Psycho-Oncology
Psycho-Oncology (2011)
Published online in Wiley Online Library (wileyonlinelibrary.com). **DOI**: 10.1002/pon.1904

Predictors of finding benefit after lung cancer diagnosis

Andrea A. Thornton[1]*†, Jason E. Owen[2], Kemp Kernstine[3], Marianna Koczywas[4], Frederic Grannis[3], Mihaela Cristea[4], Karen Reckamp[4] and Annette L. Stanton[5]

[1]*Divisions of Psychology and Behavioral Oncology, City of Hope Comprehensive Cancer Center and Beckman Research Institute, Los Angeles, CA, USA*
[2]*Department of Psychology, Loma Linda University, Loma Linda, CA, USA*
[3]*Division of Thoracic Surgery, City of Hope Comprehensive Cancer Center and Beckman Research Institute, Los Angeles, CA, USA*
[4]*Department of Medical Oncology and Therapeutics Research, City of Hope Comprehensive Cancer Center and Beckman Research Institute, Los Angeles, CA, USA*
[5]*Departments of Psychology and Psychiatry & Biobehavioral Sciences, UCLA, Los Angeles, CA, USA*

** Correspondence to: Resnick Neuropsychiatric Hospital and Semel Institute, UCLA, 760 Westwood Plaza, Room 27-371, Los Angeles, CA 90024-1759, USA. E-mail: athornton@mednet.ucla.edu*
†Current address: Andrea A. Thornton is now at the Resnick Neuropsychiatric Hospital and Semel Institute, UCLA, Los Angeles, CA, USA.

Received: 2 September 2010
Revised: 29 November 2010
Accepted: 7 December 2010

Abstract

***Objective*: We examined benefit finding in patients with lung cancer, including level of benefit finding and change in benefit finding over time, and tested a predictive model postulating that greater impact of and engagement with the stressor promotes benefit finding.**

***Methods*: Patients diagnosed with a primary lung cancer within the past 6 months ($M = 16$ weeks post-diagnosis) completed measures of benefit finding, cancer-related intrusions, perceived stressfulness, coping, and demographic and medical information at study entry (T1; $n = 118$) and 3 months later (T2; $n = 79$).**

***Results*: Level of benefit finding at both assessments was to a 'mild-to-moderate degree'. Benefit finding increased over time for patients with small cell carcinoma, but not for those with nonsmall cell carcinoma. The proposed model explained 33% of the variance in T1 benefit finding, and 64% (using T1 coping measures) and 71% (using T2 coping measures) of the variance in T2 benefit finding. Greater benefit finding was associated with having small cell lung cancer, higher cancer-related intrusions, lower perceived cancer-related stress, and greater approach-oriented coping. Positive reframing coping emerged as the single unique approach-oriented coping scale predicting benefit finding at T1, and emotional approach coping was the single unique approach-oriented coping scale predicting benefit finding at T2.**

***Conclusion*: Findings provide general support for a theoretical model positing that stressor impact and engagement with the stressor contribute to the development of benefit finding after cancer. Future research with larger, more diverse samples is needed to confirm and extend these findings.**

Keywords: lung cancer; benefit finding; coping; stress; posttraumatic growth

A large research literature documents the positive life changes that many cancer survivors associate with their illness experience (for a review, see Stanton *et al*. [1]). A variety of terms have been used to characterize these positive perceptions, including posttraumatic growth, stress-related growth, and benefit finding. Regardless of terminology, the underlying notion is similar: individuals struggling with highly adverse experiences such as cancer report both positive and negative consequences [2]. Although benefit finding research has flourished over the past decade, the literature remains limited by its largely descriptive and cross-sectional nature. In the psycho-oncology literature specifically, available data are based primarily on samples of women with breast cancer [3–7], with a few studies addressing benefit finding after prostate cancer [8,9], or in patients with mixed cancer diagnoses [10–13]. To our knowledge, no published research has addressed benefit finding or its predictors in patients with lung cancer, the first goal of the current study.

We were interested in examining benefit finding in lung cancer patients for several reasons. No research has explored this construct in lung cancer patients specifically, despite the fact that lung cancer is the second most commonly diagnosed cancer in women and men in the United States [14]. In addition, one of the tenets of many theories regarding benefit finding is that the stressor must be sufficiently challenging to motivate the individual to work through the disruption and assimilate the event into their worldview [15,16]. Lung cancer qualifies as such a stressor. Not only is long-term survival poor for the overwhelming majority of lung cancer patients [14], but also lung cancer

patients report high rates of symptom distress [17,18], unmet psychological needs [19], and psychological distress compared to other samples of cancer patients [20–22]. The high levels of distress and illness-related disruption that characterize the lung cancer experience may set the stage for the development of benefit finding. We also examined change in benefit finding over time. We hypothesized an increase in benefit finding from the first to second assessment, based on evidence of an increase in benefit finding in breast cancer patients over 18 months [3], and theory suggesting that benefit finding arises as a result of an active process of engagement with and deliberative processing of the stressor, which presumably evolves over time [15].

