

model. Ultimately, our goal is to establish whether the sensitivity of the bedside swallow examination can be augmented with the addition of an acoustic screen in humans. **METHODS/STUDY POPULATION:** Two excised canine larynges were used for laryngeal phonation simulations under six different conditions over 48 hours. Acoustic recordings were obtained while the larynges were in vibration at the phonation threshold pressure. Phonation was recorded under dry conditions and when the laryngeal introitus was covered with low viscosity glycerin (9.5cP) or high viscosity glycerin (950cP), as well as in adducted and abducted conditions. The latter mimics glottic insufficiency seen in presbylarynx or vocal fold paralysis. **RESULTS/ANTICIPATED RESULTS:** A total of 112 voice samples were generated and analyzed for pitch, sound pressure level (SPL), % shimmer, % jitter, relative average perturbation (RAP), and noise-to-harmonics using PRAAT software. A multivariate regression model showed that pitch, SPL, % shimmer, % jitter and RAP could significantly predict wetness in abducted conditions only. Could you please add numbers and p values? **DISCUSSION/SIGNIFICANCE OF IMPACT:** This pilot study indicates that classic acoustic perturbation measures distinguish the dry from the wet larynx only in glottic insufficiency condition in an ex vivo canine laryngeal model. Our next step is to study whether non-linear time series analysis and machine learning can differentiate dry and wet phonation in both adducted and abducted conditions in our animal model. **CONFLICT OF INTEREST DESCRIPTION:** Dr. Anais Rameau is a co-founder and Chief Executive Officer of MyophonX, a wearable device used to restore speech in patients with limited phonation capacity.

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Activity and Abundance of Mucus-degrading Microbes in Inflammatory Bowel Disease

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OBJECTIVES/GOALS: This study seeks to culture and characterize mucus-degrading microbes from the microbiome of inflammatory bowel disease (IBD) patients. **METHODS/STUDY POPULATION:** Stool will be collected from IBD patients and healthy first-degree relatives, then enriched for mucin-degrading microbes through growth on porcine rectal mucin. Dilution plating in both liquid and solid culture formats will be employed to isolate strains capable of growth on mucin. Cultures that are positive for mucin degradation will be identified with 16S rRNA sequencing; unique isolates will be genome sequenced and transcriptionally profiled on simple monosaccharides and mucin in order to identify putative mucin-degrading genes. The abundance of novel enzymes, pathways, and microbes will be compared in healthy and IBD patient populations using existing datasets in the literature. **RESULTS/ANTICIPATED RESULTS:** We expect to isolate previously uncultured mucin-degrading microbes, which will likely include new strains and possibly new species of bacteria. Through the transcriptomic characterization of mucin-degrading pathways, we will expand the lexicon of known mucin-degrading enzymes and pathways used by bacteria in the human colon. We expect mucin-degrading microbes to be more abundant and active in IBD patients compared to healthy controls. **DISCUSSION/SIGNIFICANCE OF IMPACT:** There is no cure for IBD and treatment relies heavily on suppressing a patient's immune system. This research seeks to understand the contribution of the gut

microbiota in the pathogenesis of IBD, which may lead to future therapeutic targets.

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Adaptation of Motor Action in Children with Hemiplegic Cerebral Palsy

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OBJECTIVES/GOALS: We study the association of adaptive decision-making, motor planning, and neuromuscular constraints, in children with hemiplegia. We examine how children scale motor decisions to body mechanics and the distance of a target while reaching in sitting/standing, and if they can recalibrate motor decisions to sudden changes in body mechanics. **METHODS/STUDY POPULATION:** Forty-five 6-12 year-olds with hemiplegia and 45 age/gender matched typically developing controls participate in clinical tests (i.e. balance, visual perceptual skills, etc.) and 3 experiments. Children "reach to tap" toward a target while sitting with both preferred and not preferred arms under three conditions: regular elbow extension sitting and standing and elbow extension range reduced by 50% via a splint while sitting. Trials are easy, ambiguous, and difficult. Motor decisions are compared to abilities and motion sensors (IMUs) worn at wrist, arm, sternum and lumbar area, record biomechanical strategies children use under different decisions. Synchronized video analysis presents biomechanical strategies under different decisions. **RESULTS/ANTICIPATED RESULTS:** Data collection is still underway. A mixed models analysis is used to compare 2 (group: hemiplegic/typically developing) X 2 (arms: healthy/impaired & dominant/non dominant) X 3 (difficulty levels) the children's decisions. Functional analysis is used to capture biomechanical strategies children use under different decisions and levels of difficulty. Exploration strategies are recorded relative to levels of difficulty. We will also compute correlations between affordance thresholds for all children and measures of sensation, range of motion, cognition and balance (in each posture). Lastly, a secondary analysis will compare behaviors of children with left/right hemisphere lesions, as they differ in spatial abilities. Preliminary results show that children with hemiplegia make errors with both their affected and unaffected side. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Motor deficits in children with hemiplegia are the primary focus of treatments. Motor learning interventions focus on biomechanical deficits. Results from these studies expand the focus to planning and cognitive control issues underlying motor deficits.

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An age-dependent, rescuable defect in intestinal barrier repair is associated with an immature enteric glial network in a neonatal pig model of intestinal ischemia

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OBJECTIVES/GOALS: An age-dependent restitution defect in our neonatal pig intestinal ischemia model is rescued by unknown factors within homogenized mucosa of weaned pigs. A postnatally