

PixelShine® Powered by AlgoMedica

MAXIMIZE IMAGE QUALITY MINIMIZE CT RADIATION

Al Powered Image Reconstruction





Challenge

Get the CT image quality you expect

- All the time
- At the lowest possible dose





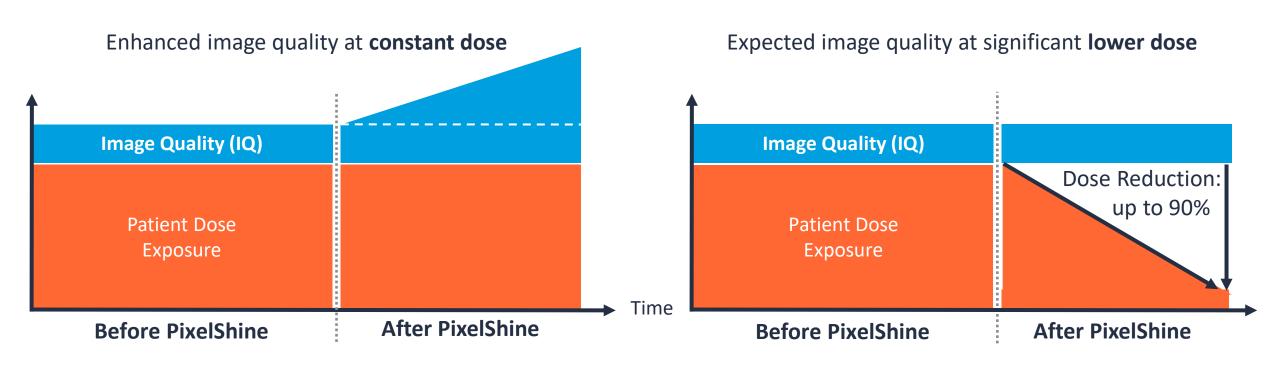
Maximize the clinical value of any CT scanner while minimizing patient dose





Improve the relationship between image quality and dose

PixelShine provides options

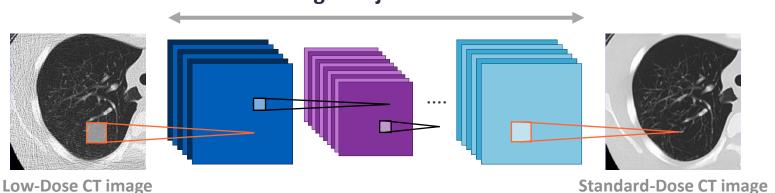




How it works – powered by Al

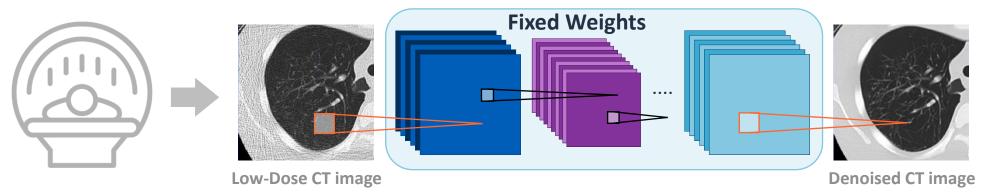
Weight adjustments

Training





After Training





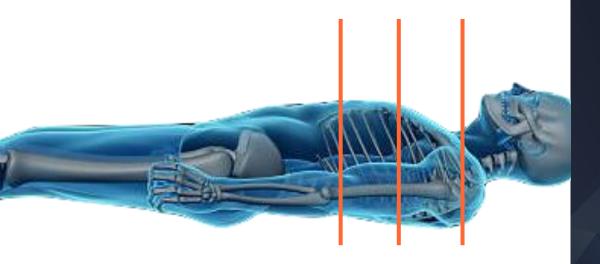
Vendor Neutral & Benefits *all* CT applications

Abdomen /Pelvis Lung Calcium **Screening** Scoring CT Brain CT Obese **Perfusion Pediatrics** Angio **Patients**

Canon **PHILIPS TOSHIBA SIEMENS**

Including older and refurbished CT scanners





Adaptive Processing

- Standardize image quality
- Streamline protocols
- Improve workflow
- Increase productivity
- Improve quality for obese patients

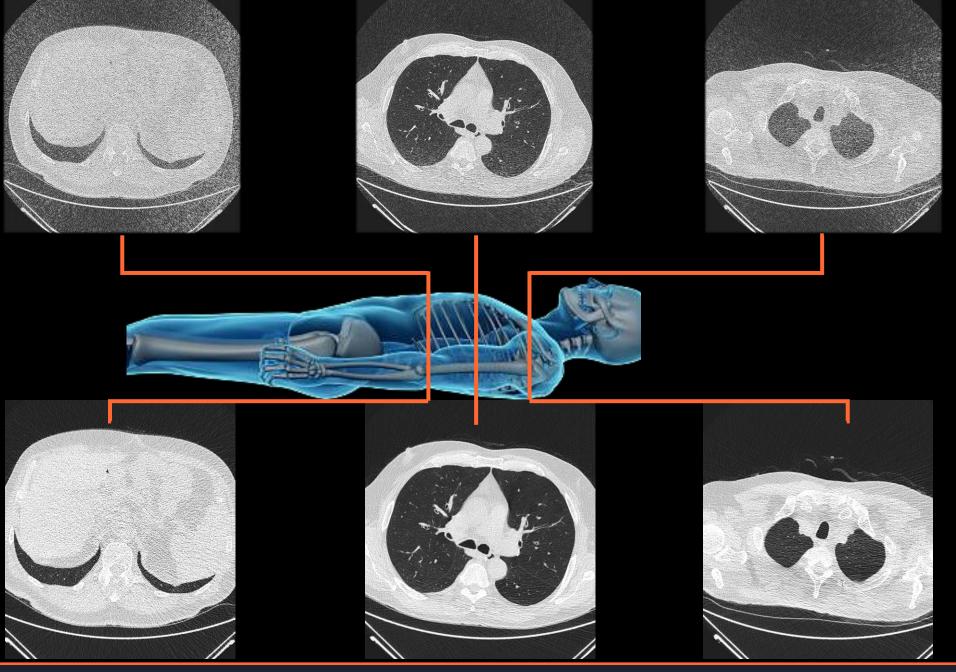




Adaptive Processing











Key Features

- Machine learning reduces noise w/o blurring
- Fast (11+ slices/sec)
- No user interaction required
- Any new, old, and refurbished scanner
- Quickly and remotely installed
- Enterprise data and access controls
- Standards based interoperability
- Virtual or server based



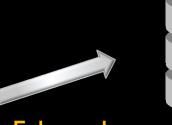


- Converts inferior CT scans to high quality images
- Avoid specific & costly CT SW upgrades





















Virtual, local server, cloud based, etc. *No integration with scanner required*

PixelShine



FBP: Filtered Back Projection **IR**: Iterative Reconstruction

... and other brands



PixelShine Workflow

- Improves image quality of all studies
- Al image re-processing reduces image noise w/o blurring
- Each PixelShine supports any number of scanners













Virtual Server or Cloud Based PACS, VNA or EMR





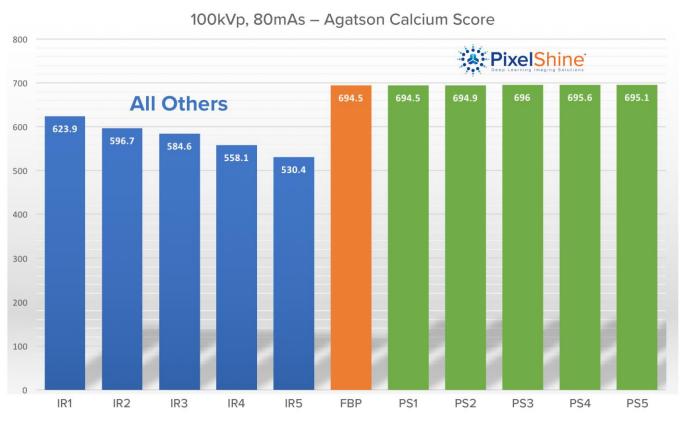
Don't Accept Reduced Pixel Density!

