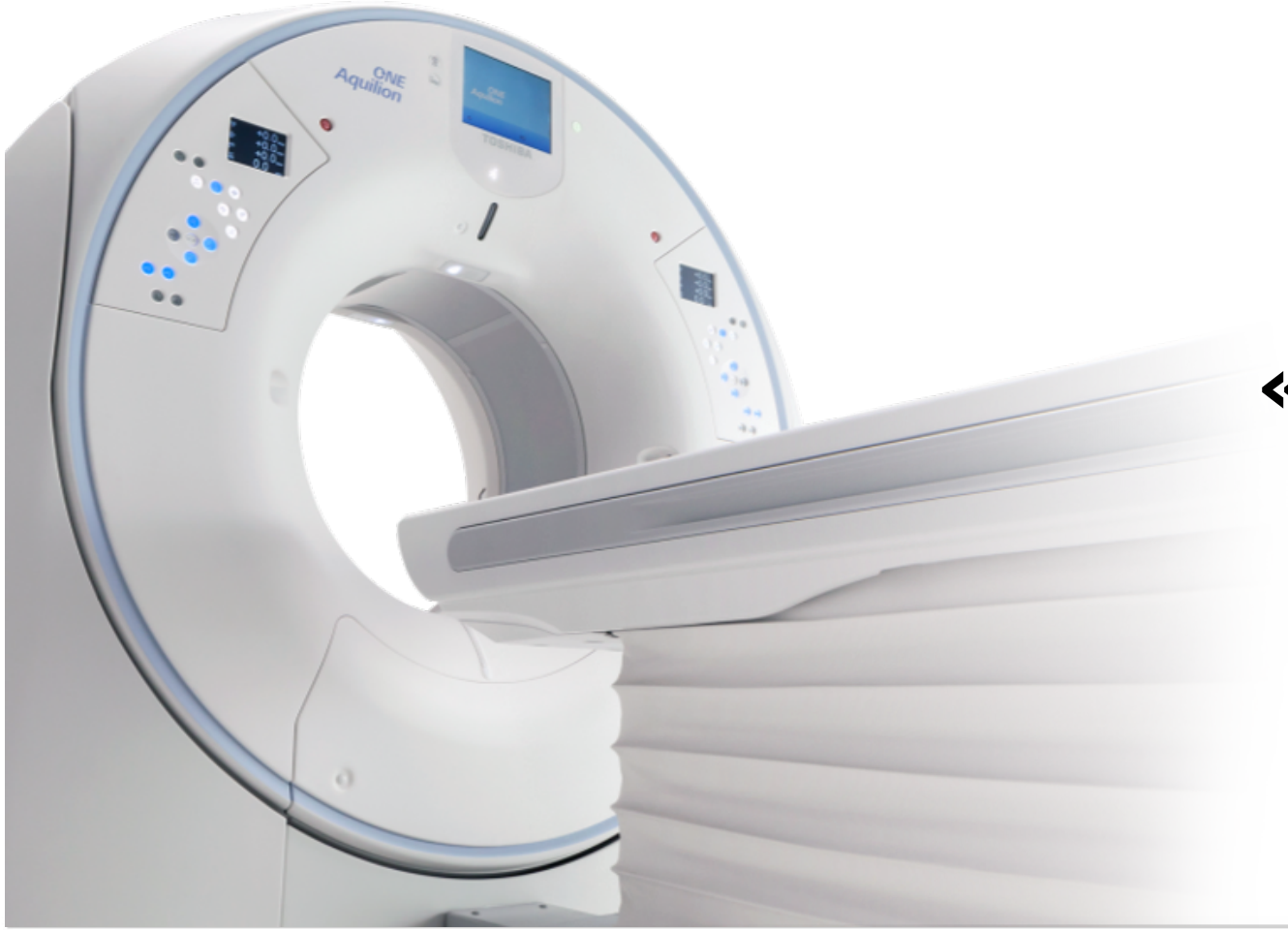
Canon

APPAC

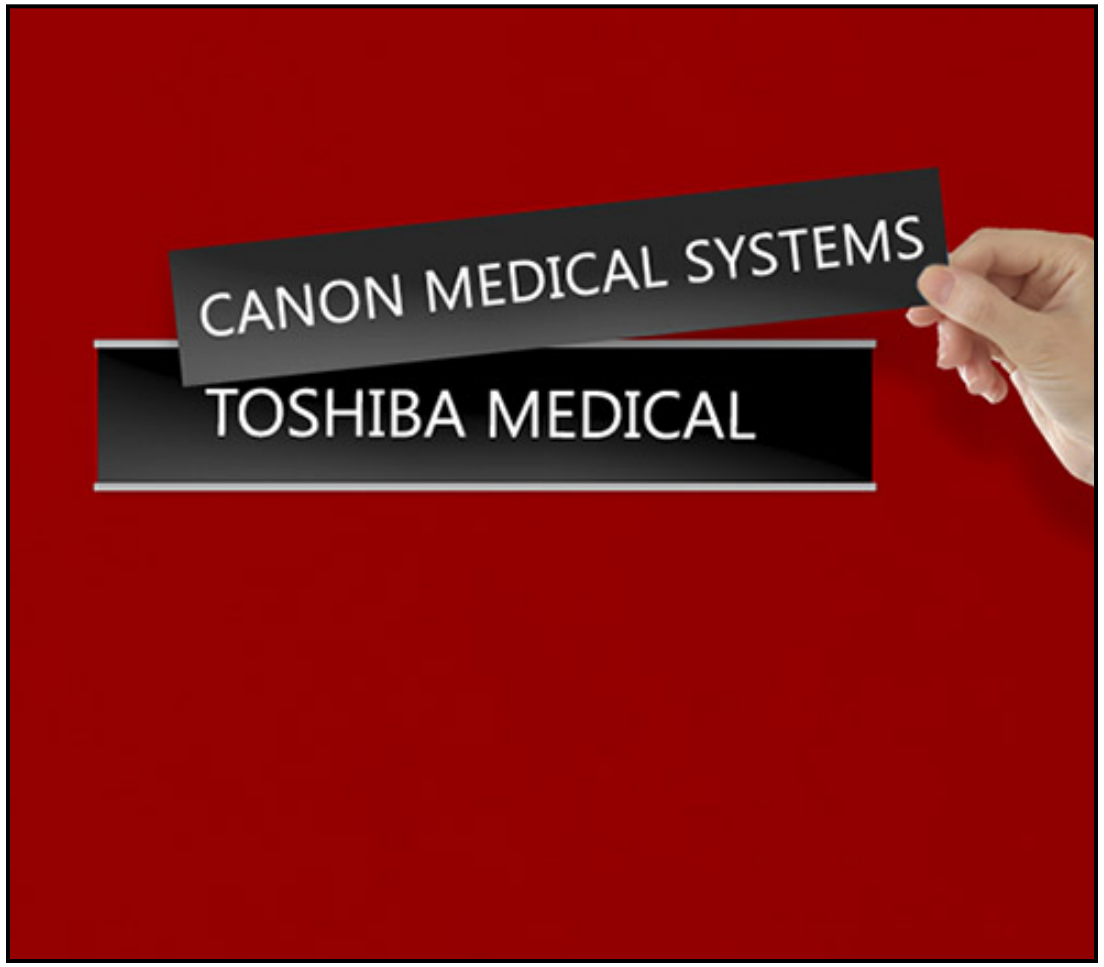
6/7/8 Juin 2018
Palais des Congrès de Biarritz



« Imagerie Fonctionnelle et Ultra Haute Résolution en Scanner Cardiaque »

