Complementary and Alternative Medicine Use by Patients Visiting a Free Health Clinic: A Single-Site, Pilot Study

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ABSTRACT

Background: The rate of use of complementary and alternative medicine (CAM) has been documented to fluctuate widely, can greatly impact medical outcomes, and can influence patients' adherence to conventional medicines. Health care providers should assess the prevalence of CAM use (primarily herbal medicine) in individual settings to most accurately provide appropriate patient care.

Objectives: The aim of this study was to determine the following: (1) differences in demographic characteristics between users and nonusers of CAM; (2) which CAM patients are using; (3) patients' sources of information concerning CAM; and (4) whether patients recall being asked about CAM use by their health care providers.

Methods: In this single-center, pilot study, a self-administered survey concerning CAM use was made available to persons seeking care at an inner-city free health clinic (Kansas City Free Health Clinic, Kansas City, Missouri). Completed surveys were scanned into a database, and descriptive analyses were performed.

Results: Three hundred eleven patients completed ≥ 1 question on the survey. Of those who reported race ($n = 278$), 168 (60.4%) were Caucasian/white, 73 (26.3%) were African American/black, and 24 (8.6%) were Hispanic/Latino. Of those who reported educational level ($n = 287$), 101 (35.2%) had some high school or were high school graduates or had a general equivalency development diploma, 102 (35.5%) had completed some college or vocational training, and 84 (29.3%) had completed college. Of those who reported personal annual income ($n = 191$), 107 (56.0%) reported up to US \$15,000, and 54 (28.3%) reported >\$15,000 to \$30,000. A high rate of CAM use (past or present) was found among survey respondents (116/285 [40.7%]). No correlation was found

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between CAM use and any of the demographic characteristics studied. Of 98 patients reporting whether their CAM use was past or current, 64 (65.3%) were using CAM at the time of the survey. Friends and physicians were reported to be most supportive of CAM use (21/41 [51.2%] and 33/86 [38.4%] patients, respectively). The most common CAM products reported as being currently used were garlic and chamomile (both, 5 patients [7.1%]), and echinacea and ginseng (both, 3 patients [4.7%]).

Conclusion: This survey of patients using an inner-city free health clinic showed a high rate of CAM use, which could significantly impact patient outcomes. (*Curr Ther Res Clin Exp.* 2004;65:481-494) Copyright © 2004 Excerpta Medica, Inc.

Key words: alternative, complementary, medically indigent, inner city, educational level.

INTRODUCTION

The National Center for Complementary and Alternative Medicine (NCCAM) defines *complementary and alternative medicine* (CAM) as medical practices and products that are not currently part of conventional or Western medicine.¹ Another definition of CAM might be treatment modalities, interventions, and agents that are not typically reimbursable by insurance plans. Common examples of CAM include acupuncture, homeopathy, traditional Chinese medicine, herbs, and dietary supplements. Because the explosion of CAM use in the United States in the late 1980s was largely a patient-driven phenomenon, health care practitioners were often unaware of which CAM products their patients were using.¹⁻³ Since the 1993 landmark study by Eisenberg et al² reported a surprisingly high rate (42%) of CAM use in the United States, the issues concerning CAM have received steadily increasing attention. Among the most commonly used CAM products reported in a subsequent survey were herbs and dietary supplements, which accounted for expenditures of more than US \$16.7 billion in 2000.³ This cost is important because it almost exclusively represents out-of-pocket expenses. A 1998 follow-up study by Eisenberg et al⁴ confirmed the continued use of CAM. Since then, there have been a number of attempts to characterize CAM users.

The rationale for CAM use may be that patients are dissatisfied with conventional treatments and the Western medical approach. This theory remains the subject of debate. Regardless, much of the research on CAM use has focused on whether CAM use in chronic medical conditions is the result of dissatisfaction with Western medicine.⁵⁻¹¹

