1. ***Calcaneal BMD Obtained by Dual X-ray and Laser (DXL) Predicts Future Hip Fractures – A Prospective Study in 4398 Swedish Women***
   Journal of Osteoporosis, volume 2010, article ID 875647, 6 pages, doi:10.4061/2010/875647.

   - "The age-adjusted AUC of DXL of calcaneus to predict future hip fractures was 0.84, which is better than that previously reported for DXA of the femoral neck. Of the patients who sustained a hip fracture 78% had a DXL T-score of < -2.5. DXL of calcaneus may therefore be suitable for diagnosing osteoporosis and for prediction of fracture risk."
   - *The 78% prediction rate of future hip fractures by DXL Calscan can be compared to the published literature on DXA scans of the hip that show only 46% of those who will sustain a hip fracture received a T-score of < -2.5.*

   Brismar TB, Janszky I, Toft LIM – Karolinska Institute, Stockholm, Sweden

2. ***The prevalence of osteoporosis using bone mineral measurements at the Calcaneus by Dual X-ray and Laser (DXL)***
   Osteoporosis International (2003) 14: 823-827.

   - "We conclude that DXL measurement at the heel bone, using a T-score threshold of –2.5 for classification of osteoporosis, is in concordance with the World Health Organization (WHO) definition of osteoporosis."

   Kullenberg R, Falch J, - Aker Univ. Hospital, Oslo, Norway

3. ***Comparison of DXL of Calcaneus and DXA of Spine and Hip in Patients with Vertebral Fractures***
   Journal Mineral Stoffwechs 2008; 15, Sonderheft 3.

   - "Scans of the calcaneus by DXL Calscan show an ability to identify vertebral fracture patients that is superior to DXA results obtained from the same patient database using the iDXA device in accordance with the WHO recommendations. DXL Calscan can be used as an effective complement to existing DXA systems, especially when spinal BMD results are suspect due to age and/or other degenerative conditions."

   Muschitz C, Kocijan R, Fertl R, Laimer M, Evdokimidis V, Waneck R, Resch H - St. Vincent Hospital, The VINFORCE Study Group, Vienna, Austria

4. ***Low calcaneal bone mineral density and the risk of distal forearm fracture in women and men: A population-based case-control study***

   Bone, 45 (2009) 789-793.

   - "This study is one of the largest population-based studies measuring calcaneal BMD with DXA in women following distal forearm fracture and one of the few studies that included men." The authors add, "Calcaneal BMD measurement appears to have predictive ability for osteoporosis-related fractures that does not substantially differ from that of lumbar spine and hip BMD."

   Atroshi I, Åhlander F, Billsten M, Ahlborg H, Mellström D, Ohlsson C, Ljunggren Ö, Karlsson M., Lund University, Lund, Sweden

5. ***Physical activity is the strongest predictor of calcaneal peak bone mass in young Swedish men***

   Osteoporosis International (2010) 21:447-455.

   - "Our results indicate that young Swedish men have reached peak bone mass at the calcaneus at the age of 18.4 years. In accordance with these findings, previous studies have reported data that supports that peak bone mass has been reached at several skeletal sites at the age between 18 and 19 in men." The authors add, "…we also demonstrated that history of regular physical activity was the strongest predictor of, and could explain more than 10% of the variation in, BMD at the calcaneus in a large cohort of young men (n=2384), highly representative of young Swedish men."

   Pettersson U, Nilsson M, Sundh V, Mellström D, Lorentzon M. – Sport Medicine Unit, Umeå University, Sweden; Center for Bone Research at Sahlgrenska Academy & Division of Endocrinology, Salgrenska Univ. Hospital, University of Gothenburg, Sweden.

6. ***Assessment of bone mineral density of the calcaneus in healthy and osteoporotic women by a new DXA device***
   Journal of Clinical Densitometry (2004) Vol 7, No. 3: 349-354.

   - "Our data showed that DXL Calscan provides a convenient method of measuring skeletal BMD with some advantages over axial BMD. Calscan diagnostic capacity and relationships with other sites of the skeleton are excellent".