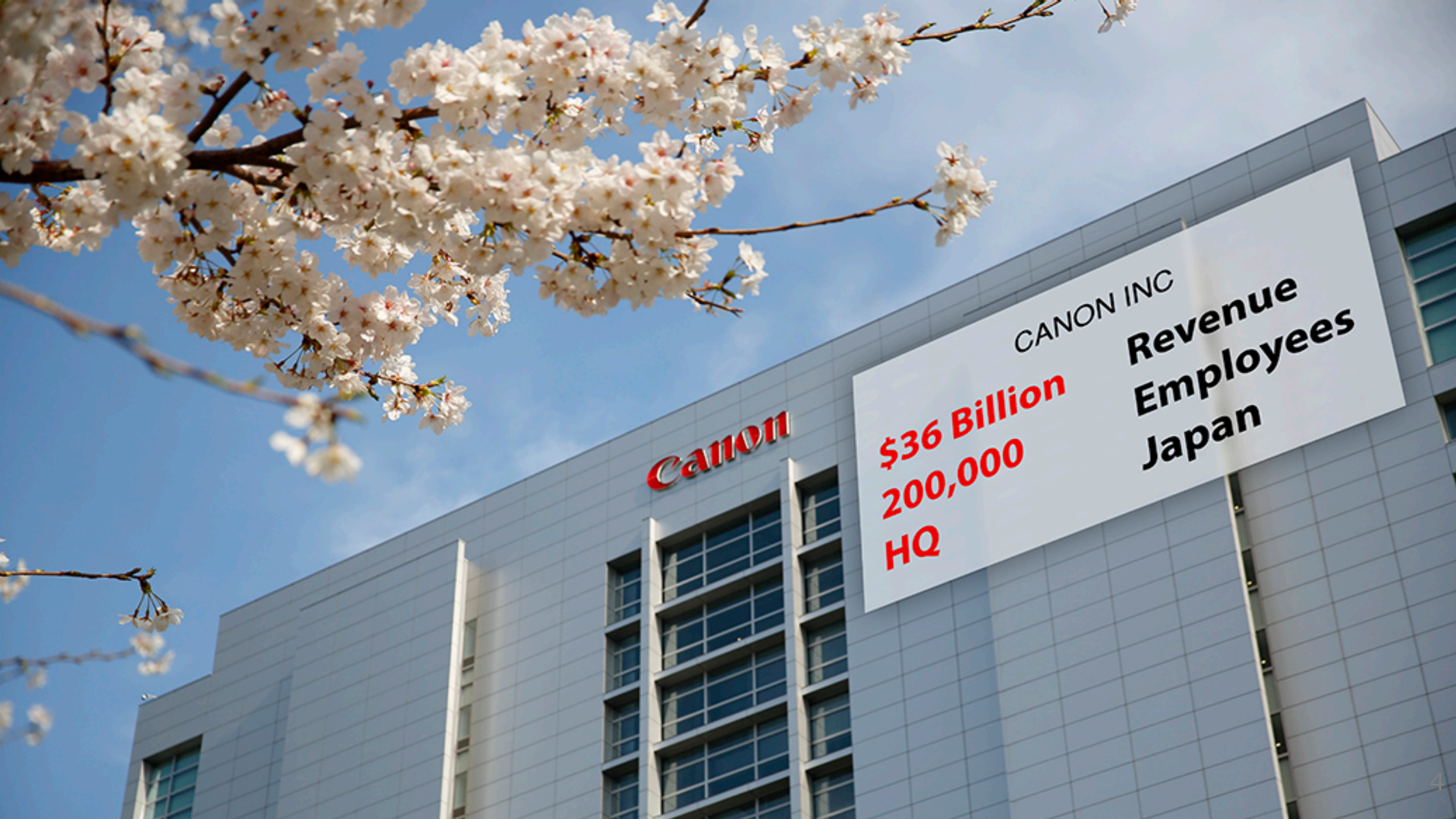
Roger DELEPAULE – Directeur Comptes Stratégiques

Introduction



Projet Canon


CANON MEDICAL SYSTEMS CORPORATION
October 1937
Founded
140
Countries
HQ
Japan
Canon


Canon
CANON INC
$36 Billion
200,000
HQ
Revenue
Employees
Japan

Toshiba Medical Corp

- Year of incorporation **1930**
- **9 800** Employees
- **135** Countries
- **US $ 4 Billion** Net Sales
- **8% of revenue R&D**
- **1 348** US Patents

2016 – Canon Inc Subsidiary

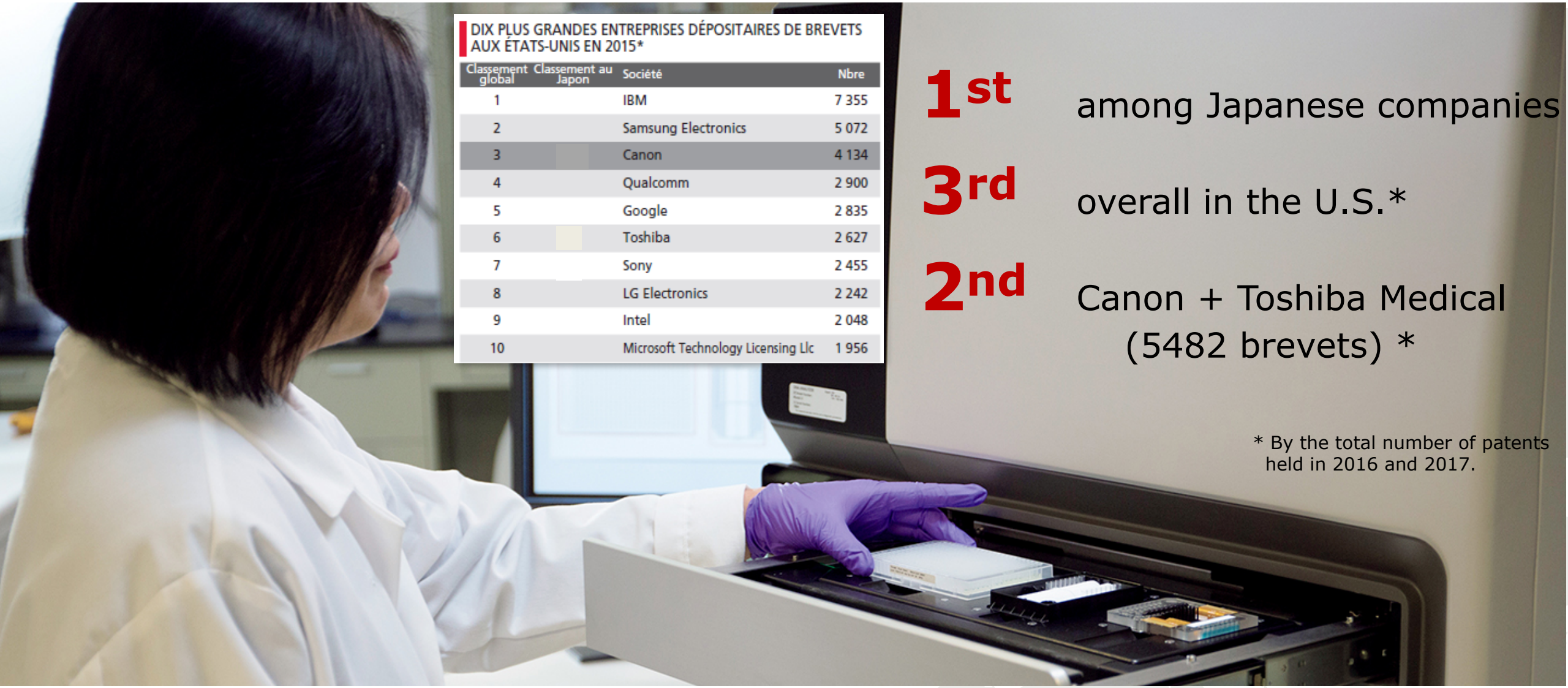
US $ 733 millions Net Profit (Q1

Canon Inc

- Year of incorporation **1937**
- **197 000** Employees
- **173** Countries
- **US $ 29.3 Billion** Net Sales
- **8,6% of revenue R&D**
- **4 134** US Patents

