

## Supplementary Information

### SI 1.

#### Participation of patients in the *Lymphoma Quality of Life* Study by hospital center.

Hospital / Clinic	Locality	Respondents	Non respondents	Percentage of participation by center
		(N = 69)	(N = 32)	
		<u>N (%)</u>	<u>N (%)</u>	<u>%</u>
CHU d'Amiens - Hôpital Sud	Amiens	3 (4.35)	1 (3.13)	75
CHU d'Angers	Angers	3 (4.35)	0 (0)	100
Hôpital Avicenne	Bobigny	2 (2.9)	5 (15.63)	28.6
CH Sud Francilien	Corbeil-Essonnes	4 (5.8)	0 (0)	100
Hôpital Henri Mondor	Créteil	13 (18.84)	8 (25)	61.9
Hôpital Bicêtre	Kremlin-Bicêtre	2 (2.9)	1 (3.13)	66.7
CHU Saint-Eloi	Montpellier	2 (2.9)	0 (0)	100
CHU de Nantes	Nantes	8 (11.59)	5 (15.63)	61.5
Hôpital Necker	Paris	0 (0)	1 (3.13)	0
CHU de Bordeaux – Hôpital Haut-Leveque	Pessac	4 (5.8)	0 (0)	100
CH Annecy Genevois – Site d'Annecy	Pringy	6 (8.7)	0 (0)	100
CHD Vendée	Roche-sur-Yon	4 (5.8)	1 (3.13)	80
Centre Henri Becquerel	Rouen	9 (13.04)	3 (9.38)	75
IUCT Oncopôle	Toulouse	2 (2.9)	0 (0)	100
CH de Versailles – Hôpital André Mignot	Versailles	1 (1.45)	0 (0)	100
Gustave Roussy	Villejuif	6 (8.7)	7 (21.88)	46.2

## Supplementary Information

### SI 2. Psychometric scales

#### SI 2.1. Psychometric scales used in the “Lymphoma Quality of Life” Study.

1. The French-validated version of the *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30) version 3* was used to assess health-related quality of life (HRQoL) of patients with lymphoma[24]. To 28/30 questions, the answers cover 4 possible categories and are placed on a Likert scale, from 1 ("not at all") to 4 ("very much"). For the other two questions which measure the Global health status, the choice of answers is ordered from 1 (very bad) to 7 (excellent). After linear transformation, all of the scales and single-item measures range in score from 0 to 100. A high score for a functional scale represents a high / healthy level of functioning; a high score for the global health status / QoL represents a high QoL, but a high score for a symptom scale or item represents a high level of symptomatology or problems[25].

2. The French version of the *High Grade Non-Hodgkin Lymphoma (NHL-HG29)* is a module with 29 items that completes the EORTC QLQ-C30. It incorporates five Multi-item scales to assess: Symptom burden due to disease and/or treatment, Neuropathy, Physical condition / fatigue, Emotional impact and Worries / fears about health and functioning. The response categories are also between 1 ("not at all") to 4 ("very much"). The calculation and interpretation of scores (which range between 0 and 100) are similar to the previous questionnaire. A high score for all of the Multi-item scales represents a high level of symptomatology or problems[25, 26].

3. *The Hospital Anxiety and Depression Scale (HADS)* is an instrument for detecting states of depression and anxiety that would facilitate the large task of detection and management of emotional disorder in patients under investigation and treatment in medical and surgical departments[27]. Questionnaire is composed of 14 items and is structured into two subscales: Anxiety and Depression. Each question has 4 possible answers and each answer corresponds to a number (0, 1, 2 or 3). By adding these numbers, the score for anxiety and depression respectively is obtained. For each subscale, values can be between 0 and 21. A score of 0 to 7 for either subscale could be regarded as being in the normal range, a score of 11 or higher indicating probable presence of the mood disorder and a score of 8 to 10 being just suggestive of the presence of the respective state[28]. The French version was validated in a population of hospitalized cancer patients[29].

