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Identifying Barriers and Facilitators to Scalp Cooling Therapy Through a National Survey of the Awareness, Practice Patterns, and Attitudes of Oncologists

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Identifying Barriers and Facilitators to Scalp Cooling Therapy Through a National Survey of the Awareness, Practice Patterns, and Attitudes of Oncologists

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abstract

PURPOSE Scalp cooling therapy (SCT) is the most effective method to reduce chemotherapy-induced alopecia (CIA), a highly distressing side effect of cancer treatment. Despite data supporting SCT efficacy and safety, SCT use in the United States is not widespread. Oncologists' interactions with scalp cooling were examined to identify facilitators and barriers to SCT implementation.

METHODS A 33-question survey was distributed through the ASCO Research Survey Pool to a nationally representative, random sample of 600 oncology providers. Outcome measures included knowledge of SCT, frequency of initiating conversations about SCT with patients, degree of support, and barriers for SCT. Significance was defined as $P < .001$.

RESULTS Of 155 (25.8%) responding providers, 62% of providers were in favor of SCT always or most of the time, but only 26% reported initiating discussions about SCT always or most of the time. Providers who treat breast cancer ($P \leq .0001$), those who report being very familiar with SCT ($P \leq .0001$), those who report having read SCT literature in the past 2 years ($P \leq .0001$), and those who work at a facility with machine SCT ($P \leq .0001$) were significantly more likely to initiate conversations with patients about SCT. Financial concerns (58%) were the primary reason for not recommending SCT use; efficacy (31%), staff or facility (24%), and safety (15%) concerns were also noted. Although safety concerns have decreased markedly over time, 14% of providers report patients who continue to express these concerns and 17% of providers see safety issues as barriers to supporting SCT.

CONCLUSION Our findings suggest that oncology provider familiarity and experience with SCT lead to increased support for scalp cooling, which may ultimately result in greater availability and utilization of SCT when indicated.

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INTRODUCTION

Chemotherapy-induced alopecia (CIA) is a common and often highly distressing side effect of cancer therapies.[1,2] More than 50% of patients with cancer have cited CIA as the most feared side effect of chemotherapy, and up to 8% of women reported that they would consider declining curative chemotherapy because of the risk of hair loss.[1,2] Different modalities have been used to decrease hair loss during chemotherapy, including topical minoxidil, oral vitamin D3, scalp compression, and most recently, scalp cooling therapy (SCT).[3]

SCT entails wearing subfreezing head caps before, during, and after the chemotherapy infusion. It is postulated to work through two primary mechanisms: (1) cold-induced vasoconstriction that reduces delivery of chemotherapy to the hair follicles and (2) a reduced metabolic rate that slows hair cell turnover and processing of chemotherapy agents.[4] There are two types of scalp cooling equipment: manual capping systems (cold caps) and machine scalp cooling systems (SCSs). Manual cold caps are typically rented by the patient, stored in either special freezers at infusion centers or in dry ice purchased by the patient, and changed approximately every 25 minutes during chemotherapy infusion. Machine SCSs are maintained by the infusion center and deliver a constant coolant to a scalp cap on the patient's head.[3,4]

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Despite guidelines for the appropriate use of SCT in certain malignancies, including US Food and Drug Administration clearance of machine SCS, and a growing body of literature supporting its efficacy and safety, the use of SCT for reducing CIA is not widespread in the United States.[5-16] We hypothesized that both patient- and physician-related barriers exist that contribute to low uptake of SCT. To address the paucity of information about facilitators and barriers in oncology practices to SCT implentation,[8,17,18] we examined oncologists' knowledge, practice patterns, and attitudes regarding scalp cooling.

METHODS

We created a 33-question survey to assess provider interactions with SCT. Questions were adapted from a previous survey that analyzed provider perceptions of fertility preservation.[19] The initial survey was piloted with University of Michigan Hematology Oncology fellows, and questions were refined on the basis of their feedback. Questions focused on demographics; facility SCT availability; and provider knowledge, attitudes, and perceptions of and practice patterns with SCT (Data Supplement, online only).

The survey was distributed through the ASCO Research Survey Pool. An e-mail was sent to a nationally representative, random sample of physicians and advanced practice providers in medical oncology, surgical oncology, gynecology, and urology in February 2020. Reminders were sent every 2-4 weeks until the survey closed in June 2020. Responses were anonymous, and no incentives to complete the survey were offered. This study was designated exempt by the University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences.

