Official title of the study: Use of NIRS to Detect Acute Kidney Injury in Preterm Infants

NCT number: NCT03384173

Date: 2/23/2017

Study Application (Version 1.7)

1.0 General Information
* Please enter the full title of your study:
Use of NIRS to detect Acute Kidney Injury in preterm neonates
* Short Study Title
NIRS for AKI in Preterm Neonates
* This field allows you to enter an abbreviated version of the Study Title to quickly identify this study.

2.0 Add Department(s)	
2.1 List departments associated with this study	
Primary Dept?	Department Name
No Department(s) have been attached to this form.	

3.0 Assign key project personnel access to the project.
3.1 * Please add a Principal Investigator for the study:
Matthew Harer, MD Select if applicable ☐ Student ☐ Department Chair ☐ Resident ☐ Fellow If the Principal Investigator is a Student, Resident, or Fellow, the name of the Faculty Advisor must be supplied below.
3.2 If applicable, please select the Research Staff personnel:
A) Additional Investigators B) Research Support Staff
3.3 Please add a Study Contact:
Matthew Harer, MD The Study Contact(s) will receive all important system notifications along with the Principal Investigator. (e.g. The project contact(s) are typically either the Study Coordinator or the Principal Investigator themselves).
3.4 If applicable, please add a Faculty Advisor:
3.5 If applicable, please select the Administrative Assistant: (s)
Administrative Assistant Note This role performs routine IRB submissions and has no contact with subjects, their data, records or specimens. Human Subject Protection Training is not required for this role.

4.0 Institutional Review Board Oversight	Version 2/23/17 (55)
4.1 Will you be requesting a deferral?	
◉ Yes ○ No	

Will you be requesting a deferral from UW-Madison so that ***UnityPoint Health - Meriter IRB*** will be your IRB of record?

- ***UnityPoint Health - Meriter IRB*** is used for investigator initiated research performed by UW affiliates through the Meriter and UW-Madison IRB Partnership Agreement.
- Do not use this form to request UW-Madison to be the IRB of record.

(•) Yes ( ) No

Will you be requesting a deferral from UnityPoint Health - Meriter so that ***Western IRB*** will be your IRB of record?

- ***Western IRB (WIRB)*** is used for multi-site clinical research sponsored by pharmceutical companies.

( ) Yes (•) No

5.0 Research Details for UW-Madison Deferrals to UnityPoint Health - Meriter IRB

5.1 Why do you think UnityPoint Health - Meriter Institutional Review Board should be the IRB of record for your research?

Use the Deferral Criteria Chart in the HELP Bubble over in the right panel to answer this question. Site the criteria that applies to your project.

1. all subjects recruited, medical records used, or study activities occur at Meriter

2.Studies involving collection of data through noninvasive procedures routinely employed in clinical practice (except x-rays, microwaves, or devices not cleared/approved for marketing) that involve Meriter and UW/UWHC/UWMF patients

5.2 Will any of the following subject populations be involved? Check all that apply.

- [x] Neonates
- [ ] Fetuses
- [ ] Prisoners
- [ ] Subjects recruited from Meriter Child and Adolescent Psychiatry Unit or Merter Addiction Medicine
- [ ] Patients from Madison VA, including use of their records or samples obtained from them.
- [ ] Patients from UWHC, including use of their records or samples obtained from them.
- [ ] Patients from a UWMF clinic, including use of their records or samples obtained from them.
- [ ] None of the Above

5.3 Please indicate the number of subjects, samples, and/or records you plan to get from each institution.

60

Additional Comments

5.4 For each research procedure in the left column, please indicate where it will occur. Skip to the next question if these procedures do not apply to your research.

Research Procedure	Meriter	UW Hospital &Clinics	UWMF	Name of Other Institution Site	Name of Other Institution Site
Record Review		☐ null	☐ null		

Subject Recruitment		☐ null	☐ null		
Specimen Banking or Collection	☐ null	☐ null	☐ null		
Administration of a drug or implantation of a device that has NOT been approved by FDA.	☐ null	☐ null	☐ null		

5.5 Do you have additional research procedures not listed above? Add them in the table below.

Research Procedure	Meriter	UW Hospital &Clinics	UWMF Clinic	Name of Other Institution Site	Name of Other Institution Site
Non-invasive Near Infrared Spectroscopy (NIRS) monitoring					

6.0 Study Type

6.1 * Study Type - Check only those that apply: iRIS will provide you with only the questions that apply to the type of research you are doing. Read the HELP Bubble in the right panel BEFORE checking a Study Type.

- ☑ General Biomedical Research
- ☐ Research on Biological Specimens
- ☐ Program Improvement - Quality Assurance
- ☐ Record Review Research
- ☐ Social/Behavioral/Educational Research - Survey, Interview, Questionnaire, Observation
- ☐ Research at Meriter when Meriter is Not Engaged - See HELP Bubble at right.
- ☐ Humanitarian Use Device
- ☐ Other

If "other" enter information below. Contact IRB Office for additional help on Study Type.

