ANCILLARY REVIEWS

Which ancillary reviews do I need and when do I need them? Refer to HRP-309 for more information about these ancillary reviews.			
Select yes or no	**Does your study…**	*If yes…*	***Impact on IRB Review***
☐ **Yes** ☑ **No**	Include Gillette resources, staff or locations	*Gillette Scientific review and Gillette Research Administration approval is required. Contact: research@gillettechildrens.com*	**Required prior to IRB submission**
☑ **Yes** ☐ **No**	Involve Epic, or Fairview patients, staff, locations, or resources?	*The Fairview ancillary review will be assigned to your study by IRB staff Contact:* ancillaryreview@Fairview.org	**Approval must be received prior to IRB committee/ designated review.** **Consider seeking approval prior to IRB submission.**
☑ **Yes** ☐ **No**	Include evaluation of drugs, devices, biologics, tobacco, or dietary supplements or data subject to FDA inspection?	*The regulatory ancillary review will be assigned to your study by IRB staff Contact: medreg@umn.edu* *See: https://policy.umn.edu/research/indide*	
☑ **Yes** ☐ **No**	Require Scientific Review? Not sure? See guidance on next page.	*Documentation of scientific merit must be provided. Contact: hrpp@umn.edu*	
☐ **Yes** ☑ **No**	Relate to cancer patients, cancer treatments, cancer screening/prevention, or tobacco?	*Complete the CPRC application process. Contact: ccprc@umn.edu*	
☐ **Yes** ☑ **No**	Include the use of radiation? (x-ray imaging, radiopharmaceuticals, external beam or brachytherapy)	*Complete the AURPC Human Use Application and follow instructions on the form for submission to the AURPC committee. Contact: barmstro@umn.edu*	**Approval from these committees must be received prior to IRB approval;**
☐ **Yes** ☑ **No**	Use the Center for Magnetic Resonance Research (CMRR) as a study location?	*Complete the CMRR pre-IRB ancillary review Contact: ande2445@umn.edu*	

☐ **Yes** ☑ **No**	Include the use of recombinant or synthetic nucleic acids, toxins, or infectious agents?	*Complete the IBC application via eprotocol.umn.edu* *Contact:*	**These groups each have their own application process.**
☐ **Yes** ☑ **No**	Include the use of human fetal tissue, human embryos, or embryonic stem cells?	*Contact OBAO for submission instructions and guidance*	
☑ **Yes** ☐ **No**	Include PHI or are you requesting a HIPAA waiver?	*If yes, HIPCO will conduct a review of this protocol.* *Contact: privacy@umn.edu*	
☐ **Yes** ☑ **No**	Use data from the Information Exchange (IE)?	*The Information Exchange ancillary review will be assigned to your study by IRB staff* *Contact: ics@umn.edu*	**Approval must be received prior to IRB approval.** **These groups do not have a separate application process but additional information from the study team may be required.**
☐ **Yes** ☑ **No**	Use the Biorepository and Laboratory Services to collect tissue for research?	*The BLS ancillary review will be assigned to your study by IRB staff.* *Contact: cdrifka@umn.edu*	
☐ **Yes** ☑ **No**	Have a PI or study team member with a conflict of interest?	*The CoI ancillary review will be assigned to your study by IRB staff* *Contact: becca002@umn.edu*	
☑ **Yes** ☐ **No**	Need to be registered on clinicaltrials.gov?	*If you select "No" in ETHOS, the clinicaltrials.gov ancillary review will be assigned to your study by IRB staff* *Contact: kmmccorm@umn.edu*	
☑ **Yes** ☐ **No**	Require registration in OnCore?	*If you select "No" or "I Don't Know" in ETHOS, the OnCore ancillary review will be assigned to your study by IRB staff* *Contact: oncore@umn.edu*	**Does not affect IRB approval.**

Protocol Title	Effect of mechanical intervention on the scalp microbiome: setting the stage for the future management of cicatricial alopecias
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Scientific Assessment	I believe Scientific Assessment is required.
IND/IDE # (if applicable)	N/A (non-significant risk IDE)
IND/IDE Holder	N/A
Investigational Drug Services # (if applicable)	N/A
Version Number/Date:	Version 5 05 August 2023

PROTOCOL COVER PAGE

REVISION HISTORY

Revision #	Version Date	Summary of Changes	Consent Change?
1	May 15 2022	Change in number of treatments/duration of study	Yes
2	September 13 2022	Addition of HairMetrix to secondary endpoint and study design	Yes
3	January 4, 2023	Edit to HairMetrix to only occur before treatment and edited the frequency of control swabs to room air	Yes
4	March 2, 2023	-Changed age of enrollment eligibility to 18-50 years old - Administrative updates -On page 11-updated sentence to indicate the treatment is over a two-week period. -Updated the section 5.3 page 12 that participation will last approximately 2.5 weeks -Removed the words "before treatment" on page 13	Yes
5	August 5, 2023	-Changed total enrollment to “n=20-25”, pg 10 - Updated total enrollment to state “A total of up to 25 subjects” on pg 10 -Deleted 20 males and 20 females on pg 10	No

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ABBREVIATIONS/DEFINITIONS

Abbreviation	Word or Phrase	Definition
LPP	Lichen planopilaris	An inflammatory condition that may cause scarring hair loss.
AA	Alopecia areata	An autoimmune disease resulting in patches of hair loss.

1.0 Objectives

1.1 Purpose: The objective of this study is to assess the effect of standardized scalp care, specifically mechanical cleansing with the Venus Glow™ Device and water, on the scalp microbiome. This study also seeks to characterize the microbiome of the normal, healthy scalp, thereby providing a baseline for which the scalp affected by hair and scalp disease can be compared.

