sis of whom 73% were currently prescribed a bone-sparing agent. Although a limitation of the study is its inability to distinguish between care gaps and data gaps, the findings suggest that alternative approaches aimed at implementing national guidance through more systematic, high quality care are urgently needed. The study also shows the usefulness of electronic audit tools to robustly monitor standards achieved in primary care organisations.

O12
VITAMIN D DEFICIENCY AMONG OLDER PEOPLE IN ENGLAND— REMAINS A CAUSE FOR CONCERN!

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Introduction: The importance of vitamin D in calcium absorption and metabolism for bone health is well known. Vitamin D deficiency in adults clinically manifests as osteomalacia and osteoporosis. There is also now emerging evidence related to the risk of several chronic diseases such as cancer, cardiovascular disease and rheumatoid arthritis. In the UK, Government initiatives have been in place since 1998, highlighting the importance of vitamin D in the prevention of osteoporosis in the elderly. In 2000, the Health Survey for England (HSE) showed the prevalence of vitamin D deficiency (25-hydroxycholecalciferol ≤25 nmol/L) to be around 10% and vitamin D insufficiency (≤50 nmol/L) was about 45% in adults living in private households.The aim of this paper is to assess vitamin D status in people aged ≥65, living in private households in England, 2005 and make comparisons with earlier surveys (HSE 2000, and the Nutrition Diet and Nutrition survey (NDNS), in 1994) and examine associations of vitamin D deficiency with risk factors.
Methods: A valid vitamin D sample was obtained from 2070 informants (950 men and 1020 women) as part of the Health Survey for England (HSE) 2005, a nationally representative survey of people aged ≥65 living in private households in England.
Results: The prevalence of vitamin D deficiency was 14% in women and 8% in men. The prevalence of vitamin D insufficiency was 58% of women and 49% of men. There are no significant improvements in vitamin D status among older people since 1994. Regression analyses showed women more likely to have vitamin D insufficiency than men (OR=1.5; p<0.0001). Men and women aged 80–84 years (OR=1.6, p=0.006), those not taking vitamin supplements (OR=2.5; p<0.0001), and those with a body mass index ≥30 kg/m^2 i.e obese (OR=1.5, p=0.007) were more likely to have a low vitamin D status. Deficiency was higher in the Winter/Autumn (OR=2.2; p<0.0001) and was associated with vitamin B12 deficiency (OR=1.6; p=0.003), cigarette smoking (OR=1.8; p=0.001) poor general health (OR=1.6; p=0.01), and long standing illness (limiting and non- limiting) (OR=1.3, p=0.02). Separate analysis for each sex showed that among men, vitamin D insufficiency was also associated with low serum ferritin levels (<45 ng/ml,OR=1.7, p=0.008) and more likely in those living in rented accommodation (OR=2.0, p=0.001); in women, there was also an association with diabetes (OR=1.8, p=0.03).
Conclusion: Overall, the results show no significant improvements in vitamin D status in comparison to earlier HSE 2000 results or the NDNS results. Low vitamin D status is associated with many risk factors and poor health outcomes. Further action and guidance is required to actively address vitamin D deficiency among the elderly.

O13
(YOUNG INVESTIGATOR AWARD)
A RANDOMISED CONTROLLED TRIAL ON THE EFFECTS OF WHOLE BODY VIBRATION ON MUSCLE POWER IN OLDER PEOPLE AT RISK OF FALLING

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Introduction: Previous research has suggested that whole body vibration (WBV) is beneficial to muscular performance in various populations including institutionalised older people. It is unclear if WBV can reduce falls risk in community dwelling older people. The aim of this randomised controlled trial was to determine if adding WBV to a standard falls prevention programme can improve muscle power in community dwelling older people at risk of falls.
Methods: Subjects attending a falls prevention programme were randomised to Vertical-WBV, Tilting-WBV or Placebo ("sham" vibrating noise) groups. Sessions occurred three days/week for 12 weeks. The intervention was progressive, finishing with six 1 minute bouts per session. Leg extensor muscle power was measured in Watts (W) using the Nottingham Leg Power Rig at baseline and post intervention.
Results: 61 subjects (37 women) were randomised. Preliminary data were available for 49 subjects (Vertical-WBV n=17, Tilt-WBV n=16, placebo n=16). The mean age of the subjects was 80.7 years (range 64 to 95). The baseline characteristics between the three groups in terms of age, sex and power were similar. ITT analysis showed that the mean differences between pre- and post-intervention (95%CI) in leg power in the placebo group +2.0 W (−3.6 to +7.6); Tilt-WBV group +8.8 W (+1.7 to +15.9); and Vertical-WBV