6.2 Are you doing this project to fulfill an educational requirement?

○ Yes ◉ No

7.0 Clinical Trials Registration Requirement

7.1 *Registration at ClinicalTrials.gov may be required in the following situations: Per FDA regulations, most studies involving the testing of a drug, biologic, or device must be registered. If publications resulting from this study will be published in a member journal of the International Committee of Medical Journal Editors (ICMJE) or in a publication that adheres to ICMJE standards, the study must be registered. Does this study need to be registered at Clinicaltrials.gov?

- ☑ Yes
- ☐ Not Applicable

7.2 If your research is listed on another public website, please provide the URL to the listing for this research.

8.0 Clinical Trials Registration Details

8.1 Who will register this study at ClinicalTrials.gov prior to the enrollment of the first subject?

PI- Matthew Harer

8.2 Help us verify that your protocol is registered on ClinicalTrials.gov Type in the ClinicalTrials.gov Identifier (also known as the NCT number) below.

9.0 Study Funding I

9.1 Instructions for Study Funding Sections

The IRB reviews financial relationships or interests that may adversely affect the rights and welfare of subjects. Please answer the following questions completely. You may attach additional documentation if you need to explain your answers.**SANCTIONS for Failure to Report Financial Conflicts of Interest**If the IRB determines that a Researcher has failed to report a financial conflict of interest as required, the IRB may immediately withdraw approval of the protocol and may bar the investigator from any future research at Meriter Hospital for a period of time specified by the IRB.

9.2 *Does any of the local research staff, their immediate family, or dependents have a proprietary interest in the research, such as current or future ownership, royalties, patents, trademarks, copyright, or licensing agreement, including any agent, device, or software being evaluated as part of the research?

○ Yes ◉ No

- Tell who has the interest.
- Describe the person's role in relationship to the research.
- Describe the plan to avoid conflict of interest while working on the research.

9.3 *Is your research being funded, has it ever been funded, or do you anticipate it being funded by any source, besides your own personal funds?

◉ Yes ○ No

9.4 * Funding Status

You may select more than one answer.

☑ Applied For/Pending
☐ Approved
☐ Funding has Expired
☐ Not Applicable (no outside funding in past, present, or future).

10.0 Study Funding II

10.1 * Granting Agency or Commercial Sponsor Identify all sources of funding for this project. You can select more than one. There must be at least one checkbox selected for each agency/sponsor.

SKIP this question iIf you have not applied for outside funding.

	Sponsor	Funding	Protocol Control	Data Coordination	Monitoring	Auditing	Pass Through Funding
Personal							
Federal - NIH							
Pharmaceutical							
Private - Non-profit	Meriter Foundation	☑	☐	☐	☐	☐	☐
State Government							

Local Government							
Federal - Other							
Business - Profit							
UW Madison/UW Hospital and Clinics							

10.2 * Is the sponsor, a commercial sponsor?

- ○ Yes
- ◉ No - my study is grant funded.
- ○ I have no sponsor or outside funding for my study.

10.3 Study Budget

If you are anticipating outside funding for this research, you will need to submit your study budget.
You'll upload your study budget later in the Intial Review Submission Packet in the Other Study Documents section.

11.0 Locations

11.1 Where is the research being conducted?

UPH - Meriter Entities

- ☑ UnityPoint Health - Meriter hospital
- ☐ UnityPoint at Home (formerly Meriter Home Health)
- ☐ UnityPoint Health - Meriter - Labarotories
- ☐ UnityPoint Health - Meriter clinics
- ☐ Other UnityPoint Health - Meriter Entity

Entities Outside of UPH - Meriter

- ☐ University of Wisconsin Hospital & Clinics (UWHC)
- ☐ Other

If you checked one of the OTHER boxes please explain.

12.0 Research Design & Procedures

12.1 * Please list all departments, nursing units, etc. that will be involved at Meriter Hospital (e.g. blood bank, 6 North nursing unit, etc.). Enter the name of the person your study team has been in contact with for each area.
Read the HELP Bubble in the right panel for more information.

Department / Nursing Unit	Contact Person
7N, Neonatal ICU	Dare Desnoyers and Carla Griffin

12.2 PURPOSE What is the objective or purpose of your study? If you have specific aims, list them here. At the end of each paragraph hit Enter. Then hit Shift + Enter.

Specific Aim 1: To determine if a reduction in renal NIRS in preterm neonates correlates with current markers of neonatal AKI (decreased urine output or increased serum creatinine) in the first 7 days after birth.

Specific Aim 2: To determine if there is a significant reduction or increase in renal NIRS due to the use of medications in the NICU.

