PROTOCOL TITLE:

The Role of Contrast Enhanced Ultrasound to Diagnose Children with Appendicitis

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VERSION NUMBER/DATE:

Protocol Version: 4.0 Protocol Date: July 20, 2020

REVISION HISTORY

Revision #	Version Date	Summary of Changes	Consent Change?
02	01/21/2019	Extend enrollment to 9-5 pm	N
03	06/04/2019	Extend enrollment to 24 hours/ day, 7 days per week	N
04	07/20/2020	Addition of e consent. Addition of MD to those who may administer Lumason	N

Table of Contents

1.0 Study Summary

Study Title	The Role of Contrast Enhanced Ultrasound to Diagnose Children with Appendicitis
Study Design	Single institution non-randomized clinical trial
Primary Objective	Determine the efficacy of contrast enhanced ultrasound (CEUS) in improving the diagnosis of acute appendicitis in children
Secondary Objective(s)	• Utility of CEUS in making a definitive diagnosis of acute appendicitis • Utility of CEUS in decreasing Rates of CT scan utilization • Outcomes of patients who undergo CEUS for appendicitis • Negative appendectomy rates • Costs
Research Intervention(s)/ Investigational Agent(s)	Lumason (sulfur hexafluoride lipid-type A microspheres) injectable suspension
IND/IDE #	N/A
Study Population	Children between the ages of 8 and 17
Sample Size	250 subjects
Study Duration for Individual Participants	30-60 minutes
Study Specific Abbreviations/ Definitions	CEUS- contrast enhanced ultra sound CT- computed tomography MRI- magnetic resonance imaging CMH- Children's Mercy Hospital DSDR- Department of Surgery Data Repository DOB- date of birth MRN- medical record number OSH- outside hospital PAS- pediatric appendicitis score LAR- legally authorized representative IV- intravenous PI-principal investigator ICU- intensive care unit P/A- permission/assent ED Emergency Department

2.0 Objectives

2.1 The main objective of this study is to determine the efficacy of Contrast Enhanced Ultrasound (CEUS) in improving the diagnoses of acute appendicitis in children.

2.2 We hypothesize that CEUS can be used effectively to make a definitive diagnosis when gray-scale ultrasound is inconclusive.

3.0 Background

3.1 Pediatric appendicitis represents the most common pediatric abdominal surgical disease with the highest incidence found in children aged ten to 19years old (1). The diagnosis of appendicitis commonly consists of a thorough history, physical exam and laboratory evaluation along with diagnostic imaging. With both a high sensitivity and specificity, CT scan remains the most commonly used imaging modality for diagnosis (2). With reports in the literature showing the adverse effects of radiation exposure in children from computed tomography (CT) imaging (3, 4), alternative methods to diagnose acute appendicitis have been applied including Magnetic Resonance Imaging (MRI) (4) and ultrasound (US). MRI eliminates ionizing radiation when compared to CT however, its widespread use is limited due to its high cost, limited availability and the potential need for sedation in young children. Trans-abdominal ultrasound is widely available and also eliminates ionizing radiation but is user dependent. The utilization of CEUS to enhance the diagnostic capabilities for appendicitis is a novel alternative to CT imaging.

3.2 A recent report in the literature demonstrates the effective use of CEUS to evaluate blunt solid organ injuries in children with abdominal trauma (5).

In Europe, CEUS using SonoVue, the European brand-name for Lumason, has been used clinically for more than a decade, reported mainly in adults. Valentino, et al. published results of a prospective study performed in Italy comparing the sensitivity and specificity of ultrasound and CEUS to abdominal/pelvis CT with IV contrast. A total of 27 patients were prospectively studied and they found CEUS to have a 92.9% sensitivity, 100% specificity, 100% positive predictive value (PPV) and 93.8% negative predictive value (NPV) compared to CT (6). Valentino published a subsequent study of 133 adult trauma patients with blunt abdominal solid organ injury on CT who underwent CEUS and found 96.4% sensitivity, 98% specificity, 98.8% PPV and 94% NPV (7) compared to CT.