Canon

Canon I 32 années leadership R&D (8,6% CA)



DIX PLUS GRANDES ENTREPRISES DÉPOSITAIRES DE BREVETS AUX ÉTATS-UNIS EN 2015*

Classement global	Classement au Japon	Société	Nbre
1		IBM	7 355
2		Samsung Electronics	5 072
3		Canon	4 134
4		Qualcomm	2 900
5		Google	2 835
6		Toshiba	2 627
7		Sony	2 455
8		LG Electronics	2 242
9		Intel	2 048
10		Microsoft Technology Licensing Llc	1 956

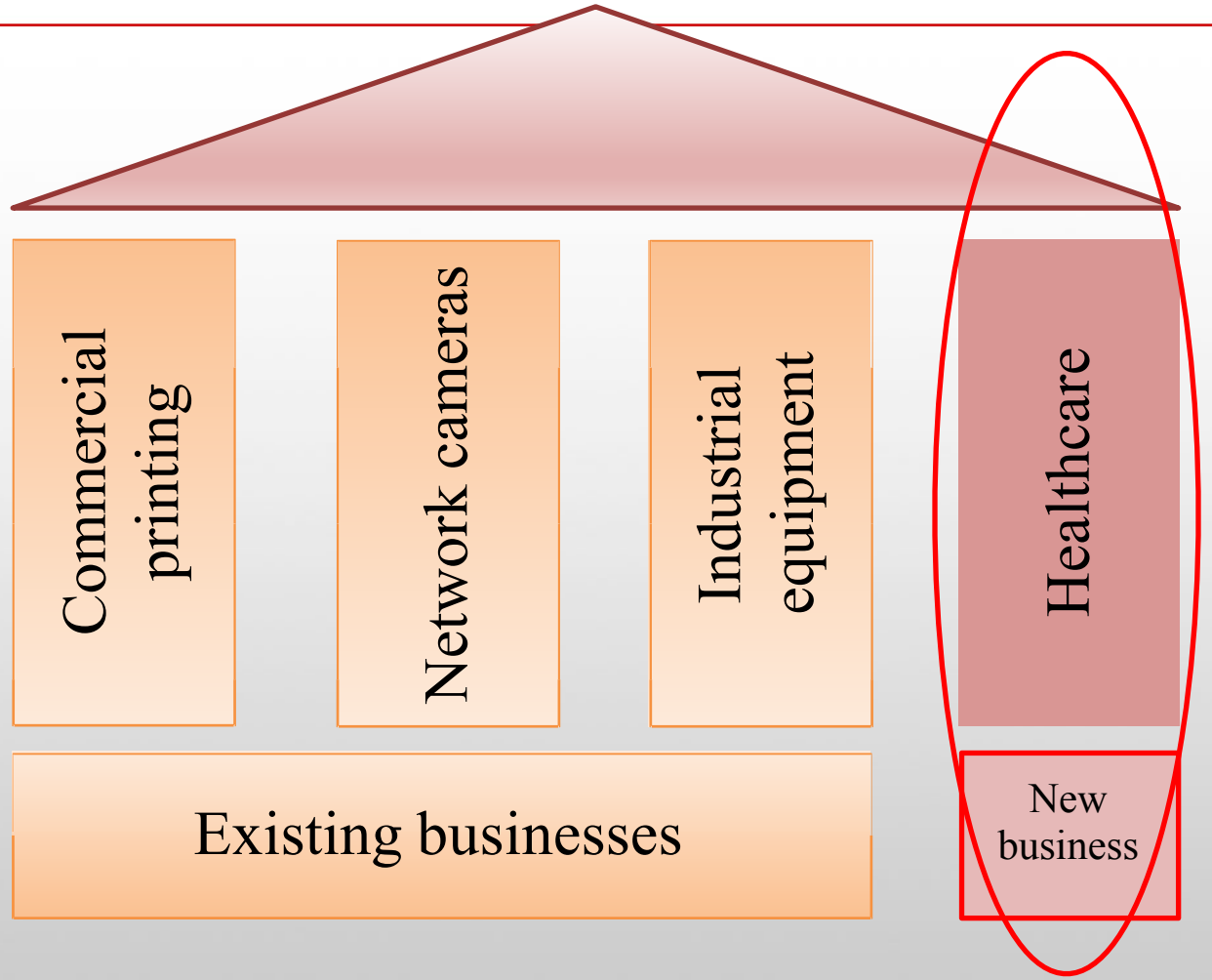
1st among Japanese companies

3rd overall in the U.S.*

2nd Canon + Toshiba Medical (5482 brevets) *

* By the total number of patents held in 2016 and 2017.

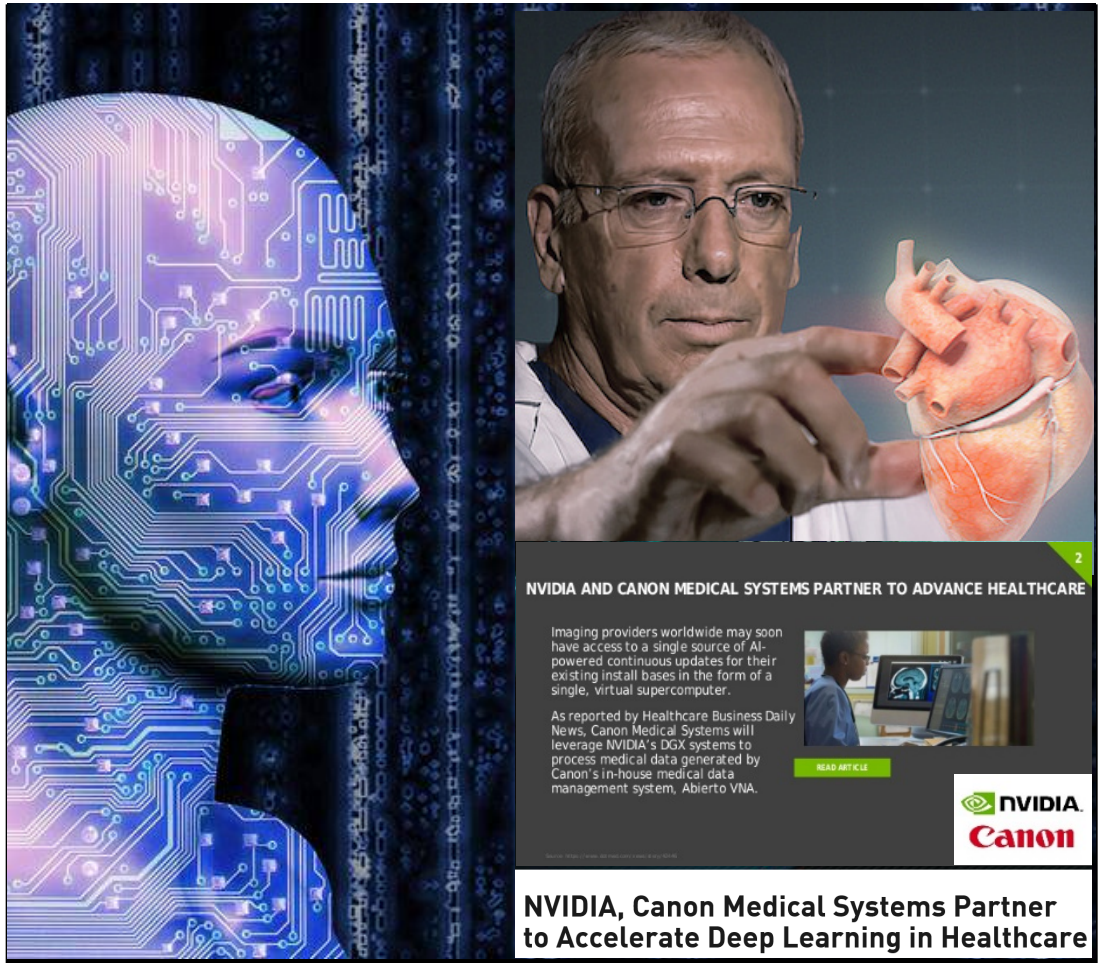
Toshiba Medical Systems constitue le 4eme pilier stratégique du groupe Canon



