



# Exploring the Innate Human Potential for Positive Adaptation in the Face of Impending Mortality: Is there a Response Shift in Subjective Quality of Life over Time in a Group of Patients with Lung Cancer Receiving Palliative Treatment?

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## Abstract

Traditionally changes in quality of life (QoL) are assessed using self report questionnaires. They rely on the assumption that the patient's point of reference does not change over time. However in reality patients with chronic and life threatening illness appear to undergo an adaptation to their disease or "Response Shift" (RS). In this study of a population of patients with advanced lung cancer receiving palliative chemotherapy we examine for a RS in subjective QoL. **Methods:** 33 patients completed the Schedule for the Evaluation of Individual Quality of Life (SEIQoL), SEIQoL-DW and the EORTC-QLQ C-30 at diagnosis. At 1, 3 and 6 months patients completed SEIQoL/ SEIQoL-DW and retrospectively reassessed their baseline QoL (the "then" test) using SEIQoL-DW. **Results:** The initial mean SEIQoL-DW score was 67.48 changing to 66.71 at one month. Retrospectively, patients reassessed their initial mean SEIQoL-DW score as 59.61, suggesting a RS of 7.87 ( $p \leq 0.0001$ ) and an actual improvement in QoL of 7.1 points. At three months the mean SEIQoL-DW score was 65.13; retrospectively patients rated their QoL at one month much lower, mean SEIQoL-DW then – test' score was 59.92, suggesting a RS of 6.79 ( $p = 0.0013$ ). At six months patients' mean SEIQoL-DW score was 61.86. Again, when retrospectively rating their QoL at three months they rated it lower, mean SEIQoL-DW score of 58.84, indicating a 'positive' RS of 6.28 ( $p = 0.0007$ ). **Conclusion:** Traditional pre/post SEIQoL-DW scores show little change in subjective QoL however by incorporating the 'then-test' we can see that patients have undergone a RS and a significant positive change in subjective QoL. By explicitly measuring RS it may be possible to assess changes in QoL with greater validity and sensitivity.

**Keywords:** Lung cancer, Palliative treatment, Quality of Life, SEIQoL/SEIQoL-DW, EORTC-QLQ C-30, Response Shift.

## Introduction

Despite advances in treatments, many individuals with lung cancer present at an advanced stage of illness, the prognosis remains poor and time from diagnosis is often short [1-5]. As the traditional outcome measures of survival and tumour response are so poor in this group, a patient based subjective quality of life (QoL) assessment may offer a more comprehensive approach to evaluating the relative risks and benefits associated with treatment. Research has demonstrated that QoL changes may be among the

most important factors in a patient's decision whether to receive palliative treatment [6]. The dynamic and individual nature of QoL is difficult to capture when using questionnaires based on group data, in which the questions asked, the response format provided and the relative weights applied to the answers have all been predetermined. While such measures, which are generally referred to as Health Related QoL (HRQoL) measures [7], provide important information regarding health status, their promulgation as measures of subjective QoL is more questionable [8].

Calman defined QoL in cancer patients as the difference, or gap, at a particular point in time between the hopes and expectations of the individual and that individual's present experiences [9]. The individual's own view of their present reality, hopes and expectations can only be described by the individual [10-12]. Traditionally, changes in QoL are assessed using self-report questionnaires which rely on the assumption that the patient's point of reference does not change over time. However in reality patients with chronic and life threatening illnesses appear to adjust to their circumstances and in essence their internal frame of reference appears to recalibrate. This change or recalibration has been discussed in terms of Response Shift' (RS) [13-26]. A human being is not a machine, therefore 'a constant calibration' is not an inherent part of the human spirit that can adjust and recalibrate when faced with stressful events. This process of psychological adaptation

appears to enable patients to cope and maintain good QoL, even in the face of adversity [8,18].

For many years' health and organisational psychologists have been interested in the methodological challenges of measuring changes in individuals' reports about their beliefs and attitudes. RS is important to consider in treatment evaluations especially in so far as it may serve to attenuate or exaggerate estimates of treatment effects as patients adapt to treatment toxicities and/or disease progression over time. Figure 1, [16] illustrates 'Reported treatment effect', 'RS effect' and 'Actual treatment effect'. When applied to the area of QoL, RS is defined as a change in the meaning of one's self-evaluation of QoL as a result of: (a) a change in one's internal standards of measurement (recalibration in psychometric terms); (b) a change in one's values; or (c) a redefinition of one's values (re-conceptualisation) [13-26].