2.0 Background

2.1 Significance of Research Question/Purpose:

Perturbations in the epidermal ecosystem which interacts with the immune system have been shown to be associated with skin diseases including rosacea, folliculitis, seborrheic dermatitis/dandruff, and alopecia areata (AA)[1]. In the cicatricial alopecias such as folliculitis decalvans and lichen planopilaris (LPP), S. aureus is commonly isolated and treated.[1] Why this bacteria is so commonly expressed in the cicatricial alopecias is not known. Furthermore, scalp hygiene practices, such as washing or shampooing, which may be influenced by an array of factors and are highly variable across populations,[2,3] may play a role. There is little known about the effects of hygiene practices on the scalp microbiome, and much less about the microbiome of the scalp affected by cicatricial alopecias; thus, this information is needed to better understand the role of microorganisms, including S. aureus, in these conditions.

The development and introduction of new devices, such as the Venus Glow™, provide a unique opportunity to fill a knowledge gap and discern the effects of scalp care and treatments on scalp health and scalp flora. This study will employ the Venus Glow™device, which is a FDA Class 1 device used for cosmetic treatments[4] and is found mostly in medical spas and salons. It is marketed to rejuvenate skin by “cleaning pores of daily debris.”[4] Treatment involves use of a lactic acid solution[5] and a serum provided by the manufacturer. In this study, only water will be delivered; no serums will be added.

Through the investigational use of the Venus Glow™ device, we propose that the technique of mechanical cleansing will change the scalp microbiome composition and will result in a clinically healthier scalp.

2.2 Preliminary Data:

Preliminary studies within our institution include a scalp swab assessment of participants with scarring alopecia compared to controls. The study thus far has found a predominance of Staphylococcus, Propionibacterium, and Auritidibacter in the frontal region of healthy control scalps. Additionally, one sample collected from a participant with dandruff had a greater proportion of Staphylococcus and a smaller proportion of Propionibacterium compared to samples, consistent with what has been reported in the literature (12,13,15,17).

2.3 Existing Literature:

The scalp hosts a unique microbiome compared to other skin surfaces, with decreased acidity and decreased exposure to ultraviolet light.[6-8] Many studies have assessed the scalp flora via swabs. The results of which are discussed below:

Author	Subjects	Methods of Analysis	Microbe Selection Process	Results
Shibagaki et al.[9]	Healthy Japanese women- ages 21-37 (n=) v. over 60 (n=)	Scalp Swab	Species with ≥0.1% presence in >50% of the all subjects in at least one skin site	Increased Proteobacteria, Klebsiella. and Prevotella in older group.
Grice et al. [10]	Healthy humans (n=10)	Occipital Scalp Swab	19 bacterial phyla were detected, but most fall within the four phyla discussed	Propionibacterium species and Staphylococci species were the most predominant.
Xu et al. [11]	Volunteers with varying dandruff levels (n=59)	Scalp Swab	11 bacterial phyla, 123 genera, and 378 operational taxonomic units of fungi were detected	Propionibacterium and Staphylococcus were the most predominant bacteria in both groups. Decreased Propionibacterium, increased Staphylococcus, decreased M. globosa in the dandruff group.
Soares et al.[12]	Dandruff (n=13) v. healthy controls (n=11)	Vertex Scalp Swab	274 fungal OTUs were detected, plant sequences were removed. 612 bacterial OTUs were detected, chloroplasts and mitochondria sequences were removed	Propionibacterium,Staphylococcus, and Corynebacterium were most predominant in both groups. M. restricta was the most predominant fungi in both groups. Increased Pseudomonas, Leptotrichia, Micrococcus, Selenomonas, Erwinia, Enhydrobacter, Bartonellaceae, Candida, Aspergillus, and Filobasidium in dandruff group. Decreased Propionibacterium in dandruff group.
Clavaud et al. [13]	Dandruff v. healthy controls	Scalp Swab	DNA from 3 major species was extracted.	Propionibacteria and Staphylococci were the most predominant bacteria in both groups. M. restricta was the most predominant fungi in both groups. Decreased P. acnes, increased M. restricta, and increased S. epidermidis in dandruff group.
Wang et al. [14]	Dandruff (n=32) v. non-dandruff controls (n=9)	Scalp Swab	2,195 bacterial and 1,818 fungal sequences were detected	P. acnes and S. epidermidis dominated both groups. M. restricta was the most predominant fungi in both groups. Increased M. restricta and Staphylococcus spp. in dandruff group. No significant difference in Propionibacterium between groups.
Grimshaw et al. [15]	Dandruff (n=32) v. healthy controls (n=9)	Scalp was exfoliated and resulting scale in saline was analyzed	Discussed the 8 predominant taxa from 273 fungal OTUs. Discuss the most predominant taxa from 300 OTUs	Malassezia was the most predominant species in both groups and higher in the dandruff group. Staphylococcus and Cutibacterium were the most predominant bacteria in both groups. Non-significant decrease in Cutibacterium and increase in Staphylococcus in dandruff groups.
Saxena et al. [16]	Dandruff (n=70) v. healthy controls (n=70)	Vertex Scalp Swab	Species with ≥1% abundance in ≥20 samples were analyzed	M. globose and M. restricta were the most predominant fungi in both groups. No difference in M. restricta abundance between groups. Increased M. globose in the healthy scalp. Increased S. epidermidis in dandruff group. No difference in P. acnes abundance between groups.
Park et al. [17]	Dandruff (n=28) and seborrheic dermatitis Korean subjects (n=29) v. Korean controls (n=45)	Vertex Scalp Swab	56 bacterial OTUs that had abundance >0.05% and 39 fungi species with abundance >0.01% were analyzed	Increased Staphylococcus sp. and M. restricta in dandruff and seborrheic dermatitis groups. Increased Propionibacterium sp. and M. globosa in control group.
Lin et al. [18]	Dandruff (n=28) and erythemal scalp Chinese Han subjects (n=29) v. Chinese Han controls (n=53)	Scalp swab from lesion and healthy sites	The 8 most predominant fungi and bacteria genera were discussed.	No difference in P. acnes abundance between groups. All groups had the same predominant microbes including: Malassezia, Aspergillus, Exophiala, Aureobacsidium, Phaeoacremonium, Lecanicillium, Cyberlindnera, Debaryomyces, Staphylococcus, Sediminibacterium, Corynebacterium, Pseudomonas, Phyllobacterium, Bardyrhizobium, Sphingomonas, and Bosea.
Juhasz et al.[19]	AA (n=25) v. healthy controls (n=25)	Scalp Swap	Not discussed.	Decreased Firmicutes and increased Actinobacteria in AA groups.
Constantinou et al.[20]	Frontal fibrosing alopecia (FFA) (n=6) v. lichen planopilaris (LPP) (n=6) v	Scalp Swap	Five most abundant genera across samples were analyzed.	Increased Staphylococcus in disease lesions in all alopecia participants. Increase in Staphylococcus in non-lesional sites in participants with LPP.