Assembled 4 new core businesses to make Canon part of every single image in the future

Orientations Stratégiques

Séquençage génôme



Imagerie Précision - IA

Politique investissements-R&D soutenue

Canon

Fysicon
creating medical solutions

Mars. 2018: Acquired leading company in Information systems and physiologicial information

TOSHIBA MEDICAL

T2Biosystems

Sept. 2016: Twenty percent stake to develop innovative diagnostic products to improve patient health

karoshealth
collaboration for life

Nov. 2016 : Acquired leading VNA IT company
Sept. 2016 : Acquired Irish partner and imaging equipment distributor

Media Imaging NI

2016

Spartan

March 2015: Strategic investment in genetic diagnostic testing products

Olea medical

Oct. 2015: Acquisition for advanced post-processing and image analysis

Canon
CANON BIOMEDICAL

March 2015: Launched subsidiary for development, manufacturing and marketing activities for life science and molecular diagnostics

June 2014: Joint venture with Abex Medical Systems (Malaysia)
March 2013: 70% stake in TI Medical Systems (South Korea)
April 2013: Merge w/ Toshiba Medical Manufacturing
Jan. 2013: Acquired TMST (Turkey)

median
The Imaging Phenomics Company™

June 2011: 15% stake in Median Technologies (France)

VIRTUAL IMAGING
A CANON COMPANY

2009: Acquired Virtual Imaging to deliver complete medical imaging and healthcare solutions

ViTAL
A Toshiba Medical Systems Group Company

April 2013: Acquisition for advanced visualization and imaging informatics

Canon CT History

Helical CT (90)

Real Time CT (93)

Sub Second CT (96)

Half Second CT (98)

Sub Millimeter Detector (99)

Aquilion 16 (02)

Aquilion 32/64 (04)

Prototype 256 Row (06)

320 Row (07)

UHR CT (18)

10 ans de développement continu

> Rien ne remplace l'expérience

SOUSTRACTION

DYNAMIC 4D

BI-ENERGIE

PERFUSION

RECALAGE

ONE Aquilion GENESIS Edition

ONE Aquilion

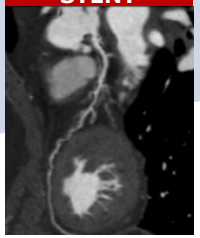
1st Generation
AIDR
Image Based Iterative Noise Reduction Algorithm

