



GE HealthCare

True Definition DL

Clinical Casebook

Real definition, deeper insight



Defining the future of AI-powered CT image reconstruction

Artificial intelligence has become an enabling technology in CT imaging, transforming how images are reconstructed, interpreted and trusted for diagnosis. GE HealthCare leads this transformation, continually investing in next-generation intelligent technologies that combine deep learning (DL) innovations with clinical insights to deliver consistently high quality imaging.

GE HealthCare's leadership in AI-enabled CT imaging is demonstrated through a portfolio of advanced DL solutions, including:

TrueFidelity™ DL

The industry's first FDA-cleared* deep learning reconstruction technology that reduces image noise while preserving anatomical detail, delivering high quality CT images without compromising dose or image texture.

True Definition DL

True Definition applies a deep learning algorithm to improve spatial resolution, enabling sharper visualization of fine anatomical details and supporting more precise diagnoses.

True Enhance DL**

True Enhance generates enhanced contrast from single-energy scans using a deep learning algorithm, improving lesion visibility and diagnostic confidence through AI-driven image optimization.

The challenge of high-resolution imaging

High-resolution CT imaging is fundamental to diagnostic confidence across a broad range of clinical applications. By enabling precise visualization of subtle microstructural abnormalities, it improves the visualization of fine anatomical details relevant to assessing interstitial lung disease, occult fractures, early osteoarthritis, and small bone lesions, supporting improved diagnostic confidence and more informed clinical decisions.

However, achieving consistently high spatial resolution remains challenging:

- It requires increased radiation dose, conflicting with the ALARA (as low as reasonably achievable) principle
- Acquisition constraints – such as scan speed, pitch and coverage – may limit resolution or introduce noise/artifacts
- Photon-counting CT offers promising improvements, but its availability is limited due to cost and accessibility.

Clinicians therefore face uncertainty when image detail is insufficient to confidently depict subtle findings, potentially leading to ambiguous interpretation, delayed diagnosis or additional downstream testing.



* TrueFidelity DL FDA 510(k) clearance: K183202.

** True Enhance DL is available on the Revolution Ascend platform, and it is not available in all regions.

True Definition DL for high-resolution imaging

Unveil the detail in your fleet

True Definition DL (TDDL) is a cutting-edge, deep learning-based CT image reconstruction algorithm designed to enhance spatial resolution and overcome the limitations of high-resolution CT imaging through **spatial resolution enhancement**, **image noise reduction**, and **artifact suppression**. TDDL is trained on extensive clinical datasets, with particular emphasis on lung and bone imaging, where visualization of subtle microstructures is critical. TDDL delivers high-quality images without requiring any hardware modifications to existing CT scanners.

**0.3 mm
slice thickness**

True Definition DL uses advanced deep learning techniques to **enhance both in-plane (XY) and cross-plane (Z) spatial resolution**, generating images with a **0.3 mm slice thickness** that significantly improve the visibility of fine anatomical structures such as small airways, pulmonary nodules, and trabecular bone patterns. This enhancement is critical for high-contrast imaging tasks, particularly in bone and lung imaging, where diagnostic confidence hinges on the ability to resolve subtle details.