Another goal of the current research was to examine predictors of benefit finding in this novel population. Although correlates of benefit finding have been identified in many studies, the data are not entirely consistent across populations or methodologies [1]. In their recent review of the benefit finding literature after cancer, Stanton and colleagues [1] identified two generally facilitative conditions for benefit finding: (1) perceived impact of the stressor, and (2) intentional engagement with the stressor. Both conditions are consistent with Tedeschi and Calhoun's conceptualization of benefit finding [2,23] and support the notion that the stressor must be sufficiently disruptive to activate a coping response aimed at managing the distress associated with the experience [15]. Further support for the role of event-related stressfulness in benefit finding comes from a recent meta-analysis in which event-related intrusive and avoidant symptoms were associated with greater benefit finding [24].

Approach-oriented coping strategies that involve the mobilization of personal and social resources and facilitate active engagement with the stressor also seem to promote benefit finding [1]. Specific coping strategies that have been associated with higher levels of benefit finding include problem-solving coping [5,12], seeking support [5,9,25], religious coping [25], active coping [7,8], positive reframing [5,9,12,25], acceptance coping [13,25], and emotional approach coping [3,26]. The findings related to coping and benefit finding are not entirely consistent, however. Antoni and colleagues [26] found that emotional approach coping correlated concurrently, but not prospectively, with their measure of benefit finding. Bussell and Naus [25] also found evidence for concurrent relationships between benefit finding and several approach-oriented coping strategies, but no significant prospective relationships. Fewer studies have tested for a negative relationship between benefit finding and avoidant coping strategies that might be anticipated to impede the development of benefit finding, although at least one study found a positive relationship between avoidant coping and benefit finding [12], and another found no relationship between denial/behavioral disengagement coping and benefit finding [7].

Finally, we also wished to examine the role of gender in perceptions of growth after lung cancer. From a theoretical perspective, women may be more inclined to engage in coping behaviors that are believed to promote benefit finding such as positive reappraisal and self-talk [24], emotional approach coping [27], and emotion-focused and support-based coping [28–31]. Recent research also suggests that women may report more distress in the context of cancer compared to men, which itself is hypothesized to set the foundation for benefit finding [32]. Although earlier studies did not reveal differences between women and men in their overall levels of benefit finding [1], recent research [33] and a meta-analytic review [24] suggest that women report higher levels of benefit finding than men.

To summarize, the first aim of this research was to extend the literature on benefit finding to the particular case of lung cancer. We hypothesized moderate levels of benefit finding in this population, and an increase in benefit finding from baseline to follow-up. Our second aim was to examine predictors of benefit finding—specifically event-related impact, engagement with the event (coping), and gender. We hypothesized higher levels of benefit finding in patients who were women, who reported higher levels of event-related stress, and who reported more approach-oriented coping (i.e. emotional approach coping, positive reframing, support seeking, and problem-focused coping) and less avoidant coping.

Method

Participants

Participants were recruited from two medical centers in Southern California: Loma Linda University Medical Center (LLUMC, $n = 26$) and City of Hope (CoH; $n = 92$) with approval from their institutions' Institutional Review Boards. Eligible patients were: (a) diagnosed with a primary cancer of the lung (nonsmall cell or small cell carcinoma) within the prior 6 months, (b) greater than 18 years of age, and (c) able to speak, read, and write in English. Participants who had a previous cancer history, who were diagnosed with a non-lung cancer chest malignancy (i.e. mesothelioma), or who were not physically well enough to be able to read and respond to the questionnaires were not eligible for participation.

Available data regarding participant attrition differs from site to site due to differences in recruitment (described below). At CoH, 143 (80%) of 179 eligible patients consented to participate, and 92 (51%) patients completed the T1 questionnaire. Of the 36 patients who did not consent to participate, 16 were passive refusals (i.e.

DOI: 10.1002/pon

took the consent home but did not return it), 16 declined participation for various reasons (e.g. lack of interest, too ill), and 4 patients were refused by their physicians. Reasons for non-completion of the T1 questionnaire ($n = 51$) included: death ($n = 7$), no questionnaire return within the study window ($n = 43$), and patient declined ($n = 1$). T2 questionnaire data were available for 63 patients from CoH. Reasons for loss to follow-up of CoH patients between T1 and T2 included death prior to questionnaire completion date ($n = 10$) and undocumented reason for non-return ($n = 19$).

At LLUMC, 26 participants who met the eligibility criteria for the study returned T1 questionnaires, and 16 of these also completed the T2 questionnaire. Reasons for loss to follow-up of LLUMC patients included: death ($n = 4$), too ill to continue ($n = 3$), and no longer interested in continuing ($n = 3$).[1]

We compared those patients who completed measures at both time points to those who completed T1 only on the socio-demographic, medical, and key study variables measured at T1. We uncovered no differences between the two groups on any of the socio-demographic or medical variables, nor did the two groups differ in level of benefit finding, perceived stress, or cancer-related intrusions. However, patients who did not complete the T2 questionnaire reported higher levels of approach-oriented coping at T1, $t(110) = 2.77$, $p < 0.01$ (which was due to higher endorsement of emotional approach and positive reinterpretation coping).

Procedures

At CoH, prospective participants were identified by the Project Coordinator (PC) in conjunction with clinic staff and the attending surgical or medical oncologist. Patients who met eligibility criteria were approached in person by the PC during their clinic appointment. During this meeting they were provided with a brief verbal overview of the study and its requirements, the study materials (consent and questionnaire), and the opportunity to ask questions about participation. Patients were then either consented in clinic, or were provided the opportunity to take the materials home for review to return at a later date. All patients were provided a stamped, addressed envelope to return the study questionnaire packet.