Blurry images from iterative reconstruction can reduce the conspicuity of small objects

Lower lesion and Agatston score

Ca	Area	Lesion score	CASC	
1	2.9mm ² (20pxls)	x 2 (214HU)	= 5.8	
2	29.0mm ² (200pxls)	x 4 (1175HU)	= 116.0	
3	43.1mm ² (297pxls)	x 4 (_674HU)	= 172.3	
4	5.2mm ² (36pxls)	x 3 (302HU)	= 15.7	
5	10.3mm ² (71pxls)	x 2 (289HU)	= 20.6	
6	1.9mm ² (13pxls)	x 1 (188HU)	= 1.9	

Agatston Calcium Score = 332.3





Fine Data Loss Example

Iterative Reconstruction Reduces the Agatston Calcium Score by an Average of 22%*

Table 1 Summary of selected studies evaluating the use of Iterative Reconstruction for Coronary Artery Calcium Scoring

Author	Year	n	IR algorithm	Vendor	Standard vs Low Radiation Median Agatston Scor
Gebhard, et al.[26]	2012	50	ASIR	GE Healthcare	837.3 (FBP) vs 709.2 (ASIR 100 %) -15.3
Kurata, et al.[25]	2013	70	SAFIRE	Siemens Healthcare	163.3 (FBP) vs 84.1 (SAFIRE 50 %)
Van Osch, et al.[27]	2014	112	ASIR	GE Healthcare	81 (FBP) vs 53 (ASIR 100 %) -34.
Obmann, et al.[29]	2015	68	HIR	Philips Healthcare	621.4 (FBP) vs 531.8 (L7) (CAC>400)
Takahashi, et al.[28]	2015	352	ASIR	GE Healthcare	119 (FBP) vs 79 (ASIR 100 %)
Szilveszter, et al.[30]	2015	567	HIR/IMR	Philips Healthcare	147.7 (FBP) vs 107.0 (HIR) vs 115.1 (IMR) -22.

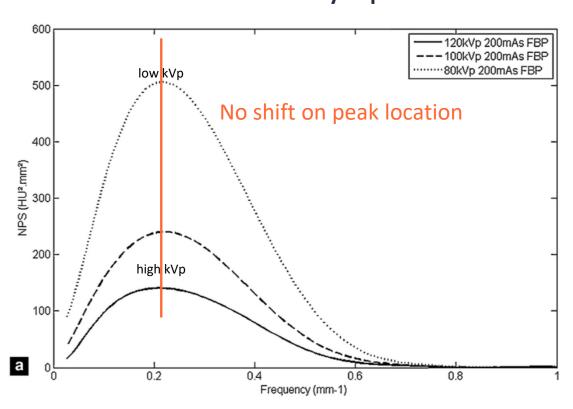
n number of patients, IR iterative reconstruction, IRIS iterative reconstruction in image space, SAFIRE sinogram-affirmed iterative reconstruction, AIDR3D adaptive iterative dose reduction 3D, ASIR adaptive statistical iterative reconstruction, HIR hybrid iterative reconstruction, IMR iterative model reconstruction, FBP filtered back projection



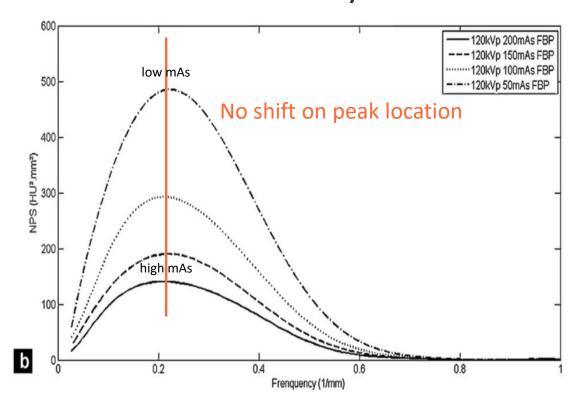


How NPS Curves Should Look

Dose Reduction by kVp

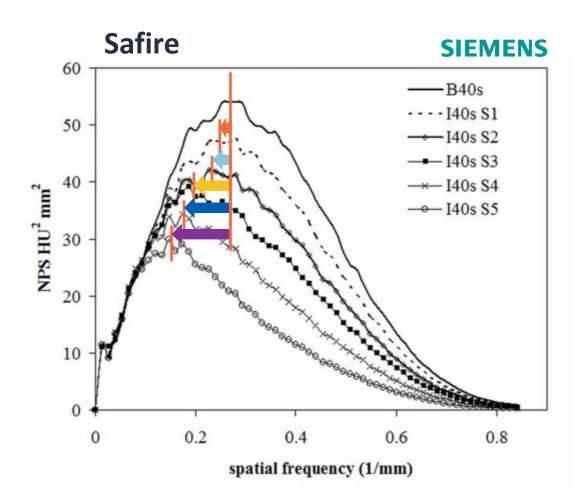


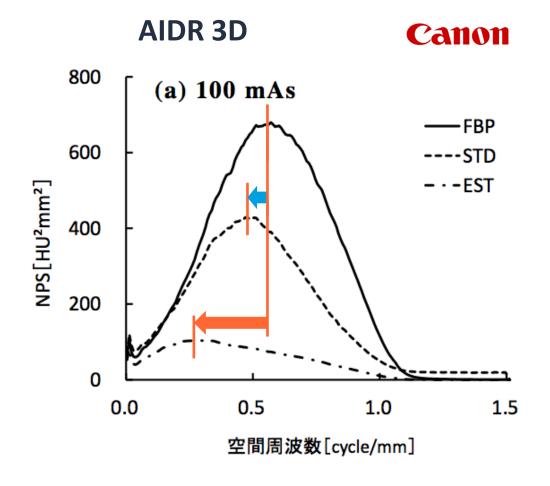
Dose Reduction by mAs











^{*} Ghetti, C., Palleri, F., Serreli, G., et al.: Physical characterization of a new CT iterative reconstruction method operating in sinogram space. J. Appl. Clini. Med. Phys., 14 • 4, 263 ~ 271, 2013.



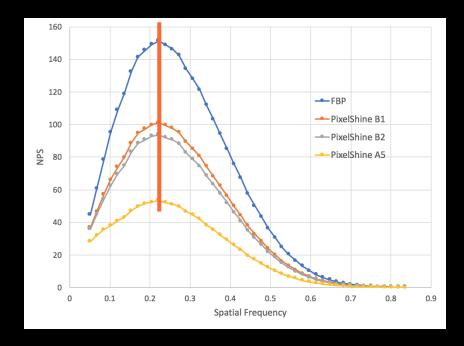


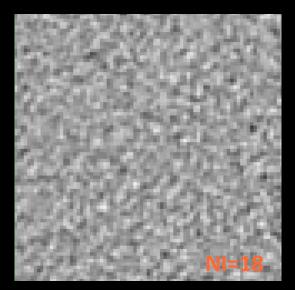


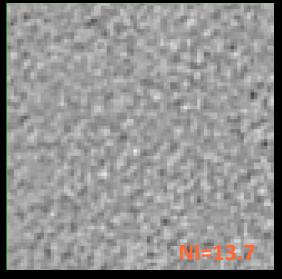
A non-linear filter developed using machine learning technology:

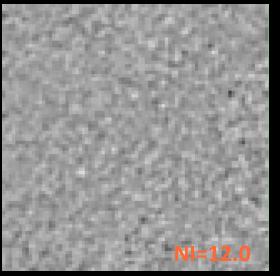
- Reduces noise
- No change in noise texture

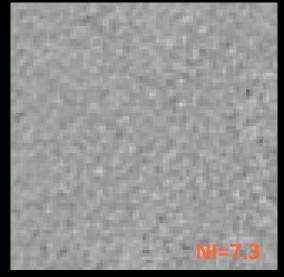
We don't shift the peak!