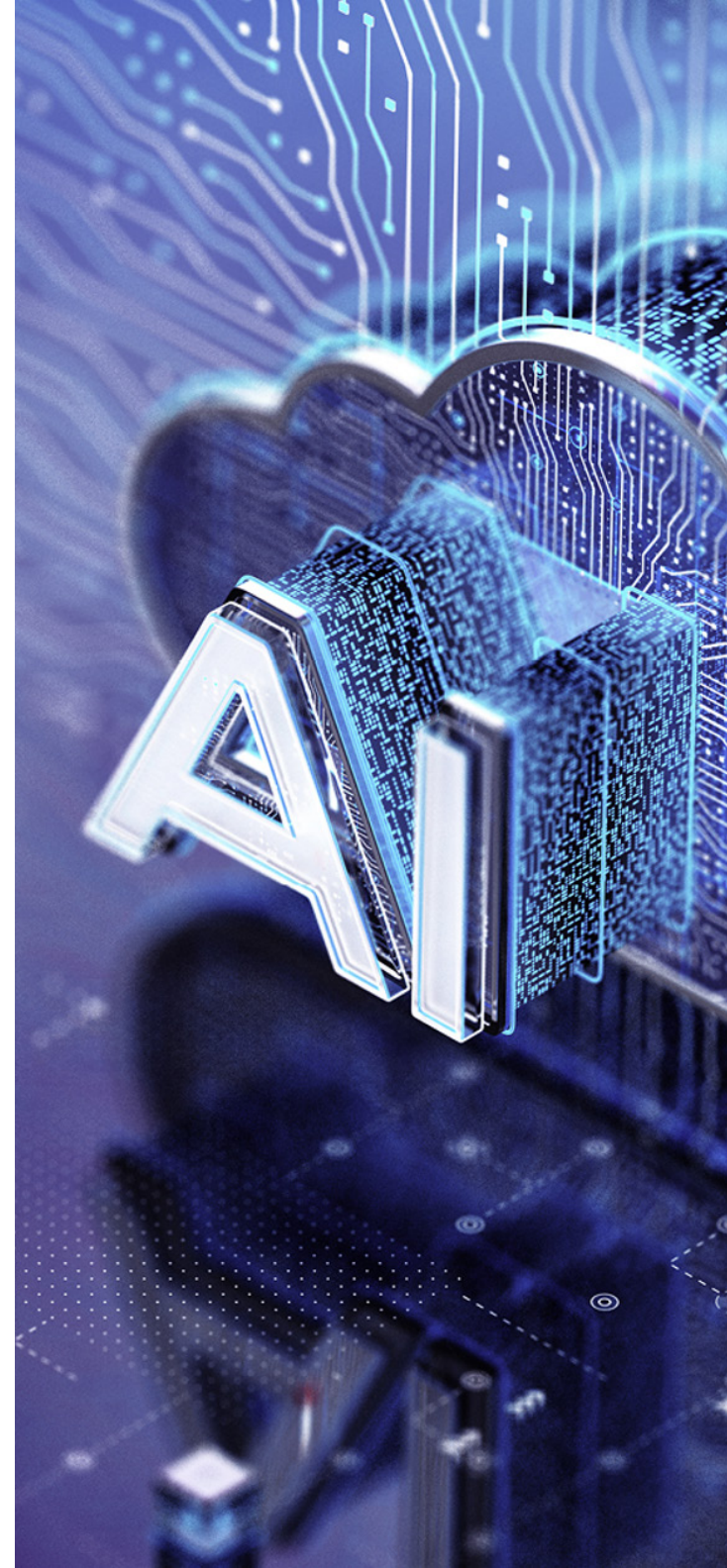
Lung imaging: Reveal subtle microstructures with clarity, supporting earlier identification and diagnosis of interstitial lung disease and other diffuse parenchymal abnormalities.

Musculoskeletal and inner ear imaging: Detect subtle bone lesions and fine structural changes, enabling more confident clinical decision-making. TDDL also visualizes intricate inner ear structures and microchannels with high precision, supporting more accurate diagnosis.



Dr. Stephanie Bitschnau
Radiologist and partner at Radiomed

“True Definition DL delivers exceptional spatial resolution for visualizing very small anatomical structures. In chest imaging, this level of detail is particularly valuable for assessing small airways, supporting earlier and more confident evaluation of interstitial lung disease. Additionally, the technology is highly beneficial in applications such as inner ear imaging with petrous bone scans, where it allows us to clearly visualize the auditory ossicles and detect erosions at an early stage. This improved definition also supports more confident fracture assessment.”



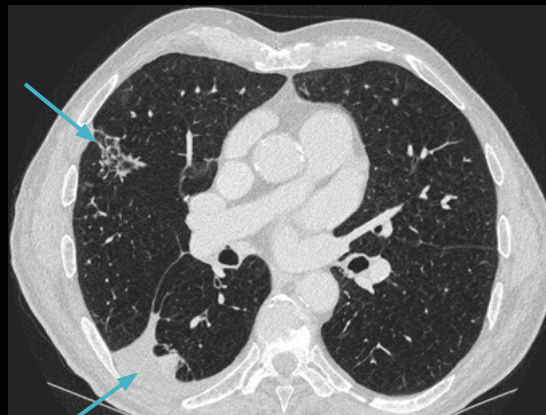


Lung

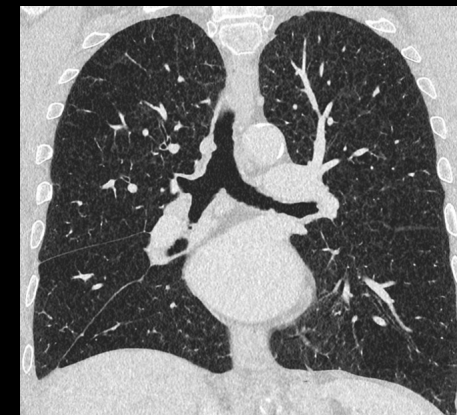
Low-dose high-resolution chest CT to detect pneumopathies



