STUDY TITLE: The Impact of Buoy on Hydration Status of Active Men and Women

IRB: STUDY22090018

NCT05768789

Study Protocol: 06 FEB 2024

Basic Study Information

1. * **Title of study:**
The Impact of Buoy on Hydration Status of Active Men and Women

2. * **Short title:**
Buoy Electrolyte Study

3. * **Brief description:**
Buoy is an all-natural, organic, FDA compliant dietary electrolyte supplement that can be dissolved in 8-12oz water (or other liquid) and provide electrolytes in servings of 1/3 teaspoon. This study will evaluate Buoy in hydrating active adults.

4. * **What kind of study is this?**
Single-site study

5. * **Will an external IRB act as the IRB of record for this study?**
○ Yes ● **No**

6. * **Local principal investigator:**
Harikesh Subramanian
* **Is this your first submission, as PI, to the Pitt IRB?**
● **Yes** ○ No

7. * **Does the local principal investigator have a financial interest related to this research?**
○ Yes ● **No**

8. **Attach the protocol:**
   - Sponsor/Multicenter/Investigator-initiated protocol
   - Coordinating Center supplement
   - Emergency Use Consent/ Protocol/ FDA Form 3926
   - Exempt Application form

Document Category Date Modified Document History
There are no items to display

View: Pitt SF: Funding Sources (not integrated with Grants)

Funding Sources

1. * **Indicate all sources of support:**
   Internal funding

2. * **Provide the source of your Internal funding:**
   Department of Anesthesiology and Perioperative Medicine

Study Team Members

1. * **Identify each person involved in the design, conduct, or reporting of the research:**

Name	Roles	Department/School	Affiliation	Involved in Consent	Qualifications	Financial Interest
Cary Boyd	Co-investigator	U of Pgh | School of Medicine | Medicine	UPP/UPMC staff	yes	Dr. Cary Boyd, MD, PhD is a physician scientist that is specialized in internal medicine and nephrology, more specifically renal-electrolyte. Dr. Boy... view all	no
Kimberly Howard-Quijano	Co-investigator	U of Pgh | School of Medicine | Anesthesiology	UPP/UPMC staff	yes	Dr. Kimberly Howard, MD is a cardiac anesthesiologist, Director of Translation Research, and the Associate Vice Chair for Research in the Department ... view all	no
Amy Monroe	Key Personnel / Support Staff	U of Pgh | School of Medicine | Anesthesiology	UPP/UPMC staff	no	Amy Monroe is the clinical trials manager in the Department of Anesthesiology and Perioperative Medicine and will be the administrative support for t... view all	no
Evan Ray	Co-investigator	U of Pgh | School of Medicine | Medicine	UPP/UPMC staff	yes	Dr. Evan Ray, MD, PhD is a physician specialized in internal medicine and nephrology. Dr. Ray has published extensively, and therefore, will advise t... view all	no

Name	Roles	Department/School	Affiliation	Involved in Consent	Qualifications	Financial Interest
Kathirvel Subramaniam	Co-investigator	U of Pgh | School of Medicine | Anesthesiology	UPP/UPMC staff	yes	Dr. Kathirvel Subramaniam, MD, is a clinical cardiac anesthesiologist in the Department of Anesthesiology and Perioperative Medicine. He is also a wi... view all	no
Harikesh Subramanian	Principal Investigator	Other	UPP/UPMC staff	yes	Dr. Harikesh Subramanian, MBBS is a cardiothoracic and liver transplantation anesthesiologist in the Department of Anesthesiology and Perioperative M... view all	no
Nicole Zharichenko	Key Personnel / Support Staff	Other	UPP/UPMC staff	no	Nicole Zharichenko is the ERAS research manager in the Department of Anesthesiology and Perioperative Medicine.	no

2. External team member information: (Address all study team members in item 1. above and leave this section blank)

Name	Description
There are no items to display	

3. Have you, Harikesh Subramanian**, verified that all members of the research team have the appropriate expertise, credentials, training, and if applicable, child clearances and/or hospital privileges to perform those research procedures that are their responsibility as outlined in the IRB application?**

* ● **Yes** ○ No

Study Scope

Check all that apply

1. * Will this study actively recruit any of the following populations?

- [ ] Adults with impaired decision-making capacity
- [ ] Children (under the applicable law of the jurisdiction in which the research will be conducted (<18 years for PA))
- [ ] Children who are Wards of the State
- [ ] Employees of the University of Pittsburgh/UPMC
- [ ] Medical Students of University of Pittsburgh as primary research group
- [x] Students of the University of Pittsburgh
- [ ] Neonates of uncertain viability
- [ ] Non-viable neonates
- [ ] Non-English speakers
- [ ] Nursing home patients in the state of Pennsylvania
- [ ] Pregnant women
- [ ] Prisoners
- [ ] N/A

2. * Will any Waivers be requested?

- [ ] Waiver/Alteration of Consent
- [x] Waiver to Document Consent
- [ ] Waiver/Alteration of HIPAA
- [ ] Exception from consent for emergency research
- [ ] N/A

3. * Will this study involve any of the following?

- [x] Specimens
- [ ] Honest Broker to provide data/specimens
- [ ] Return of Results to Subjects or Others
- [ ] Fetal tissue
- [ ] N/A

4. * Will Protected Health Information be collected?

