in subsequent orders for other testing (i.e., proteinuria) were not significant. **Conclusions:** Following implementation of eGFR reporting, the likelihood of referral to nephrologists increased though the number of nephrology clinic visits did not. Clinicians who were younger, family medicine, and worked full time were more likely to increase referrals after eGFR.

Keywords: Chronic Kidney Disease; Laboratory Reporting; eGFR
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PS3-35:

MRI Detection of Substantia Nigra Degeneration in Parkinson's Disease: Developing a Candidate Biomarker

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Background/Aims: The substantia nigra (SN) selectively degenerates in Parkinson's disease (PD). Prior MRI studies of SN have used manual segmentation to make quantitative measurements, an approach with inherently limited accuracy. Here we used an in-house optimized neuromelanin MRI (NM-MRI) protocol, and a novel semi-automated segmentation method to investigate changes in SN associated with PD. The relationship between MRI measures and orthostatic hypotension, a phenotypic feature of PD, was also examined. **Methods:** Eight controls and 10 PD patients were scanned on a 3.0 Tesla Siemens MRI scanner using our optimized NM-MRI sequence (2D gradient echo sequence with magnetization transfer contrast preparation pulse) and processing protocol. A contrast to noise ratio (CNR) binary map was generated, identifying voxels with intensity >3 SD above the mean intensity. SN ROIs were defined on the binary map based on the location of the high intensity voxels, which defined its borders discretely. Mean CNR and number of voxels (volume) were then obtained for the SN. Statistical analysis was performed with SPSS. **Results:** Comparison of means revealed that both CNR and volume of the SN were significantly lower in the PD group than in controls (CNR: $P = 0.044$; volume: $P = 0.028$). Each of the two MRI measures were significantly correlated with the orthostatic blood pressure drop (Pearson's correlation, CNR: $r = -0.725$, $P = 0.001$; volume: $r = -0.661$, $P = 0.003$). **Conclusions:** As hypothesized, both CNR and volume of SN were significantly lower in the PD group than in controls. Since SN degenerates in PD, this NM-MRI approach appears to detect PD-associated degeneration of SN in vivo. Also as hypothesized, the MRI measures had a significant negative association with orthostatic blood pressure drop, a phenotypic characteristic of PD. These results indicate that the MRI measures presented here represent promising candidate PD biomarkers. Longitudinal studies are warranted to test this approach as part of an early diagnosis strategy and as a potential clinical trial outcome measure.

Keywords: Parkinson's Disease; Biomarkers
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PS3-36:

Testosterone Replacement Therapy Patterns for Aging Males in a Managed Care Setting

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Background/Aims: Testosterone replacement therapy is a widespread and growing practice for treating androgen deficiency. Characteristics of males receiving testosterone and treatment patterns in a managed care setting are relatively unexplored. The purpose of this study was to describe the characteristics and treatment patterns of males receiving testosterone therapy. **Methods:** We identified patients who received a testosterone prescription from January 1999 to December 2010 in Kaiser Permanente Southern California (KPSC). We excluded patients receiving testosterone therapy for indications other than androgen deficiency, including: 1) age <30, 2) genetic indications, 3) hypothalamic or pituitary dysfunction, and 4) testicular or pituitary trauma. Twelve months continuous membership prior to the index date was required for inclusion in the cohort. We investigated demographics, testosterone prescriptions, baseline diagnoses, total serum testosterone laboratory results, and physician specialty. Descriptive statistics and paired

t-test were used. **Results:** Among testosterone users ($N = 10,159$) the mean (SD) age was 56.8 (11.6) and 67.7% were white. On an annual basis, from 1999 to 2010, the treatment rate increased by 183% and number of prescriptions per patient increased by 22%. The most frequently prescribed testosterone products were transdermal gels (55.7%), patches (26.2%), and intramuscular injections (14.4%). The average duration of exposure was close to one year [mean (SD) days supply = 320.0 (504.2) days]. Baseline testosterone levels were obtained in 91.0% of patients and the mean (SD) serum testosterone level was 259.7 (179.5) ng/dL. Follow-up testosterone levels were drawn in 59.8% of patients within one year of the index date and the mean (SD) serum testosterone level was 395.0 (275.3) ng/dL. The mean increase from the baseline was 151.9 (95% CI = 160.5, 143.3) for transdermal gels, 118.0 (129.5, 106.5) for patches, and 200.7 (237.0, 164.3) for intramuscular injections. The most frequent diagnoses at baseline were hypertension (43.7%), hyperlipidemia (43.1%), erectile dysfunction (33.5%), testicular dysfunction (26.7%), and diabetes (20.3%). Testosterone prescriptions were most frequently written by primary care providers (family practice [36.0%] or internal medicine [20.1%]) followed by specialists (endocrinology [13.5%] and urology [6.6%]). **Conclusions:** Testosterone therapy is rapidly increasing treatment among aging males in KPSC, and most frequently prescribed by primary care physicians.

Keywords: Testosterone; Androgen Deficiency
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PS3-45:

A Randomized Controlled Trial to Improve Bone Health: A Multi-Modal Approach to Patient Recruitment

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Background/Aims: Kaiser Permanente Georgia (KPGA) is one of three sites participating in a randomized controlled trial to evaluate the effect that a direct mailing of Dual-Energy X-ray Absorptiometry (DXA) results will have on patients' bone health. This abstract describes KPGA's multi-modal approach to patient recruitment. **Methods:** Over a 24-month period, KPGA will enroll approximately 2,900 English-speaking men and women age 50 years and older who present to 1 of 5 locations to complete a bone density scan. Patients with significant mental, visual or hearing impairments will be excluded. As part of the study, participants will be asked to complete a 30-minute baseline interview in the clinic immediately following his/her DXA scan. In order to reach our enrollment goal, we have taken a multi-modal approach to patient recruitment which includes (1) proactive outreach prior to the DXA appointment, and (2) clinic-based outreach on the day of the DXA appointment. Proactive outreach includes daily review of the DXA appointment database to identify potentially eligible patients. Patients identified by this method receive an invitation letter to participate in the study as well as a follow-up phone call to determine if the patient would like to participate. Clinic-based outreach consists of flyers and posters strategically placed in high impact areas of patient waiting rooms and in-person recruitment that is initiated by the DXA technologist. **Results:** During the first 8 months of recruitment, we assessed 3,164 patients for eligibility and enrolled 1,001 patients into the study. 344 (16%) did not meet the inclusion criteria, 1,571 (50%) declined to participate, 243 (8%) were missed, and 5 (0.2%) started the baseline interview but could not complete it. Clinic workflow has not been adversely affected by the implementation of our study, and the DXA technologists have provided positive feedback on our clinic-based recruitment measures. **Conclusions:** Taking a multi-modal approach to patient recruitment may be effective in enrolling large numbers of patients in a randomized controlled trial. Our recruitment approach has been well received by both patients and clinic staff.

Keywords: Patient Recruitment; Osteoporosis; Musculoskeletal Health
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