4. The *Post Traumatic Growth Inventory (PTGI)* is an instrument for assessing positive outcomes reported by persons who have experienced traumatic events[30], which has been validated in French[31]. The PTGI is composed of 5 subscales, which include factors of: New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life. It consists of 21 items, and the response scale is a 6-point Likert scale asking respondents the degree to which changes occurred in their lives as a result of the crisis, where 0 represented “I did not experience this change” and 5 represented “I experienced this change to a very great degree”. The possible values are between 0-35, 0-25, 0-20, 0-15, and 0-10 for Relating to others, New possibilities, Personal strength, Appreciation of life and Spiritual changes, respectively. The total PTGI score is calculated by adding the specific scores, for values between 0 and 105. Post-traumatic development increases also with the calculated score.

5. *The Multidimensional Fatigue Inventory (MFI)* is a psychometric instrument to assess fatigue from answers to 20 questions[32] which has been validated in French[33]. This scale evaluates five dimensions of fatigue: General, Physical and Mental fatigue, Reduced motivation, and Reduced activity. Items are scored on a 5-point scale (“yes, that is true” to “no, that is not true”), with 10 positively phrased items reverse scored. The resulting scale scores range from 4 to 20 for each scale. High scores represent high levels of fatigue. The total score is calculated by adding the scores of 5 subscales.

**Overall, HRQoL scores measured with the five psychometric scales were correlated with each other (SI 2.2 and SI 2.3).**

## SI 2.2.

### Correlations between subscales of each Quality of Life scale

All the subscales of a psychometric scale were strongly correlated with each other. Pearson's correlation coefficients vary between 0.41 and 0.77; 0.41 and 0.84; 0.30 and 0.92; 0.50 and 0.78, between the EORTC QLQ-C30 Functional scales, EORTC QLQ-NHL-HG29 subscales, PTGI, and MFI-20 subscales, respectively. HADS Anxiety and Depression were correlated with  $r = 0.51$  ( $P < 0.0001$ ) (see below).

### Pearson correlations between the subscales of different administered psychometric scales ( $N = 57$ )

EORTC QLQ-C30 (v3)						
Functional scales	QLQ-PF	QLQ-RF	QLQ-EF	QLQ-CF	QLQ-SF	QLQ-GS
QLQ-PF	1.0	0.77 <.0001	0.54 <.0001	0.67 <.0001	0.62 <.0001	0.7 <.0001
QLQ-RF		1.0	0.41 0.0015	0.53 <.0001	0.4947 <.0001	0.51 <.0001
QLQ-EF			1.0	0.69 <.0001	0.66 <.0001	0.48 0.0001
QLQ-CF				1.0	0.72 <.0001	0.57 <.0001
QLQ-SF					1.0	0.5 <.0001

  

Symptom scales / items	QLQ-F	QLQ-NV	QLQ-P	QLQ-Dy	QLQ-I	QLQ-AL	QLQ-C	QLQ-D	QLQ-FD
QLQ-F	1.0	0.39 0.0028	0.76 <.0001	0.69 <.0001	0.27 0.0435	0.53 <.0001	0.54 <.0001	0.47 0.0003	0.16 0.2260
QLQ-NV		1.0	0.38 0.0034	0.33 0.0123	0.45 0.0004	0.56 <.0001	0.27 0.0466	0.58 <.0001	0.30 0.0228
QLQ-P			1.0	0.55 <.0001	0.37 0.0051	0.48 0.0001	0.49 <.0001	0.4 0.0021	-0.03 0.8464
QLQ-Dy				1.0	0.06 0.6611	0.46 0.0004	0.39 0.0029	0.46 0.0003	0.22 0.1014
QLQ-I					1.0	0.22 0.0976	0.36 0.0067	0.33 0.0114	0.06 0.6787
QLQ-AL						1.0	0.21 0.1230	0.39 0.0024	0.02 0.8993
QLQ-C							1.0	0.39 0.0027	0.08 0.5493
QLQ-D								1.0	0.22 0.1078

  

EORTC QLQ-NHL-HG29					
	NHL-SB	NHL-N	NHL-F	NHL-EI	NHL-W
NHL-SB	1.0	0.55 <.0001	0.84 <.0001	0.82 <.0001	0.52 <.0001
NHL-N		1.0	0.52 <.0001	0.61 <.0001	0.41 0.0014
NHL-F			1.0	0.85 <.0001	0.66 <.0001
NHL-EI				1.0	0.71 <.0001

  

HADS		
	HADS-A	HADS-D
HADS-A	1.0	0.51 <.0001

  