2nd Generation
AIDR+
Integration into SURE Exposure 3D settings

3rd Generation
AIDR 3D
Noise reduction in the raw and image data space

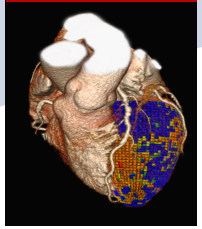
FIRST Integrated

CALCIUM STENT



ARYTHMIES

FONCTIONNEL



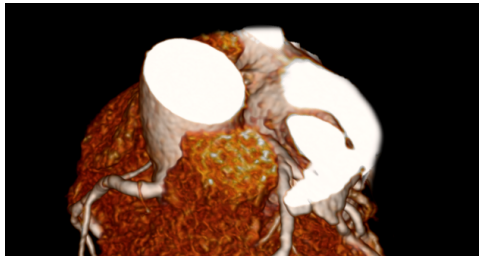
Canon

ONE GENESIS

Single Rotation
64 detector row CT coverage

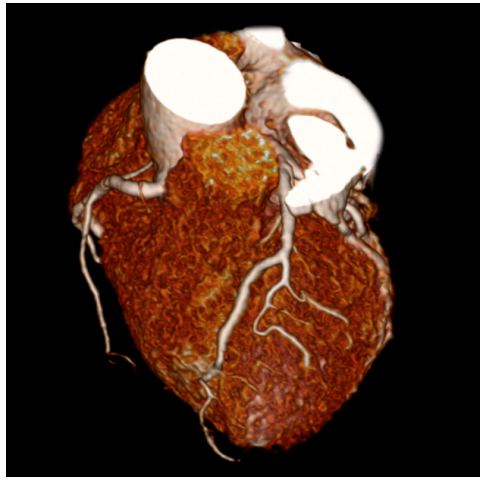
4 cm

Single Rotation
160 detector row CT coverage

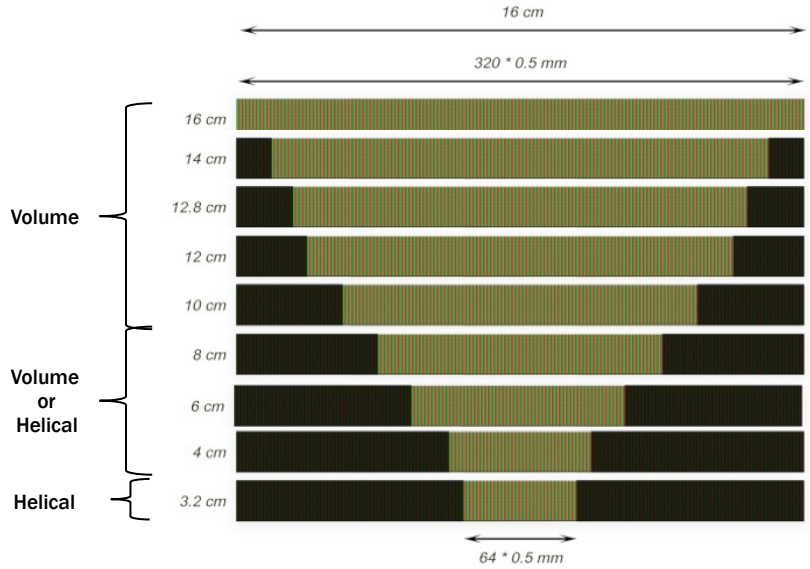


8 cm

Single Rotation
320 detector row CT coverage



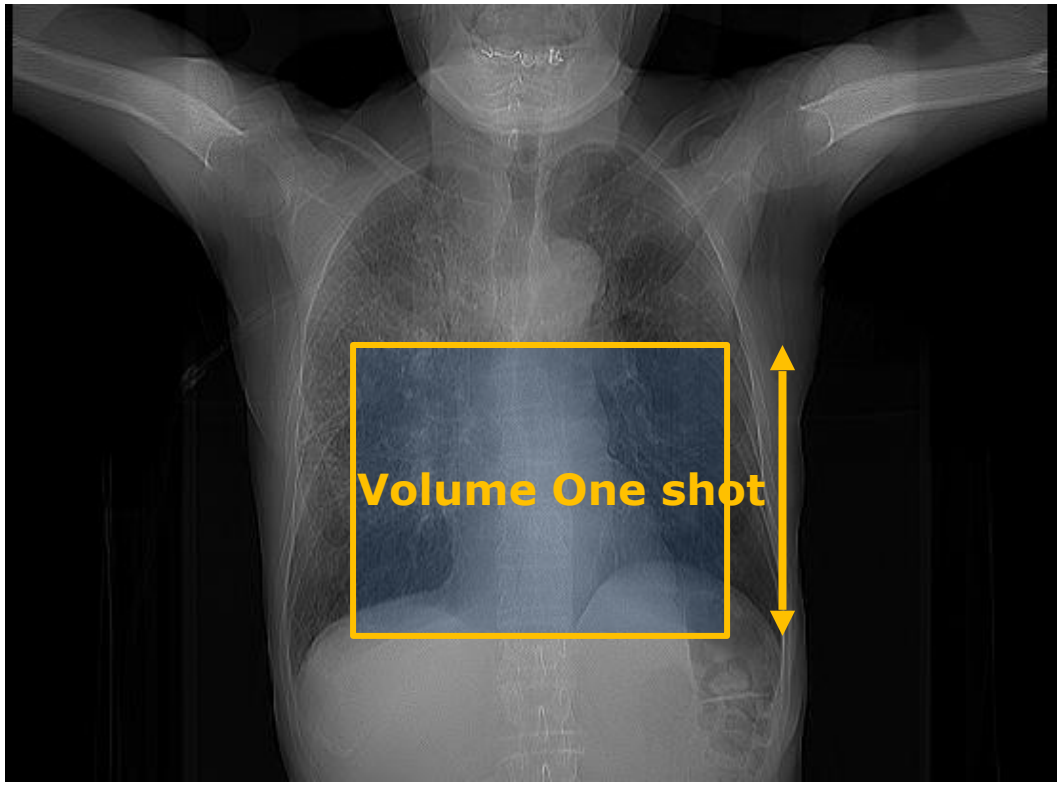
16 cm

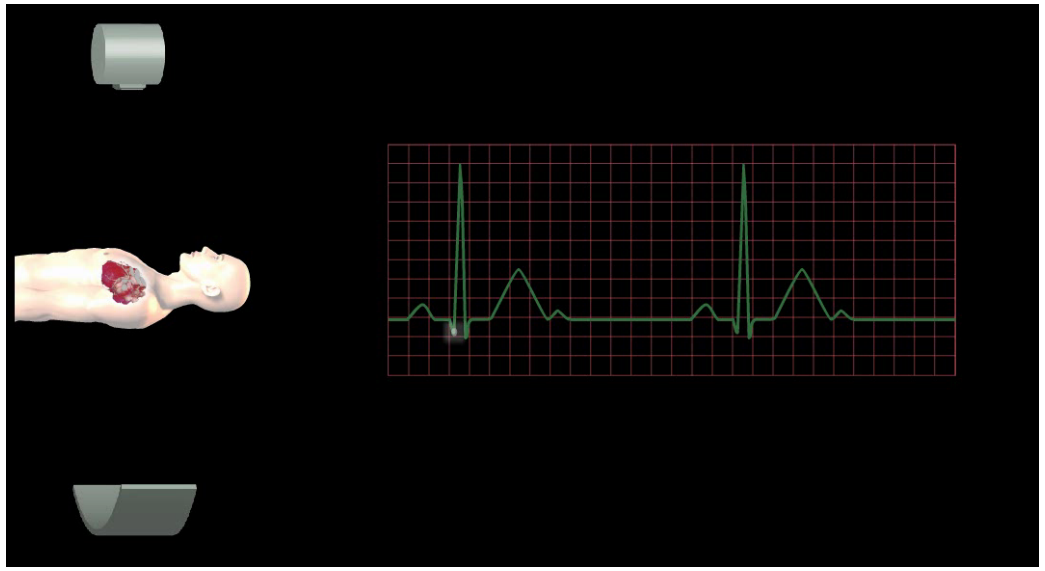


- **320 rangées de détecteurs de 0,5 mm, 640 coupes par ro**
- **16 cm de couverture en Z, permet de couvrir la plus part des organes en 1 seule rotation**
- **Transfert Ultra-rapide du signal « Noiseless » à 25Gb/se**

Canon

CANON l'Inventeur du Mode "Volume One Shot"

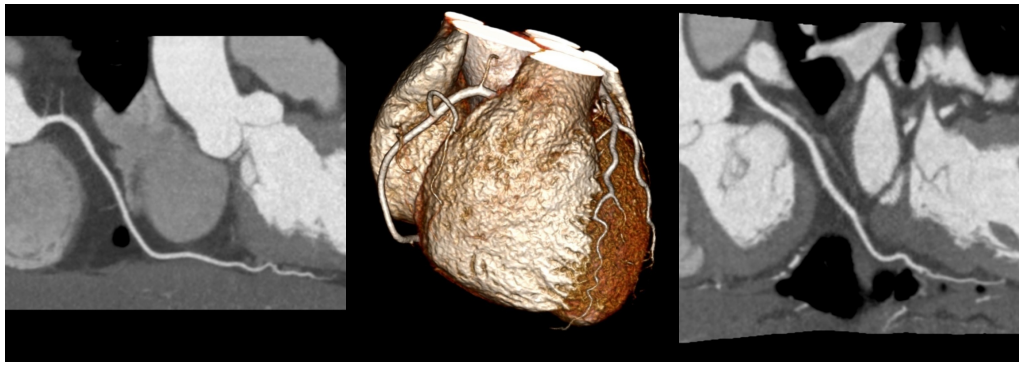




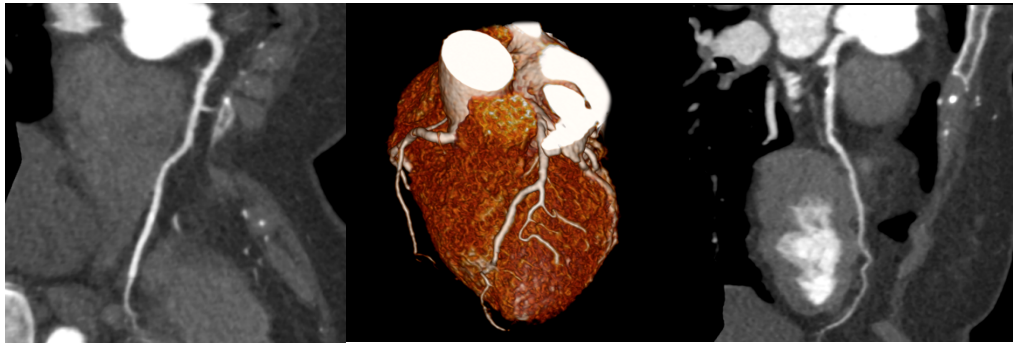
Volume One Shot

- **Acquisition Ultra rapide et quasi-instantanée sur un seul battement**
- **Aucun déplacement de table**
- **Disparition du pitch et de l'overranging (réduction dose)**
- **Plusieurs collimations possibles (320x0.5 ; 280x0.5 etc.)**