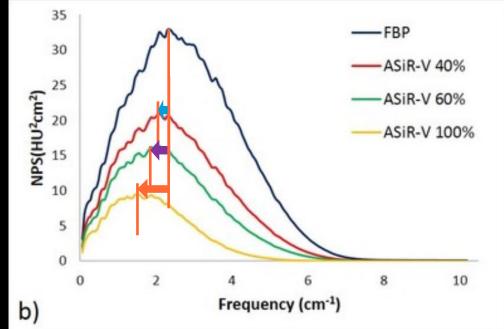


FBP PixelShine B1

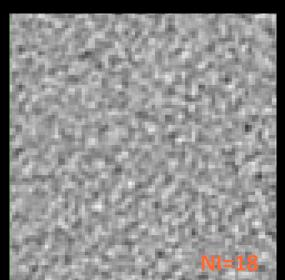
PixelShine B2 PixelShine A5

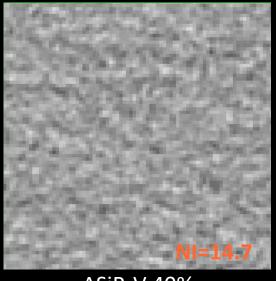


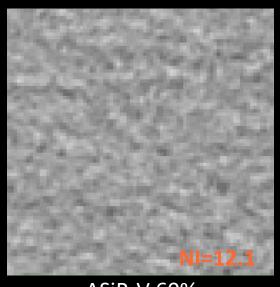


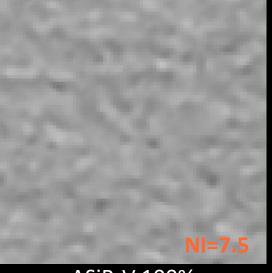










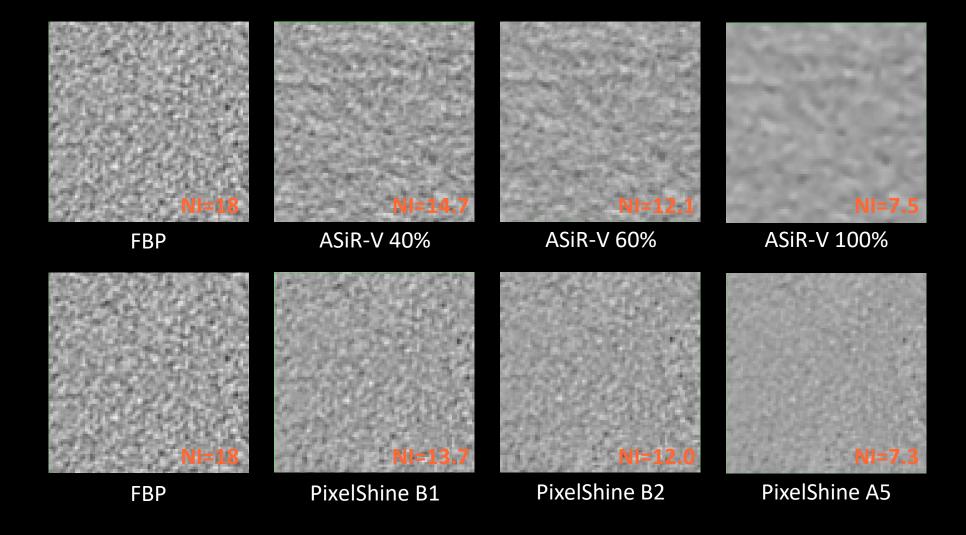


FBP ASiR-V 40% ASiR-V 60% ASiR-V 100%



^{*} De Marco, P., Origgi, D.: Noise performance assessment of the new ASiR-V; Preliminary results. ECR 2017, Vienna, Austria, 2017.





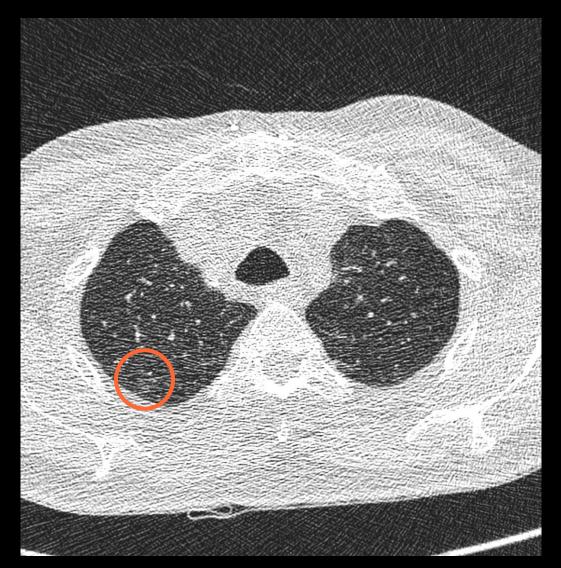


Clinical Examples

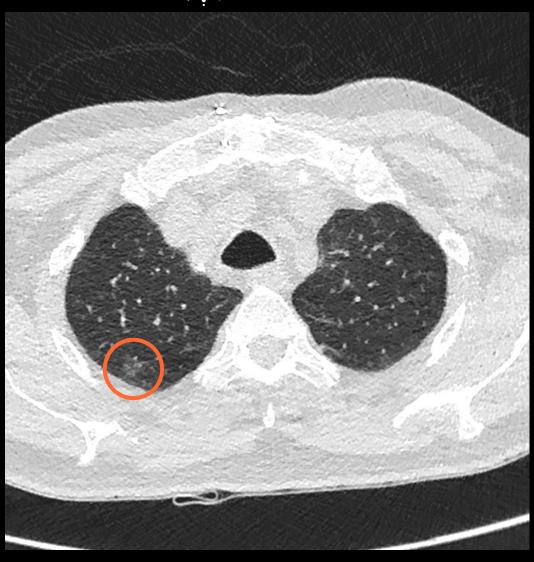


FBP

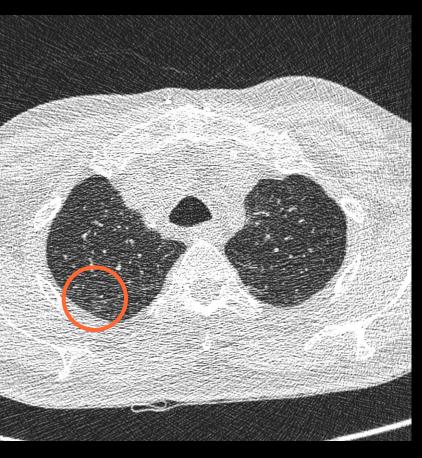


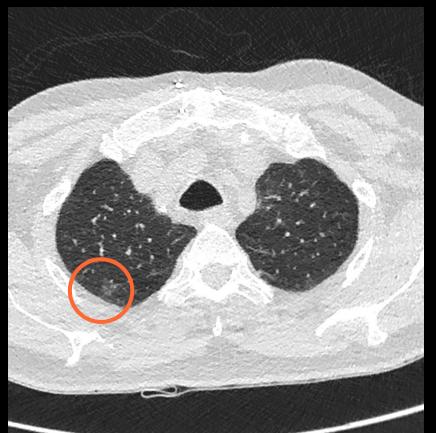






120kVp 22.4mAs 1mm **1.3mGy**







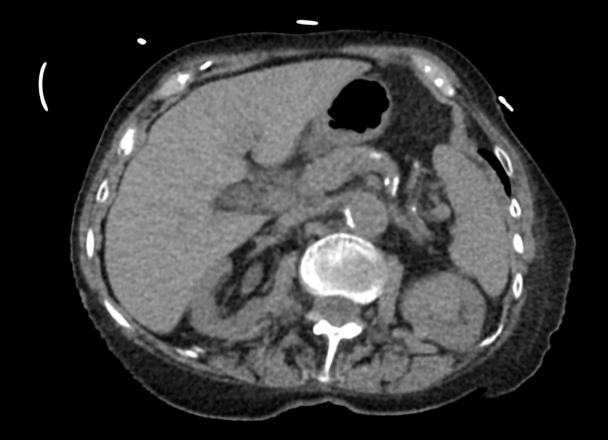
FBP (low dose)



VS.

FBP (high dose)

AIDR3D Standard

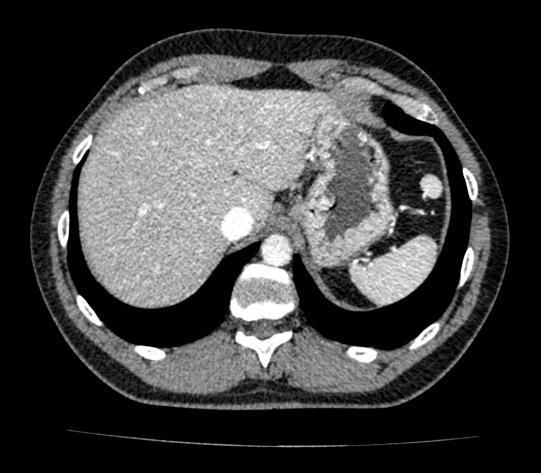




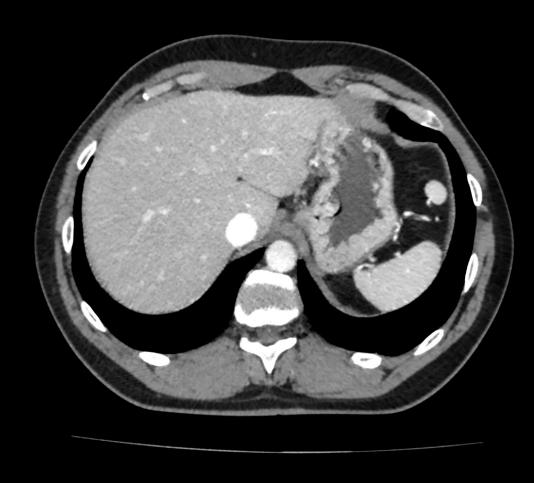


Abdomen HCT 5mm 120kVp 38.32mAs 5mm (2.9mGy)

