aged 70–79 years featured amyloidosis associated with hemodialysis (1 case), severe interstitial pneumonia,¹ Parkinson's disease,¹ total knee arthroplasty triggered by RA,² and mean RA duration was 17±11 years. Of 3 cases aged 80–89 years, RA onset was after age 80 years in two. At the time of fracture, 7 were receiving anti-osteoporosis treatment; 2 were on teriparatide, 4 on bisphosphonate, and 3 on activated vitamin D. Some patients discontinued anti-osteoporotic medication because of renal failure or side effects; 84% of patients had taken anti-osteoporotic medications prior to fracture. Seven patients were taking steroids (mean prednisolone dose 3.9±2.1 mg/day). Secondary fractures occurred in 2 cases; one had RA of the mutilated type with renal failure; a secondary fracture occurred 4 months later. The 2nd case was taking anti-osteoporotic medication but the secondary fracture occurred 32 months later. At 3 months after surgery, the walking abilities of all patients were the same as prior to fracture. No mortality was recorded at either 30 days or 1 year. No infective complication was noted.

Conclusions: Hip fracture in patients with RA occurs in 1.4% of the general population in Joetsu and Myoko, Japan, ranging from 0.93% in Taiwan² to 1.6% in Sweden³, and 1.6% of all RA patients, ranging 3.3% in Taiwan² to 6.5% in Sweden³. The mean age at hip fracture was 76±7.0 years, thus about 8 years younger than that of fracture patients from the general population, but was 72±4.5 years 10 years ago¹. Among all patients, 64% were on steroids (83% 10 years ago¹), 84% were on anti-osteoporosis drugs (31% 10 years ago¹) and the n/t ratio was 1.2 (3.2 10 years ago¹).

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THU0489 THE IMPACT OF CALCIUM INTAKE AND PHYSICAL EXERCISE ON PEAK BONE MINERAL DENSITY

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Background: Regular exercise and adequate nutrition are frequently prescribed as strategies to optimise peak bone mass and maintain bone and muscle health throughout life.

Objectives: The aim of our work was to determine the relationship of clinically assessed milk intake and physical exercise with bone mineral density (BMD) in young adults.

Methods: This cross-sectional study included members of the general population aged between 20 and 30 years from the Portuguese cohort SAOL (individuals aged 18+years randomly selected from a local county of Coimbra, Portugal). No exclusion criteria were applied. Individuals were asked to describe their milk intake (up to 2 glass/day and 2+glass/day, corresponding to up to and more than 480 mg/day), regular physical activity (categorised as none-to-moderate and at least intense physical activity) and strenuous sports practice (up to 2 hour/week and 2+hour/week) from the age of 10 to 25. They underwent a Dual-energy x-ray absorptiometry (DEXA) of the lumbar spine (LS) and proximal femur (PF). Categorical data is presented as proportions/percentages and continuous variable as median ±standard deviation. Differences between groups were assessed by Mann–Whitney U test. Potential predictors of a higher BMD of PF and LS were identified using multiple linear regression analysis. P-values<0.05 were considered statistically significant.

Results: We included 259 individuals (mean age of 24.7±2.7 years, 60.6% being female). The majority (82.6%), described having a moderate regular physical activity (equivalent to working as a mailman), practicing strenuous sports at least 2 hours per week (81.1%) and ingesting at least two glasses of milk per day (83.4%). The current BMD of the PF and LS were 0.8±0.13 and 0.99±0.11, respectively. On univariate analysis, the only significant association related the PF BMD and milk intake (p=0.008). Multiple linear regression analysis showed that while physical activity and sports practice did not predict BMD values, milk intake persisted as a predictor of a higher BMD of PF (p=0.022), even after including other explanatory variables. No statistically significant predictors were found for BMD of the LS.

Conclusions: Our study showed that clinically assessed milk intake between the ages of 10 and 25 years, but not physical exercise, is a significant predictor of higher bone mineral density assessed by DEXA at the PF. These results do not exclude a positive impact of exercise upon peak bone mass, but suggest that its retrospective evaluation in a clinical setting should not be taken as reassurance that a good peak bone mass was achieved in early adulthood.