   Martini G, Valenti R, Giovani S, Gennari L, Salvadori S, Galli B, Nuti R. – Univ. of Siena, Siena, Italy

7. ***DXL Measurement as a Bone Mineral Density Screening Method***
2005 Turkish Osteoporosis Society Annual Meeting, oral presentation

- 54,241 women from both the Asian and European sides of Istanbul were scanned with DXL Calscan during 2003 and 2004. From this group, 4,321 were also randomly chosen for axial DXA scans. DXL Calscan showed 99% sensitivity for osteoporosis diagnosis when compared to DXA of hip & spine results. Since 2004, the project has acquired more Calscan units and scanned more than 400,000 women in Istanbul.

Çiftçi A, Yilmaz F, Konyalioğlu R, Hamdemir F, Bulut T, Güveli M. - Istanbul Metropolitan Municipality Department of Health, Turkey

8. ***The DXL Calscan heel densitometer: evaluation and diagnostic thresholds***
The British Journal of Radiology (2006) 79, 336-341

- "The Calscan is well-suited for use in the management of post-menopausal osteoporosis."

Thorpe J, Steel, S.A. – Centre for Metabolic Diseases, Hull Royal Infirmary, United Kingdom

9. ***The Value of Calcaneal Bone Mass Measurement Using a Dual X-Ray Laser Calscan Device in Risk Screening for Osteoporosis***
Clinics 2009;64(8):757-62.

- "Bone mineral density measurements in the calcaneus using dual x-ray and laser are valuable for screening Turkish women over 40 years of age for the risk of osteoporosis."

Kayalar, G, Cevikol A, Yavuzer G, Sanisoglu Y, Cakci A, Arasil T., Ministry of Health Educational & Research Hospital, Ankara, Turkey

10. ***The Relationship Between Dual X-ray Absorptiometry (DXA) and DXA With Laser (DXL) Measurements in Children***
The Journal of Clinical Densitometry (2008) vol.11, no. 4, 555-560.

- "We conclude that BMD values obtained with the DXA and DXL techniques effectively identify the same individuals with low BMD. The DXL Calscan, which is portable, easy to use and gives a low radiation dose, can be useful for assessing bone mass in a young population."

Söderpalm AC, Kullenberg R, Swolin-Eide D. – The Queen Silvia Children's Hospital, Sahlgrenska University, Göteborg, Sweden

11. ***DXL Calscan of Calcaneal Bone vs. Axial DXA for Older Women***
2006 Congress of Traumatology, Moscow

- "Calscan identified correctly significantly more cases of clinical osteoporosis than axial DXA. This was due to the lack of sensitivity at the hip region and the falsely elevated T-scores often found in spinal scores of the elderly."

Rodionova SS, Morozov AK, Varetskaya-Chivilikhina NB – Central Institute of Traumatology and Orthopedics, Moscow, Russia

12. ***Bone Mineral Density and Lifestyle Among Female Students Aged 16-24***
Gynecological Endocrinology 2002; 16: 91-98.

- "Hormonal age was a stronger indicator of BMD than chronological age. Menstrual disturbances might be an indication of low BMD and might therefore be a reason for measuring BMD among young females."

Elgán C, Dykes AK, Samsioe G. – Lund University Hospital, Lund, Sweden

13. ***Speeding up assessment of bone mineral density***
Practice Nursing 2008, Vol 19, No 4.

- "The Centre for Metabolic Bone Disease at the Royal Hull Hospitals NHS Trust, evaluated the capabilities of the DXL Calscan. The facility is the largest bone densitometry centre in the UK, and following the results of the study, the metabolic bone unit purchased a DXL Calscan and now uses it for triage diagnostics in the Hull area."

Coe J – M.A.S. Medical – Brighouse, United Kingdom

14. ***Disturbance of peak bone mass formation as a risk factor of osteoporosis in women of elder age***
Annals of Traumatology and Orthopedics, 2008; No.2, p.20-25.

- This study of 2854 women confirmed a two-fold increase in the prevalence of osteoporosis among women whose peak bone mass formation was disturbed by the 1986 Chernobyl accident. The study included 2 separate control groups and concluded that widespread use of the DXL Calscan scanner in affected areas could permit control of rates of peak bone mass formation in the young, allowing the formation of osteoporosis risk groups for outpatient observation and treatment if necessary.

