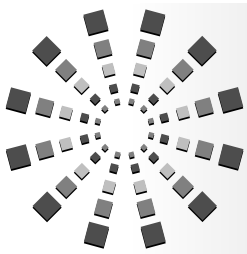

Linda Anguiano, MSN, RN
Deborah K. Mayer, PhD, RN, AOCN, FAAN
Mary Lynn Piven, PhD, PMHCNS-BC
Donald Rosenstein, MD

A Literature Review of Suicide in Cancer Patients

KEY WORDS
Cancer
Depression
Head and neck cancer
Hopelessness
Neoplasm
PHQ-9
Prostate cancer
Psychology
Suicide
Suicide ideation

Background: Cancer survivors have a higher suicide rate than the general population. Oncology nurses need to have knowledge and skills in assessing risk for suicide in this population. **Objective:** This study aimed to conduct a literature review on risk factors for and incidence of suicide in patients with cancer and to identify potential screening tools. **Methods:** PubMed, CINAHL, and PsycINFO databases were searched to identify research articles in peer-reviewed journals from 1999 to 2009. The variables under study included suicide rate, cancer type, demographic characteristics, and signs and symptoms associated with suicide. In addition, articles focused on suicide risk assessment tools were also included. **Results:** Twenty-four articles met the inclusion criteria. As in the general population, suicide risk was higher among men with cancer as compared with women with cancer. Patients aged 65 years or older with cancer have a higher rate of suicide compared with those younger than 65 years, with rates highest among men 80 years or older. Specific diagnoses associated with higher suicide rates include prostate, lung, pancreatic, and head and neck cancers. The first year after diagnosis carries a higher risk for completed suicide. Multiple risk assessment tools have been developed and are effective in identifying patients with depression or hopelessness, factors associated with higher risk for suicide. However, no tools exist that sensitively and specifically predict suicide. **Conclusion:** The incidence of suicide in someone with a cancer diagnosis is approximately double the incidence of suicide in the general population. Early detection of depression in special cancer populations, such as older male patients, may help identify those at greatest

Author Affiliations: School of Nursing, University of North Carolina, Chapel Hill (Ms Anguiano and Drs Mayer and Piven); and University of North Carolina Comprehensive Cancer Support Program and School of Medicine (Dr Rosenstein), Chapel Hill.

The authors have no funding or conflicts of interest to disclose.

Correspondence: Deborah K. Mayer, PhD, RN, AOCN, FAAN, School of Nursing, University of North Carolina at Chapel Hill, Carrington Hall, CB 7460, Chapel Hill, NC 27599-7460 (dmayer@unc.edu).

Accepted for publication July 26, 2011.
DOI: 10.1097/NCC.0b013e31822fc76c

suicide risk. **Implications for Practice:** Oncology nurses should be aware of cancer patients considered at higher risk for suicide. Systematic screening for suicidal ideation and behavior may identify cancer patients at high risk and facilitate appropriate mental health evaluation and treatment.

Suicide was ranked as the 11th leading cause of death in the United States, responsible for 33,289 deaths[1] in 2006. Risk factors associated with suicide in the general population include chronic diseases, pain, depression, both older age and youth, living alone, and unemployment. Gender also influences suicide rates with males at 4 times higher risk of suicide than females. Suicide was the seventh leading cause of death for males and the 16th for women[2] in 2006. In addition, Americans 65 years or older have a higher incidence of suicide. According to the National Institute of Mental Health, 14.2 of 100,000 older Americans died as a result of suicide in 2006 as compared to 10.6 of 100,000 people in the general population. More than 90% of people who commit suicide in the general population have depression, mental illness, and/or substance abuse.[2]

The suicide rate for persons with cancer is estimated to be twice the rate in the general US population.[3] Yet oncology nurses are often unable to identify factors that may put the cancer patient at higher risk.[4] Failure to recognize suicide risk in patients with cancer may lead to further morbidity and mortality. Therefore, the purpose of this review of the literature was to identify (1) risk factors associated with suicide in cancer patients and (2) evidence-based assessment methods.

■ Methods

Search Strategy

PubMed, CINAHL, and PsycINFO databases were searched and literature identified within an 11-year period (1999–2010); these articles reported data collected over several decades. The literature search was followed by a hand reference list checking for relevant articles from these 3 databases. Medical Subject Headings terms used in PubMed were *neoplasm*, *psychology*, and *suicide in adults*. MH exact Subject Headings used for CINAHL were (MH "Neoplasm's/PF") and (MH "Suicide"). PsycINFO search used DE "Neoplasms" and DE "Suicide". Searches were confined to human, English, and adults.

Inclusion Criteria

The sources reviewed were research articles published in peer-reviewed journals within the specified 11-year period. The studies were peer reviewed and were relevant to cancer and suicide in the adult population. They included 1 or more of the variables associated with cancer and suicide such as population demographics (gender, age, type, and site of cancer), suicide rates, risk factors including psychological well-being, suicide and depression, assessment tools, and prevention measures. Articles using meta-analysis and case-controlled studies were included.

Data Extraction

A summary table to catalog articles alphabetically by author including publication date, citation, sample, methods, findings, and study limitations was created (see Table). Key findings were organized in this table for further analysis.

■ Results

After the database search, 193 articles were identified that mentioned suicide and cancer. However, when the inclusion criteria were applied, 22 articles were selected; 2 additional articles were retrieved from reference lists from these 22 articles for a total of 24 articles for this review. Among the 24 articles reviewed, 13 reported suicide risk factors, 9 evaluated tools used to detect increased suicide risk, and 2 discussed suicide prevention strategies for the terminal cancer patient. Major findings associated with suicide rates included type of cancer, gender, age, depression, and time from diagnosis.

