Poster Number 076 **Central or Peripheral DXA**

ASE REPORT: EFFECT OF SILICONE BUTTOCK IMPLANT ON DXA SCAN EVALUATION

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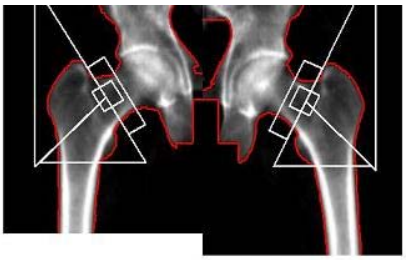
BACKGROUND: This is a case report of the potential effect a buttock implants on measurement of Bone Mineral Density of the hips.

CASE REPORT: A 69 year-old genotypic male underwent a sexual reassignment surgery to become a phenotypic female. The patient, in association with the gender reassignment, started estrogen 5mg PO daily. Baseline DXA of the spine and hips performed on a Lunar Prodigy in 2007 demonstrates osteopenia with a T score of -1.5 in the hips. (Image 1 , upper) . Vitamin D, calcium and parathyroid hormone levels were checked and found to be within normal limits and patient was started on bisphosphonate.

IMAGE 1



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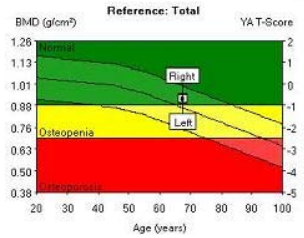


Region	BMD [1] (g/cm²)	Young-Adult [2,7] T-Score	Age-Matched [3] Z-Score
Neck			
Left	0.818	-1.6	-0.2
Right	0.829	-1.5	-0.1
Mean	0.824	-1.5	-0.2
Difference	0.011	0.1	0.1
Total			
Left	0.916	-0.7	0.4
Right	0.923	-0.7	0.4
Mean	0.919	-0.7	0.4
Difference	0.007	0.1	0.1

Prior to a follow-up DXA scan, the individual underwent buttock augmentation surgery with implant of silicon based prostheses in each buttock.

A follow up DXA scan performed in 2008 showed a 19% decrease in BMD over a one year period. (Image 2, lower). As can be seen on the DXA, the silicone implant overlaps the hip area of interest which accounts for the dramatic change in BMD. A repeat DXA in 2009 shows no significant change from 2008.

IMAGE 2

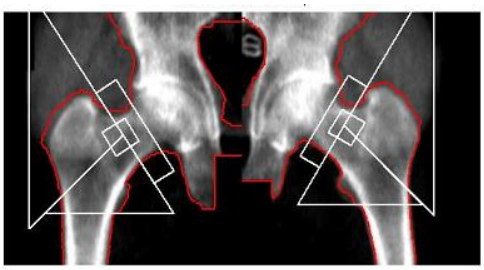
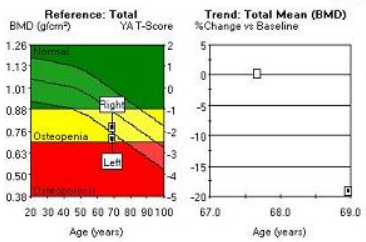


Image not for diagnosis



Region	BMD [1] (g/cm²)	Young-Adult [2,7] T-Score	Age-Matched [3] Z-Score
Neck			
Left	0.738	-2.2	-0.8
Right	0.720	-2.3	-1.0
Mean	0.729	-2.2	-0.9
Difference	0.018	0.1	0.1
Total			
Left	0.710	-2.4	-1.3
Right	0.775	-1.8	-0.8
Mean	0.743	-2.1	-1.0
Difference	0.065	0.5	0.5

Trend: Total Mean

Measured Date	Age (years)	BMD [1] (g/cm²)	Change vs Previous (g/cm²)	Change vs Previous (%)
8/14/2008	68.9	0.743	-0.177	-19.2
4/26/2007	67.6	0.919	-	-

CONCLUSION: Buttock implants have the potential to significantly affect Bone Mineral Density measurements of the hip. A review of the literature shows two case reports of increased bone mineral density score in individuals who have undergone buttock augmentation. Our results are opposite, and we assume that the difference is due to the location of the buttock implant; in our case the implant apparently causes an overestimation of soft tissue density resulting in over-subtraction of soft tissue.

