

Fiona Stuart, BA, Alicia Chua, MS, Allison LaRussa, BA, Kaitlynn LeClaire, BA, Sandra Cook, BSN, Bonnie I. Glanz, PhD, Brian C. Healy, PhD
Partners Multiple Sclerosis Center, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Background

- The introduction of oral disease-modifying therapies (DMTs) for multiple sclerosis (MS) has presented patients with a new mode of therapy administration
- Clinical trials have demonstrated similar efficacy among injectable and oral DMTs
- Patient treatment satisfaction may contribute to treatment adherence, which can affect clinical outcomes in MS

Objective

- To investigate the differences in treatment satisfaction among MS patients taking DMTs through injectable, infusion, and oral DMT routes, as well as differences among the individual DMTs interferon beta-1a intramuscular (IFN β -1a IM), interferon beta-1a subcutaneous (IFN β -1a SC), glatiramer acetate (GA), natalizumab (NTZ), fingolimod (FTY), and dimethyl fumarate (BG-12)

Methods

Participants

- Patients participating in the CLIMB study (Comprehensive Longitudinal Investigation of Multiple Sclerosis at Brigham and Women's Hospital), an ongoing observational study collecting data since the year 2000
- A subgroup of CLIMB participants complete patient-reported outcomes (PROs) biennially, including the Treatment Satisfaction Questionnaire for Medication (TSQM)
- The TSQM is a 14-item PRO measuring four summary scores: effectiveness, side effects, convenience, and overall satisfaction

Demographics

- 377 patients were included in analyses, of whom 215 were treated with injectable DMTs, 51 with the infusion DMT, and 111 with oral DMTs (see Table 1)
- 84.9% of patients had RRMS, 10.9% had SPMS or PPMS

Table 1. Demographic characteristics of study subjects

	N	377
Age (years, (SD))	47.51 (11.39)	
Male (n, %)	107 (28.38)	
Race (n, %)		
White	355 (94.16)	
Black	11 (2.92)	
Asian	2 (0.53)	
More than one race	7 (1.86)	
Unknown/unreported	2 (0.53)	
Ethnicity (n, %)		
Hispanic or Latino	14 (3.71)	
Not Hispanic or Latino	363 (96.29)	
Disease category (n, %)		
Relapsing-remitting MS	320 (84.88)	
Primary progressive MS	2 (0.53)	
Secondary progressive MS	39 (10.34)	
Progressive relapsing MS	7 (1.86)	
Clinically isolated syndrome	9 (2.39)	
Disease duration (years, (SD))	14.56 (8.10)	
EDSS at questionnaire (median, (IQR))	1.5 (1.5)	

Statistics

- Analyzed responses to the TSQM
- Multivariable models were used to compare treatment satisfaction across all DMTs
- Multiple linear regression models were also used to compare treatment satisfaction between patients treated with injectable, infusion, and oral DMT categories
- All models were adjusted for race, sex, age, disease duration, and disease category

Results

Table 2. Mean (SD) TSQM Domain scores by medication route

	Oral	Injectable	Infusion
N	111	215	51
Side effects, n	36	119	11
TSQM Domains (mean, (SD))			
Effectiveness	72.05 (19.54)	74.63 (19.65)	72.77 (20.22)
Side effects	74.65 (20.64)	79.88 (15.36)	71.59 (14.89)
Convenience	88.23 (16.76)	68.68 (17.69)	70.04 (19.97)
Overall satisfaction	75.52 (22.85)	76.24 (20.93)	74.89 (19.18)

- There were no significantly different mean scores for overall satisfaction, effectiveness, and presence of side effects among patients taking oral, injectable, and infusion DMTs (Table 2)
- Patients taking oral DMTs reported this medication route as significantly more convenient as compared to scores obtained from patients taking injectable and infusion DMTs (Figure 1)

