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### In-hospital Change in Lung Ultrasound Congestion Score Predicts Heart Failure Rehospitalization and Death: Implications for Clinical Trials.

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**OBJECTIVES/GOALS:** Lung Ultrasound Congestion Score (LUS-CS) is a proposed measure for guiding treatment in acute heart failure (AHF). An emergency department (ED) pilot trial of LUS-guided diuresis showed reduced LUS-CS at 48 hours but no difference at hospital discharge or for clinical outcomes. We hypothesized total change in LUS-CS would predict adverse outcomes. **METHODS/STUDY POPULATION:** This was a post-hoc secondary analysis of the BLUSHED-AHF trial. BLUSHED-AHF was a pilot trial in which AHF patients were randomized to a LUS-guided diuresis strategy vs. usual care in the ED. The intervention was stopped after the ED course (i.e. during hospitalization). BLUSHED-AHF was designed for the intervention to target absolute values of LUS-CS over time, rather than change in LUS-CS from each patient's baseline. We fit a cox regression model for a primary outcome of death or AHF rehospitalization, with total (ED to Hospital Discharge) change in LUS-CS as the primary predictor, adjusted for the Get-With-The-Guidelines heart failure risk score (GWTG). Survival curves were plotted, and hazard ratios calculated. **RESULTS/ANTICIPATED RESULTS:** 128 patients in BLUSHED-AHF were analyzed. Greater reduction in LUS-CS from ED to hospital discharge predicted event-free survival (HR = 0.74 for each 20 unit reduction in LUS-CS, 95%CI 0.56-0.99). This effect did not vary by hospitalization length or ED disposition. There was a significant interaction between change in LUS-CS and GWTG score (p  $< 0.05$ ). **DISCUSSION/SIGNIFICANCE:** LUS-CS total change, and not absolute values, predict adverse events in LUS-guided diuresis. Post-ED cessation of the intervention in BLUSHED-AHF may have precluded opportunity for clinical benefit. Future trials should run the entire hospital course, target change from baseline, and consider patient selection by AHF severity and initial LUS-CS.

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### Mandibular Advancement vs Home Treatment for Primary Snoring: A Randomized Trial

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**OBJECTIVES/GOALS:** The primary aim is to evaluate the efficacy of a Mandibular Advancement Device (MAD) vs conservative treatment for adults with non-apneic snoring, as measured by the sleeping partner. The secondary aim is to evaluate the effectiveness of treatment of snoring on the sleeping partner's sleep quality. **METHODS/STUDY POPULATION:** We plan to enroll 60 pairs of primary snorers and their sleeping partners in our randomized clinical trial. Snorers will be randomized to either 4 weeks of conservative therapy, consisting of nightly Mometasone nasal rinse, breathe-rite strips, mouth taping, and lateral positional therapy, or 4 weeks of Mandibular Advancement Device therapy (MAD). 30 pairs of snorers and their partners will be in each arm. At follow up the primary outcome measure, the Clinical Global Impression of Improvement Scale (CGI-I), will be assessed by the sleeping partner to evaluate the response to snoring treatment. **RESULTS/ANTICIPATED RESULTS:** To date, there is no study reporting the rate of response in participants using MAD in Primary

Snoring. Due to lack of preliminary data and effect size, we hypothesize that the rate of the responders in the MAD group will be 20% higher than the rate of responders in the active control group based on literature studies and preliminary results. A responder will be classified as someone whose sleeping partner rates on the CGI-I scale that the snoring was much improved or very much improved. MAD has been shown previously to be an effective therapy at treating sleep apnea and reducing snoring, and we anticipate it will continue to be so for patients who do not have sleep apnea. **DISCUSSION/SIGNIFICANCE:** Snoring is a nearly ubiquitous problem that prevents restful sleep for spouses of snorers, which is known to have detrimental health effects. Yet it does not have scientifically proven treatments. Our study will evaluate these treatments in an effort to improve the health of the sleeping partners.

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### Measuring Ocular Misalignment by Age at Space Center Houston to Inform Spaceflight Analysis\*

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**OBJECTIVES/GOALS:** We developed a non-invasive test of ocular alignment (OA) as a measure of otolith asymmetry, which impacts vestibular function. This test has also been administered on commercial astronauts to study the effect of microgravity on vestibular function. We will assess OA test performance in ground subjects, which has not yet been characterized. **METHODS/STUDY POPULATION:** Subjects were recruited from visitors to Space Center Houston from June to October 2022. Participants wore red-blue glasses in a darkened room and aligned two vertically or torsionally misaligned line segments, one red and one blue, on a tablet. Each subject underwent 11 vertical and torsional trials. The remaining misalignment was used to calculate ocular misalignment. Subjects self-reported demographic and health data. We calculated descriptive statistics and explored the distribution of overall vertical and torsional OA and distributions by age. Next steps will establish the reliability of the outcome measures with intraclass correlation coefficients and analyze associations between demographic variables and health status with OA performance using linear regression analysis. **RESULTS/ANTICIPATED RESULTS:** A total of 143 participants (67 female) with a median age of 21 (range 5-74 years old) completed OA testing. Of participants, 64% identified as white, 10% as black, 14% as Asian, 3% as Native American, and 8% as unknown. This test battery was feasible to implement in this mixed-age sample, with a 95% completion rate. Median absolute vertical OA was 0.08 degrees (IQR = 0.17 degrees), and median absolute torsional OA was 0.80 degrees (IQR = 1.20 degrees). Visual analysis of plots of OA by trial number reveals no apparent learning effect within subjects, though some individuals had considerable variation in performance. Average absolute vertical ocular misalignment increased modestly when plotted by age (fitted regression line  $b = 0.0032$  degrees per year of age,  $p = 0.004$ ), unadjusted for potential confounders. **DISCUSSION/SIGNIFICANCE:** Ocular alignment testing was feasible in a mixed-age general population sample. Our findings will expand understanding of how OA varies with age. These results will be used to create a normative database to compare and inform analysis of OA results from commercial spaceflights, which include individuals of varying age and health statuses.