CAM has been used to treat different conditions (eg, arthritis, peripheral neuropathy, dementia, AIDS) with varying success. CAM may significantly impact outcomes in patients being treated for serious medical conditions. Some of the impact is positive, such as the efficacy demonstrated with dietary supplements (eg, glucosamine for arthritis).¹² However, based on the literature identified in a MEDLINE

search (key words: *complementary, alternative, and comorbid conditions*; years: 1966–2001), deleterious effects associated with supplements seem to be much more commonly reported than positive impact. These effects include clinically significant drug-herb interactions and direct adverse effects (AEs) that may substantially decrease the plasma levels of the noncomplementary agent, which could lead to poor outcomes in patients. For example, interactions between St. John's wort and conventional drugs (eg, protease inhibitors, warfarin, immunosuppressants) have been documented in patients with HIV and transplant recipients.^{13–16}

Complicating studies of CAM use is that CAM use fluctuates. Numerous patient factors, including disease state, age, socioeconomic class, and geographic location, can affect the rate of use of different types of CAM.^{17–19} The potentially misleading profile of the most frequent CAM user—affluent, white, female—dominates the literature.^{20,21} The way in which CAM is defined has prevented comparisons among various surveys.^{22,23} In the largest interview survey to date, conducted by the Centers for Disease Control and Prevention,²² interventions such as the Atkins and Zone diets were classified as CAM therapies. In addition, that study, which included >31,000 adults, found that when prayer and megadose vitamins were included as CAM therapies, blacks were more likely to use CAM products than were whites.²² Even the NCCAM admits that the definition of CAM is fluid and contingent on what is considered unconventional.¹

Individual clinicians still do not have a clear picture of the prevalence of CAM use, the types of modalities being used, or factors that influence CAM use in a specific medically indigent (primarily low-income) population or in a patient population with a specific disease. This lack of a consensus can be attributed to a number of factors. Some of the discrepancies in the literature concerning CAM use may be due to data-collection methods. Surveys conducted by telephone or mail may omit various patient groups, including those in low socioeconomic strata, those with low health-literacy levels, and those whose primary language is not English.

The aim of this study was to determine the following: (1) differences in demographic characteristics between users and nonusers of CAM products; (2) which CAM products these patients are using; (3) patients' sources of information concerning CAM products; and (4) whether patients recall being asked about CAM use by their health care providers.

PATIENTS AND METHODS

This pilot study was conducted at the Kansas City Free Health Clinic, Kansas City, Missouri. The University of Missouri–Kansas City Adult Health Sciences Institutional Review Board approved the study protocol.

Survey Distribution

A self-administered survey concerning CAM use was made available to patients at the primary, inner-city location (of 3) of the Kansas City Free Health

Clinic, which consisted of a general medicine free health clinic and a Ryan White Title III HIV–primary care clinic. Surveys were distributed in 3 ways: attached to a clipboard in conjunction with other routine paperwork that was to be completed in the waiting area; placed in the phlebotomy waiting room; and placed in examination rooms. Each survey had a cover page clearly identifying it as voluntary and confidential and directing the patient to the proper placement of the survey if completed on-site (ie, the large green boxes with yellow signs that were placed around the clinic). Alternatively, patients could mail the survey back to the investigators using a prepaid envelope, which was stapled to the back of the survey, in case they preferred to complete the survey after leaving the clinic. Surveys were collected at the end of each day. Patients were not compensated for completing the survey. Five hundred surveys were set out for completion over a 6-month period.

Demographic Characteristics

Demographic characteristics captured were age (not date of birth), sex (at birth), race (self-identified as Caucasian/white, African-American/black, Hispanic/Latino, Asian/Pacific Islander, Native American/Alaskan native, or other), educational level (<8th grade, high school/general education development [GED] diploma, some college/vocational training, college degree, or postgraduate degree), and annual income (family size was not captured) ($\leq$ \$15,000, $>$ \$15,000–\$30,000, $>$ \$30,000–\$45,000, $>$ \$45,000–\$60,000, and $>$ \$60,000). For the purposes of analysis, educational level was coded as <high school diploma/GED, high school diploma/GED, some college/vocational training, and $\geq$ college graduate. Annual income was stratified into 3 levels: $\leq$ \$15,000, $>$ \$15,000–\$30,000, and $>$ \$30,000. Patients were also asked to indicate whether they had ever been diagnosed with any of the 50 diseases listed in the survey.