Poster Number 077 **Central or Peripheral DXA**

COMPARISON OF DXA PRECISION BY ONE VS TWO TECHNOLOGISTS AT A DXA CENTER

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Objective: To compare the precision of Dual Energy X-ray Absorptiometry (DXA) measurement at the hip and lumbar regions by one technologist with the precision of DXA performed by two different technologists.
Method: We examined bone mineral density (BMD) in 60 post-menopausal women. Thirty were scanned by one technologist and 30 by two different technologists. BMD was measured at the lumbar spine (L1-L4) and at the left femoral neck, left total femur, right femoral neck and right total femur. One technologist analyzed all scans. The patients were scanned and positioned by technologists trained in the same facility, on the same scanner, one who was more experienced, and one who had several months experience. Measurements were made on the GE Lunar Prodigy, software version 11.4. The LSC was calculated using the advanced calculator on the www.iscd.org.
Results and Analysis: Results of patients scanned by two different technologists show that at the lumbar spine L1-L4 , the least significant change (LSC) is 3.65. LSC at the left neck, right neck, left total, right total was 4.80, 6.28, 3.27, 2.08 respectively when scans were done by two technologists. When the patients were scanned by same technologist, LSC was 3.97, 4.96, 4.96, 2.62, 1.91 at L1-L4, left neck, left total, right neck and right total respectively.
Conclusion: Despite similar initial training, precision is affected by a change in technologist, and this finding is site specific. When more than one technologist works in a facility, patient follow-up scans should be performed by the same technologist, or further training may be needed to assure consistency.

Poster Number 078 **Central or Peripheral DXA**

PRECISION AND LEAST SIGNIFICANT CHANGE IN PEDIATRIC MEASUREMENTS OF BONE, BODY COMPOSITION AND MECHANOSTAT PARAMETERS BY GE LUNAR PRODIGY

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Reproducibility is crucial for characterizing a method and for monitoring therapy. Its derivative, last significant change (LSC), allows a direct comparison of two consecutive measurements and discrimination between “true” and apparent change. The aim of this study was: to assess the reproducibility of bone, body composition and mechanostat parameters in children using GE Lunar Prodigy, and to evaluate impact of measurement mode and subject’s age on its reproducibility. Studied group consisted of 70 girls and 77 boys, aged 5-18 yrs (12.6±3.9), recruited from typical patients of Densitometry Lab. Ethical approval was obtained for the study from local Ethics Committee. Measurement mode was automatically set by the software (v.11.4). Total body and PA spine measurements were done twice, with reposition. Total body bone mineral density (TBBMD), total body bone mineral density less head (TBBMDlh), total body bone mineral content (TBBMC), total body bone area (TBBA), fat mass (FM), lean body mass (LBM), spine bone mineral density (SBMD), spine bone mineral content (SBMC), spine bone area (SBA), FM/body weight, LBM/body weight, FM/LBM, TBBMC/LBM and SBMC/LBM were measured. Absolute errors and coefficients of variation (CV%) were calculated for all outcomes for each participant. Nonparametric statistics were used. Reproducibility for whole group was calculated as root mean square (RMS) and then used to calculate LSC. Statistically significant correlations of absolute CV values with age were observed for TBBMC ($r=0.38$), TBBA ($r=0.28$), FM ($r=0.24$), LBM ($r=0.30$), SBMD ($r=0.24$) and SBMC ($r=0.30$) ($p<0.05$). In contrast, CV expressed in percentage (CV%) correlated with age only for TBBMD ($r=-0.28$, $p<0.05$). Calculated LSC values were: TBBMD mode thin 2.47%, TBBMD mode standard 2.02%, TBBMDlh 1.91%, TBBMC 3.88%, TBBA 4.40%, SBMD 2.24%, SBMC 5.87%, SBA 5.60%, FM 5.21%, LBM 2.22%, FM/BW 5.21%, LBM/BW 2.22 %, FM/LBM 7.15%, TBBMC/LBM 5.76% and SBMC/LBM 5.68%. Due to stability of CV% values in wide range of age the use of precision error expressed in percentages rather than absolute error seems to be more convenient for calculation of LSC in pediatric population.