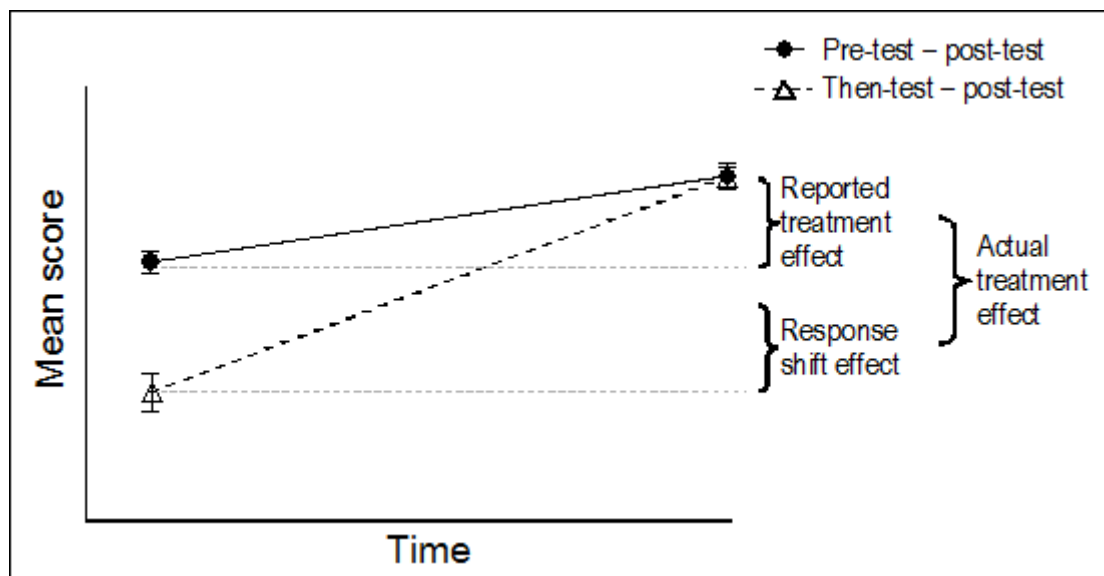


Figure 1: The 'then-test' approach to measuring response shift (adapted from Sprangers et al 1999<sup>16</sup>)

The subjective, dynamic nature of QoL creates significant difficulties for its measurement and research in this area has produced a number of contradictory findings. Waldron et al, showed that, even in the case of serious illness, the expected deterioration in QoL did not occur [8]. Temel et al, showed that patients with lung cancer live longer if palliative care is involved from diagnosis [27]. What is the reason for this? As QoL is the pivotal aim of palliative care personal, is it that the focus on QoL issues is helping patients to live longer? To further extrapolate from this hypothesis we need to understand patients' real QoL issues and if over time these issues fundamentally change, we as clinicians, need to understand and be receptive to fundamental 'shifts' in patients' conceptualisation of their QoL issues. The aim of this study was to understand the true changes in QoL for patients with lung cancer, to increase the accuracy of future studies incorporating QoL assessment and to challenge the hypothesis that 'knowledge' of individualised QoL may be key to helping patients with terminal illnesses to live longer.

The study looked at lung cancer patients, from diagnosis, receiving palliative treatment, in receipt of palliative care from diagnosis, measured their health-related QoL (HRQoL) [28,29], their individualised QoL and incorporated methodology to assess for possible re-conceptualisation and/or recalibration, *i.e.*, RS of their previous QoL issues. Individualised QoL was assessed using a validated methodology, SEIQoL and SEIQoL-DW, that presents the patient with a 'blank canvas' and the patient essentially lead the outcome [30-34] This study is from 2009 but as this work has not

been replicated, the authors consider it important to publish. The treatments of Lung Cancer have changed since this time, but the relevance of QoL in such a very ill patient population has significant relevance [27].

## Patients and Methods

### Participants

The sample consisted of patients with recently diagnosed stage IIIB/IV lung cancer attending the Respiratory Unit in Merlin Park Galway University Hospital, Ireland for palliative chemotherapy. 33 patients were interviewed at time of attending for their first dose of chemotherapy. All patients were aware that they had advanced lung cancer and treatment was being administered with a palliative intent. All patients were referred to Palliative Care from diagnosis. The assessment was repeated at one, three and six months. These follow up assessments included a 'then-test' to assess for response shift. Patients were excluded if they were considered to have a life expectancy of less than one month or had a cognitive impairment such that the patient was considered unable to complete the questionnaires.

### QoL Assessment

Individualised QoL was assessed using the SEIQoL and the short schedule SEIQoL-DW. Health - related QoL was assessed using the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC-QLQ C-30) supplemented with the lung cancer module (LC-13). At follow up assessments the

'then-test' was performed using SEIQoL/ SEIQoL-DW to assess for evidence of RS.

**Details of Measures Used**

**SEIQoL**

The SEIQoL and SEIQoL-DW both consist of a three-stage semi-structured Interview [30-35] A semi-structured interview using SEIQoL DW tool was used to gather information on all patients QoL.

**Interview Schedule:**

**Step 1:** Patients were asked to identify cues/domains of importance to their QoL and rate their perceived current level of functioning of each cue on a scale between 0-100. This was presented on a bar graph.

**Step 2:** The relative importance of each cue is determined by using judgement analysis (JA) in SEIQoL, which is a long process of presenting the patient with 'their' QoL cues in 30 hypothetical scenarios, 8 of which are replicated unknown to the patient. This assesses 'internal reliability'(r), and the 30 cases are incorporated into a multiple regression analysis that assesses internal validity (R<sup>2</sup>). SEIQoL allows solid scientific quantitative analysis consolidate the information gathered from the shorter SEIQoL-DW. The Direct Weighting procedure (SEIQoL-DW) was obtained using a pie-chart containing five individually coloured, movable segments (DISK) representing the five cues nominated by the individual. The patient was asked to manipulate the segments of the DISK to reflect the relative weight of importance of each cue to their overall Subjective QoL. A global QoL score is calculated from both interviews and the information generates a graphical view of the patient's QoL cues and how they are functioning.

