QIW Session 5

Exploring New CT Imaging & AI Technical Opportunities

Rick Avila

Accumetra, LLC

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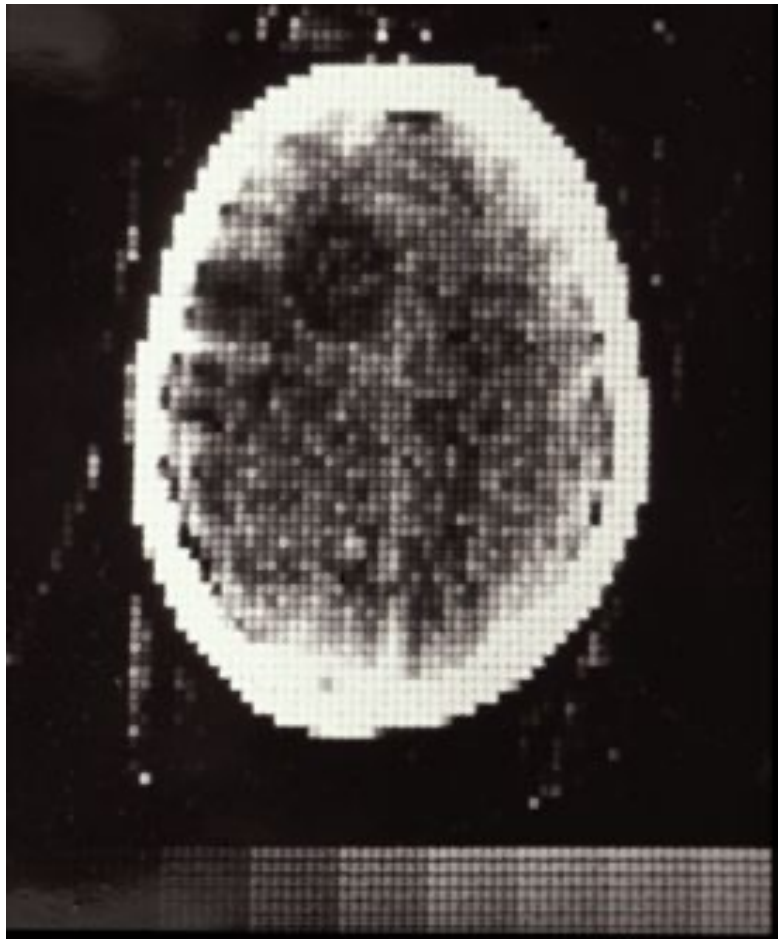
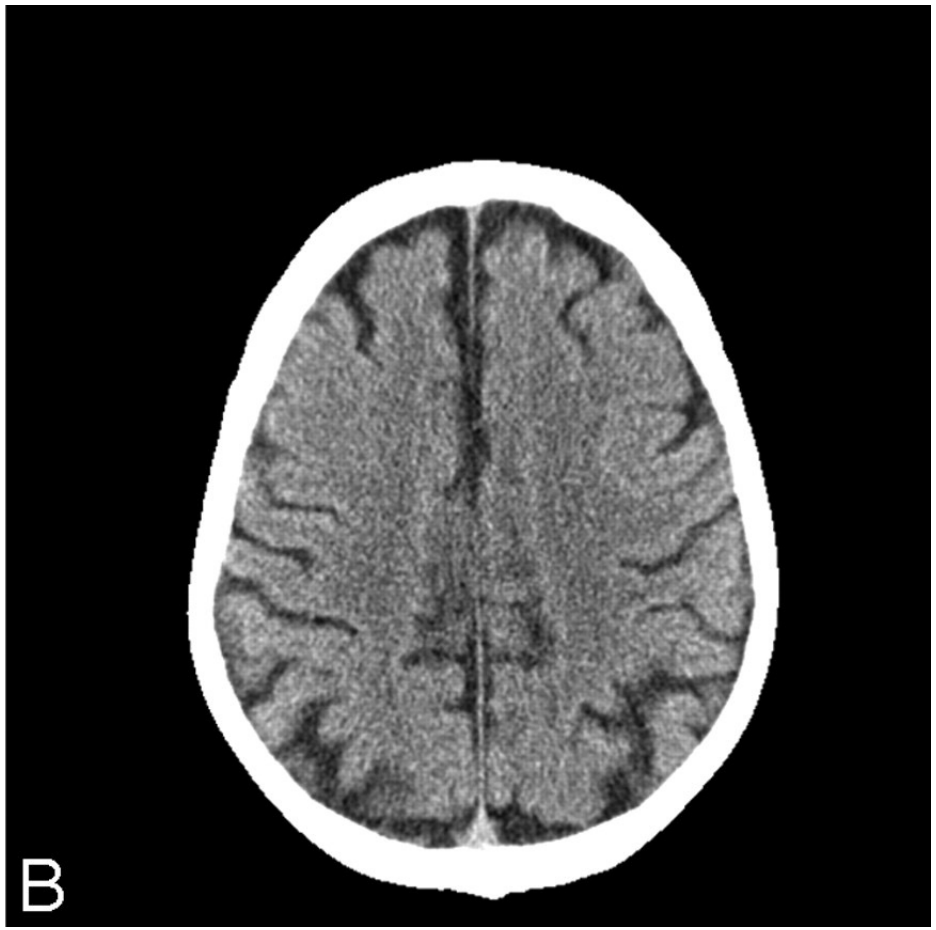
Disclosures