Cancer Type

Four studies identified specific cancer sites associated with increased suicide risk, whereas 21 articles reported results under the broad category of cancer. The 4 site-specific malignancies with higher suicide rates included prostate, pancreatic, lung, and head and neck. In a population-based retrospective cohort study of older men living in South Florida from 1983 to 1993 who committed suicide, a total of 667 suicides were completed of which 20 were in men with prostate cancer.[12] The incidence of suicide in this study population was 55.32 per 100,000 older men, compared with 274.7 per 100,000 for older men with prostate cancer. Overall, the risk of suicide in men with prostate cancer was 4.24 times the age- and gender-specific cohort.[12] Miller et al[14] examined 1 of the first population-based studies to establish the relative risk of suicide in Americans 65 years or older while controlling for medical and psychiatric comorbidity. In a multivariate analysis, the only medical illness associated with suicide was cancer (odds ration [OR], 2.3; 95% confidence interval [CI], 1.1–4.8). There were a total of 19 suicides among patients with a cancer diagnosis of which 8 were in men with prostrate cancer. This study demonstrated a suicide rate of 23% (8 of 35) among those patients with prostate cancer.[14]

In a review of patients with cancer, Passik and Breitbart[15] focused on the connection between pancreatic cancer, depression,

Table • Suicide in Cancer Patients: Literature Review

Citation	Sample	Method	Findings	Weaknesses
Abbey et al[5]	200 Hospice patients with a life expectancy of less than 6 mo.	Cross-sectional study. The BHS, as well as other distress measures, was administered by trained staff.	All scales were valid and reliable measures of hopelessness. The 7- and 13-item subscales out preformed the original 20-item BHS in the prediction of suicidal ideation and desire for hastened death. The data suggest that the 20-item BHS may be improved when applied to a terminally ill patient by elimination of problematic items.	Small sample Lack of "gold standard" to measure hopelessness. State of the art facility. Mostly white and Catholic participants.
Akechi et al. Symptom indicator of severity of depression in cancer patients: a comparison of *DSM-IV* criteria with alternative diagnostic criteria. *Gen Hosp Psychiatry Jpn.* 2008.	5431 Cancer patients were referred during the study period.	Retrospective study using a computerized database from 1996 to 2003. Of the 5431 cancer patients, 728 (12.8%) had been diagnosed with depression using an inclusion approach.	*DSM-IV,* diagnostic criteria have a low ability for discriminating the severity of depression. As several other studies suggest the somatic symptoms among the *DSM-IV* criteria may not be useful markers for the severity of depression in cancer patients. Not participating in medical care and social withdrawal seem to be good markers of moderately severe depression in cancer patients.	No measurement of depression used. Would have been useful to compare with the Beck Inventory Scale or HRSD. Generalized to only referred patients with major depression. Cultural differences cannot be randomized.
Akechi et al. Clinical factors associated with suicidality in cancer patients. *Jpn J Clin Oncol.* 2002.	1713 Psychiatric consultations referred to the National Cancer Centre Hospital East, Japan, from 1996 to 1999.	Retrospective study using database of 1713 consults. Diagnostic and trained staff administered *DSM-IV.*	62 (3.6%) were related to suicidality, including 44 cases of suicidal ideation, 10 attempts, and 8 requests for euthanasia. Impaired physical functioning and major depression were significant associated factors. Management of major depression and improving physical functioning may help to prevent suicide.	Physician bias History of depression and suicide not addressed Social support factors, family life not addressed
Akechi et al. Suicidality in terminally ill Japanese patients with cancer. *Am Cancer Soc.* 2003.	140 Terminally ill patients with cancer, whose survival time was estimated to be less than 6 mo.	Follow-up study of consecutive outpatients who registered with the palliative care service. Structured clinical interviews for *DSM-III-R* to assess suicidal ideation.	At baseline, 8.6% had ideation and 5.0% had interest. Self-reported anxiety and depression were associated with ideation ($P = .003$). Changes in ideation and interest occurred in 38% and 15% of patients. Suicidality can change in terminally ill patients.	Institutional bias—1 institution Small samples No identification of factors that predict changes in suicidal thoughts. No validated measures

continues

Table • Suicide in Cancer Patients: Literature Review, continued

Citation	Sample	Method	Findings	Weaknesses
Akechi et al[6]	1721 Cancer patients referred to a psychiatric hospital.	Retrospective study of database using 1721 patients with cancer. Modified *DSM-IV* diagnostic inclusion approach, which is based on depressive symptomatology regardless of presumed etiology.	220 (12.8%) were diagnosed with major depression. 113 of these 220 had suicidal ideation. The results of this study found that more than half (51.4%) of the referred cancer patients with depression had suicide ideation. The most common cancer site was lung (n = 54, 24.5%). Significant risk factors identified include the following: Poor physical status (OR = 1.29; 95% CI, 1.03–1.63; *P* = .03) Severe depression (OR = 1.80; 95% CI, 1.89–2.37; *P* = .0001 Poor physical functioning and major depression are important indicators of suicidal ideation.	Physician bias Physical symptoms other than pain not included. History of depression or anxiety not addressed
Akechi et al[7]	89 Newly diagnosed unresectable non–small cell lung cancer patients. Consecutive patients who were diagnosed in the National Cancer Center Hospital East, Japan.	Baseline and 6-mo follow-up study using the HRSD to assess. Suicidal ideation by a psychiatrist using item 3 of the HRSD. Major depression and adjustment disorders were assessed using the *DSM-III-R*.	13 of 89 (15%) patients had suicidal ideation. Multivariate analysis indicated pain (OR = 3.72; 95% CI = 1.12–14.69; *P* = .04). And in depressive disorder, OR = 27.97; 95% CI, 5.18–214.14; *P* = .0003 were significant predictive factors. Earlier pain management and appropriate psychiatric intervention is needed.	Sample small Sampling bias Type of pain not assessed No family history Lung cancer only.
Breitbart et al[8]	92 Terminally ill cancer patients who passed a cognitive screening test.	Prospective survey conducted in a 200-bed palliative care hospital in New York, New York. Self-report measure on SAHD, *DSM-IV*, as well as other distress measures were administered and read to patients by trained staff.	15 (16%) had high desire for death using SAHD scale. 16 (17%) *DSM-IV* classified as major depression. Depressed patients were 4 times more likely to have a high desire for hastened death compared with patients without depression (47% vs 12%). Based on SCID interviews, 15 (17%) of the 89 patients met *DSM-IV* criteria for major depression. 16 (17%) of the 92 patients had a high desire for hastened death.	Small sample Generalizability—1 institution