- [ ] Pitt medical records
- [x] UPMC medical records
- [ ] Other Institutions' medical records
- [ ] N/A

5. * Other Requests?

- [ ] Deception (if not Exempt, also requires Waiver/Alteration of Consent)
- [ ] Emergency Use / Single Patient Expanded Access (using FDA Form 3926)

- [ ] Placebo Arm
- [ ] Withdraw from usual care
- [x] N/A

6. * **Determining Scientific Review:**
Department Scientific Review (this option MUST be picked if there is DoD funding)

   * **Choose the appropriate organization to conduct the scientific review:**
U of Pgh | School of Medicine | Anesthesiology

7. * **Has this study (or substantially similar study) been previously disapproved by the Pitt IRB or, to your knowledge, by any other IRB?**
○ Yes ● **No**

> *Review the HRPO policy, if participating in research at the VA Pittsburgh Healthcare System or using funding from the VA*

8. * **Does the study use an approved drug or biologic, use an unapproved drug or biologic, or use a food or dietary supplement to prevent, diagnose, cure, treat, or mitigate a disease or condition?**
○ Yes ● **No**

9. * **Does the study evaluate the safety or effectiveness of a device (includes in-vitro laboratory assays)?**
○ Yes ● **No**

10. * **Is this application being submitted to convert an approved study from OSIRIS to PittPRO?** (Tip Sheet)

○ Yes ● **No**

11. * **Does your research protocol involve the evaluation or use of procedures that emit ionizing radiation and, after reviewing this** HUSC guidance**, does your research protocol require HUSC review? (If yes, upload the** HUSC form **in the Local Supporting Documents section). If you are unsure of review requirement, select yes.**
○ Yes ● **No**

Research Sites

1. **Choose all sites that apply:**
   UPMC

   * **Select the UPMC sites where research will be conducted:**
   Montefiore
   Presbyterian

2. **Describe the availability of resources and the adequacy of the facilities to conduct this study:**
   Study visits will take place in the same-day surgery center in Montefiore Hospital. The study will be conducted on the weekend, ensuring that this space will be available for use and will not interfere with regularly scheduled activities. The study PI and coordinator will be available to run each study visit. Additionally, a phlebotomist will be utilized to complete the blood draws.

Click **Continue** as this page was intentionally left blank.

Recruitment Methods

* **Will you be recruiting individuals for participation in this study?**
● **Yes** ○ No

1. * **Describe who will be recruiting individuals for participation for this study:**
The study team will be responsible for recruiting individuals for participation in this study.

2. * **Select all methods to be used for recruitment:**
Flyers/Posters or Brochures
Pitt+Me
Other

* **Enter description of 'Other' method of recruiting:**
Individuals will be recruited into this study through word of mouth. Potential subjects recruited through word of mouth will be provided both an email address and phone number to contact for study enrollment.
Study flyers will be posted around the University of Pittsburgh's campus. The study flyers will be used to provide general information about the study and contact information for potential participants to get in contact with the study team.

3. * **Provide details on your recruitment methods:**
Individuals from local colleges will be approached for recruitment into the study, including the University of Pittsburgh School of Medicine, University of Pittsburgh, and Duquesne University. These individuals will be recruited using word of mouth, as detailed in the above response. Individuals will also be recruited through word-of-mouth and Pitt+Me.
Students will not be required to participate in the research study and individual students will not be specifically targeted. Potential participants will be solicited from a "broad base" of individuals meeting the conditions for the study.

4. * **Describe all compensation/incentives offered to participants and timing of these offers:**
Patients will be compensated $300 after completion of three visits. Payment will be given on a reloadable Vincent debit card. The payment will not be separated by visit but will instead be provided pending successful completion of the three study visits.

5. **Recruitment materials:** (attach all material to be seen or heard by subjects, including advertisements and scripts)

	Document	Category	Date Modified	Document History
View	Buoy Recruitment Flyer(2)	Recruitment Materials	7/6/2023	History

Study Aims

1. * **Describe the purpose, specific aims, or objectives and state the hypotheses to be tested:**
   The study aims include:
   1. Evaluate if giving BUOY will decrease the total volume of urine excretion
   2. Determine is BUOY will lead to bigger increase in Total Body Fluid
   3. Determine if there are quantifiable differences between giving BUOY in divided doses versus a bolus of NUUN