Participants from LLUMC were recruited via the tumor registry. Eligible patients were contacted by mail and received a follow-up telephone call from the PC at LLUMC to determine whether they were interested in receiving the study materials. During the telephone call they were provided with a brief description of the study and its requirements, and provided the opportunity to ask any questions. Interested patients were sent a baseline (T1) study questionnaire packet with a stamped return envelope.

At both sites, participants who did not return their questionnaire within approximately three weeks received a reminder telephone call from the PC inquiring as to whether they had any questions about the study or its materials. A duplicate questionnaire was sent to participants who did not return their questionnaires within two weeks of this call. A follow-up questionnaire (T2) was mailed to participants approximately 3 months following recruitment, and similar follow-up procedures were used. We used 3 months as a follow-up period given the high morbidity and mortality in this group of cancer patients [14]. Participants received $20.00 following completion of each study questionnaire and a $30.00 gift card following completion of both T1 and T2 questionnaires.

Measures

Medical and demographic information

Basic demographic and medical information was captured at baseline with a brief measure designed for this study.

Coping

We used scales from the COPE [34,35], and the Emotional Approach Coping Scales [36] to assess strategies that patients reported using to manage distress related to their cancer at T1 and T2. The COPE is a frequently used measure of coping in the health psychology literature. Respondents rated each of the COPE items on a 1 (*I don't do this as all*) to 4 (*I do this a lot*) scale referring to how they are coping with the cancer experience. We used the following COPE scales (α for the current sample at T1 and T2 are provided in parentheses): positive reframing coping (four items, $\alpha_{T1} = 0.82$, $\alpha_{T2} = 0.84$), coping through social support (four items assessing emotional and instrumental support, $\alpha_{T1} = 0.80$, $\alpha_{T2} = 0.78$), problem-focused coping (four items representing active and planning coping, $\alpha_{T1} = 0.79$, $\alpha_{T2} = 0.86$), denial coping (four items, $\alpha_{T1} = 0.73$, $\alpha_{T2} = 0.67$), and behavioral disengagement coping (four items, $\alpha_{T1} = 0.64$, $\alpha_{T2} = 0.69$). Mental disengagement coping (four items) was dropped from analyses because of the unacceptable alpha, $\alpha_{T1} = 0.47$, $\alpha_{T2} = 0.47$).

The Emotional Approach Coping scales consist of eight items that assess two aspects of emotional approach coping: emotional processing and emotional expression [36]. Participants rated each item on a response scale from 1 (*I don't do this at all*) to 4 (*I do this a lot*), referencing how they coped with their cancer experience. In the current study, $\alpha_{T1} = 0.88$, and $\alpha_{T2} = 0.90$.[2]

Consistent with prior research [12,37], we developed a composite approach-oriented coping scale

DOI: 10.1002/pon

comprised of the social support coping, problem-focused coping, positive reframing coping, and emotional approach coping scales ($\alpha_{T1} = 0.93$, and $\alpha_{T2} = 0.94$), and a composite avoidance coping scale comprised of the behavioral disengagement and denial coping scales ($\alpha_{T1} = 0.66$, and $\alpha_{T2} = 0.72$).

Cancer-related stress

Because the literature is mixed as to whether perceived stress or stress-related cognitive intrusions are more predictive of benefit finding, we included measures of both in our analyses. We used the intrusion subscale of the Impact of Event Scale or IES [38], a widely used self-report instrument, to assess cancer-related intrusions at T1 and T2. Respondents indicated how often they experienced each of the seven weighted Likert-type items (0 = not at all, 1 = rarely, 3 = sometimes, 5 = often) assessing involuntary intrusive experiences. The scale was keyed to the cancer experience specifically and was internally consistent: $\alpha_{T1} = 0.84$, and $\alpha_{T2} = 0.85$.[3]

Participants also rated their level of perceived cancer-related stress (perceived stress) at baseline by responding to the following item: 'Currently, how stressful is your experience with cancer?' on a 1 (*not at all stressful*) to 5 (*extremely stressful*) Likert-type scale.

Benefit Finding. We used the total score of the Posttraumatic Growth Inventory or PTGI [39] to assess perceived positive changes associated with the experience of having had lung cancer at T1 and T2. Respondents completed each of 21 items on a scale ranging from 0 (*I did not experience this change as a result of my experience with cancer*) to 5 (*I experienced this change to a very great degree as a result of my experience with cancer*). Higher scores indicate higher benefit finding and coefficients alpha were high in the current sample: $\alpha_{T1} = 0.96$, and $\alpha_{T2} = 0.96$.

Results

Participant characteristics

Participants were 68 women and 50 men ($N = 118$) diagnosed with lung cancer within the prior 6 months. At study entry, participants had been diagnosed an average of 16.00 (SD = 9.32) weeks and their average age was 66.81 (SD = 10.73) years. Most (85%) participants were Caucasian (4% were Hispanic, 4% African-American, 5% Asian, and 1% American Indian) and married (68%). The mean number of years of education was 13.86 (SD = 2.64). The majority (77%) of patients had non-small cell lung cancer (17% had small cell cancer, and the remaining 6% were unknown/missing data), and most (56%) had Stage III or IV disease (20% were stage I or II, and nearly 24% of patients reported that they did not know their stage or left the response blank). Patients reported having had surgery (26%), chemotherapy (64%), or radiation (28%) to treat their lung cancer, and 14% of patients were missing treatment data.