PTGI						
	PTGI-RO	PTGI-NP	PTGI-PS	PTGI-SC	PTGI-AF	PTGI total score
PTGI-RO	1.0	0.72 <.0001	0.77 <.0001	0.54 <.0001	0.54 <.0001	0.9 <.0001
PTGI-NP		1.0	0.81 <.0001	0.5 <.0001	0.631 <.0001	0.9 <.0001
PTGI-PS			1.0	0.56	0.61	0.92

<b>PTGI-SC</b>	<.0001	<.0001	<.0001
	1.0	0.3	0.65
<b>PTGI-AF</b>		0.0252	<.0001
		1.0	0.71
			<.0001

<b>MFI-20</b>						
	<b>MFI-GF</b>	<b>MFI-PF</b>	<b>MFI-MF</b>	<b>MFI-RA</b>	<b>MFI-RM</b>	<b>MFI-20 total score</b>
<b>MFI-GF</b>	1.0	0.74	0.71	0.72	0.78	0.91
		<.0001	<.0001	<.0001	<.0001	<.0001
<b>MFI-PF</b>		1.0	0.56	0.5	0.76	0.83
			<.0001	<.0001	<.0001	<.0001
<b>MFI-MF</b>			1.0	0.67	0.74	0.85
				<.0001	<.0001	<.0001
<b>MFI-RA</b>				1.0	0.71	0.83
					<.0001	<.0001
<b>MFI-RM</b>					1.0	0.92
						<.0001

**Abbreviations:** EORTC QLQ-C30 (v3) - Physical functioning: QLQ-PF; Role functioning: QLQ-RF; Emotional functioning: QLQ-EF; Cognitive functioning: QLQ-CF; Social functioning: QLQ-SF; Global health status: QLQ-GS; Fatigue: QLQ-F; Nausea and vomiting: QLQ-NV; Pain: QLQ-P; Dyspnoea: QLQ-Dy; Insomnia: QLQ-I; Appetite loss: QLQ-AL; Constipation: QLQ-C; Diarrhoea: QLQ-D; Financial difficulties: QLQ-FD; EORTC QLQ-NHL-HG29 - Symptom burden: NHL-SB; Neuropathy: NHL-N; Physical condition / fatigue: NHL-F; Emotional impact: NHL-EI; Worries / fears about health and functioning: NHL-W; HADS Anxiety: HADS-A; HADS Depression: HADS-D; PTGI Relating to others: PTGI-RO; PTGI New possibilities: PTGI-NP; PTGI Personal strength: PTGI-PS; PTGI Appreciation of life: PTGI-AF; PTGI Spiritual changes: PTGI-SC; MFI-20-General fatigue: MFI-GF; MFI-20-Physical fatigue: MFI-PF; MFI-20-Mental fatigue: MFI-MF; MFI-20-Reduction of activities: MFI-RA; MFI-20-Reduction of motivation: MFI-RM.

### SI 2.3. Correlations between Quality of Life scales

**Physical fatigue** was investigated differently using the scales: MFI-20, EORTC QLQ-C30 and EORTC QLQ-NHL-HG29, and the three scores were all significantly correlated with each other ( $r$  between 0.48 and 0.76). These three scales are also very strongly correlated with General Fatigue ( $r$  between 0.72 and 0.82) and Reduction of activities ( $r$  between 0.48 and 0.60) measured with MFI-20, and inversely correlated with Physical Functioning ( $r$  between -0.54 and -0.74) measured with EORTC QLQ-C30.

Concerning the **emotional level**, two scales, EORTC QLQ-C30 and EORTC QLQ-NHL-HG29 allow measuring the Emotional functioning and the Emotional impact, respectively, and which were inversely and very strongly correlated ( $r$  of -0.80). The Emotional impact and the Emotional functioning were very strongly correlated to the EORTC QLQ-NHL-HG29 Worries or fears about health and functioning ( $r$  of 0.71 and -0.72, respectively), and all three parameters were correlated with HADS Anxiety ( $r$  of 0.68, 0.62 and -0.76, for Emotional impact, Worries and Emotional functioning, respectively) and with HADS Depression ( $r$  of 0.63, 0.76 and -0.66, respectively). Additionally, Emotional impact, Worries, Depression, and Emotional functioning were correlated with MFI-20 Reduction of motivation ( $r$  of 0.47, 0.48, 0.57 and -0.41, respectively).

Other correlations between the different scales are given below.