12.3 BACKGROUND What prior information or knowledge exists to support the conduct of this project or study? At the end of each paragraph hit Enter. Then hit Shift + Enter.

Preterm birth (< 37 weeks gestation) currently occurs in 1 in 8 deliveries and the majority of these infants are born with a low birth weight (LBW; <2.5kg), with many having a very low birth weight (VLBW; <1.5 kg). Although LBW is a well recognized risk factor for developing chronic kidney disease (CKD), prematurity and VLBW status have only recently been shown to be associated with later onset CKD. Children born preterm or with a VLBW are most at risk for developing CKD due to incomplete nephrogenesis, neonatal nephrotoxin exposures, and acute kidney injury (AKI) secondary to complex neonatal intensive care unit (NICU) hospitalizations. In 2013, Wisconsin had over 5,000 babies born preterm- over 600 of which were born with a VLBW. If you combine VLBW and LBW babies, the number of children at risk for developing CKD born each year in Wisconsin is over 1200.

Chronic kidney disease is a widespread public health epidemic associated with increased risks of cardiovascular disease and death. In Wisconsin, CKD has increased 3 fold since 1982 with early stage CKD now affecting over 40,000 and late stage CKD affecting over 3,000 in the state. Along with the rising incidence of CKD there have been associated increased costs – since 1993 the costs of caring for patients with CKD have increased 5 fold nationally. **The long-term goal of my research is to evaluate the contribution of preterm birth, NICU exposures and specifically AKI to the development of CKD in childhood and adulthood.** This past year I published a paper comparing the renal function of former preterm infants at 5 years of age. In this research study we found that preterm patients with a history of AKI in the NICU were 4 times as likely to have signs of CKD compared to those without a history of AKI in the NICU. This was consistent with pediatric and adult literature that has shown increased risk of CKD following an episode of AKI. It is clear from these studies that AKI is a significant risk factor for development of CKD and prevention of AKI should be a focus of all intensive care unit patients.

Acute kidney injury in the NICU is not only associated with long term development of CKD, but also with acute morbidity and increased rates of mortality. With AKI occurring in 12 to 40% of preterm infants, it is a common occurrence, particularly in the smallest and most preterm patients. The diagnosis of AKI in the NICU is currently based off of a standardized definition of increases in serum creatinine or decreases in urine output. Unfortunately, each of these criteria generally change hours to days after the initial insult resulting in the AKI band changes in therapy are generally not made until after the diagnosis. Multiple studies have examined the use of urinary biomarkers to diagnose AKI and many of these are promising for early detection of AKI- but these also are most often seen after the kidney injury. Ideally changes in blood flow or oxygenation of the kidneys could be detected prior to injury and this would allow clinicians to change therapy immediately.

Recently there has been increased use of a device to detect tissue oxygenation. Near infrared spectroscopy (NIRS) is a non-invasive skin-monitoring device used on patients to determine regional tissue oxygenation. Sensors can be placed in multiple locations, but most commonly the head, abdomen or flank are used to reflect brain, gut and kidney oxygen levels respectively. Studies in animals, pediatric and adult patients have shown that NIRS can be used to detect flow-induced changes in oxygen levels in the kidneys. In preterm neonates, a recent study showed that renal NIRS can be used to diagnose a hemodynamically significant PDA, a risk factor for AKI in nearly all neonatal AKI studies. In term neonates renal NIRS has been used in intra and post-operative cardiac surgery patients to detect AKI and has correlated with changes in both serum creatinine and urinary biomarkers. However, no studies currently exist demonstrating the correlation with urinary output or serum creatinine (the markers used for the current definition of AKI) and NIRS monitoring in preterm infants.

NIRS monitoring has been shown to be safe in multiple preterm studies. The sensor is both a light source and a detector used to measure the absorption of light by oxygenated and deoxygenated hemoglobin in the tissue. The sensor generates no heat and lasts between 1-4 days before needing to be changed. Normal renal NIRS values have been demonstrated in a number of small cohort studies and there are a number of factors that can affect the normal values: gestational age, post-menstrual age and hemoglobin. Given the large inter-individual variability, several different definitions have been used to define a low renal NIRS value: < 25% baseline, > 15 points below baseline and < 65%.

Given that AKI is common in preterm infants, can lead to long-term CKD, and current methods of diagnosis occur after injury, we propose that NIRS monitors can identify AKI in real time that may result in decreased rates of AKI and improved long-term outcomes.

12.4 ENROLLMENT Describe how subjects will be identified, and enrolled in the study. Indicate if randomization occurs and/or how subjects are assigned to study arms or groups if applicable. At the end of each paragraph hit Enter. Then hit Shift + Enter.