Preliminary analyses

Prior to examining the hypothesized predictors of benefit finding, we conducted preliminary analyses of medical (cancer type, stage, and time since diagnosis) and sociodemographic (age, marital status, education, ethnicity/race, and recruitment location) variables as potential covariates in the analyses. Consistent with the Stanton *et al.* [1] review, we found little evidence of an influence of these variables on benefit finding with the exception of type of lung cancer. Participants who were diagnosed with small cell lung cancer reported significantly higher benefit finding ($M = 71.63$, SD = 19.55) than those with nonsmall cell carcinoma ($M = 50.05$, SD = 25.94; $t(69) = 2.62$, $p < 0.05$) at T2, but not at T1 (this finding was confirmed using nonparametric tests given the unequal cells and relatively small number of patients with small cell carcinoma). Thus, we included lung cancer type as a covariate in the model predicting T2 benefit finding.

Descriptive data

Descriptive data are presented in Table 1. The mean PTGI scores at each time point correspond to a moderate degree of benefit finding, with individuals on average reporting that they changed a 'small-to-moderate degree' in the queried life domains as a result of their experience with cancer. These scores are slightly lower than those reported in some studies with breast cancer patients [4,5], but similar to those reported by others [3,40], and higher than those reported after prostate cancer [9]; also, for a review that includes levels of benefit finding across several studies of patients with cancer see Stanton and colleagues [1].

The mean scores on the cancer-related intrusions scale at each time point were T1 = 8.55

Table 1. Mean scores on key study variables at T1 and T2

	T1		T2	
Variable name	***n***	***M* (SD)**	***n***	***M* (SD)**
Total PTGI Score	112	55.30 (28.22)	75	52.95 (26.22)
Perceived Stressfulness	118	2.91 (0.96)	—	—
Cancer-Related Intrusions	114	8.55 (7.62)	76	8.88 (7.31)
Approach-Oriented Coping	112	2.79 (0.64)	73	2.53 (0.67)
Emotional Approach Coping	115	2.69 (0.69)	74	2.49 (0.73)
Positive Reframing Coping	116	2.88 (0.84)	74	2.63 (0.90)
Problem Focused Coping	114	2.82 (0.77)	75	2.63 (0.87)
Avoidance Coping	116	1.42 (0.40)	74	1.42 (0.44)
Denial Coping	118	1.41 (0.56)	75	1.34 (0.48)
Behavioral Disengagement Coping	115	1.44 (0.52)	75	1.51 (0.58)

DOI: 10.1002/pon

(SD = 7.62), and T2 = 8.88 (SD = 7.31), suggesting mild-to-moderate intrusive symptoms of cancer-related stress. This mean is comparable to, but slightly lower than, the means reported in a study of breast cancer survivors over an 18-month time span where the mean ranged from 13.6 at baseline to 7.9 at 18 months later [3]. The mean perceived stressfulness of the cancer experience was 2.91 (out of a possible 5), suggesting a moderately high level of stress. Approach-oriented coping was endorsed more frequently than avoidance coping.

The hypothesis that patients would report an increase in benefit finding over time was not supported, $t(73) = -0.34$, $p = 0.74$. However, as suggested in the preliminary analyses, there was a significant time × type of cancer interaction, $F(1, 68) = 11.66$, $p < 0.001$, such that patients with small cell cancer reported an increase in benefit finding from T1 ($M = 52.45$, SD = 23.16) to T2 ($M = 71.63$, SD = 19.55) that was not observed in patients with nonsmall cell cancer (T1 $M = 52.89$, SD = 26.79; T2 $M = 50.12$, SD = 26.16).

As hypothesized, we identified a relationship between gender and benefit finding, which was significant at T2, $t(73) = -2.44$, $p < 0.05$, and approached significance at T1, $t(84.16) = -1.70$, $p < 0.10$. The mean score on the PTGI for women at T2 was 58.31 (SD = 24.35) versus 43.40 (SD = 27.15) for men. At T1, the mean was 59.32 (SD = 24.28) for women, and 49.94 (SD = 32.22) for men.

Regression of benefit finding on predictors

Hierarchical multiple regression was used to test the hypothesis that PTGI scores would be higher in women compared to men, and in patients who reported higher levels of cancer-related intrusive stress symptoms and perceived stress, more approach coping, and less avoidant coping. In the first model we tested the contribution of this set of variables within time to T1 PTGI. No covariates were identified for the model regarding T1 PTGI. Thus, we entered gender in the first step of the model, perceived stress and T1 cancer-related intrusions in the second step, and the approach-oriented and avoidant coping composites in the third step. As shown in Table 2, T1 benefit finding was higher in patients who reported higher cancer-related intrusions and more approach-oriented coping. In a follow-up analysis to determine which specific components of approach-oriented coping were most strongly associated with benefit finding, positive reframing coping ($\beta = 0.31$, $p < .01$) emerged as the single significant approach-oriented coping variable (table not shown).[4]

Table 3 contains the results for the model predicting T2 benefit finding. The variance accounted for by T1 benefit finding was partialled out by entering it in the first step of the model along with the type of lung cancer, which was related to benefit finding in the preliminary analyses. In this model, benefit finding increased over time in patients who were diagnosed with small cell lung cancer, reported lower perceived stress, and reported more approach-oriented coping at T1.[5] In an analysis to examine which specific approach-oriented coping components tested in this model most strongly related to T2 benefit finding, none of the individual coping scales was a unique predictor. However, when we excluded the T1 PTGI covariate from the model, emotional approach coping was significant ($\beta = 0.32$, $p = 0.05$), along with intrusive symptoms ($\beta = 0.27$, $p < 0.05$), type of cancer ($\beta = -0.29$, $p < 0.005$), and perceived stress ($\beta = -0.23$, $p = 0.06$).