2. * **Describe the relevant prior experience and gaps in current knowledge including preliminary data. Provide for the scientific or scholarly background for, rationale for, and significance of the research based on existing literature and how it will add to existing knowledge:**
   Maintaining adequate hydration is essential to optimal health [1,2,3] and athletic performance [4,5]. Dehydration can contribute to a host of issues, including altered cognition and digestion, as well as organ dysfunction in the heart, kidneys, and skin [3]. When individuals exercise (particularly in a warm environment), they can lose excessive amounts of fluids through sweating, along with necessary electrolytes (e.g., sodium, potassium, chloride) [5,6]. With dehydration, athletes may feel sluggish and physical performance can suffer [7,8].
   Many attempts have been made to improve the hydration status of active individuals [7,8,9,10]. According to the American College of Sports Medicine's position stand, fluids containing sodium should be slowly ingested leading up to activity to help retain fluids, so that athletes maintain euhydration with normal electrolyte levels [6]. Hydration strategies during physical activity should be aimed at preventing fluid loss greater than 2% of the body weight, which can be optimally accomplished by ingesting a diluted carbohydrate/electrolyte beverage at a rate approximately equivalent to sweat loss. During recovery, enough water and food containing sodium should be ingested to replenish electrolyte losses and reestablish euhydration [6]. This approach seems to work well. However, some debate remains over what the best fluid is to consume, particularly with respect to macronutrient type and the specific electrolyte mix.
   Related to the above, it is well-accepted that electrolyte replenishment is of importance both during and following exercise, to aid in rehydration for subsequent exercise bouts [6,11]. Electrolytes (sodium in particular) have been used for decades to aid athlete hydration, and this has led to the development of various sport drinks —which also often include moderate amounts of carbohydrate (e.g., Gatorade® (PepsiCo; Chicago, IL, USA) and Powerade® (The Coca-cola Company; Austin, TX, USA)). However, one problem with carbohydrate ingestion is that some individuals experience gastrointestinal (GI) upset following carbohydrate ingestion before [12] and during an event [13], despite very good physical performance outcomes. Due to this GI upset, some individuals (in particular, recreationally active individuals who are not competing at high levels) rely solely on water and seek a method to ingest the lost electrolytes. In addition, some individuals prefer to have both plain water and an electrolyte beverage during their training/competition sessions, and in some activities (e.g., running and cycling), carrying multiple bottles of fluid is difficult.

Buoy is an all-natural, organic, FDA compliant dietary electrolyte supplement that can be dissolved in 8-12oz water (or other liquid) and provide electrolytes in servings of 1/3 teaspoon. This study will evaluate Buoy in hydrating active adults.

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2. Liska D., Mah E., Brisbois T., Barrios P.L., Baker L.B., Spriet L.L. Narrative Review of Hydration and Selected Health Outcomes in the General Population. Nutrients. 2019;11:70. doi: 10.3390/nu11010070. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
3. Popkin B.M., D'Anci K.E., Rosenberg I.H. Water, hydration, and health. Nutr. Rev. 2010;68:439–458. doi: 10.1111/j.1753-4887.2010.00304.x. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
4. Nuccio R.P., Barnes K.A., Carter J.M., Baker L.B. Fluid Balance in Team Sport Athletes and the Effect of Hypohydration on Cognitive, Technical, and Physical Performance. Sports Med. 2017;47:1951–1982. doi: 10.1007/s40279-017-0738-7. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
5. Von Duvillard S.P., Braun W.A., Markofski M., Beneke R., Leithäuser R. Fluids and hydration in prolonged endurance performance. Nutrition. 2004;20:651–656. doi: 10.1016/j.nut.2004.04.011. [PubMed] [CrossRef] [Google Scholar]
6. Sawka M.N., Burke L.M., Eichner E.R., Maughan R.J., Montain S.J., Stachenfeld N.S. Exercise and Fluid Replacement. Med. Sci. Sports Exerc. 2007;39:377–390. doi: 10.1249/mss.0b013e31802ca597. [PubMed] [CrossRef] [Google Scholar]
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8. Kenefick R.W. Drinking Strategies: Planned Drinking Versus Drinking to Thirst. Sports Med. 2018;48:31–37. doi: 10.1007/s40279-017-0844-6. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
9. Love T.D., Baker D.F., Healey P., Black K.E. Measured and perceived indices of fluid balance in professional athletes. The use and impact of hydration assessment strategies. Eur. J. Sport Sci. 2018;18:349–356. doi: 10.1080/17461391.2017.1418910. [PubMed] [CrossRef] [Google Scholar]
10. Maughan R.J., Shirreffs S.M. Development of hydration strategies to optimize performance for athletes in high-intensity sports and in sports with repeated intense efforts: Development of hydration strategies to optimize performance for athletes. Scand. J. Med. Sci. Sports. 2010;20:59–69. doi: 10.1111/j.1600-0838.2010.01191.x. [PubMed] [CrossRef] [Google Scholar]
11. Evans G.H., James L.J., Shirreffs S.M., Maughan R.J. Optimizing the restoration and maintenance of fluid balance after exercise-induced dehydration. J. Appl. Physiol. 2017;122:945–951. doi: 10.1152/japplphysiol.00745.2016. [PubMed] [CrossRef] [Google Scholar]
12. Pence J, Bloomer RJ. Impact of Nuun Electrolyte Tablets on Fluid Balance in Active Men and Women. Nutrients. 2020 Oct 2;12(10):3030. doi: 10.3390/nu12103030. PMID: 33023276; PMCID: PMC7600513.
13. Maughan RJ, Watson P, Cordery PA, Walsh NP, Oliver SJ, Dolci A, Rodriguez-

Sanchez N, Galloway SD. A randomized trial to assess the potential of different beverages to affect hydration status: development of a beverage hydration index. Am J Clin Nutr. 2016 Mar;103(3):717-23. doi: 10.3945/ajcn.115.114769. Epub 2015 Dec 23. PMID: 26702122.

Study Design

1. **Total number of subjects to be enrolled at this site (enter -1 for chart reviews, banking, registries):**
   34

2. **Describe and explain the study design:**
   The proposed study will be conducted as a single-center prospective, cross-over, placebo-controlled clinical trial at the University of Pittsburgh Medical Center (UPMC).