**Step 3:** The patient reported global QoL score was reflected on a visual analogue scale (VAS). This VAS is part of SEIQoL and SEIQoL-DW but not part of the calculation of the global QoL score. It gives a 'snap-shot' view of the person's overall view of their QoL.

**'Then – Test': Assessing Response Shift with SEIQoL-DW**

At follow up interviews at one, three and six months current levels of functioning and relative weights of the five cues nominated at baseline are recorded as in stage 2 and 3 of the SEIQoL-DW explained above. Respondents, were then asked to rate how they now think, reflecting back, they were doing in each of the five life areas at the time of their last interview, and how important these five life areas were in relation to each other then. If SEIQoL-DW was administered on two occasions, changes in the content of the cues selected by the respondent as being most important to their QoL would represent *reconceptualisation*; changes in cue levels would reflect *internal standard change and changes in values* would be reflected by changes in cue weights [13-26] SEIQOL using JA was not used for measuring RS as it was considered too time consuming on the patient.

**EORTC QLQ - C30 & LC13**

This cancer specific HRQoL instrument has been well validated [28,29]. The QLQ has 30 questions covering three main categories, how the patient is functioning, how their overall QoL is and if they have any of the physical symptoms considered common to patients with cancer. The lung cancer module (LC13) includes questions assessing lung cancer-associated symptoms, treatment-related side effects and pain medication.

**Outcome Measures and Statistical Methods**

EORTC-QLQ C-30 was analysed as per instructions from EORTC group [28,29]. The SEIQoL and SEIQoL –DW generate a number of outcome measures;

- 1) Cues: the five areas of life nominated by the respondent as being most important to their overall QoL;
- 2) Levels: The respondent's current status/level of functioning on each of the cues;
- 3) Relative weights: derived by judgement analysis (JA) in the case of the SEIQoL using Policy PC programme which processes the relative weights of QoL cues by multiple regression analysis and in the case of the SEIQoL-DW by means of percentage measurement of each colored disk space allocated by the patient; each cue is weighted 'relative' to the other out of 100.
- 4) Internal validity (R<sup>2</sup>) is measured using Policy PC programme (R<sup>2</sup> >0.7 is considered acceptable in the context of psychosocial measurement)<sup>[23]</sup>;
- 5) Internal reliability: the ratings given to 10 repeated vignettes are correlated (Pearson's r) to provide a measure of internal consistency;
- 6) Global QoL score: calculated by multiplying each cue level by the corresponding cue weight and summing the products across the five cues. Statistical analyses were performed using Datadesk software, version 6.0. Standard measures were used to calculate differences between means (t test), when comparing overall QoL scores within the group for each QoL instrument used. The 'measure of agreement' between the QoL instruments used in this study was assessed by calculating the correlation co-efficient; as the overall QoL scores were continuous from 0 to 100, Pearson's R was calculated for all results.

**Results**

**Study Group:** Thirty three patients were interviewed at initial diagnosis on attendance for first dose of chemotherapy. Patient characteristics are listed in Table 1. The majority of the patients were male (N=27); N=21 had Non Small Cell Lung Cancer (NSCLC); N=12 patients had Small Cell Lung Cancer (SCLC); mean age of the study population was 63yrs and the median age was 62yrs. There was a high attrition rate over the six-month study period. Although 33 patients were recruited at the start of this study; 20 patients completed an interview at one month (T2); 15 patients completed an interview at three months (T3); and 7 patients completed an interview at six months (T4). The main reason for the fall in patient numbers over time was due to deterioration in patients' health status due to disease progression and death over this study period.

**Table 1: Patient demographics**

Characteristic	No. of Patients	% of Patients
<b>Age, years</b>		
Mean	63	
Median	62	
Age Range	37 – 80	
<b>Gender</b>		
Male	27	82
Female	6	18
<b>Diagnosis</b>		
NSCLC	21	64
SCLC	12	36
<b>Marital Status</b>		
Married	25	76

Single	5	15
Separated	2	6
Widowed	1	3
<b>Occupation</b>		
Employed	14	42
Retired	14	42
Housewife	3	9
Unemployed	2	6
<b>Patients Interviewed</b>		
Study start (T1)	33	100
One month (T2)	20	60
Three months (T3)	15	45
Six months (T4)	7	21

**Global QoL scores**

Scores on the SEIQoL, SEIQoL-DW and the EORTC QLQ-C30 were normally distributed based on normal probability plots. There was good correlation between all measures. (Table 2) The mean QoL scores as measured using SEIQoL (JA) and SEIQoL-DW and EORTC-QLQ-C30 are displayed in Table 3. At the first interview, of a possible score of 100, the mean SEIQoL JA global QoL score was 65.27; the mean SEIQoL-DW QoL score was 67.48; the mean EORTC global QoL score was 52.52 and the VAS score was nearer SEIQoL/SEIQoL-DW, 63.2. At the 2nd interview one month later the mean SEIQoL JA global QoL score was 62.99; the mean SEIQoL-DW QoL score was 66.71; the mean EORTC global QoL score was 53.33; the VAS score was 66.35.