In a final set of analyses, we aimed to predict T2 benefit finding using gender and the covariates (lung cancer type, T1 PTGI score), T1 perceived stress (not administered at T2), T2 cancer-related intrusions, and T2 coping. Results shown in Table 4 demonstrate that an increase in benefit finding was associated with having been diagnosed with small cell lung cancer, and with reporting lower perceived stress at T1 as well as higher intrusive symptoms and approach-oriented coping at T2. Approach-oriented coping accounted for a unique 10% of the variance in the increase in benefit finding. In a follow-up analysis examining which specific T2 approach-oriented coping components predicted

Table 2. Benefit finding at T1 regressed on T1 stress and composite coping scales ($N = 107$)

	Step 1			Step 2			Step 3		
Variable	***B***	**SE**	***β***	***B***	**SE**	***β***	***B***	**SE**	***β***
Gender	10.92	5.44	0.19*	8.36	5.18	0.15	4.02	4.79	0.07
T1 Perceived Stress				−2.14	2.98	−0.07	−1.01	2.77	−0.03
T1 Cancer-Related Intrusions				1.46	0.37	0.39***	1.38	0.35	0.37***
T1 Approach-Oriented Coping							17.36	3.68	0.39***
T1 Avoidant Coping							7.90	6.32	0.11
ΔF for step	4.03*			8.07***			12.13***		
ΔR^2 for step	0.04			0.13			0.16		
Total $R^2 = 0.33$									

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

DOI: 10.1002/pon

Table 3. Benefit finding at T2 regressed on T1 benefit finding, stress and composite coping scales ($N = 69$)

	Step 1			Step 2			Step 3			Step 4		
Variable	***B***	**SE**	***β***	***B***	**SE**	***β***	***B***	**SE**	***β***	***B***	**SE**	***β***
T1 PTGI	0.69	0.08	0.68***	0.66	0.09	0.65***	0.65	0.09	0.64***	0.57	0.09	0.56***
Cancer Type	−21.82	5.87	−0.30	−21.30	5.91	−0.30***	−22.64	5.75	−0.32***	−21.37	5.57	−0.30***
Gender				4.31	4.76	0.08	4.93	4.64	0.09	2.15	4.63	0.04
T1 Perceived Stress							−5.59	2.31	−0.21*	−4.08	2.30	−0.15†
T1 Cancer-Related Intrusions							0.14	0.38	0.04	0.30	0.38	0.08
T1 Approach-Oriented Coping										9.45	3.65	0.23**
T1 Avoidant Coping										−1.94	5.64	−0.03
ΔF for step	41.31***			0.82			3.13*			3.50*		
ΔR^2 for step	0.55			0.01			0.04			0.04		
Total $R^2 = 0.64$												

†$p < 0.10$. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 4. Benefit finding at T2 regressed on T1 perceived stress, T2 cancer-related intrusions, and T2 composite coping scales ($N = 65$)

	Step 1			Step 2			Step 3			Step 4		
Variable	***B***	**SE**	***β***	***B***	**SE**	***β***	***B***	**SE**	***β***	***B***	**SE**	***β***
T1 PTGI	0.72	0.08	0.71***	0.68	0.09	0.67***	0.64	0.09	0.63***	0.53	0.09	0.53***
Cancer Type	−18.61	6.03	−0.26**	−18.40	6.03	−0.25**	−19.93	5.94	−0.27***	−14.76	5.42	−0.20**
Gender				4.81	4.95	0.09	6.86	4.87	0.13	3.84	4.35	0.07
T1 Perceived Stress							−5.79	2.38	−0.22*	−4.49	2.21	−0.17*
T2 Cancer-Related Intrusions							0.42	0.33	0.12	0.58	0.29	0.16*
T2 Approach-Oriented Coping										13.91	3.13	0.35***
T2 Avoidance Coping										−1.77	5.03	−0.03
ΔF for step	42.08***			0.95			3.02†			9.91***		
ΔR^2 for step	0.57			0.01			0.04			0.10		
Total $R^2 = 0.71$												

†$p < 0.10$. **$p < 0.01$. ***$p < 0.001$.

T2 benefit finding, emotional approach coping was the single significant approach-oriented coping variable ($\beta = 0.27$, $p < 0.05$).

Discussion

This longitudinal study examined benefit finding and its predictors across time in newly diagnosed lung cancer patients. Those diagnosed with lung cancer attributed a moderate degree of benefit to their cancer experience. The mean level of benefit finding was also comparable to what has been reported in the research with other samples of cancer patients [4,5], suggesting that lung cancer patients may be more similar to than different from other samples of cancer patients in their tendency to attribute something positive to this stressful experience.

The hypothesis that patients would report an increase in benefit finding over time was only partially supported, with the mean level of benefit finding increasing over time for patients with small cell lung cancer, but not for those with nonsmall cell cancer. In addition, the mean benefit finding score was significantly higher in patients with small cell cancer at T2. We interpret these findings conservatively given the small sample size and the unequal cell sizes. However, it is possible that the increase in benefit finding observed in patients with small cell cancer reflects the tendency of patients with small cell lung cancer to respond rapidly to chemotherapy and experience some resolution of their symptoms, which might influence their ability to find benefit in their illness experience.