	alopecia areata circumscripta (AAc) (n=7)			
Pinto et al.[21]	AA (n=15) v. healthy controls (n=15)	Scalp Swab	Not discussed.	Increased P. acnes, decreased S. epidermidis in AA group. No difference in S. aureus abundance between groups.

No studies have assessed the use of the Venus Glow™ device on the scalp and no studies have assessed the different scalp regions, such as the vertex, temporal and postauricular scalp, systematically.

3.0 Study Endpoints/Events/Outcomes

3.1 Primary Endpoint/Event/Outcome: The primary endpoint will be scalp swab assessment of scalp microbiome composition before and after Venus Glow™ treatment. Our hypothesis is that there will be a decrease in microbe burden on the scalp with treatment.

3.2 Secondary Endpoint(s)/Event(s)/Outcome(s): Secondary endpoint includes scalp swab assessment of scalp microbiome composition after participants have returned to their normal hair and scalp care routine, providing information about the normal, healthy scalp microbiome. In addition, photography comparisons with the HairMetrix device will be taken before each treatment at the swab sites for each participant.

4.0 Study Intervention(s)/Investigational Agent(s)

4.1 Description:

Venus Glow™device is an FDA Class 1 device used for cosmetic treatments[4]. The device utilizes hydradermabrasion to clean and remove debris from the skin. Hydradermabrasion is a form of microdermabrasion that utilizes a crystal-free exfoliation tip with water and often a method for suction.[22,23] To complete such treatment, the Venus Glow™ device employs a hand-piece functional with a rotating tip, two 70-micron jets, and a vacuum.[4] The rotating tip and jets allow for dispersion of a selected solution to clean and the vacuum allows for removal of debris via the suction.

Our off-label design utilizes the Venus Glow™device, but with device setting adjustments optimized for scalp health. The device will be set to the weakest injection setting (setting 1) given we are not injecting serums and intend to wet only the scalp, not the hair fibers. The suction will be set to the maximum setting (setting 3) to allow for ample removal of debris. No sensitivity or adverse events such as bruising have been seen when using this setting on the scalp. Finally, the rotation will be set to the medium setting (setting 2) to allow for a moderate cleansing without unnecessary exfoliation.

We believe this device may be a non-significant risk device as it:

- is not an implant and does not present a potential for serious risk to the health, safety, or welfare of a participant;
- is not purported and will not be represented to be for use supporting or sustaining human life and presents a potential for serious risk to the health, safety, or welfare of a participant;
- will not be used of substantial importance in diagnosing, curing, mitigating, or treating disease, or otherwise preventing impairment of human health and does not present a potential for serious risk to the health, safety, or welfare of a participant; or
- does not otherwise pose a potential for serious risk to the health, safety, or welfare of a participant.

4.2 Drug/Device Handling:

The off-label Venus Glow™device will be stored in the University of Minnesota Department of Dermatology in the Phillips-Wangensteen building, Maple Grove clinic or the Clinics and Surgery Center. Additional supplies will be stored separately in the respective clinics.

While wearing gloves, the device and treatment room will be wiped down with disinfectant wipes after each use. The handpiece tips will be changed in between each subject visit. Gloves and masks will be utilized by the study staff that is administering the treatment. Participants will be asked to follow the current CDC guidelines regarding COVID-19.

4.3 Biosafety: N/A - The research does not involve a recombinant or synthetic nucleic acid, human gene transfer, biologically derived toxin, or an infectious agent.

4.4 Stem Cells: N/A - The research does not involve stem cells.

4.5 Fetal Tissue: N/A - The research does not involve fetal tissue.

5.0 Procedures Involved

5.1 Study Design: This is a research study utilizing scalp swabs to evaluate the efficacy of the Venus Glow™device treatment on the scalp microbiome. Healthy participants who have not been diagnosed with scalp or hair disease will be followed over a period of 2 weeks to assess their scalp microbiome and see how well the investigational device works on decreasing the microbe burden of the scalp.

Total Enrollment (N= 20-25): A total of up to 25 subjects between the ages of 18-50 years with different self-reported ethnicities and evaluated skin and hair types will be enrolled in the study.