Main outcome measures included the distribution of providers' knowledge of SCT, frequency of initiating conversations about SCT with patients, and degree of provider support for its use. The survey also investigated barriers to support of SCT and scalp cooling options offered at respondents' institutions. The majority of analyses were descriptive. Chi-square and Fisher's exact tests were used. Answer categories were combined for analyses to create either four groups (1) all of the time and most of the time, (2) half of the time and some of the time, (3) never, and (4) do not know enough; or three groups (1) strongly agree and somewhat agree, (2) neither agree nor disagree, and (3) somewhat disagree and strongly disagree. Rates of initiating discussions with patients about SCT and being in favor of SCT were compared between the following groups: providers who treat breast cancer versus those who do not, providers who are very familiar with SCT versus those who have only heard of it, providers who have read literature versus those who have not, providers who work at institutions that offer scalp cooling versus those who do not, and providers who strongly or somewhat agree that they have high concern for their patients' hair loss versus those who neither agree nor disagree versus those who somewhat or strongly disagree with that statement. All data were analyzed using SAS v9.4 (Cary, NC). Using Bonferroni multiple comparisons correction, significance was defined conservatively at $P < .001$.

RESULTS

Demographics

Of 600 invited providers from the ASCO research survey pool, 155 responded (25.8%). Provider characteristics are shown in Table 1. The majority of respondents were medical oncologists (118 of 155, 76.1%). Breast cancer was the most commonly treated malignancy (93 of 155, 60.0%). Nearly half of the participants (76 of 155, 49.0%) worked at a university hospital, and 64.5% (100 of 155) of providers worked in an urban setting. The largest proportion of respondents were 45-54 years old. The subset who responded were representative of the full population invited to participate regarding sex, ethnicity, region of practice, specialty, and type of practice.

Provider Knowledge, Practice Patterns, and Attitudes on SCT

Table 2 characterizes provider knowledge, practice patterns, and attitudes about SCT and facility offerings of SCT. Among respondents, 52.9% (82 of 155) reported being very familiar with SCT, 65.8% (100 of 152) reported having read literature on SCT in the past two years, and 63.9% (99 of 155) were interested in learning more about SCT as a means to reduce CIA. Providers interested in learning more about scalp cooling were more likely to be unfamiliar with SCT compared with those who responded that they were not interested in learning more ($P = .0003$). Approximately half of the providers (85 of 155, 54.8%) agreed that the effects of hair loss on their patients were a major concern. Providers on average estimated that their female patients were significantly more interested in options to prevent CIA than their male patients ($P \leq .0001$). Forty-four percent of providers (58 of 132) estimated that > 50% of their female patients were interested in options to prevent CIA, whereas 9% (8 of 94) estimated that > 50% of their male patients were interested.

Sixty-two percent (94 of 152) of providers responded that they were in favor of SCT all or most of the time, and 67.1% (102 of 152) felt that all patients should be offered SCT. Thirty-six percent (55 of 152) of responders thought that "the effort and cost involved [with SCT] were worth the benefit." Seventy-three percent of providers (109 of 151) said that they would support their facility providing SCT. However, only 26.3% (40 of 152) reported initiating discussions about SCT always or most of the time.

For providers who treat breast cancer ($P \leq .0001$), those who reported being very familiar with scalp cooling ($P \leq .0001$), those who reported having read literature in the past 2 years about SCT ($P \leq .0001$), and those who work at a facility with machine SCSs ($P \leq .0001$) were

TABLE 1. Demographic Data of Survey Respondents (N = 155)

Respondents	No. (%)
Provider designation	
Medical oncologist	118 (76.1)
Surgical oncologist	7 (4.5)
Gynecologic oncologist	12 (7.7)
Urologist	1 (0.6)
Nurse practitioner or physician assistant	16 (10.3)
Others	2 (1.3)
Cancer treated (can choose multiple)	
Breast cancer	93 (60.0)
Leukemia	53 (34.2)
Lymphoma	66 (42.6)
Sarcoma	50 (32.3)
CNS tumors	44 (28.4)
GI tumors	74 (47.7)
Lung cancer	74 (47.7)
Gynecologic tumors	62 (40.0)
Testicular cancer	54 (34.8)
Prostate cancer	65 (41.9)
Other genitourinary cancers	59 (38.1)
Others	16 (10.3)
Sex	
Male	78 (50.3)
Female	77 (49.7)
Years of practice after residency or fellowship	
0-5	26 (16.8)
6-10	26 (16.8)
11-20	53 (34.2)
> 20	50 (32.3)
Age, years	
< 34	0 (0.0)
35-44	45 (29.0)
45-54	47 (30.3)
55-64	36 (23.2)
> 64	20 (12.9)
Unknown	7 (4.5)
Practice setting	
University hospital	76 (49.0)
Community or private	88 (56.8)
Practice location	
Urban	100 (64.5)
Suburban	60 (38.7)
Rural	17 (11.0)