The finding that levels of benefit finding were higher in patients with small cell cancer may buttress claims that benefit finding is related to event impact. Small cell carcinoma is the most aggressive form of lung cancer and generally has a poorer prognosis given the tendency to grow and metastasize quickly [14]. To the extent that patients with small cell carcinoma experience greater life disruption, they may report more benefit finding. It is important to note, however, that cancer type and the measures of stress (perceived stress and intrusive thoughts) were not significantly related. Some evidence indicates that patients with more advanced cancers report more benefit [6,41], suggesting that greater threat to mortality may serve as a precursor to efforts at making meaning from the experience [1], which may include benefit

DOI: 10.1002/pon

finding. Future research is needed to replicate and examine these issues as well as to examine whether benefit finding changes as patients experience tumor progression or recurrent disease.

The majority of patients (who also had nonsmall cell cancer) did not exhibit an increase in benefit finding over time. Although theoretical work suggests that benefit finding evolves as a result of an active struggle to manage the challenges brought on by a serious life stressor, which presumably evolves over time [1,15], no consistent relationship between stressor duration and benefit finding has emerged from the numerous cross-sectional studies that are available [1], although one longitudinal study reported an increase in benefit finding over time [3]. Thus, it may be the case that the extent to which an individual attributes benefit to their experience with cancer is related less to the amount of time that passes, and more to the resources that the individual brings to bear on the situation, which is consistent with conceptualizations of benefit finding after adversity. The fact that benefit finding was reported relatively soon following diagnosis and remained stable over time for most patients could also be interpreted as suggesting that benefit finding reflects a dispositional tendency or underlying personality variable, which may be an important direction to explore in future research. At the same time, however, the duration of follow-up was brief, necessitating future research with longer follow-up. It should be noted that participants were diagnosed an average of 16 weeks prior to study entry, and greater change in benefit finding might have been evident if it had been assessed more immediately after lung cancer diagnosis.

This study provides general support for Tedeschi and Calhoun's [2,15] model of posttraumatic growth, and the impact-engagement model of Stanton and colleagues [1]. At study entry, levels of benefit finding were higher in patients who endorsed greater cancer-related intrusive symptoms and approach-oriented coping, with positive reframing coping accounting for significant unique variance in the prediction of benefit finding compared to other types of approach-oriented coping. Perceived stress and avoidance coping were unrelated to benefit finding at this initial time point.

Approach-oriented coping also emerged as a significant predictor of benefit finding at T2, both concurrently and prospectively. More specifically, emotional approach coping was the single unique component of approach-oriented coping that we identified in the prediction of T2 benefit finding. Intrusive symptoms also were predictive of greater benefit finding at T2, but only when measured concurrently—intrusive symptoms measured at T1 did not prospectively predict T2 benefit finding. In addition, patients who reported perceiving their cancer as less stressful at T1 reported higher levels of benefit finding at T2, as did patients who were diagnosed with small cell lung cancer.

Taken together, these results suggest that patients who endorse greater use of coping by actively approaching and engaging with the stressor are more likely to find benefit in the experience. In addition, we found that different components of approach-oriented coping were more strongly associated with benefit finding at the two time points. At study entry, positive reframing, the attempt to identify something positive in the experience, was most predictive of benefit finding. Positive reframing has been linked to benefit finding in several other studies [5,9,12] and is perhaps the coping strategy that is most conceptually similar to benefit finding. Positive reframing coping also shares some overlap conceptually with dispositional optimism, which itself has been linked to higher levels of benefit finding [5,26]. It is intriguing that emotional approach coping and not positive reframing was more important in the prediction of T2 benefit finding. Emotional approach coping is an active process that includes both the expression and processing of one's stressor-related emotions and conceptually is a coping strategy expected to be especially predictive of benefit finding during uncontrollable stressors, given the emphasis on approaching and working through the distress associated with the stressful event. Our data suggest that emotional approach coping may be a more important predictor than positive reframing coping to sustained reports of benefit finding.

These data also provide partial support for the hypothesis that benefit finding is positively related to how much of an impact the event produces: reports of benefit finding after lung cancer were higher in patients who experienced more intrusive stress symptoms related to their cancer. The measure of intrusive stress symptoms that we used may also be construed as an indicator of cognitive processing [24], which also would be consistent with theory suggesting that benefit finding arises as a result of engaging with a highly stressful event [2]. It may be important in future research to tease apart the extent to which perceived stress versus stressor-related cognitive processing is more predictive of benefit finding after cancer.

We had not expected that lower levels of perceived stress at study entry would be related to higher levels of benefit finding 3 months later at T2. If anything, perceived stress has tended to demonstrate a positive relationship to benefit finding in the literature [5,7,12], although findings have not been entirely consistent [1]. With acknowledgment of the limitations inherent in using a single-item measure of perceived stress, one interpretation of this finding is that patients who perceived cancer as less stressful at study entry were those who felt that they had the resources available to manage the experience, and thus were those who also reported greater benefit

DOI: 10.1002/pon

finding at follow-up. It is also possible that these patients may have been less symptomatic and experienced better survival, which could also have been related to more benefit finding.