Lumason is now FDA-approved for echocardiography in adults, characterization of liver lesions in both the adult and pediatric population, and vesicoureteral reflux in pediatrics.

3.3 The potential use of CEUS to diagnose pediatric appendicitis remains unknown. The goal of this trial is to determine the utility of

CEUS to enhance diagnostic capabilities in children with suspected appendicitis. We hope that our study will give physicians an added diagnostic tool for children with abdominal pain.

4.0 Study Endpoints

4.1 The primary endpoint is the proportion of patients for whom the appendix is enhanced by CEUS when using the same diagnostic criteria as gray scale ultrasound. Lumason will be considered effective if the sensitivity of grayscale ultrasound is enhanced in more than 50% of images as determined by the blinded interpreting pediatric radiologist.

Secondary endpoints include:

•Utility of CEUS in making a definitive diagnosis of acute appendicitis

•Utility of CEUS in decreasing rates of CT scan utilization

•Negative appendectomy rates

5.0 Study Intervention/Investigational Agent

5.1 Lumason (sulfur hexafluoride lipid-type A microspheres) for injectable suspension is used to prepare the ultrasound contrast agent. The single use kit contains the following three items:

- One clear glass 10mL vial containing 25mg of lyophilized powder lipid-type A, 60.7 mg of sulfur hexafluoride gas and capped with a blue flip-cap
- One prefilled syringe containing 5 mL Sodium Chloride 0.9% Injection, USP (Diluent)
- One Mini-Spike

Each vial is formulated as a 25 mg sterile, pyrogen-free lyophilized powder containing 24.56 mg of polyethylene glycol 4000, 0.19 mg of distearoylphosphatidyl-choline (DSPC), 0.19 mg of dipalmitoylphosphatidylglycerol sodium (DPPG-Na) and 0.04 mg of palmitic acid. The headspace of each vial contains 6.07 mg/mL (± 2 %) sulfur hexafluoride, SF6, or 60.7 mg per vial.

Each prefilled syringe with 5 mL of diluent 0.9% Sodium Chloride Injection is sterile, nonpyrogenic, preservative free containing 9 mg sodium chloride per mL.

Upon reconstitution with 5mL diluent, Lumason is a milky white, homogeneous suspension containing sulfur hexafluoride lipid-type A microspheres. The suspension is isotonic and has a pH of 4.5 to 7.5; it is only for intravenous administration.

The sulfur hexafluoride lipid microspheres are composed of SF6 gas in the core surrounded by an outer shell monolayer of phospholipids consisting DSPC and DPPG-Na with palmitic acid as a stabilizer. Sulfur hexafluoride has a molecular weight of 145.9. Each milliliter of reconstituted Lumason suspension contains 1.5 to 5.6 x108 microspheres, 68 mcg SF6 (12 mcL), 0.038 mg DSPC, 0.038 mg DPPG-Na, 4.91 mg polyethylene glycol 4000 and 0.008 mg palmitic acid. The sulfur hexafluoride associated with the microspheres suspension is 45 mcg/mL. Fifteen to twenty three percent of the total lipids in the suspension are associated with the microspheres. The sulfur hexafluoride lipid microsphere characteristics are listed in Table 2:

Microsphere Characteristics	
Mean diameter range	1.5 – 2.5 μm
Percent of microspheres	≤ 10 μm ≥ 99%
Upper size limit	100.0% ≤ 20 μm

5.2 The control drug used in this protocol will follow the established, approved, approved organization SOP entitled Investigational Drug Service Product Storage.

5.3 N/A

6.0 Procedures Involved

6.1 This will be a single-center non-randomized trial that will add to our institution's current diagnostic algorithm one CEUS to subjects whom are clinically suspicious for acute appendicitis. Currently, a gray-scale abdominal ultrasound is performed to help establish the diagnosis. When the results of the gray-scale abdominal ultrasound are inconclusive, the treating physician may choose to refer the patient for a CT scan in order to establish a definitive diagnosis. Our study does not look to alter that process.