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THU0490 TEMPORAL INCREASES IN SIDE EFFECT CONCERNS OF OSTEOPOROSIS MEDICATIONS AMONG WOMEN WITH PREVIOUS FRACTURES

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Background: High-consequence, albeit rare, adverse side effects of osteoporosis medication raise patients' risk perceptions and contribute to non-adherence. In the past decade, fears of osteonecrosis of the jaw (ONJ) and atypical femoral fractures (AFF) have been increasingly reported as barriers to both the initiation of and adherence to osteoporosis medications.

Objectives: To examine the temporal prevalence of self-reported concern about ONJ and AFF as reason for discontinuation of osteoporosis medication.

Methods: Activating Patients at Risk for Osteoporosis (APROPOS) enrolled US women from the Global Longitudinal Study of Osteoporosis (GLOW) with previous self-reported fractures and no current use of osteoporosis medication. Using mailed surveys in 2010 (T1), 2012 (T2) and 2013 (T3), women were asked whether they discontinued osteoporosis medication in the prior year because of concerns about ONJ at three time points (T1, T2, T3) and AFF at two time points (T2, T3). We calculated the proportion of women reporting fears of ONJ and AFF among those who discontinued osteoporosis medication, and compared the proportions using chi-square tests.

Results: A total of 833 women discontinued osteoporosis treatment at three time points, T1 (n=255), T2 (n=471), and T3 (n=107), respectively. There were no differences in the demographic characteristics between groups. The proportion of women reporting concerns of ONJ was 18.4% (T1), 26.7% (T2) and 64.5% (T3), while 23.5% (T2) and 60.7% (T3) reported fear of AFF as reason to discontinue osteoporosis treatment. These differences were statistically significant (p<0.0001) for all comparisons.

Conclusions: The proportion of women reporting concerns of ONJ and AFF increased over time among those women who discontinue osteoporosis medications. Strategies are needed to help patients balance risks and benefits given a significant and temporally growing concern of rare bisphosphonate side effects.

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THU0491 FACTORS ASSOCIATED WITH ANNUAL PERCENTAGE CHANGES IN BONE MINERAL DENSITY: A-14 YEARS PROSPECTIVE POPULATION-BASED STUDY

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Background: Gradual bone loss is expected with advancing age and gender differences were reported in the rate of annual loss of bone. Ideally, the decision to introduce interventions designed to prevent bone loss would be informed by reliable algorithms to identify fast bone losers. However, these are not readily available.

Objectives: In this analysis of 14 years prospective population-based data, we aim to identify predictors of the bone mineral density (BMD) loss in the perimenopausal and elderly population.

Methods: This study included members of the general population aged 40+years from the longitudinal cohort SAOL (individuals aged 18+years randomly selected from a local county of Coimbra, Portugal). The included individuals answered validated self-reported questionnaires at baseline (1997–2000) comprising questions on osteoporosis risk factors and medication use and underwent a Dual-energy x-ray absorptiometry (DXA) of the proximal femur (PF) and lumbar spine (LS). These procedures were repeated at follow-up (2011–2014). Demographic characteristics and DXA BMD details were descriptively summarised at baseline.

Annual percentage changes of total BMD (g/cm^2) in the PF and LS were computed (annual ΔBMD). The relationship between annual ΔBMD and potential predictors was assessed by independent-samples t-test or Pearson correlations, according to the categorical or continuous nature of the independent variable. The baseline independent variables included were: age (years); gender; body mass index (kg/m^2); smoking, alcohol intake, rheumatoid arthritis, glucocorticoid treatment and secondary osteoporosis according to FRAX algorithm definitions. The follow-up reported calcium/vitamin D supplementation and treatment with bisphosphonates, for at least 1 year (yes/no), were also considered as independent variables. We used linear regression models (enter method) to estimate the possible association between socio-demographic/clinical variables and the BMD changes of PF and LS. The predictor variables included in the model were selected *a priori* based on variables that were associated with annual ΔBMD on univariate analysis. Results were considered significant when $p < 0.05$.