3. **Describe the primary and secondary study endpoints:**
   Urine volume (collected each visit over 6-hour time frame)
   Electrolytes: sodium, potassium, chloride
   Urine osmolarity
   Urine creatinine

4. **Provide a description of the following study timelines:**

   Duration of an individual subject's active participation:
   The individual's active participation will involve three separate sessions, each lasting approximately 6 hours (total of 18 hours for each participant).
   Study visits will be completed within a three-to-four month period.
   Duration anticipated to enroll all subjects:
   Approximately 9 months
   Estimated date for the investigator to complete this study (complete primary analyses):
   4/1/2024

5. **List the inclusion criteria:**
   • Male or female, >18 to 45 years of age
   • Freely given written consent
   • Non-tobacco users
   • Negative pregnancy test in women of childbearing potential
   • BMI < 35 kg/m2
   • GFR > 60 ml/min
   • No known underlying medical condition
   • Willing to refrain from EtOH for 24h prior to test day
   • Willing to refrain from strenuous exercise for 24 h prior to each test day
   • Acceptable to have one 8oz cup of coffee/liquid on the morning of the test, but must be consistent each visit
   • Without active infection of any kind
   • Engaged in exercise three or more hours per week

6. List the exclusion criteria:

• Abnormal creatinine (Cr > 1.2).
• Proteinuria / hematuria / glucosuria based on urine dipstick.
• Diagnosed medical condition that would impede results (CHF, HTN, CAD, CKD, history of electrolyte abnormality).
• Pregnancy
• Use of diuretics within past 2 weeks
• Obesity (BMI > 35)
• Active infection based on symptoms (bacterial or viral)
• Hemodynamic abnormality at screening visit: Blood pressure less than 100/60 or greater than 140/90.

7. Will children or any gender, racial or ethnic subgroups be explicitly excluded from participation?

● **Yes** ○ No

* **Identify the subgroups and provide a justification:**

Children will be excluded from participation since the study is looking at the hydration status of active adults.

8. Describe the power analysis used and cite your method of statistical analysis. If a power analysis is not possible, thoroughly justify the sample size required for the study, including appropriate literature citation (alternatively provide page reference in attached protocol):

The data will be presented as mean ± SD, analyzed using the conditions x time analysis of variance (ANOVA), while BHI will be analyzed using a one-way ANOVA. Tukey post-hoc testing and contrast analysis can be used as appropriate. Statistical significance was set at $p \leq 0.05$.

We aim to have 30 subjects complete the study. This is a pilot study to inform a future large-scale trial with appropriate power calculation.

Research Activities

1. * **Provide a detailed description of all research activities (including screening and follow-up procedures) that will be performed for the purpose of this research study. This description of activities should be complete and of sufficient detail to permit an assessment of associated risks.**

Prior to initiation of the study, subjects will complete a brief phone screen to assess basic eligibility and will be asked to fast. The screening visit will consist of informed consent, health history, and discussing eligibility requirements for each study visit, including (1) refrain from vigorous exercise for 24 hrs prior, (2) fast overnight for at least 10 hrs, (3) empty bowel and bladder upon waking up, (4) can consume one 8oz cup of coffee or tea. For female subjects, this will also include their last date for menstruation and/or birth control method to take into consideration the effects of ovulation on water retention.

Prior to all research visits (screening, visits 1, 2, and 3), participants must refrain from vigorous exercise (exercises that results in a high heart rate and rapid breathing) within 24 hours of study visit. Participants will fast (food) overnight for 10h prior to initiation of test. Upon waking they are asked to empty their bowel and bladder. They can consume one 8oz cup of coffee or tea (plain with no sugar or additives) to reduce caffeine headaches. They will present at 7-8am, which will be pre-specified. Prior to emptying their bladder, a blood draw of up to 1 ml will be drawn by a trained phlebotomist for the i-STAT testing, which will be used to measure creatine and electrolytes. After this they will be asked to empty their bladder. Immediately after emptying the bladder, bioimpedence will be measured. Females will be administered a urine pregnancy test. A urinalysis dipstick for protein/blood/glucose and i-STAT measurement for creatinine and electrolytes will be completed to confirm eligibility. Next, the subject will be asked to rest for 5 mins, after which baseline vitals will be taken, including blood pressure, heart rate, weight. For Visit 2 and Visit 3, the participant will be asked to review medical history and any change in status may warrant an additional baseline creatinine and blood/protein test to confirm eligibility. All studies will be repeated in the same subject using either Buoy (intervention) or water (control) or Nuun (intervention). Urine will be collected at four specific timepoints during the intervention and the volume will be recorded. If participants need to urinate between scheduled collection times, urine will be collected, volume recorded, and combined with the urine collection of the following timepoint. These urine samples will be measured and a fraction of it will be sent to the lab to be tested for the following electrolytes: sodium, potassium, chloride and urine osmolarity. Urine creatinine will also be tested at these timepoints.
Additional food or beverage will not be allowed throughout the study period.

VISIT 1---BUOY INTERVENTION: The goal is to give 600mg of Na+ over 4 hours while measuring urine output over 6 hours. The recommended Buoy dosage is ⅓ tsp in 237 ml of water (50mg Na+) multiple times a day (Table 1). Therefore, to safely achieve a total dose 600mg Na+ (6-fold increase from single dose) we will use 4 tsps (18 ml) of Buoy diluted in 1 L of water.
Prior to initiation of test blood pressure and heart rate will be measured. Urine will be collected and discarded.