**Table 2: Pearson’s Product - Moment Correlation for SEIQoL, SEIQoL-DW and EORTC**

Pearson’s r	SEIQoL	SEIQoL-DW	EORTC QLQ-C30
Time1 (study start)	0.976	0.985	0.977
Time 2 (1 month)	0.986	0.987	0.983
Time 3 (3 months)	0.982	0.973	0.963
Time 4 (6 months)	0.926	0.951	0.892

**Table 3: Mean QoL Scores over six months**

Mean QoL Score	T1 (n=33)	T2 (n=20)	T3 (n=15)	T4 (n=7)
SEIQoL	65.27	62.99	61.27	61.44
SEIQoL-DW	67.48	66.71	65.13	61.86
EORTC QL2	52.52	53.33	52.22	54.76
VAS	63.2	66.35	66.35	61.4

At the third interview at three months the mean SEIQoL JA global QoL score was 61.27; the SEIQoL-DW global QoL score was 65.13; the EORTC global QoL score was 52.22; the VAS score was 66.35. At the final interview at six months the mean SEIQoL JA global QoL score was 61.44; the SEIQoL-DW global QoL

score was 61.86; the EORTC global QoL score was 54.76; the VAS score was 61.40. The mean internal validity (R<sup>2</sup>) and internal reliability (r) scores for the patients who completed the SEIQoL were high at all time points (Table 4).

**Table 4: Mean Internal Validity (R<sup>2</sup>) and internal reliability (r) for SEIQoL**

Study Time	T1 (n=33)	T2 (n=20)	T3 (n=15)	T4 (n=7)
Points				
Mean r	0.91	0.89	0.91	0.92
Mean R2	0.85	0.84	0.86	0.9

A paired t-Test was performed to assess if there was a statistically significant deterioration in mean QoL scores over the six-month study period. Results indicate that there was no significant deterioration in mean QoL in any of the measurement scales.

A paired t-Test was performed to assess if there was a statistically significant difference in mean QoL scores using the

SEIQoL/SEIQoL-DW and the EORTC-QLQ-C30 over the six-month study period. Results indicate that there was a highly significant difference at T=1 (p<0.0001) and significant difference, T2,3, with lower EORTC-QLQ-C30 mean QoL scores. (Table 5)

**Table 5: Results of paired t-Test comparing EORTC-QLQ scores with SEIQoL JA and SEIQoL-DW over 6 month study period**

Paired t – Test	T1 EORTC-QLQ	T2 EORTC-QLQ	T3 EORTC-QLQ	T4 EORTC-QLQ
SEIQoL P value	< 0.0001	0.0016	0.0152	0.054(n.s)
SEIQoL-DW P value	<0.0001	0.0034	0.0003	0.022

**Response Shift in QoL**

In this study we assessed for evidence of response shift by incorporating the ‘then-test’ into the SEIQoL-DW methodology as outlined above. The ‘then-test’ was performed using SEIQoL-DW at T2, T3 and T4 and compared with the mean SEIQoL-DW QoL scores to assess for evidence of response shift at these different time points. The results are outlined in Table 6. The mean SEIQoL-DW score was 67.48 at first interview (T1). At the second interview, one month later (T2) the mean SEIQoL-DW score was 66.7. A paired t-test revealed no significant difference between

scores (p=0.2). However, at T2 when patients were retrospectively asked to rate their recollection of their QoL at T1 (1st T-T) they rated it much lower; mean SEIQoL-DW score was 59.61, indicating a response shift of 7.87 points. A paired t-test (Table 7) comparing the mean SEIQoL – DW score at T1 and the ‘then-test’ score shows a highly significant difference between scores (p≤0.0001). There were similar findings at the follow up interviews at three months (p= 0.0031) and six months (p=0.0007). The results show an actual improvement in QoL over time that was clinically significant.