Volume rendering



TDDL-H



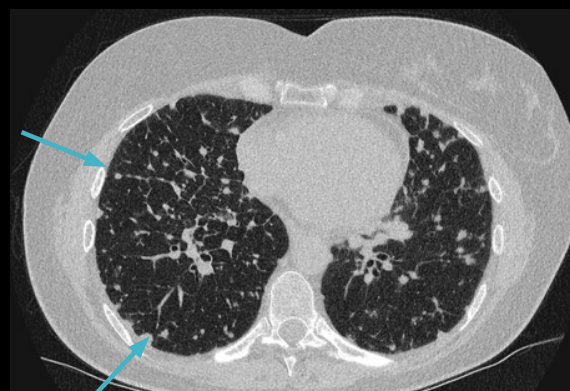
TDDL-H

Parameters : Rot. 0.35 s | 100 kV | Pitch : 0.984 | Auto mA : 280 / 110 | NI : 18 | 0.3 mm | DLP : 102 mGy-cm | CTDi : 2.60 mGy

Ultra-low-dose high-resolution chest CT to depict metastatic cancer lesions



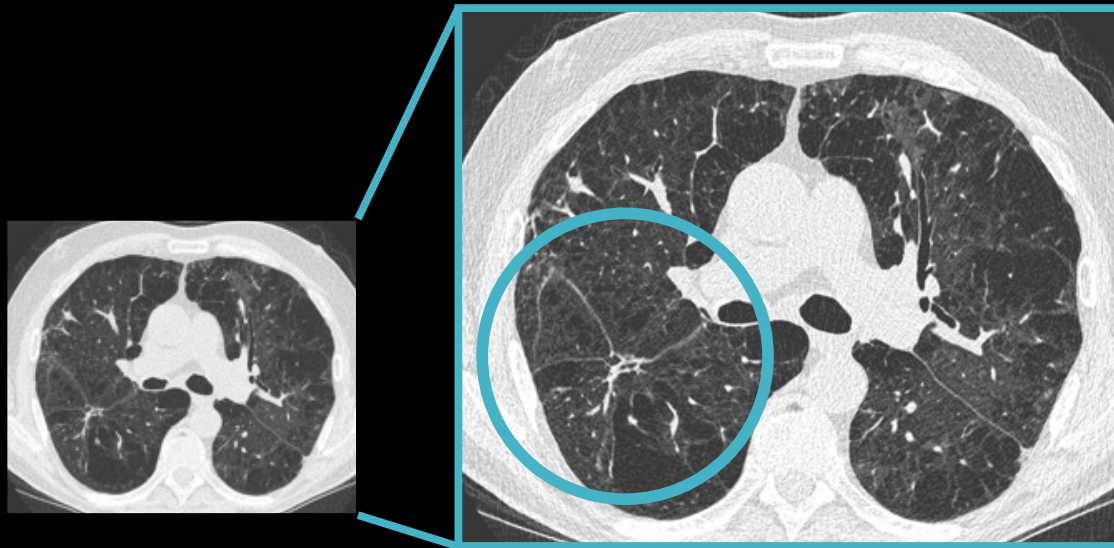
TDDL-H



TDDL-H

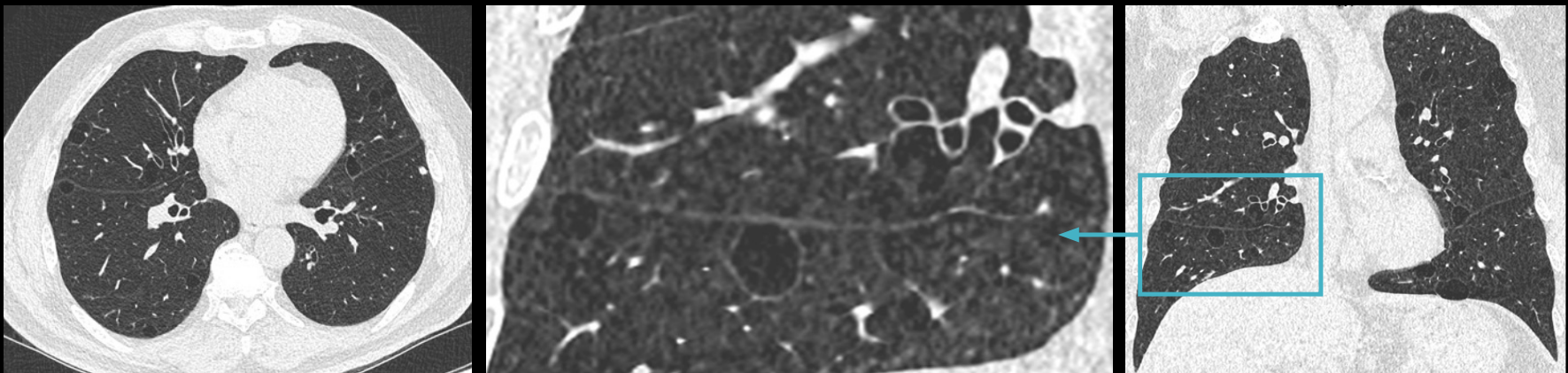
Parameters : Rot. 0.35 s | 140 kV | Pitch : 0.984 | Auto mA : 30 / 39 | NI : 24 | 0.3 mm | DLP : 56 mGy-cm | CTDi : 1.70 mGy