To our knowledge, this is the first longitudinal study to test a model of benefit finding in lung cancer patients, although it is not without limitations. One limitation is that the sample is not very racially or ethnically diverse, and most patients were well-educated and economically advantaged. Thus, these results may be limited in their generalizability. Second, the sample size was not large, although it was an achievement given the morbidity and mortality associated with this particular population of cancer patients and the longitudinal design. Although the study was longitudinal, the follow-up period of 3 months was relatively brief and we experienced significant attrition even with this short follow-up. Although attrition was not unexpected given the physical health issues and mortality facing this particular population, it is possible that different results would have been obtained with longer follow-up, and the response and attrition rates pose additional limitations to the generalizability of the results. However, a longer time between assessments would likely have resulted in even greater attrition.

Despite these limitations, the current study contributes to the benefit finding literature in several respects and provides direction for future research. Additional studies are needed to replicate and extend the findings reported here in larger and more diverse samples to refine theoretical conceptualizations of benefit finding after cancer. It will also be important in future research to explore the relationship of various clinical parameters to benefit finding in studies incorporating a longer follow-up period. In light of the consistent relationship between approach-oriented coping efforts and benefit finding, facilitation of such attempts may be useful clinically. The divergent findings that were obtained when using the measure of event-related intrusive thoughts versus perceived stress in predicting benefit finding suggest a need for further careful consideration of the relationship between event-related stress and cognitive processing of the event over time in the facilitation of benefit finding. Finally, a cautionary note is warranted. Although benefit finding seems to be a common experience following cancer, it is not universal and is not consistently related to other indicators of adjustment [1]. Future research is required to understand what (if any) implications benefit finding has for long-term psychological adjustment and clinical intervention following cancer.

Notes

1. We were unable to ascertain the specific response rate for patients at LLUMC because of differences in recruitment. However, at LLUMC, 338 potential participants were identified from the cancer registry (with no time since diagnosis limitation). T1 questionnaires were sent to 338 potential participants, of whom 141 (41.7%) responded and returned the questionnaire, and 26 of these met eligibility criteria for the current study (i.e. were within 6 months of diagnosis). Because date of diagnosis was not available from registry data, it was not possible to ascertain the response rate separately for those who were within 6 months of diagnosis and those who were beyond the 6-month eligibility criterion.
2. Findings were similar whether the EAC, emotional processing, or emotional expression subscale was used in the analyses.
3. We used the intrusions subscale because it appeared to be a cleaner measure of the extent to which the event was producing a stress response in the participant and also to minimize any potential overlap with the avoidant coping composite. We obtained identical results with the avoidant scale score as well as with the total score.
4. Including cancer type in this model did not change the results.
5. When the T1 PTGI score was not included in the model, cancer-related intrusions retained significance along with the other significant predictors.

Acknowledgements

This research was supported by a grant from the Lance Armstrong Foundation awarded to the first author. We also extend our thanks to the patients who lent their time to this study. Thank you also to Tanya Chavez, Melanie Sabado, Helena Stanbridge, Doni Woo, Laura Testerman, and Kevin Criswell for assistance in participant recruitment and study coordination.

References

1. Stanton AL, Bower JE, Low CA. Posttraumatic growth after cancer. In *Handbook of Posttraumatic Growth: Research and Practice*, Calhoun LG, Tedeschi RG (eds). Erlbaum: Mahwah, NJ, 2006; 138–175.
2. Tedeschi RG, Calhoun LG. Posttraumatic growth: conceptual foundations and empirical evidence. *Psychol Inquiry* 2004;**15**(1):1–18.
3. Manne S, Ostroff J, Winkel G, Goldstein L, Fox K, Grana G. Posttraumatic growth after breast cancer: patient, partner, and couple perspectives. *Psychosom Med* 2004;**66**(3):442–454.
4. Cordova MJ, Cunningham LL, Carlson CR, Andrykowski MA. Posttraumatic growth following breast cancer: a controlled comparison study. *Health Psychol* 2001;**20**(3):176–185.
5. Sears SR, Stanton AL, Danoff-Burg S. The yellow brick road and the emerald city: benefit finding, positive reappraisal coping and posttraumatic growth in women with early-stage breast cancer. *Health Psychol* 2003; **22**(5):487–497.