#### Pearson correlation coefficients between different psychometric scales ( $N = 57$ ).

	QLQ-PF	QLQ-RF	QLQ-SF	QLQ-EF	QLQ-CF	QLQ-GS	QLQ-F
<b>HADS-A</b>	-0.35 0.0082	-0.30 0.0223	-0.52 <.0001	-0.76 <.0001	-0.49 0.0001	-0.3 0.0258	0.46 0.0003
<b>HADS-D</b>	-0.67 <.0001	-0.47 0.0002	-0.5 <.0001	-0.66 <.0001	-0.57 <.0001	-0.71 <.0001	0.68 <.0001
<b>MFI-RM</b>	-0.64 <.0001	-0.48 0.0001	-0.36 0.0053	-0.41 0.0014	-0.46 0.0003	-0.59 <.0001	0.69 <.0001
<b>MFI-RA</b>	-0.66 <.0001	-0.56 <.0001	-0.48 0.0002	-0.59 <.0001	-0.59 <.0001	-0.51 <.0001	0.6 <.0001
<b>MFI-MF</b>	-0.55 <.0001	-0.31 0.0201	-0.27 0.0465	-0.49 <.0001	-0.36 0.0062	-0.48 0.0001	0.55 <.0001
<b>MFI-PF</b>	-0.54 <.0001	-0.39 0.0025	-0.33 0.0118	-0.22 0.0939	-0.39 0.0031	-0.72 <.0001	0.67 <.0001
<b>MFI-GF</b>	-0.65 <.0001	-0.49 <.0001	-0.53 <.0001	-0.58 <.0001	-0.62 <.0001	-0.76 <.0001	0.82 <.0001

  

	NHL-SB	NHL-N	NHL-F	NHL-EI	NHL-W
<b>QLQ-PF</b>	-0.31 0.0185	-0.62 <.0001	-0.67 <.0001	-0.57 <.0001	-0.67 <.0001
<b>QLQ-RF</b>	-0.24 0.0758	-0.50 <.0001	-0.54 <.0001	-0.47 0.0002	-0.57 <.0001
<b>QLQ-SF</b>	-0.37 0.0049	-0.66 <.0001	-0.76 <.0001	-0.55 <.0001	-0.67 <.0001
<b>QLQ-EF</b>	-0.44 0.0006	-0.7 <.0001	-0.8 <.0001	-0.72 <.0001	-0.60 <.0001
<b>QLQ-CF</b>	-0.36 0.0067	-0.67 <.0001	-0.78 <.0001	-0.59 <.0001	-0.66 <.0001
<b>QLQ-GS</b>	-0.21 0.1194	-0.66 <.0001	-0.56 <.0001	-0.54 <.0001	-0.59 <.0001
<b>QLQ-F</b>	0.41 0.0016	0.76 <.0001	0.72 <.0001	0.6 <.0001	0.7 <.0001
<b>HADS-A</b>	0.51 <.0001	0.43 0.001	0.48 0.0001	0.68 <.0001	0.62 <.0001
<b>HADS-D</b>	0.53 <.0001	0.35 0.0074	0.62 <.0001	0.63 <.0001	0.76 <.0001
<b>MFI-RM</b>	0.38 0.0037	0.18 0.1885	0.51 <.0001	0.47 0.0002	0.49 0.0001
<b>MFI-RA</b>	0.48 0.0002	0.26 0.0489	0.48 0.0002	0.6 <.0001	0.64 <.0001
<b>MFI-MF</b>	0.38 0.0037	0.21 0.1103	0.43 0.0008	0.45 0.0004	0.54 <.0001

<b>MFI-PF</b>	0.31	0.11	0.48	0.39	0.44
	0.0205	0.4030	0.0002	0.0031	0.0006
<b>MFI-GF</b>	0.61	0.27	0.72	0.64	0.67
	<.0001	0.0442	<.0001	<.0001	<.0001