Figure 1: TSQM Convenience domain across DMT routes

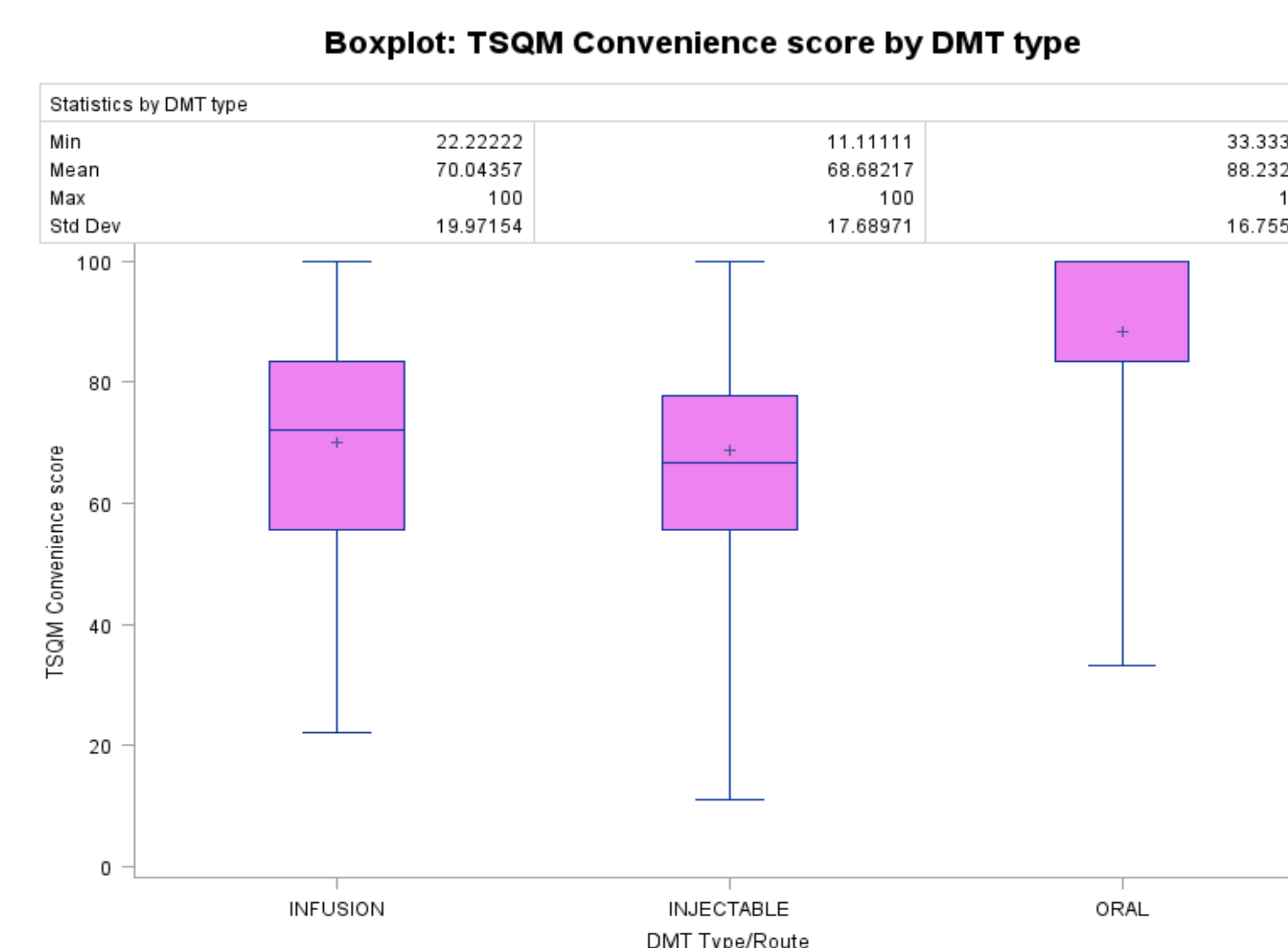
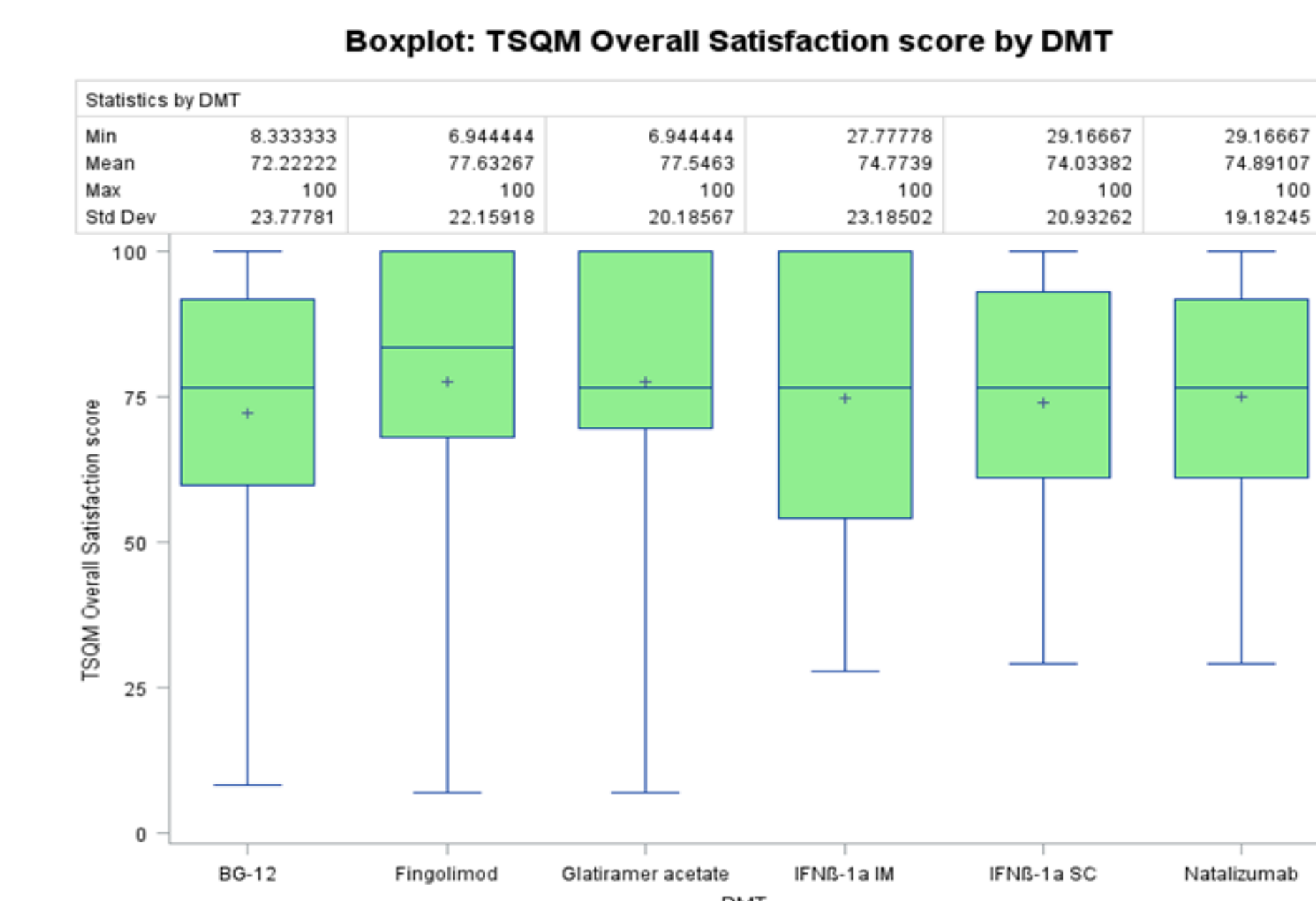


