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Caregiving Burden, Stress, and Health Effects Among Family Caregivers of Adult Cancer Patients

Margaret F. Bevans, RN, PhD, LCDR and Esther M. Sternberg, MD

National Institutes of Health, Clinical Center 10 Center Drive, Room 12s235b, MSC 1905
Bethesda, MD 20892

Abstract

Unlike professional caregivers such as physicians and nurses, informal caregivers, typically family members or friends, provide care to individuals with a variety of conditions including advanced age, dementia, and cancer. This experience is commonly perceived as a chronic stressor, and caregivers often experience negative psychological, behavioral, and physiological effects on their daily lives and health. In this report, we describe the experience of a 53-year-old woman who is the sole caregiver for her husband, who has acute myelogenous leukemia and was undergoing allogeneic hematopoietic stem cell transplantation. During his intense and unpredictable course, the caregiver's burden is complex and complicated by multiple competing priorities. Because caregivers are often faced with multiple concurrent stressful events and extended, unrelenting stress, they may experience negative health effects, mediated in part by immune and autonomic dysregulation. Physicians and their interdisciplinary teams are presented daily with individuals providing such care and have opportunity to intervene. This report describes a case that exemplifies caregiving burden and discusses the importance of identifying caregivers at risk of negative health outcomes and intervening to attenuate the stress associated with the caregiving experience.

Case Study

A 56-year-old man with myelodysplastic syndrome transformed into acute myelogenous leukemia with cytogenetic abnormalities presented for a reduced intensity allogeneic matched unrelated-donor hematopoietic stem cell transplantation (HSCT). Prior to HSCT he had multiple unanticipated complications and treatment toxicities from his cytoreductive regimen resulting in a 3 month in-patient hospitalization. The caregiver was his wife of 23 years, a 53-year-old female. She reported a history of arthritis and was 3 years post coronary artery bypass graft surgery following a myocardial infarct. Currently a smoker, she reported that she was trying to quit. The caregiver reported extremely high levels of psychological distress, including anxiety, depression, worry and extreme loneliness, prior to the transplant.

Baseline Factors

The couple's primary residence was in New Jersey, 143 miles from the transplant center, therefore they were required to establish a temporary residence nearby. Because both the patient and caregiver were unemployed due to disability, their income was restricted. Social support was limited to a 20-year-old daughter in college and the caregiver's sister, employed full-time in New Jersey. In addition, the caregiver's elderly mother and aunt depended upon

Corresponding Author: Margaret Bevans, RN, PhD, National Institutes of Health, Clinical Center, 10 Center Dr, Room 2B13, MSC 1151, Bethesda, MD20892 (mbevans@cc.nih.gov).

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her for assistance, as did her father who resided in a nursing home after becoming disabled following brain surgery.

Course of Treatment

The HSCT initial hospitalization and immediate recovery period was difficult and prolonged, lasting approximately two months. The patient experienced a pericardial effusion, renal failure, pneumonia, and acute Graft versus Host Disease. After the initial hospital discharge, the patient was readmitted twice: once for coughing, diarrhea, and hematuria with clots; and a second time for acute heart failure and sepsis.

Caregiving Challenges

This caregiver had multiple caregiving responsibilities, maintained two residences, subsisted on limited finances, and managed multiple health conditions of her own. Lacking the physical presence of a support system, she shouldered the entire burden of her husband's brief but intense outpatient care including: cleaning, driving, preparing meals, and coordinating medication, oxygen and other treatment-related activities. She struggled to maintain hope for the transplant's success, while living with the constant uncertainty of her husband's survival, a concern that was exacerbated by the sudden death of a close cousin. While she complained little, when asked, she reported severe emotional distress, significant fatigue, sleep impairment, and difficulty maintaining her focus and energy throughout the transplant trajectory.