significantly more likely to always or most of the time initiate conversations with patients about SCT and less likely to never initiate conversations (Fig 1A). Similarly, providers who report being very familiar with scalp cooling ($P \leq .0001$), who reported reading literature in the past 2 years about SCT ($P \leq .0001$), and who worked at a facility with machine SCSs ($P \leq .0001$) were also significantly more likely to be in favor of SCT always or most of the time (Fig 1B). Providers who reported that they had higher concern for their patients' hair loss were more likely to always or most of the time initiate discussions with their patients ($P = .024$) and be in favor of SCT ($P = .003$) than those who responded that they were indifferent or not concerned with hair loss, although these did not reach significance. There was no statistically significant difference between other demographic information and the rate of initiating conversations with patients about or being in favor of SCT.

Provider-Reported Barriers and Facilitators to SCT

Financial concern for the patient was the most frequently cited reason why providers did not always initiate conversations with patients about SCT (76 of 131, 58.0%) and why providers were not always in favor of SCT (57 of 84, 67.9%; Appendix Table A1, online only). Efficacy was the second most common concern for not initiating the conversation and not being in favor of SCT, reported by 31.3% (41 of 131) and 42.9% (36 of 84) of providers, respectively. Financial concern for the hospital (40 of 78, 51.3%) and staff constraints (39 of 78, 50.0%) were the most frequently reported reasons for providers to be unsupportive of any SCT use at their institution.

When asked about reasons that patients do not use SCT, 69.7% (101 of 145) of providers cited financial concerns, 44.1% (64 of 145) responded that patients are not overly concerned about hair loss, and 13.8% answered that patients do not use SCT because of safety concerns (Appendix Table A1). Seventy-three percent (62 of 85) and 44.7% (38 of 85) of providers answered that "importance of hair preservation to patient" and patient sex, respectively, were the top patient factors that made a provider more likely to initiate a conversation about SCT.

DISCUSSION

To our knowledge, this is the largest and most comprehensive survey of cancer providers in the United States regarding perspectives, attitudes, and practice patterns surrounding SCT. Although the majority of responding providers agreed that patients should be educated about the option of scalp cooling (62%), the reported rate of initiating conversations on SCT was low (26%). Major barriers to initiating conversations included lack of familiarity with the technology and patient-related financial concerns. Institutional concerns including staff or space constraints, facility rules about SCT, and hospital-incurred costs were other barriers to SCT implementation.

Providers more familiar with scalp cooling (eg, direct experience and reading literature) were significantly more

TABLE 2. Physician Knowledge, Practice Patterns, Attitudes, and Perspectives About SCT

Physician Knowledge

Familiarity with SCT[a]	Very familiar 82 (52.9)	Not very familiar 70 (45.2)	Not familiar 3 (1.9)			Total 155
Interested in learning more	Yes 99 (63.9)	No 56 (36.1)				155
Read literature in the past 2 years on SCT	Yes 100 (65.8)	No 52 (34.2)				152
Does SCT increase incidence of scalp metastases	Definitely yes 2 (1.3)	Probably yes 7 (4.6)	Might or might not 36 (23.7)	Probably not 83 (54.6)	Definitely not 24 (15.8)	152

Physician Practice Patterns

	Always	Most of the time	About half of the time	Sometimes	Never	Not applicable[b]	Total
Initiate discussion about SCT	14 (9.2)	26 (17.1)	7 (4.6)	52 (34.2)	46 (30.3)	7 (4.6)	152
Patients raise topic of SCT	0 (0)	2 (1.3)	9 (5.9)	99 (65.1)	42 (27.6)		152
	Always	Most of the time	About half of the time	Sometimes	Never	Do not know	
In favor of SCT	42 (27.6)	52 (34.2)	3 (2.0)	27 (17.8)	2 (1.3)	26 (17.1)	152