At time 0, the participant will begin to drink fluid (drinking 6.25% of their total amount every 15 min). Urine will be collected at 60, 120, 240, and 360 min. Bioimpedence will be measured after each urine collection. Collect urine for a total of 6 hours.
VISIT 2—WATER CONTROL: Participants will ingest 1 L of water at a rate of 6.25% of the calculated amount of water every 15 min for 4 hours.
Prior to initiation of test blood pressure and heart rate will be measured. Urine will be collected and discarded.
At time 0, the participant will begin to drink fluid (drinking 6.25% of their total calculated amount every 15 min). Urine will be collected at 60, 120, 240, and 360 min. Bioimpedence will be measured after each urine collection. Collect urine for a total of 6 hours.
VISIT 3—NUUN INTERVENTION: The goal is to give a one-time dose of 2 tablets of Nuun Sport (600mg Na+) at the start of the trial, diluted in 1L water to be consumed within 30 min (similar to prior published data, Pence 2020).
Prior to initiation of test blood pressure and heart rate will be measured. Urine will be collected and discarded.
At time 0, the participant will consume the beverage over 30 min. Urine will be collected at 60, 120, 240, and 360. Bioimpedence will be measured after each urine collection. Collect urine for a total of 6 hours. Patients will be compensated $300 after completion of three visits.

Buoy is an all-natural, organic, FDA compliant dietary electrolyte supplement that can be dissolved in 8-12oz water (or other liquid) and provide electrolytes in servings of 1/3 teaspoon. Nuun are electrolyte tablets that are added to water to improve fluid balance and beverage hydration index (BHI) in healthy individuals (Pence, 2020). Nuun tablets contain a mix of electrolytes, including calcium, magnesium (as an oxide), chloride, sodium, and potassium. The recommended use of Nuun is one tablet dissolved in water, administered once daily.

The PI and study team will be performing the research procedures. A phlebotomist will be used to complete the blood draws.

Following each study visit, a boxed lunch will be offered to each participant. This lunch will be Jimmy John's (or a similar sandwich shop). Each participant will be asked about preferences and food allergies during the screening process so provide an appropriate option for participants involved.

2. Upload a copy of all materials used to collect data about subjects: (Attach all surveys, interview/focus group scripts, and data collection forms except for case report forms, SCID or KSADS):

	Document	Category	Date Modified	Document History
View	Buoy Patient Data Sheet(1)	Data Collection	7/6/2023	History

3. * Will blood samples be obtained for research purposes?

● **Yes** ○ No

*** Provide the volume per withdrawal, total volume and frequency, and qualifications of individual performing the procedure:**

Venous whole blood will be collected using phlebotomy and up to 1 ml will be collected to be analyzed using an i-STAT. Blood will be collected for i-STAT analysis during the screening visit. For Visit 2 and Visit 3, the participant will be asked to review medical history and any change in status may warrant an additional baseline blood test to confirm eligibility.
Blood will be drawn by a trained phlebotomist.

Consent Process

Enter N/A in response to the following questions if a Waiver of Consent is requested for all research activities or if no subjects are being enrolled.

1. * **Indicate where the consent process will take place and at what point consent will be obtained:**
The consent process will take place prior to the initiation of study procedures. eConsent will be collected prior to the screening visit and Visit 1 in order to minimize the time spent by each participant during the first visit. eConsent will be collected using Pitt RedCap. eConsent will be signed via stylus, fingertip, or mouse.

2. * **Describe the steps that will be taken to minimize coercion and undue influence, including assurance that there is sufficient time for subjects to make an informed decision:**
In order to minimize the possibility of coercion or undue influence, the participants will first be informed that their choice of participation in the study is completely voluntary in nature. Prospective participants will be encouraged to ask questions and to discuss the study with others during the consent process. All of the participants questions will be addressed. It will be made clear that the participant may withdraw from the study at any time.
eConsent will be completed over the phone. An electronic copy will be provided to participants at the time of eConsent.

3. **For studies that involve multiple visits, describe the process to ensure ongoing consent:**
Individuals will be reminded that their participation in the study is voluntary and that they can withdraw at any time during each visit.

Consent will be re-affirmed prior to each ensuing study visit.

4. * **Steps to be taken to ensure the subjects' understanding:**
Individuals will be provided with a full explanation of the study-related goals and procedures. Questions will be answered from the participant. Participants will be given as much time as necessary to read the consent form and ask questions.

Consent will be obtained by the study PI, Co-investigator, or study coordinator.

5. * **Are you requesting an exception to the IRB policy related to the informed consent process:**
● **Yes** ○ No

* **Provide a justification and describe the qualifications of the individuals who will obtain consent:**
This is a minimal risk study and we are requesting that Nicole Zharichenko be permitted to conduct the informed consent process. Nicole Zharichenko has

extensive experience and training in conducting informed consent for these types of studies.

Consent Forms

1. **Consent Forms:**

	Document	Category	Date Modified	Document History
View	Buoy Consent Form (4.04)	Consent Form	2/5/2024	History

Refer to the following templates and instructional documents:

- Guidance - Consent Wording
- Template - Consent Document - Short Form
- HRP-090 - SOP - Informed Consent Process for Research
- HRP-091 - SOP - Written Documentation of Consent

Waiver to Document Informed Consent

This waiver to document informed consent can be requested for any or all participants, for any or all procedures (e.g., a verbal or computerized consent script will be used, but the subjects will not be required to sign a written informed consent document, such as with phone screening).