Background

Family caregivers are essential partners in the delivery of complex health care services and this case exemplifies the associated caregiver burden and stress during cancer treatment. Unlike professional caregivers such as physicians and nurses, informal caregivers, typically family members or friends, provide care to individuals with a variety of conditions, most commonly advanced age, dementia, and cancer¹. As more and more evidence suggests that caregiving is deleterious to one's health, increased attention is being paid to the day to day well-being of caregivers². Compared to non-caregivers, caregivers often experience psychological, behavioral, and physiological effects that can contribute to impaired immune system function and coronary heart disease, and early death³⁻⁵.

The level of burden upon caregivers of cancer patients is greater than the burden experienced by those caring for the elderly and similar to that experienced by caregivers of patients with dementia⁶. To receive a diagnosis of cancer is recognized as a significant stressor to the patient and family. However, the resultant treatment creates additional fears and challenges, and frequently requires the direct support of a caregiver including: assisting with activities of daily living, administering medications, providing transportation, preparing meals, managing finances, advocating for health care, and providing emotional support. Caregiving is labor intensive, with approximately one-quarter of those caring for cancer patients spending in excess of 40 hours a week providing these services to family or friends¹. The level of care required by the care recipient is a major factor that influences the caregiver's life and health effects. Caregivers of cancer patients providing higher levels of support are more likely to report negative outcomes, less likely to be effective partners in the patient's care, and are more likely to postpone their own health care needs.

While cancer patients in general report high symptom severity resulting in a greater need for support from the health care team⁷, one of the most complex cancer treatments, allogeneic hematopoietic stem cell transplantation (HSCT), is particularly burdensome. Even an uncomplicated or reduced intensity allogeneic HSCT may require a 2- to 4- week hospitalization, followed by 3- to 4- months of intense outpatient management. Allogeneic

HSCT recipients are often debilitated and frequently experience complications and other treatment-related toxicities that result in multiple hospital readmissions⁸. For this reason, the caregiver and her husband were required to establish a residence near the transplant center. Without a caregiver, transplant options may be limited and survival shortened^{9, 10}. While this potentially curative treatment provides hope, it also carries a 30% mortality rate within the first year¹¹. As a result, caregivers experience layer upon layer of stress, as the burden of caring (often exclusively) for their sick loved ones, separated from their own support systems, while balancing other life responsibilities, threatens to overwhelm them¹².

Presenting Signs and Symptoms of Stress

As evident in the case study, the most obvious signs and symptoms of caregiving stress are often psychological problems, most commonly anxiety, depression, worry and loneliness¹³. These psychological reactions are related to the caregiver's appraisal of the experience, with those reporting more benefit and deriving more meaning from the experience feeling less stress and reporting better quality of life¹⁴. The level of distress reported by many of those caring for someone with cancer can be equal to or greater than that of the cancer patient¹⁵, with adult daughters seeming to have the greatest difficulties¹⁴. In addition, those reporting higher levels of emotional distress also report more problems with fatigue, sleep impairment and unhealthy behaviors¹⁶.

Caregivers of patients with cancer report having to modify their lifestyles to accommodate the care recipient's needs including restricting leisure activity and contact with friends and family¹³. Thus, at a time when caregivers are most in need of the restorative benefits of relaxation, they have the least amount of time and resources available. Further complicating matters, caregivers of cancer patients prioritize the needs of the patient over their own¹⁷, leaving little time for maintaining good nutrition, exercising, and undertaking health evaluations. As a result, caregivers have numerous health related problems, such as sleep disturbances and fatigue, which worsen as the patient's physical function and symptom burden increase¹⁸. The symptom burden in HSCT recipients can be significant for weeks to months following the treatment¹⁹ and may contribute to the symptoms reported by HSCT caregivers during the survivorship phase²⁰.