- Accumetra, LLC shareholder
- Kitware, LLC shareholder
- Kitware, Inc shareholder

CT Imaging Has Come A Long Way Over 51 Years

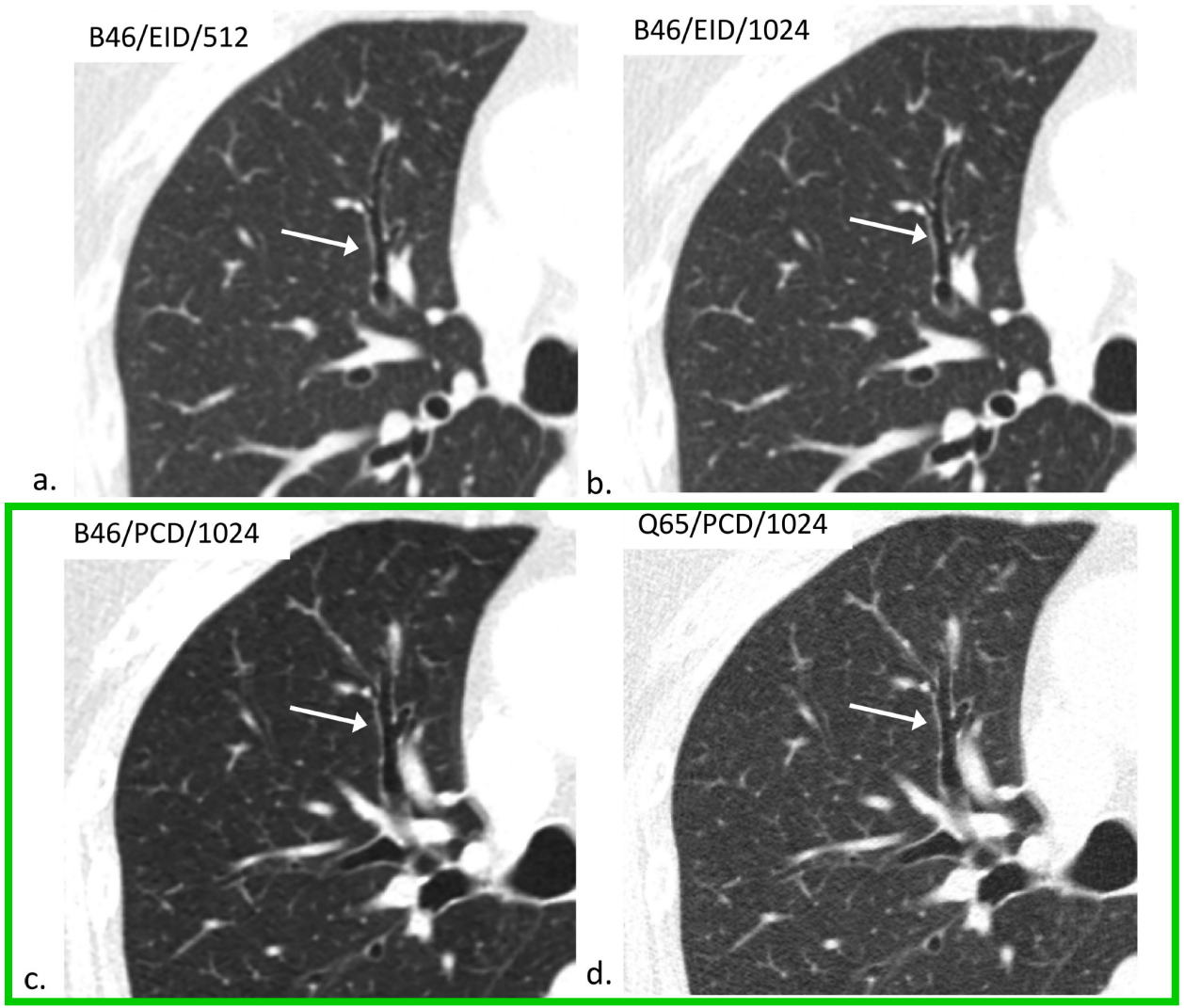




Photon Counting CT

Main Advantages

- In-plane Resolution
- Energy Resolution
- Detector Efficiency



Bartlett, Investigative Radiology 2019

Deep Learning AI CT Reconstruction