Goal Enrollment: 60 preterm patients

Eligibility: All preterm infants < 32 weeks admitted to Meriter UPH NICU

Inclusion Criteria:

1. Preterm neonate < 32 weeks
2. Admission to Meriter UPH NICU < 48 hours of age
3. Application of NIRS < 48 hours of age (Rationale: The most rapid change in renal function is in the first week of life. In the first 72 hours the serum creatinine is changing rapidly, reflecting a significant change in renal blood flow. Previous AKI studies have shown that 75-80% of AKI in the NICU occurs in the first week of life. In order to potentially capture this AKI episode we will aim to have NIRS on patients as early as possible, but for sure before 48 hours of age. If we started after 48 hours of age we may have potentially already missed the period of AKI and the renal NIRS may reflect post AKI oxygenation instead of oxygenation during the time of injury.)

Exclusion Criteria

1. Congenital anomaly of the Kidney or Urinary Tract (CAKUT)

Identification of Eligible Infants:

Each morning the RN Shift Manager will view the NICU census and identfity subjects meeting inclusion criteria for the study. The PI, Matthew Harer, will also check the NICU census daily to idenfity subjects which meet the inclusion criteria.

12.5 PROCEDURES Describe the study procedures or interventions that will be done at Meriter. If other institutions are involved, indicate how Meriter's involvement compares to the other intistiutions' involved. At the end of each paragraph hit Enter. Then hit Shift + Enter.

Solicitation of Study Interest

- Once a possible subject is identified, a member of the NICU team caring for the infant (NICU attending, NICU Fellow, NICU advanced practice provider, RN shift manager, or patient's RN) will speak with family to determine interest in participating in the study. If interest is identified, the PI or a NICU fellow will be notified to begin the consent process.

Solicitation of Informed Consent

- Once an interested family has been identified, the PI or NICU fellow will begin the informed consent process.

Step One: The Investigator (or IRB approved designee) will explain the study to the potential subject's parent verbally, providing all pertinent information (purpose, procedures, risks, benefits, alternatives to participation, etc.), and will allow the potential subject's parent ample opportunity to ask questions.

Step Two: Following this verbal explanation, the potential subject's parent will be provided with a written consent form and afforded up to 48 hours to consider whether or not to participate in the research.

Step Three: After allowing the potential subject's parent time to read the consent form, an Investigator listed on the consent form will meet with the potential subject's parent and answer any additional questions s/he may have.

- If the parent of the subject wishes to enroll the subject, a consent form will be signed, copied and given to the family for their records.
- If the consenting adult is a legal guardian or a minor parent, written proof (court document) will be required.

Application of Probe

- Application of regional NIRS neonatal probe (FDA approved for preterm infants) on top of a piece of Mepitel (gel impregnated gauze) barrier to the right or posterior flank above the iliac crest and below the costal margin (T10-L2) for monitoring or Renal sat (Rsat) levels within 48 hours of birth by one of the NICU

shift manager RNs.
- Application of regional NIRS neonatal probe to the central forehead for measurement of cerebral saturation (Csat) by one of the NICU shift manager RNs.

(Rationale for having shift manager RN's place mepitel and sensor: this small group of shift manager RNs will be trained to appropriately place the sensor and they are the skin experts for the NICU. They have the most expertise in applying skin protectants like mepitel and also have expertice in applying skin monitors and sensors like neonatal EKG probes and pulse oximiters which are similar to the neonatal NIRS probes to be used in this study)

Monitoring of Probe Site
- Each neonate will have the area surrounding the mepitel and probe assessed daily for erythema or skin changes by the RN taking care of that baby.

Measurement of Rsat and Csat
- Rsat and Csat levels will be measured continuously for the first 7 days of age
- Sensors will be used for as long as a value returns without signal degradation (average 4 days)
- Clinicians will be blinded to the saturation values

Record Review
- Medical records will be reviewied for neonatal, perinatal, and maternal demographics. Vital sign infromation, labs, medications and imaging results will also be recorded. This data will be used to correlate NIRS values to a variety of perinatal and neonatal factors: vitals, labs, medications, hospitiliztaion events, imaging studies. This data will hopefully inform future research on possible interventions to improve NIRS values in subsequent populations of preterm neonates.

12.6 What is the anticipated DURATION of your project or study?

12-18 months depending on subject recruitment

12.7 * Does your research involve biospecimen collection?

○ Yes ◉ No

12.8 Does your research involve extracting and storing data from medical records?

◉ Yes ○ No

13.0 Record Review Details

13.1 Enter the date range for the data you plan to collect (e.g. 1/1/2010 - 12/31/2015).

From:

01/01/2018

To:

12/31/2018

13.2 How many records do you plan to access at UnityPoint Health - Meriter?

60

13.3 Will you be using records from other institutions?

○ Yes ◉ No

In the text box below, list the institutions for all the records you plan to use. Give the approximate number of records from each institution.