Pathogenesis of Health Effects in Caregivers

The experience of caring for an individual undergoing HSCT transplantation is inherently stressful and one's perception of an event plays a large role in the body's response. All stressors activate the hypothalamic-pituitary-adrenal (HPA) axis and the adrenergic sympathetic nervous system (SNS). After exposure to stressful stimuli, the hypothalamus releases corticotropin-releasing hormone (CRH), which stimulates the pituitary gland to release adrenocorticotropic hormone (ACTH). ACTH in turn triggers the release of glucocorticoids (cortisol) from the adrenal cortex. At the same time the sympathetic nervous system is activated with release of epinephrine (adrenalin) from the adrenal medulla and norepinephrine from sympathetic nerves. In combination, the molecules released during the stress response have profound effects on the function of most cells and organs throughout the body, including the brain, heart, respiratory system, muscles, skin, liver, gastrointestinal tract and, importantly, the immune system²¹.

Activation of the acute stress response is life-saving and prepares the organism to avoid impending danger, with enhanced vigilance, focused attention and increased energy. In contrast, chronic stress has negative consequences on health. In chronic stress the healthy 'diurnal rhythm' of the HPA axis, with a late evening nadir and a morning peak, is flattened showing instead low morning and elevated afternoon/evening cortisol levels²². This represents a state of physiological "burn-out" that often accompanies psychological burnout.

In the early stages of burnout, HPA axis activity is increased. Months later, HPA axis activity decreases. Family caregivers of cancer patients also show autonomic imbalance with a shift towards the sympathetic and away from the parasympathetic tone^{23, 24}, and dementia caregivers, compared to non-caregiving controls, exhibited higher Framingham coronary risk scores largely due to higher blood pressure²⁵. One explanation for this progression may be related to changes in caregivers' psychological coping and expectations, with active coping early and loss of expectations of being able to cope successfully later in the process. More recent studies indicate that dysregulation of circadian rhythm during chronic stress also has an endocrine basis. Thus, even mild elevations in evening cortisol, as occurs in chronic stress, can disrupt the CLOCK gene mechanism of circadian regulation of the HPA axis, resulting in functional hypercortisolism²⁶.

While a single stressful event or multiple events with time to recover between events may not affect health, multiple stressors without adequate recovery time or chronic stressful events as presented in the case study, are likely to increase the risk for illness. `Allostatic load' is the term coined to define the "load" or total burden of multiple stressors²⁷, such as those to which caregivers are exposed on a daily basis. A large allostatic load is a potential mechanism linking caregiving to adverse health outcomes²⁸. Chronic stress, including in caregivers of Alzheimer's patients, has been shown to increase risk for infection^{29, 30}; decrease take rate of vaccine; slow wound healing³⁰; speed cancer growth via beta-adrenergic mechanisms that stimulate angiogenesis³¹; and speed chromosomal aging as indicated by telomere shortening³². Stress does not cause these conditions, but can foster them through the effects of stress hormones and neurotransmitters on disease processes and immune responses. On the other hand, a blunted HPA axis response and functional glucocorticoid resistance have been associated with pro-inflammatory states and predispose to autoimmune/inflammatory diseases²¹, cardiovascular disease³³, diabetes and metabolic syndrome, which is characterized by central or abdominal obesity, high blood pressure, elevated cholesterol and insulin resistance³⁴, and depression³⁵.

Evaluating and Managing Stress in Caregivers of Cancer Patients

While stressful events are inevitable, it is possible to identify those at increased risk for negative outcomes, assess the degree to which the caregiver's life and health may be negatively affected, and recommend interventions that could attenuate the negative repercussions of the caregiving experience. Should a patient present for a primary care visit and it is determined that they serve as a caregiver for an individual with cancer; it can rightly be assumed that the caregiver will be affected¹⁵. As a component of preventative care, recognizing the challenges and possible effects of caregiving will enhance the plan of care developed between the physician and the patient. However, when a caregiver accompanies a cancer patient for a medical visit, the caregiver may hide or minimize the effects of the caregiving experience in an effort to shield the patient and avoid shifting attention to themselves. In this setting, determining the context of the caregiving experience can begin with an expanded history and physical on the patient that includes the caregiver's assessment.