Poster Number 079 **Central or Peripheral DXA**

LONG-TERM VS. SHORT-TERM PRECISION MEASUREMENT OF DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA) SCANS AND THE IMPACT OF INTERPRETING CHANGE IN BONE MINERAL DENSITY (BMD) AT FOLLOW-UP

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Introduction: DXA measurement precision assessment provides data used to determine if a change in BMD at follow-up is statistically significant. Typically, repeat scans are conducted within minutes in the same scan session. This is termed short-term precision (STP). In clinical practice however, repeat DXA scans are performed after months or years. Therefore, long-term precision (LTP), in which repeat scans are performed on different days, may more accurately reflect true DXA variability. The primary objective of this study was to compare STP and LTP in the same patients.
Methods: *Prospective Comparison of Precision (Study I):* In the first scan session (baseline scans), duplicate scans of one or more regions of interest (ROI) (lumbar spine L1-4, left and right femoral neck, left and right total hip, and/or nondominant radius 33%) were performed with repositioning between scans to calculate STP (n = 80). The same patients returned from 2 to12 months later for repeat scans; the first baseline scan and the follow-up scan were used to calculate LTP. Strict criteria were used to exclude patients if any interval event may have affected BMD such as starting menopause, bisphosphonate treatment, etc., resulting in n = 30 for each ROI (52 total patients). Phantom scan results confirmed DXA system stability over the time course of the study.
Impact of Using LTP to Evaluate Change at Follow-Up (Study II): A sampling of postmenopausal white women returning for follow-up to an Osteoporosis Clinic were used to evaluate the impact of using LTP vs. STP to interpret change.
Results: LTP was significantly greater than STP: LTP as root-mean-square standard deviation was 0.022, 0.024, 0.017, 0.018 g/cm^2 for L1-4, left femoral neck, left total hip, and radius 33%; STP were 0.012, 0.009, 0.007, 0.012 respectively ($P < 0.01$by F test). When evaluating clinical patients at follow-up (Study II), use of a least significant change value based on LTP (LTP LSC) resulted in significantly fewer patients having “significant” change at follow-up. Also, use of the LTP LSC eliminated discordance in several patients who had apparent increase in BMD at one ROI and apparent decrease at another ROI.
Conclusions: STP may underestimate true DXA variability and result in over diagnosis of change at follow-up.

Poster Number 080 **Central or Peripheral DXA**

WHICH TO USE TO EVALUATE CHANGE IN BMD AT FOLLOW-UP: RMS-SD OR RMS-%CV?

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Introduction: There is bias toward the use of RMS-SD over RMS-%CV to calculate a LSC term that is used to determine if change in BMD at follow-up is statistically significant. In part, this bias is based on the assumption that SD is relatively constant over a wide range of BMD as opposed to %CV, which is assumed to increase as BMD decreases. However, evidence to support these assumptions is scant. The purpose of this project was to determine the frequency of discrepancies in interpretation of follow-up data using a LSC based on RMS-SD (LSC-SD) vs. RMS-%CV (LSC-CV).
Methods: A convenience sample of 100 patients returning for follow-up DXA scans was used to compare the frequency change in BMD exceeding LSC-SD vs. LSC-CV.
Results: Agreement in exceeding (or not) both LSC-SD and LSC-CV was nearly 95% for L1-4 lumbar spine, femoral neck, and total hip. Disagreements were characterized by BMD changes barely failing to exceed either LSC-SD or LSC-CV.