Attitudes and Perceptions

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Do not know	Total
Effects of hair loss on my patients are a major concern for me	34 (22.5)	51 (33.8)	36 (23.8)	24 (15.9)	6 (4.0)		151
Effort and cost involved are worth benefit	15 (9.9)	40 (26.5)	39 (25.8)	28 (18.5)	6 (4.0)	23 (15.2)	151
All patients should be educated about SCT	56 (37.1)	46 (30.5)	41 (27.2)	7 (4.6)	1 (0.7)		151

Facility Offerings

Does facility offer SCT	Dry ice 45 (29.6)	Freezers 17 (11.2)	Machine 59 (38.8)	In process 11 (7.2)	Does not allow 22 (14.5)	Do not know 34 (22.4)	Total 152
Support for facility providing SCT	Definitely yes 58 (38.7)	Probably yes 51 (34.0)	Might or might not 19 (12.7)	Probably not 6 (4.0)	Definitely not 2 (1.3)	Do not know 14 (9.3)	150
Satisfaction with SCT at facility	Definitely yes 30 (19.9)	Somewhat 40 (26.5)	Needs improvement 27 (17.9)	Definitely not 18 (11.9)	Do not know 36 (23.8)		151

NOTE. Data are shown as No. (%).

Abbreviation: SCT, scalp cooling therapy.

[a]Complete wording of answer choices to this question on the provider survey included (1) Yes, I am very familiar with these options; (2) Yes, I have heard of these options, but I am not very familiar with them; and (3) No, I am not familiar with these options.

[b]Not applicable means that none of my patients are appropriate candidates for scalp cooling.

likely to initiate SCT conversations with patients and to support SCT use. A 2018 qualitative study on barriers to scalp cooling showed that presenting physicians with clinical data on SCT led to an increase in the frequency of discussions with patients for physicians who are initially reluctant.[8] Lack of provider familiarity has also been cited as a barrier for adoption of other cancer-related procedures, including pretreatment fertility preservation, despite supportive published guidelines.[19] An oncofertility program focused on provider education and multidisciplinary collaboration resulted in a significant increase in fertility preservation discussions.[20] A similar approach focusing on either physician-directed learning or short training programs should be considered to increase uptake of SCT.

Our survey showed that, with an average cost of $1,500-$3,000 US dollars for a course of chemotherapy, financial concerns are primary barriers to adoption of SCT, a finding that is consistent with previous reports.[8,18,21] SCT is not generally covered by medical insurance, so patients must pay out-of-pocket or seek philanthropic support. New long-term support options to facilitate widespread adoption are needed.[18,22]

In contrast to previous studies, which reported that safety of SCT was a concern,[8,18] the majority of providers in this

