Assessment of Physical Therapy and Activity in Multiple Sclerosis (APTAIMS)
Development, reliability and validity of a new questionnaire

Amaury GIET[1], Marguerite FOIDART-DESSALLE[2], Sébastien PIERARD[3], Marc VAN DROOGENBROECK[3], Rémy PHAN BA[4]

[1] Physiotherapy and Rehabilitation, University of Liège, Liège, Belgium; [2] Physical Medicine Department, University Hospital, University of Liège, Liège, Belgium; [3] INTELSIG Laboratory, Montefiore Institute, University of Liège, Liège, Belgium; [4] Department of Neurology, University Hospital, University of Liège, Liège, Belgium

Background

✓ Gait impairment is a clinical hallmark of Multiple Sclerosis (MS) progression and one great concern for people with MS (pwMS). Evidence suggest that pwMS may benefit from physical activity (PA) and physical therapy (PT) [1-2]. To our knowledge, no objective instrument allows the measure of the efficacy of both interventions in clinical routine or trials.

Aims

1) **Creation** and

2) **Validation** of the APTAIMS: a scale Assessing PT and PA in ambulatory pwMS

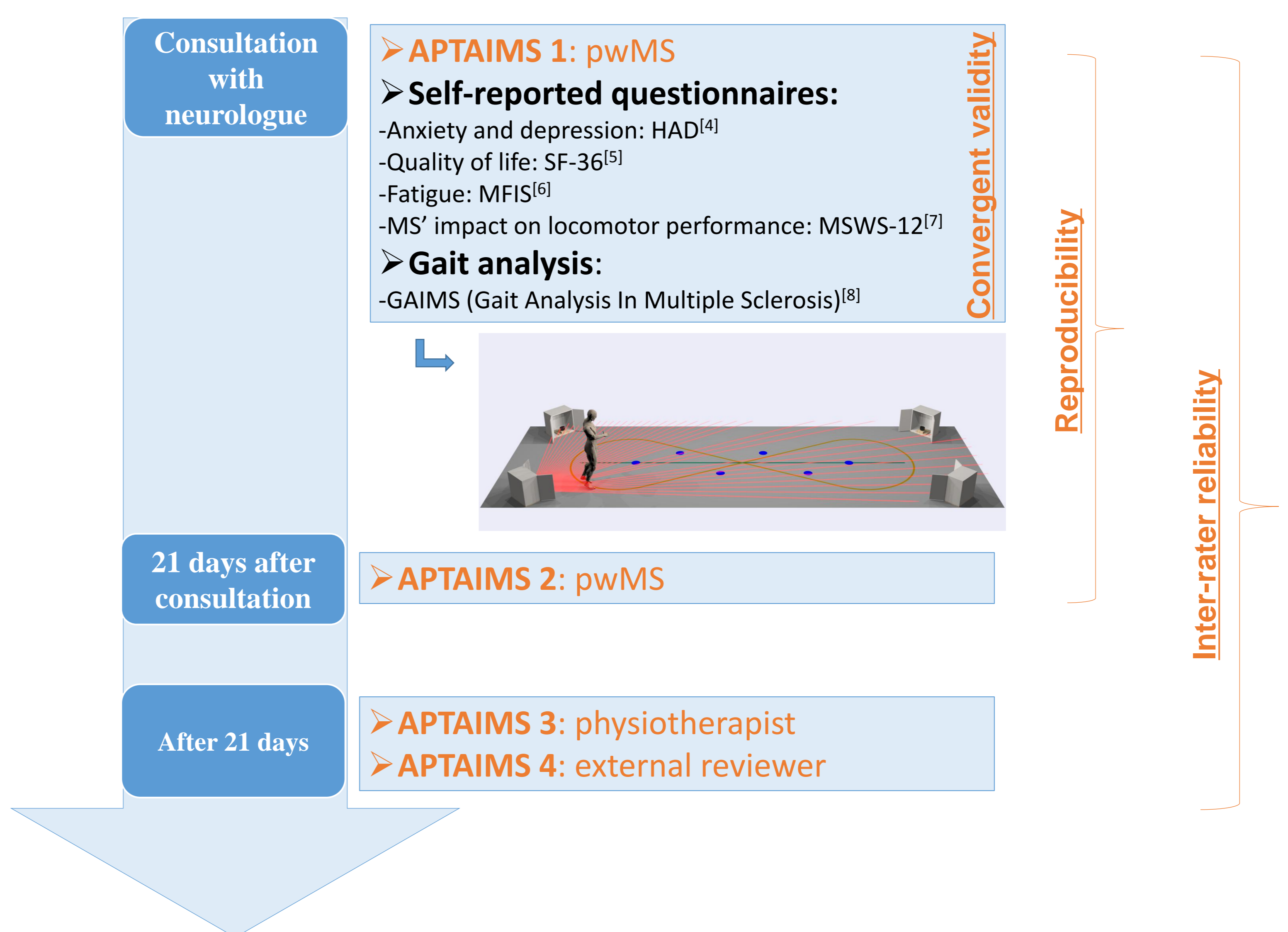| APTAIMS subscales	
Quantitative measure of PT	e.g. number and duration of PT sessions per week
Qualitative measure of PT	e.g. exercices realized in sessions according to the patient
Emotional aspect of PT	e.g. quality of the relation with the physiotherapist
Coaching aspect of PT	e.g. feeling of being supported by the physiotherapist
PA: GLTEQ[3]	i.e. usual leisure-time exercise habits

