> 1 SMBP measure/day was 3 days/week. Women (n= 22, 88%) and Black participants (n= 15, 60%) were more likely to continue taking their home blood pressure measurements to End-of-Study (p=.002, p=.037, respectively). DISCUSSION/SIGNIFICANCE: This study provides the first data to support the potential of DASH as part of an effective community-implemented program for seniors and demonstrates the feasibility of implementing a multi-component intervention using existing congregate meal programs at senior centers that can reach minority and low-income communities.

## *Precision Medicine/Health*

292

### Fibromyalgianess and Glucocorticoid Persistence Among Patients with Rheumatoid Arthritis

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OBJECTIVES/GOALS: Over 30% of patients with rheumatoid arthritis (RA) exhibit fibromyalgianess, a symptom cluster associated with increased pain sensitivity. Up to half of RA patients use oral glucocorticoids (GCs) long-term despite their known, dose-dependent toxicity. We examined the association between fibromyalgianess and oral GC persistence in RA patients. METHODS/STUDY POPULATION: We used data from the Central Pain in Rheumatoid Arthritis (CPIRA) cohort to follow participants with active RA on oral prednisone who initiated a new disease-modifying anti-rheumatic drug. We measured fibromyalgianess using the Fibromyalgia Survey Questionnaire (FSQ), previously shown to correlate with key fibromyalgia features often superimposed upon RA. We stratified fibromyalgianess severity as follows: FSQ<8 low, 8-10 moderate, >10 high/very high. We defined GC persistence as GC use at 3 month followup visit. We assessed the association between baseline fibromyalgianess (exposure) and GC persistence at followup (outcome) using multiple logistic regression, adjusted for demographics, RA duration, serostatus, and inflammatory activity measured by swollen joint count and C reactive protein. RESULTS/ANTICIPATED RESULTS: Of 97 participants on prednisone at baseline, 65% were taking prednisone at follow-up. Fifty-seven percent of participants with low baseline fibromyalgianess had persistent GC use, compared to 84% with high or very high fibromyalgianess. After adjustment as outlined above, participants with high/very high baseline fibromyalgianess remained more likely to be on prednisone at follow-up, relative to those with low fibromyalgianess (OR 4.99 [95% CI 1.20 – 20.73]). DISCUSSION/SIGNIFICANCE: In this cohort of patients with active RA, high fibromyalgianess is associated with persistent GC use, independent of inflammatory activity. This finding suggests non-inflammatory pain related to fibromyalgianess may be misclassified as inflammatory pain related to RA disease activity.

297

### The Acute to Chronic Pain Signatures Program (A2CPS): Conceptual Design and Protocol Implementation of a Multi-site Observational Study Assessing Risk and Resilience Biomarkers

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OBJECTIVES/GOALS: The A2CPS was funded by the National Institutes of Health (NIH) Common Fund to identify biomarkers and their collective biosignatures (combination of several biomarkers) that predict susceptibility or resilience to the development of chronic pain. METHODS/STUDY POPULATION: The A2CPS includes 2-Multisite Clinical Centers (10 recruitment sites and 6 data collection sites), 1-Clinical Coordinating Center, 1-Data Integration and Resource Center, 3-Omics Data Generation Centers, and representation from the NIH. The A2CPS will recruit a large cohort from 2 different surgical interventions, total knee arthroplasty (n?1800) and thoracotomy (n?1800). This observational study will collect candidate and exploratory biomarkers across the following domains: clinical pain, fatigue, function, sleep, psychosocial, genomics, proteomics, metabolomics, lipidomics, pain sensitivity, and brain imaging. Data will be collected before and up to 3 months after surgery to determine factors that predict chronic pain at 6 months. RESULTS/ANTICIPATED RESULTS: Recruitment started in 2021 following standard operating procedures and is ongoing at both Multisite Clinical Centers. The A2CPS will provide an example of collaborative, multidisciplinary efforts in establishing a data repository consisting of biopsychosocial markers that will be available to the research community to test novel hypotheses. This presentation will describe the conceptual design, study aims, biomarker selection, protocol standardization and study implementation for the A2CPS. An update on study progress and data completeness will be presented. Final results will be reported after study completion which is anticipated by 2024. DISCUSSION/SIGNIFICANCE: Identifying biomarkers and biosignatures that predict high- versus low-risk for the transition to chronic pain will inform future clinical trials, identify novel therapeutic targets, and advance personalized pain treatment strategies; ultimately transforming the prevention and treatment of chronic postsurgical pain.

298

### Feasibility of A Dietary Sodium Reduction Intervention Using mHealth Technology to Improve Adherence in Hypertensive Patients

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OBJECTIVES/GOALS: Despite the large body of evidence concerning the effects of dietary interventions on blood pressure, trials have often reported poor adherence to sodium restriction. We implemented the Sodium Watcher Program-Hypertension (SWPH) program using digital self-monitoring. The purpose of this study was to determine the feasibility of the SWPH program. METHODS/STUDY POPULATION: The SWPH is a pilot two-arm, 2-month randomized controlled trial that enrolls adults with hypertension. The intervention group received personalized feedback on dietary