continues

Table • Suicide in Cancer Patients: Literature Review, continued

Citation	Sample	Method	Findings	Weaknesses
Ciaramella and Poli[9]	100 Consecutive cancer patients from the pain therapy and palliative care unit, Santa Chaira Hospital, Italy.	Depression was assessed using a structured clinical interview for *DSM-III-R* (SCID), Endicott criteria, and HRSD.	49% of patients were depressed using the SCID compared with 29% using Endicott criteria. 28% were depressed using both. When modified for psychological symptoms in place of somatic symptoms, the prevalence rate dropped from 49% to 29%. These 2 structured interviews were equally valid. Suicide was not predicted by lifetime depression but by the severity of present depression, pain, and metastasis.	One institution—bias Cultural influence Small sample
Filiberti et al. Suicide and suicidal thoughts in cancer patients. *Tumori*. 2001.	Suicidal cancer patients	Review of literature about cancer in suicide patients was done using MEDLINE, PSYLIT, and peer contacts.	Increased communication between physician and patient and palliative individualized care may help reduce suicide in cancer patients.	Older review of literature
Hem et al[10]	490,245 Cancer patients registered in the Cancer Registry of Norway from 1960 to 1997.	Retrospective cohort study using the Cancer Registry of Norway, which includes site, diagnosis, grade, type, stage, and time of cancer diagnosis from 1960 to 1997. Suicide was defined by the *ICD* diagnosis of suicide.	(N = 490,245 patients with 520,823 cancer diagnosis) Death certificates defined suicide. 589 Cancer patients (407 males and 182 females) committed suicide. Risk was highest in the first months after diagnosis, male sex, and respiratory organs. Risk elevated for males and females, SMR of 1.55 (95% CI, 1.41–1.71) and 1.35 (95% CI, 1.17–1.56). Risk was highest in the first months after diagnosis. The risk was significantly increased after with the diagnosis with cancer of the respiratory organs (SMR, 4.08; 95% CI, 2.96–5.4). With all cancer types, the SMRs varied from 0.76 to 3.67. Bronchus, trachea, and lung cancers carried the highest suicide risk in men. Buccal cavity and pharynx carried the highest among women.	Norway study—generalizability concern
Kendal[11]	1.3 million cancer patients from SEER from 1973 to 2001.	Sex comparative study of persons with invasive cancers. Data were reviewed from individuals with invasive cancer from all SEER data including anatomic sites, gender, and age at diagnosis, race, and marital status.	The frequency of completed suicide for females was 0.02% about one-fifth of males. For males, the strongest association with suicide was with distant metastasis. 4.8 times excess in total suicides in male over female	Suicide reasons not studied

continues

Table • Suicide in Cancer Patients: Literature Review, continued

Citation	Sample	Method	Findings	Weaknesses
			Divorce carried a higher incidence of suicide. Suicide hazard for African Americans was decreased. The high-risk patient was male, with head and neck cancer or myeloma, advanced disease, little social support, and limited treatment options.	
Llorente et al[12]	Men 65 y and older in South Florida during 1983–1993.	Population-based retrospective cohort review.	667 Completed suicides, 20 were prostate cancer related (3% of the total male suicide sample). The average annual incidence of suicide for men was 55.32 per 100,000 persons, but for men with prostate cancer, the rate was 274.7 per 100,000. The risk of suicide in men with prostate cancer was 4.24 times that of an age and gender-specific cohort.	Information obtained from different sources. ME recall bias One geographical area
Lloyd-Williams et al[13]	79 Hospice inpatients (Lefevre study) 100 Inpatients with metastatic cancer (Lloyd study) 197 Palliative care patients (Chochinov study)	Literature review: Librarian: Cochrane review. Three studies were identified that compared 7 screening tools. HADS. 12-Item general health questionnaire (GHQ-12, Lefevre study). EPDS (Lloyd study). Beck Depression Inventory (Chochinov study). Are you depressed?	The question "Are you depressed" has a sensitivity of 1 and a specificity of 1 and a positive predictive value of 1. The 10-item EPDS has a sensitivity of 0.81 and a specificity of 0.79 and a positive predictive value of 0.53. The 14-item HADS has a sensitivity of 0.77 and a specificity of 0.89 and a positive predictive value of 0.48. The GHQ-12 did not give sensitivities and specificities because of its evaluation of somatic symptoms. Beck Depression Inventory, 13 items; sensitivity of 0.79 and a specificity of 0.71 and a positive predictive value of 0.27.	2003 Review Librarian bias
Miller et al[14]	1,408 New Jersey residents 65 y and older enrolled in Medicare and in a pharmaceutical insurance program.	Case control study of suicide risk associated with medical illness in older Americans. Period of study, 1994–2002.	The only medical condition that was associated with suicide was cancer (OR, 2.3; 95% CI, 1.1–4.8). 128 Suicides in patients aged 65 y and older. Prostate cancer was the predominant cancer among cases and controls. Of the 19 cases of suicide among patients with cancer, 8 (42%) had prostate cancer.	Study only examined patients on Medicare and a drug prescription program for low-income elderly. Unrecognized depression common in elderly.