For Example:

- 100 records from the Wisconsin State Department of Health and Human Services
- 50 Records from UW Hospital and Clinics
- 500 records from Marshfield Clinic

13.4 Does your record review research involve matching subject data from more than one medical record system?

○ Yes ◉ No

If YES, list the medical record systems involved and explain the methods you will use to match subject data.

13.5 Will the data collected be used for purposes other than those described in this application?

○ Yes ◉ No

◉ Yes ○ No

14.0 Record Review Support Documents

14.1 Data Research Summary Form

MANDATORY - You must complete and upload this form to your submission.

- Get the **Data Research Summary Form** **HERE**.
- **Download** the form to your computer.
- **Complete** the form, following the instructions on the lower left tab in the excel workbook. Put a version number and date in the top left cell (A1). This should match what you enter in the iRIS upload screen.
- **Add** the completed form later in the Initial Review Submission Packet in the Other Study Documents section.

14.2 Health Information Management Endorsement

Will subjects sign a consent document that allows you to access their records for research purposes?

◉ Yes ○ No

If you answered NO above, follow the MANDATORY directions below.

MANDATORY for access to Meriter-UnityPoint Health Records **for RESEARCH purposes** without subjects' consent.

- Get the **Patient Records Endorsement Form** **HERE**.
- **Download** the form to your computer.
- **Complete** the form following the instructions on page 1.
- **Add** the completed **signed** form later in the Initial Review Submission Packet in the Other Study

Documents section.

14.3 DATA SECURITY for Non-employees

Are you a UnityPoint Health - Meriter employee?

HINT: If your paycheck doesn't come from a UnityPoint Health entity, you are not an employee.

○ Yes ◉ No

If you answered NO above, follow the MANDATORY directions below.

MANDATORY for those **not** employed by a UnityPoint Health entity.
If you plan to store study data that inlcudes patient identifiers on a non-Meriter server or a non-Meriter device, your plan must be endorsed by the UnityPoint Health - Meriter IT Security Officer.

- Get the **Electronic Data Security Endorsement** **HERE**.
- **Download** the form to your computer.
- **Complete** the form, following the directions at the top of the page.
- **Send** the **Electronic Data Security Endorsement** (requires signature) with the **Data Research Summary** form to the **IT Security Officer** for signature.
- **Add** the completed **signed** form later in the Initial Review Submission Packet in the Other Documents section.

15.0 Study Population

15.1 * Age

Select all that apply:

☑ 0-6 (parental consent only)
☐ 7-11 (Requires child's assent plus parental permission)
☐ 12-17 (Requires consent plus parental permission)
☐ 18+ (Requires consent only)

Enter the specific age range for study population (if overlap or specific within a category):

0.00

to

1.00

◉ months
○ years

15.2 * Gender

○ Male
○ Female
◉ Both male and female

15.3 Is any racial/ethnic group excluded?

○ Yes ◉ No

15.4 * What is the number of participants, biological samples, or records you are planning to enroll or review at UnityPoint Health - Meriter?

60

If necessary, provide explanation below:

15.5 * What is the number of participants, biological specimens, or records that will be enrolled or reviewed at all sites?

60

If necessary, provide explanation below:

15.6 * Justification for the number of subjects, specimens or records required. Include information about the statistical analysis of your data.

Study Population:
In order to have the ability to identify a difference of renal NIRS in preterm patients with AKI and preterm patients without AKI, a total of 60 patients will need to be enrolled. At the time of enrollment all subjects will be 'normal' without evidence of AKI. The majority of these patients will likely end up to be preterm patients without AKI given an average rate of AKI in the first week of life of 15%. However, with only 9 patients in the AKI group and 51 in the no AKI group, we will have the statistical power necessary to detect a 10 point renal NIRS difference in these groups.

Statistical Power calculation:
renal NIRS average for AKI group = 60
renal NIRS average for non-AKI group = 70

Standard deviation for AKI group = 10
Standard deviation for non-AKI group = 10

5% alpha
50% beta

Power calculation for the above would require at least 5 patients in each group.

With a rate of AKI of 15%, out of 60 patients there would be 9 in the AKI group and 51 in the no AKI group.

15.7 Are vulnerable populations the primary subjects of this study?

(•) Yes ( ) No

- [ ] Pregnant Women
- [ ] Embryos or Fetuses
- [x] Neonates/Children/Minors
- [ ] Adults who cannot consent for themsleves and who require consent by a legally authorized representative.
- [ ] Economically or educationally disadvantaged persons
- [ ] Limited or non-readers
- [ ] Subjects who have status relationship with investigator, research site, or sponsor (i.e. employees, students, etc.)
- [ ] Prisoners
- [ ] Institutionalized people (e.g. nursing home residents)

☐ Others vulnerable to coercion.