Cardio ONE GENESIS

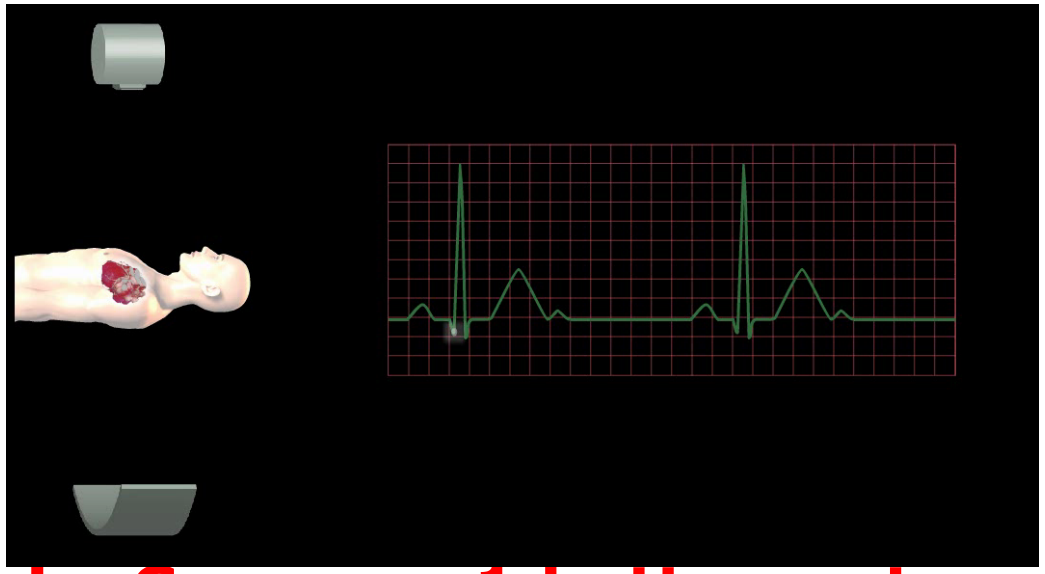


0,87 mSv



0,37 mSv

Courtesy CHU Toulouse Rangueil, France



Le Coeur en 1 battement

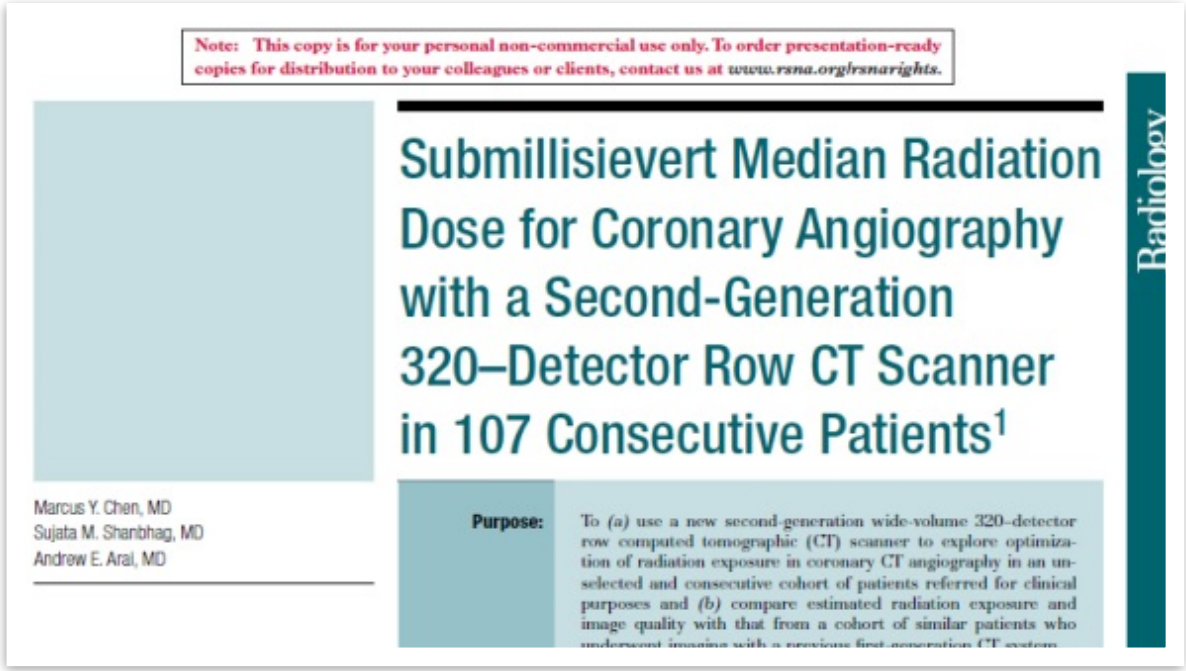
- **Etude des Coronaires – Low Dose – sur un seul battement**
- **Temps acquisition total 0,275s**
- **Mode prospectif quelque soit la fréquence cardiaque**
- **35cc quantité Produit Contraste**
- **80% Réduction Dose**

Canon

Cardio ONE GENESIS

Sub mSv in 107 consecutive patients (Chen et al)

- No patient cohort selection
- All heart rates
- Robust CTA scanning
  97,2% success rate



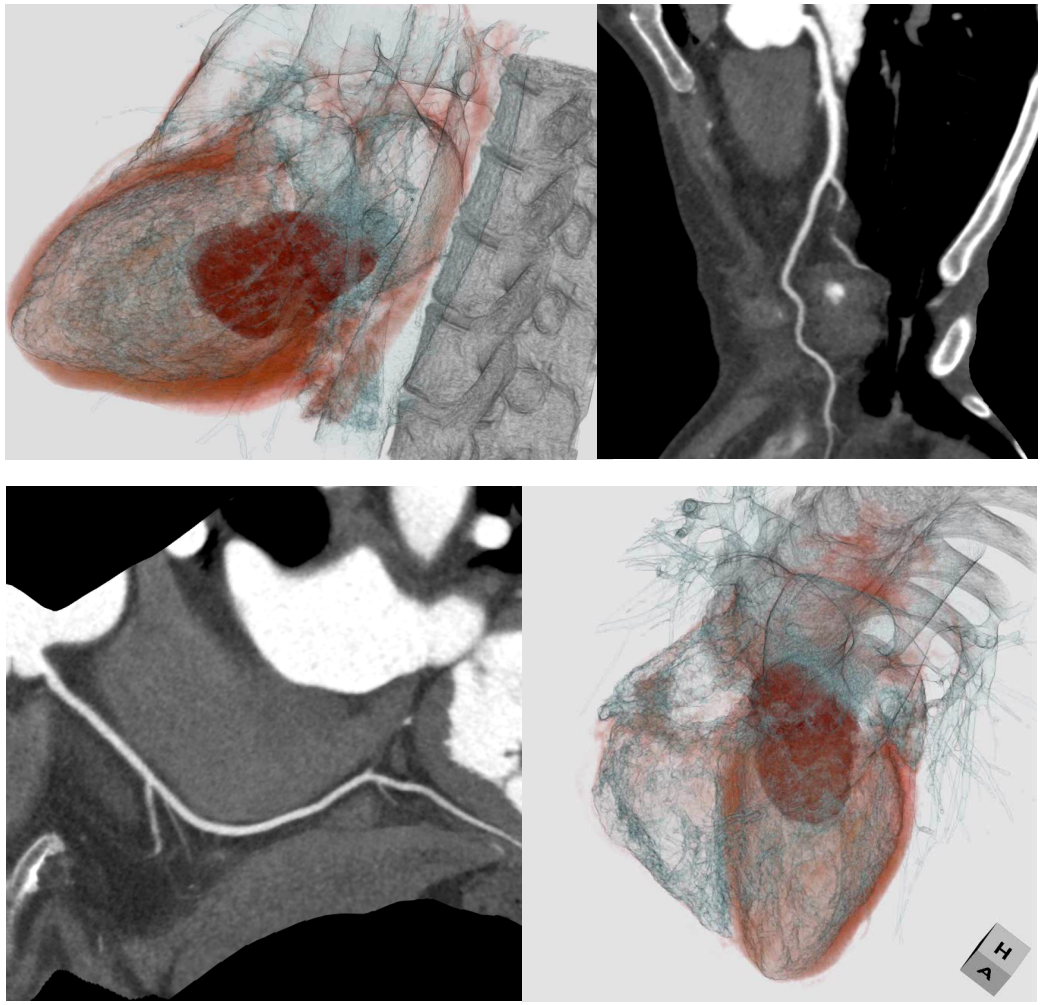
Submillisievert Median Radiation Dose for Coronary Angiography with a Second-Generation 320–Detector Row CT Scanner in 107 Consecutive Patients[1]