continues

Table • Suicide in Cancer Patients: Literature Review, continued

Citation	Sample	Method	Findings	Weaknesses
			Of the 64 who did not commit suicide, 27 or 43% had prostate cancer. The risk of suicide in older adults is higher among patients with cancer.	
Misono et al[3]	3,594,750 Patients in the SEER program of the National Cancer Institute who were diagnosed with cancer from 1973 to 2002.	Retrospective cohort study of suicide in persons with cancer. Data from the SEER included age at diagnosis, gender, race marital status, and year at diagnosis. Patients were identified as committing suicide if the cause of death was coded suicide and self-inflicted injury. Contingency tables of suicide rates were used to help comparison with the general population as well as different anatomic sites.	Rate of suicide among SEER; 31.4 of 100,000 person years compared to the general US population of 16.7 of 100,000 person years. Patients with cancer have nearly twice the incidence of suicide than the general population. Suicide rates were highest in patients with cancers of the lung and bronchus (81.7 of 100,000; SMR = 5.74; CI, 5.30–6.22) followed by stomach cancers (71.7 of 100,000 person years; SMR = 4.68; 95% CI, 3.81–5.70), and cancers of the oral cavity and pharynx (53.1 of 100,000 person years; SMR = 3.66; 95% CI, 3.16–4.22). Suicide risk was highest immediately after diagnosis; however, it remained increased for more than 15 y after diagnosis. Male sex, white race, and older age had a higher risk.	Cause of death is often misclassified, sometimes as unexplained. Death may be misclassified as accidental. Tobacco and ETOH may increase risk.
Passik and Breitbart[15]	Review of depressive disorders in patients with cancer of the pancreas.	Clinical and research review of data on the connection between depression and cancer of the pancreas.	One study found that 76% of patients diagnosed with cancer of the pancreas had psychiatric symptoms compared with only 17% in patients with colon cancers. Another study found 50% of patients with cancer of the pancreas met criteria for depression. Another study reviewed found that 38% of 131 patients with cancer of the pancreas had significant symptoms of depression using the Beck Depression Inventory. Patients with cancer of the pancreas often have depression and anxiety that occur more often than other types of cancer.	Older article Limited to pancreas

continues

Table • Suicide in Cancer Patients: Literature Review, continued

Citation	Sample	Method	Findings	Weaknesses
			Identification and treatment of depression can enhance quality of life in pancreatic cancer patients. Depression is best managed with therapy, cognitive behavioral interventions, and antidepressant medications.	
Recklitis et al. Suicidal ideation and attempts in adult survivors of childhood cancer. *J Clin Oncol.* 2006.	226 Adult survivors of cancer seen in clinic.	Evaluated with depression suicidal ideation tools. 29 or 12.8% reported suicidality.	12.8% reported suicidal symptoms. Suicidal thoughts in adult survivors of childhood cancer are related to cancer treatments and physical and physiological well-being.	Convenience sample Generalizability Participants in clinic setting
Nissim et al[16]	27 Ambulatory patients aged 45–82 y with advanced lung or gastrointestinal cancer.	Qualitative study. Patients were recruited through theoretical sampling from outpatient clinics at a large cancer center in Toronto, Canada. 54 Audiotape interviews on "What is life like for you these days" and questions were imbedded into interview regarding desire for hastened death. Later reviewed by trained staff.	Based on SADH cutoff scores, 10 (37%) were classified as having high SADH scores, 7 had moderate (26%), and 10 had low (37%). The experience of hastened death in advanced cancer was found to be multidimensional and has 3 distinct categories. 1. Desire for hastened death as a hypothetical exit plan 2. Desire for hastened death as an expression of despair 3. Desire for hastened death as a manifestation of letting go	Small sample Limited to large urban cancer center.
Robinson et al[17]	206,129 Men and 211,443 women diagnosed with cancer in Southeast England between 1996 and 2005. Database of Thames cancer registry.	Population-based retrospective study of database. Suicide was identified as either from ICD or text in the death certificate.	166 Suicides (117 in men and 49 in women). Mean age at diagnosis of those committing suicide, 67.9 in men and 63.4 in women. Increased suicide in men, SMR = 1.45; 95% CI, 120–173. In women, the SMR was lower and did not reach statistical significance (SMR = 1.19; 95% CI, 0.88–1.57).	Generalizability

