



*E & N News to Use*  
*for cancer patients, survivors and caregivers*

*EXERCISE & NUTRITION* during/after\* *CANCER*

CURRENT PEER-REVIEWED MEDICAL LITERATURE and EXPERT COMMENTARY  
from RELIABLE SOURCES and DR. BLEYER

\*Studies on cancer prevention are included if they have special relevance to cancer survivors

*March 2010*

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DIET | EXERCISE | FAMILY | EDUCATION | ATTITUDE | THRIVING

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▶ Exercise

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**Physical activity and weight gain prevention**

In this study of more than 34,000 healthy women, exercise for more than an average of 1 hour per day and not being overweight to begin with was associated with weight gain prevention

Lee IM, Djoussé L, Sesso HD, Wang L, Buring JE.

JAMA. 2010 Mar 24;303(12):1173-9.

Brigham and Women's Hospital, Harvard Medical School, Boston, MA 02215, USA.

**CONTEXT:** The amount of physical activity needed to prevent long-term weight gain is unclear. In 2008, federal guidelines recommended at least 150 minutes per week (7.5 metabolic equivalent [MET] hours per week) of moderate-intensity activity for "substantial health benefits." **OBJECTIVE:** To examine the association of different amounts of physical activity with long-term weight changes among women consuming a usual diet.

**DESIGN, SETTING, AND PARTICIPANTS:** A prospective cohort study involving **34,079 healthy US women** (mean age, 54.2 years) from 1992-2007. At baseline and months 36, 72, 96, 120, 144, and 156, women reported their physical activity and body weight. Women were classified as expending less than 7.5, 7.5 to less than 21, and 21 or more MET hours per week of activity at each time. Repeated-measures regression prospectively examined physical activity and weight change over intervals averaging 3 years. **MAIN OUTCOME MEASURE:** Change in weight.

**RESULTS:** Women gained a mean of 2.6 kg throughout the study. A multivariate analysis comparing women expending 21 or more MET hours per week with those expending from 7.5 to less than 21 MET hours per week showed that the latter group gained a mean (SD) 0.11 kg (0.04 kg;  $P = .003$ ) over a mean interval of 3 years, and those expending less than 7.5 MET hours per week gained 0.12 kg (0.04;  $P = .002$ ). There was a significant interaction with body mass index (BMI), such that there was an inverse dose-response relation between activity levels and weight gain among women with a BMI of less than 25 ( $P$  for trend  $< .001$ ) but no relation among women with a BMI from 25 to 29.9 ( $P$  for trend = .56) or with a BMI of 30.0 or higher ( $P$  for trend = .50). A total of 4540 women (13.3%) with a BMI lower than 25 at study start successfully maintained their weight by gaining less than 2.3 kg throughout. Their mean activity level over the study was 21.5 MET hours per week (approximately 60 minutes a day of moderate-intensity activity).

**CONCLUSIONS:** Among women consuming a usual diet, physical activity was associated with less weight gain only among women whose BMI was lower than 25. Women successful in maintaining normal weight and gaining fewer than 2.3 kg over 13 years averaged approximately 60 minutes a day of moderate-intensity activity throughout the study.

**Dr. Bleyer:**

- ☑ This report received instant publicity because it indicated that a lot more exercise is necessary to prevent weight gain than had been previously appreciated.
  - ☑ Not publicized is more bad news: weight gain prevention was not achieved by women who were overweight to begin with, even with one hour a day of exercise; only women starting with normal weight were able to prevent weight gain with exercise.
  - ☑ As **DEFEATcancer** has repeatedly emphasized, nutrition strongly influences the effect of exercise; since diet was not evaluated in this study, it is quite possible that overweight persons can prevent weight gain with a combination of exercise and nutrition (**E&N**)
  - ☑ Thus the interpretation of this study should not be pessimistic, since 1) exercise can improve quality of life without leading to weight loss or preventing weight gain, 2) **E+N** can have positive effects when either **E** or **N** alone can not, and 3) for those persons in whom an hour of exercise a day is feasible, even more benefits may accrue
  - ☑ Nonetheless, that more exercise is needed to prevent weight gain when diet is not considered is a lesson of value
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### **Promotion of physical activity among oncologists in the United States**

[One third of the U.S. oncologists surveyed did not inquire about physical activity in their patients and those that did were most likely to have been in practice longer, exercise themselves or were medical \(vs. radiation\) oncologists](#)

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Karvinen KH, DuBose KD, Carney B, Allison RR.