	<b>PTGI-RO</b>	<b>PTGI-NP</b>	<b>PTGI-PS</b>	<b>PTGI-AL</b>	<b>PTGI-SC</b>
<b>QLQ-PF</b>	0.27	0.31	0.31	0.18	0.07
	0.0398	0.0205	0.0210	0.1838	0.6197
<b>QLQ-RF</b>	0.22	0.15	0.22	-0.02	0.04
	0.1076	0.2742	0.0992	0.8854	0.7464
<b>QLQ-SF</b>	0.19	0.14	0.30	-0.01	0.16
	0.1518	0.2893	0.0226	0.9525	0.2394
<b>QLQ-EF</b>	0.22	0.22	0.22	-0.04	0.2
	0.0959	0.1040	0.1011	0.7896	0.1374
<b>QLQ-CF</b>	0.18	0.29	0.33	0.02	0.18
	0.1745	0.0279	0.0130	0.8723	0.1758
<b>QLQ-GS</b>	-0.29	-0.28	-0.35	-0.1	-0.25
	0.0308	0.0371	0.0077	0.4719	0.0599
<b>QLQ-F</b>	-0.24	-0.21	-0.27	-0.16	-0.17
	0.0780	0.1157	0.0416	0.2335	0.2092
<b>NHL-SB</b>	-0.25	-0.18	-0.23	-0.24	-0.21
	0.0617	0.1823	0.0891	0.0726	0.1130
<b>NHL-N</b>	-0.25	-0.27	-0.31	-0.15	-0.22
	0.0577	0.0462	0.0202	0.2826	0.1032
<b>NHL-F</b>	-0.26	-0.19	-0.27	-0.14	-0.17
	0.0510	0.1504	0.0410	0.2956	0.2187
<b>NHL-EI</b>	-0.08	-0.14	-0.09	0.07	-0.04
	0.5619	0.3055	0.5016	0.5843	0.7603
<b>NHL-W</b>	0.35	0.41	0.39	0.18	0.29
	0.0074	0.0017	0.0025	0.1696	0.0280
<b>HADS-A</b>	0.12	0.18	0.05	0.09	0.03
	0.3760	0.1856	0.7219	0.4981	0.8304
<b>HADS-D</b>	-0.29	-0.35	-0.35	-0.02	-0.22
	0.0284	0.008	0.0091	0.8911	0.1072
<b>MFI-RM</b>	-0.26	-0.24	-0.28	-0.19	-0.23
	0.0533	0.0691	0.0333	0.1478	0.0827
<b>MFI-RA</b>	-0.13	-0.02	-0.11	-0.02	-0.19
	0.3271	0.9111	0.4165	0.8867	0.1652
<b>MFI-MF</b>	-0.25	-0.22	-0.28	-0.18	-0.17
	0.0652	0.1056	0.0344	0.1899	0.2132
<b>MFI-PF</b>	-0.12	-0.18	-0.17	-0.06	-0.08
	0.3608	0.1832	0.2094	0.6530	0.5639
<b>MFI-GF</b>	-0.22	-0.18	-0.27	-0.05	-0.20
	0.1068	0.1697	0.0449	0.7100	0.1309

	<b>MFI-RM</b>	<b>MFI-RA</b>	<b>MFI-MF</b>	<b>MFI-PF</b>	<b>MFI-GF</b>
<b>HADS-A</b>	0.22	0.53	0.249	0.13	0.41
	0.1031	<.0001	0.0617	0.3280	0.0016
<b>HADS-D</b>	0.57	0.57	0.58	0.53	0.76
	<.0001	<.0001	<.0001	<.0001	<.0001

**Abbreviations:** EORTC QLQ-C30 (v3) - Physical functioning: QLQ-PF; Role functioning: QLQ-RF; Emotional functioning: QLQ-EF; Cognitive functioning: QLQ-CF; Social functioning: QLQ-SF; Global health status: QLQ-GS; Fatigue: QLQ-F;  
EORTC QLQ-NHL-HG29 - Symptom burden: NHL-SB; Neuropathy: NHL-N; Physical condition / fatigue: NHL-F; Emotional impact: NHL-EI; Worries / fears about health and functioning: NHL-W;  
HADS Anxiety: HADS-A; HADS Depression: HADS-D;  
PTGI Relating to others: PTGI-RO; PTGI New possibilities: PTGI-NP; PTGI Personal strength: PTGI-PS; PTGI Appreciation of life: PTGI-AF; PTGI Spiritual changes: PTGI-SC;  
MFI-20-General fatigue: MFI-GF; MFI-20-Physical fatigue: MFI-PF; MFI-20-Mental fatigue: MFI-MF; MFI-20-Reduction of activities: MFI-RA; MFI-20-Reduction of motivation: MFI-RM.