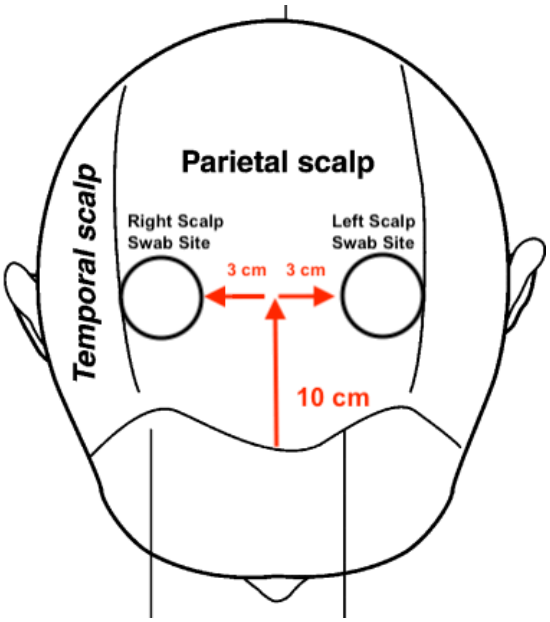
5.2 Study Procedures:

Subjects will come for Venus Glow™ treatments, two treatments over a two week period. At the first visit they will complete an initial questionnaire regarding current scalp care practices, skin type, and hair type. An initial baseline scalp swab and HairMetrix photography in the two swab sites will be taken at the beginning of this visit. Treatment with the Venus Glow™ device will also occur. To treat, the scalp will be divided into four quadrants. In the right two quadrants, the hair will be sectioned into both vertical and horizontal parts about 1 cm apart. The tip of the device will then be dragged in zig zag movements along vertical part widths, then along horizontal part widths, and then once more along the vertical part widths, to account for a total of three passes. The left side will not be treated with the device.

Swab samples will be collected from the untreated right mid-frontal scalp, treated right mid-frontal scalp, and the untreated left mid-frontal scalp and will be collected at the first baseline and concurrent treatment session, second treatment session and 3-6 days after the last treatment when participants have returned to their usual cleansing routine. In addition, HairMetrix photography will be taken in the two swab sites (right scalp swab site and left scalp swab site) before treatment at the first baseline and concurrent treatment session, the second treatment session and the follow-up session 3-6 days after the last treatment.

All swabs will be taken 10 cm from the nasal bridge and 3 cm from the midline (see Photo 1 below). Subjects will avoid shampooing, chemical, or heat treatments, but will be able to wet their hair during the study.

Photo 1: Swab Sites (25)



To collect samples, sterile cotton swabs will be soaked for at least 30s in collection buffer (0.15 M NaCl, 0.1% Tween-20) and rubbed on the scalp surface in the following locations: right and left mid-frontal scalp, covering an area of 4 cm^2 per scalp section. Swabs will be stored in a collection buffer amended to a final concentration of 10% glycerol and stored at -80 °C prior to shipping/processing. If necessary, samples will be shipped to the microbiology lab on dry ice. Control swabs exposed to just room air and the buffer will be collected throughout the course of the study when treating participants. DNA will be extracted from the swab tips using the Daisy PowerSoil Pro DNA isolation kit (QIAGEN). Bacteria/archaea will be characterized by amplification and sequencing using the 515F/806R primer set targeting the V4 hypervariable region of the 16S rRNA gene. [25] Fungal communities will be characterized by sequencing of the ITS1 region using the ITS1f/ITS2 primer set. [26] Paired-end sequencing will be carried out at a read length of 300 bp on the Illumina MiSeq platform by the UMN Genomics Center. Bioinformatics and computational analyses of microbiome data will be done by the Staley lab using mothur software and raw data will be made publicly available on the Sequence Read Archive.

5.3 Study Duration: The total duration of participant participation will be approximately 2.5 weeks. The duration anticipated to enroll all study participants is expected to be approximately 5 months. It is anticipated that it will take just over 1 years to complete all study procedures including data analysis.

Week 0 - Baseline/First Treatment	● Consenting and enrollment ● Demographic information ● Medical history ● Subjects to complete a questionnaire about current scalp care practices, skin type, and hair type, including: o Number of days prior to last shampooing o Names of products that they have used on their hair/scalp since their last shampoo (oils, sprays, gels, etc.) o Average frequency of shampooing per week o Average frequency of hair styling with hot tools per week o Hair type I-VIII (Loussouarn et al.)[24] o Fitzpatrick Skin Type

	● Swab of right and left mid-frontal scalp prior to treatment ● HairMetrix photography before treatment ● Right side of scalp treatment with the Venus Glow™ device and brush (left side will not be treated) ● Swab of right mid-frontal scalp post- treatment
Beginning of Week 1 - Second Treatment **(+/- 3 days)**	● Participant report of adverse events ● Swab of right and left mid-frontal scalp prior to treatment ● HairMetrix photography before treatment ● Right side of scalp treatment with the Venus Glow™ device and brush (left side will not be treated) ● Swab of right mid-frontal scalp post-treatment
End of Week 1- Final Visit (+/3 days)	● Participant report of adverse events ● Swab of right and left mid-frontal scalp ● HairMetrix photography

All participants will have a final 3-6 day visit and swab collection after their treatments have been completed and they have returned to their typical hair and scalp care routine, described above. All visits including this final visit will be compensated at $10 per visit. If a patient happens to miss a study visit, one of the study staff will reach out to the patient via a phone call.

5.4 Use of radiation*:* N/A

5.5 Use of Center for Magnetic Resonance Research*:* N/A

6.0 Data and Specimen Banking

6.1 Storage and Access: Deidentified data may be banked in the University's Box Secure Storage or REDCap database.

6.2 Data: Deidentified data may be banked for future analyses and compilation into larger datasets, such as clinical and demographic information and clinical assessments and rating scales.

6.3 Release/Sharing: Deidentified data from this study may be used in the future to compile larger datasets from multiple studies with similar methodologies and populations to conduct additional analyses and publications. Should the investigators pursue this, future studies seeking to compile data acquired from this protocol will obtain IRB approval before doing so. In the event that this occurs, only investigators or study personnel listed in an IRB-approved protocol pertaining to the data compilation will have access to this data.

7.0 Sharing of Results with Participants

7.1 The individual results of the study will not be shared with participants or others. Deidentified data will be compiled, analyzed, and summarized for journal publication and/or poster presentations.