Rodionova SS, Krivova AV, Doroshchenko VN, Proshin AD, Fetisov SN – Central Institute of Traumatology & Orthopedics, Russia

15. ***Comprehensive Osteoporosis Management with easy access to bone mineral density measurements***
Journal of Evaluation in Clinical Paractice, Vol.12, 2006, p.675-681.

- A multi-disciplinary team established an effective osteoporosis management system covering all of a large rural county in Sweden. Using four portable DXL Calscan scanners and limited resources, the project routinely scans those at risk at their primary care heath facilty. The cost to the county was less than the cost of one axial DXA system.

Kullenberg R, Hansson B, Sandberg R, Dahlberg H – Department of Orthopaedics, Central Hospital, Karlstad, Sweden

16. ***Bone mineral density measurement in the calcaneus with DXL: comparison with hip and spine measurements in a cross-sectional study of an elderly female population***
Osteoporosis International (2005), 16(5), p541-551

- "Using the NHANES III database for axial DXA and the published database for Calscan (Kullenberg 2003), and using the WHO cut-off point of –2.5 for osteoporosis, the heel measurements by DXL Calscan had optimal accuracy for detecting osteoporosis."

Salminen H, Sääf M, Ringertz H, Strender LE - Karolinska Institute, Stockholm, Sweden

17. ***A list of device-specific thresholds for the clinical interpretation of peripheral x-ray absorptiometry examinations***
Osteoporosis Int. 2005 Dec;16(12):2149-56.

- The National Osteoporosis Society's scientific committee approves the use of DXL Calscan for diagnostic purposes using thresholds established in clinical study. The DXL Calscan threshold for diagnosis and treatment of osteoporosis is set at a T-score of –2.7.

Blake GM, Chinn D, Steel S, Patel R, Panayiotou E, Thorpe J, Fordham JN - Department of Nuclear Medicine, Guy's Hospital, London

18. ***The usefulness of dual X-ray and laser absorptiometry of the calcaneus versus dual energy X-ray absorptiometry of hip and spine in diagnosing manifest osteoporosis***
Archives of Orthopaedic Trauma and Surgery, 2009, Feb; 129(2): 251-7.

- "The Calscan is a promising technique which might be used as a screening device at a Fracture & Osteoporosis clinic, especially when DXA is not easily available."

de Klerk G, van der Velde D, van der Palen J, van Bergeijk L, Hegeman JH – Dept. Of Surgery, Twenteborg Hospital, The Netherlands

19. ***Comparison of Bone Mineral Density Measured by Dual X-ray, Axial Dual-energy Photon X-ray Absorptiometry and Laser Absorptiometry of Calcaneus***
Iran Journal of Medical Science, 2005; 30(1): 34-37.

- "We found excellent sensitivity and specificity for the diagnosis of osteoporosis. A cut-off T-score of –2.5 for DXL Calscan identifies the same number of patients as osteoporotic as do measurements with DEXA."

Forogh, B., Ghasemzadeh, A., Salimzadeh, A – Dept. of Physical & Medical Rehabilitation, Iran University of Medical Science

20. ***Dual Energy X-ray Laser Measurement of Calcaneal Bone Mineral Density***
Physics in Medicine and Biology 48 (2003) 1741-1752.

- Reproducibility excellent with *in vivo* short-term precision of DXL Calscan 1.2%. "DXL Calscan provides a more accurate measure of calcaneal BMD than traditional DXA instruments."

Hakulinen M, Saarakkala S, Töyräs J, Kröger H, Jurvelin JS - Dept. of Applied Physics, University of Kuopio, Finland

21. ***Reference database for Dual X-ray and Laser (DXL) Calscan bone densitometer***
Journal of Clinical Densitometry, vol. 6, no. 4, 367–371, 2003.

- "After exclusionary criteria were applied, 993 women and 459 men were included in the study. The peak bone mass for women was found at an age of 22 years and for men at an age of 25 years. No significant differences could be found between the right and left measurements."