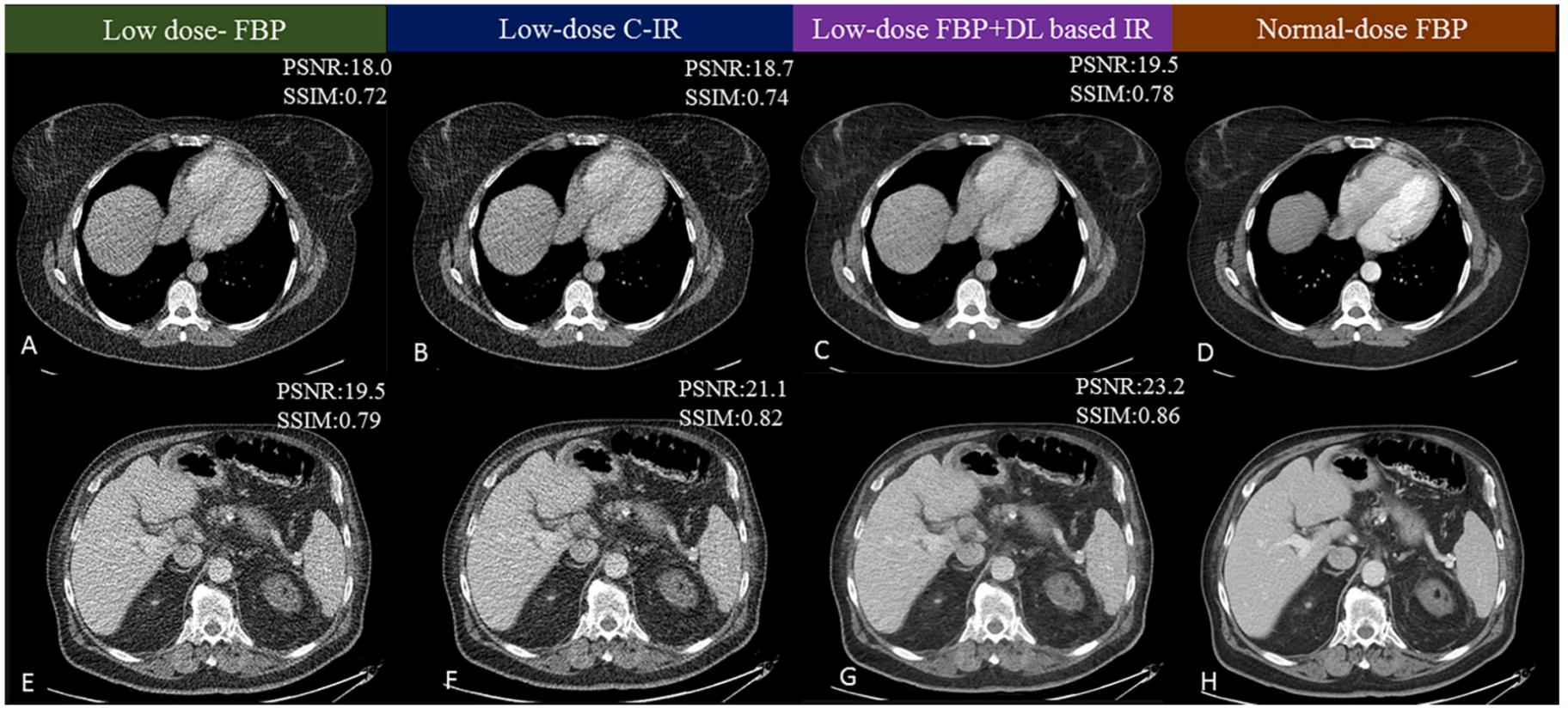


Fig. 1. Low dose FBP-DL chest (C) and abdomen (G) CT images show better denoising and artifact reduction compared to low-dose FBP (A, E) and low-dose C-IR (commercial/clinical iterative reconstruction) images (B, F). Chest (low dose: CTDIvol 1.1 mGy; normal dose: 9 mGy) and abdomen (low dose: CTDIvol 1.2 mGy; normal dose: 10 mGy) were