7.2 Sharing of genetic testing:

7.2.1 Disclosure of results: N/A

7.2.2 If returning results to participants: N/A

- Aggregate or individual results: N/A
- Laboratory results: N/A
- Plan for return of results to participants: N/A
- Types of results to be returned to participants: N/A

7.2.3 Future analysis of genotypes: N/A

8.0 Study Population

8.1 Inclusion Criteria:

Participants must meet all of the inclusion criteria.

- All individuals between 18-35 years of age
- Ability to understand study procedures and to comply with them

8.2 Exclusion Criteria:

All candidates meeting any of the exclusion criteria at baseline will be excluded from participation in this study.

- Non-English speakers
- Exclusion related to pregnancy, lactation, or has plans to become pregnant over the course of the study
    - Based on self-report from the participant
- Current scalp or hair disease diagnosis
- Using oral or topical antimicrobial medication 4 weeks prior to their baseline visit or in the duration of the study

- Current clinical condition that, in the opinion of the site investigator, would interfere with adherence to study requirements
- Inability or unwillingness of individual to give written informed consent

8.3 Screening: Adult healthy subjects in the Department of Dermatology at the M Health Fairview Clinics and Surgery Center or M Health Fairview Maple Grove Clinic will be approached to determine their interest in the study. Dermatologists, Dr. Hordinsky and Dr. Farah, will identify healthy subjects that may benefit from scalp cleansing. The study will be introduced after the healthy subjects' clinical visit and contact information will be provided if they are interested. Participants may self-refer if they become aware of the study through recruitment materials or word of mouth referrals. Individuals who respond to the recruitment materials will be taken through a phone screening questionnaire. Interested healthy subjects will be screened for eligibility using the inclusion and exclusion criteria and written informed consent will be obtained from eligible healthy subjects at the baseline visit. Following the screening process, the healthy subjects will be seen for their baseline/first treatment visit (see section 5.3 for an outline of study procedures that occur at the baseline visit).

9.0 Vulnerable Populations

9.1 Vulnerable Populations:

Population / Group	Identify whether any of the following populations will be targeted, included (not necessarily targeted) or excluded from participation in the study.
Children	No
Pregnant women/fetuses/neonates	No
Prisoners	No
Adults lacking capacity to consent and/or adults with diminished capacity to consent, including, but not limited to, those with acute medical conditions, psychiatric disorders, neurologic disorders, developmental disorders, and behavioral disorders	No
Non-English speakers	No
Those unable to read (illiterate)	No
Employees of the researcher	No

Students of the researcher	No
Undervalued or disenfranchised social group	Included / not targeted
Active members of the military (service members), DoD personnel (including civilian employees)	Included
Individual or group that is approached for participation in research during a stressful situation such as emergency room setting, childbirth (labor), etc.	No
Individual or group that is disadvantaged in the distribution of social goods and services such as income, housing, or healthcare.	Included / not targeted
Individual or group with a serious health condition for which there are no satisfactory standard treatments.	No
Individual or group with a fear of negative consequences for not participating in the research (e.g. institutionalization, deportation, disclosure of stigmatizing behavior).	No
Any other circumstance/dynamic that could increase vulnerability to coercion or exploitation that might influence consent to research or decision to continue in research.	No

9.2 Additional Safeguards: Undervalued or disadvantaged people may not be known, research staff will not be asking a direct question about socioeconomic status to potential participants. We do not anticipate the vulnerability for this group to be increased by participating in this study. Additionally, members of the military may not be known, as research staff will not be asking a direct question about military status to potential participants. We do not anticipate the vulnerability for this group to be increased by participating in this study.

10.0 Local Number of Participants

10.1 Local Number of Participants to be Consented: 40 participants are needed for data analysis and we anticipate needing to consent 55 people to reach that goal.

11.0 Local Recruitment Methods

11.1 Recruitment Process:

If a potential participant is identified at the Department of Dermatology at the University of Minnesota Clinics and Surgery Center or Maple Grove Clinic, the attending provider will briefly introduce the study and ask if a member of the study team may come in to talk with them. If the potential participant agrees, the investigator and/or study coordinator will describe the study in detail, answer any questions the potential participant may have and describe next steps. All investigators and study staff will be trained in privacy and confidentiality requirements for conducting research at Fairview facilities. Patients who have opted out of research in their medical record will only be approached by clinical staff.

Additionally, public recruitment will be done via the use of flyers in buildings on the University of Minnesota campus. These buildings could include academic buildings, student residences, athletic facilities, and student dining/recreation buildings. The study will also be posted on the University of Minnesota Department of Dermatology website: https://med.umn.edu/dermatology/research/clinical. Additionally, we will attach a PDF of the flyer to email to be sent out to the Dermatology Interest Group listserv.

Participants may self-refer if they become aware of the study through these recruitment materials or word of mouth referrals. Individuals who respond to the recruitment materials will be taken through a phone screening questionnaire. If following the phone screen the potential participant is eligible and interested, the study coordinator will schedule the screening study visit.

11.2 Identification of Potential Participants: Potential participants will be identified by the investigators from among patients under their care. Investigators will make the initial contact with potential participants at the time of their clinic visit.

11.3 Recruitment Materials: Public recruitment will be done via the use of flyers that include the study and contact information. Tabs will be available at the bottom of the flyer to take if interested. Flyers will be posted in buildings on the University of Minnesota campus. These buildings could include the Malcolm Moos Health Sciences Tower, Phillips-Wangensteen building, Molecular and Cellular Biology building, and Jackson Hall.

11.4 Payment:

- Subjects will be given compensation for engagement in the study. Total compensation for subjects is $30.00. Subjects will receive $10.00 per

visit including the first baseline and concurrent treatment visit, one additional treatment visits, and one follow up visit.