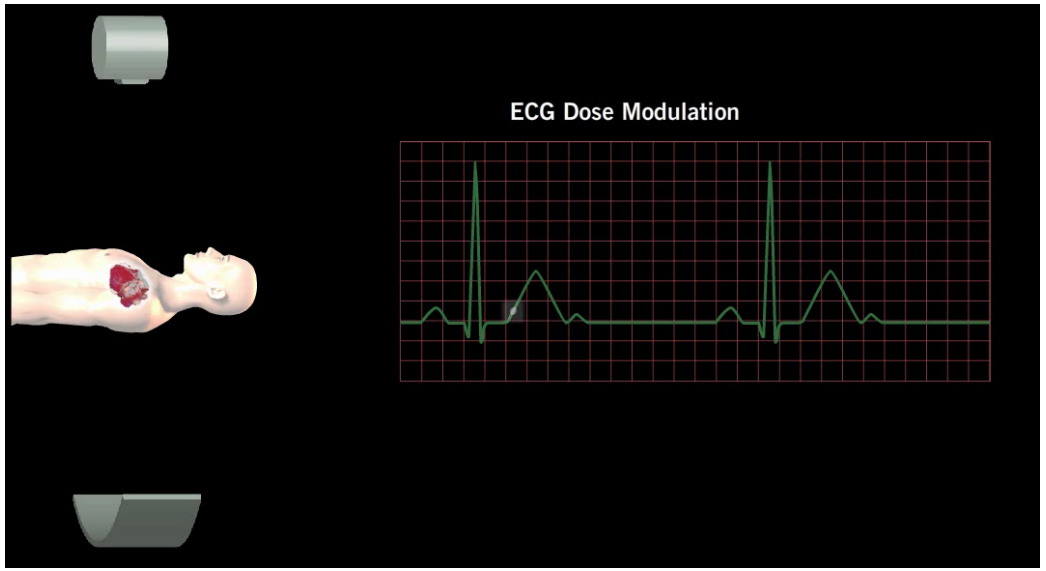
Marcus Y. Chen, MD
Sujata M. Shanbhag, MD
Andrew E. Arai, MD

Radiology

Purpose: To *(a)* use a new second-generation wide-volume 320-detector row computed tomographic (CT) scanner to explore optimization of radiation exposure in coronary CT angiography in an unselected and consecutive cohort of patients referred for clinical purposes and *(b)* compare estimated radiation exposure and image quality with that from a cohort of similar patients who

Cardio ONE GENESIS



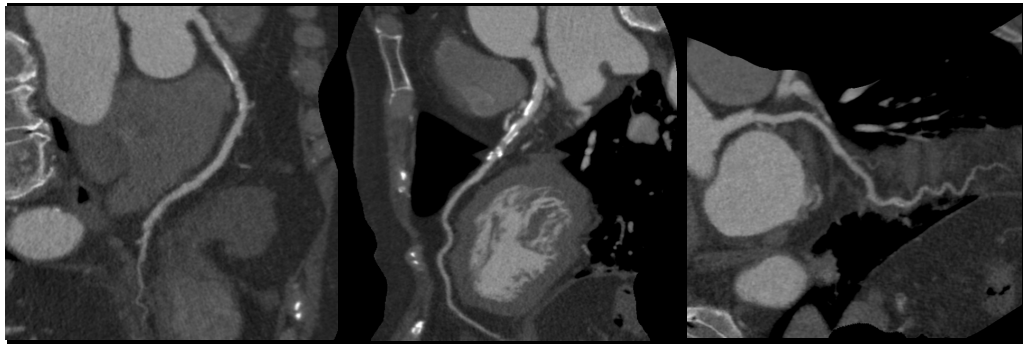


CFA/CTA en 1 battement

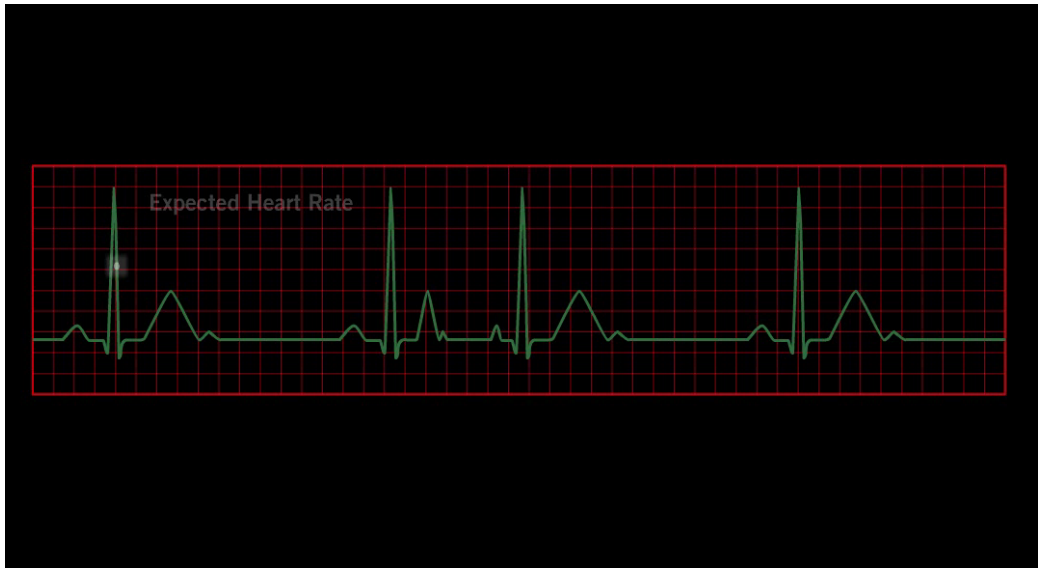
- **Etude complète du cœur sur un cycle : Coronaire, Fraction éjection, Analyse fonctionnelle avec modulation.**
- **Tumeur de l'Atrium**