6.2 For those who consent to study participation, we propose obtaining a CEUS after the initial gray-scale ultrasound. Once the initial ultrasound is complete, the contrast Lumason® (sulfur hexafluoride lipid type-A microspheres) will be administered through an already existing IV catheter by an MD, RN or a radiology technologist trained and certified to administer the Lumason® contrast agent, and

an abdominal scan will be completed. The patient will then continue with standard of care treatment per his treating physician. The CEUS image will be read at a future time by a CMH radiologist blinded to the results of the gray scale ultrasound and CT if one was obtained as these will be used for comparison.

6.3

- Lumason will be administered by radiology personnel (radiologist, US technologist, or Sedation RN). Subjects will be monitored during the entirety of the procedure. Once the study procedure has been completed, patients will continue to go through the standard of care process and return to the ED (Emergency Department) or floor while they await the results of their gray-scale ultrasound and CT, if one was obtained. ED/ floor staff will continue to monitor patients for any adverse events.
- Lumason (sulfur hexafluoride lipid-type A microspheres) is the investigational product. The recommended dose of Lumason for children is 0.03 mL/kg up to a maximum dose of 2.4mL injected into a peripheral intravenous catheter. See individualization of dose below.

  1. Follow the Lumason injection with a flush of 5 ml of 0.9% Sodium Chloride Injection, USP.

  2. The maximum total dose for children as listed in the package insert should not exceed 2.4 mL in any 10-minute period. For this study, over any 10-minute period we intend to administer the approved dose of 0.03 mL/kg up to a maximum of 2.4 mL.

  3. The maximum total dose for children as listed in the package insert should not exceed 4.8 mL in any one patient during the full time on study. In this study, we intend to administer a total dose in any one patient during the full time on study of 0.06 mL/kg with a maximal dose of 4.8 mL.

6.4 Data extracted from the electronic medical record will be entered into a secure REDCap database and stored in a password protected file on the CMH network. A master list containing only the assigned study ID and linking MRN will be kept in a separate REDCap instrument. All electronic files will be kept on the secure password-protected computers of the research staff and principal investigator.

Data points to be collected include the following: demographics, findings on radiology imaging (US, CEUS, and CT if applicable),

pathology, intraoperative findings, other/ comments. Reports of headache, nausea, altered taste, injection site reaction, feeling hot/ flushed, chest pain, or dizziness will also be recorded.

6.5 N/A

6.6 N/A

7.0 Data and Specimen Banking

7.1 N/A

7.2 Participants who enroll in this study will be given the opportunity to have their de-identified data rolled into the Department of Surgery Data Repository (DSDR) IRB# 18020079. We will continue to protect and safeguard study data under the provisions of the DSDR.

7.3 N/A

7.4 N/A

7.5 N/A

8.0 Genetic Analysis Information

N/A

9.0 Sharing of Results with Subjects

N/A

10.0 Study Timelines

- An individual subject's participation in the study will comprise of one study procedure (contrast enhanced ultrasound will take 10 to 20 minutes total) we anticipate study duration will take approximately 30-60 minutes in length. Additionally data generating from SOC will obtained from chart.
- Assuming an accrual rate of 15-20 subjects per month, we estimate enrollment will take 12-15 months to enroll 250 subjects.
- The Approximate study end date will be 3 years after IRB approval.