Low-dose high-resolution chest CT for emphysema evaluation



Parameters : Rot. 0.28 s | 120 kV | 74/129 mA | NI : 30 | 0.3 mm | CTDi : 1.87 mGy

Low-dose high-resolution chest CT for emphysema evaluation



TDDL Bone

Parameters : Rot. 0.28 s | 120 kV | 74/114 mA | NI : 30 | 0.3 mm | CTDi : 1.62 mGy

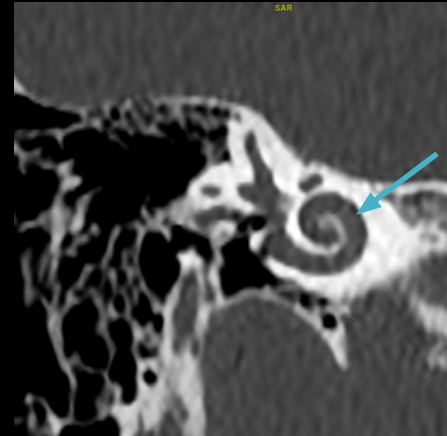


Inner ear

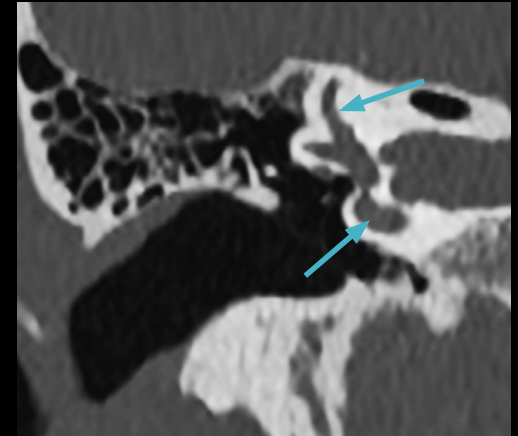
High-resolution imaging of the temporal bones for detailed evaluation of inner ear microstructures



Stapes



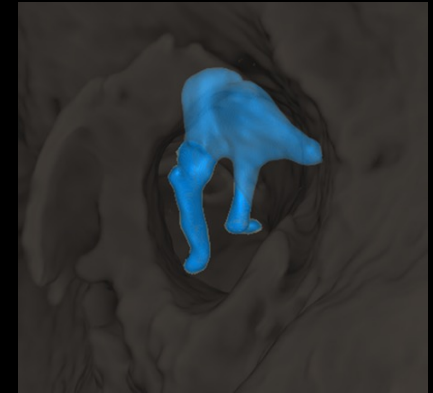
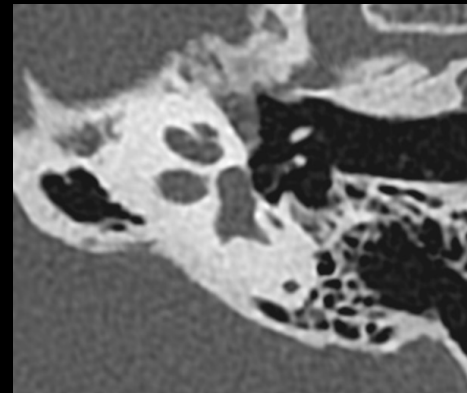
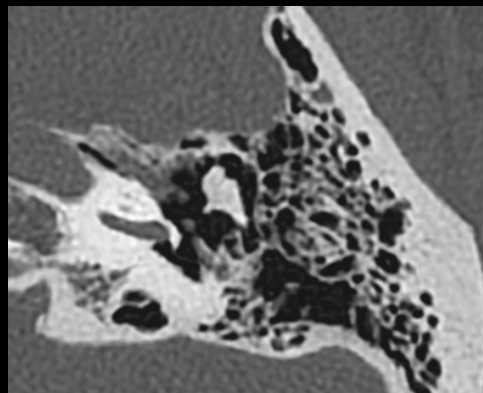
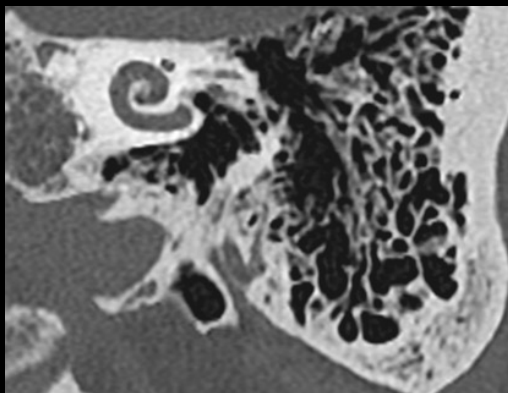
Cochlea



