

quantifiably
better.



CLINIQCT®

NO-DOSE CT BONE DENSITOMETRY FOR ROUTINE AND SPECIALIST USE

- » Clinically superior BMD solutions for physicians
- » DXA equivalent hip measurements
- » Dual-use of standard abdominal or pelvic CT studies
- » Adds "no patient phantom" calibration to QCT Pro™

MINDWAYS CT 
www.qct.com

MINDWAYS CT

quantifiably better.

MindwaysCT is an industry leader and innovator; providing physicians with technologies that fully enable the quantitative assessment of CT images.

Incorporated in 1997, the company can trace its origins to ground-breaking work at UCSF in the late 1970s leading to the development of the Cann & Genant QCT calibration standard in the early 80's. Today, our systems are based around the 3rd generation, solid version of the calibration phantoms that use this standard.

Since its inception, MindwaysCT has been a pioneer in the industry. We were the first to develop a fully volumetric 3D Spine QCT system in 1997 and introduced the first fully functional CTXA hip system for QCT bone mineral density measurement at the proximal femur in 2001. We were also the first in the market with a QCT system that could connect to and support the storage and viewing of QCT BMD reports on PACS infrastructure. In 2012, we introduced easy to interpret reports consistent with WHO and ACR guidelines, and in 2014 we introduced our new "CliniQCT"[®] asynchronous calibration technology to make QCT workflow even more efficient.

With a focus on the accurate determination of tissue densities, structures and types, MindwaysCT continues with its research and development efforts in order to advance Quantitative CT (QCT) technologies for new and innovative applications.

— J Keenan Brown, Ph.D.
CEO, Mindways Software, Inc.

Mindways QCT bone density measurement included in FRAX[®]

The World Health Organisation (WHO) Fracture Risk Assessment Tool (FRAX[®]) is a web-based tool used to calculate absolute fracture risk to ensure that people with the greatest chance of breaking a bone are treated. The tool was developed to help health care providers determine the chances of a patient breaking their hip or another major bone within a ten year period.

The inclusion of Mindways QCT bone density measurement into FRAX[®], now offers patients and physicians an accurate and cost-effective alternative assessment method for determining osteoporotic fracture risk.



More Efficient Bone Densitometry

QCT with asynchronous calibration

Asynchronous calibration QCT

Quantitative Computed Tomography (QCT) is one of three methods cited by the National Osteoporosis Foundation as safe and effective for the evaluation of Bone Mineral Density (BMD). QCT is a fast, non-invasive BMD exam that utilizes a standard CT scanner.

Asynchronous calibration is a new technology that means a calibration phantom does not need to be present on the table during the QCT scan. CliniQCT® means better workflow and efficient re-use of CT scans acquired for other purposes.

The QCT Exam

A QCT exam takes around 5 minutes and is very similar to an ordinary CT scan. During the exam, both the spine and hip are scanned for diagnosis of low bone mass (osteopenia) or osteoporosis.

Low-dose CT scan protocols are used and so the amount of radiation required is around 500-800 μ Sv or comparable to a set of mammograms. All the work, including report generation, is carried out by a CT technician. In addition, the exam can be combined with other (non-IV contrast) abdominal/pelvic scans such as CT Colonography with no further image acquisition or radiation dose to the patient.

Patient benefits: how does QCT compare?

At the hip, QCT produces BMD T-score measurements that are the same as DXA measurements. QCT differs from DXA, however,

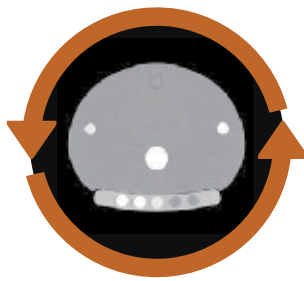
in that QCT is a truly 3-D bone density exam meaning QCT can measure the metabolically-active trabecular (spongy) interior bone separately from the dense cortical (compact) bone forming the outside bone walls.

Since trabecular bone is affected earlier and to a greater degree than cortical bone, QCT is likely to detect low bone mass earlier in the spine than other bone mineral density exams. In addition, QCT spine BMD measurements can be made for patients with scoliosis; and the artificially high BMD measurements that can affect DXA due to obesity, disc space narrowing, spinal degenerative diseases, aortic calcification and osteophytes in patients with arthritis can be avoided.