Kullenberg R **-** Associate Professor of Medical Physics, University of Göteborg, Sweden

22. ***Bone mass, biochemical markers and growth in children with chronic kidney disease; a 1-year prospective study***
Acta Pediatrica, The Authors/Journal Compilation 2007, pp. 720-725, 2007.

- This prospective study of children with CKD was designed to investigate development of BMD over a 1-year period and whether biochemical markers of bone turnover can predict changes in BMD. Results from the DXA and DXL Calscan showed similar significant increases in BMD for total body, spine and the calcaneus after one year. Biochemical markers could not predict the BMD changes over 1 year.

Swolin-Eide D, Magnusson P, Hansson S - Queen Silvia Children's Hospital, The Sahlgrenska Academy, Univ. of Göteborg, Sweden

23. ***Nutritional status, as determined by the Mini-Nutritional Assessment, and osteoporosis: a cross-sectional study of an elderly female population***
European Journal of Clinical Nutrition (2006) 60, 486-493.

- Subjects with lower nutritional assessment scores had significantly lower BMD scores when measured by Calscan at the heel or Hologic 4500 at the femur neck and total hip.

Salminen H, Sääf M, Johansson SE, Ringertz H, Strender LE - Sahlgrenska Univ. Hospital, Gothenburg, Sweden

24. Osteoporosis screening on a population of elderly people living in a rest home
Turkish Journal of Geriatrics, 2006;9(1) p.25-29.

- Study showed that the rate of osteoporosis in rest homes was similar to persons not in rest homes, however the patients in the rest homes had a lower rate of fractures. Rest home preventive practices aimed at reducing risk of falling may decrease the rate of fragility fractures and this should be considered to decrease overall incidence of fractures.

Küçükardali Y., Solmazgül, E. *et al* - GATA Haydarpaşa Eğitim Hospital, Istanbul, Turkey

25. A new measuring device for quantifying the amount of mineral in the heel bone
Annals of the New York Academy of Science, 904 (2000), 115-117.

- Calscan showed high level of accuracy with varied quantities of bone mineral – the standard error of estimate is less than 1.6%.

Swanpalmer J, Kullenberg R - Sahlgrenska Univ. Hospital, Gothenburg, Sweden

26. Influence of smoking and oral contraceptives on bone mineral density and bone remodelling in young women: a 2-year study
Contraception, Volume 67, Issue 6, June 2003, Pages 439-447.

- "BMD was measured by DXA (DXL Calscan) because external radiation is minimal with this device. The equipment can be used in any environment without specific precautions. It is concluded that smokers without OC's (oral contraceptives) had a negative BMD development and BMD in young women with irregular menstruations seems to be improved by OC's."

Elgán C., Dykes A.K., Samsioe G - Lund Univ. Hospital, Lund, Sweden

27. ***Calcaneus BMD Short-Term Precision in Young and Elderly Subjects Using DXL Calscan***
Journal of Clinical Densitometry, Assessment of Skeletal Health (2008).

- There was no statistical difference between the average BMD of the left and right heels. The observed short and long-term reproducibility, as well as the acceptable variation between individual machines, show that Demetech's DXL Calscan is suitable for measuring BMD.

Toft LIM, Brismar TB - Dept. For Clinical Science, Intervention and Technology, Radiology, Karolinska Institute Stockholm, Sweden

28. ***The Comparison Between Affected and Non-Affected Side of the Calcaneal Bone Density in Chronic Hemiparetic Patients***
Osteoporoz Dünyasindan (2005) 11 (2), 52-56.

- Population had a mean age of 58.9 years and were diagnosed with Hemipalegia after experiencing a stroke. We found that higher spasticity levels were associated with lower bone mineral density. As a result, spasticity and motor functional level may be determining factors for BMD value in hemiparetic patients.

Ofluoğlu D, et al – Marmara Üniversitesi Hospital, Istanbul, Turkey

29. ***Short-term variations in bone remodelling markers of an oral contraception formulation containing 3 mg of drospirenone plus 3 μg of ethinyl estradiol: observational study in young post adolescent women***
Contraception, vol. 70, 2004, pp. 293-298.

