

**SUPPLEMENTARY MATERIAL: Validation of a new glucocorticoid-specific patient reported outcome questionnaire (the Steroid PRO)**

**Supplementary Table S1:** Survey responses at Timepoint 1; full list of diseases

	<b>n</b>	
Adult-onset Still's disease	1	0%
ANCA Vasculitis (NOS)	5	0%
Ankylosing spondylitis	9	1%
Aortitis	1	0%
Behcet's disease	20	2%
CNS Vasculitis	7	1%
Cryoglobulinemia vasculitis	2	0%
Enteropathic arthritis	2	0%
Eosinophilic granulomatosis with polyangiitis (also known as Churg Strauss Vasculitis)	34	3%
Giant Cell Arteritis (also known as Temporal Arteritis)	128	11%
Gout	3	0%
Granulomatosis with polyangiitis (Wegener's)	110	9%
IgA/Henoch Schonlein	8	1%
IgG4-related disease	1	0%
Inflammatory arthritis (NOS)	2	0%
Inflammatory myositis (polymyositis or dermatomyositis)	10	1%
Juvenile inflammatory arthritis (JIA)	7	1%
Large Vessel Vasculitis (NOS)	2	0%
Leukocytoclastic vasculitis	1	0%
Mast Cell Activation Disorder	1	0%
Microscopic polyangiitis	24	2%

Mixed connective tissue disease	20	2%
Palindromic rheumatism	4	0%
Polyarteritis nodosa	10	1%
Polymyalgia rheumatica	302	26%
Psoriatic arthritis	21	2%
Reactive arthritis	10	1%
Relapsing polychondritis	3	0%
Rheumatoid arthritis	164	14%
Seronegative arthritis/spondyloarthropathy	8	1%
Sjogren's syndrome	31	3%
Small vessel vasculitis (NOS)	11	1%
Systemic Lupus Erythematosus (Lupus or SLE)	66	6%
Systemic sarcoidosis	64	6%
Systemic sclerosis (Scleroderma)	32	3%
Takayasu arteritis	18	2%
Undifferentiated rheumatic disease	10	1%
Urticarial vasculitis	11	1%

NB: Participants were able to report multiple diseases

**Supplementary Table S2: Survey responses at Timepoint 1; participant ethnicities**

	n	
English / Welsh / Scottish / Northern Irish / British	693	73%
American	117	12%
Australian	41	4%
Irish	18	2%
American Indian / Alaska Native	4	0%
African	6	1%
Black British	2	0%
Chinese	4	0%
Indian	3	0%
Pakistani	2	0%
Other ethnic background	11	1%
Other Asian background	2	0%
Other black background	3	0%
Other white background	30	3%
Prefer not to answer	10	1%
<b>Total completed responses</b>	<b>946</b>	

**Supplementary Table S3: Rasch Analysis with individual items, comparing 5 and 4 category response structure**

Seq	Item	5 Category responses (never=0, rarely=1, sometimes=2, often=3 and always=4)					4 Category responses (never=0, sometimes=1, often=2 and always=3)						
		Location	SE	FitResid	$\chi^2$	DF	*p-value	Location	SE	FitResid	$\chi^2$	DF	*p-value
10	Fatigue/ tiredness	-0.76	0.037	1.76	14.865	9	0.094708	-0.864	0.042	2.298	13.763	9	0.131019
15	Appearance changes	-0.472	0.031	0.873	8.439	9	0.490604	-0.686	0.037	0.007	9.645	9	0.379995
16	Clothes not fitting	-0.269	0.031	-0.036	2.197	9	0.987949	-0.428	0.037	-0.853	5.141	9	0.821816
20	Anger/ irritation	0.433	0.037	0.156	12.757	9	0.173922	0.609	0.046	-0.453	13.132	9	0.156715
23	Anxiety	0.482	0.036	-0.26	6.628	9	0.675758	0.618	0.046	0.03	6.268	9	0.712872
24	Physical agitation	0.551	0.037	0.222	11.651	9	0.233731	0.745	0.047	0.093	11.445	9	0.246461
26	Clarity of thinking	0.663	0.037	-0.438	23.113	9	0.005948	0.818	0.048	-0.928	18.706	9	0.027816
27	Talking too much	1.068	0.038	2.272	23.364	9	0.005431	1.271	0.052	0.322	10.53	9	0.309318
28	Feeling upset	-0.029	0.033	-1.623	14.107	9	0.118581	-0.08	0.04	-2.406	11.363	9	0.251663
29	Extra medications	-0.03	0.033	0.795	7.202	9	0.616128	-0.118	0.04	-0.092	5.841	9	0.755673
30	Long-term risks	-0.951	0.037	1.684	7.884	9	0.545882	-1.032	0.041	2.233	6.741	9	0.664059
31	Worrying about weight	-0.773	0.034	1.229	12.082	9	0.208727	-0.99	0.039	0.974	5.111	9	0.824522
38	Everyday responsibilities	-0.027	0.034	-0.462	13.881	9	0.126632	-0.001	0.041	-0.439	9.861	9	0.361824
39	Being with other people	0.161	0.034	2.232	2.535	9	0.979935	0.159	0.043	3.12	4.009	9	0.910832
40	Joining in	-0.048	0.036	-2.123	20.561	9	0.014751	-0.019	0.043	-2.088	24.372	9	0.003752
<b>Overall fit</b>		$\chi^2$ (DF) 181.26(135); p=0.0049; PSI=0.8997					$\chi^2$ (DF) 155.93 (135); p=0.105; PSI=0.877						

Legends: SE, Standard error; DF, degree of freedom; FitResid, Fit residuals expected to be within -2.5 and 2.5 for model fit;

\*p-value,  $\chi^2$  probability, where >0.05 (>0.00125 for Bonferroni correction for 5 Category responses, >0.0033 for Bonferroni correction for 4 Category responses) suggests adequate fit to the model.

**Supplementary Table S4: Results of DIF analysis in the disease groups (IA, CTD/Vasculitis and GCA/PMR)**

	<i>Main effects: Disease group (uniform DIF)</i>				<i>Interaction effects: class interval by disease (non-uniform DIF)</i>			
	<b>MS</b>	<b>F</b>	<b>DF</b>	<b>p-value</b>	<b>MS</b>	<b>F</b>	<b>DF</b>	<b>p-value</b>
Social impact	0.475	0.661	2	0.517	1.013	1.408	18	0.119
Impact on appearance	2.677	3.467	2	0.032	0.421	0.545	18	0.937
Psychological impact	3.454	4.903	2	0.008	0.573	0.814	18	0.685
Treatment Concerns	9.481	12.013	2	<0.001	0.629	0.797	18	0.705
Expected				>0.0125				>0.0125

Supplementary Figure S1: Item characteristic curves for DIF analysis in the disease groups.