Return on Investment

Bone Mineral Density (BMD) measurement by QCT is reimbursed for the screening of postmenopausal women every two years by Medicare in the USA under CPT code 77078. The Mindways QCT system costs around half as much as an entry-level DXA machine. Unlike DXA, a dedicated room and dedicated technician are not required and there are no on-going hardware replacement costs.

- » More cost-effective than DXA machines
- » Requires only 10 min of CT tech time
- » Reimbursed by Medicare
- » Maximize the use of your CT scanner



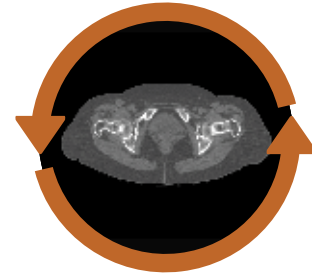
Precision Calibration

A regular QA/calibration scan using a combination of two phantoms is used to calibrate patient scans and correct for non-uniformities in the CT scan field



Spine Scan

Any two unfractured levels of the lumbar spine between T11-L4 are imaged using a standard CT scanner.



Hip Scan

The pelvis from above the femoral heads to 1cm below the lesser trochanters is scanned for analysis of either hip.



Trabecular Spine Analysis

Trabecular bone measurement avoids interference from arthritis and degenerative diseases. High metabolic turnover of trabecular bone produces high sensitivity to change.

DXA-equivalent Hip Analysis

A projection of the 3D CT image produces DXA-equivalent T-score and areal BMD measurements that are included in the WHO FRAX® online fracture risk tool.

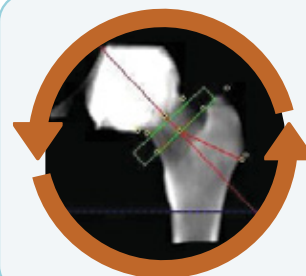
Spine Report

The trabecular bone volumetric BMD measurements are compared to American College of Radiology guidelines. Normal data for Z-scores is provided for ages 2-90 years.



Hip Report

T-scores for the femoral neck are compared with the standard World Health Organization diagnostic thresholds for normal, low bone mass and osteoporosis.



CliniQCT® workflow using asynchronous calibration

3D Volumetric Spine BMD

Trabecular bone mineral density measurement

QCT measurement of the spine is a truly 3D bone density exam of only the metabolically-active trabecular bone. Since trabecular bone is affected earlier and to a greater degree than cortical bone, QCT is likely to detect low bone mass earlier in the spine than other bone mineral density exams.

Volumetric measurement of the interior trabecular bone also means avoiding the artificially high BMD measurements that can affect DXA due to obesity, disc space narrowing, spine degenerative diseases, aortic calcification and osteophytes in patients with arthritis. In addition, complex deformities such as scoliosis can be handled by rotating the anatomy in software.

3D Spine studies are fast and easy. Scan times are typically under ten seconds and the automated analysis takes about two minutes. Total study times of less than ten minutes are easily attainable. The spine and hip can also be scanned in one study for further efficiency.

Combine with other scans. Using our new CliniQCT® asynchronous technology, non IV-contrast abdominal CT scans can be used for 3D Spine osteoporosis assessment whether you planned a bone mineral density study or not.

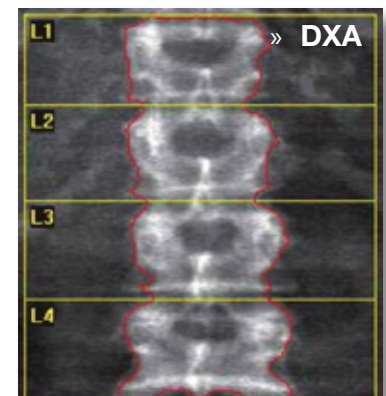
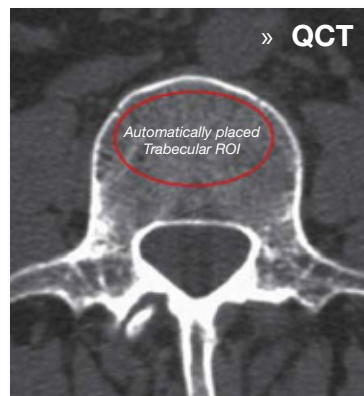
Features at a glance