	RMS-SD exceeded **Yes**	RMS-SD exceeded **No**
Lumbar Spine		
RMS-CV exceeded **Yes**	32	4
RMS-CV exceeded **No**	2	62
Femoral neck		
RMS-CV exceeded **Yes**	39	2
RMS-CV exceeded **No**	3	56
Total hip		
RMS-CV exceeded **Yes**	26	4
RMS-CV exceeded **No**	1	69

Conclusions
The answer to the question “Which to Use to Evaluate Change in BMD at Follow-Up: RMS-SD or RMS-%CV?” may be: *use both*. That is, significant change in BMD almost always exceeds both LSC-SD and LSC-CV. Thus there may be no basis for the bias in favor of using LSC-SD. Further, a criterion that *both* LSC-SD and LSC-CV must be exceeded may help avoid overcalling marginal change as being significant.

Poster Number 081 **Central or Peripheral DXA**

THE AVERAGE PRECISION ERROR OF DUAL ENERGY X-RAY ABSORPTIOMETRY PERFORMED BY MULTIPLE BONE DENSITOMETRY TECHNOLOGISTS

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The result of DXA bone density measurement is related to the technologist. Short-term in-vivo precision assessment measures technologist's ability to reproduce technical factors from one scan to next on same patient. The only one way that a physician can know that a real biologic change has occurred is to know if the least significant change (LSC) of the technique has been exceeded. Each technologist should establish their own LSC value. In the case of multiple technologists performing densitometry studies, the values for the precision studies form individual technologists be averaged to determine the precision for the facility. This study was performed to establish the average LSC value of lumbar spine bone mineral density measurements by 3 densitometry technologists. A total of 45 healthy female subjects who ranged from 34 to 47 years old (mean = 39.6 ± 3.8) with normal anatomy, no pregnancy and without taking any medicine which could influence bone metabolism. 45 healthy volunteers' mean height was 158.1 ± 4.8 cm (mean ± SD), mean weight was 56.5 ± 8.4 kg and mean body mass index (BMI) was 22.6 ± 3.5. The percent coefficient of variation (% CV) of daily quality assurance was 0.394 %. Choosing PA spine scan mode, precision error (group root-mean-square average standard deviation of the error; in g/cm^2) and LSC of each technologist were determined in 15 healthy volunteers scanned 3 times each at the lumbar spine (15 patient × 3 scans / patient = 45 scans / technologist × 3 technologists = 135 scans) on Hologic QDR 4500 scanner, with repositioning after each scan. All patients' L-spine scans for each technologist were done on same day. All precision error and LSC data derived from 3 technologists done within 1 month. The average precision error (RMS SD) in BMD for L1-L4 by 3 technologists was 0.009 g/cm^2. An average calculate LSC for the group at the 95% confidence interval was 0.024 g/cm^2 (= 0.009 g/cm^2 × 2.77). Precision overall is excellent and these results are consistent with International Society for Clinical Densitometry (ISCD) recommendations (the RMS SD less than 0.020 g/cm^2 for spine). As well as the regular scanning of phantoms to check system calibration and patient related factors (artifact, anatomy deformities, patients' movements, and patient cooperation), the other major quality assurance issue is the training of staff performing bone densitometry investigations to ensure consistency in patient positioning and scan analysis. It is difficult to follow the same positioning and analysis standard for multiple technologists. This study was a very successful experience about establishing an average PE and an average LSC value performed by multiple technologists.