Data Concerning Complementary and Alternative Medicine Use

After the demographic characteristics section of the survey, there was a yes/no question inquiring about past or present use of any CAM. Patients responding that they had never used any CAM were instructed to discontinue the survey and place it in one of the boxes. Patients indicating past or current CAM use were instructed to complete the remaining items on the survey. These items included sources of information concerning, and support for, CAM use and an extensive list of herbs and dietary supplements (eg, ginseng, St. John's wort, melatonin) (**Appendix**). Patients who had used CAM in the past but were not currently using it were asked why they had discontinued its use.

Statistical Analysis

The questionnaire was designed and interpreted by TeleForm version 8.1 (Cardiff Software Inc., Vista, California). The completed forms were scanned into a database, and the scanned images were interpreted by the TeleForm software, which uses decision rules to interpret the information provided in each

data field. If the recognition rules used by the software indicated uncertainty for a data field, those data were reviewed by a person and entered manually. Analysis of variance (Student *t* test and chi square test) was used for statistical analysis of continuous variables. The chi-square test was used for nominal-scale variables. Data were analyzed using SPSS version 12.2 (SPSS Inc., Chicago, Illinois).

Data Quality Assurance

Quality-assurance trials were conducted to ensure the integrity of the data. Samples of stored data, whether collected by software or entered manually, were compared with the original data forms. The size of the sample was ~10% of all surveys completed. For example, if a survey indicated no CAM use, no further data from that survey could be entered into the database.

RESULTS

Three hundred eleven patients completed ≥ 1 survey question, and their surveys were scanned into the database. Most patients completed the survey while at the clinic. Rarely (<10 surveys), patients returned the survey by mail. No discrepancies were found between data entered into the software when either read by the scanner or reviewed by a person. Of the 311 respondents, 285 (91.6%) provided information regarding CAM use, whereas 26 patients (8.4%) completed the demographic information only. The demographic and clinical characteristics of the patients who completed ≥ 1 question on the survey are shown in **Table I**. This population was primarily Caucasian/white (168/278 patients [60.4%]), generally well educated (>high school diploma/GED, 186/287 [64.8%]), and had a low annual income ($\leq$ \$30,000, 161/191 [84.3%]).

The demographic characteristics of persons using all 3 clinic locations during all hours of operation are given in **Table II**.²⁴ Statistical comparisons were not carried out.

Of the 285 individuals who provided information regarding CAM use, 116 (40.7%) reported ever having used CAM, whereas 169 (59.3%) reported not having used it (**Table III**). Of the 116 who had used CAM, 98 (84.5%) went on to specify whether the use was current (current use, 64 [65.3%]; past use, 34 [34.7%]). Of those who were no longer using CAM, 27 (79.4%) indicated a reason for discontinuation (**Figure 1**). Cost was by far the most common reason (13 patients [48.1%]). Difficulties adhering to the regimen (eg, forgetting to take the medication, 6 patients [22.2%]; complicated regimen, 2 patients [7.4%]) were reported by 8 patients (29.6%). AEs were rarely reported as the reason for discontinuation (1 patient [3.7%]). Neither age, sex, race, nor education level predicted current use of CAM products.

Figure 2 shows patients' mean monthly expenditures on CAM. Of 51 patients who reported monthly expenditures on CAM, 41 (80.4%) reported spending $\leq$ \$20/mo. Expenditures for CAM were not correlated with reported annual income.

Table I. Demographic and clinical characteristics of persons completing ≥ 1 question on the study survey (N = 331).*

Characteristic	No. (%)
Age group, y (n = 292)	
18–25	40 (13.7)
>25–45	153 (52.4)
>45–55	65 (22.3)
>55	34 (11.6)
Sex (n = 291)	
Male	157 (54.0)
Female	134 (46.0)
Race (n = 278)	
Caucasian/White	168 (60.4)
African-American/Black	73 (26.3)
Hispanic/Latino	24 (8.6)
Native American/Native Alaskan	5 (1.8)
Asian/Pacific Islander	4 (1.4)
Other†	4 (1.4)
Educational level (n = 287)	
$\leq$ High school diploma/GED	101 (35.2)
Some college/vocational	102 (35.5)
College graduate/postgraduate	84 (29.3)
Income, US \$/y (n = 191)	
$\leq 15,000$	107 (56.0)
>15,000–30,000	54 (28.3)
>30,000	30 (15.7)
Medical condition (n = 311)	
Nicotine dependence	126 (40.5)
Depression	114 (36.7)
HIV+/AIDS	113 (36.3)
Hypertension	98 (31.5)
Allergies	96 (30.9)
Fatigue	75 (24.1)
Insomnia	58 (18.6)
Hypercholesterolemia	57 (18.3)
Diarrhea	55 (17.7)
Arthritis	42 (13.5)

GED = general education development.