**Table 6: Mean SEIQoL –DW and Then-Test (T-T) Scores T1 –T4**

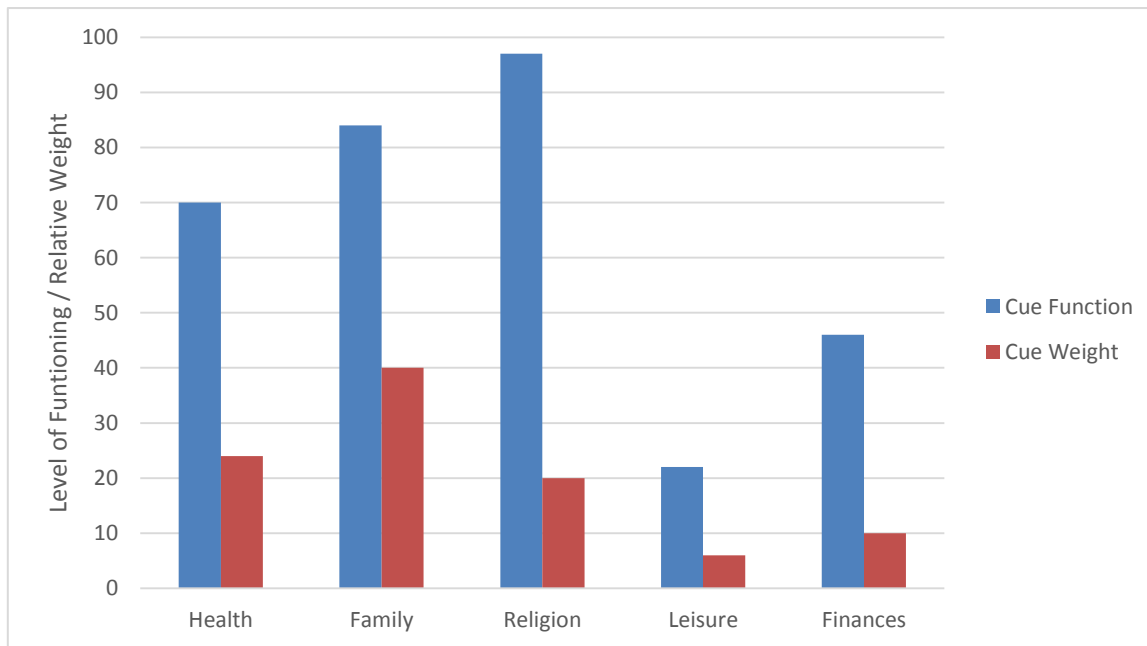
Mean QoL Score	T1 (n=33)	T2 (n=20)	1 <sup>st</sup> T-T (n=20)	T3 (n=15)	2 <sup>nd</sup> T-T (n=15)	T4 (n=7)	3 <sup>rd</sup> T-T (n=7)
SEIQoL -DW	67.48	66.71	59.61	65.13	59.92	61.86	58.84
Response Shift			7.87		6.79		6.28
P value*		0.205	≤0.0001	0.617	0.0031	0.598	0.0007

P\* = Paired t test

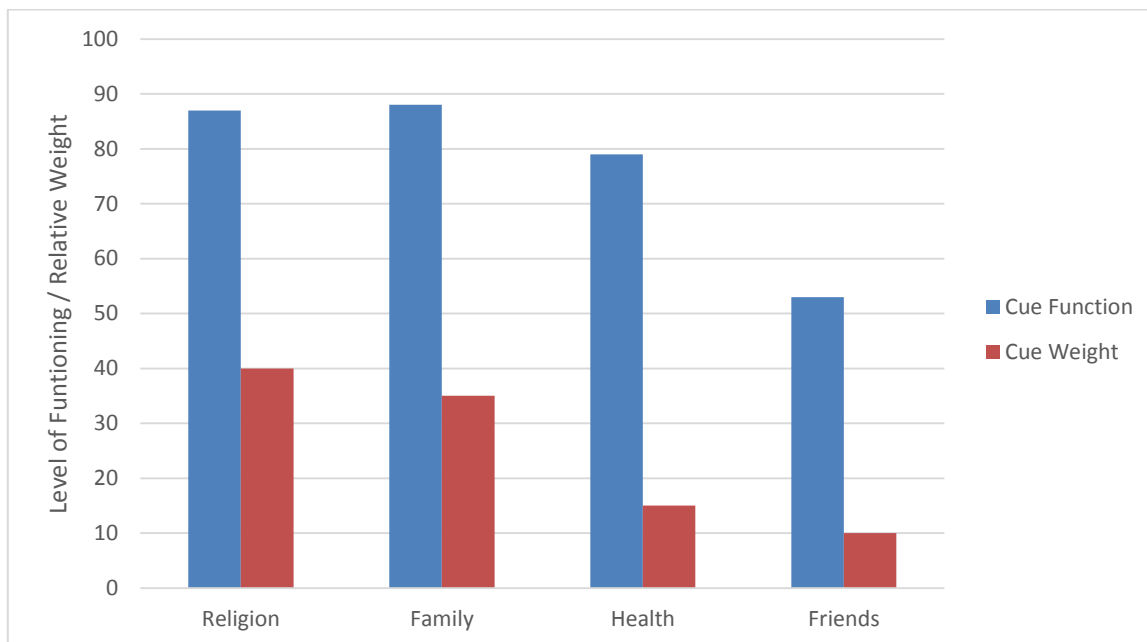
**Individual case study**

Mr G.G. was a 48 year old married gentleman who had advanced metastatic NSCLC at presentation. At the first interview (T1) he nominated five cues as being important to his QoL: health, family,

religion, leisure activities and finances. He gave high weightings to family (40%), health (25%) and religion (20%). As he rated family, health and religion as functioning well at that time he had a high SEIQoL–DW score of 78.9 out of a possible 100 (Figure 2).