11.0 Inclusion and Exclusion Criteria

Inclusion Criteria

- Present to Children's Mercy Adele Hall campus with a clinical concern for acute appendicitis
- Age 8 through 17 years
- seen between IRB approval date and 12/31/2020
- Has had an IV catheter placed as part of their standard of care

Exclusion Criteria

- Known cardiac abnormality
- Pulmonary hypertension
- Known sensitivity to sulfur hexafluoride, polyethylene glycol 4000, distearoylphosphatidylcholine (DSPC), dipalmitoylphosphatidylglycerol sodium (DPPG-Na), or palmitic acid
- Does not had an IV catheter placed
- Unable to roll over
- Unable to assent
- Pregnant
- Lactating
- Received an ultrasound image from an OSH

11.1 These patients will be excluded from the study

- Adults unable to consent
- Pregnant women
- Prisoners
- Wards of the state

12.0 Vulnerable Populations: Individuals who are not yet adults (infants, children, teenagers)

12.1 Adequate provisions have been made for soliciting the permission of parents or guardians as well as for soliciting the assent of children. Lumason is FDA approved for the use in the pediatric population to identify other abdominal abnormalities, specifically focal liver lesions The intervention presents an experience that is reasonably commensurate with that inherent in the subjects medical situation, and is likely to yield generalizable knowledge about the condition, which is of vital importance for the amelioration of pediatric appendicitis.

13.0 Local Number of Subjects

13.1 This study will enroll 250 subjects. Assuming an accrual rate of 15-20 subjects per month, we estimate it will take 12-15 months to complete enrollment.

13.2 Based on prior data, approximately 375 children are diagnosed with appendicitis at our institution per year. We plan to screen up to 750 potential subjects for eligibility over the course of the study.

14.0 Screening and Recruitment Methods

14.1 Potential subjects will be recruited in their hospital room, ED, or radiology department by a member of the general surgery team. Per standard of care, the general surgery team will be alerted by the emergency department when

a patient presents with concern for acute appendicitis. The general surgery staff will screen for eligibility criteria. Those meeting all inclusion and no exclusion criteria will be invited to participate. PAC will be obtained on either a paper or electronic form.

14.2 The source of subjects will be the CMH Adele Hall campus emergency department.

14.3 Potential subjects will be identified when, per standard of care, the general surgery team is alerted by emergency department staff of a patient presents with concern for acute appendicitis. The general surgery staff will screen for eligibility criteria. Those meeting all inclusion and no exclusion criteria will be invited to participate.

14.4 A pre-screening log will be maintained for the purpose of tracking enrollment. Patients who are referred to the department of surgery for concern of acute appendicitis will have the date of referral, DOB, MRN, PAS, whether or not they met inclusion, were approached for participation and their choice to participate recorded on the pre-screen log. We are requesting a Waiver of HIPAA Authorization for recruitment purposes only. The PHI recorded on the screening log will help ensure required reporting elements at time of study publication, including the percentage of eligible patients enrolled and reasons patients decline enrollment. The pre-screen log will be destroyed at the conclusion of the study.

14.5 N/A

14.6 N/A

15.0 Reimbursement, Payment and Tangible Property provided to subjects

N/A

16.0 Withdrawal of Subjects

16.1 As this study consists of a one-time intervention, we do not anticipate any circumstance in which a subject will be withdrawn without their consent.

16.2 Subjects may choose to discontinue study participation at any time, for any reason, specified or unspecified, and without prejudice. Subjects may be discontinued from the study for any of the following reasons:

- At the subject's or their parent's/LAR's request
- At the discretion of the site investigator as deemed appropriate for any reason

Procedures for orderly termination will include a discussion with the parents or LAR for the reasons behind early termination.

16.3 If a subject withdraws from the research study, data that has already been collected may still be used; however, no new information will be collected except information related to adverse events or other safety issues.

17.0 Risks to Subjects

17.1 As part of SOC, all patients enrolling in this study will have at least one functioning intravenous catheter placed during the SOC blood draw, hence no new IV access will be required. We expect that there may be some mild discomfort related to the performance of the ultrasound study itself and will monitor for this. Other than the discomfort from the ultrasound probe, we do not expect any other ultrasound-related discomfort. Patients will be monitored by licensed personnel during the study interval. Per standard of care, patients will return to the ED while the results of their gray scale ultrasound and CT, if one was taken, are obtained. ED staff will continue to monitor patients for any adverse event.