Poster Number 082 **Central or Peripheral DXA**

REVIEWING BONE DENSITY IMAGES USING ONLINE REPORTING SYSTEM "BONESTATION" MAY IMPROVE THE ABILITY OF THE REVIEWER TO DETECT RADIOGRAPHIC ABNORMALITIES COMPARED WITH REVIEWING IMAGES ON PAPER PRINTOUTS

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BACKGROUND: When reporting bone densitometry, any significant radiographic abnormalities that are observed should be mentioned in the final report. However, the ability of the reader to detect radiographic abnormalities in bone densitometry is limited by the resolution of the images produced, and the resolution of the modality on which the bone density is viewed. Our center recently transitioned from a paper-based BMD viewing and reporting systems to a web-based system called BoneStation, which has resulted in substantial savings in cost, space, and manpower (in press, Endocrine Practice). Since this transition we noticed radiographic abnormalities that were clearly present previously, but were not reported when we used to base reports on paper printouts. This observation suggested that a web-based reviewing system might improve image resolution sufficiently to improve sensitivity to detect radiographic abnormalities. We plan to present examples, but thought that it was important to quantify this finding. METHODS: Fifty sets of BMD with 92 radiographic abnormalities were identified from our archive, and one of the authors (AOM) reviewed each abnormality on paper and online and assigned a score for clarity based on a VAS (visual analog scale 1-10). In order to avoid reviewer bias, the paper and online images were not shown consecutively, and the reviewer did not know which paper image went with which online image.
RESULTS: The mean±SEM clarity score for the pager images was 3.26±0.25, while mean±SEM clarity score for online images was 3.81±0.22 (p for the difference was 0.01).

CONCLUSIONS: We conclude that online reviewing of bone densitometry using BoneStation resulted in better clarity of the radiographic abnormalities compared with the prior paper-based system.

Poster Number 083 **Central or Peripheral DXA**

CHALLENGES IN ESTABLISHING A BONE CENTER IN A MIDSIZE CHILDREN'S HOSPITAL

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In 2005 Kids' Center for Bone Health opened in Connecticut Children's Medical Center , Hartford CT with the acquisition of a Lunar Prodigy Advance bone density machine(GE Lunar ,Madison WI).In 2007, we presented the profile of pediatric referrals for DXA for the first year operations of the newly opened pediatric bone center.

In this follow up report, we aim to analyze the progress of the center since 2005 and discuss the challenges of establishing a pediatric bone center in a midsize children's hospital.

During the first year of operations in 2005, 121 referrals were made for DXA evaluation. In 2009, the number of DXA referrals was 173 with a 43 % increase compared to the first year. The highest volume of DXA referrals were made from endocrinology and gastroenterology divisions (42 % and 27 % of all referrals respectively).The most common reasons for DXA referral during 2009 were the history of recurrent fractures(24 %) and inflammatory bowel diseases (23 %). Among other specialties, highest DXA referral increase in 2009 was observed in hematology /oncology as 40 % compared to 2005.

Our center utilizes pediatric official positions published by ISCD in 2007. In our experience, the current challenges in maintaining a pediatric bone center in a midsize children's hospital include: referring provider related, technologist related, pediatric DXA assessment related and reimbursement related difficulties.

In conclusion, although significant quality of care progress has been made in bone health and DXA assessment of children at risk for low bone mass since 2005, more challenges still require solutions.

Poster Number 084 **Central or Peripheral DXA**

DUAL-ENERGY X-RAY ABSORPTIOMETRY WITH SERUM FERRITIN PREDICT LIVER IRON CONCENTRATION AND CHANGE IN CONCENTRATION BETTER THAN FERRITIN ALONE

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Accurate assessment of liver iron concentration (LIC) is critical to prevent iron toxicity in multi-transfused patients. Serum ferritin is the most widely used even though its association to LIC is only modest. We studied if a liver-specific measure using Dual-energy X-ray absorptiometry (DXA) systems could improve LIC estimates over ferritin alone in Thalassemia (Thal) patients. Thirty-seven patients with Thal (18.1 ± 6.4 yrs, 20 Male) were studied and ten had multiple visits. Height, weight, ferritin, whole-body DXA, and hepatic Superconducting Quantum Interference Device (SQUID) were measured within 5 weeks. DXA hepatic density was measured using right rib, whole liver, and multiple sub liver regions. The best agreement to SQUID LIC was found using a combination of ferritin, weight, DXA sub-liver region 3 (R3) BMC, and right rib BMC. DXA with ferritin improved the ferritin alone correlation from R2=0.35 to R2=0.62. Serial LIC changes using DXA were associated with serial SQUID changes (r=0.73, p=0.02). Changes in ferritin alone were not significant (p=0.06). We conclude that the addition of whole body DXA measures and body weight substantially increased the accuracy of LIC and change in LIC estimates over the use of ferritin alone and could be useful when MRI or SQUID are not available.