continues

Table • Suicide in Cancer Patients: Literature Review, continued

Citation	Sample	Method	Findings	Weaknesses
			Both sexes had a downward trend in relative risk of suicide with increased time since diagnosis.	
Rosenfeld et al. The schedule of attitudes towards hastened death; measuring desire for death in terminally ill cancer patients. *Cancer*. 2000.	92 Terminally ill cancer patients, all with a life expectancy of less than 6 mo (after admission to a palliative care hospital).	Interview survey: Patients were administered the SAHD, a self-reported measure. A clinician rated measure of desire for death.	15 (16.3%) Patients endorsed >10 items indicating a high desire for hastened death. The SADH seems to be a reliable and valid measure of desire for death in terminally ill cancer patients.	Sample terminally ill from same institution. State of the art institution, good palliative services. Voluntary, those unwilling to discuss not used.
Walker et al[18]	A survey of 2924 cancer patients from an outpatient clinic at Regional Cancer Center in Edinburgh, United Kingdom.	Cross-sectional survey Consecutive patients used touch screen computers before their oncology visits. Each patient completed the 9-item patient health questionnaire, which included question 9 that asks if they are better off dead or of hurting themselves in the previous 2 wk and the HADS 14-item self-report scale and also the 30-item European Organization for Research and Treatment of Cancer Quality of Life Questionnaire.	Data obtained from 2924 patients, 7.8% or 229 were positive responders (95% CI, 6.9–8.9). 8% of outpatients who attended the oncology clinic felt they would be better off dead or thought of hurting themselves for at least several days in the previous 2 weeks. Emotional distress; significant pain; and, to a lesser extent, older age were all associated with positive responders.	Regional bias—generalizability. Self-reported questionnaire versus interview. Cross-sectional—not all data collected.
Yousaf et al[19]	564,508 Cancer patients in the Danish Cancer Registry.	Population-based cohort study. Subjects had a cancer diagnosis between 1971 and 1999 were followed up by the Danish Causes of Death registrar for completed suicide, excluding non–melanoma skin cancers.	A total of 1241 suicides (740 men, 501 women) were observed. The overall incidence of suicide was 1.7% for men and 1.4 for women. Suicide rates where higher for men in the first 3 mo and from 3 to 12 mo for women. Increased suicide risk after diagnosis. Suicide risk increased with increased stage of cancer diagnosis. Cancer patients between the ages of 50 and 79 y committed most suicides.	Generalizability

Abbreviations: BHS, Beck Hopelessness Scale; CI, confidence interval; *DSM-III-R, Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition;* EPDS, Edinburgh Postnatal Depression Scale; HADS, Hospital Anxiety and Depression Scale; HRSD, Hamilton Rating Scale for Depression; ICD, International Classification of Diseases; OR, odds ratio; SADH, Schedule of Attitudes toward Hastened Death; SEER, Surveillance, Epidemiology, and End Results; SMR, standardized mortality ratio.

and suicidal ideation. Examination of psychiatric consultation data at Memorial Sloan Kettering Cancer Center revealed that one-third of cancer patients found to have suicidal ideation were patients with major depression.[15] The study reported that for cancer patients with localized disease, only 25% experienced depressive symptoms compared with 77% of patients with advanced cancer disease. Similar findings have been reported in patients with pancreatic cancer who are usually diagnosed at an advanced stage. In a summary of 52 case reports of patients with pancreatic cancer, 71% had symptoms of depression, 48% had anxiety-related disorders, and 29% had both.[15] The authors reported that suicidal ideation is likely to be associated with depression in patients with advanced cancer.

Akechi et al[7] evaluated predictive factors for suicidal ideation in 89 newly diagnosed patients with unresectable lung cancer. He found that 15% of patients had some degree of suicidal ideation at 6 months after initial diagnosis. Risk factors, identified using multivariate analysis, indicated that pain at baseline (OR = 3.72) and the development of a depressive disorder (OR = 27.97) were significantly associated with development of suicidal ideation. The report concluded that comprehensive cancer care should include pain management and appropriate psychiatric intervention in an effort to minimize suicidal ideation. A retrospective review by Kendal[11] of 1.3 million cancer cases from the SEER database found a significant association between head and neck cancers in men and suicide (0.32%; 95% CI, 0.26–0.39).

In summary, having prostate, lung, head and neck, or pancreatic cancer was associated with higher rates of suicide or suicidal ideation. These studies were limited as they were primarily retrospective analyses of case reports. The Akechi trial was small, and it is difficult to apply these findings to other cancer populations. It is noteworthy that there have not been prospective studies evaluating depression and suicide in common malignancies such as breast and colon cancer.

Gender Differences

In the general American population, males are 4 times more likely to commit suicide than females.[11] Five articles reported male gender as a risk factor for completed suicides. One retrospective study from the Cancer Registry in Norway reported that of the 490,245 patients who died from cancer, 589 committed suicide. The relative suicide risk was increased for both men and women; however, men were at higher risk with a standardized mortality ratio (SMR) of 1.55 (95% CI, 1.41–1.71) as compared with women, who had an SMR of 1.35 (95% CI, 1.17–1.56).[10]

A large Danish study included 564,517 cancer patients diagnosed between 1971 and 1999 and found that 1241 had died as a result of suicide (0.22%).[19] The suicide rate in this study was higher for men than women. The age standardized (world) suicide rates (WSTP) per 100,000 ranged from 16.8 to 30.2 for men and 6.1 to 16.3 for women. A similar large retrospective study from the Thames Cancer Registry in England from 1996 and 2005 reported a significantly increased risk of suicide in men. The study reported an SMR of 1.45 (95% CI, 1.20–1.73) for men compared with 1.19 (95% CI, 0.88–1.57) for women.[17] A gender comparison study of 1.3 million cancer patients from the US Surveillance, Epidemiology, and End Results (SEER) registry, a population-based database regarding the pathology, disease extent, social factors, treatment, and causes of death of people with cancer in the United States, also noted that male sex is a risk factor.[11] The results of this study concluded that women completed suicide rate (0.02%) was about one-fifth that of men (0.1%). The suicide hazards ratio for women was 1 and men, 6.2. This study showed a 4.8 times excess in overall number of male suicides over female suicides, which is consistent with the general American population ratio[11] of 4.5.