performed with 120 kV, 0.9:1 pitch, gantry rotation time of 0.5 s, and automatic exposure control technique.

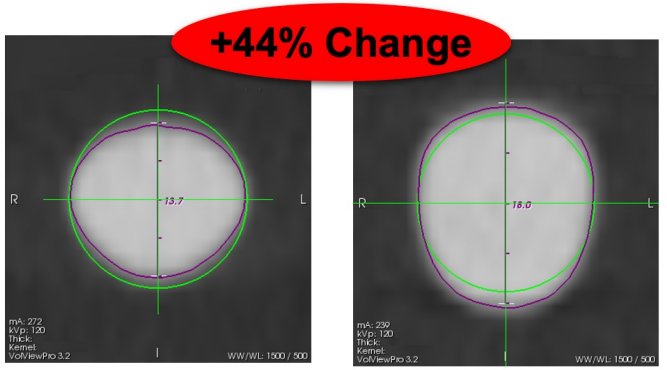
Exciting Times

- But as we have learned before, we need to verify the quality for each clinical application.

2010: Roche ABIGAIL Study

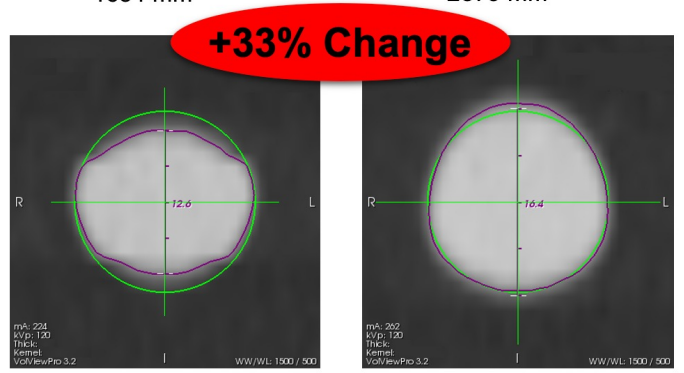
[Henschke, … Avila, J Med Imaging 2016]