Semicircular channels

Parameters : Rot. 1 s | 120 kV | Axial | Auto mA : 162 | NI : 10 | 0.3 mm | DLP : 195 mGy-cm | CTDi : 24.00 mGy

Enhanced Visualization of Fine Anatomical Structures



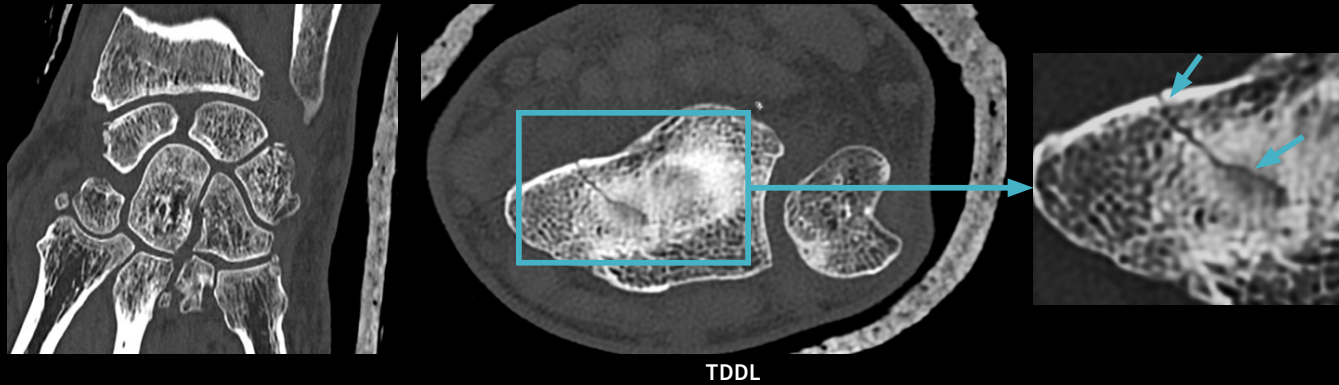
TDDL Bone

Parameters : Rot. 1 s | 120 kV | 255 mA | NI : 15 | 0.3 mm | CTDi : 78.70 mGy



MSK

High-resolution imaging for detailed assessment of a wrist fracture



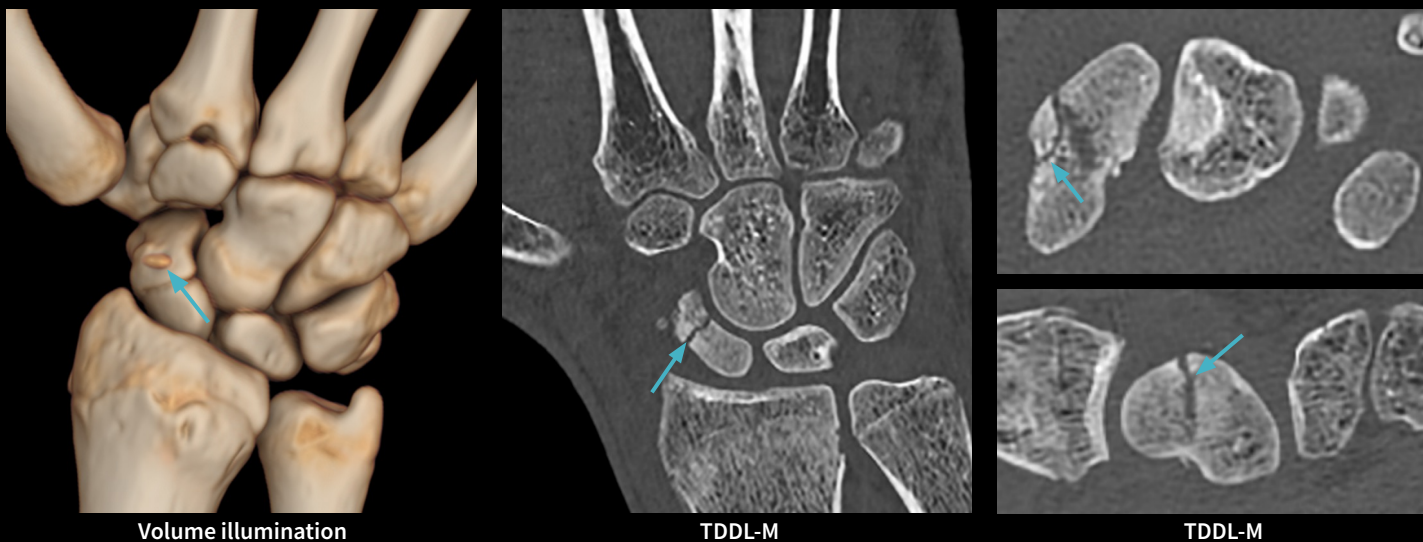
Parameters : Rot. 1 s | 120 kV | 170 mA | 0.3 mm | CTDi : 21.50 mGy

