Assessing Pulmonary Changes in HSCT

Status: RECRUITING

Eligibility Criteria

Sex: ALL
Age: 3 years and over
Healthy Volunteers: This study is also accepting healthy volunteers
Inclusion Criteria:

- Ages 3 years and older

Exclusion Criteria:

- Pregnancy or positive pregnancy test
- Baseline oximetry at MRI visit of less than 90% on room air or less than 90% on a previously prescribed dosage of oxygen delivered by nasal cannula. In some cases of cardiorespiratory disease, if the participant is referred to this research study by their treating physician and considered stable for imaging, the cardiorespiratory criteria will be 5% of their clinical baseline. This should be documented in the research record upon referral of a participant that meets this scenario.
- Any condition in the opinion of the investigator that would make the participant unable to tolerate the MRI procedure (e.g., neurocognitive delay, behavioral issues).
- Standard MRI exclusions (e.g., metal, incompatible implants).

Conditions & Interventions

Interventions:
DRUG: Hyperpolarized 129 Xenon
Conditions:
HSCT, Respiratory, Gas Exchange Impairment

More Information

Description:
This will be an un-blinded, open-label study of children and adults, including those who are being evaluated for or who have undergone HSCT, those with existing respiratory conditions and/or diagnosed gas-exchange impairment, and healthy control volunteers. The participants will be male or female between 3-17 years old (children) and adults age 18 and older. The study objective is to: * To optimize the acquisition of images reflecting the "dissolved-phase" Xe distribution in the pulmonary tissues and blood (Xe gas-exchange MRI). * To develop and test Xe MRI acquisition strategies that separately image alveolar airspace distribution (ventilation), as well as Xe dissolved in pulmonary tissues versus red blood cells (RBCs). * To acquire images of Xe ventilation and dissolved-phase Xe regional distribution in the enrolled participants. * To understand the same-day variability of Xe MRI techniques. * To determine the relationship between Xe MRI and clinical measures such as pulmonary-function-test (PFT) parameters or other biological biomarkers. * To develop and optimize strategies for Xe MRI in young children including those who are unable to follow the inhalation and breath-hold instructions typical of the Xe MRI procedure.

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