Reported risks related to Lumason administration include:

Adverse Reaction	Number	(%)
Any Adverse Reaction	340	5
Headache	65	1
Nausea	37	0.5
Dysgeusia	29	0.4
Injection site pain	23	0.3
Feeling hot	18	0.3
Chest discomfort	17	0.2
Chest pain	12	0.2
Dizziness	11	0.2
Injection site warmth	11	0.2

Serious cardiopulmonary reactions, including fatalities, have occurred uncommonly in adults during or shortly following administration of ultrasound contrast agents, including Lumason. These reactions typically occurred within 30 minutes of administration. Hypersensitivity reactions such as skin erythema, rash, urticaria, flushing, throat tightness, dyspnea, or anaphylactic shock have uncommonly been observed following the injection of Lumason. The exclusion criteria eliminate any subjects with a known cardiac abnormality or a known sensitivity to sulfur hexafluoride, so we do not anticipate that these reactions will occur. Resuscitation personnel and equipment will be available during the study treatment and follow-up period.

17.2 This study poses a minor increase over minimal risk as Lumason will be used off-label, but the intervention presents an experience that is reasonably commensurate with those inherent to the subject's medical situation. The only risks attributable to the study are those

of the adverse reactions listed above, as these patients will have already had an IV placed, and would have ultrasound as part of their appendicitis workup. Furthermore, Lumason is currently FDA approved, and in use at CMH, for other abdominal CEUS applications such liver lesions and vesicoureteral reflux in pediatrics.

17.3 N/A

17.4 N/A

17.5 N/A

18.0 Potential Benefits to Subjects

18.1 There is some possibility of potential benefit to subjects participating in this research. Although Lumason is not yet approved for use in diagnosing appendicitis, it is possible that the improved quality of US images produced will provide better information to providers treating these patients. It is also possible that the improved quality imaging could result in incidental findings, such as abdominal anomalies other than appendicitis. If such anomalies are found, the investigator could recommend to parents to follow up with appropriate services.

19.0 Investigator Assessment of Risk/Benefits Ratio: (IRB makes the final determination)

Select as applicable:	**Pediatric Risk Category:**	
	Category 1	Research not involving greater than minimal risk (45 CFR §46.404 and 21 CFR §50.51)
X	Category 2	Research involving greater than minimal risk but presenting the prospect of direct benefit to the individual subjects. (45 CFR §46.405 and 21 CFR §50.52)
	Category 3	Research involving greater than minimal risk and no prospect of direct benefit to individual subjects, but likely to yield generalizable knowledge about the subject's disorder or condition. (45 CFR §46.406 and 21 CFR §50.53)
	Category 4	Research not otherwise approvable which presents an opportunity to understand, prevent, or alleviate a serious problem affecting the health or welfare of children. (45 CFR §46.407 and 21 CFR §50.54)
Select if applicable:	**Adult Risk Category:**	
	Not Greater than Minimal Risk	
	Greater than Minimal Risk	

20.0 Data Management and Confidentiality

20.1 The captured CEUS images will be evaluated by a single Children's Mercy Hospital pediatric radiologist to determine and establish a pattern compared to the standard gray scale ultrasound report. This radiologist will be blinded to the final reads from the gray scale reports. For the children who meet the criteria of appendicitis, they will be followed post-operatively to confirm and correlate the intra-operative findings with the gray scale read.

Descriptive analysis of demographics and patient-level data will be performed using STATA. Direct comparisons will be made with parametric or nonparametric measures depending on the distribution of the data.

20.2 This study will be made up of a convenience sampling of children presenting to the CMH Adele Hall emergency department with concerns for appendicitis. Enrollment will consist of up to 250 participants.