Methods

Table 1. Socio-demographic characteristics (n=27)

Age: mean ± SD	46.9 ± 11.1
Gender : n(%)	
Female	16 (59.3)
Male	11 (40.7)
BMI: mean ± SD (kg.m^{-2})	24.1 ± 4 .5
Ethnicity: n(%)	
Caucasian	27 (100)
Types of SEP : n(%)	
PP (primary progressive)	4 (14.8)
SP (secondary progressive)	3 (11.1)
SCI (clinically isolated syndrome)	3 (11.1)
RR (relapsing-remitting)	17 (63)
Duration of illness (years): median (P25-P75)	13 (6-22)
EDSS Global: median (P25-P75)	4 (3.5-4)
Physiotherapy: n(%)	
No	10 (37)
Yes	17 (63)
Physical activity: n(%)	
No	5 (18.5)
Yes	22 (81.5)

SD : Standart Deviation

Consultation with neurologue

> **APTAIMS 1**: pwMS
> **Self-reported questionnaires:**
> -Anxiety and depression: HAD[4]
> -Quality of life: SF-36[5]
> -Fatigue: MFIS[6]
> -MS' impact on locomotor performance: MSWS-12[7]
> **Gait analysis**:
> -GAIMS (Gait Analysis In Multiple Sclerosis)[8]

21 days after consultation

> **APTAIMS 2**: pwMS

After 21 days

> **APTAIMS 3**: physiotherapist
> **APTAIMS 4**: external reviewer

Convergent validity
Reproducibility
Inter-rater reliability

Results

(1) Reproducibility

Wilcoxon test for the total score of the APTAIMS: p=.492
→ good reproducibility of the questionnaire over time with a test-retest (*APTAIMS T1-T2*).

(2) Inter–rater reliability

Wilcoxon tests for the total score of the APTAIMS 1 and 3 without GLTEQ: p=.196 (n=12) and for the total score of the APTAIMS 1 and 4 without the GLTEQ: p=.0302 (n=13)
→ good inter-rater reliability for the *APTAIMS T1-T3 but not for the APTAIMS T1-T4* (Did pwMS overestimate the quality of the PT because of the relation they had developed with their physiotherapist?)

(3) Convergent validity

Table 2. Pattern of correlations of the APTAIMS measures with self-reported measures and GAIT analysis

APTAIMS measures	↗ **Total score (n=27)**	↗ **Quantitative measure of PT (n=17)**	↗ **PA (n=27)**	↗ **Coaching aspect of PT (n=17)**
Correlated variables (r)	➤ ↗ **comfortable walking speed** (25 feets) : r=.42*	➤ ↗ **double support time** (25 feets « as fast as possible »): r=-.54* ➤ ↘ **anxiety:** r=-.58** and **depression:** r=-.50* ➤ ↗ **fatigue:** (global: r=.66**, cognitive: r=.49*, physical: r=.66**, psychosocial: r=.68***)	➤ ↘ **SEP impact on locomotion:** r=-.43* ➤ ↗ **comfortable walking speed** (25 feets: r=.41* and 100m: r=.47§ ➤ ↗ **PA** (SF-36): r=.50*	➤ ↗ **walking speed** (useful velocity ; 25 feets): r=.46§ ➤ ↘ **double support time:** r=-67*** ➤ ↗ **quality of life:** r=-.52* ➤ ↘ **limitations at work** (SF-36): r=.42* **and in daily activities** (SF-36): r=.52* ➤ ↘ **anxiety**: r=-.54* ➤ ↗ **fatigue:** (global: r=.47§, cognitive: r=.57*, physical: r=.53*, psychosocial: r=.51*)

§p<.10 *p<.05 **p<.01 ***p<.001

→ Quality of PA and PT is associated with gait performance and psychological well-being, suggesting good convergent validity

Conclusion

✓This study describes the creation and first validation step of a scale aimed at evaluating PT and PA in pwMS. Our results suggest that the APTAIMS is reliable and valid. Quality of PT may affect patients' QoL as well as their mental and physical health. These findings need to be replicated with a larger sample with a prospective design.

1. Dalgas, U. et al. (2009). *Int MS J, 16*(1), 5-11.
2. Döring, A. et al. (2011). *EPMA J, 3*(1).
3. Godin, G. et al. (1985). *Can J Appl Sport Sci, 10*(3), 141-146.
4. Wood, B. et al. (2013). *Mult Scler , 19*(2) 217-224.
5. Vickrey, B. et al. (1995). *Qual Life Resity of Life Res, 4*(3), 187-206.
6. Kos, D. et al. (2005). *Mult Scler, 11*(1), 76-80.
7. Hobart, J. et al. (2003). *Neurology, 60*(1), 31-36.
8. Phan-Ba, R. et al. (2011). *Neurorehabil Neural Repair, 25*(7), 672-679.

Contact : Amaury GIET – Physiotherapist – giet.amaury@hotmail.fr