**Figure 2: Individual Patient Profile at T1 (SEIQoL cues); SEIQoL –DW Index: 78.9**



**Figure 3: Individual Patient Profile at T2 (SEIQoL cues); SEIQoL- DW Index: 82.85**

At the second interview at one month (T2) he nominated 4 cues as being important to his QoL (Figure 3); 3 of these were the same as T1: religion, family and health. His fourth cue ‘friends’ was a new cue. This change in cues reflects **re-conceptualisation**. There was also a change in cue weighting at T2; religion was now assigned

the highest weight (40%) followed by family (35%), health (15%) and friends (10%). This change in cue weights is reflecting a **change in values**. As he rated his 3 top cues as functioning highly his SEIQoL–DW score was high at 82.85 out of 100.

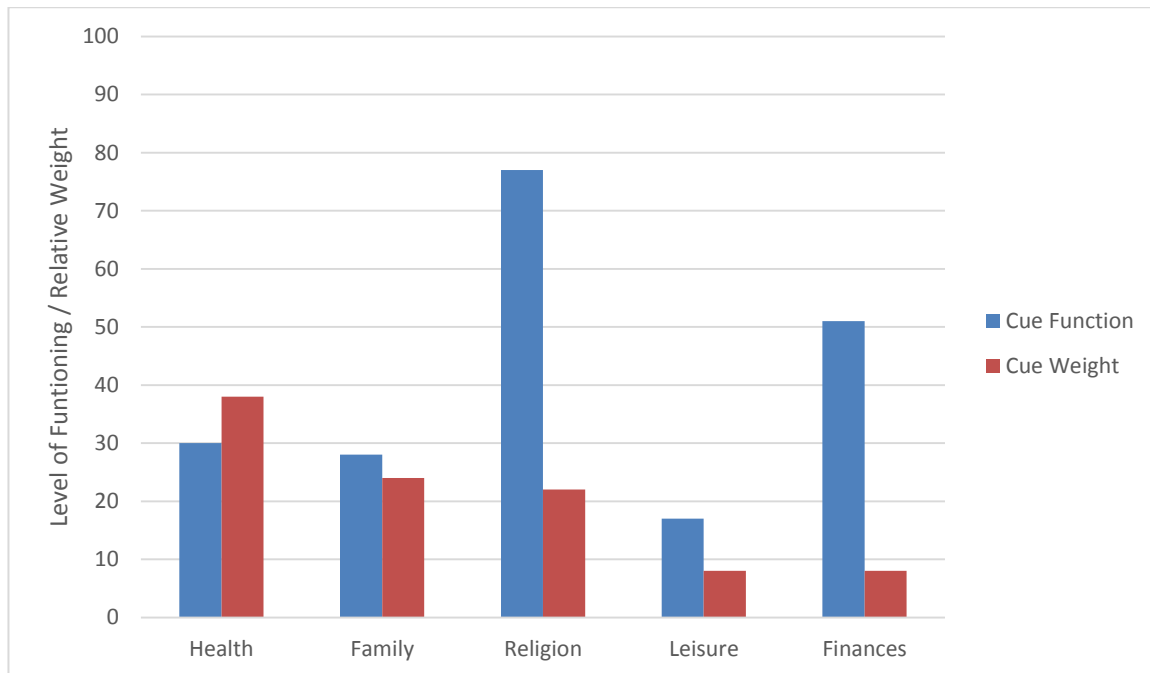


Figure 4: Individual Patient Profile T1 'then-test'; SEIQoL-DW Index: 41.07

At the second interview (T2) he was asked to remember how the 5 cues he had nominated at the first interview were functioning then; in addition he was asked to remember how important he felt these areas were in relation to each other at that time (Figure 4). Retrospectively he rated 4 of the 5 cues as functioning much lower than he had rated at the time of the first interview. In particular there was a marked difference in how he rated the functioning of his health (70/100 at T1 vs. 30/100 'then-test') and family (89/100 at T1 vs. 28/100 'then-test'). This change in cue level functioning is reflecting an **internal standard change**. There was also a difference in his weighting of cues; retrospectively he gave a higher weighting to health (38% 'then-test' vs. 25% T1) and a lower weighting to family (23% 'then-test' vs. 40% T1). His 'then - test' SEIQoL -DW score is only 41.07 out of a possible 100.

## Discussion

The experience of having cancer and enduring cancer treatments can have a significant impact on every aspect of an individual's sense of well being and thus his/her QoL. In evaluating the effectiveness of treatment regimens, it is important to capture this dimension to ensure individuals are offered appropriate care and support.

The major limitations to this study are, the time elapsed since it was completed and the high patient attrition rate. This is a recurring problem for studies of patient's with terminal illnesses. The original SEIQoL (JA) allows for each patient to be their own control and this helps to allow scientific interpretation despite small patient numbers. This research has not been replicated since it was completed.

SEIQoL is essentially patient directed, the patient in essence, is presented with a 'blank page' and it is the patient that delivers the information that creates the 'graph' of their QoL. SEIQoL is developed based on the definition of QoL as 'what the patient says it is' [30-34]. SEIQoL, completed using the JA methodology, gives strong scientific validity to the study with mean internal reliability ( $r$ ) remaining around 0.9 throughout all Time points (Table 4) with above 0.7 being considered reliable [10]. Internal validity ( $R^2$ ) also remained above 0.84 through all Time points, mean above 0.7 considered reliable. SEIQoL, using JA, has

solid validity and internal reliability as an integral component of each interview, i.e., each interview could be considered an  $N=1$  study. SEIQoL-DW is 'user-friendly', it takes on average ten minutes, therefore, 'time' is short to complete this validated interview [31]. SEIQoL using JA is considered to assess 'unconscious' thought and SEIQoL-DW more 'conscious' thought, therefore SEIQoL-DW is more relevant to the 'clinical' scenario [8].