High-resolution imaging to assess the wrist post screw fixation



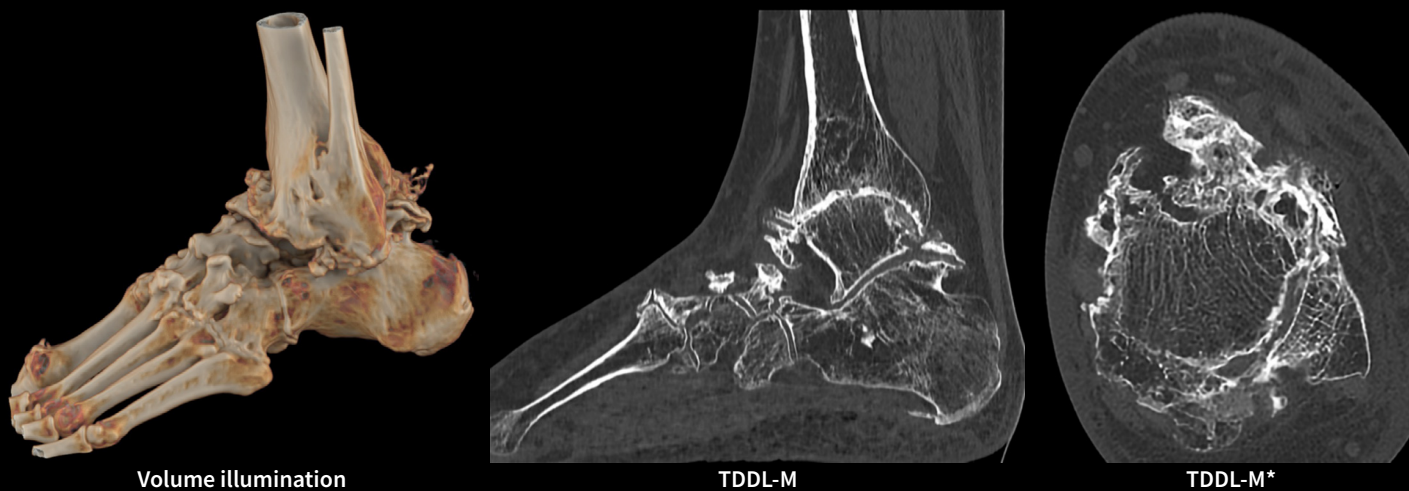
Parameters : Rot. 1 s | 100 kV | 180 mA | 0.3 mm | CTDi : 14.34 mGy

High-resolution wrist imaging for scaphoid fracture assessment



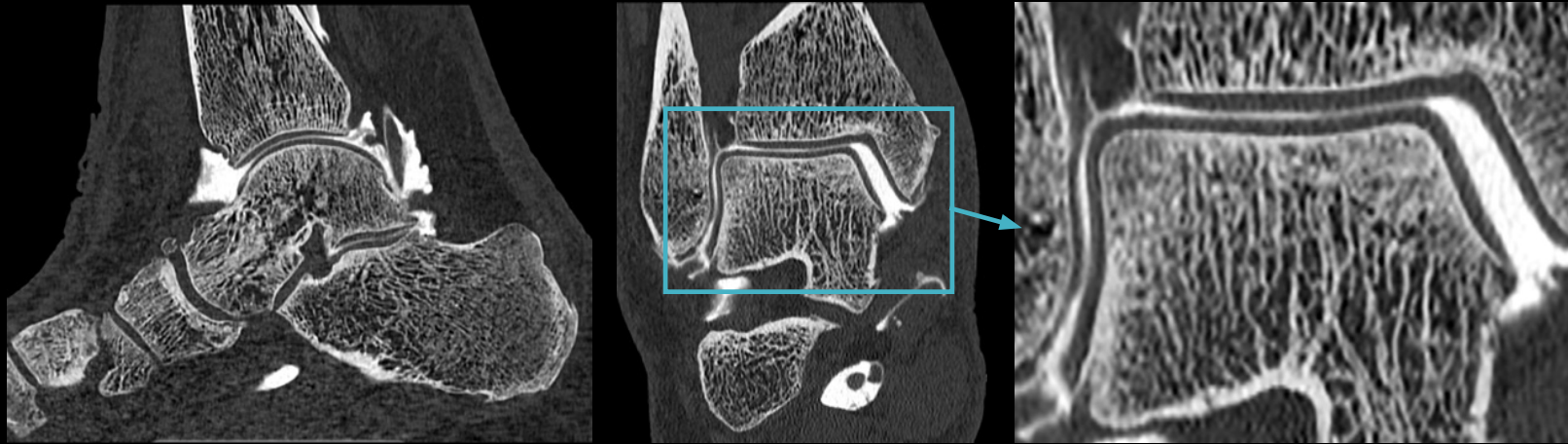
Parameters : Rot. 0.6 s | 120 kV | Pitch : 0.516 | Auto mA : 120 | NI: 30 | 0.3 mm | DLP : 95 mGy-cm | CTDi : 5.5