The caregiver in this case study presented with her husband, and their needs were assessed by the interdisciplinary team including an oncology social worker. This included the knowledge level of the caregiver related to role expectations, the patient care needs or degree of burden, and the presence of competing responsibilities. Brief screening questionnaires can be helpful in a busy clinical environment. Caregivers can complete the questionnaire independently and the responses are easy to interpret by a nurse, social worker or physician providing guidance regarding possible referrals for specialized care. The Distress Thermometer (DT)³⁶ is a single-item self-report measure of distress and includes a list of 'problems' creating distress for cancer patients and has been validated in HSCT

caregivers³⁷. In addition, the American Medical Association (AMA) developed the *Caregiver Self-Assessment Questionnaire (CASQ)*³⁸ to assess caregiver stress and health which was validated as a self-report screening measure for depression in caregivers of patients with dementia³⁹. The AMA Healthier Life Steps Program's *Personal Health Habits Questionnaire* assesses key lifestyle behaviors including smoking, use of alcohol, nutrition practices and exercise⁴⁰. Web-based collection systems such as the Patient Reported Outcomes Measurement Information System (PROMIS)[®] are now available to both researchers and clinicians, allowing collection of a large variety of outcome data including symptoms commonly prevalent in caregivers of cancer patient such as: depression, anxiety, fatigue, and sleep disturbance⁴¹. Two unique functions of PROMIS[®] are the ability to collect patient outcomes longitudinally, making it possible to follow changes in function over time, as well as the ability to compare patients' outcomes against national norms.

Many well validated psychological questionnaires are sensitive, but are also subjective indicating the need for development of more objective, quantitative measures of allostatic load. In a research setting, a comprehensive assessment of allostatic load or cumulative stress includes psychological measures of stress such as distress, anxiety, and depression; hormonal measures of the HPA axis response (cortisol); physiological measures of the sympathetic and parasympathetic nervous system (BP, HR, heart rate variability (HRV))^{42, 43} and salivary amylase⁴⁴; and measures of end-organ effects such as immune system status and chromosomal damage^{27, 32}. Some newer non-invasive methods include cortisol levels in hair⁴⁵ and stress and immune biomarkers in eluates from sweat patches⁴⁶. While many of these approaches show promise, they are not yet applicable in the clinical setting. More research is needed to develop and validate sensitive, non-invasive and quantitative measures of allostatic load and to develop models that predict health outcomes.

The assessment of stress and how it affects the health of family caregivers should be followed by guidance and individualized interventions to attenuate the health consequences. The mere act of assessing and listening to the caregivers' needs communicates empathy which may in itself improve outcomes^{47, 48}. Offering the patient and caregiver 'how to' information regarding patient care, maintenance of family and marital relationships, and the importance of self-care may help caregivers be more prepared and less distressed⁴⁹. Community or web-based resources for caregivers are plentiful (www.cc.nih.gov/wecare/resources.html) with a selected few highlighted in Table 1. A growing body of evidence also supports simple stress management practices such as walking, meditating and adopting nutritional changes such as the Mediterranean diet that may help reduce fatigue, improve sleep and reduce the risk of some stress-related illnesses^{50, 51}. Clinicians should remain alert to stress-related symptoms such as elevated blood pressure and heart rate, as well as delayed wound healing or increased frequency of infections. Current evidence may be limited due to single site designs and small sample sizes but multisite studies with a focus on the translation of interventions into practice in addition to studies on caregivers' physical health specifically those who are at high risk for poorer outcomes, will guide the development of cost-effective targeted approaches to care⁴⁹. Providing this level of care is not without reward, as improving the experiences of caregivers may in itself, provide "greater sustenance and meaning" for the physician⁴⁸.