1. * Identify the specific research procedures and/or the specific subject populations for which you are requesting a waiver of the requirement to obtain a signed consent form:

Phone screen to determine subject eligibility and ask permission to fast.

2. * Select the regulatory criteria applicable to your request:

- ○ 45 CFR 46.117(c)(1) That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern.
- ● 45 CFR 46.117(c)(2) That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context
- ○ 45 CFR 46.117(c)(3) If the subjects or legally authorized representatives are members of a distinct cultural group or community in which signing forms is not the norm.

*** Address why the specific research procedures for which you are requesting a waiver of the requirement to obtain a signed consent form presents no more than minimal risk of harm to the research subjects:**

The specific research procedure for which we are requesting a waiver of signed consent consists of permission to fast for the first visit. The potential risks are feelings of hunger, dizziness, and headaches, which are considered minimal.

*** Justify why the research involves no procedures for which written informed consent is normally required outside of the research context:**

The only research activity is asking subjects to fast. Patients are normally asked to fast for clinical care procedures that would not normally require written consent.

3. * Upload Scripts:

	Document	Category	Date Modified	Document History
View	Phone Screening Script(2)	Waiver Script	1/23/2024	History

Medical Records

1. You are required to submit this study to the Research Informatics Office, Health Record Research Request (R3). Per UPMC Policy HS-RS0005, all research projects that access or involve UPMC electronic protected health information (e-PHI) must be submitted to R3, with the exception of clinical trials that are contracted through the UPMC Office of Sponsored Programs and Research Support (OSPARS).

   Complete the R3 intake form available at http://rio.pitt.edu/services. An R3 representative will conduct a review. You will be notified once your R3 review is complete or if anything further is needed.

*** Describe the protected health information that will be collected from the covered entity and/or the research derived information that will be placed into the medical records:**

The information that will be recorded will include lab results, both from blood and urinalysis, medical history, and patient demographics including: name, age, MRN, race, gender, and date of birth

This research study will result in identifiable information that will be placed into patient medical records held at UPMC. Information placed in patient's medical records will include the urine electrolytes and urine creatinine. Testing placed in the medical records will be completed at a CLIA certified UPMC lab.

Electronic Data Management

1. * **Will only anonymous data be collected (select NO if identifiers will be recorded at anytime during the conduct of the study)?**

○ Yes ● No

Select all identifiers to be collected during any phase of the research including screening:

Name:	☑	**Internet Protocol (IP) Address:**	☐
E-mail address:	☑	**Web Universal Resource Locators (URLs):**	☐
Social security #:	☐	**Social security # (for Vincent payment only):**	☑
Phone/Fax #:	☑	**Full face photo images or comparable images:**	☐
Account #:	☐	**Health plan beneficiary #:**	☐
Medical record #:	☑	**Device identifiers/serial numbers:**	☐
Certificate/license #:	☐	**Vehicle identifiers/serial #/license plate #:**	☐
		Biometric identifiers, finger and voice prints:	☐

* **a: Will you be collecting any of the following location data: geographic subdivisions smaller than a State such as street address, city, county, precinct, zip, geocodes, etc.?** ● Yes ○ No

* **b: Will you be collecting any date information such as birth date, death, admission, discharge, date of surgery/service?** ● Yes ○ No

c: List any other unique identifying numbers, characteristics or codes related to an individual that are to be collected:

All data will be coded with a participant's unique study ID and de-identified

d: Will you be collecting any data subject to the General Data Protection Regulation (GDPR)? ○ Yes ● No

* **e: Provide a justification for recording Social Security numbers including why it's required, where it's stored, how it's protected and who will have access:**

Social security numbers will be collected for payment purposes only. Social security number will be destroyed once entered in the Vincent system.

* **For ALL identifiable data collected, will you be coding the data by removing the identifiers and assigning a unique study ID/code to protect the identity of the participant?** ● Yes ○ No

* **Will the data be HIPAA de-identified?** ○ Yes ● No

* **Briefly describe your plan to store coded data separately from the identifiable data:**

Data collected will be managed by the research study team and stored in a manner that maintains patient confidentiality. Identifiable data will be stored in

a separate password-protected file on the UPMC server and will be kept separate from the main de-identified data set.

2. **During this study, will restricted data as defined by the University's Data Risk Classification matrix (** https://www.technology.pitt.edu/security/data-risk-classification-and-compliance **) be processed, stored, or transmitted?**

● **Yes** ○ No

3. * **During this study, will sensitive data (**https://www.hrpo.pitt.edu/electronic-data-security**) be collected where disclosure of identifying information could have adverse consequences for subjects or damage their financial standing, employability, insurability, educational advancement, reputation or place them at risk for criminal or civil liability?**

○ Yes ● **No**

4. * **Select all locations where data will be stored or archived(including e.g.,** personal / employer laptop or desktop**): If you have access to University owned or controlled resources, facilities, or repositories, such as computer servers, please choose that option to comply with the** Research Data Management Interim Policy R1 14**.**

Please note that to address Research Security Requirements, University data must be stored in University owned, controlled, or approved repositories, such as Pitt OneDrive. If UPMC or external electronic repositories must be used, they must be approved by Pitt IT.