Model A Site 1



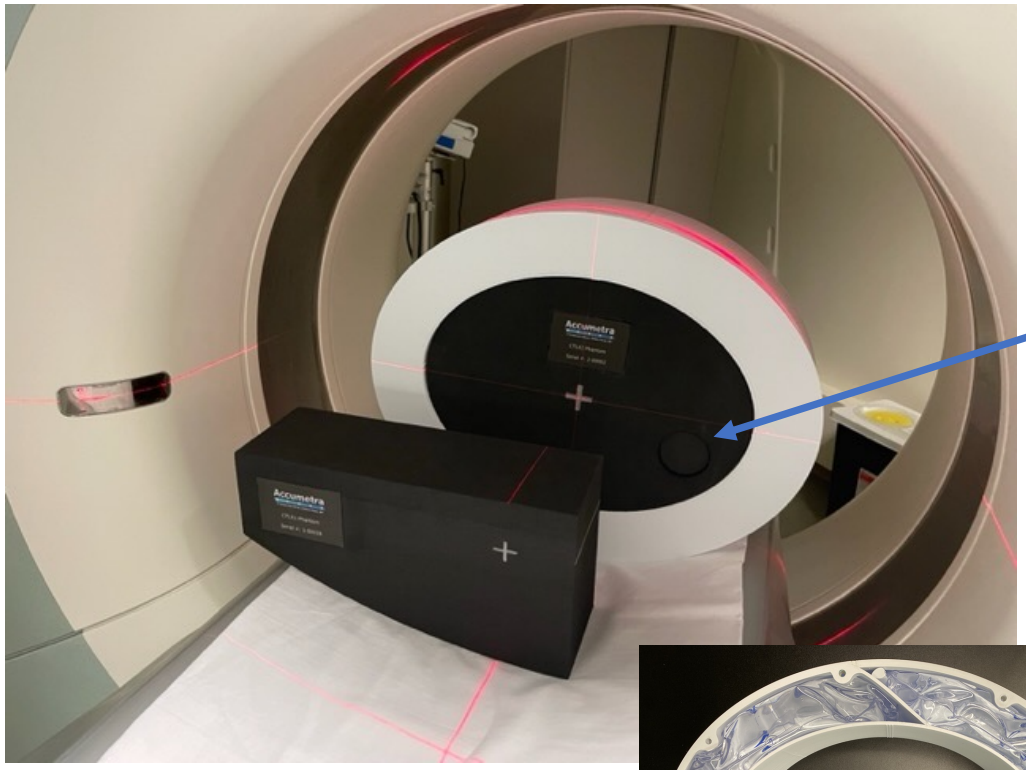
1654 mm^3 2379 mm^3

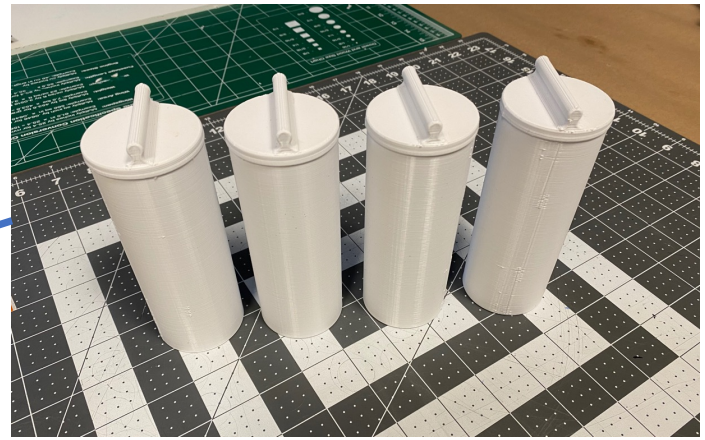
Model A Site 2

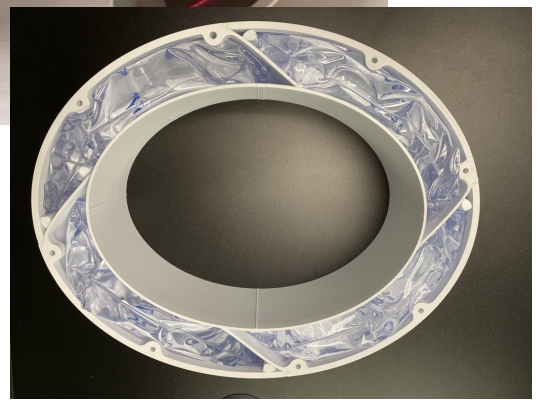


1601 mm^3 2127 mm^3

3D Printing







Thank You