Case Study Follow-up

The patient expired during his second readmission, within 6 months of beginning the HSCT treatment. His wife then "had to go thru the phases of planning his funeral which I was not prepared for feeling like there was nothing left for me." She "went through the grieving process like everyone else...just trying to survive". She had the daunting task of explaining to her sick elderly father that her husband had passed away; four months later he too passed

away, only two days before his 90th birthday. Shortly thereafter, she experienced another myocardial infarction and required the placement of a pacemaker.

More recently, financial pressures forced the caregiver to sell her house and downgrade to more affordable housing, and her cardiovascular disease continues to require careful management. On a happier note, her daughter, now 22 years old, is expecting the family's first grandchild.

Recognizing the psychological, behavioral, and physiological effects of caring for a loved one with cancer is an opportunity for primary prevention. A common barrier in primary prevention is access; attending to a population without overt need for health care services. In this population, the potentially affected individuals are entering offices and health care agencies on a regular basis with a cancer patient. Caregivers of patients with cancer are essential partners in the quality care we strive to deliver to our patients. How preventive services such as screening, education and referrals are systematically incorporated into our health care system is beyond the scope of this paper but worthy of future attention.

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References

1. NAC. [Accessed 8/20/10] Caregiving in the U.S. 2009. http://www.caregiving.org/data/Caregiving_in_the_US_2009_full_report.pdf.
2. Vitaliano PP, Zhang JP, Scanlan JM. Is caregiving hazardous to one's physical health? A meta-analysis. *Psychol. Bull.* Nov; 2003 129(6):946–972. [PubMed: 14599289]
3. Gouin JP, Hantsoo L, Kiecolt-Glaser JK. Immune dysregulation and chronic stress among older adults: a review. *Neuroimmunomodulation.* 2008; 15(4–6):251–259. [PubMed: 19047802]
4. Lee S, Colditz GA, Berkman LF, Kawachi I. Caregiving and risk of coronary heart disease in U.S. women: A prospective study. *Am. J. Prev. Med.* 2003; 24(2):113–119. [PubMed: 12568816]
5. Schulz R, Beach SR. Caregiving as a risk factor for mortality - The caregiver health effects study. *Jama-J Am Med Assoc.* Dec 15; 1999 282(23):2215–2219.
6. Kim Y, Schulz R. Family caregivers' strains: comparative analysis of cancer caregiving with dementia, diabetes, and frail elderly caregiving. *J. Aging Health.* Aug; 2008 20(5):483–503. [PubMed: 18420838]
7. Kurtz ME, Kurtz JC, Given CW, Given BA. Depression and physical health among family caregivers of geriatric patients with cancer--a longitudinal view. *Med Sci Monit.* Aug; 2004 10(8):CR447–456. [PubMed: 15277994]
8. Grant M, Cooke L, Bhatia S, Forman SJ. Discharge and unscheduled readmissions of adult patients undergoing hematopoietic stem cell transplantation: Implications for developing nursing interventions. *Oncol. Nurs. Forum.* 2005; 32(1):E1–E8. [PubMed: 15660137]
9. Foster LW, McLellan LJ, Rybicki LA, Sassano DA, Hsu A, Bolwell BJ. Survival of patients who have undergone allogeneic bone marrow transplantation: The relative importance of in-hospital lay care-partner support. *J Psychosoc Oncol.* 2004; 22(2):1–20.
10. Frey P, Stinson T, Siston A, et al. Lack of caregivers limits use of outpatient hematopoietic stem cell transplant program. *Bone Marrow Transplant.* 2002; 30(11):741–748. [PubMed: 12439696]
11. CIBMTR. [Accessed 11/22/11] Annual Report. [web page]. Reference Center, Slides Reports, Summary Slides. 2009. Available at: <http://www.cibmtr.org/ReferenceCenter/SlidesReports/SummarySlides/Pages/Index.aspx>.