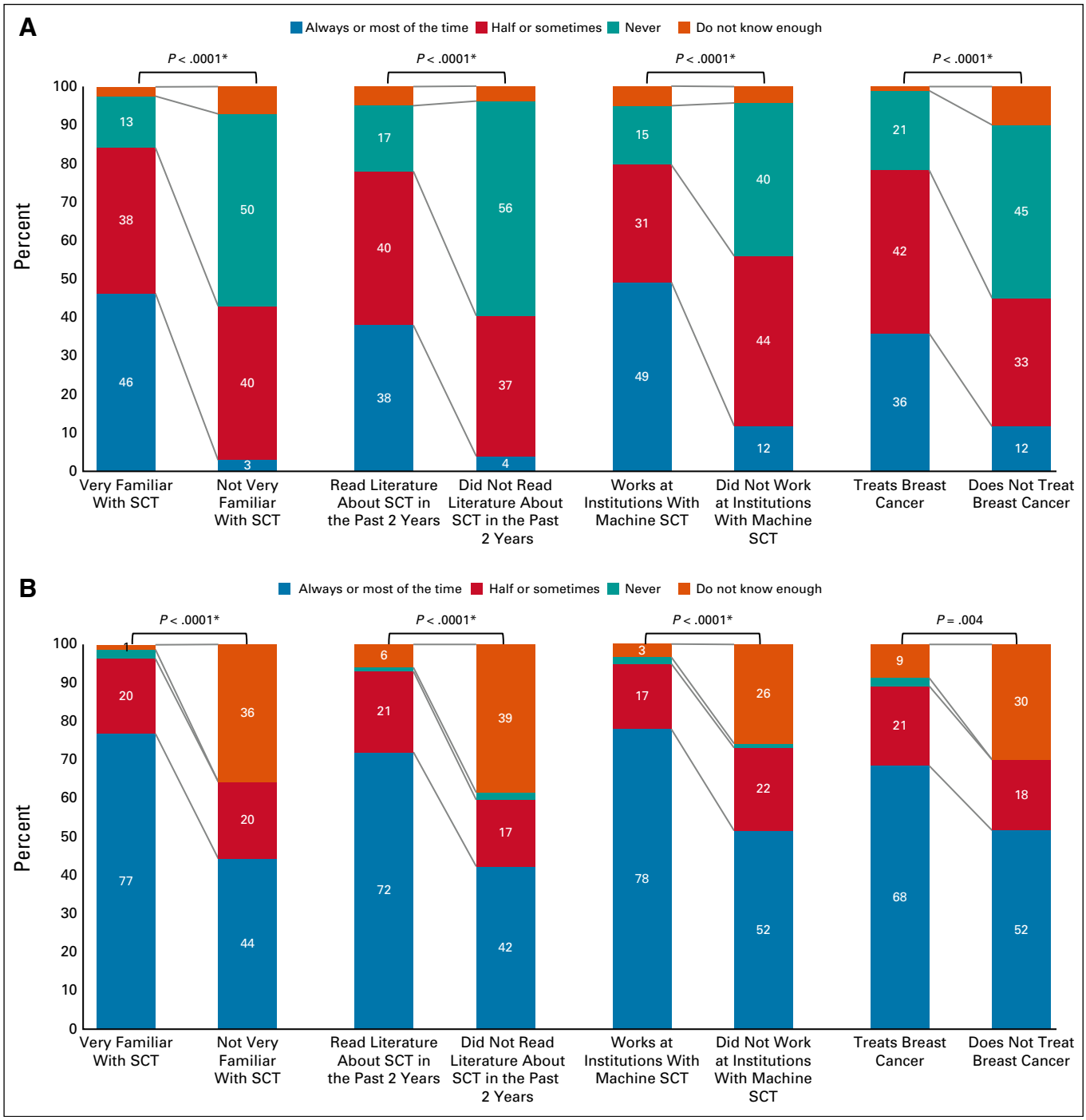

FIG 1. Summary of respondent answers related to frequency of (A) initiating conversations about SCT with patients and (B) being in favor of SCT by answering between the following answer choices: always or most of the time, about half of the time or sometimes, never, or do not know. SCP, scalp cooling therapy.

survey (70%) agreed that SCT probably or definitely does not cause increased incidence of scalp metastases. Only 15% of respondents cited safety concerns as major barriers for initiating discussions with patients about SCT, and only 17% reported not being in favor of SCT because of safety issues. This contrasts previous studies that reported safety concerns as one of, if not, the top reasons to not use or recommend SCT.[8,18] This shift in provider attitudes is consistent with recent literature supporting the safety of SCT.[10,23-28] Multiple studies have reported no cases of scalp metastases with up to 5 years of patient follow-up.[26,28] In addition, a relatively recent systematic review and meta-analysis of

1,959 patients who used SCT and 1,238 who did not use SCT failed to demonstrate a significant difference in the incidence of scalp metastases (0.61% *v* 0.41%; $P = .43$).[10]

Some safety concerns remain, however, and may affect patient use of SCT as 13% of providers reported that their patients do not use SCT because of safety concerns. Of note, the US Food and Drug Administration has not cleared SCT in patients with hematologic malignancies.[29,30] Further research with long-term follow-up is needed to corroborate strong existing safety data of SCT and for provider education and reassurance, especially in patients being treated with curative intent for their malignancies.

Just under half of the providers expressed concern about efficacy of SCT (43%), consistent with previous studies.[8,18] Importantly, recent studies have demonstrated successful hair preservation with SCT, generally defined as < 50% hair loss and not requiring a wig.[2,10,12,31,32] In a recent systematic review, scalp cooling significantly reduced the relative risk of alopecia by 43% ($P < .00001$).[33] In a randomized control trial of machine scalp cooling, half of the patients with breast cancer who used SCT had successful hair preservation versus none of the women in the control group.[9] Similar results were found in a prospective cohort study with two thirds with successful results versus none in the control group.[31] Providers must also be reminded that 100% hair loss prevention is not needed as up to 50% loss of scalp hair is generally not aesthetically appreciated.[9]