J Support Oncol. 2010 Jan-Feb;8(1):35-41.

East Carolina University, Greenville, NC

Promotion of physical activity by health care providers has been found to positively influence the levels of physical activity in patients. The primary purpose of this study was to examine physical activity promotion practices of oncologists in the United States. Secondary purposes were to examine oncologists' perceptions of the benefits of physical activity for cancer survivors and barriers for promotion of physical activity. Of 702 medical and radiation oncologists in the United States invited to participate in the mailed survey, 199 oncologists responded to the survey (response rate, 30%). Approximately **64% of oncologists inquired about their patients' physical activity on some or most visits**. Logistic regression indicated that oncologists who had been **practicing > or =10 years** (OR [odds ratio] = 2.52), **were themselves physically active** (OR = 1.99), or were **medical oncologists** (OR = 2.25) were the most likely to recommend physical activity to their patients. "Reducing the risk of recurrence" was rated lowest of all the potential benefits of physical activity for cancer patients. "Insufficient time" was rated the highest as a barrier to promotion of physical activity. Some oncologists are still not discussing physical activity with their patients. A number of barriers and perceptions of the benefits of physical activity may influence such discussions.

#### **Dr. Bleyer:**

- ☑ With 70% of the oncologists failing to return the survey, there undoubtedly is a selection bias in this results that has led to a overestimate of the rate of interest in exercise by oncologists and for their patients; I know this from personal experience in that the oncologists who do take the time to complete and return such surveys are more careful in general and in taking care of their patients
- ☑ Since **DEFEATcancer** is based in an exercise-focused community (Central Oregon), it is likely that its oncologists are more likely to advocate physical activity for their cancer patients
- ☑ Although reducing the risk of recurrence of cancer was least important to the oncologists in recommending exercise, **DEFEATcancer** has reported the evidence that the risk can be reduced for a variety of cancer when both exercise and nutrition (**E&N**) are improved

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### **Physical activity, quality of life, and the interest in physical exercise programs in patients undergoing palliative chemotherapy**

[In this report from Germany, cancer patients receiving palliative chemotherapy \(with intent to prolong life since cure was not possible\), quality of life was correlated the amount of exercise](#)

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Oechsle K, Jensen W, Schmidt T, Reer R, Braumann KM, de Wit M, Bokemeyer C.

Support Care Cancer. 2010 Mar 31. [Epub ahead of print]

University Cancer Center Hamburg, University Hospital, Germany

**PURPOSE:** Quality of life is of major importance in patients with advanced cancers undergoing palliative chemotherapy. In contrast to the number of studies on physical activity in patients with curable malignancies, data on patients undergoing palliative chemotherapy are scarce.

**METHODS:** A total of 53 patients receiving palliative chemotherapy on an outpatient basis were interviewed using three standardized questionnaires within a time period of 4 weeks (Questionnaire for Measurement of Habitual Physical Activity, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C13 questionnaire, International Physical Activity questionnaire), and a questionnaire regarding patients' acceptance of a potential physical training program.

**RESULTS:** **Thirty-six percent of the patients still performed self-instructed physical activities during palliative chemotherapy.** Patients showed significantly higher values in the "leisure time index" during their malignancy than before ( $p < 0.01$ ). **Significantly positive correlations were found between "work index" and quality of life ( $p = 0.004$ ), "work index" and physical function ( $p = 0.02$ ), and**

**"hours of physical activity per week" and quality of life ( $p < 0.05$ ).** A negative correlation was found between "work index" and fatigue ( $p < 0.05$ ). Quality of life scores were significantly higher in patients with sportive activities  $\geq 9$  metabolic equivalent (MET) h/week than in patients with  $<9$  MET h/weeks ( $p < 0.01$ ). Sixty percent of patients indicated that they would be willing to participate in an individually adapted activity training program.