*Twenty-six persons (7.9%) provided only demographic data and did not respond to any other survey questions.

†Includes Middle Eastern and Indian.

Table II. Demographic characteristics of all persons seeking care at all 3 locations of the Kansas City Free Health Clinic and at all hours of operation.*

Characteristic	No. (%)
Age group, y (n = 16,188)	
≤20	1 508 (9.3)
>20–40	7 783 (48.1)
>40	6 897 (42.6)
Sex (n = 16,225)	
Female	10,126 (62.4)
Male	6 099 (37.6)
Race (n = 15,945)	
African-American/Black	8 796 (55.2)
Caucasian/White	5 365 (33.6)
Hispanic/Latino	740 (4.6)
Native American/Native Alaskan	139 (0.9)
Other†	905 (5.7)

*Available clinic demographic data represent all persons served by the clinic at all 3 locations and during all clinic times (9 AM to 9 PM), whereas the demographic data in the study survey represent only those collected on the survey conducted at only one of the clinic's sites and during normal business hours only. Data concerning patients' educational level and income were not collected. Statistical comparisons were not carried out.

†Includes Asian/Pacific Islander, Middle Eastern, and Indian.

The source of information and level of recommendation provided to persons who had ever used a CAM are shown in **Table IV**. In general, patients received the strongest support for CAM use from friends (21/41 patients [51.2%]) and physicians (33/86 [38.4%]), and somewhat less support from pharmacists (19/75 [25.3%]), books (10/40 [25.0%]), and chiropractors (20/85 [23.5%]). Patients in this sample did not often use the Internet to obtain information on CAM products (3/39 [7.7%]). Few sources were reported to have discouraged CAM use, but of those sources, physicians were the most likely to do so (4/86 [4.7%]).

The most commonly used CAM products indicated in the survey are presented in **Table V**. The percentages of time any one specific agent was used were in general low (no one agent was reported to have ever been used by >18.9% of patients), and the total number of CAM products used was 96. The proportion of the sample that reported current use of a product was also small (64/311 patients [20.6%]) and lower than the proportion that had ever used CAM (116 patients [37.3%]). Among the agents that were most commonly being used at the time the patients completed the survey were garlic and chamomile (both, 5 patients [7.1%]), and echinacea and ginseng (both, 3 patients [4.7%]).

DISCUSSION

This in-depth assessment of CAM use in a primarily medically indigent population provides clinically meaningful data. According to the literature, despite efforts to screen for and educate against the use of pharmacokinetically and pharmacodynamically detrimental CAM agents, clinic patients are still using agents known to interfere with and alter the metabolism and/or efficacy of many concomitant medications.^{6,13,14} Because a number of patients surveyed not only had HIV infection but also hepatitis C infection, the use of garlic, kava kava, ginseng, and St. John's wort are especially worrisome due to their influence on drug metabolism and potential for hepatotoxicity.^{10,11,14} The wide variety of products specified by respondents suggests no strong preference for a particular product. The fact that the number of patients currently using CAM was lower than that which had ever used CAM suggests that respondents' use of CAM products tended to be episodic.

One novel aspect of this study was assessment of the source of information about CAM used by primarily medically indigent patients with a history of CAM use. Also captured was whether that source was a positive, neutral, or negative advocate of CAM. Physicians encouraged and discouraged CAM use more than any other providers, a finding deserving investigation in future surveys. The rare use of the Internet as a resource is not completely explained by accessibility, as free computer terminals were available in the clinic waiting area (the location of

Table III. Demographic characteristics of users and nonusers of complementary and alternative medicine as indicated in the study survey (N = 285).^{*†}

Characteristic	Users (n = 116) [‡]	Nonusers (n = 169)
Age, mean (SD), y	39.66 (13.63)	39.75 (11.84)
Sex, no. (%)		
Female	62 (53.4)	95 (56.4)
Male	54 (46.6)	74 (43.8)
Race, no. (%)		
White	74 (63.8)	96 (56.8)
Black	26 (22.4)	53 (31.4)
Other [§]	16 (13.8)	20 (11.8)
Educational level, no. (%)		
≤High school	36 (31.0)	70 (41.4)
≥College	80 (69.0)	99 (58.6)
Income, mean (SD)	1.71 (1.06)	1.77 (1.1)

^{*}No significant between-group differences were found (Student *t* test or chi-square test).