20.3 All data will be entered into a REDCap database that is accessible only to researchers named on the study. Data will be stored on the CMH secure network. The list of chart identifiers which meet inclusion criteria along with dates of birth will be maintained separately from data that will be used for analysis. Each chart will be reviewed by research staff and data entered directly into the research records. The researchers alone will have full access to the data; we will assign a study ID to the medical records in order that we can reference our information during the course of our research. A master list linking Study ID to MRN, Name and other identifiers will be kept separately from the study data, and accessible only to the study team.

20.4 N/A

20.5 All data will be entered into a REDCap database that is accessible only to researchers named on the study. Data will be stored on the CMH secure network. The list of chart identifiers which meet inclusion criteria along with dates of birth will be maintained separately from data that will be used for analysis. Each chart will be reviewed by research staff and data entered directly into the research records. The researchers alone will have full access to the data; we will assign a study ID to the medical records in order that we can reference our information during the course of our research. A master list linking Study ID to MRN and other identifiers will be kept separately from the study data, and accessible only to the study team.

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21.0 Provisions to Monitor the Data to Ensure the Safety of Subjects

This study proposes a one-time intervention of CEUS. Subjects will be monitored in real time at the time of and following the CEUS. Data collected will be evaluated after the first 10 subjects are enrolled.

- All data collected on subjects who receive study drug will be analyzed for safety. The proportion of patients with specific adverse events will be reported as well as the worst grade observed across all adverse events. The maximum confidence interval width for these estimates is 16.8%. If the observed estimated adverse event proportion is 10%, the 95% confidence interval is (5.3,15.6%).
- Safety information will be collected at the time of study visit when the patient is monitored during contrast administration.
- Safety data collection will begin with the first participant. Participants will be monitored in real time.
- The PI or an assigned co-investigator will be responsible for monitoring the data.
- Cumulative data will be reviewed on a weekly basis beginning with the first study participant.
- All data collected on subjects who receive study drug will be analyzed for safety. The proportion of patients with specific adverse events will be reported as well as the worst grade observed across all adverse events. The maximum confidence interval width for these estimates is 16.8%. If the observed estimated adverse event proportion is 10%, the 95% confidence interval is (5.3,15.6%).
- Any adverse event resulting from the contrast agent requiring an ICU admission will trigger an immediate suspension of the research.

22.0 Provisions to Protect the Privacy Interests of Subjects

22.1 Subject confidentiality and privacy will be maintained by recording only de-identified data onto the REDCap research record. A subject-specific ID will be assigned to each record. A linking master list will be created and kept in a separate REDCap data instrument.

22.2 During the informed consent process the purpose of the research study, study procedure, potential risks and societal benefits will be thoroughly explained to the subject and his/her parents or LAR. They will be given the opportunity to ask questions during the informed consent process and at any time during or after study participation.

22.3 The research team will access the patient's medical record in order to collect pertinent data points generated through clinical care. Only the minimum necessary data will be recorded in REDCap. The researchers alone will

have full access to the REDCap database. A subject-specific ID will be assigned to each record. A linking master list will be created and kept in a separate REDCap data instrument.

22.4 PHI to be accessed and/or recorded for this research study includes the following:

- names/initials- accessed
- dates- recorded
- medical record number-recorded
- hospital account number-recorded

22.5 HIPAA Authorization from subjects/parents to access and/or record PHI for this research study will be included within the permission/assent form(s).

23.0 Compensation for Research-Related Injury

23.1 Regular clinical review will minimize the risk of complications or harm as a result of study participation. In the event that an adverse event results from the study procedure, it will be reviewed by the principal investigator, reported to the IRB, and dealt with per institutional policy. Treatment will be available at CMH and will be provided at the usual charge. Payment for this treatment will be the participant's responsibility as this research study does not have funds set aside to pay research participants if the research results in harm or complications. The approved IRB P/A will include known possible adverse events of study participation as well as payment responsibility for any adverse event.