Table 3. Mean (SD) TSQM Domain scores by medication

	IFN β -1a IM	IFN β -1a SC	GA	FTY	BG-12	NTZ
N	43	46	126	67	44	51
Side effects, n	28	37	54	10	26	11
TSQM Domain (mean, (SD))						
Effectiveness	74.07 (19.58)	72.96 (18.71)	75.42 (20.11)	73.38 (19.26)	70.01 (20.02)	72.77 (20.22)
Side effects	77.01 (18.64)	77.36 (15.82)	83.10 (12.60)	71.88 (19.15)	75.72 (21.46)	71.59 (14.88)
Convenience	66.80 (16.29)	64.13 (19.49)	70.99 (17.20)	93.20 (12.71)	80.49 (19.34)	70.04 (19.97)
Overall satisfaction	74.77 (23.19)	74.03 (20.93)	77.55 (20.19)	77.63 (22.16)	72.22 (23.78)	74.89 (19.18)

- Across all medications, there were no significant differences in overall satisfaction or the domains of effectiveness and side effects (Table 3)
- Both fingolimod and BG-12 were reported as significantly more convenient than all other medications ($p < 0.05$ for all comparisons); there were no other significant findings among the injectable and infusion medications
- Fingolimod was reported as more convenient than BG-12 ($p = 0.0028$)

Figure 2: TSQM overall satisfaction across medications



- Among all medications, there were no significant differences in overall treatment satisfaction (Figure 2)

Conclusion

- We found no significant differences among treatment modalities and specific medications for patient reports of effectiveness, side effects, and overall treatment satisfaction
- Patients reported treatment with the oral medications (specifically fingolimod and BG-12) as more convenient than the injectable and infusion DMTs
- The relationship between MS medications and treatment modalities and satisfaction warrants future research, particularly as it relates to treatment adherence

References

- Kim, W., Zandona, M. E., Kim, S., & Kim, H. J. (2015). Oral disease-modifying therapies for multiple sclerosis. *J Clin Neurol*, 11(1), 9-19. doi:10.3988/jcn.2015.11.1.9
- Atkinson, M. J., Sinha, A., Hass, S. L., Colman, S. S., Kumar, R. N., Brod, M., & Rowland, C. R. (2004). Validation of a general measure of treatment satisfaction, the Treatment Satisfaction Questionnaire for Medication (TSQM), using a national panel study of chronic disease. *Health and Quality of Life Outcomes*, 2(12). doi:10.1186/1477-7525-2-12