If other, please explain below:

15.8 * List Subject Inclusion Criteria

Order Number	Criteria
1	Admission to Meriter NICU < 48 hours of age
2	Birth prior to 32 weeks gestational age
3	renal NIRS applied within 48 hours of birth

15.9 * List Subject Exclusion Criteria

Click the **bar** below. Click **Add New Criteria** button.List the criteria one statement at a time, clicking the SAVE button each time.

Order Number	Criteria
1	Congenital abnormalitiy of the kidney or urinary tract (CAKUT)

15.10 Provide justification for inclusion or exclusion of any group (gender, race, or other):

16.0 Methodology

16.1 Specify the activities, procedures or tests that are being performed solely to screen for study eligibility. At the end of each paragraph hit Enter. Then hit Shift + Enter.

Each morning the shift manager will evaluate the NICU census for patients meeting inclusion criteria. If eligible, the family will be approached by a member of the NICU team caring for the patient (NICU attending, NICU fellow, NICU advanced practice provider, RN shift manager, NICU RN caring for the patient) to see if they are interested in hearing about a research study. If the family is interested, the PI (Matthew Harer) will be contacted. If the PI is available for the consent process he will perform the consent. If he is unavailable (out of town, busy taking care of patients), one of the NICU MD Fellows will perform the consent process. If either the PI or the Fellow MD is busy taking care of patients this will take priority over getting consent for the research study.

The plan is for recruitment to occur 7 days a week. There may be times when neither the PI or a NICU fellow will be available to consent eligible patients.

16.2 Help us understand what part of your project is research and what part is standard clinical care. At the end of each paragraph hit Enter. Then hit Shift + Enter.

With regards to < 32 week preterm infants admitted to the NICU and monitoring of renal function the current standard of care is:
1. Monitoring of urine output for the first week at least
2. Intermittent checking of serum creatinine dependent on severity of illness (range of creatinine checks from 1-7 in the first 7 days)

Renal and cerebral NIRS monitoring for 7 days with the forehead and flank sensors.

16.3 Identify study team members who will be intervening or interacting with subjects (e.g. administering surveys, conducting physical interventions, etc.) if applicable. Click the drop down arrow in the first column and select study personnel.

Key Study Personnel Name	Key Study Personnel's Role in Research
Harer, Matthew, MD	Family consent, set-up of monitor, trouble shooting.

- Following grant funding, I plan to add the Neonatology Fellow MDs to the protocol. They will be involved in presenting the research project to the families and obtaining informed consent.
- The day shift manager RNs will be involved in placing the probes and mepitel on the infants.

16.4 * Will interviews, questionnaires and/or surveys be part of the study?

○ Yes ◉ No

17.0 Risks & Benefits

17.1 Check all the possible risks to participants.

- ☐ Loss of Privacy - see HELP Bubble in right panel for definition.
- ☑ Breach of Confidentiality - see HELP Bubble in right panel for definition.
- ☑ Physical harm.
- ☐ Psychological harm.
- ☐ Other

17.2 Check all the methods below that tell how you will minimize the risks identified above. Refer to the HELP Bubble in the right panel for UnityPoint Health - Meriter Security Requirements for Protected Health Information (PHI).

- ☐ Use of drapes or barriers for subjects who must disrobe.
- ☐ Research interviews and interventions are conducted in a private room.
- ☑ Collection of sensitive information about subjects is limited to the amount necessary to achieve the aims of the research, so that no unneeded sensitive information is collected.
- ☐ Paper based records will be kept in a secure UnityPoint Health - Meriter location and only be accessible to personnel involved in the study.
- ☑ Electronic and digital files will be stored and accessed in accordance with the UnityPoint Health - Meriter Privacy and Security Requirements - see HELP Bubble in right panel.
- ☑ Whenever feasible, identifers will be removed from study-related information.
- ☐ Audio and/or video recordings of subjects will be transcribed and then destroyed to eliminate audible or visual identification of subjects.
- ☐ Counseling will be offered to subjects who are distressed from the research intervention.
- ☐ Use of a code list. The code list links de-identified patient/subject data to a patient's identity. For example, in medical record research, each study record representing a subject's information will be assigned a study number. The code list will link study numbers to medical record numbers. Researchers use a code list to enable verifying data.
- ☐ Other

To avoid physical harm a barrier (mepitel gel gauze) will be placed between the skin and probe sensor and the site monitored daily.

17.3 Identify components of your plan to identify and address unanticipated problems or complications.

- ☑ Regular meetings with research staff to identify unanticipated problems.
- ☑ Monitoring subject results/outcomes.
- ☑ Monitoring data entry procedures for breaches of confidentiality.
- ☑ Reporting all unanticipated problems to the IRB within 5 working days.
- ☑ Complying with IRB requests to resolve unanticipated problems.
- ☐ Other

17.4 What type of facility is the local site(s)?

- ☐ Outpatient Clinic
- ☑ Hospital
- ☐ Other

17.5 What resources are available at the local site(s) to treat emergencies resulting from study-related procedures?

- [x] BLS trained personnel.
- [ ] ACLS trained personnel and crash cart.
- [x] NRP and/or PALS trained personnel.
- [ ] Emergency supplies to stabilize subject until emergency personnel arrive.
- [ ] Emergency Response Team within facility.
- [ ] Call 911
- [x] Other: Specify below.
- [ ] Not Applicable

Patient will be in an ICU

17.6 *Is there potential for direct benefit to the subject?