In our study, providers more familiar with scalp cooling (eg, literature and experience) were more likely to be in favor of SCT and willing to discuss it with patients ostensibly because of the positive results in the literature or favorable experience with scalp cooling. It is important to recognize that efficacy varies on the basis of multiple factors.[34] For example, patients treated at institutions with more experience with SCT have less alopecia, whereas those treated with anthracyclines have more alopecia.[31] Future research should be directed at modifiable factors that affect the effectiveness of SCT, such as chemotherapy regimen, capping technique, and manual versus machine SCSs.[5,35]

Providers at institutions where machine SCT is established were found to be more likely to offer scalp cooling (49% *v* 12%), but many providers in our survey cited financial concerns (51.3%), in addition to staff and space constraints (50.0%), as barriers to SCT adoption. Nursing constraints and change to workflows were found to be a significant barrier in previous studies.[8,18] Some institutions have published details about the development of their scalp cooling workflows, which combine efforts of providers and nurses to treat CIA, providing successful strategies for SCT adoption for other institutions.[36,37]

Multiple studies have chronicled the adverse psychosocial effects of CIA on both men and women, with reports of at least 50% of patients defining hair loss as one of their most feared chemotherapy-related side effects.[6,38-43] We found that more than 40% of surveyed providers stated that patients do not use SCT because of not being overly concerned about hair loss and may initiate these conversations principally in women and patients with breast cancer. These findings highlight the need to expand SCT to a broader population and to not limit discussions of SCT by patient characteristics, including sex or cancer type.

Our study was limited by a 25% response rate and may be due to the timing of distribution of the survey at the onset of the COVID-19 pandemic. Respondents were generally representative of the total survey population.

In conclusion, to our knowledge, this is the largest study to address provider interaction, knowledge, and perspectives with scalp cooling within the United States. Although the majority of surveyed providers reported feeling favorably toward scalp cooling, rates of initiating conversations about SCT with patients were low (24%). Our findings suggest the need for physician education and exposure to SCT, through either physician-directed learning or short training programs, and clear institutional guidelines for the use of SCT. Although further research on efficacy and safety and continuous efforts to expand insurance coverage will be imperative for SCT to become widespread, physicians and allied health professionals should be educated on SCT, with the goal of increasing rates of patient education and access to this important treatment option.

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Provision of study materials or patients: Jacqueline S. Jeruss
Collection and assembly of data: Madison Novice, Taylor Novice, Monika L. Burness
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REFERENCES