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sodium intake and BP and the control group participants received usual care for hypertension. Both groups participated in digital self-monitoring of daily diet and BP over 8 weeks. The primary outcomes were adherence to dietary sodium intake as captured by 24-hour urinary sodium excretion and BP at baseline and at the 2-month follow-up. Feasibility assessment included adherence to dietary sodium intake monitoring and in-home BP monitoring measured by the percentage of days that participant logged their food intake and in-home BP. The preliminary effect on the outcome variables was tested by using a repeated-measures analysis of variance. RESULTS/ANTICIPATED RESULTS: In this feasibility study, we included data from 12 participants (n=9 SWPH, n=3 control) who completed all phases of the study. The patients median age was 56.5 years and 70% were female. The mean baseline BP was 142.7/87.5 mmHg. The mean 24-hour urine sodium of 4853.0 mg (SD=1639.9 mg) with 80% having 24-hour urine sodium >2300 mg at baseline. SWPH group had lower systolic (baseline 142.4 mmHg vs follow-up 124.1 mmHg, p<0.001), diastolic (baseline 87.1 mmHg vs follow-up 77.5 mmHg, p<0.05) BP, and 24-hour urine sodium (baseline 3790.4 mg vs 2609.7 mg, p<0.05) compared with control group. Compared with the control group, the SWPH group had significantly more eligible days of digital food log usage (control 80.0% vs intervention 98.2%, p<0.01) and in-home BP monitor usage (control 77.6% vs intervention 94.6%, p<0.01). DISCUSSION/SIGNIFICANCE: Millions of Americans remain in need of effective interventions to manage their hypertension. Innovative and accessible strategies to sustain a low sodium diet intervention are needed for the majority of individuals not following the low sodium diet. By leveraging digital self-monitoring, a low sodium diet program was feasible and in reducing BP.

299

## Serum Aldosterone and Urine Electrolytes Dynamics in Response to DASH Diet Intervention†

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OBJECTIVES/GOALS: Dietary approach to stop hypertension (DASH) is a proven intervention to treat hypertension. Despite years of research the immediate physiologic response to its implementation was never characterized.This translational trial describes the biological pathway from nutrition through hormons, urine electrolytes and blood pressure reduction. METHODS/STUDY POPULATION: A single center interventional trial. Stage 1 hypertensive otherwise healthy volunteers were admitted for 14-days, transitioning from American style diet to DASH diet. Nutritional habits were assessed with food frequency questionnaires, and menus designed according to the guidelines of the National Heart Blood and Lung Institute (NHBLI) of the National Institute of Health (NIH). Data were collected daily for vital signs, blood and urine. Participants completed two 24-hour ABPM on days 1,10, and two 24-hour urine collections in parallel. We conducted a follow up visit two weeks after discharge. RESULTS/ANTICIPATED RESULTS: 9 volunteers (78% male, 89% Black individuals) completed the protocol. During an inpatient stay, they consumed a mean daily potassium intake of 5.6 g (Â±0.7g) and 2.6 g (Â±0.3g) of Sodium. Serum Aldosterone increased from day 0 (mean 8.3, range 2.8-18.9) to day 5 (mean 17.8, range 10.2-27.2) after intervention, and decreased on day 11 (mean 11.5, range 4.8-18.2) despite continuous exposure (p-value=0.002). The urine electrolyte ratio of ([Na]/[K]) decreased from a mean of 3.5 before intervention to 1.16 on day 4, creating a statistically significant slope (p-value<0.001). Blood pressure by 24-hour ABPM decreased by 3.7 mmHg systolic BP and 2.3 mmHg diastolic BP from day 1 to 10 for the entire period, and for measures taken during sleep or awake time, assessed separately. DISCUSSION/SIGNIFICANCE: Shifting from a high-sodium low-potassium diet to the opposite composition leads to serial physiological changes that are governed by aldosterone and result in blood pressure reduction. Urine electrolyte ratio reflects nutritional changes within 4 days of transition and should guide clinicians in assessing lifestyle modification adherence.

300

## Improving the diagnosis and classification of facial pain conditions with MRI-based features*,†

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OBJECTIVES/GOALS: Trigeminal Neuralgia (TN) is a debilitating neuropathic condition characterized by electric-shock-like pain attacks. TN is considered a clinical diagnosis, and few proposed objective markers exist. This work studies the ability of advanced MRI techniques to diagnose and classify TN. METHODS/STUDY POPULATION: Anatomical MRI data from patients undergoing radiosurgery to treat TN was collected. A custom deep-learning UNet algorithm was trained to segment trigeminal nerves from the pons to the anterior wall of Meckels cave using segments drawn by an expert in neuroanatomy. 108 radiomics features related to nerve shape, voxel intensity, and image texture were extracted from the segmented nerves. A 2 layer neural network was trained to distinguish TN affected nerves from the pain-free contralateral nerves. Feature selection was performed within a cross-validation scheme to prevent model overfitting. Mean model performance over the validation sets was used to estimate model generalizability. RESULTS/ANTICIPATED RESULTS: 134 patients and 268 nerves were included. The average number of years with TN was 8. The average validation set accuracy was 78% [range: 75-80%]. The average validation set sensitivity and specificity were 0.82 [range: 0.79-0.84] and 0.76 [range: 0.70-0.79]. 34% of patients had undergone a prior invasive procedure to treat their TN. To evaluate whether the model detected signal changes relating to the previous treatment, those patients were excluded and the model was retrained on the surgically naive patients. Model performance in a reduced cohort of patients was similar to the model trained on all the patients, with accuracy of 77% [range: 73-82%]. DISCUSSION/SIGNIFICANCE: This study suggests that radiomics features calculated from MRIs of trigeminal nerves correlate with anatomical changes in TN affected nerves. This technique will need to be verified in a larger, more heterogeneous cohort of TN patients with a range of MRI acquisition parameters.

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