○ Yes ◉ No

17.7 *Describe how your research may benefit a future patient group or society as a whole.

Future benefits to a similar patient group would be able to detect acute kidney injury as it occurs with renal NIRS and change treatments to either prevent it from occuring or decrease the severity. This is not currently possible because urine output and creatinine changes occur several hours to days after the kidney injury. This may then result in improved long term kidney function for these preterm infants.

18.0 Investigator Details

18.1 For this protocol, will the Prinicipal Investigator supervise study staff or study sites that will not be under the purview of this IRB?

○ Yes
◉ No

Summary of PI's Responsibilities for This Protocol
How many research staff will the Prinicipal Investigator supervise that are not listed on this protocol?
List each of the other sites where you will be doing this protocol and how many subjects are targeted for enrollment at each site.

18.2 Does the Principal Investigator have other human subject research projects besides this one?

○ Yes ◉ No

Principal Investigator's Other Research Responsibilities
How many open studies does the PI have?
How many other sites do you conduct research at?
How many research staff do you supervise for your other protocols?
How many active subjects do you have on other protocols?

19.0 Recruitment and Advertising

19.1 Check any of the following methods that you will use to recruit subjects.

- [x] Direct contact in a medical setting
- [ ] Direct contact in a non-medical setting
- [ ] Advertising – Includes flyers, brochures, other print media, radio, TV, internet, etc.
- [ ] Referrals
- [ ] Letter
- [ ] Other

If OTHER, please describe below.

19.2 * Does your study use recruitment materials such as flyers, brochures or advertisementing media?

○ Yes ◉ No

If YES . . .All recruitment materials must be approved by Meriter IRB before use. You will be prompted to attach your recruitment materials later when you submit your application.

19.3 * Identify study team members who will recruit subjects for this study? Click the drop down arrow to the right of the column. Select study personnel.

No records have been added.

Neonatal ICU Shift Manager RNs

20.0 Subject Payment & Research Costs

20.1 * Subject Payment Information

Will subjects be paid?

○ Yes ◉ No

If Subjects WILL BE PAID . . . Click on the bar below.
Copy and paste language from the consent document explaining the payment plan (amounts, visits that are paid, when payment will be made) in the text box.
Example: See **HELP Bubble** in the right panel.

20.2 * Will there be any costs to subjects associated with their participation in research?

○ Yes ◉ No

If so, please explain:

21.0 Consent Requirements

21.1 Which of the following will you be using for your research?

☐ WAIVER of CONSENT - Subjects are not asked for their consent
☐ WAIVER of DOCUMENTATION of CONSENT - Subjects receive, but do not sign, a consent or information sheet about the research.
☑ INFORMED CONSENT - Subject signs and keeps a copy of an informed consent document.

22.0 Consent Procedures

22.1 * Identify study team members who will conduct the consent discussion with the potential subject.
See the Help Bubble in the right panel for Soliciting Consent Requirements. Below, click the drop down arrow to the right of the column. Select study personnel.

Harer, Matthew, MD

22.2 * Where will the consent discussion take place?

- [x] In the patient's hospital room or clinic exam room at Meriter.
- [ ] In a hospital or clinic waiting room at Meriter.
- [ ] In a group setting.
- [ ] In a group setting with follow-up in a private room.
- [ ] Online, in public or over the phone.
- [ ] Other

22.3 * How will you be sure there is sufficient opportunity for the subject to consider whether to consent?

- [x] Potential subjects will be allowed to take home the unsigned consent form for consideration before signing. Taking the consent home is recommended unless the person is hospitalized.
- [x] Potential hospitalized subjects will be allowed a waiting period of at least 8 hours to consider their decision.
- [ ] Other

22.4 * Will non-English speaking people be asked to participate in this study?
See the HELP Bubble in the right panel for special consent requirements.

- ○ Yes
- ◉ No

22.5 * If you are enrolling non-English speaking subjects, you must have plans for: translating all subject materials including the consent document, and conducting the consent discussion in a language understandable to the subject, and having ongoing communication with the subject throughout the research and in case of emergency. Check all that apply below.