**CONCLUSIONS:** In patients undergoing palliative chemotherapy, a statistically significant positive correlation between physical activity and quality of life could be demonstrated. About two thirds of critically ill patients are interested in participating in training programs

**Dr. Bleyer:**

- ☑ The adage that *is it never too late* applies to exercise in patients with advanced cancer who are in the final phase of life; this study clearly shows that exercise improves the quality of life, reduces fatigue, and enables more physical functioning even during palliative chemotherapy
- ☑ That more than one third of patients with advanced cancer still performed self-instructed physical activities during palliative chemotherapy demonstrate feasibility in settings cancer patients, cancer doctors and their staffs may not have thought possible
- ☑ With respect to prolonging live, **DEFEATcancer** would postulate that the improved physical and mental functioning provided by exercise and nutrition (E&N) improves tolerance of cancer therapy, including chemotherapy, allows more of to be given to the patients, and thereby more likely to prolong life

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**Exercise as a supportive therapy in incurable cancer: exploring patient preferences**

[In this study from England, exercise as a supportive therapy for patients with incurable cancer, including those receiving chemotherapy, was found to be reasonable, feasible and desirable by a majority of patients](#)

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Maddocks M, Armstrong S, Wilcock A  
 Psychooncology. 2010 Mar 24. [Epub ahead of print]  
 Nottingham University Hospitals NHS Trust, Nottingham, England

**OBJECTIVE:** Therapeutic exercise may benefit patients with incurable cancer, but there is little data on its practicality. We have explored the acceptability of six exercise programmes based on different types of exercise, the preferred delivery method, location and time relative to anticancer treatments and whether various patient characteristics influence choice of exercise.

**METHODS:** A questionnaire determined patients' perceived capability and preparedness to undertake six exercise programmes, each illustrated by looping video clips and accompanying text, most preferred programme and preferences for its delivery. Frequency counts and percentages were calculated and multiple logistic regression used to examine associations between patient characteristics and preparedness to undertake each of the programmes.

**RESULTS:** Two hundred patients (103 female; mean (SD) age 64 (9); ECOG 02) with common incurable cancers mostly receiving palliative chemotherapy took part. All considered themselves physically capable of undertaking one or more of the exercise programmes and two-thirds were prepared to undertake a programme at that moment in time. The three **most preferred exercise programmes were those based on neuromuscular electrical stimulation, walking and resistance training.** The **majority of patients preferred to undertake exercise at home**, alone and unsupervised. **One-third were not prepared to undertake any exercise**, with a tendency for the least prepared to be older males and those with a lower performance status.

**CONCLUSIONS:** Our findings suggest that it is realistic to develop exercise as a supportive therapy for patients with incurable cancer, including those receiving chemotherapy, and can be used to inform further research in this area.

**Dr. Bleyer:**

- ☑ As in the prior report on cancer patients in their palliative-care phase, two thirds or more of patients with incurable cancer are still interested and willing to undertake an exercise program
  - ☑ That the patients are willing is remarkable; medical professionals should take advantage of this patient-driven interest, as **DEFEATcancer** is endeavoring to accomplish
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***Preliminary findings of a 4-month intrahospital exercise training intervention on IGFs and IGFBPs in children with leukemia***

[In this study from Sweden, Colorado, Connecticut and Spain, children 4 to 7 years of age successfully underwent a 4-month exercise program during treatment for their leukemia, without evidence that insulin growth factors, implicated as mediating the benefits of exercise in cancer patients, were affected by exercise](#)

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Ruiz JR, Fleck SJ, Vingren JL, Ramírez M, Madero L, Fragala MS, Kraemer W, Lucia A  
J Strength Cond Res. 2010 Mar 10. [Epub ahead of print]

Karolinska Institutet, Huddinge, Sweden; Colorado College, Colorado Springs, Colorado; University of Connecticut, Storrs, Connecticut; Hospital Infantil Universitario Niño Jesús, Madrid; Universidad Europea de Madrid, Spain.