- Trabecular bone mineral analysis at 2-3 levels of lumbar spine between T11-L4
- Measure only trabecular bone with the highest sensitivity for the earliest detection of bone loss and therapeutic response.
- Avoid DXA confounding factors such as DJD, osteophytosis, aortic calcifications, and scoliosis.
- Highly automated analysis in 1–2 minutes
- Precision: up to 1%
- Compatible with any DICOM CT or PET/CT scanner

ACR guideline thresholds are used. The volumetric trabecular spine BMD measurement is compared to guideline thresholds from the American College of Radiology (ACR):

- » BMD < 80 mg/cm³ = osteoporosis;
- » BMD < 120 and > 80 mg/cm³ = low bone mass;
- » BMD above 120 mg/cm³ = normal.

QCT
VS
DXA





Using MindwaysCT asynchronous calibration technology, bone mineral density scans may now be combined with other studies such as CT colonography screening with no additional patient time or x-ray dose.

CTXA-Hip™ produces areal BMD and T-score measures that are DXA-equivalent, so that these measures can be used in the exactly same way as DXA measures.

Results are easy to use by comparing CXTA-Hip™ output to WHO DXA diagnostic thresholds or as an input to the online WHO FRAX® fracture risk calculator.

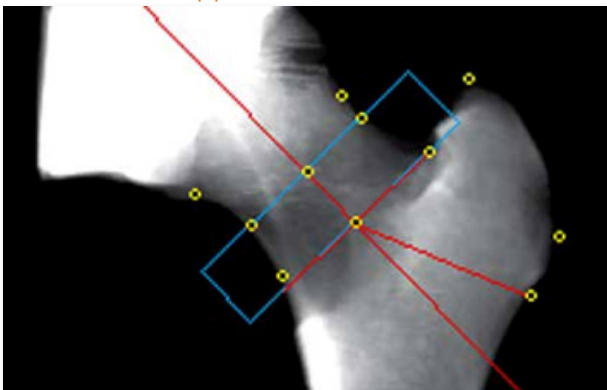
CTXA-Hip™ studies are fast and easy. Scan times are typically under ten seconds and the automated analysis takes about two minutes. Total study times of less than ten minutes are easily attainable. The hip and spine can also be scanned at one study for further efficiency.

Combine with other scans. Using our new CliniQCT® asynchronous technology, non IV-contrast pelvic CT scans can be used for CXTA-Hip™ osteoporosis assessment whether you planned a bone mineral density study or not.

Conversion from DXA. Because CXTA produces DXA-equivalent areal BMD results, DXA-CTXA results conversion at the hip can be made in the same way as DXA-DXA conversion if necessary.

Patient positioning is easier. For those patients have osteoarthritis at the hip or knee, rotation of the hips for a DXA scan can be difficult; impacting measurement reproducibility. Using a 3D QCT image, positioning of the hip can be done using software after the scan.

CTXA-Hip™ generates a projection image that has the same appearance as DXA. ▼

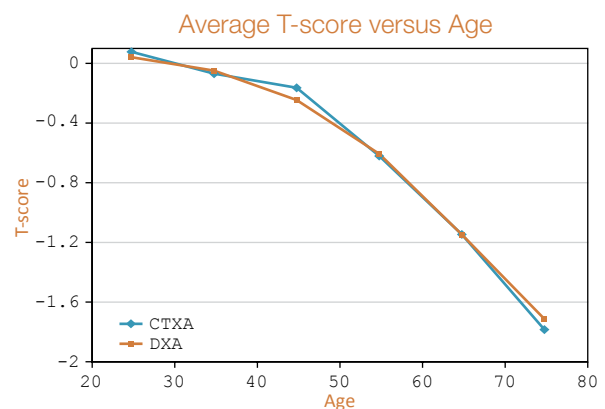


Features at a glance

- Bone mineral analysis of the proximal femur.
- Clinically equivalent to DXA
- Identical areal BMD measurements and ROIs to DXA, as well as comparable T-scores.
- Bilateral hips from a single scan.
- Hip positioning may be done using software
- Highly automated analysis in 1–2 minutes.
- Precision: 0.7% short-term; 1.1% long-term total hip; 1.2% long-term femoral neck.
- Mindways areal BMD included in WHO FRAX® online fracture risk calculator
- Compatible with any DICOM CT or PET/CT scanner

Comparison of CXTA and DXA Proximal Femur Reference Data

The graph below shows the comparison of T-score measurements of the total hip made with CXTA and DXA*.