In summary, as in the general US population, suicide risk is higher in male cancer patients than in female cancer patients. Extensive population-based studies have confirmed the increased rate in the male population. There are no studies that make this comparison by gender or in a specific cancer diagnosis such as lung cancer.

Older Oncology Patients

In the US population, suicide in the context of medical illness is higher in older adults.[14] Miller et al[14] focused on the risk of suicide in older Americans with cancer. In a case-controlled study of 1408 patients aged 65 years and older, he noted that 128 had died as a result of suicide during a study period from 1994 to 2002. In an adjusted analysis, the only medical condition associated with suicide was cancer (OR = 2.3). The authors concluded that the risk of suicide in older adults was higher among patients with cancer than among patients with other medical illnesses.

Misono et al[3] reviewed the SEER database in an effort to identify cancer patient and disease characteristics associated with higher suicide rates. This study found higher suicide rates in men (SMR = 2.09), white race (SMR = 1.88), and older age at diagnosis (SMR = 2.42 in patients aged 65–69 years). The age-adjusted suicide rate in the general population was 22.0 per 100,000 person years for ages 80 to 84 years, yet this study revealed a suicide rate of 52.4 among the same age group with cancer. The higher rates were notable among men who demonstrated a suicide rate of 100.3 per 100,000 in those patients aged 80 to 84 years. This study also found an increased suicide rate in older (>65-year) patients with cancer. This risk increased as age increased and older men were at the highest risk. An analysis of cancer type would help further define special populations at higher risk of suicide.

Depression/Hopelessness

In a recent study of patients with cancer, depression was determined to be the major risk factor for suicidality (r = 0.36–0.39, $P < .01$). Hopelessness was also reported as increasing the risk for suicide (r = 0.45–0.49. $P < .01$). In this study of advanced cancer patients by Wilson et al,[20] "feeling oneself a burden to others" was found to be a moderate to extreme concern to patients (39.1%). A study by Breitbart et al[8] found

that depressed cancer patients were 4 times more likely to have a desire for hastened death (DHD) compared with those patients without depression (47% vs 12%). A retrospective study of 1721 cancer patients referred for a psychiatric consultation found that 220 had major depression (12.8%) and more than half of these (113) demonstrated suicidal ideation. Major depression was a significant risk factor for suicidal ideation in this study (OR = 1.80; 95% CI, 1.89–2.37; $P = .0001$).[7]

Recent Cancer Diagnosis

Hem et al[10] studied a cohort of patients from the Cancer Registry of Norway who were linked to a suicide diagnosis in the Registry of Deaths from 1960 to 1997. During this period, 589 cancer patients committed suicide; 407 were males. The risk of death from suicide was highest in the first months after diagnosis. The SMR was 3.09 for men and 2.18 for women within the first 5 months of diagnosis. After 12 months from diagnosis, the SMR decreased to 1.57 for men and 1.72 for women. Hem et al[10] concluded that the relative risk was elevated for both sexes in the first months after diagnosis ($P < .001$) and significantly decreased with time ($P = .005$).

In a recent study of suicide in cancer patients from England, Robinson et al[17] found that the relative risk of suicide was greatest in the first year after cancer diagnosis. The SMR was 2.42 for men and 1.44 for women in the first year. The authors concluded that there was a critical period just after diagnosis in which suicide risk was high. Yousaf et al[19] explored suicides among Danish cancer patients from 1971 to 1999. They reported that after a cancer diagnosis, suicide risk was highest in the first 1 to 3 months for men and between 3 and 12 months for women.[19]

In summary, multiple studies have identified the first months after cancer diagnosis as higher risk for suicide. More data exploring specific cancer diagnosis and extent of disease may be helpful in further defining this risk. Interventions identifying early detection of depression or suicidal ideation may help prevent suicide.

SUICIDE RISK SCREENING TOOLS

Depressed cancer patients are more likely to have a high DHD compared with patients without depression (47% vs 12%).[8] Consequently, systematic approaches to screening for suicide ideation with validated instruments hold promise for improved mental healthcare for patients with cancer. Eight studies from a general oncology population explored various screening tools in an effort to identify suicide risk. Tools used to assess depression in these articles included the Beck Hopelessness Scale (BHS); *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria; Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition* (SCID); Endicott criteria using the Hamilton Depressive Rating Scale; Edinburgh Postnatal Depression Scale; Hospital Anxiety and Depression Scale; Schedule of Attitudes towards Hastened Death; Patient Health Questionnaire (PHQ-9); 13-item structured interview of symptoms and concerns; and simply asking the question "are you depressed."

Clinical signs and symptoms of major depression are often also present as signs and symptoms in cancer patients making it difficult to differentiate them.[9] Anorexia, weight loss, low energy, and sleep disturbances are common as a result of both disease and treatment processes. Some study authors have proposed to drop these somatic symptoms from assessment screening tools that evaluate depression in this population. The prevalence of major depression in cancer patients has been recorded as low as 5% to 6% in 1 study to as high as 40% in others.[9] This variability is most likely related to differences in how depression was measured in these studies. The gold standard for the diagnosis of depression is a clinical examination administered by someone trained to use the SCID; instead, many studies used brief screening with varying psychometric qualities, cancer type, and disease stage.[9] A study by Ciaramella and Poli[9] using 2-structured methods for assessing major depression found that 49% of patients were considered depressed when evaluated using the SCID screening tool; however, when somatic symptoms were eliminated using the Endicott criteria, only 29% were depressed. Using both depression tools, the SCID and Endicott criteria, 28% were found to have a current depressive episode. These results suggested that the prevalence of major depression in cancer patients was 28%, which is similar to depression in other medical illnesses.[9] The sensitivity and specificity of self-reported depression screening have been studied for both cancer patients and those with mental illness. Symptoms, age, and gender were found to bias scores.[9]