In this study of patients with advanced lung cancer receiving palliative treatments QoL was assessed using two related measures of individual QoL, the SEIQoL and SEIQoL-DW and a disease specific questionnaire measure the EORTC-QLC and LC13 module. There was a strong correlation between the SEIQoL, SEIQoL-DW and the EORTC at all time points (Table 3). Over the six month study period there was a statistically significant difference in mean QoL scores between the individual QoL measures (SEIQoL and SEIQoL-DW) and the EORTC-QLQ (Table 5), the difference being highly significant at Time 1 (paired t-test  $<0.0001$ ), except for SEIQoL (JA) at T4 which almost reached a significant value ( $p=0.054$ ), (Table 5). At all time-points the EORTC-QLC was at a clinical significant lower QoL score. (Table 3) This is most likely reflecting the fact that, the EORTC-QLQ is a disease specific measure, which has health as an anchor. The psychometric data for the SEIQoL/ SEIQoL-DW indicated that patients were very good judges of their own QoL and those judgements were consistent over time. HRQoL measures seek information on functioning in a range of predetermined areas and usually places the highest priority on health. However, Waldron et al, [8] showed that in assessing individual QoL, in a group of patients with advanced cancer, health was not the single most important area to this patient group, patients consistently gave higher weightings to family. There is a sense that palliative care patients may 'let go' off what can't be controlled, i.e., 'Health' and focus on 'Other' issues of importance to their Subjective QoL as reflected when professional carers rate proxy QoL and symptoms much lower than the patient does [35].

The above SEIQoL-DW results in Table 7 show that 'RS' is occurring in this study population with highly significant statistical/clinical significance. Clinical significance has been established as an improvement or deterioration of 7.5 points over time [30-34]. This has significant implications, both for the

interpretation of previous studies that have not allowed for RS and for the design of future studies in which QoL is used as an outcome measure, especially when QoL outcome is a major component of the study. By explicitly measuring 'RS' it may be possible to assess changes in perceived QoL with greater validity and sensitivity.

The individual case profile above described, allows us to examine how this gentleman has undergone a major 'RS' to his illness. Traditional pre and post test SEIQoL-DW scores at T2 and T3 show little change (78.9 vs. 82.85). (Figure 2,3) However, by incorporating the results of the 'then-test' we can see that this gentleman has undergone a 'RS' of 37.83 points (78.9 - 41.07) and an actual improvement in subjective QoL at T2 of 41.78 points (82.85-41.07). (Figure 4) In assessment of QoL it is vital that instruments accurately reflect changes encountered by patients. RS is important to consider in treatment evaluations especially in so far as it may serve to attenuate or exaggerate estimates of treatment effects as patients adapt to treatment toxicities and/or disease progression over time [13-26] In this study we look at changes in subjective QoL both with conventional pre/post testing and with the retrospective pre-test or then-test technique. This provides a comparison of results with and without the incorporation of RS. Incorporating the 'then -test' increased the magnitude of the changes in QoL measured. Using the pre/post test method in many cases led these changes to become statistically significant. (Table 6) Use of the SEIQoL provides an insight into the mechanisms by which this RS occur. As the trend is for actual improvement in QoL over time in the face of a terminal illness, this does suggest an adaptation that is positive rather than, as could be expected in this setting, be negative.

## Future Directions

What is remarkable in this study is that subjective QoL actually improved over time when RS was incorporated, for an extremely ill patient population. We, as human beings, base how we 'feel today' based on our 'reflection' of how we felt at a previous time point. Despite this patient group all facing inevitable death and relentless deterioration in their physical health, they, somehow, were able to 'anchor' their perception of their QoL based on non-health related parameters. This finding is intuitively right to those of us who look after terminally ill patients, whom as 'people' are able to maintain good spirits and harness good in the situation they find themselves in. It is as if the human spirit has an in-ate potential to 'let go' of inexorable physical deterioration, that is beyond their control and not only cope but create deeper 'meaning' in their lives and somehow improve their QoL. Improvement of reversible health problems, good symptom control remains a real focus for all clinicians [35-39].

The phenomenon of 'RS' has significant implications in situations where QoL judgements must be made well in advance of a medical intervention or where such an intervention is based on a 'proxy judgement' of an individual's QoL [35,40] Patient adaptation to treatment toxicities and/or to changes in health status may result in an inaccurate assessment of QoL over time, if RS is not considered. It is generally accepted that patients have a right to have input into decisions about their future, even when they are not capable of making decisions, and there is considerable and growing interest in the development of advance directives. The longitudinal validity of such directives is likely to be decreased if RS occurs in patients' judgements over time. We cannot assume that decisions made by patients while in good health are necessarily representative of decisions they would make at a later stage when

re-conceptualisation or changes in values are likely to have occurred [40-43].