- Parking will be provided for all subjects who elect to participate at the Department of Dermatology at the University of Minnesota in the Phillips-Wangensteen building or Clinics and Surgery Center . The study will be completed at the University of Minnesota Department of Dermatology in the LCRU space, Maple Grove clinic or the Clinics and Surgery Center. Parking vouchers for the Oak Street patient visit parking ramp will be provided to participants at each in-office visit. Parking at the Maple Grove clinic is free of charge and thus parking vouchers will not be provided if the participants elects to participate at that location.

12.0 Withdrawal of Participants

12.1 Withdrawal Circumstances: Participation in this study is voluntary. Participants are free to withdraw at any time. Investigators may also withdraw participants from the study if participants fail to adhere to the study protocol requirements. Possible withdrawal circumstances may also include: the participant no longer meets the inclusion/exclusion criteria, the participant is lost to follow-up, or it is in the participant's best interest to withdraw from the study, as determined by the PI.

12.2 Withdrawal Procedures: Data collection of withdrawn participants will be collected up to the point of withdrawal. Data from withdrawn participants will not be included in the analysis.

12.3 Termination Procedures: This study may be suspended or prematurely terminated if there is sufficient reasonable cause. If the study is prematurely terminated or suspended, the PI will promptly inform the IRB and will provide the reason(s) for the termination or suspension. The study team will also notify the participants of the study termination. Data will not be used after termination. Circumstances that may warrant termination or suspension include, but are not limited to:

- Determination of unexpected, significant, or unacceptable risk to participants
- Demonstration of efficacy that would warrant stopping
- Insufficient compliance to protocol requirements
- Data that are not sufficiently complete and/or evaluable
- Determination of futility

13.0 Risks to Participants

13.1 Foreseeable Risks:

Potential risks include scalp irritation, redness, headache, itching, tingling, and abrasion of the skin.

Privacy/Confidentiality Risks: There is always the slight risk of loss of confidentiality of the medical record information and associated privacy of the participants. These risks will be minimized by storing data securely as per UMN institutional guidelines and limiting access to information contained within the registry to trained UMN investigators and members of the research team.

13.2 Reproduction Risks: N/A

13.3 Risks to Others: N/A

14.0 Potential Benefits to Participants

14.1 Potential Benefits: Participants may experience an improvement in scale and/or oiliness of the scalp. Additionally, society and investigators will benefit from the knowledge gained.

15.0 Statistical Considerations

15.1 Data Analysis Plan:
The primary analysis will evaluate whether there is a difference in the baseline and 2-week change in the relative abundance of pre-specified bacteria (approx. 20) between the device-treated portion of the scalp and the non-treated portion. In order to account for the within-subject correlation, mixed-effects models will be performed. As a secondary analysis, we will compare the HairMetrix images and analyze how various demographic and clinical factors such as sex and skin type impact the effect of the device.

15.2 Power Analysis:
Limited data are available to inform a power/sample size estimate. However, if there is a total of 38 subjects (40 initial, with 5% dropout), then we will have pre- and post-treatment data for 38 device-treated, and 38 non-treated portions of the scalp. Even when ignoring the within-subject correlation, this will allow us to have 80% power to detect an effect size of 0.7 (difference in the baseline to week 1 change between groups), assuming an alpha of 0.05.

15.3 Data Integrity:

- The study monitor will ensure that the investigation is conducted according to protocol design and regulatory requirements. The monitor will provide ongoing monitoring of data validity and regulatory issues (e.g., eligibility determinations, consent form process, serious adverse event reporting, IRB actions, disclosures of conflict of interest).
- Study records will be monitored at regular intervals by the study monitor. The monitor will perform source data verification and as such must be given access to the subject's primary source documentation, such as paper or electronic medical records such as consent to participate in the study, visit dates, demographic information, adverse events, concomitant medications, drug accountability, etc. that support data entries in the CRF.

- The PI will be provided copies of monitoring reports shortly after the monitoring visit. Findings will be noted and followed up in the subsequent monitoring visit.

16.0 Health Information and Privacy Compliance

16.1 Select which of the following is applicable to your research:

☐ My research does not require access to individual health information and therefore assert HIPAA does not apply.

☑ I am requesting that all research participants sign a HIPCO approved HIPAA Disclosure Authorization to participate in the research (either the standalone form or the combined consent and HIPAA Authorization).

☐ I am requesting the IRB to approve a Waiver or an alteration of research participant authorization to participate in the research.

☐ An external IRB (e.g. Advarra) is reviewing and we are requesting use of the authorization language embedded in the template consent form in lieu of the U of M stand-alone HIPAA Authorization. Note: External IRB must be serving as the privacy board for this option.

16.2 Identify the source of Private Health Information you will be using for your research (Check all that apply)

☐ I will use the Informatics Consulting Services (ICS) available through CTSI (also referred to as the University's Information Exchange (IE) or data shelter) to pull records for me

☑ I will collect information directly from research participants.

☐ I will use University services to access and retrieve records from the Bone Marrow Transplant (BMPT) database, also known as the HSCT (Hematopoietic Stem Cell Transplant) database.

☐ I will pull records directly from EPIC.

☐ I will retrieve record directly from axiUm / MiPACS

☐ I will receive data from the Center for Medicare/Medicaid Services

☐ I will receive a limited data set from another institution

☐ Other.

16.3 Explain how you will ensure that only records of patients who have agreed to have their information used for research will be reviewed.

Patients who have opted out of research in their medical record only be approached by clinical staff to assess interest in participation in the study.

16.4 Approximate number of records required for review: N/A

16.5 Please describe how you will communicate with research participants during the course of this research. Check all applicable boxes

☐ This research involves record review only. There will be no communication with research participants.

☑ Communication with research participants will take place in the course of treatment, through MyChart, or other similar forms of communication used with patients receiving treatment.