Hopelessness is a powerful predictor of suicidal ideation and completed suicides.[5] Abbey et al[5] found that the BHS could be improved when used with the terminally ill, by removing problematic items like the question "I can't imagine what my life will be like in ten years" or "I have enough time to accomplish the things I want to." This study examined abbreviated versions of the BHS for use in the terminally ill population. All 3 versions reported adequate reliability and validity as measures of hopelessness for the terminally ill. When compared with the original 20-item scale, the 7- and 13-item versions had slightly more variance at end of life despair measures (ideation and hastened death). The 3-item version performed well accounting for as much variance as did the longer original. In summary, multiple tools have been used to help identify those patients who may be at high risk for suicide because of depression, helplessness, or DHD.

Desire for hastened death, as defined by Abbey and colleagues,[5] in the context of advanced cancer is a multidimensional construct, not necessarily pathological, and may have multiple meanings unrelated to taking one's life. Three distinct experiences of the meaning include DHD as a hypothetical exit plan, an expression of despair, and as a manifestation of letting go. It often served as a adaptive purpose of managing distress.[16]

The PHQ-9 is a validated self-report measure that is used to screen for mental disorders.[21,22] One item of the PHQ-9 asks, "In the last 2 weeks how often have you been bothered by the following problem: thoughts that you would be better off dead or hurting yourself in some way?". In a study of 330

cancer patients, an association was found for those who endorsed this question and suicidality; those with higher scores were more likely to be suicidal on interview.

■ Discussion

Cancer patients have a higher rate of suicide than the general population.[23,24] A number of factors place the cancer patient at higher risk for suicide including having prostate, lung, pancreatic, or head and neck cancer and being male, older, depressed, and recently (within the first year) diagnosed with cancer. Suicidality was also higher in adult survivors of childhood cancers.[25] In general, cancer patients who have significant physical, psychological, and social impairments may be at greater risk for suicide.[26]

Depression is a well-documented risk factor for suicide in cancer patients.[26] Depression and hopelessness are the strongest predictors of a desire for death in terminally ill cancer patients.[8] It has been established that depression in cancer patients adversely affects quality of life, including length of survival, adherence with care, and perception of pain. Depression is often undetected and underdiagnosed in cancer patients, and failure to treat is a major concern. Based on this research, use of the shorter screening tool (eg, the 3-item BHS, which includes [1] in the future, I expect to succeed in what concerns me the most; [2] all I can see ahead of me is unpleasantness rather than pleasantness; [3] it is very unlikely that I will get any real satisfaction in the future) to assess for depression and suicidal ideation in cancer patients is recommended. There is enough evidence to support use of this tool in current clinical practice. Alternatively, simply asking "are you depressed" may ease the use of suicide risk tools. Implementation of screening tools, however, will require clinical consultation with psychiatric experts, for instance, referral to a psychiatrist, a psychiatric-mental health nurse practitioner or clinical nurse specialist, social worker, psychologist, or other mental health professional.

Special populations were identified who may be at especially high risk of suicide. Men 65 years or older with lung, pancreatic, head and neck, or prostate cancer were identified in multiple studies to be at particularly high risk. Further studies, which focus on these patients, are needed in an effort to decrease the high rate of suicide in special oncology populations. However, current studies are limited by their focus on white populations and exclusion of minority groups. Future studies should focus on minority populations with cancer. Published population studies also failed to explore underlying mental illness, such as anxiety and major depression, and will likely bias results. The most glaring omission in current studies is the lack of screening tools to help prevent suicide in cancer populations. Further studies should be initiated to explore suicide prevention strategies in high-risk populations. Given these studies, one may speculate that cancer site does make an important difference in suicidality and therefore suggest a differential clinical approach to the identification and management of suicide.

Secondary prevention of suicide, defined as decreasing the likelihood of a suicide attempt in high-risk patients, is an important goal in the care of individuals with cancer.[25] Increased awareness among healthcare providers for cancer patients at greater risk may be the key to help decrease preventable deaths in this population. Early identification of and intervention with cancer patients at high risks of suicide should impact rates of death. A secondary benefit of early detection is to identify those risk factors, which are known to contribute to suicidality including depression, distress, and pain and to make appropriate interventions. These interventions include pharmacological and psychological interventions, follow-up care, and reduced access to lethal means.[27]

Implication for Future Research

Current research is limited, and prospective trials should be funded to further refine suicide risk using detection tools and to develop best practices for prevention. Special populations, such as older men with prostate cancer, should have interventions developed and tested to minimize suicide risk. Early identification with valid and reliable screening tools combined with these interventions should lead to decreased morbidity and mortality. Further research should also explore other factors such as marital status, socioeconomic factors, and ethnicity.

Implications for Healthcare Practice

Although a relatively rare event, healthcare providers should be aware that having a diagnosis of cancer increases the risk for suicide. More specifically, prostate, lung, pancreatic, and head and neck cancer; male sex; older adult; recent diagnosis; and depression have all been associated with an increased incidence of suicide. All of these variables except depression are easily identified by[28] the clinical approach. Incorporating the 3-item Beck assessment tool (16) into the admission flow sheet and simply asking the question "are you depressed" are simple, efficient methods to help identify the depressed cancer patient and alert the provider to either refer or treat these symptoms and arrange for follow-up. The tool should be in place on all intake follow-up questionnaires for all cancer patients as it may be hard to differentiate on specific cancer patients at risk. Educating providers of these increased risk factors especially among those with significant physical, psychological, and social impairments could be accomplished during annual continuing cancer updates.