The aim of this study was to determine the effect of a 16-week intrahospital supervised, conditioning program including both resistance and aerobic type training on insulin-like growth factors 1 and 2 (IGF-1, IGF-2), several IGF-binding proteins (IGFBPs), and growth hormone (GH) in children receiving treatment against acute lymphoblastic leukemia (ALL). We also analyzed the effects of a 20-week detraining period on these hormones. Seven children (3 girls and 4 boys) aged 4-7 years in the maintenance phase of treatment against ALL performed 3 training sessions per week for 16 weeks of resistance (1 set of 8-15 repetitions of 11 exercises) and aerobic training (30 minutes at  $\geq 50\%$  heart rate max) followed by 20 weeks of detraining where no structured exercise program was performed. Levels of IGF-1 and IGF-2 did not significantly change after the intervention period or after the detraining phase. Likewise, levels of GH, IGFBP-2, and IGFBP-3 remained stable pre and posttraining and after the detraining period. IGFBP-1 levels significantly decreased after training (-43.8%,  $p = 0.014$ ), whereas there were no significant differences between pretraining vs. detraining (-17.8%,  $p = 0.108$ ) nor between posttraining vs. detraining (17.7%,  $p = 0.251$ ). Exercise training did not have major effects on the IGFs, IGFBPs, and GH in children with ALL. Although the importance of these findings to long-term cancer prognosis and/or recurrence remains to be determined, the present data (particularly those on IGF-1 and IGFBP-3) support the idea that exercise training can be safely undergone during treatment against ALL with no major adverse effect.

**Dr. Bleyer:**

- ☑ That four centers in three countries and two states (Sweden, Spain, Connecticut, Colorado) were required to evaluate 7 children illustrates 1) the international interest the effects of exercise in cancer patients, 2) the difficulty of conducting research in children, and 3) the capability of international research
- ☑ Although this study was done in only 7 children, the results fairly clearly indicate that insulin growth factors and related molecules are not significantly affected by exercise
- ☑ That the study was done in young children signifies how convincing the concept that exercise can help prevent cancer recurrence has become

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***Effectiveness of behavioral techniques and physical exercise on psychosocial functioning and health-related quality of life in breast cancer patients and survivors—a meta-analysis***

[In this review of 56 studies of exercise in breast cancer survivors, exercise was correlated with significantly less fatigue, depression, anxiety and stress](#)

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Duijts SF, Faber MM, Oldenburg HS, van Beurden M, Aaronson NK.

Psychooncology. 2010 Mar 24. [Epub ahead of print]

The Netherlands Cancer Institute, Amsterdam, The Netherlands.

**OBJECTIVE:** To evaluate the effect of behavioral techniques and physical exercise on psychosocial functioning and health-related quality of life (HRQoL) outcomes in breast cancer patients and survivors.

**METHODS:** A meta-analysis was carried out to quantify the effects of behavioral and exercise interventions on fatigue, depression, anxiety, body-image, stress and HRQoL. Summary effect sizes and standard errors were calculated. The presence of publication bias was explored and sensitivity analyses were performed to identify possible sources of heterogeneity.

**RESULTS:** In total, 56 studies were included. Statistically significant results were found for the effect of behavioral techniques on fatigue (ES -0.158; 95% CI -0.233 to -0.082,  $p < 0.001$ ), depression (ES -0.336; 95% CI -0.482 to -0.190,  $p < 0.001$ ), anxiety (ES -0.346; 95% CI -0.538 to -0.154,  $p < 0.001$ ) and stress (ES -0.159; 95% CI -0.310 to -0.009,  $p = 0.038$ ). For the effect of physical exercise interventions, statistically significant results were found on fatigue (ES -0.315; 95% CI -0.532 to -0.098,  $p = 0.004$ ), depression (ES -0.262; 95% CI -0.476 to -0.049,  $p = 0.016$ ), body-image (ES 0.280; 95% CI 0.077 to 0.482,  $p = 0.007$ ) and HRQoL (ES 0.298; 95% CI 0.117 to 0.479,  $p = 0.001$ ).