[†]Percentages may not total 100 due to rounding.

[‡]Persons who have used complementary and alternative medicine.

[§]Includes Hispanic/Latino, Asian/Pacific Islander, Native American/Alaskan American, Middle Eastern, and Indian.

^{||}Scale: 1 = ≤\$15,000/y; 2 = >\$15,000/y to \$30,000/y; 3 = >\$30,000/y to \$45,000/y; and 4 = >\$45,000/y.

Figure 1. Reasons for discontinuation of complementary and alternative medicine (N = 27). *Includes unpleasantness (eg, taste, odor).

the surveys). However, the number of surveys on which these conclusions are based is relatively small (39/311 [12.5%]).

Superficially, the findings of this study appear to be similar to those of other surveys showing that CAM users were largely white and relatively well educated.^{2,4} However, closer examination of the data reveals that in persons completing the survey, these 2 populations were not more likely to use CAM

Figure 2. Patients' mean monthly expenditure (US \$) on complementary and alternative medicine.

Table IV. Sources of information concerning, and levels of recommendation of, complementary and alternative medicine (CAM) among persons indicating CAM use on the study survey. Values are no. (%) of users.

Source	No. of Users	Recommended or Suggested Specific Agents	Supported But Did Not Recommend Use	Discussed Use But No Preference	Did Not Discuss Use	Discouraged Use	Not Consulted
Physician	86	33 (38.4)	12 (14.0)	6 (7.0)	13 (15.1)	4 (4.7)	18 (20.9)
Chiropractor	85	20 (23.5)	8 (9.4)	5 (5.9)	8 (9.4)	1 (1.2)	43 (50.6)
Acupuncturist	76	14 (18.4)	2 (2.6)	0 (0.0)	9 (11.8)	0 (0.0)	51 (67.1)
Pharmacist	75	19 (25.3)	9 (12.0)	1 (1.3)	15 (20.0)	2 (2.7)	29 (38.7)
Massage therapist	74	7 (9.5)	6 (8.1)	3 (4.1)	7 (9.5)	1 (1.4)	50 (67.6)
Naturopathic doctor	74	7 (9.5)	2 (2.7)	1 (1.4)	8 (10.8)	1 (1.4)	55 (74.3)
Nurse	73	13 (17.8)	8 (11.0)	7 (9.6)	13 (17.8)	1 (1.4)	31 (42.5)
Advertisement	70	13 (18.6)	6 (8.6)	5 (7.1)	8 (11.4)	2 (2.9)	36 (51.4)
Herbalist	67	7 (10.4)	1 (1.5)	3 (4.5)	4 (6.0)	0 (0.0)	52 (77.6)
Friend	41	21 (51.2)	2 (4.9)	7 (17.1)	1 (2.4)	0 (0.0)	10 (24.4)
Books	40	10 (25.0)	4 (10.0)	5 (12.5)	1 (2.5)	1 (2.5)	19 (47.5)
Internet	39	7 (17.9)	1 (2.6)	3 (7.7)	0 (0.0)	0 (0.0)	28 (71.8)

Table V. Complementary and alternative medicines most commonly used by respondents of the study survey. Values are no. (%) of users.

Agent	Ever Used (n = 116)	Still in Use (n = 64)
Garlic	22 (19.0)	5 (7.8)
Chamomile	16 (13.8)	5 (7.8)
Echinacea	16 (13.8)	3 (4.7)
Ginseng	11 (9.5)	3 (4.7)
Glucosamine	10 (8.6)	3 (4.7)
Folic acid	9 (7.8)	3 (4.7)
Aloe vera	18 (15.5)	2 (3.1)
St. John's wort	15 (12.9)	2 (3.1)
Cranberry	11 (9.5)	2 (3.1)
Ginkgo biloba	11 (9.5)	2 (3.1)
Tea tree oil	10 (8.6)	2 (3.1)
Ephedra	9 (7.8)	2 (3.1)
Valerian	7 (6.0)	2 (3.1)
Kava kava	7 (6.0)	2 (3.1)
Soy	7 (6.0)	2 (3.1)
Green tea	18 (15.5)	1 (1.6)

compared with nonwhites or those with less education. In this study, the demographic characteristics of patients who had never used CAM were not different from those who had. These data suggest that in a primarily medically indigent population, standard demographic data may not predict users or nonusers of CAM products. Accordingly, providers should ask patients directly about their use of CAM.