FBP



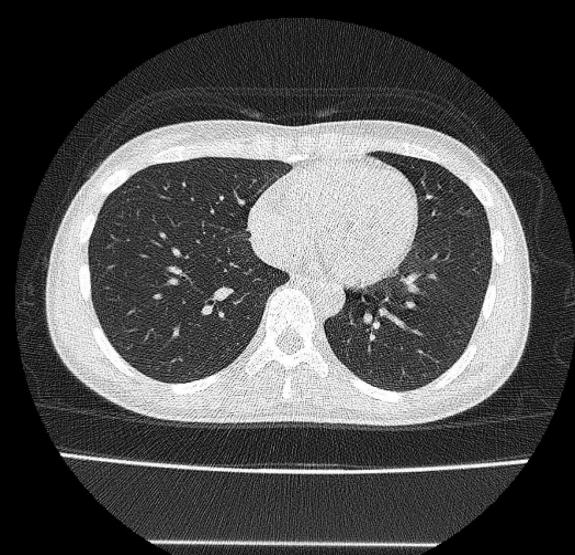


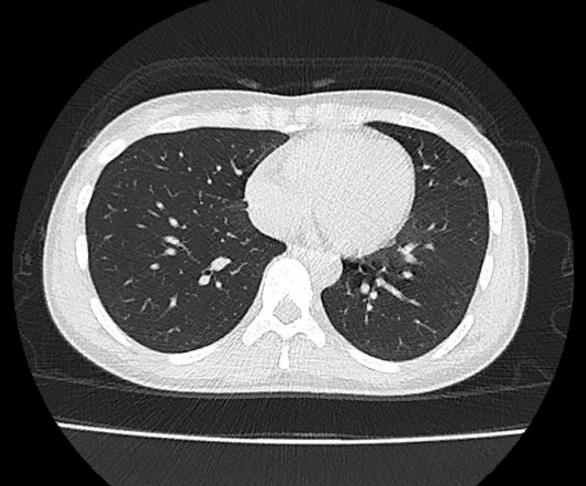


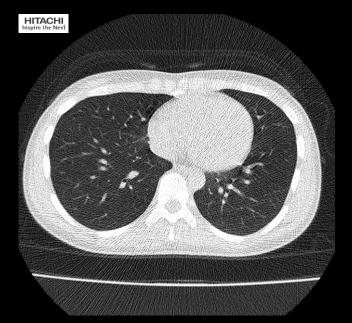
FBP

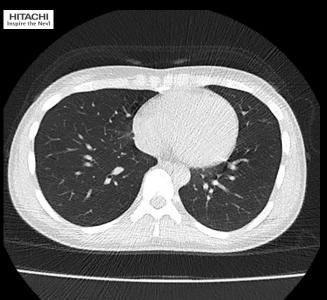




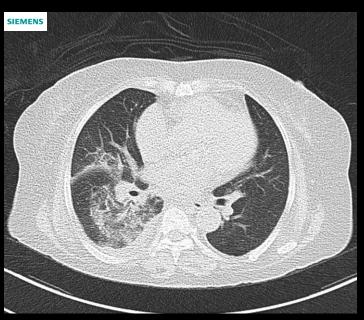


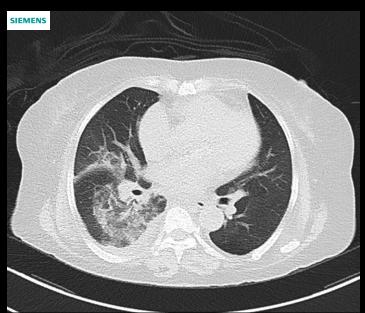




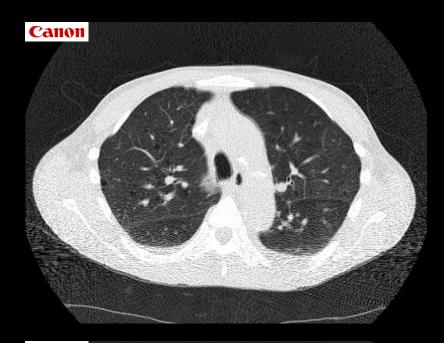


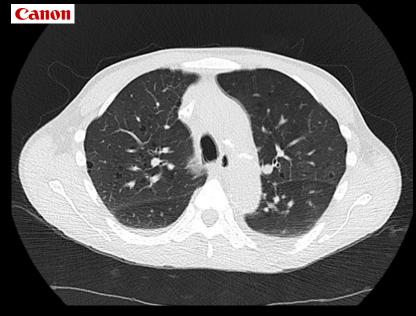




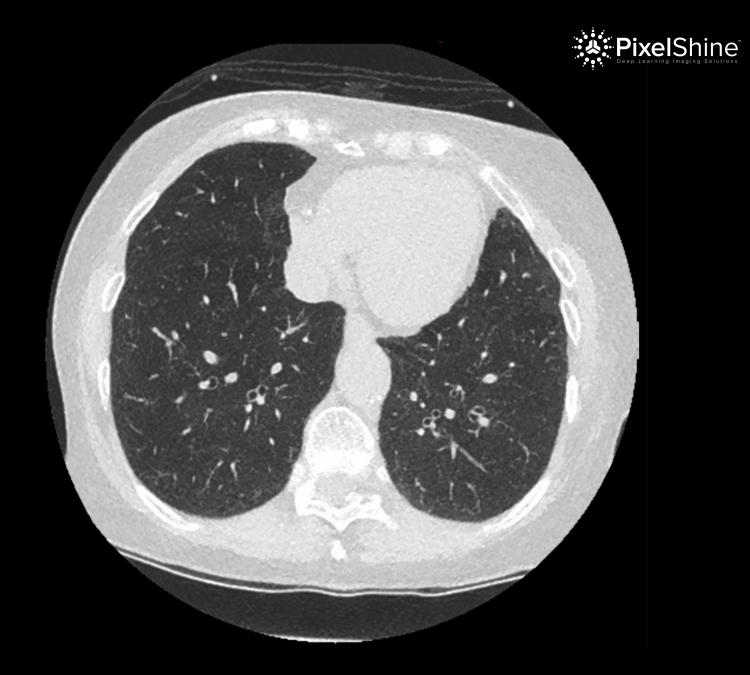




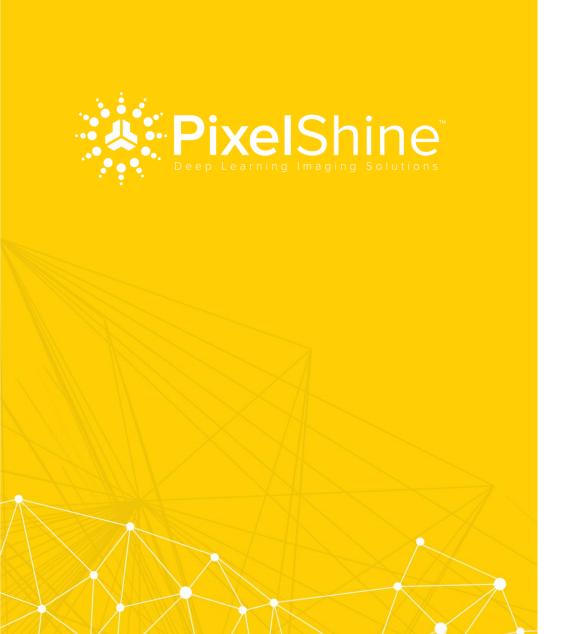






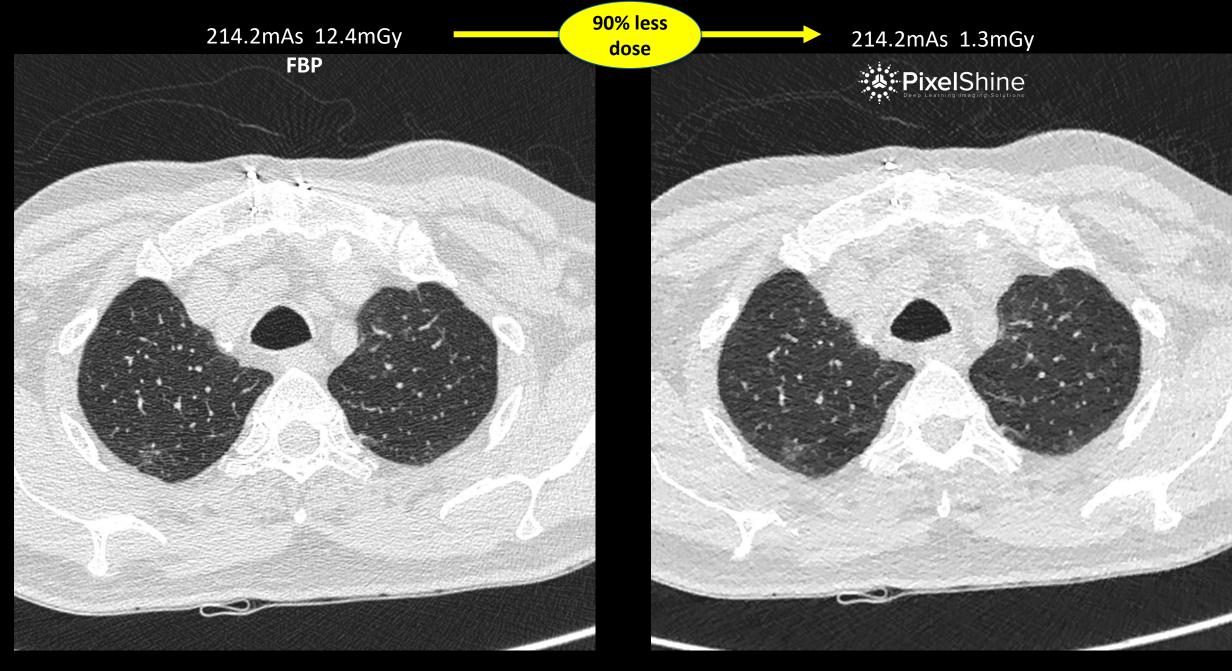


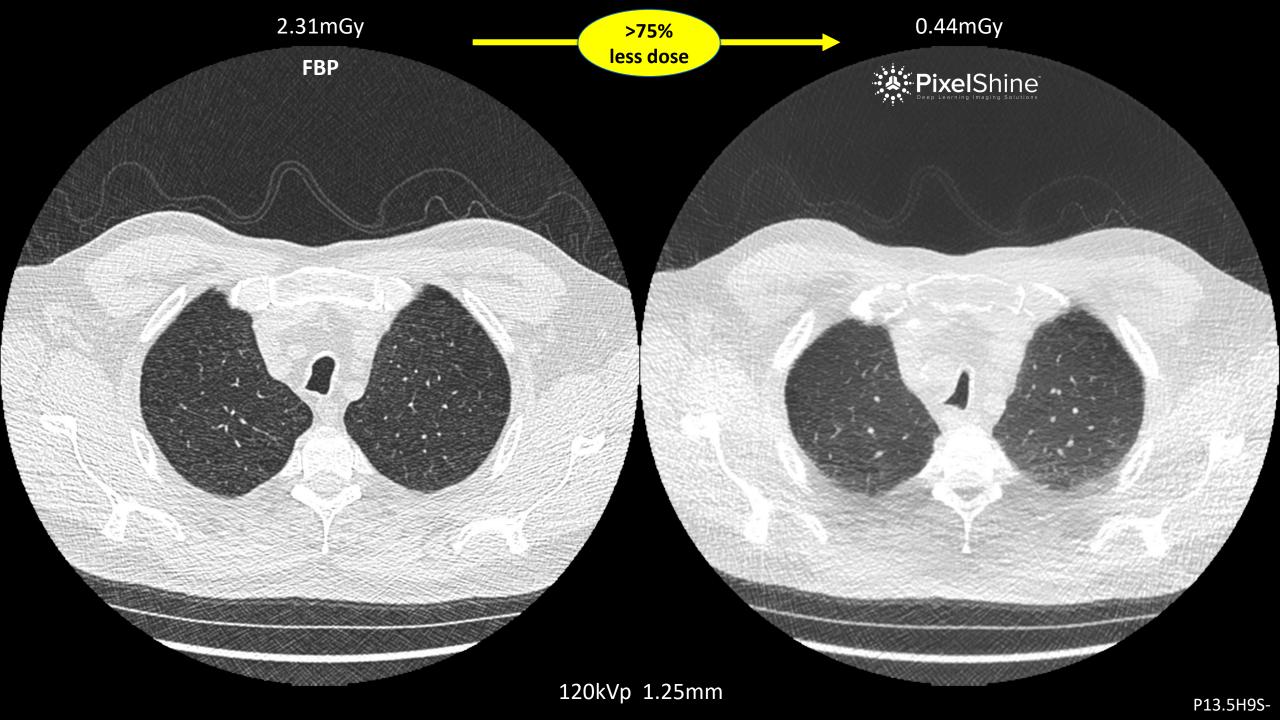
100kVp 15.1mAs 1.25mm 0.7mGy

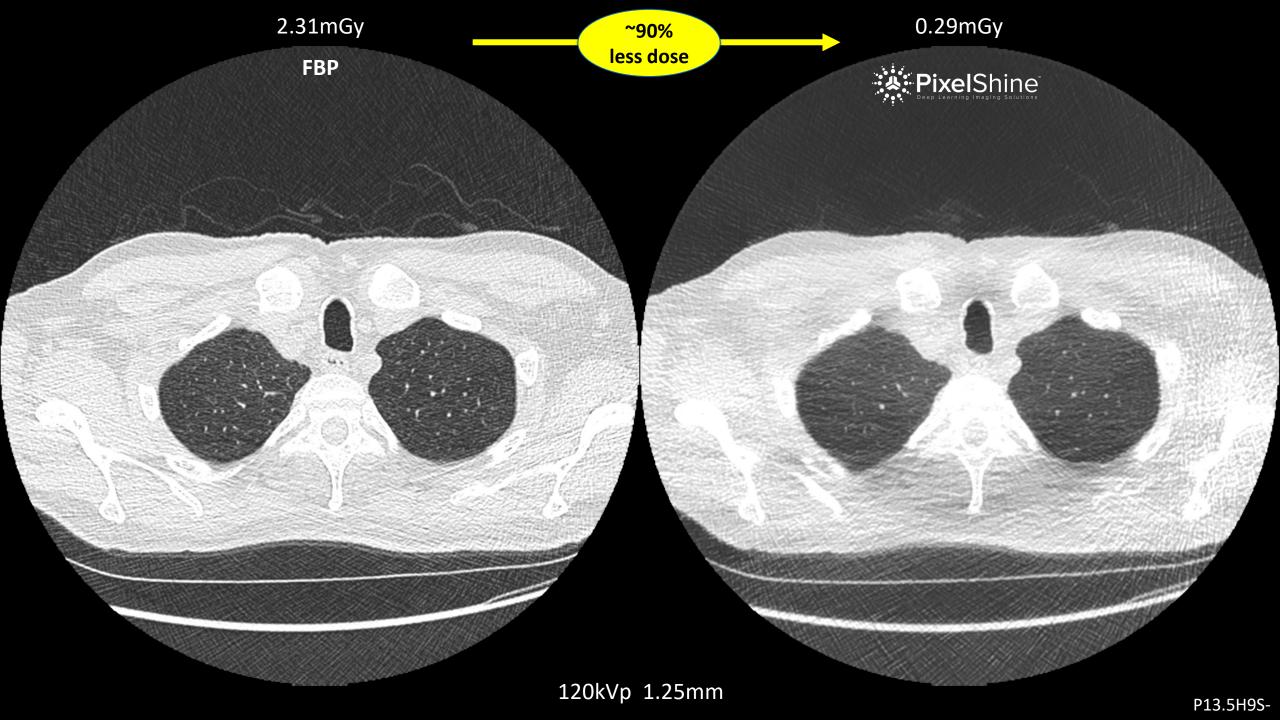