DOI: 10.1002/pon

6. Andrykowski MA, Curran SL, Studts JL *et al*. Psychosocial adjustment and quality of life in women with breast cancer and benign breast problems: a controlled comparison. *J Clin Epidemiol* 1996;**49**(8):827–834.
7. Bellizzi KM, Blank TO. Predicting posttraumatic growth in breast cancer survivors. *Health Psychol* 2006;**25**(1):47–56.
8. Kinsinger DP, Penedo FJ, Antoni MH, Dahn JR, Lechner SC, Schneiderman N. Psychosocial and sociodemographic correlates of benefit-finding in men treated for localized prostate cancer. *Psycho-Oncology* 2006; **15**(11):954–961.
9. Thornton AA, Perez MA. Posttraumatic growth in prostate cancer survivors and their partners. *Psycho-Oncology* 2006; **15**:285–296.
10. Andrykowski MA, Brady MJ, Hunt JW. Positive psychosocial adjustment in potential bone marrow transplant recipients: cancer as a psychosocial transition. *Psycho-Oncology* 1993;**2**:261–276.
11. Lechner SC, Zakowski SG, Antoni MH, Greenhawt M, Block K, Block P. Do sociodemographic and disease-related variables influence benefit-finding in cancer patients? *Psycho-Oncology* 2003;**12**(5):491–499.
12. Widows MR, Jacobsen PB, Booth-Jones M, Fields KK. Predictors of posttraumatic growth following bone marrow transplantation for cancer. *Health Psychol* 2005;**24**(3):266–273.
13. Schulz U, Mohamed NE. Turning the tide: benefit finding after cancer surgery. *Soc Sci Med* 2004;**59**(3):653–662.
14. ACS. *Cancer Facts and Figures—2010*. Author: Atlanta, GA, 2010.
15. Calhoun LG, Tedeschi RG. The foundations of posttraumatic growth: an expanded framework. In *Handbook of Posttraumatic Growth*, Calhoun LG, Tedeschi RG (eds). Lawrence Erlbaum Associates: New York, 2006; 3–23.
16. Janoff-Bulman R. *Shattered Assumptions*. Free Press: New York, 1992.
17. Degner LF, Sloan JA. Symptom distress in newly diagnosed ambulatory cancer patients and as a predictor of survival in lung cancer. *J Pain Symptom Manage* 1995;**10**(6):423–431.
18. Fox SW, Lyon DE. Symptom clusters and quality of life in survivors of lung cancer. *Oncol Nurs Forum* 2006; **33**(5):931–936.
19. Li J, Girgis A. Supportive care needs: are patients with lung cancer a neglected population? *Psycho-Oncology* 2006;**15**(6):509–516.
20. Sarna L. Lung cancer. In *Psycho-Oncology*, Holland J (ed.). Oxford University Press: New York, 1998; 340–348.
21. Zabora J, Brintzenhofeszoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. *Psycho-Oncology* 2001;**10**(1):19–28.
22. Schag CA, Ganz PA, Wing DS, Sim MS, Lee JJ. Quality of life in adult survivors of lung, colon and prostate cancer. *Qual Life Res* 1994;**3**(2):127–141.
23. Tedeschi RG, Calhoun LG. *Trauma and Transformation*: *Growing in the Aftermath of Suffering*. Sage: Thousand Oaks, 1995.
24. Helgeson V, Reynolds K, Tomich P. A meta-analytic review of benefit finding and growth. *J Consult Clin Psychol* 2006;**74**(5):797–816.
25. Bussell V, Naus M. A longitudinal investigation of coping and posttraumatic growth in breast cancer survivors. *J Psychosoc Oncol* 2010;**28**:61–78.
26. Antoni MH, Lehman JM, Klibourn KM *et al*. Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychol* 2001;**20**(1): 20–32.
27. Stanton AL, Danoff-Burg S, Cameron CL, Ellis AP. Coping through emotional approach: problems of conceptualization and confounding. *J Pers Soc Psychol* 1994;**66**(2):350–362.
28. Ptacek J, Smith RE, Zanas J. Gender, appraisal, and coping: a longitudinal analysis. *J Pers* 1992;**60**(4): 747–770.
29. Stone AA, Neale JM. New measure of daily coping: development and preliminary results. *J Pers Soc Psychol* 1984;**46**:892–906.
30. Vingerhoets AJ, Van Heck GL. Gender, coping and psychosomatic symptoms. *Psychol Med* 1990;**20**(1): 125–135.
31. Billings AG, Moos RH. The role of coping responses and social resources in attenuating the stress of life events. *J Behav Med* 1981;**4**(2):139–157.
32. Hagedoorn M, Sanderman R, Coyne JC, Bolks HN, Tuinstra J. Distress in couples coping with cancer: a meta-analysis and critical review of role and gender effects. *Psychol Bull* 2008;**134**(1):1–30.
33. Zwahlen D, Hagenbuch N, Carley M, Jenewein J, Buchi S. Posttraumatic growth in cancer patients and partners—effects of role, gender, and the dyad on couples' posttraumatic growth experience. *Psycho-Oncology* 2010;**19**(1):12–20.
34. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. *J Pers Soc Psychol* 1989;**56**(2):267–283.
35. Carver CS. You want to measure coping but your protocol's too long: consider the brief COPE. *International Journal of Behavioral Medicine* 1997; **4**:92–100.
36. Stanton AL, Kirk SB, Cameron CL, Danoff-Burg S. Coping through emotional approach: scale construction and validation. *J Pers Soc Psychol* 2000;**78**(6): 1150–1169.
37. Sanders SL, Bantum EO, Owen JE, Thornton AA, Stanton AL. Supportive care needs in patients with lung cancer. *Psycho-Oncology* 2010;**19**(5):480–489.
38. Horowitz M, Wilner N, Alvarez W. Impact of event scale: a measure of subjective stress. *Psychosom Med* 1979;**41**(3):209–218.
39. Tedeschi RG, Calhoun LG. The posttraumatic growth inventory: measuring the positive legacy of trauma. *J Trauma Stress* 1996;**9**(3):455–471.
40. Low CA, Stanton AL, Danoff-Burg S. Expressive disclosure and benefit finding among breast cancer patients: mechanisms for positive health effects. *Health Psychol* 2006;**25**(2):181–189.
41. Tomich PL, Helgeson VS. Is finding something good in the bad always good? Benefit finding among women with breast cancer. *Health Psychol* 2004;**23**(1): 16–23.

DOI: 10.1002/pon