High-resolution ankle imaging in a patient with osteoarthritis



Parameters : Rot. 0.6 s | 120 kV | Pitch : 0.516 | Auto mA : 140 | 0.3 mm | DLP : 220 | CTDi : 10

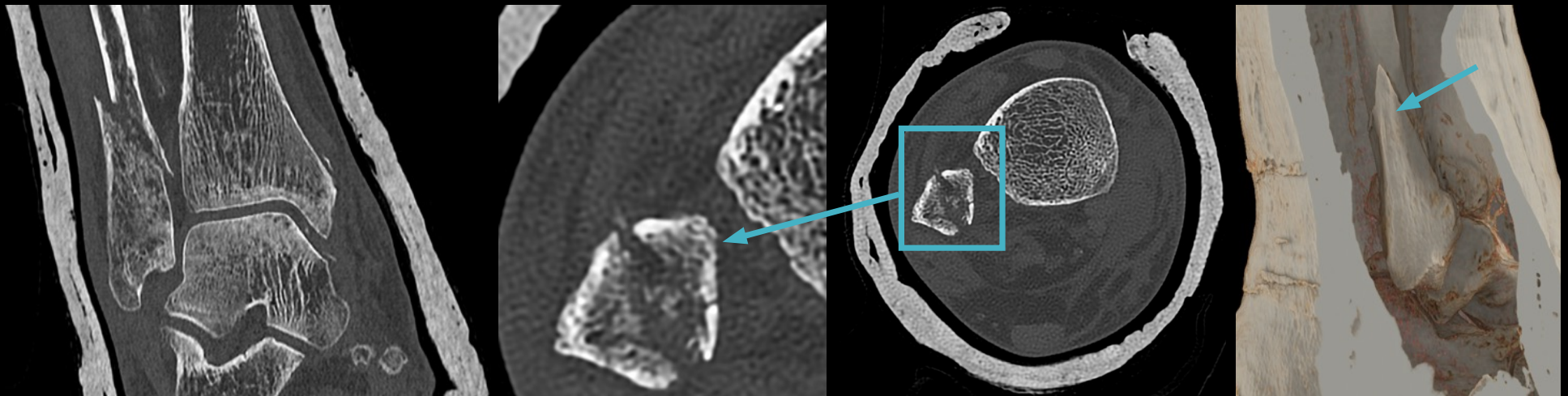
High-resolution ankle arthrography for detailed joint evaluation