Lung Cases



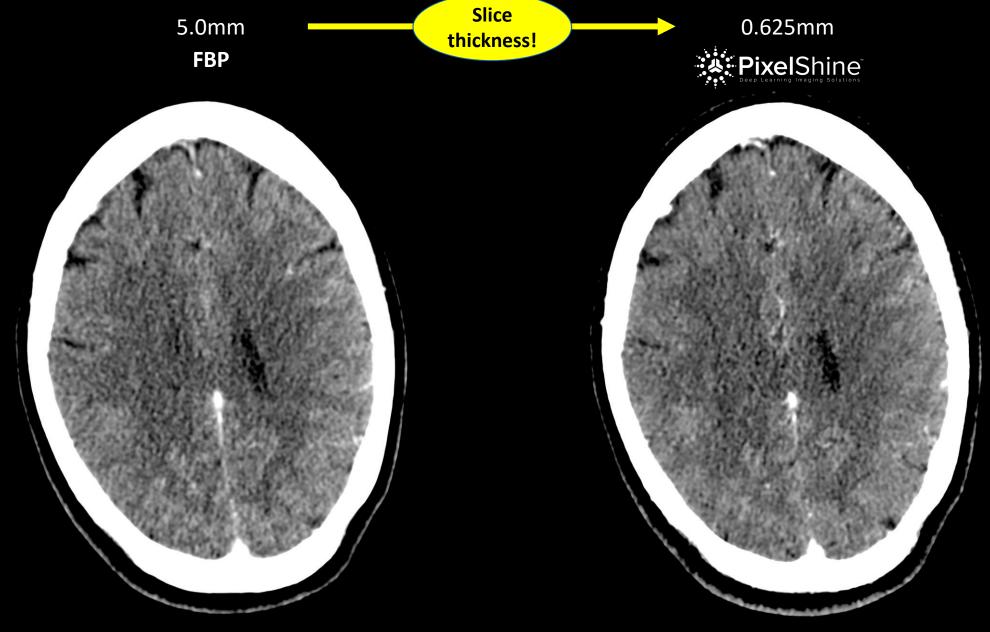


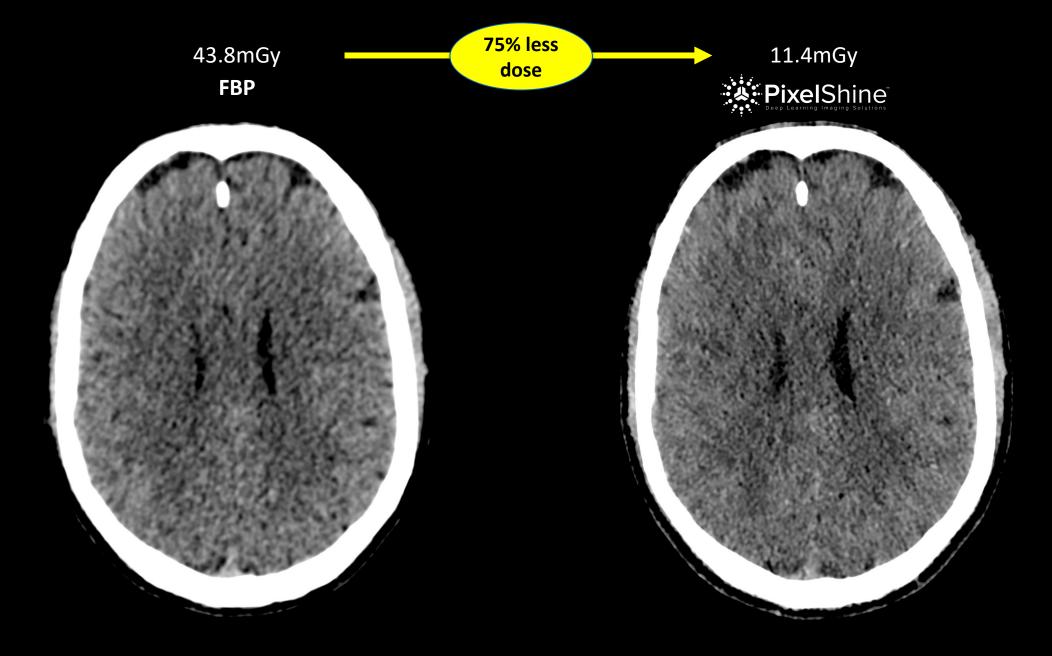




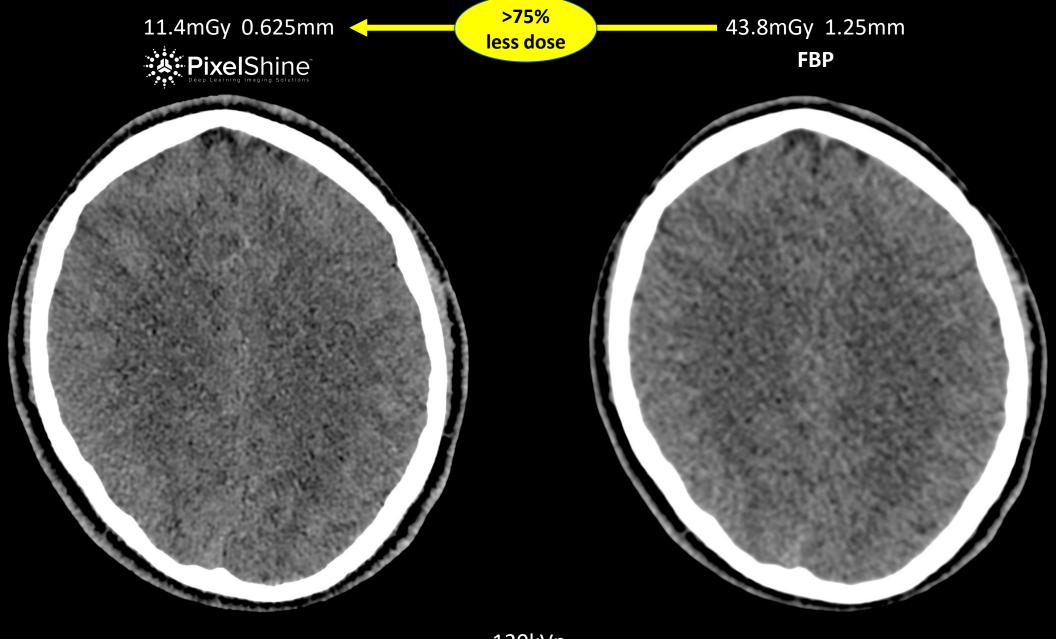


Brain Cases



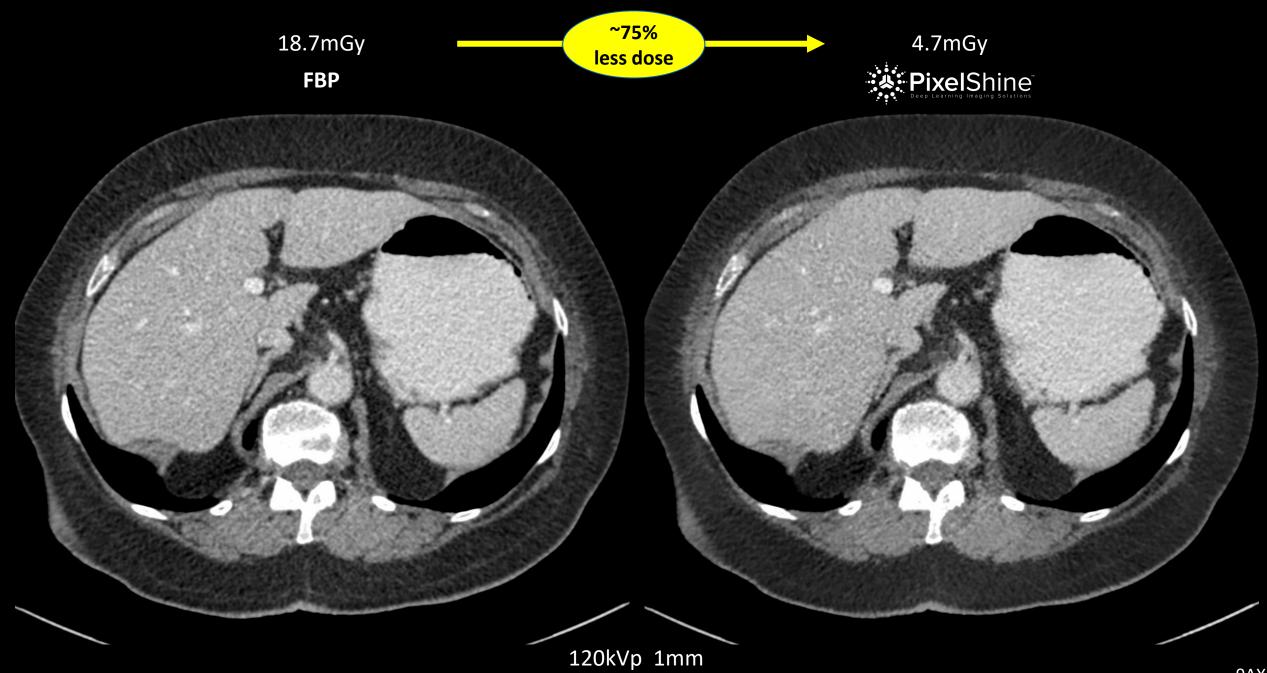


120kVp 1.25mm

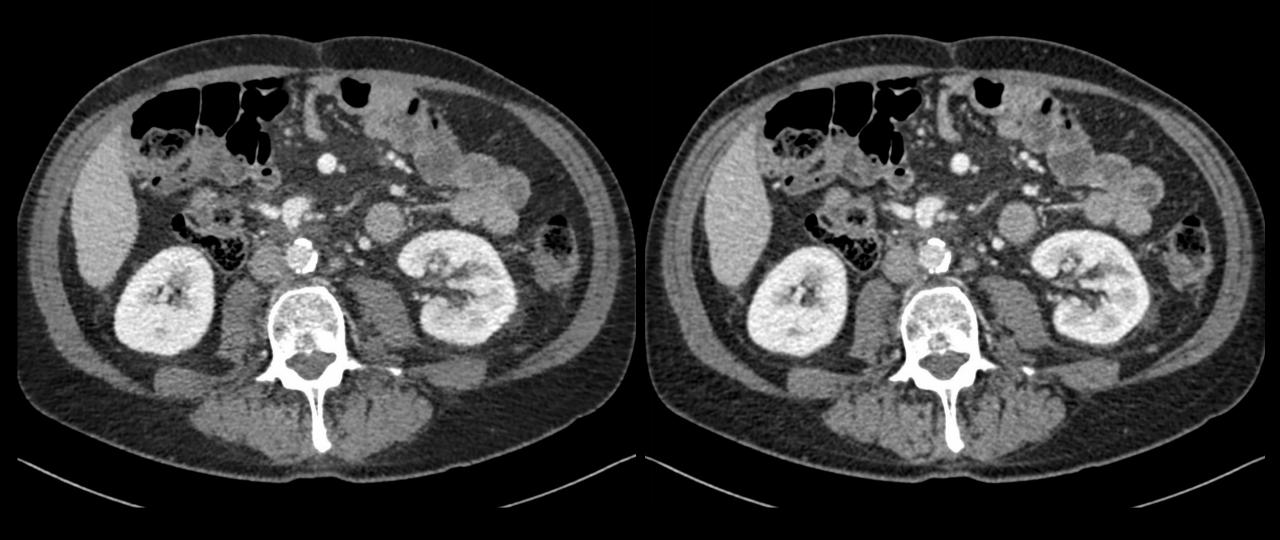


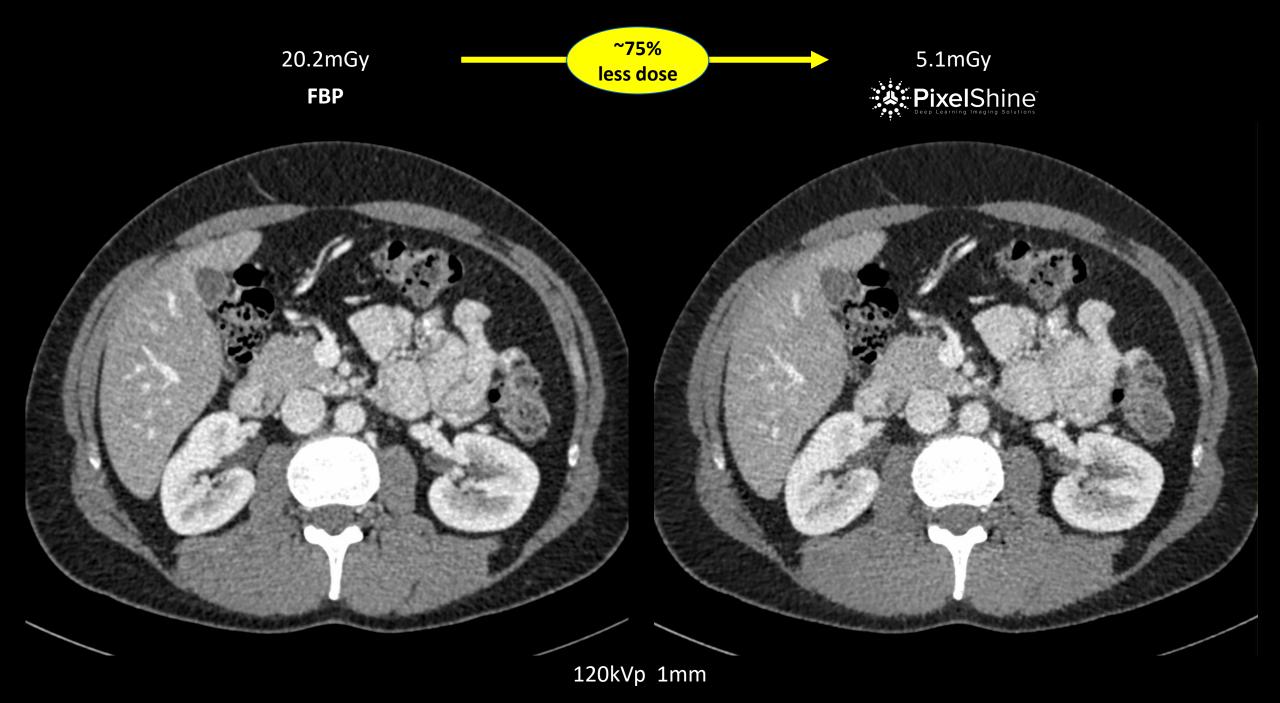


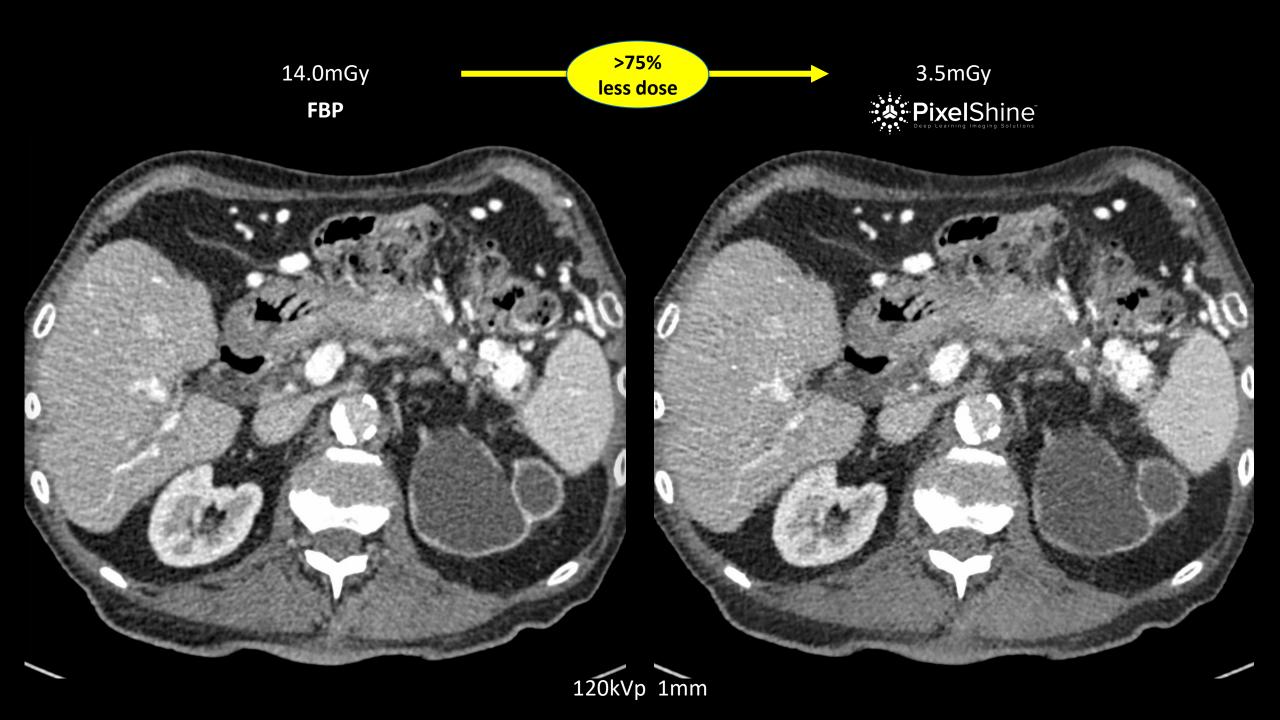
Abdomen Cases





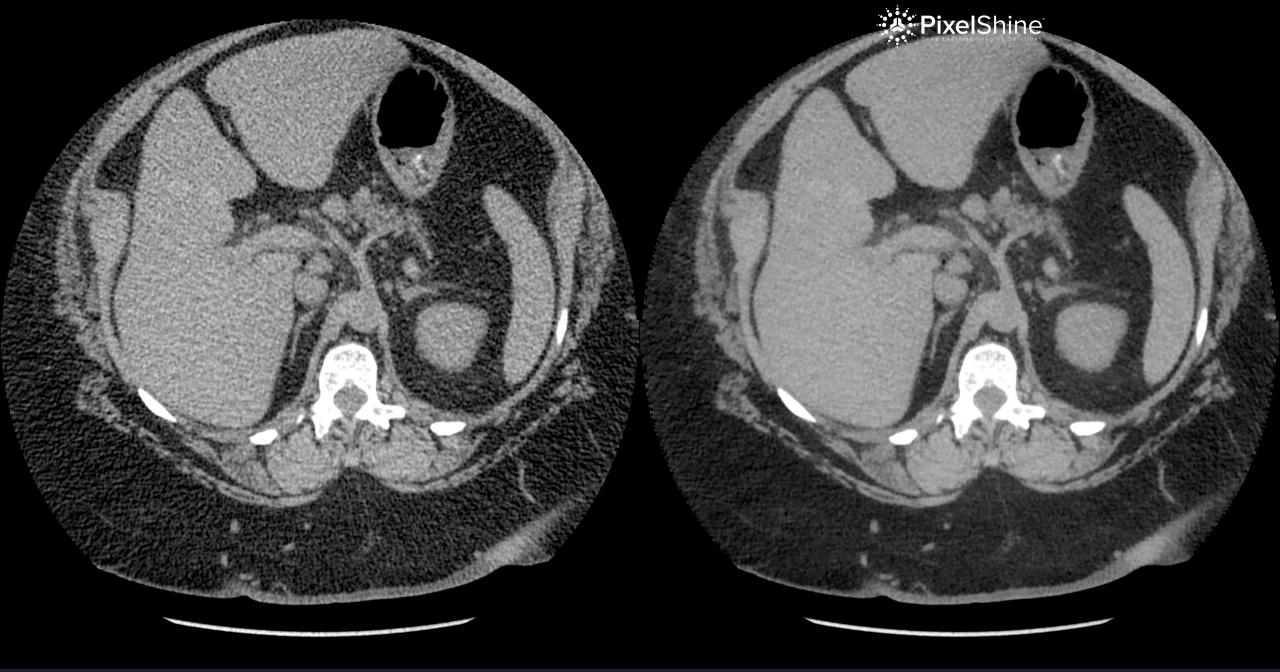








Obese Patient Cases







Pediatric Cases







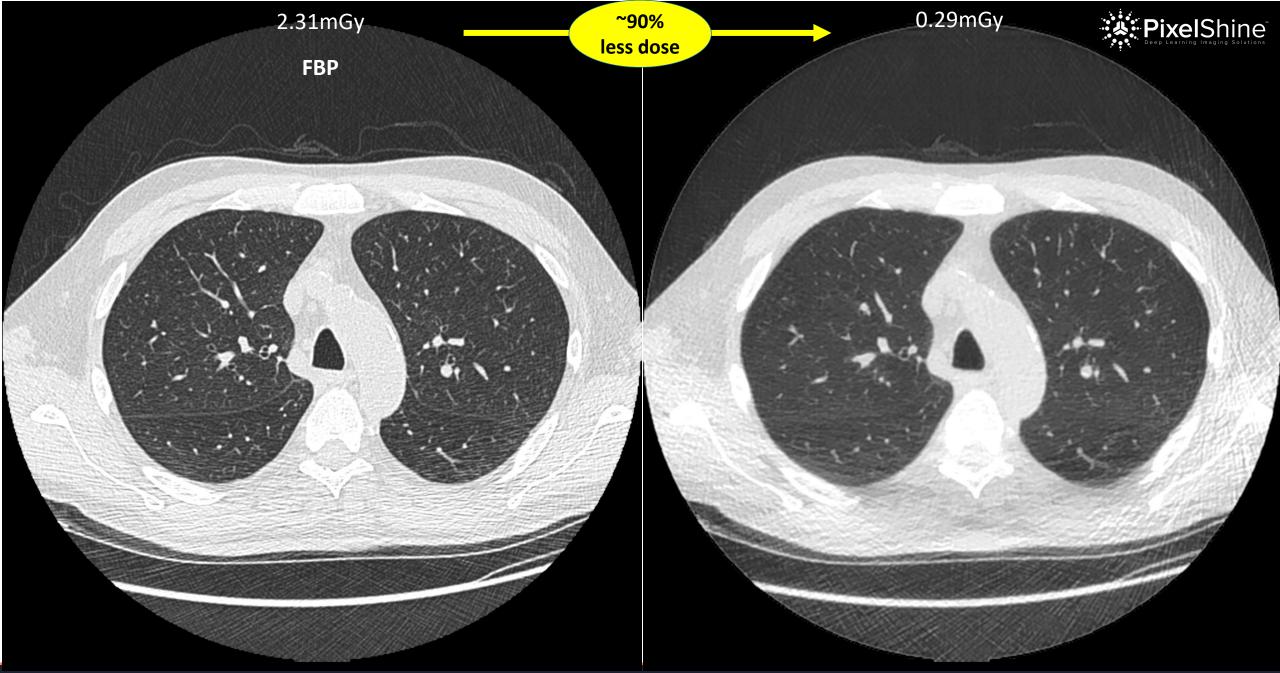


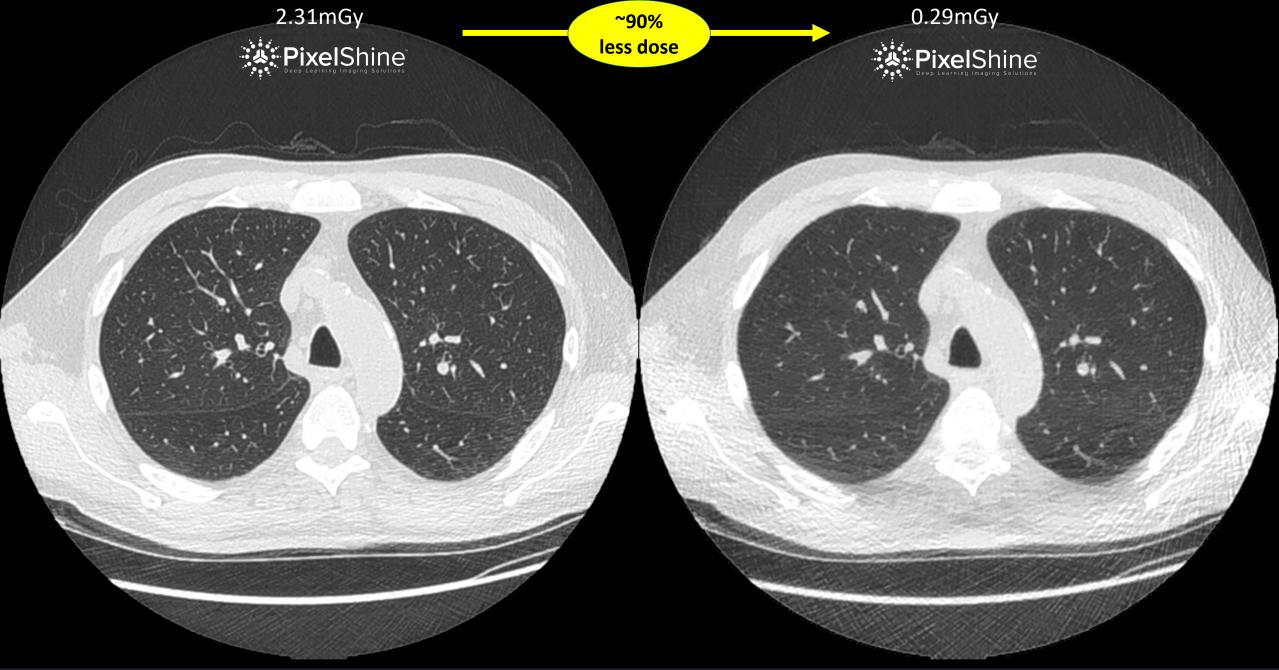




Lung Screening Cases









"First Time Right"