Poster Number 085 **Central or Peripheral DXA**

THE ROLE OF DXA FOREARM ANALYSIS IN OSTEOPOROSIS CLINICAL INVESTIGATION

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INTRODUCTION: Osteoporosis is a silent disease and dual energy x-ray (DXA) bone densitometry is still considered the gold standard method for the diagnosis and follow-up. Routine examination includes the study of lumbar spine and hip. The distal forearm acquisition which has a low precision error, is used when one of the previous skeletal sites are not qualified for diagnosis.
OBJECTIVE: Our goal was to identify if using the distal forearm analysis as an additional skeletal site in DXA routine examination would make any difference for the diagnosis of osteoporosis when the other two skeletal sites (lumber spine and hip) are considered adequated for analysis.
MATERIAL AND METHODS:
Pós menopausal women were referred for DXA osteoporosis investigation in November 2008, and they agreed to perform additional forearm study. The BMD was measured using GE Lunar DPX NT (pencil beam) at lumbar spine, hip and forearm for all the patients. A control phantom was scanned everyday and all DXA measurements were performed by the same experienced operator.
RESULTS: A hundred one pos menopausal women with both lumbar spine and hip sites valid for diagnosis performed forearm examinations. The mean age was 66 years (SD 9,1), 7% were smokers and 2% had previous diagnosis of Rheumathoid arthritis.. The risk factors of family fractures and previous fractures were present in 18,8% and 23,8% respectively.
The means BMD were 1,014g/cm² (lumbar spine), 0,836g/ cm² (neck), 0,882g/ cm² (total hip) and 0,742g/ cm² (distal forearm). In this last site de differences between means BMD respectively for age groups from 40 years to 80 years achieved statistically significance ($p<0,001$).
CONCLUSION: In this study, when forearm findings were included as an additional skeletal site, we notice more diagnosis of osteoporosis. These preliminary data must be considered with care and should be verified with a greater sample, because of health costs and possible changes in clinical investigation of osteoporosis.

Poster Number 086 **Central or Peripheral DXA**

UTILITY AND PRECISION OF BODY COMPOSITION PREDICTION FROM HALF-BODY AND SPINE/HIP DXA: COMPARISON OF PRODIGY WITH iDXA

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There is increasing interest in body composition assessment using DXA. Available scan width is a technical limitation in some clinical situations for which half-body analysis appears to be a valid approach. Additionally, given the increasing recognition of sarcopenia as a fracture risk factor, it is plausible that routine spine/hip DXA can provide additional information by estimating lean body mass. As such, the purposes of this study were to compare body composition as obtained by total body DXA with that estimated from half-body and spine/hip measurement with a GE Healthcare Lunar Prodigy and iDXA densitometer. Eighty individuals (38 women/42 men) age 20-85.4 years had lumbar spine, proximal femur and total body measurements performed on both instruments in routine clinical manner by ISCD certified technologists. Precision assessment was conducted in a randomly-selected subset (n = 30). Software versions 9.2 (Prodigy) and 9.3 (iDXA) were used for acquisition, 11 (iDXA), 11.4 (Prodigy) and 12 (both) for analyses. The ISCD precision calculating tool was used to determine precision of total body measurement and half-body estimation. Body composition results were compared by linear regression and Bland-Altman analyses using Analyze-it software. Instrument precision was compared by F-test. Total body bone, fat and lean mass as estimated from half-body analysis was extremely highly correlated with that obtained by actual measurement (r^2 = 0.98-1.00) for both instruments. Total body precision (%CV) for bone, fat and lean mass was better (p <0.0001) with iDXA (<1%) than Prodigy (1.2-2.1%). Precision of half-body estimates were good although inferior to direct measurement (Table).