12. Beattie S, Lebel S. The experience of caregivers of hematological cancer patients undergoing a hematopoietic stem cell transplant: a comprehensive literature review. *Psycho-Oncol.* 2011; 20(11):1137–1150.
13. Stenberg U, Ruland CM, Miaskowski C. Review of the literature on the effects of caring for a patient with cancer. *Psycho-Oncol.* 2010; 19(10):1013–1025.
14. Kim Y, Schulz R, Carver CS. Benefit-finding in the cancer caregiving experience. *Psychosom. Med. Apr;* 2007 69(3):283–291. [PubMed: 17420443]
15. Hodges LJ, Humphris GM, Macfarlane G. A meta-analytic investigation of the relationship between the psychological distress of cancer patients and their carers. *Soc. Sci. Med.* 2005; 60(1): 1–12. [PubMed: 15482862]
16. Swore Fletcher B, Dodd M. Symptom experience of family caregivers of patients with cancer. *Oncol. Nurs. Forum.* 2008; 35(2):E23–E44. [PubMed: 19405245]
17. Williams LA. Whatever it takes: Informal caregiving dynamics in blood and marrow transplantation. *Oncol. Nurs. Forum.* 2007; 34(2):379–387. [PubMed: 17573302]
18. Palos GR, Mendoza TR, Liao KP, et al. Caregiver symptom burden: the risk of caring for an underserved patient with advanced cancer. *Cancer.* Mar 1; 2011 117(5):1070–1079. [PubMed: 20960510]
19. Bevans MF, Mitchell SA, Marden S. The symptom experience in the first 100 days following allogeneic hematopoietic stem cell transplantation (HSCT). *Support. Care Cancer.* 2008; 16(11): 1243–1254. [PubMed: 18322708]
20. Bishop MM, Beaumont JL, Hahn EA, et al. Late effects of cancer and hematopoietic stem-cell transplantation on spouses or partners compared with survivors and survivor-matched controls. *J. Clin. Oncol.* 2007; 25(11):1403–1411. [PubMed: 17416860]
21. Sternberg EM. Neural regulation of innate immunity: a coordinated nonspecific host response to pathogens. *Nat. Rev. Immunol.* 2006; 6(4):318–328. [PubMed: 16557263]
22. Heim C, Ehler U, Hellhammer DH. The potential role of hypocortisolism in the pathophysiology of stress-related bodily disorders. *Psychoneuroendocrinology.* 2000; 25(1):1–35. [PubMed: 10633533]
23. Lucini D, Cannone V, Malacarne M, et al. Evidence of autonomic dysregulation in otherwise healthy cancer caregivers: a possible link with health hazard. *Eur. J. Cancer.* Nov; 2008 44(16): 2437–2443. [PubMed: 18804998]
24. Rohleder N, Marin TJ, Ma R, Miller GE. Biologic Cost of Caring for a Cancer Patient: Dysregulation of Pro- and Anti-Inflammatory Signaling Pathways. *J. Clin. Oncol.* Jun 20; 2009 27(18):2909–2915. [PubMed: 19433690]
25. von Kanel R, Mausbach BT, Patterson TL, et al. Increased Framingham coronary heart disease risk score in dementia caregivers relative to non-caregiving controls. *Gerontology.* 2008; 54(3):131–137. [PubMed: 18204247]
26. Nader N, Chrousos GP, Kino T. Interactions of the circadian CLOCK system and the HPA axis. *Trends Endocrin Met.* May; 2010 21(5):277–286.
27. Juster RP, McEwen BS, Lupien SJ. Allostatic load biomarkers of chronic stress and impact on health and cognition. *Neurosci. Biobehav. Rev.* Sep; 2010 35(1):2–16. [PubMed: 19822172]
28. Roepke SK, Mausbach BT, Patterson TL, et al. Effects of Alzheimer caregiving on allostatic load. *J Health Psychol.* Jan; 2011 16(1):58–69. [PubMed: 20709885]
29. Cohen S, Tyrrell DA, Smith AP. Psychological stress and susceptibility to the common cold. *N. Engl. J. Med.* 1991; 325(9):606–612. [PubMed: 1713648]
30. Glaser R, Kiecolt-Glaser JK. Stress-induced immune dysfunction: implications for health. *Nat. Rev. Immunol.* 2005; 5(3):243–251. [PubMed: 15738954]
31. Armaiz-Pena GN, Lutgendorf SK, Cole SW, Sood AK. Neuroendocrine modulation of cancer progression. *Brain. Behav. Immun.* 2009; 23(1):10–15. [PubMed: 18638541]
32. Epel ES, Blackburn EH, Lin J, et al. Accelerated telomere shortening in response to life stress. *Proc. Natl. Acad. Sci. U. S. A.* 2004; 101(49):17312–17315. [PubMed: 15574496]
33. Nijm J, Jonasson L. Inflammation and cortisol response in coronary artery disease. *Ann. Med.* 2009; 41(3):224–233. [PubMed: 18979272]