TDDL Bone

Parameters : Rot. 0.8 s | 120 kV | 150 mA | 0.3 mm | CTDi : 15.19 mGy

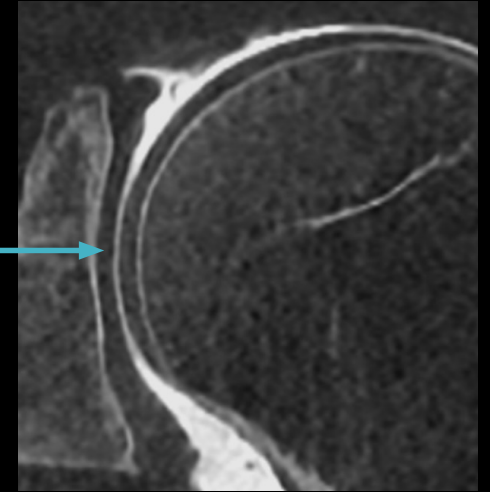
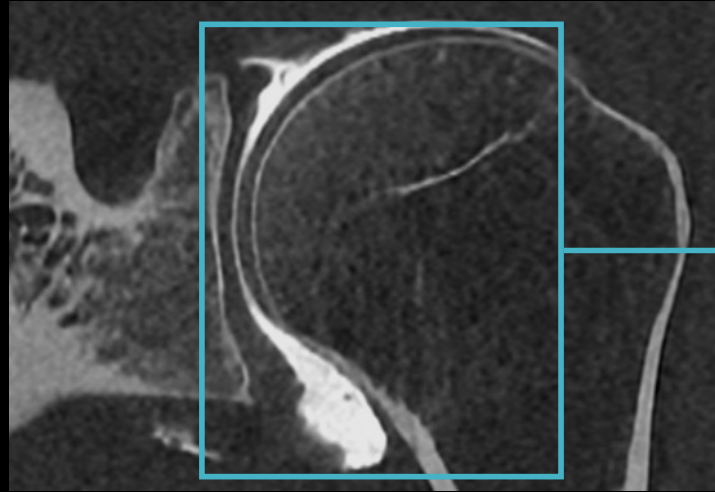
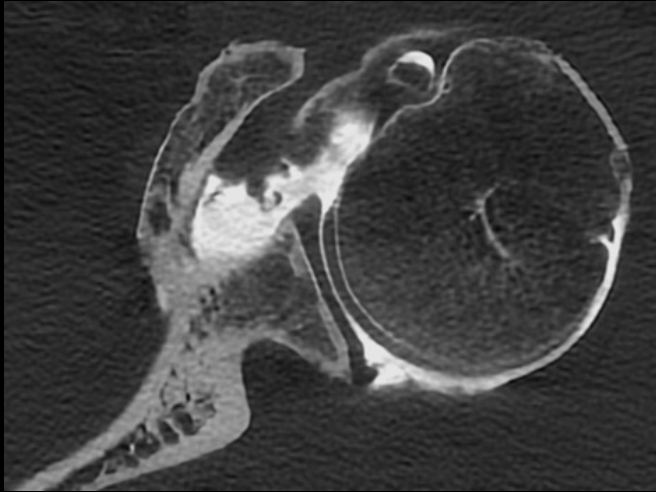
High-resolution ankle imaging to assess for fibular fractures



TDDL

Parameters : Rot. 1 s | 120 kV | 100 mA | 0.3 mm | CTDi : 12.00 mGy

High-resolution shoulder arthrography for detailed joint evaluation



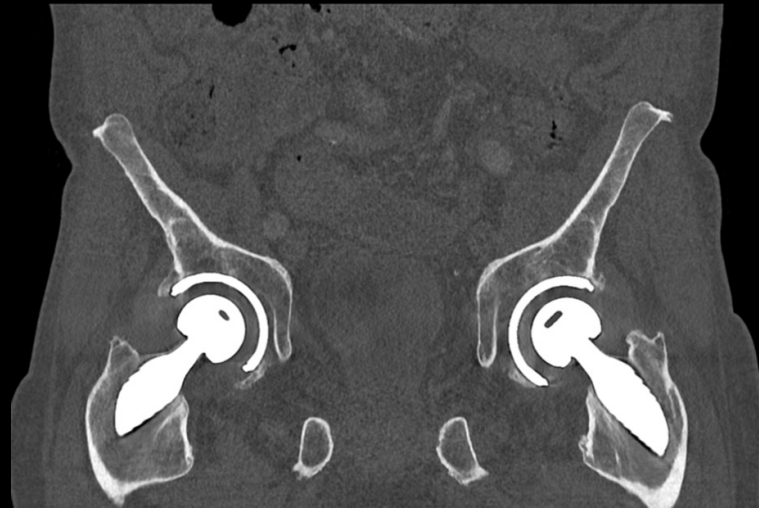
TDDL Bone

Parameters : Rot. 0.8 s | 120 kV | 450 mA | 0.3 mm | CTDi : 45.57 mGy

High-resolution abdominopelvic imaging to assess hip prosthesis



Volume illumination
MAR



TDDL-H

Parameters : Rot. 0.8 s | 120 kV | Pitch : 1.375 | Auto mA : 170/250 | NI : 19 | 0.3 mm | DLP : 399 mGy-cm | CTDi : 8.20 mGy

About GE HealthCare Technologies Inc.

GE HealthCare is a trusted partner and leading global healthcare solutions provider, innovating medical technology, pharmaceutical diagnostics, and integrated, cloud-first AI-enabled solutions, services and data analytics. We aim to make hospitals and health systems more efficient, clinicians more effective, therapies more precise, and patients healthier and happier. Serving patients and providers for more than 125 years, GE HealthCare is advancing personalized, connected and compassionate care, while simplifying the patient's journey across care pathways. Together, our Imaging, Advanced Visualization Solutions, Patient Care Solutions and Pharmaceutical Diagnostics businesses help improve patient care from screening and diagnosis to therapy and monitoring. We are a \$19.7 billion business with approximately 53,000 colleagues working to create a world where healthcare has no limits.

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