- [ ] After Meriter IRB approves my English language consent and subject materials, I will pay for an independent language translation of these materials. I will submit all translations with a certificate of translation to Meriter IRB.
- [ ] At least one member of the research team is a certified translator approved by Meriter Guest Services.
- [ ] The research team will use Meriter Hospital Interpreters from Guest Services. A letter of endorsement from Interpretive Services will be attached to this submission.
- [ ] The research team will hire an interpreter who has been approved by the Interpretive Coordinator at Meriter Guest Services. A letter of endorsement from Guest Services will be attached to this submission.
- [ ] Other plans for accomodating non-English speaking subjects.

22.6 * Will illiterate people be asked to participate in this study? See the HELP Bubble in the right panel for special consent requirements.

- ○ Yes
- ◉ No

22.7 * Will adults who can not consent for themselves be asked to participate in this study? See the HELP Bubble in the right panel for special consent requirements.

- ○ Yes
- ◉ No

22.8 * Will potential HIV carriers be asked to participate in this study? See the HELP Bubble in the righ panel for special consent requirements.

- ○ Yes
- ◉ No

22.9 If the study involves minors, describe the processs of parental permission and how the assent of the minor will be sought.

See the HELP Bubble in the right panel for special consent requirements.

The study is minimal risk and we will be seeking consent from one parent.

We will try to enroll babies who parents are minors. If the parents are emancipated minors we will seek their consent and if they are not, we will seek consent of the babies' parent's parent.

22.10 In case of injury, please explain who will pay for the treatment.

Meriter NICU

23.0 HIPAA Requirements

23.1 Which of the following are you using to comply with HIPAA? If you're not sure, click here for a quick guide.

- [x] HIPAA Authorization
- [x] Waiver of HIPAA Authorization
- [ ] Exempt from HIPAA - not looking at or recording any PHI

24.0 Waiver of Authorization (revised April 2016)

24.1 Select the identifiers you will be looking at or recording for study purposes.

Starred identifiers may be used as part of a limited data set.

- [x] Name
- [ ] Address (steet, city*, county, state*, zip code*)
- [ ] Telephone / Fax Numbers
- [ ] Social Security Number
- [x] Dates such as Birth Date*, Admission Date*, Discharge Date*, Date of Death, Other Date
- [ ] Ages greater tha 89 and all elements of dates indcative of such age.
- [ ] E-mail addresses / URLs
- [x] Medical Record Numbers (MRNs)
- [ ] Health Plan Beneficiary Numbers
- [ ] Account Numbers
- [ ] Certificate / License Numbers
- [ ] Vehicle Identifiers and Serial Numbers
- [ ] Device Identifiers and Serial Numbers
- [ ] Biometric Identifiers (e.g. finger or voice prints, full face photographic images)
- [x] Any other unique identifying number, characteristic or code.

24.2 List the specific health information you plan to collect for this study (i.e. specific lab values, BMI, gender, diabetes, etc.)

Screening NICU Census for potential research subjects:
- Name
- Birth Date
- Gestational Age
- Admission date to Meriter-UPH NICU

24.3 Will private health information with identifiers be disclosed to a party or parties outside of UnityPoint Health - Meriter?

○ Yes ◉ No

If YES, describe what data you'll be disclosing and to whom below.

24.4 Describe your plan to protect identifiers from improper user / disclosure.

A de-identified list will be used with a code list to the patient identifiers.

This will be stored on a secured department server.

24.5 Describe your plan to destroy identifiers at the earliest possible opportunity.

Once a patient from the NICU Census is identified as eligible, we will record their information in a de-identified list of eligible patients and keep a code list to the patient identifiers. If the patient is consented and becomes a subject in the study their information will be de-identified as discussed in previous sections. If a patient is eligible and not consented, the patient will be coded, and their identifiers kept in a coded list and at the completion of the study the patient identifiers will be discarded. It is important to keep the patient's information whom are eligible and not consented so that their demographics can be compared to the subjects who completed the study (often asked for during manuscript submission).

24.6 Explain why the research can not be practicably conducted without this waiver of authorization.

In order to determine which subjects meet inclusion criteria we need to be able to screen the NICU census list.

24.7 Federal Law prohibits the re-use or disclosure of Private Health Information (PHI) in connection with this research to any person or entity other than those authorized to receive it, except: as required by law; for authorized oversight of the research; or in connection with other research for which the HIPAA Privacy Rule permits the PHI to be used or disclosed. Do you agree to abide by these limitations in order to obtain a waiver of authorization?

(•) Agree ( ) Disagree

25.0 Authorization For Release of Medical Information For Research (HIPAA)

25.1 Complete the Authorization For Release of Medical Information for Research form.

1.
Click the name of the form above to open it.
2.
Complete the answers.
3.
Leave the subject name and signature lines blank.
4.
Save the form to your drive.
5.
You will be prompted in a later screen to attach this form to your submission.

26.0 Investigator Statement - Last Page in Study Application

26.1 * "I have discussed the protocol with all of my collaborators. The research is NOT underway and WILL NOT BEGIN until approved by the Meriter IRB."

(•) Agree ( ) Disagree