34. Bjorntorp P, Rosmond R. Neuroendocrine abnormalities in visceral obesity. *Int. J. Obes.* Jun.2000 24:S80–S85.
35. Pace TWW, Hu F, Miller AH. Cytokine-effects on glucocorticoid receptor function: Relevance to glucocorticoid resistance and the pathophysiology and treatment of major depression. *Brain Behavior and Immunity.* Jan; 2007 21(1):9–19.
36. NCCN. [Accessed 11/21/11] Distress Management - NCCN Guidelines for Supportive Care. 2011. http://www.nccn.org/professionals/physician_gls/f_guidelines.asp.
37. Bevans M, Wehrlen L, Prachenko O, Soeken K, Zabora J, Wallen GR. Distress screening in allogeneic hematopoietic stem cell (HSCT) caregivers and patients. *Psycho-Oncol.* 2011
38. AMA. [Accessed 11/22/11] American Medical Association-Caregiver Self-Assessment. 2011. <http://www.ama-assn.org/ama/pub/physician-resources/public-health/promoting-healthy-lifestyles/geriatric-health/caregiver-health/caregiver-self-assessment.page>.
39. Epstein-Lubow G, Gaudiano BA, Hinckley M, Salloway S, Miller IW. Evidence for the validity of the American Medical Association's caregiver self-assessment questionnaire as a screening measure for depression. *J. Am. Geriatr. Soc.* Feb; 2010 58(2):387–388. [PubMed: 20370867]
40. AMA. [Accessed 11/14/11] Healthier Life Steps Questionnaire - American Medical Association. 2008. http://www.ama-assn.org/resources/doc/public-health/hl_questionnaire.pdf.
41. PROMIS-NIH. [Accessed 05/20/11] Patient Reported Outcomes Measurement Information System (PROMIS). 2011. <http://www.nihpromis.org/>.
42. Lederbogen F, Kuhner C, Kirschbaum C, et al. Salivary cortisol in a middle-aged community sample: results from 990 men and women of the KORA-F3 Augsburg study. *Eur. J. Endocrinol.* Sep; 2010 163(3):443–451. [PubMed: 20576743]
43. Thayer JF, Sternberg EM. Neural aspects of immunomodulation: focus on the vagus nerve. *Brain. Behav. Immun.* Nov; 2010 24(8):1223–1228. [PubMed: 20674737]
44. Strahler J, Mueller A, Rosenloecher F, Kirschbaum C, Rohleder N. Salivary alpha-amylase stress reactivity across different age groups. *Psychophysiology.* May; 2010 47(3):587–595. [PubMed: 20070573]
45. Steudte S, Stalder T, Dettenborn L, et al. Decreased hair cortisol concentrations in generalised anxiety disorder. *Psychiatry Res.* Apr 30; 2011 186(2–3):310–314. [PubMed: 20889215]
46. Cizza G, Marques AH, Eskandari F, et al. Elevated neuroimmune biomarkers in sweat patches and plasma of premenopausal women with major depressive disorder in remission: the POWER study. *Biol. Psychiatry.* 2008; 64(10):907–911. [PubMed: 18657799]
47. Emanuel EJ, Fairclough DL, Slutsman J, Emanuel LL. Understanding economic and other burdens of terminal illness: the experience of patients and their caregivers. *Ann. Intern. Med.* Mar 21; 2000 132(6):451–459. [PubMed: 10733444]
48. Rabow MW, Hauser JM, Adams J. Supporting family caregivers at the end of life: “they don't know what they don't know”. *JAMA.* Jan 28; 2004 291(4):483–491. [PubMed: 14747506]
49. Northouse LL, Katapodi MC, Song L, Zhang L, Mood DW. Interventions with family caregivers of cancer patients: meta-analysis of randomized trials. *CA. Cancer J. Clin.* Sep-Oct; 2010 60(5): 317–339. [PubMed: 20709946]
50. Jacobs TL, Epel ES, Lin J, et al. Intensive meditation training, immune cell telomerase activity, and psychological mediators. *Psychoneuroendocrinology.* Jun; 2011 36(5):664–681. [PubMed: 21035949]
51. Sofi F, Abbate R, Gensini GF, Casini A. Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis. *Am. J. Clin. Nutr.* Nov; 2010 92(5):1189–1196. [PubMed: 20810976]