- An analysis of whether a specific oral contraceptive (OC) can affect bone metabolism. Even though a subtle decrease in bone formation appears to have been observed, reduced BMD values are only shown in the presence of a dramatic and rapid decrease of ovarian function.

Paoletti AM, Orrú, M, Lello, S, Floris, S, Ranuzzi F, Etzi R, Zedda P, et al - University of Cagliari & University Tor Vergata, Rome, Italy

30. ***Are distal radius fractures due to fragility or falls? A consecutive case-controlled study of bone mineral density, tendency to fall, risk factors for osteoporosis and health-related quality of life***
Acta Orthopaedica, vol. 78, Issue 2, April 2007. p 271-277.

- "Several researchers have shown that heel DXL can be used in the measurement of BMD according to the WHO criteria for the diagnosis of normal BMD, osteopenia and osteoporosis. This study indicates that the underlying cause of a distal radius fracture may be different in patients aged 45-64 years and those who are older than 64 years old."

Nordvall H, Glanberg-Persson G, Lysholm J – Departments of Physiotherapy & Orthopaedics, Sunderby Hospital, Luleå, Sweden

31. ***Pediatric Reference Data for Bone Mineral Density in the Calcaneus for Healthy Children 2, 4, and 7 Years of Age by Dual-Energy X-ray Absorptiometry and Laser (DXL)***
Journal of Clinical Densitometry, 2005 vol. 8, no. 3, p. 305–313.

- A DXL Calscan device using Calscan Paediatric Workstation software was used in a paediatric setting. The calcaneus can easily and quickly be measured using the portable DXL device, and measurements are well tolerated by young children, even those 2 yr of age. "Some patients with syndromes or diseases that are known to have a low BMD and with clinical signs of osteoporosis were measured in order to highlight the utility of the DXL method. All (these) patients had low percentile values for BMD and BMAD compared with the healthy children measured in our study, which indicates that the DXL device is able to recognize this low value."

Söderpalm A-C, Kullenberg R, Albertsson-Wikland K, Swolin-Eide D - Orthopaedics, Sahlgrenska Univ. Hosp., Göteborg Sweden

32. ***Fruit and Vegetable Intake and Bone Mineral Density in Residents of Villages Surrounding Tehran***
Iranian Journal of Public Health, 2004, A supplementary issue on Osteoporosis, p.49-56.

- Fruit and vegetable intake was assessed in subjects who had BMD measured by DXL Calscan. Fruit intake did not correlate to BMD results. The women who reported eating more than 1.5 servings of vegetables per day had significantly higher T-scores than those who ate less than 1.5 servings of vegetables per day (-1.1 vs. –1.9).

Ebrahimof S, Adibi, H., et al - *Endocrinology and Metabolism Research Center,* Shariati Hospital, Tehran, Iran

33. Osteoporosis in a nursing home, determined by the DEXA technique (DXL Calscan)
Medical Science Monitor, 2005; 11(2): CR 67-70.

- A DXL Calscan device (which uses DXA and laser technology), was used to scan nursing home patients, mean age was 84 years. Results showed that 92% of the women and 70% of the men scanned had osteoporosis according to the WHO definition. It is conceivable that such a degree of osteoporosis is usual in corresponding nursing homes, which should be taken into consideration by prioritizing prevention against future fragility fractures with available non-pharmacological and pharmacological treatment.

Sallin U, Mellström D, Eggertsson R - Department of Primary Healthcare, Göteborg University, Sweden

34. The effect of anterior cruciate ligament surgery on bone mineral in the calcaneus: a prospective study with a 2-year follow-up evaluation
Arthroscopy, 2004; vol.20, issue 4, p.352-359.

- Patients with a unilateral ACL rupture had a lower BMD in the calcaneus on the injured side compared with the non-injured side. Although patients increased activity levels after reconstruction, the BMD in the calcaneus decreased on both the injured and the non-injured side up to 2 years after surgery. LEVEL OF EVIDENCE: Level II-1, prospective cohort study.

Ejerhed, L, Kartus J, Nilsén R, Nilsson U, Kullenberg R, Karlsson J – Dept. of Orthopaedics, Uddevalla Hospital, Sweden