild limitation/ I make frequent adjustments	3 - moderate limitation/ I reduced my daily activities	4 - severe limitation/ I gave up some activities	5 - very severe limitation/ I'm unable to do many daily activities	6 - total limitation/ I'm unable to do most daily activities
Walking	0	1	2	3	4	5	6
Hand function/Dexterity Poor hand coordination, tremors	0	1	2	3	4	5	6
Spasticity & Stiffness Muscle cramping or muscle tightness	0	1	2	3	4	5	6
Bodily pain Aches, tenderness	0	1	2	3	4	5	6
Sensory Numbness, tingling, or burning	0	1	2	3	4	5	6
Bladder control Urinary urgency, frequency	0	1	2	3	4	5	6
Fatigue	0	1	2	3	4	5	6
Vision Blurry vision, double vision	0	1	2	3	4	5	6
Dizziness Feeling off balance, 'spinning'/vertigo	0	1	2	3	4	5	6
Cognitive function Memory, concentration problems	0	1	2	3	4	5	6
Depression Depressed thoughts, low mood	0	1	2	3	4	5	6
Anxiety Feelings of stress, panic attacks	0	1	2	3	4	5	6

1. Have you fallen since your last visit (please circle one)? YES NO If yes, how many times? \_\_\_\_\_

2. In general, how would you rate your health today (please circle one)? Very good Good Moderate Bad Very Bad

3. Overall, how does your health today compare to your last visit? Same Better Worse Unable to answer

Optional comments about your MS symptoms: \_\_\_\_\_

The regression on MV of the right eye yielded the strongest and most significant regression equation  $F(5, 133) = 2.83, p < .05, R^2 = .10$ . Of the regression variables, only the vision domain ( $\beta = -.21$ ) added statistical significance to the prediction,  $p < .05$ .

### Conclusion:

Worse self-reported vision predicted lower values for OCT data, representative of the adverse ophthalmic changes that accompany demyelinating disease. Findings were most significant for MV of OD. Overall, though statistically significant, the relationship between self-reported vision and OCT measures was modest. Future studies utilizing larger cohorts and inclusion of fundoscopic examination would be useful.

References: 1- Feng, Liguio, et al. "The evaluation of the retinal nerve fiber layer in multiple sclerosis with special-domain optical coherence tomography." *Ophthalmologica* 230.3 (2013): 116-120. 2-Burkholder, Bryn M., et al. "Macular volume determined by optical coherence tomography as a measure of neuronal loss in multiple sclerosis." *Archives of neurology* 66.11 (2009): 1366-1372.

### Methods:

- OCT exams and symptoMScreen (above, left), were administered to consecutive MS patients at our center.
- Exclusion criteria included relapse within the last 3 months, diabetes, amblyopia, glaucoma, ocular hypertension, angle closure, and disc hemorrhage. RNFL, PMB, and MV data was extracted from OCT reports.
- A multiple linear regression was performed to control for the effects of age, gender, disease duration, and MS sub-type on significant correlations between symptoMScreen vision scores and OCT data.