23.2 N/A.

24.0 Economic Burden to Subjects

24.1 There is no costs to patients for participating in this research study. Patients who agree to study participation will not be charged for the Lumason contrast agent nor for the CEUS. They will be charged for all standard of care procedures including the standard (non-contrast/ gray scale) ultrasound, and any other diagnostic workup and treatment for appendicitis they would receive whether or not they were enrolled in the study.

25.0 Permission/Assent/Consent Process

25.1 Permission/assent will be obtained on all subjects wishing to participate.

- The p/a process will take place in the ED at the patient's bedside.

- While eligible candidates will be given all necessary information to make an informed decision and will have every opportunity to ask questions, the waiting period available between informing the prospective subject and obtaining p/a will be limited as this study does not intend to delay standard of care treatment. A potential subject who has not affirmatively signed the p/a form prior to the standard gray scale ultrasound will continue through SOC treatment without prejudice.
- We will be following CMH research policies on informed consent.
- We will not be obtaining permission/assent via telephone as such is not feasible for this study.
- This pediatric research study will be conducted entirely in the state of Missouri and will involve enrolling minors under the age of 18.
- Parental permission will be obtained from one parent or LAR.
- Other than biological parents, LARs such as an adoptive parent will be allowed to consent for a child's participation in this study.
- Assent will be obtained from all children participating in this study unless the study team member attempting to obtain P/A determines the child is not cable of providing assent.
- The child's assent will be documented on the combined P/A form.
- In the event assent may not be obtained, the reason(s) will be documented in the provided section of the P/A form.

Consent at 18 years of age, when minor subjects become adults

We are requesting a Waiver of Consent at Age 18. Active participation of the subject will be concluded, as this is a single-visit ultrasound study. Data collection will be completed before the subject turns 18. Data analysis might continue after some subjects have turned 18, but this is explained in the Permission/Assent form they would have signed at the time of enrollment. Furthermore, re-consenting at age 18 would be impracticable for this study, as these subjects will be emergency appendicitis patients at CMH, and most will be unlikely to return for follow up appointments after reaching 18.

Waiver or Alteration of Parental Permission or Child Assent Process (permission and/or assent will not be obtained, required information will not be disclosed, or the research involves deception)

N/A

Waiver or Alteration of Consent Process (consent will not be obtained, required information will not be disclosed, or the research involves deception)

N/A

Non-English Speaking Subjects

N/A

Cognitively Impaired Adults

N/A

Adults Unable to Consent

N/A

26.0 Process to Document Permission/Assent/Consent

26.1 Study staff will be following CM Research Policy 10.04 Obtaining Permission/Assent/Consent.

26.2 N/A

26.3 N/A

27.0 Setting

27.1

- Study team members (specifically surgery fellows and attending's) will identify patients presenting to the CMH Adele Hall Emergency Department with concerns of appendicitis, and will approach patients/parents to recruit for the study.
- Ultrasounds will be performed in the Radiology department at CMH Adele Hall. Data will be collected by study team members at CMH Adele Hall Emergency, Radiology and Surgery departments.

28.0 Resources Available

28.1 Resources available to conduct this research study include the following:

- The research team anticipates access to approximately 375 potential subjects as prior data reveals 375 children are diagnosed with appendicitis at our institution each year.

- This study will take place entirely within CMH Adele Hall campus, specifically in the Emergency, Radiology and Surgery departments.
- The study will involve approximately 60 minutes of patient interaction. Data collection and review of aggregate data will continue while the project is ongoing.
- While it is not anticipated that subjects will need additional medical or psychological services as a result of participating in this study, care will be available at CMH and will be provided at the usual charge should the need arise.
- All study team members will have read the protocol and any standard operating procedures for the study. All study team members will have completed their required research trainings to conduct research at CMH and be knowledgeable of their duties and functions as evidenced by their signature in the study delegation log.

29.0 Multi-Site Research

N/A

30.0 International Research

N/A

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