**CONCLUSIONS:** The results indicate that behavioral techniques and physical exercise improve psychosocial functioning and HRQoL in breast cancer patients and survivors. Future research is needed on the effect of physical exercise on stress and the effect of the combined intervention in breast cancer patients.

**Dr. Bleyer:**

- ☑ That there were as many as 56 studies to evaluate indicates the depth and breadth of the importance of exercise in cancer patients and survivors
- ☑ The results are not surprising, albeit the level of statistical significance—the chance that the correlation is not real was less than one in 1000—is impressive

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***Interest and preferences for exercise counseling and programming among Norwegian cancer survivors***

In this study from Norway, three fourths of cancer patients desired exercise counseling and most preferred advice from a cancer center expert and early in or immediately after their therapy

Gjerset GM, Fosså SD, Courneya KS, Skovlund E, Jacobsen AB, Thorsen L.  
 Eur J Cancer Care (Engl). 2010 Mar 23. [Epub ahead of print]  
 Norwegian Radium Hospital, Oslo University Hospital, Oslo, Norway.

Interest and preferences for exercise counseling and programming among Norwegian cancer survivors To be able to make suitable exercise intervention programs for cancer survivors, we need more information about exercise preferences. The primary aim of the study was to investigate the interest and preferences for exercise among Norwegian cancer survivors. A secondary aim was to identify demographic and medical characteristics associated with interest in exercise counseling. A questionnaire was completed by 1284 cancer survivors. Overall, **76% of participants were interested or maybe interested in receiving exercise counseling** at some point during their cancer experience. Logistic regression analyses indicated that the **interest in exercise counseling** in men was associated with **younger age**, presence of comorbidity and having received chemotherapy. In women, the interest was associated with younger age, higher education and change in physical activity level. The participants **preferred face-to-face exercise counseling with an exercise specialist from a cancer centre, at a hospital**, immediately after treatment. **Most cancer survivors were interested in an exercise program, walking as activity, at moderate intensity and they wanted to start immediately after treatment.** The knowledge from this study can contribute to make suitable physical rehabilitation available to cancer patients in the future.

**Dr. Bleyer:**

- ☑ That three of every four cancer patients desire exercise advice contrasts with the prior report that indicates the proportion of oncologists engaging cancer patients in exercise discussion is less

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► **Nutrition**

***Nutritional status, nutrition practices and post-operative complications in patients with gastrointestinal cancer***

In this report from Australia, patients undergoing cancer surgery were much more likely to require more time recovering from their operations and sustaining more complications if their nutritional status was compromised

Garth AK, Newsome CM, Simmance N, Crowe TC.  
 J Hum Nutr Diet. 2010 Mar 23. [Epub ahead of print]  
 Deakin University, Melbourne, Victoria, Australia.

**BACKGROUND:** Malnutrition and its associated complications are a considerable issue for surgical patients with upper gastrointestinal and colorectal cancer. The present study aimed to determine whether specific perioperative nutritional practices and protocols are associated with improved patient outcomes in this group.

**METHODS:** Patients admitted for elective upper gastrointestinal or colorectal cancer surgery (n = 95) over a 19-month period underwent a medical history audit assessing weight changes, nutritional intake, biochemistry, post-operative complications and length of stay. A subset of patients (n = 25) underwent nutritional assessment by subjective global assessment prior to surgery in addition to assessment of post-operative medical outcomes, nutritional intake and timing of dietetic intervention.