Again, identifying and treating depression in the cancer patients could not only decrease the risk of suicide but also improve quality of life.

References

1. CDC/Suicide Statistics 2009 resources page. Center for Disease Control Web site. http://www.cdc.gov/ViolencePrevention/suicide/statistics/. Accessed August 26, 2011.
2. NIMH/Suicide Statistics 2009 resources page. National Institute of Mental Health Web site. http://www.nimh.nih.gov/health/publications/suicide-in-the-us-statistics-and-prevention/index.shtml. Accessed August 26, 2011.

3. Misono S, Weiss NS, Fann JR, Redman M, Yueh B. Incidence of suicide in persons with cancer. *J Clin Oncol*. 2008;26(29):4731–4738.
4. Valente S. Oncology nurses' knowledge of suicide evaluation and prevention. *Cancer Nurs*. 2010;22(4):290–295.
5. Abbey JG, Rosenfeld B, Pessin H, Breitbart W. Hopelessness at the end of life: the utility of the hopelessness scale with terminally ill cancer patients. *Br J Health Psychol*. 2006;11(Pt 2):173–183.
6. Akechi T, Okamura H, Yamawaki S, Uchitomi Y. Why do some cancer patients with depression desire an early death and others do not? *Psychosomatics*. 2001;42(2):141–145.
7. Akechi T, Okamura H, Nishiwaki Y, Uchitomi Y. Predictive factors for suicide ideation in patients with unresectable lung carcinoma; a 6 month follow-up study. *Am Cancer Society*. 2002;95:1085–1093.
8. Breitbart W, Rosenfeld B, Pessin H, et al. Depression, hopelessness, and desire for hastened death in terminally ill patients with cancer. *JAMA*. 2000;284(22):2907–2911.
9. Ciaramella A, Poli P. Assessment of depression among cancer patients: the role of pain, cancer type and treatment. *Psychooncology*. 2001;10(2): 156–165.
10. Hem E, Loge JH, Haldorsen T, Ekeberg O. Suicide risk in cancer patients from 1960 to 1999. *J Clin Oncol*. 2004;22(20):4209–4216.
11. Kendal WS. Suicide and cancer: a gender-comparative study. *Ann Oncol*. 2007;18(2):381–387.
12. Llorente MD, Burke M, Gregory GR, et al. Prostrate cancer: a significant risk factor for late-life suicide. *Am J Geriatr Psychiatry*. 2005;13(3): 195–201.
13. Lloyd-Williams M, Spiller J, Ward J. Which depression screening tools should be used in palliative care? *Palliat Med*. 2003;17(1):40–43.
14. Miller M, Mogun H, Azrael D, Hempstead K, Solomon DH. Cancer and the risk of suicide in older Americans. *J Clin Oncol*. 2008;26(29): 4720–4724.
15. Passik SD, Breitbart WS. Depression in patients with pancreatic carcinoma. Diagnostic and treatment issues. *Cancer*. 1996;78(suppl 3):615–626.
16. Nissim R, Gagliese L, Rodin G. The desire for hastened death in individuals with advanced cancer: a longitudinal qualitative study. *Soc Sci Med*. 2009; 69(2):165–171.
17. Robinson D, Renshaw C, Okello C, Moller H, Davies EA. Suicide in cancer patients in southeast England from 1996 to 2005: a population-based study. *Br J Cancer*. 2009;101(1):198–201.
18. Walker J, Waters RA, Murray G, et al. Better off dead: suicidal thoughts in cancer patients. *J Clin Oncol*. 2010;26(29):4725–4730.
19. Yousaf U, Christensen ML, Engholm G, Storm HH. Suicides among Danish cancer patients 1971–1999. *Br J Cancer*. 2005;92(6):995–1000.
20. Wilson KG, Curran D, McPherson CJ. A burden to others: a common source of distress for the terminally ill. *Cogn Behav Ther*. 2005; 34(2):115–123.
21. Spitzer R, Kroenke K, Williams J, the Patient Health Questionnaire Primary Care Study Group. Validation and utility of a self-report version of PRIME-MD. *JAMA*. 1999;282:1737–1744.
22. Walker J, Hansen C, Hodges L, et al. Screening for suicidality in cancer patients using Item 9 of the nine-item patient health questionnaire; does the item score predict who requires further assessment? *Gen Hosp Psychiatry*. 2010;32:218–220.
23. Chung K, Lin H. Methods of suicide among cancer patients: a nationwide population-based study. *Suicide Life Threat Behav*. 2010;40(2):107114.
24. Robson A, Scrutton F, Wilkinson L, MacLeod F. The risk of suicide in cancer patients: a review of the literature. *Psychooncology*. 2010; doi: 10.1002/pon.1717.
25. Recklitis C, Diller L, Li X, Najita J, Robison L, Zelter L. Suicide ideation in adult survivors of childhood cancer: a report from the childhood cancer survivor study. *J Clin Oncol*. 2010;28(4):655–661.
26. Spoletini H, Gianni W, Caltagirone C, et al. Suicide and cancer: where do we go from here? *Crit Rev Oncol Hematol*. 2010; doi: 10.1016/j.critrevonc.2010.05.005.
27. Ganz D, Braquehais M, Sher L. Secondary prevention of suicide. *PLoS Med*. 2010;7(6):e1000271.
28. Van Leeuwen P, Schroeder F. Risk factors: increased risk of suicide after prostate cancer diagnosis. *Nat Rev Urol*. 2010;7:369–370.