Results: This analysis included data from 636 individuals (mean ($\pm\text{SD}$) age of 53 ± 8 years, 76% female). The mean ($\pm\text{SD}$) follow-up period was 13.6 ± 1.1 years. Baseline mean ($\pm\text{SD}$) BMD of the PF and LS were 0.77 ± 0.004 and 0.94 ± 0.132 , respectively. The mean ($\pm\text{SD}$) percentage of annual bone loss was: -0.19 ± 1.02 for PF and -0.06 ± 0.84 for LS. On univariate analysis, ΔBMD at both the PF and LS was significantly associated with gender ($p < 0.001$). Annual ΔBMD was also associated with vitamin D supplements ($p = 0.014$) at PF, and with calcium supplements ($p = 0.002$) and bisphosphonate treatment ($p = 0.027$) at LS. On multiple linear regression analysis, female gender persisted as a predictor of faster BMD loss in both PF ($p \leq 0.001$) and LS ($p = 0.006$). While bisphosphonate treatment didn't predict the annual bone loss, vitamin D and calcium supplementation persisted as predictors of lower annual ΔBMD at PF ($p = 0.034$) and LS ($p = 0.033$), respectively.

Conclusions: Our results confirm that the rate of BMD loss at PF and LS over 14 years is significantly associated with gender. Vitamin D and calcium supplementation appeared to have a role in the prevention of bone loss in this general population cohort.

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THU0492 PRELIMINARY STUDY OF THE BONE MASS IN LUNG TRANSPLANTED PATIENTS IN TREATMENT WITH DENOSUMAB

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Background: Osteoporosis (OP) is a known complication before and after a lung transplant. In addition to altering bone mass, treatment with glucocorticoids alters the bone microarchitecture, conditioning an increased risk of fracture in these patients. Denosumab (Dmab) is a monoclonal antibody approved for the treatment of postmenopausal OP and its use for corticoid OP is pending approval.

Objectives: To describe the subcohort of lung transplant patients who have been treated with Dmab. To study the evolution of bone mass in patients with lung transplantation, with OP induced by glucocorticoids, treated with Dmab.

Methods: We included 19 lung transplant patients between 1995 and 2017 controlled in rheumatology for OP and in treatment with Dmab. Of these 19 patients, the evolution of bone mass of the 9 patients who have completed a minimum of 12 months of treatment is shown. Bone densitometry (DXA) was performed on a General Electric Healthcare Lunar Prodigy Advance 15 version densitometer, before and after treatment with Dmab. Demographic data of the patients were collected, the diagnosis of the disease that motivated the transplant, the glucocorticoid doses before and after the transplant, as well as the immunosuppressive treatment. In the 9 patients with DXA follow-up, the 3D-SHAPER software was applied in the DXA before and after the transplant.

Results: We included 19 patients (10 women) with a mean age of 58.6 years ± 11.4 . The diagnosis of the disease that led to the transplant was in 4 COPD patients, 6 patients with pulmonary fibrosis or diffuse interstitial disease, 2 with bronchiectasis, 2 patients with cystic fibrosis, 1 with histiocytosis X, 2 with lymphangioleiomyomatosis, 1 with bronchiolitis obliterans and 1 patient with pulmonary hypertension. Before transplantation, 8 patients (42.1%) had required high doses of glucocorticoids. The prevalence of OP prior to start Dmab treatment in the 19 lung transplant patients was 94.7%. The means of BMD in g/cm^2 and T-score before treatment with Dmab and the results of the 3D-SHAPER are shown in table 1.