SEIQoL and SEIQoL-DW generates a 'graphical' image of the patient's QoL. This makes it amenable for clinicians to understand. As clinicians, we are used to interpreting 'graphs' and 'trends', charts are kept at the patient's bedside usually with temperature, blood pressure, heart rate and respiratory rate (TPR chart), and we 'view' this TPR chart and gain an immediate understanding of the patient's 'vital signs' from which we formulate a management plan. McInerney et al, completed a controlled study, in the acute hospital setting, using SEIQoL results incorporated into patient notes to test the hypothesis that using the graphical knowledge of QoL as a clinical tool, improves the actual outcome of QoL and symptom interference in QoL, compared to a similar study performed in a Hospice setting, where up-front graphical knowledge of SEIQoL and symptom information did not influence the outcome of QoL and symptom control [36-39]. The hypothesis being that a 'Hospice' setting was totally focused on QoL and symptom control, using QoL/symptom information in the acute hospital setting could focus teams looking after patients with advanced cancer to address individual patient's issues, this was borne out in practice [36-38].

As Temel et al, showed prolongation of life for a similar patient population by palliative care involvement from diagnosis,[27] this raises an important question. Is this improved survival pivotal to enhanced awareness and action taken based on QoL issues? Therefore, based on this hypothesis, we as clinicians, have a duty to further explore what QoL means to our patients, how each patient 'recalibrates and shifts' in their appreciation of QoL issues over the trajectory of their disease and 'how' we measure QoL in future studies. SEIQoL/ SEIQoL-DW could be used in future studies, to explore the hypothesis, if we as clinicians are in tune with our patient's perceived QoL issues and how these issues may change as patient's adapt and reconceptualise their lives to what really matters throughout the trajectory of their terminal illness, then maybe this knowledge could be a key factor in improved actual 'quality' and 'longevity' for a vulnerable patient group.

HRQoL remains an extremely important outcome measure for treatment effects throughout curative/palliative treatments, however, a combination of Subjective plus HRQoL, incorporating RS could be the optimum future direction in QoL outcome measurement [28,29].

We hypothesis, that 'RS' is pivotal to our understanding of the complex underpinning of each individual patient's illness journey. Patients are not machines, emotions and QoL are subjective measures and therefore can 'shift' and recalibrate over time, especially in the face of adversity. As we measure serial radiological scanning for patients with malignancy to access how disease shifts/stabilizes, then surely we need to put 'time' and 'effort' into measuring serial patient driven QoL assessments that are cognizant of shifts/stability in this equally important outcome measurement?

Murtagh et al, highlights the acceptability of SEIQoL for first year medical students on a 'Special Study Module' called 'Introducing the Medical Student to the 'person' not the patient. In general medical students found the process of the SEIQoL acceptable and felt they 'knew' the patient better after performing the SEIQoL interview with them [45].

The 'blank page' method of SEIQoL could have a role, in future studies to 'select out' patients that need more in-depth exploration (unconscious thought) of the underpinning of their QoL

issues, i.e. for legal documents, patient's having difficulties making informed decisions regarding treatment options<sup>[41-43]</sup>.

Failure by health professionals to understand the complex nature of individual QoL could result in treatment regimens that not only fail to improve QoL but actually contribute to it's deterioration. Modern approaches to patient treatment increasingly recognize the importance of incorporating the views of patients in treatment planning<sup>[46]</sup>. Therefore, patients with advanced disease should be asked what they prioritize in their lives. Based on a biomedical model of disease, it is often assumed that QoL invariably deteriorates with advancing disease<sup>[8,46]</sup>. However, in clinical practice there is evidence that patients may undergo a psychological adaptation to their illness and shift the focus of QoL judgments from physical deterioration to spiritual, psychological and social domains. This ability to adapt to changing circumstances is a defining characteristic of human beings, and illustrates the resilience and extraordinary vitality of the human spirit<sup>[47,48]</sup>.

There could be a role for Clinicians to help patient's cope better by empowering a 'RS' for patients to harness what truly matters to their lives in the face of inevitable mortality, i.e, help patients 'use memory' as a clinical 'method' to harness a RS in a positive direction. We need to study this phenomenon in larger studies and in different cultures. The result from this study is that in this patient group QoL was maintained at the same level over time using traditional measures and that there was a clinically significant improvement after incorporation of RS.

To recognize first that we, as clinicians involved in care of patients whose disease trajectory leads to 'end of life', have an ethical duty to be able and willing to 'shift' with our patient's as they recalibrate what matters to their QoL<sup>[48,49]</sup>. This is a good beginning. However, to accept that we also need to measure, give credence and value to our patient's subjective views and their re-evaluation of their QoL could require a paradigm shift<sup>[48-50]</sup>. Temel et al, created a paradigm shift by scientifically showing that palliative care involvement for terminally ill lung cancer patients from diagnosis, improved survival<sup>[27]</sup>. Twenty years ago at a major international QoL meeting the general view was that subjective QoL measurement was not under negotiation, 'that train had left the station', maybe we need to get back that train? As eloquently said by Steve Jobs<sup>[51]</sup>, "Death is a destination we all share".. "Things fall away in the face of death leaving only the things that are important"

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