	Storage Device	Description	Identifiable Data	Sensitive Data	De-Identified/Anonymous Data
View	UPMC: Departmental or Hospital Server		yes	yes	yes
View	UPMC owned desktop, laptop or other device		no	no	no

5. * **Select all technologies being used to collect data or interact with subjects: Technologies selected in this section may require a Vendor Security Risk Assessment, which can be requested** here**.**

Web-based site, survey, or other tool

N/A

6. * **Web Based Technologies – identify all web based technologies to be used to collect data during any phase of the research:**

	name	Identifiable
View	Pitt Redcap Version	

Data Safety and Monitoring

1. * **Describe your plan to periodically evaluate the data collected regarding both harms and benefits to determine whether subjects remain safe. The plan might include establishing a data monitoring committee and a plan for reporting data monitoring committee findings to the IRB and the sponsor:**
   The following data and safety monitoring plan will be instituted to ensure the safety of the subjects and to maintain the confidentiality of the research data. The investigators and study coordinators will perform a monthly review of the accrued data, including adverse events, unanticipated problems and subject withdrawals, to ensure the validity and integrity of the data and to reassess the benefit-to-risk ratio on a frequent and regular basis. Subject privacy and research data confidentiality will be ensured by reviewing the adequacy of the secure location of where the data is stored and by making sure it is all de-identified with the coded case numbers as described previously. The results from the data and safety monitoring will be forwarded to the Institutional Review Board at least yearly or during annual review.

2. * **Describe your plan for sharing data and/or specimens:**
   De-identified data may be shared with others inside and outside of the University who are conducting similar research. Though, at this time, there is no plan to share data with outside universities.
   An appropriate sharing agreement will be completed prior to sharing.

3. **If any research data is collected, stored, or shared in a paper format, address what precautions will be used to maintain the confidentiality of the data:**
   Any data collected, stored, or shared in a paper format will be kept in a locked file cabinet, with access only provided to study members.

Specimens and Related Data

1. * **Data and Specimens will be stored:**
   Limited time (i.e., only until the study is completed)

2. * **Indicate the type of specimen, describe where stored, and for how long:**
   Blood and urine specimens will be collected during this study. The specimens will only be used to obtain test results, including electrolytes, creatinine, protein, and glucose, and will be discarded after results are obtained.

3. * **How the specimens will be accessed and who will have access to the specimens:**
   All specimens will be sent to the UPMC lab. None will be stored by the study team.

4. * **List the data to be stored or associated with each specimen:**
   All specimens will be sent to the UPMC lab. None will be stored by the study team.

5. * **Describe the procedures to release data or specimens, including the process to request a release, who can obtain data or specimens, the data to be provided with the specimens:**
   The data will be released to the study team upon testing of the specimens.

Risk and Benefits

1. * **Enter all reasonably foreseeable risks, discomforts, hazards, or inconveniences to the subjects related to subjects' participation in the research:**

View

Research Activity	**Blood draw**
Common Risks	**Hematoma, bruising**
Infrequent Risks	**Fainting**
Other Risks	***No Value Entered***

View

Research Activity	**Nuun**
Common Risks	***No Value Entered***
Infrequent Risks	**Nausea, dislike of taste**
Other Risks	***No Value Entered***

View

Research Activity	**Ingestion of water**
Common Risks	***No Value Entered***
Infrequent Risks	**Water intoxication can occur if consuming 4-5 L of water in a few hours, symptoms include headache, cramping weakness, nausea, vomiting, drowsiness and fatigue.**
Other Risks	***No Value Entered***

View

Research Activity	**Buoy**
Common Risks	***No Value Entered***
Infrequent Risks	**Nausea, dislike of taste**
Other Risks	***No Value Entered***

View

Research Activity	**Collection and storage of private health information**
Common Risks	***No Value Entered***
Infrequent Risks	**Risk of breach of confidentiality**
Other Risks	***No Value Entered***

View

Research Activity	**Fasting**
Common Risks	**Headache, dizziness, hunger**
Infrequent Risks	**Fainting**
Other Risks	***No Value Entered***

2. * **Describe the steps that will be taken to prevent or to minimize risks:**
To avoid water intoxication, we will limit free water intake to no more than 2.5 L per testing day (PMID 12053855).

All data will be stored with a unique ID and will be kept on a secure server or in locked filing cabinet in a secure office.

Subjects will be encouraged to bring a snack with them to eat after the completion of fasting.

3. **Financial risks - will the subject or insurer be charged for any research required procedures?**
○ Yes ● **No**

4. **Describe the steps that will be taken to protect subjects' privacy:**
All research interventions will be conducted in a private exam room. Collection of sensitive information about subjects is limited to the amount necessary to achieve the aims of the study.

5. **What steps will be taken in the event that a clinically significant, unexpected disease or condition is identified during the conduct of the study:**
Should a clinically significant, unexpected disease or condition be identified during the conduct of the study, the patient's primary medical team will be immediately notified of the unexpected, clinically significant condition. The patient's clinically significant medical condition will be managed accordingly. If any of the clinically significant medical conditions is related to the study, then the patient's participation in the study will be re-evaluated, with the possibility of the patient being withdrawn from the study if it leads to the resolution of the clinically significant medical condition.

6. **Describe the potential benefit that individual subjects may experience from taking part in the research or indicate if there is no direct benefit. Do not include benefits to society or others:**
Participation in the research does not offer direct benefit to the research subjects.