☑ Communication with research participants will take place outside of treatment settings. If this box is selected, please describe the type of communication and how it will be received by participants.

Participants may self-refer if they become aware of the study through these recruitment materials or word of mouth referrals. Individuals who respond to the recruitment materials will be taken through a phone screening questionnaire.

16.6 Explain how the research team has legitimate access to patients/potential participants:

If a potential participant is identified at the Department of Dermatology at the University of Minnesota Clinics and Surgery Center or Maple Grove Clinic, the attending provider will briefly introduce the study and ask if a member of the study team may come in to talk with them. If the potential participant agrees, the investigator and/or study coordinator will describe the study in detail, answer any questions the potential participant may have and describe next steps. All investigators and study staff will be trained in privacy and confidentiality requirements for conducting research at Fairview facilities.

16.7 Location(s) of storage, sharing and analysis of research data, including any links to research data (check all that apply).

☐ In the data shelter of the Information Exchange (IE)

☐ Store ☐ Analyze ☐ Share

☐ In the Bone Marrow Transplant (BMT) database, also known as the HSCT (Hematopoietic Stem Cell Transplant) Database

☐ Store ☐ Analyze ☐ Share

☑ In REDCap (recap.ahc.umn.edu)

☑ Store ☑ Analyze ☑ Share

☐ In Qualtrics (qualtrics.umn.edu)

☐ Store ☐ Analyze ☐ Share

☐ In OnCore (oncore.umn.edu)

☐ Store ☐ Analyze ☐ Share

☑ In the University's Box Secure Storage (box.umn.edu)

☑ Store ☑ Analyze ☑ Share

☐ In an AHC-IS supported server. Provide folder path, location of server and IT Support Contact:

☐ Store ☐ Analyze ☐ Share

☐ In an AHC-IS supported desktop or laptop. Provide UMN device numbers of all devices:

☐ Store ☐ Analyze ☐ Share

☐ Other. Describe:

Indicate if data will be collected, downloaded, accessed, shared or stored using a server, desktop, laptop, external drive or mobile device (including a tablet computer such as an iPad or a smartform (iPhone or Android devices) that you have not already identified in the preceding questions

☐I will use a server not previously listed to collect/download research data

☐I will use a desktop or laptop not previously listed

☐I will use an external hard drive or USB drive ("flash" or "thumb" drives) not previously listed

☐I will use a mobile device such as an tablet or smartphone not previously listed

16.8 Consultants. Vendors. Third Parties: N/A

16.9 Links to identifiable data: All data will be identified with an identification code unique to the participant. Study staff will keep the mapping of identification code to the identity of the participant on an encrypted password protected computer stored separately from the data in the University's Box Secure Storage. That same identification code will be used for data-entry into the REDCap database. Any internal data reports will use only these codes and will not use any identifiable information. Any external data reports, abstracts, publications, presentations, etc. will present de-identified, grouped, and/or aggregate data. Any reports to the University of Minnesota IRB (such as Adverse Event reporting and annual renewal reports) will be kept confidential; they will not include participant- identifiable information; only the participant's identification code will be used.

16.10 Sharing of Data with Research Team Members: Only IRB-approved members of the study team will have access to the data. Data will be shared through REDCap or the University's Box Secure Storage.

16.11 Storage and Disposal of Paper Documents: This study will not require the use of paper documents. All documents will be stored electronically via the REDCap database or the University's Box Secure Storage. Consent forms will be signed and stored in REDCap.

17.0 Confidentiality

17.1 Data Security: Only research staff will have access to subject information. All participant data will be stored in locked cabinets and electronically in REDCap. Passwords will be required to access data in REDCap. Study data will be available only to select staff that need access to the information to conduct their research duties. To minimize the volume of documents containing identifying information, all study documents or data will contain a unique participant ID that will be used when possible. No copy of the consent form or other research study information will be placed in the participant's medical, employment, or educational records.

18.0 Provisions to Monitor the Data to Ensure the Safety of Participants

18.1 Data Integrity Monitoring:

Independent monitoring of the clinical study for clinical protocol and IND/IDE application compliance will be conducted by the University of Minnesota's Clinical and Translational Science Institute (CTSI) clinical trial monitoring service. The CTSI monitors will confirm that study activities are in compliance with the approved protocol and applicable regulatory authorities (FDA, IRB, local and State regulations). Frequency of monitoring visits will occur after IRB approval and as soon as possible after the first subject is enrolled, during the study data collection phase and after the last subject has completed his/her participation in the study. Monitoring visits will be performed annually, at a minimum. This monitoring schedule may be revised based on the following considerations:

- Accrual rate
- Protocol deviations or non-compliance with regulatory authorities
- Magnitude of data corrections required
- Study stage (e.g. start-up or follow-up)
- Complexity of the trial
- Request (IRB, Investigator, other etc.)

The sponsor-investigator will permit direct access to the study monitors and appropriate regulatory authorities to the study data and to the corresponding source data and documents to verify the accuracy of these data.

Primary responsibilities of the monitors will include verifying the following:

- Investigator qualifications
- Facilities and equipment
- Storage, dispensing and disposition of investigational products
- Protocol compliance
- Informed consent
- Training and delegation of authority
- Subject eligibility
- Recruitment, screening and enrollment
- Verification of data and data clarification
- Adverse event reporting
- FDA correspondence
- Deviations

18.2 Data Safety Monitoring:

The investigators will ask participants about adverse events at each of the follow-up study visits. Participants are encouraged to call in if they experience any adverse events prior to that time. Study progress and safety will be reviewed monthly (and more frequently if needed) by the PI. The PI will review patient safety data monthly and determine if adverse event rates are consistent with pre-study assumptions, or if there is an increased rate of risk or new information that should be shared with enrolled participants. If a serious adverse event (SAE), Unanticipated Problem Involving Risks to Subjects or Others (UPIRTSO), or other event causing risk to the research subjects occurs, the clinical research team will notify the PI immediately. The PI will assure the study is conducted in accordance with the investigator's agreement, the investigational plan, the IDE and other applicable FDA regulations, and conditions of approval imposed by the reviewing IRB.