**RESULTS:** Mean (SD) length of stay for patients was 14.0 (12.2) days, with complication rates at 35%. Length of stay was significantly longer in patients who experienced significant preoperative weight loss compared to those who did not [17.0 (15.8) days versus 10.0 (6.8) days, respectively;  $P < 0.05$ ]. Low albumin and post-operative weight loss were also predictive of increased length of stay. Of patients who underwent nutritional assessment, 32% were classified as mild-moderately malnourished and 16% severely malnourished. Malnourished patients were **hospitalised twice as long** as well-nourished patients [15.8 (12.8) days versus 7.6 (3.5) days;  $P < 0.05$ ]. Time taken [6.9 (3.6) days] to achieve adequate nutrition post surgery was a factor in post-operative outcomes, with a positive correlation with length of stay ( $r = 0.493$ ;  $P < 0.01$ ), a negative correlation with post-operative weight change ( $r = -0.417$ ;  $P < 0.05$ ) and a **greater risk of complications (52% versus 13%;  $P < 0.01$ )**.

**CONCLUSIONS:** Malnutrition is prevalent among surgical patients with gastrointestinal cancer. Poor nutritional status coupled with delayed and inadequate post-operative nutrition practices are associated with worse clinical outcomes.

**Dr. Bleyer:**

- ☑ Not surprising, the conclusion of this study is that malnourished patients do not tolerate major surgical procedures as well as those who are well nourished
- ☑ Other studies reported by DEFEATcancer have also shown that the opposite problem (over-nourished, overweight) is also associated with poor post-operative outcomes

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**► Related Articles**

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***Complementary and alternative medicine: use and disclosure in radiation oncology community practice***

[In a rural community in the upper Midwest of the U.S. the use of complementary and alternative modalities of care, including spiritual/healing care, was reported in 95% of the cancer patients](#)

Rausch SM, Winegardner F, Kruk KM, Phatak V, Wahner-Roedler DL, Bauer B, Vincent A.  
Support Care Cancer. 2010 Mar 25. [Epub ahead of print]  
Integrative Medicine, H. Lee Moffitt Cancer Center, Tampa, FL, USA, Sarah.rausch@moffitt.org.

**PURPOSE:** The aims of this study were to evaluate the frequency of complementary and alternative medicine (CAM) use among radiation oncology patients, the coping strategies that influenced this use, and the rates of disclosure of CAM use to their healthcare providers.

**METHODS:** One hundred fifty-three patients undergoing radiation therapy for various neoplasms at rural cancer centers in Minnesota completed the Mayo Complementary and Alternative Medicine Use Survey and the Coping Inventory for Stressful Situations questionnaires. Data regarding CAM use was also compared with provider consultation notes in the medical record at the onset of radiation therapy to determine rates of patient disclosure of CAM use to their healthcare providers.

**RESULTS:** A total of 153 participants completed the study with 61.4% females and 38.6% males and a mean age of 64.9 years. The two most frequent diagnoses of participants were breast cancer (43.8%) and prostate cancer (22.9%). CAM use was reported in 95% of the participants and was categorized into three domains: treatments and techniques, vitamins, and herbs and supplements. The three most frequently reported treatments and techniques were spiritual healing/prayer (62.1%), exercise (19.6%), and music (17.6%). The top three most frequently used biologically based CAM therapies were multivitamins (48.1%), calcium (37.3%), and vitamin with minerals (21.5%). The most frequently used herbs and other

dietary supplements were fish oil (19.0%), flaxseed (15.0%), glucosamine (15.0%), and green tea (15.0%). The most common reason cited for CAM treatments and techniques use was previous use (26.1%), for use of vitamins and minerals was recommendation by a physician (33.0%), and for use of herbs and other supplements was previous use (19.0%). One hundred twelve participants reported taking vitamins, minerals, or supplements, and 47% of those 112 did not disclose this use to their providers.

**CONCLUSIONS:** Consistent with previous research, our study found that the majority of cancer patients used CAM treatments. **Spiritual healing/prayer was the most commonly reported**, followed by multivitamins. Patients reported using CAM primarily due to previous use and physician recommendation. Unfortunately, disclosure of CAM use to healthcare providers was relatively low.

**Dr. Bleyer:**

- ☑ This finding, albeit with a higher rate of CAM use than usual, has been repeatedly noted in cancer patients
  - ☑ Not expected from prior studies is that physician recommendation was one of the two major reasons for CAM use
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