1. McGarvey EL, Baum LD, Pinkerton RC, et al: Psychological sequelae and alopecia among women with cancer. Cancer Pract. 9:283-289, 2001
2. Hershman DL: Scalp cooling to prevent chemotherapy-induced alopecia: The time has come. JAMA 317:587-588, 2017
3. Freites-Martinez A, Shapiro J, van den Hurk C, et al: Hair disorders in cancer survivors. J Am Acad Dermatol 80:1199-1213, 2019
4. Novice T, Novice M, Shapiro J, et al: Chemotherapy-induced alopecia-A potentially preventable side effect with scalp cooling. J Am Acad Dermatol 82:e57-e59, 2020
5. Nangia J, Wang T, Osborne C, et al: Effect of a scalp cooling device on alopecia in women undergoing chemotherapy for breast cancer: The SCALP randomized clinical trial. JAMA 317:596-605, 2017
6. Nangia J: Quality of life matters: It is time to integrate scalp cooling in routine clinical practice. JCO Oncol Pract 14:157-158, 2018
7. Ohsumi S, Kiyoto S, Takahashi M, et al: Scalp cooling for hair loss prevention in female Japanese breast cancer patients receiving (neo)adjuvant chemotherapy. Support Care Cancer 29:437-443, 2020
8. Shaw JM, O'Brien J, Chua S, et al: Barriers and enablers to implementing scalp cooling in Australia: A qualitative study of health professionals' attitudes to and experience with scalp cooling. Support Care Cancer 26:305-312, 2018
9. Rugo HS, Klein P, Melin SA, et al: Association between use of a scalp cooling device and alopecia after chemotherapy for breast cancer. JAMA 317:606-614, 2017
10. Rugo HS, Melin SA, Voigt J: Scalp cooling with adjuvant/neoadjuvant chemotherapy for breast cancer and the risk of scalp metastases: Systematic review and meta-analysis. Breast Cancer Res Treat 163:199-205, 2017
11. Shah VV, Wikramanayake TC, DelCanto GM, et al: Scalp hypothermia as a preventative measure for chemotherapy-induced alopecia: A review of controlled clinical trials. J Eur Acad Dermatol Venereol 32:720-734, 2018
12. Rice BA, Ver Hoeve ES, DeLuca AN, et al: Registry study to assess hair loss prevention with the Penguin Cold Cap in breast cancer patients receiving chemotherapy. Breast Cancer Res Treat 167:117-122, 2018
13. Mustoe MM, Lee CM, Melisko ME, et al: The DigniCap Scalp Cooling System and its use in the treatment of chemotherapy-induced alopecia. Future Oncol 14: 2461-2469, 2018
14. Marks DH, Okhovat JP, Hagigeorges D, et al: The effect of scalp cooling on CIA-related quality of life in breast cancer patients: A systematic review. Breast Cancer Res Treat 175:267-276, 2019
15. Marks DH, Qureshi A, Friedman A: Evaluation of prevention interventions for taxane-induced dermatologic adverse events: A systematic review. JAMA Dermatol 154:1465-1472, 2018
16. Smetanay K, Junio P, Feißt M, et al: COOLHAIR: A prospective randomized trial to investigate the efficacy and tolerability of scalp cooling in patients undergoing (neo)adjuvant chemotherapy for early breast cancer. Breast Cancer Res Treat 173:135-143, 2019
17. Komen MMC, van den Hurk CJG, Nortier JWR, et al: Patient-reported outcome assessment and objective evaluation of chemotherapy-induced alopecia. Eur J Oncol Nurs 33:49-55, 2018
18. Peerbooms M, van den Hurk CJ, Breed WP: Familiarity, opinions, experiences and knowledge about scalp cooling: A Dutch survey among breast cancer patients and oncological professionals. Asia Pac J Oncol Nurs 2:35-41, 2015
19. Köhler TS, Kondapalli LA, Shah A, et al: Results from the survey for preservation of adolescent reproduction (SPARE) study: Gender disparity in delivery of fertility preservation message to adolescents with cancer. J Assist Reprod Genet 28:269-277, 2011
20. Vu JV, Llarena NC, Estevez SL, et al: Oncofertility program implementation increases access to fertility preservation options and assisted reproductive procedures for breast cancer patients. J Surg Oncol 115:116-121, 2017
21. Shaw J, Baylock B, O'Reilly A, et al: Scalp cooling: A qualitative study to assess the perceptions and experiences of Australian patients with breast cancer. Support Care Cancer 24:3813-3820, 2016
22. van den Hurk CJ, van den Akker-van Marle ME, Breed WP, et al: Cost-effectiveness analysis of scalp cooling to reduce chemotherapy-induced alopecia. Acta Oncol 53:80-87, 2014
23. van den Hurk CJG, van de Poll-Franse LV, Breed WPM, et al: Scalp cooling to prevent alopecia after chemotherapy can be considered safe in patients with breast cancer. Breast 22:1001-1004, 2013
24. Grevelman EG, Breed WPM: Prevention of chemotherapy-induced hair loss by scalp cooling. Ann Oncol 16:352-358, 2005
25. Lemieux J, Amireault C, Provencher L, et al: Incidence of scalp metastases in breast cancer: A retrospective cohort study in women who were offered scalp cooling. Breast Cancer Res Treat 118:547-552, 2009
26. van den Hurk CJ, Peerbooms M, van de Poll-Franse LV, et al: Scalp cooling for hair preservation and associated characteristics in 1411 chemotherapy patients—Results of the Dutch Scalp Cooling Registry. Acta Oncol 51:497-504, 2012
27. Ross M, Fischer-Cartlidge E: Scalp cooling: A literature review of efficacy, safety, and tolerability for chemotherapy-induced alopecia. Clin J Oncol Nurs 21: 226-233, 2017
28. Rugo HS, Klein P, Hurvitz SA, et al: Long-term safety follow-up of patients with early stage breast cancer treated with scalp cooling on the Dignitana scalp cooling trial. 2018 San Antonio Breast Cancer Symposium, San Antonio, TX, December 4-8, 2018
29. Forsberg SA: Scalp cooling therapy and cytotoxic treatment. Lancet 357:1134, 2001