	DMO g/cm^2	T-score
Lumbar spine	0.909 ± 0.13	-2.40 ± 1.08
Femoral Neck	0.708 ± 0.94	-2.50 ± 0.77
Total Hip	0.702 ± 0.86	-2.73 ± 0.59
Cortical Density (g/cm^2)	109.3 ± 7.7	-2.9 ± 0.3
Trabecular vBMD (g/cm^3)	85.7 ± 21.4	-2.9 ± 0.8
Integral vBMD (g/cm^3)	198.7 ± 19	-3.3 ± 0.5

The mean time in which the DXA was performed prior to the treatment with Dmab with respect to the transplant date was 4.31 ± 5.83 years. The mean time in which the DXA was performed after the start of Dmab was 19 ± 4.17 months. The results of the evolutionary BMD, the 3D-SHAPER study and its percentage of change are shown in table 2. Of these 9 patients, 88.9% had received osteoactive treatment before Dmab, 5 with oral bisphosphonates and 3 with endovenous bisphosphonates. The mean time of treatment with bisphosphonates until the onset of Dmab was 5.4 years. There were no significant differences in BMD evolution between patients treated for OP prior to Dmab and those not treated, nor for 3D-SHAPER.

	Tx (9)	
OP pre-Dmab	8 (88,9%)	
OP post-Dmab	8 (88,9%)	
DMO post-Dmab (mean)	g/cm^2	T-score
- L1-L4	0,949 $\pm 0,13$	-2,05 $\pm 1,07$
- CF	0,722 $\pm 0,12$	-1,86 $\pm 2,22$
- FT	0,696 $\pm 0,06$	-2,76 $\pm 0,49$
% change DMO		
- L1-L4	8,42 $\pm 6,64^*$	
- CF	2,21 $\pm 6,55^*$	
- FT	2,80 $\pm 3,56^*$	
High GC dose pre-Transplant	2 (22,2%)	
3D-SHAPER (mean):		
- Cortical Density (g/cm^2)	113,7 ± 10	
- Trabecular vBMD (g/cm^3)	88,5 $\pm 23,7$	
- Integral vBMD (g/cm^3)	203,7 $\pm 24,4$	
% change 3D-SHAPER:		
- Cortical Density	4,13 $\pm 4,5$	
- Trabecular vBMD	3,4 $\pm 10,9$	
- Integral vBMD	2,6 $\pm 7,7$	

Conclusions: All patients who started treatment with Dmab had a diagnosis of OP except one patient with osteopenia. The mean increase in BMD in patients treated with Dmab was significant in all the regions assessed, being higher in the lumbar spine. There was an increase in cortical density, trabecular volumetric BMD and integral volumetric BMD after Dmab treatment, although this increase was not significant for any of the three parameters.

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THU0493 ARE BISPHOSPHONATES SOLELY RESPONSIBLE FOR ATYPICAL FEMORAL FRACTURES? A CASE SERIES

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Background: Atypical femoral fracture (AFF) is an uncommon but important type of fracture. It is concerning because of the associated morbidity, bilateral nature of the condition and delay in healing which has significant implications on the health of the patients.

Objectives: To identify other risk factors contributing to development of atypical femoral fractures in our cohort of patients presenting to the fracture liaison service.

Methods: We identified a case series of 18 cases were retrospectively from June 2006 to January 2018 through the cohort of patients presenting to the fracture liaison service at Yeovil District Hospital NHS foundation trust, with features suggestive of Atypical femoral fractures. Individual patient cases were evaluated and notes and images reviewed. Atypical femoral fractures were diagnosed according to the 2013 American society of mineral and bone research (ASMBR) criteria. Demographic and co morbidity status was investigated from case notes. Blood results and dual energy x-ray absorptiometry (DEXA) images were accessed through electronic patient records. The results were compiled with Microsoft excel.

Results: There were total 22 patient episodes, of which 4 patients had bilateral symptoms. Female to male ratio was 21:1. Median age of presentation was 71. The incidence of AFF was more in shaft fractures. 54% cases had prodromal symptoms lasting from 1-3 months. 9 cases had radiographic evidence of stress fractures of whom 6 were not identified until they fractured. 86% cases had either concurrent or previous bisphosphonate therapy. Duration of Bisphosphonate therapy was variable from 12 months to 30 years. 54% were taking Proton pump inhibitors and 41% were on long term glucocorticoids. 9% were active smokers. 50% episodes were in patients having two or more risk factors. 3 patients had no risk factors identified.