"PixelShine is the type of AI technology clinicians should be leveraging to improve patient care and reduce radiation dose"

Dr. Jose Morey

"Fabulous, very impressive and I am looking forward to using it in my clinic."

Dr. Torben Kristensen, Director of Radiology Palo Alto Medical Clinic

"You nailed it when it comes to lung parenchyma! Higher dose reduction, better noise reduction, edges better defined, no artifacts."

Dr. Sarabjeet Singh, Radiology Department Massachusetts General Hospital Expert in dose reduction technologies

Who We Are

- FDA cleared & CE labeled
- HQ in Sunnyvale, CA / EU office in Germany
- Collaboration sites:
 - Wake Forest Baptist Medical Center
 - University of Virginia Health System
 - University Medical Center Groningen (Netherlands)
 - University Hospital Heidelberg
 - University Hospital Düsseldorf
- FUJIFILM partnership
- Privately funded
- US based R&D and Intl. customer support
- Other markets to follow





Clinical Benefits

- Harmonize image quality to drive diagnostic confidence, at the lowest possible dose
- Dramatically improve quality of ultra-low dose <u>lung screening</u> and <u>pediatric imaging</u>
- Exceptional image quality of obese patients, at lower dose
- "First Time Right"





Operational Benefits

- Maximize image quality at lowest possible dose
- Harmonize and standardize image quality for all
 - Shorten time to decision
 - Improve departmental productivity
- Improve clinical confidence esp. low-dose lung screening





Financial Benefits

- Legacy scanners; extend life and improve utility
- Harmonize image quality & drive down time to decision
- Reduce risk of mis-diagnosis from poor quality images
- Improve clinical outcomes
- SaaS, Capital or Study Volume purchase





PixelShine® Powered by AlgoMedica

THANK YOU

Al Powered Image Reconstruction