Cost was the most common reason for discontinuation of CAM use. Over half of the sample surveyed in this study who provided information about their income reported an annual income of $\leq \$15,000$, which may explain why patients elected to discontinue CAM use despite the seemingly small amount spent per month (~60% of patients spent $\leq \$20/\text{mo}$).

Study Limitations

This study had inherent limitations. First, we could not make a comparison with persons choosing not to complete the survey. Consequently, we were unable to predict which primarily medically indigent subpopulation may be more likely to use herbal medicines. This is a common flaw in survey research, especially pertaining to CAM. Second, multiple surveys may have been completed by 1 patient because of the distribution methods used. Third, an inability to understand English is an obvious barrier to study participation. Patients with language and literacy issues are a population with significant CAM use. As such, this patient population was targeted for study during the 2nd International

Conference on Complementary, Alternative and Integrative Medicine Research in 2002.^{22,25–27} However, in our study, a lack of personnel and time, and the possibility of creating methodologic inconsistencies prohibited administration of the survey by clinic practitioners, including certified interpreters. Providing the survey only in English may have prohibited the non-English-speaking population served by the clinic from study participation. However, previous clinic surveys conducted in languages other than English did not generate significant participation. Therefore, the investigators believed they were justified in offering the survey only in English. Finally, data regarding income level should be viewed with caution due to the large number of nonresponders to this questionnaire item (120/311 [38.6%]).

CONCLUSIONS

This survey of patients using an inner-city free health clinic showed a high rate of CAM use, which could significantly impact patient outcome. In our study, potentially hazardous CAM agents were being used, and health care providers were not being asked their opinion of, nor were they inquiring about, CAM use. Providers of care to primarily medically indigent populations should increase vigilance for CAM use in all patients served.

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Appendix. Complementary and alternative medicines listed in the survey.

African wild potato	Evening primrose oil	Maitake mushroom
Aloe (source: juice, capsules)	Feverfew	Marijuana
Alpha-lipoic acid	Folic acid	Melatonin
Amino acid	Garlic	MGN-3
Asparagus	Germanium	Milk thistle
Astragalus	Ginger	Methylsulfonylmethane (MSM)
Beta-sitosterol	Ginkgo biloba	Noni juice
Bilberry	Ginseng (panax, Korean)	Olive leaf
Bitter melon	Glucosamine	Osha root
Black cohosh	Glutamine	Pantothenic acid
Bovine cartilage	Glutathione	PC-SPES
Bovine colostrum	Goldenseal	Peppermint
Buchu	Gossypol	Pygeum
Capsicum	Gotu kola	Reishi mushroom
Cat's claw	Grapeseed extract	St. John's wort
Chamomile	Green tea	SAMe (1,4-butanedisulfonate)
Chaste tree	Guaraná	Sangre de Grado
Chinese cucumber	Guggulipid	Saw palmetto
Chitosan	Hawthorn	Scullcap
Chlorella	Horse chestnut	Selenium
Chondroitin	Inositol	Shark cartilage
Chromium	Juniper berry	Siberian ginseng
Codonopsis	Kava kava	Soy
Coenzyme Q ₁₀	Kombucha tea	Sweet Annie
Cranberry	<i>Lactobacillus acidophilus</i>	Tea tree oil
Colloidal silver	Larch arabinogalactan	Terminalia
Creatine	L-Carnitine	Thymus extract
Da qing ye (wild indigo/Isatis leaf)	Laurelwood	Valerian
Dehydroepiandrosterone (DHEA)	Lecithin	Vanadium
Dong quai	Lentinan	Willow bark
Echinacea	Licorice	Witch hazel
European mistletoe	Lomatium	Yohimbe
	Ma huang	

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