All AEs will be assessed by the study investigators using a protocol defined grading system.

- Mild – Events require minimal or no treatment and do not interfere with the participant's daily activities.
- Moderate – Events result in a low level of inconvenience or concern with the therapeutic measures. Moderate events may cause some interference with functioning.
- Serious – Events interrupt a participant's usual daily activity and may require systemic drug therapy or other treatment. Severe events are usually potentially life-threatening or incapacitating.
- Related – The AE is known to occur with the study intervention, there is a reasonable possibility that the study intervention caused the AE, or

there is a temporal relationship between the study intervention and event. Reasonable possibility means that there is evidence to suggest a causal relationship between the study intervention and the AE.

- Not Related – There is not a reasonable possibility that the administration of the study intervention caused the event, there is no temporal relationship between the study intervention and event onset, or an alternate etiology has been established.

The Principal Investigator will be responsible for determining whether an adverse event (AE) is expected or unexpected. An AE will be considered unexpected if the nature, severity, or frequency of the event is not consistent with the risk information previously described for the study intervention.

19.0 Provisions to Protect the Privacy Interests of Participants

19.1 Protecting Privacy: The study consent form will describe in detail any intrusive, uncomfortable, or unfamiliar questions, procedures, or interactions with researchers or study personnel that the participant will be asked to complete. Furthermore, the study consent form will communicate that it is the participant's right to opt-out of any study procedures for the study or withdraw from the study at any time and this information will be reiterated and revisited periodically throughout the study in advance of intrusive, uncomfortable, or unfamiliar questions, procedures, or interactions. Participants will not be compelled or pressured to provide information or specimens or study data that they do not wish to provide.

19.2 Access to Participants*:* Participants will be fully informed of the ways in which their data will/may be used during the informed consent process. The research team has been trained in conducting these conversations and the participants are also assessed for their understanding of consent prior to signing the consent form or initiating any study procedures.

20.0 Compensation for Research-Related Injury

20.1 Compensation for Research-Related Injury: If this research activity results in an injury, treatment will be available, including first aid, emergency treatment and follow-up care as needed. Care for such injuries will be billed in the ordinary manner, to the participant or his/her insurance company.

20.2 Contract Language: N/A

21.0 Consent Process

21.1 Consent Process (when consent will be obtained):

The consent process will take place in a private room at the University of Minnesota Department of Dermatology in the Phillips-Wangensteen building, Maple Grove clinic or the Clinics and Surgery Center. If a patient meets the

criteria via the phone screening, we will consent the patient at their baseline visit in person. Informed consent is a process that is initiated prior to the individual agreeing to participate in the study and continues throughout the individual's study participation. Extensive discussion of risks and possible benefits of participation will be provided to the participants. REDCap eConsent forms will be approved by the IRB, and the participant will be asked to read and review the document using a tablet provided by the investigator. The investigator will explain the research study to the participant and answer any questions that may arise. All participants will receive a verbal explanation in terms suited to their comprehension of the purposes, procedures, and potential risks of the study and of their rights as research participants. Participants will have the opportunity to carefully review the written consent form and ask questions prior to signing. The participant will be asked to sign the informed consent document or electronically sign using the HIPAA compliant REDCap eConsent, prior to any procedures being done specifically for the study. The participants may withdraw consent at any time throughout the course of the trial. A copy of the informed consent document will be given to the participants for their records. The rights and welfare of the participants will be protected by emphasizing to them that the quality of their medical care will not be adversely affected if they decline to participate in this study.

21.2 Waiver or Alteration of Consent Process (when consent will not be obtained): N/A

21.3 Waiver of Written/Signed Documentation of Consent (when written/signed consent will not be obtained): We are requesting a waiver of written/signed documentation of consent for the screening portion of this study. A short phone script will be read to the participant before any screening questions are asked. The participant will need to provide verbal consent to answering these screening questions before proceeding. See attached for the screening phone script.

21.4 Non-English Speaking Participants: N/A

21.5 Participants Who Are Not Yet Adults (infants, children, teenagers under 18 years of age): N/A

21.6 Cognitively Impaired Adults, or adults with fluctuating or diminished capacity to consent: N/A

21.7 Adults Unable to Consent: N/A

22.0 Setting

22.1 Research Sites: Participants will be recruited from the University of Minnesota Maple Grove clinic and the University of Minnesota Clinics and Surgery Center. All study procedures will take place at the University of Minnesota Department of Dermatology in the Phillips-Wangensteen building, Maple Grove clinic, or the University of Minnesota Clinics and Surgery Center.

22.2 International Research: N/A

23.0 Multi-Site Research: N/A

24.0 Coordinating Center Research

24.1 Role: N/A
24.2 Responsibilities: N/A
24.3 Oversight: N/A
24.4 Collection and Management of Data: N/A

25.0 Resources Available

25.1 Resources Available:

- The dermatology research interns/fellows will be participating in study procedures with the support of the PI. No students will be involved in this study.
- The number of recruitable participants is appropriate for the time period of three years. Forty participants are needed for data analysis and we anticipate needing to consent 55 people to reach that goal.
- One to two hours of PI/study staff time will be dedicated to each visit.
- Facilities for this study include the M Health Fairview Maple Grove Clinic, M Health Fairview Clinics and Surgery Center, and the clinical research room in the University of Minnesota Department of Dermatology.
- There are no anticipated severe consequences of the treatment, however, two of the sites are in the clinical setting and one is connected to the UMMC Hospital.
- The PI or Co-PI will be present for all treatments, in addition to dedicated dermatology research staff.

26.0 Citations

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