Table 1

Caregiver Resources

Resource	Website address	Description
American Cancer Society	www.cancer.org/treatment/caregivers/index	<ul style="list-style-type: none"> • Caregiver support • Coping information
Cancercare	www.cancercare.org/get help/loved one.php	<ul style="list-style-type: none"> • Support groups • Education • Workshops • Counseling services • Financial assistance
CarePages.com	www.carepages.com/	<ul style="list-style-type: none"> • Free site to create video or website blog to stay connect with others
CARING BRIDGE	www.CARINGBRIDGE.org	<ul style="list-style-type: none"> • Free site to stay connected with friends and family while undergoing health challenges
Family Caregiving Alliance	www.caregiver.org	<ul style="list-style-type: none"> • Information, education, links to services, research and advocacy for caregivers
The Leukemia & Lymphoma Society	http://www.lls.org/#/diseaseinformation/forcaregivers/	<ul style="list-style-type: none"> • Educational resources specific for cancer caregivers
National Alliance for Caregiving	http://www.caregiving.org/	<ul style="list-style-type: none"> • Conduct research and develop national programs to increase the awareness of caregiving in the U.S. • Educational resources, webcasts and conferences on caregiving
National Caregiving Foundation	www.caregivingfoundation.org/	<ul style="list-style-type: none"> • Links to caregiving resources • Free caregiver support kit
National Family Caregivers Association	www.nfcacares.org	<ul style="list-style-type: none"> • Educational and support • Empowering caregivers
NIH Medline Plus	www.nlm.nih.gov/medlineplus/caregivers.html	<ul style="list-style-type: none"> • Educational resources (English & Spanish) • Links to research • Health information and care tips for the caregiver
The National Cancer Institute	www.cancer.gov/cancertopics/coping/familyfriends	<ul style="list-style-type: none"> • Support for caregivers • Resources for children and teens with family members diagnosed with cancer • Resources to prepare for end-of-life

Table 2

Brief Depression and Stress Screening Tools for Caregivers

Questionnaire	Source	Description
Distress Thermometer (DT)	National Comprehensive Cancer Network (NCCN)	A single item measure of global distress with 36 common problems that can contribute to distress (yes/no).
Caregiver Self-Assessment Questionnaire	American Medical Association (AMA)	An 18-item questionnaire to measure emotional and physical distress
PROMIS: <ul style="list-style-type: none"> • Depression • Anxiety • Sleep Disturbance • Fatigue 	Patient Reported Outcomes Measurement Information System – NIH	Individual 4-item measures to independently assess depression, anxiety, sleep disturbance or fatigue.
PROMIS-Global	Patient Reported Outcomes Measurement Information System – NIH	A 10-item questionnaire that measures emotional and physical distress