Normalizing the CXTA data to the DXA data results in an approximate relationship between CXTA and DXA total hip BMD estimates of:

$$BMD_{CTXA} = 1.006 * BMD_{DXA} - 0.106 \text{ g/cm}^2$$

* Looker AC, Orwoll ES, Johnston CC, Lindsay RL, Wahner HW, Dunn WL, Calvo MS, Harris TB, Heyse SP. Prevalence of low femoral bone density in older U.S. adults from NHANES III. J Bone Miner Res 1997; 12: 1761-1768

QCT Pro™ PACS option

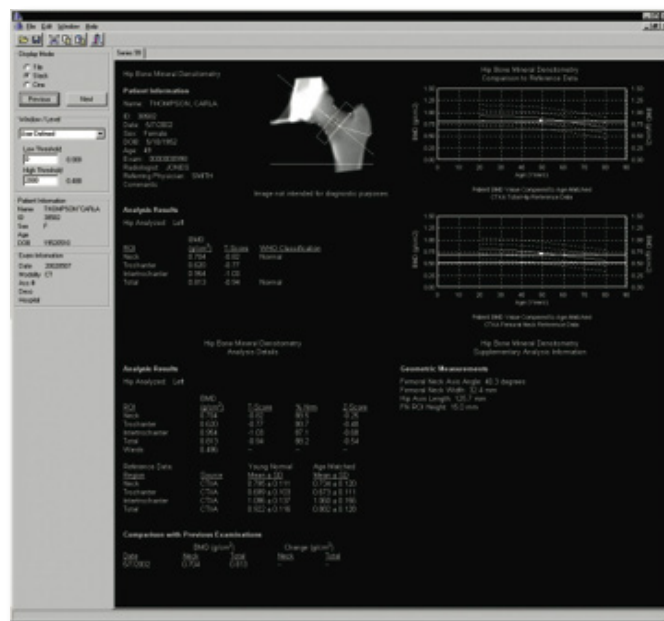
Increase physician access to BMD reporting

The QCT Pro™ PACS option provides for the integration of QCT Pro™ into your local PACS solution.

This integration allows you to exploit your local PACS infrastructure to work more efficiently by providing a paperless report that can be electronically archived and retrieved, reviewed locally or remotely, delivered in electronic form to your patients or physicians, or handled in other manners supported by your PACS.

After installation, PACS export is automatic and occurs during report printing. CTXA-Hip™ generates a projection image that has the same appearance as DXA.

PACS Export Example



Exact display of information depends on your PACS system.

Features at a glance

Export of QCT Pro™ Spine and/or Hip BMD reports to DICOM destinations.

Multiple methods for selecting the destination(s) for a report, including:

- static list of one or more destinations;
- selection from a drop-down list; and
- automatic delivery based on CT scanner ID associated with an analyzed data set

PC Specifications:

The QCT Pro™ computer should meet the following recommended minimum specifications:

- » Windows®-compatible PC
- » Windows® OS
- » CD-ROM drive
- » USB Port
- » 512 MB RAM
- » 80 GB Hard Drive
- » Video 1024 x 768 16-bit color
- » Ethernet adapter



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CliniQCT® from Mindways is also available through distributors in these countries:



China

Beijing Everbright Success Technology Co. Ltd
www.qct8.com



Australia

MINDWAYS AUSTRALIA
www.mindwaysaustralia.com.au



Italy

EUKON srl
www.eukon.it



Korea

CMP Trading Co. Ltd
www.cmptrading.co.kr



Mexico

Telecomunicacion Y Equipos, S.A. De C.V.



Japan

TORECK Co. Ltd.
www.toreck.co.jp



Poland

ALSTOR Sp.j.
www.alstor.com.pl



Middle East & Lebanon

CreoMedic S.A.R.L.
www.creomedic.com



Turkey

iMediT Tibbi Görüntüleme Cihazları & Sis. Ltd.
www.imedit.com



South Africa

TECMED Africa
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CliniQCT® is an optional module that provides additional asynchronous calibration functionality to the Mindways QCT Pro™ Bone Mineral Densitometry System