Precision of Body Composition Measurement and Estimation (%CV)

	Measured total body (grams)	Estimated total body from ½ body measurement (grams)
iDXA		
BMC	0.4%	0.5%
Fat	0.9%	[a]1.3%
Lean	0.5%	[a]1.2%
Prodigy		
BMC	[c]1.7%	[c]1.8%
Fat	[c]2.1%	[a, c]2.5%
Lean	[c]1.2%	[b, c]1.8%

[a]Different than total body measured; p < 0.01
[b]Different than total body measured; p < 0.05
[c]Different than iDXA; p < 0.01

Limitations of existing reference databases precluded estimation of body composition from spine/hip data in 18 subjects including seven from the precision sample. In the remaining 62, estimated percent lean and fat mass were highly correlated (r^2 > 0.92) with that obtained by direct measurement. In conclusion, these estimation methods are a good representation of the results obtained by actual total body measurement.

Poster Number 087 **Central or Peripheral DXA**

COMPARISON OF THE PA AND LATERAL SPINE T- AND Z-SCORES BY DUAL ENERGY X-RAY ABSORPTIOMETRY IN PERSONS WITH SPINAL CORD INJURY

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Background: Bone mineral density (BMD) of the posterior-anterior lumbar spine (PA L-spine) has been reported to be normal by routine DXA in persons with chronic spinal cord injury (SCI). Unlike the extremities and pelvis, several cross-sectional studies have found that the vertebral column does not appear to lose bone mass after paralysis but, rather, tends to gain bone mass with age and/or longer duration of injury (DOI). However, the posterior elements captured by the PA spine scan are rich in cortical bone and prone to extraneous calcification due to degenerative joint disease that may be made worse by paralysis and wheelchair-dependence. As reported in the able-bodied population, the inclusion of extraneous calcification of the posterior elements may underestimate bone loss of the lumbar vertebrae. The objective of this study was to determine if DXA PA L-spine measurements underestimate bone loss compared with those of the LAT L-spine in persons with SCI.
Methods: A prospective, cross-sectional, observational study was performed. Measurements of the PA and LAT L-spine were performed in 15 subjects with SCI: 9 with tetraplegia and 6 with paraplegia, 12 men and 3 women. The DXA (GE Lunar Prodigy Advance) images of the PA and LAT L-spine were obtained using standard software.
Results: T- and Z-scores of the LAT L-spine were lower than those for PA L-spine (T-scores L_2: -0.673±0.321 vs. 0.020±0.355, $p<0.01$; L_3: -0.940±0,422 vs. 1.290±0.042, $p<0.02$; L_2- L_3: -0.800±0.337 vs. 1.270±0.042, $p<0.001$; Z-scores L_2: -0.267±0.285 vs. 0.207± 0.326, $p<0.05$; L_3: -0.547±0.347 vs. 0.487±0.337, $p<0.01$; L_2-L_3: -0.427±0.280 vs. 0.360±0.309, $p<0.005$). The T- and Z-scores for total hip (-1.140±0.274 and -0.967±0.265, respectively) and L_2-L_3 LAT L-spine scores were both reduced and remarkably similar, whereas the L_2-L_3 PA L-spine scores were not reduced. LAT, but not PA, L-spine BMD was inversely related to DOI ($R=-0.53$, $P<0.05$). In a subset of subjects with a DOI was > 18 months (n=10), 31% of the reduction in LAT L-spine was explained by DOI ($P<0.05$).
Conclusions: Bone loss of the L-spine evident on LAT DXA may be misdiagnosed by PA projections, underestimating the risk of fracture in persons with SCI. DOI appears to be associated with loss of LAT L-spine BMD, consistent with our previously reported findings for the leg. The increased sensitivity of the LAT L-spine scan to diagnose bone loss in this population may be of clinical utility when prescribing exercise therapy.