group +18.9 (+1.7 to + 30.3) were different [ANOVA p= 0.016]. Between group differences (Bonferroni) showed that Vertical-WBV increased power significantly more than placebo (p=0.014). No significant differences existed between Tilt-WBV and placebo; or between Tilt-WBV and Vertical-WBV. The mean difference between pre- and post-intervention in the combined-WBV (Tilt+Vertical) group was +14.0 W (+7.3 to +20.7) which was significantly greater than the placebo group (p=0.006).
Conclusion: These data suggest that the addition of whole body vibration to a falls prevention programme improved leg extensor muscle power in community dwelling older patients at risk of falling compared to the falls prevention programme alone. Whole body vibration could have an important role in improving falls prevention. Further larger trials are now required.

O14
(YOUNG INVESTIGATOR AWARD) RESPIRATORY FUNCTION IS ASSOCIATED WITH BONE ULTRASOUND MEASURES AND HIP FRACTURE: EUROPEAN PROSPECTIVE INVESTIGATION INTO CANCER-NORFOLK POPULATION COHORT STUDY

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Forced expiratory volume in 1 second (FEV_1), an easily obtainable measure of respiratory function in clinics, has been shown to be associated with physical activity. We hypothesized that FEV_1 is linked with bone health.
In the context of the European Prospective Investigation into Cancer-Norfolk study, 14,800 participants aged 42–81 in 1997–2000 were evaluated by spirometry and heel ultrasound and were followed for fracture outcomes up to July 2007. After excluding participants with history of pulmonary diseases, among 5,555 men and 6,935 women (mean age 62.1+/−9.0), FEV_1 significantly correlated with heel broadband ultrasound attenuation (BUA; Pearson r=0.403; p<0.001) and velocity of sound (VOS; r=0.269; p<0.001). The association remained significant in sex-stratified linear regression models after adjustment for age, history of fracture, height, body mass index, smoking status and alcohol consumption (standardized β coefficient=0.057 and p<0.001 in men; β=0.075 and p<0.001 in women). Mean adjusted FEV1 among 109 hip fracture patients (2.00+/−0.60 liter) was significantly lower than that of other participants (2.49+/−0.71 liter; t-test p<0.001). In a Cox proportional hazards regression model, FEV1 was a significant predictor of hip fracture after adjustment for age, sex, history of fracture, height, body mass index, smoking and alcohol consumption (hazard ratio for 1 standard deviation [700 ml in 1 second] decrease in FEV1=1.39, 95%CI 1.03–1.88, p=0.029). Among 6197 current and former smoker participants, hazard ratio for 1 standard deviation decrease in FEV1 was 1.67 (95%CI 1.11–2.57, p=0.014).
Middle aged and older men and women with lower respiratory function appear to be at increased risk of osteoporosis and hip fracture. The observed association might be related to the level of physical activity or deformities in thoracic spine related to osteoporosis. Given the feasibility and affordability of spirometry in general practices, it can be used to improve the identification of high risk groups at the first point of care.

O15
SILENT CHRONIC KIDNEY DISEASE AND BONE METABOLISM IN A UK RESIDENTIAL HOME POPULATION

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Introduction: The risk of osteoporotic fractures increases in the elderly population with the rate of falls three times greater in residential homes compared with those in the community. One cause may be secondary hyperparathyroidism, driven by vitamin D deficiency and decreased calcium intake. Secondary hyperparathyroidism is also common amongst patients with chronic kidney disease (CKD). Here we determine the prevalence of vitamin D deficiency in a residential home population and assess the relationship between markers of bone metabolism and severity of CKD.
Methods: Older subjects (n=250) were recruited over a nine month period from 155 residential care homes in East Kent: 17.6% had glomerular filtration rate (GFR mL/min/1.73 m^2) of >60, 39.2% stage 3a CKD (GFR 45–59), 33.6% stage 3b CKD (GFR 30–44) and 9.6% had stage 4 CKD (GFR 15–29). After exclusion of patients with primary hyperparathyroidism (n=8), thyrotoxicosis (n=1) and those receiving calcium/vitamin D supplementation (n=56), plasma parathyroid hormone (PTH), serum vitamin D metabolites, calcium and phosphate were measured in 188 residents.
Results: Median PTH concentrations (reference range 14–72 ng/L) increased with declining GFR (>60: 62.3 ng/L,