30. Witman G, Cadman E, Chen M: Misuse of scalp hypothermia. Cancer Treat Rep 65:507-508, 1981
31. Nangia J, Wang T, Osborne C, et al: Effect of a scalp cooling device on alopecia inwomen undergoing chemotherapy for breast cancer: The SCALP randomized clinical trial. JAMA 317:596-605, 2017
32. West HJ: Do the data on scalp cooling for patients with breast cancer warrant broad adoption? JAMA Oncol 3:1130-1131, 2017
33. Rugo HS, Voigt J: Scalp hypothermia for preventing alopecia during chemotherapy. A systematic review and meta-analysis of randomized controlled trials. Clin Breast Cancer 18:19-28, 2018
34. Komen MMC, Smorenburg CH, van den Hurk CJG, et al: Factors influencing the effectiveness of scalp cooling in the prevention of chemotherapy-induced alopecia. Oncologist 18:885-891, 2013
35. Komen MMC, Smorenburg CH, Nortier JWR, et al: Results of scalp cooling during anthracycline containing chemotherapy depend on scalp skin temperature. Breast 30:105-110, 2016
36. Peterson LL, Lustberg M, Tolaney SM, et al: Integration of physician and nursing professional efforts to deliver supportive scalp cooling care to oncology patients at risk for alopecia. Oncol Ther 8:325-332, 2020
37. Fischer-Cartlidge E, Ross M, Hernández K, et al: Scalp cooling: Implementation of a program at a multisite organization. Clin J Oncol Nurs 22:534-541, 2018
38. Lemenager M, Lecomte S, Bonneterre ME, et al: Effectiveness of cold cap in the prevention of docetaxel-induced alopecia. Eur J Cancer 33:297-300, 1997
39. Tierney AJ: Preventing chemotherapy-induced alopecia in cancer patients: Is scalp cooling worthwhile? J Adv Nurs 12:303-310, 1987
40. Hussein AM: Chemotherapy-induced alopecia: New developments. South Med J 86:489-496, 1993
41. Pickard-Holley S: The symptom experience of alopecia. Semin Oncol Nurs 11:235-238, 1995
42. Freites-Martinez A, Chan D, Sibaud V, et al: Assessment of quality of life and treatment outcomes of patients with persistent postchemotherapy alopecia. JAMA Dermatol 155:724-728, 2019
43. Hilton S, Hunt K, Emslie C, et al: Have men been overlooked? A comparison of young men and women's experiences of chemotherapy-induced alopecia. Psychooncology 17:577-583, 2008

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

Identifying Barriers and Facilitators to Scalp Cooling Therapy Through a National Survey of the Awareness, Practice Patterns, and Attitudes of Oncologists

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APPENDIX

TABLE A1. Provider-Reported Reasons for (1) Not Initiating Discussions With Patients About SCT or (2) Not Being in Favor of SCT and Provider Perspectives on Why Patients Do Not Use SCT

Provider-Reported Reasons for Not Recommending SCT

Providers Who Either Do Not Initiate Discussions on SCT or Who Are Not in Favor of SCT Cited the Following Reasons[a]	Providers Not Initiating Discussions (%)[b]	Providers Not Being in Favor (%)[c]
Financial concern for patients	58	67.9
Efficacy concerns	31.3	42.9
Staff constraints	23.7	28.6
Facility does not offer	23.7	19
Do not remember to bring it up	22.1	—
Do not know enough/limited knowledge	20.6	10.7
Safety concerns	15.3	16.7
Too much time to discuss in clinic	11.5	13.1
Do not believe patient interested	11.5	23.8
Space constraints	10.7	10.7
Side effects	9.2	17.9
Too much time in infusion room	9.2	3.6
Other	7.6	2.4
Financial concern for hospital	—	7.1

Providers Perspectives on Why Patients Do Not Use SCT

Providers Cited the Following Reasons That Patients Do Not Use SCT	Provider Responses, No. (%)
Financial concerns	101 (69.7)
Not overly concerned about hair loss	64 (44.1)
Unaware of option	61 (42.1)
Too much effort needed	54 (37.2)
Efficacy concerns	40 (27.6)
Safety concerns	20 (13.8)
Fear of side effects	17 (11.7)
Do not know enough to answer	17 (11.7)
Other	4 (2.8)

Abbreviation: SCT, scalp cooling therapy.

[a]Providers were asked to rank the top 3 reasons they do not initiate discussions with patients about SCT and are not in favor of SCT.

[b]All providers except those who answered that they always initiate discussions with patients about SCT were asked this question (n = 131).

[c]All providers except those who answered that they always are in favor of SCT were asked this question (n = 84).