7. **Do you anticipate any circumstances under which subjects might be withdrawn from the research without their consent?**
○ Yes ● **No**

8. **Describe procedures that will be followed when subjects withdraw from the research, including partial withdrawal from procedures with continued data collection and data already collected:**
Any identifiable research or medical information recorded for, or resulting from, participation in the research study prior to the date of withdrawal may continue to be used and disclosed by the investigator for the purposes of research. Data will continue to be stored on secure servers and de-identified prior to analysis.

Conflict of Interest

Institutional Financial Interests

1. * **To the best of your knowledge, has the University of Pittsburgh optioned or licensed technology that will be tested or evaluated in this research?**
   ○ Yes ● **No**

Ancillary Reviews

1. **Ancillary reviews or notifications selected below are required based on previous answers to questions. If a selection is incorrect, return to the appropriate page and adjust the answers to questions on that page:**

- [ ] Conflict of Interest (**COI**)
- [ ] Clinical and Translational Research Center (**CTRC**)
- [x] Data Security
- [ ] Honest Broker
- [ ] UPMC Investigational Drug Service
- [ ] Pitt Medical School Review
- [x] Pitt+Me
- [ ] IND & IDE Support(**IIS**)
- [ ] Radioactive Drug Research Committee (**RDRC**)(study involves the evaluation or use of procedures that emit ionizing radiation)
- [ ] ORP Business **Manager** (required for industry sponsored studies)
- [ ] Religious Directives
- [x] Scientific Review
- [x] Health Record Research Request (**R3**) (required if using UPMC clinical data and authorization for other UPMC data sources for research)
- [x] UPMC Office of Sponsored Programs and Research **Support** (using UPMC facilities and/or UPMC patients during the conduct of the study)

2. **Additional ancillary reviews the PI may choose to include as needed for the research:**

- [ ] Human Stem Cell Oversight (**hSCRO**)
- [ ] Institutional Biosafety Committee (**IBC**)(study involves deliberate transfer of recombinant or synthetic nucleic acid molecules)

Good Clinical Practice (GCP) Training

1. * **Regardless of funding source, is this study a clinical trial (**as defined by the NIH**)?**
   - ● **Yes** ○ No

ClinicalTrials.gov Information

Visit the University of Pittsburgh Office for ClinicalTrials.gov website or contact ctgov@pitt.edu for further information.

2. * **Was this study registered, or will it be registered, on ClinicalTrials.gov?**
   - ● **Yes** ○ No

3. * **Is the University of Pittsburgh or UPMC the Sponsor Organization for this study record?**
   - ● **Yes** ○ No

   * **Who will be the Responsible Party for this study record?**

   Principal Investigator of this IRB application

Supporting Documents

1. **Attach any additional supporting documents not previously uploaded. Name the documents as you want them to appear in the approval letter:**

Document	Category	Date Modified	Document History
There are no items to display			

Add Storage Information

1. * **Select a Storage Type:**
   UPMC: Departmental or Hospital Server

2. **Description:**

3. * **Will identifiable data be stored in this location?**
   ● **Yes** ○ No

4. * **Will sensitive data be stored in this location?**
   ● **Yes** ○ No

5. **Will de-Identified or anonymous data be stored in this location?**
   ● **Yes** ○ No

6. **Provide additional information as needed:**

Add Storage Information

1. * **Select a Storage Type:**
   UPMC owned desktop, laptop or other device

2. **Description:**

3. * **Will identifiable data be stored in this location?**
   ○ Yes ● **No**

4. * **Will sensitive data be stored in this location?**
   ○ Yes ● **No**

5. **Will de-Identified or anonymous data be stored in this location?**
   ○ Yes ● **No**

6. * **Is anti-virus software installed and up to date on all devices and are the operating systems kept up-to-date on all devices?**
   ● **Yes** ○ No

7. **Provide additional information as needed:**

View: Pitt Risk

Risk

1. * **Research Activity:**
   Blood draw

2. **Common Risks:**
   Hematoma, bruising

3. **Infrequent Risks:**
   Fainting

4. **Other Risks:**

View: Pitt Risk

Risk

1. * **Research Activity:**
   Nuun

2. **Common Risks:**

3. **Infrequent Risks:**
   Nausea, dislike of taste

4. **Other Risks:**

View: Pitt Risk

Risk

1. * **Research Activity:**
   Ingestion of water

2. **Common Risks:**

3. **Infrequent Risks:**
   Water intoxication can occur if consuming 4-5 L of water in a few hours, symptoms include headache, cramping weakness, nausea, vomiting, drowsiness and fatigue.

4. **Other Risks:**

View: Pitt Risk

Risk

1. * **Research Activity:**
   Buoy

2. **Common Risks:**

3. **Infrequent Risks:**
   Nausea, dislike of taste

4. **Other Risks:**

View: Pitt Risk

Risk

1. * **Research Activity:**
   Collection and storage of private health information

2. **Common Risks:**

3. **Infrequent Risks:**
   Risk of breach of confidentiality

4. **Other Risks:**

View: Pitt Risk

Risk

1. * **Research Activity:**
   Fasting

2. **Common Risks:**
   Headache, dizziness, hunger

3. **Infrequent Risks:**
   Fainting

4. **Other Risks:**