Cardio ONE GENESIS

Arythmie 59 à 111 bpm



Courtesy Mt.Elizabeth Hospital, Singapore



Real time beat control

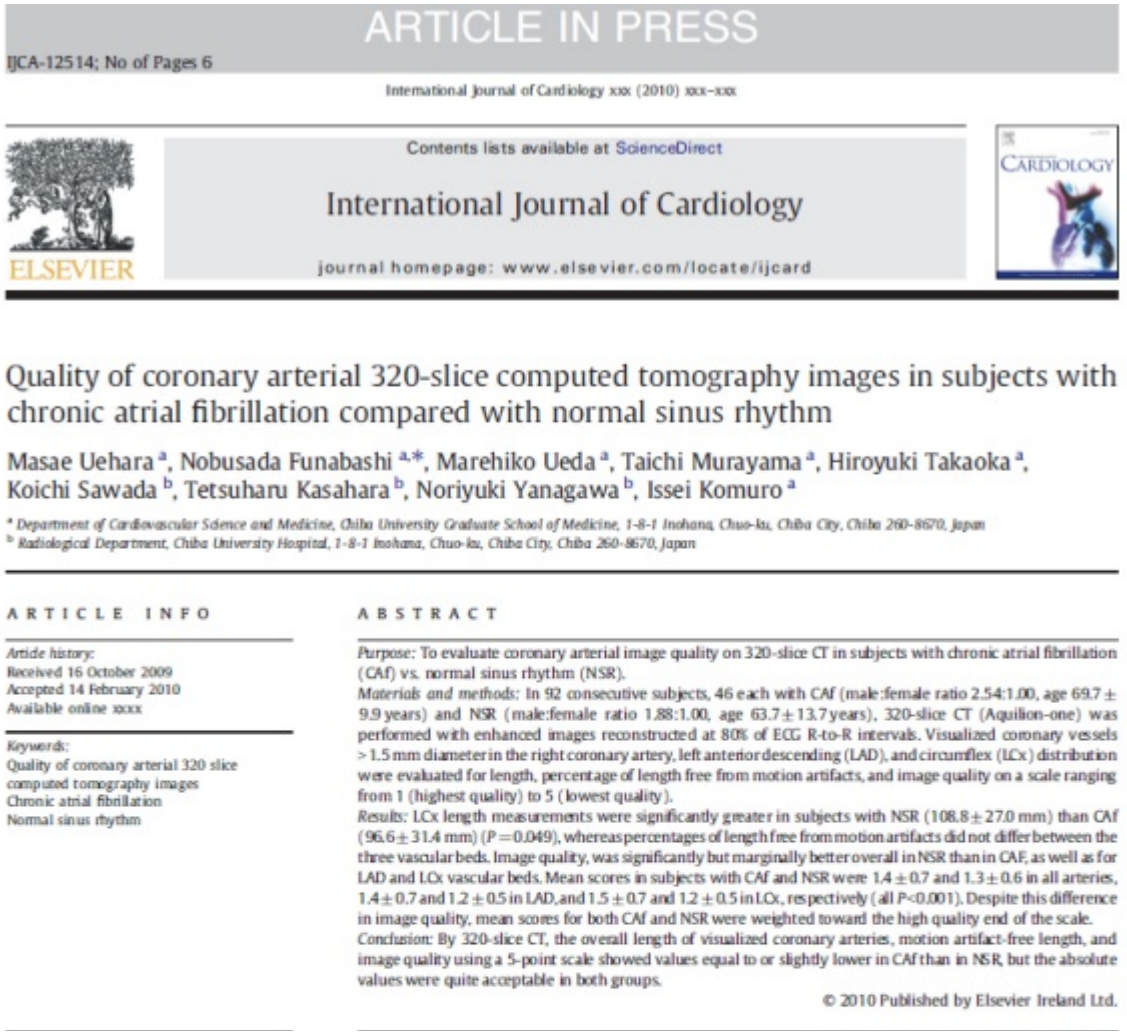
- **Parfaite gestion des arythmies**
- **Contraction prématuré du Ventricule pendant l'acquisition**
- **Le ONE GENESIS détecte le battement anormal, il coupe automatiquement les X et va attendre le prochain battement stable.**

Cardio ONE GENESIS

A-fib compared to NSR (Uehara et al)

No patient cohort selection

- 46 patients with Atrium fibrillation
- 46 patients with Normal Sinus Rhythm
- High quality: 90.2% vs 95.6%
- Average quality: 97.9% vs 98.4%



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Quality of coronary arterial 320-slice computed tomography images in subjects with chronic atrial fibrillation compared with normal sinus rhythm

Masae Uehara [a], Nobusada Funabashi [a,*], Marehiko Ueda [a], Taichi Murayama [a], Hiroyuki Takaoka [a], Koichi Sawada [b], Tetsuharu Kasahara [b], Noriyuki Yanagawa [b], Issei Komuro [a]

[a] Department of Cardiovascular Science and Medicine, Chiba University Graduate School of Medicine, 1-8-1 Inohana, Chuo-ku, Chiba City, Chiba 260-8670, Japan
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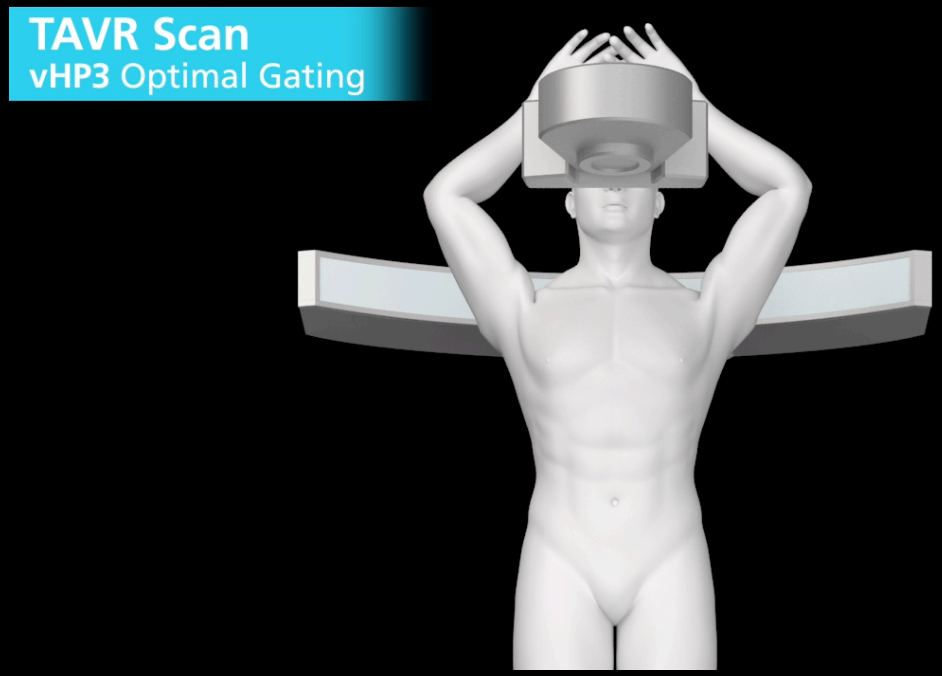
Keywords:
Quality of coronary arterial 320 slice computed tomography images
Chronic atrial fibrillation
Normal sinus rhythm

ABSTRACT

Purpose: To evaluate coronary arterial image quality on 320-slice CT in subjects with chronic atrial fibrillation (CAf) vs. normal sinus rhythm (NSR).
Materials and methods: In 92 consecutive subjects, 46 each with CAf (male:female ratio 2.54:1.00, age 69.7 ± 9.9 years) and NSR (male:female ratio 1.88:1.00, age 63.7 ± 13.7 years), 320-slice CT (Aquilion-one) was performed with enhanced images reconstructed at 80% of ECG R-to-R intervals. Visualized coronary vessels >1.5 mm diameter in the right coronary artery, left anterior descending (LAD), and circumflex (LCx) distribution were evaluated for length, percentage of length free from motion artifacts, and image quality on a scale ranging from 1 (highest quality) to 5 (lowest quality).
Results: LCx length measurements were significantly greater in subjects with NSR (108.8 ± 27.0 mm) than CAf (96.6 ± 31.4 mm) ($P = 0.049$), whereas percentages of length free from motion artifacts did not differ between the three vascular beds. Image quality, was significantly but marginally better overall in NSR than in CAf, as well as for LAD and LCx vascular beds. Mean scores in subjects with CAf and NSR were 1.4 ± 0.7 and 1.3 ± 0.6 in all arteries, 1.4 ± 0.7 and 1.2 ± 0.5 in LAD, and 1.5 ± 0.7 and 1.2 ± 0.5 in LCx, respectively (all $P<0.001$). Despite this difference in image quality, mean scores for both CAf and NSR were weighted toward the high quality end of the scale.
Conclusion: By 320-slice CT, the overall length of visualized coronary arteries, motion artifact-free length, and image quality using a 5-point scale showed values equal to or slightly lower in CAf than in NSR, but the absolute values were quite acceptable in both groups.

VHP’3

➢ Acquisition hélicoidale ultra-rapide 3 phases



- **Combine 3 protocoles avec des paramètres d’acquisitions différents en une seule hélice**
- **Adaptation automatique de la vitesse du déplacement de la table**
- **Réduction quantité produit contraste**
- **Jusqu’à 40% réduction dose**
- **Polytraumatisés, Bilan TAVI ,Douleurs thoraciques atypiques, Angio de membres inférieurs**

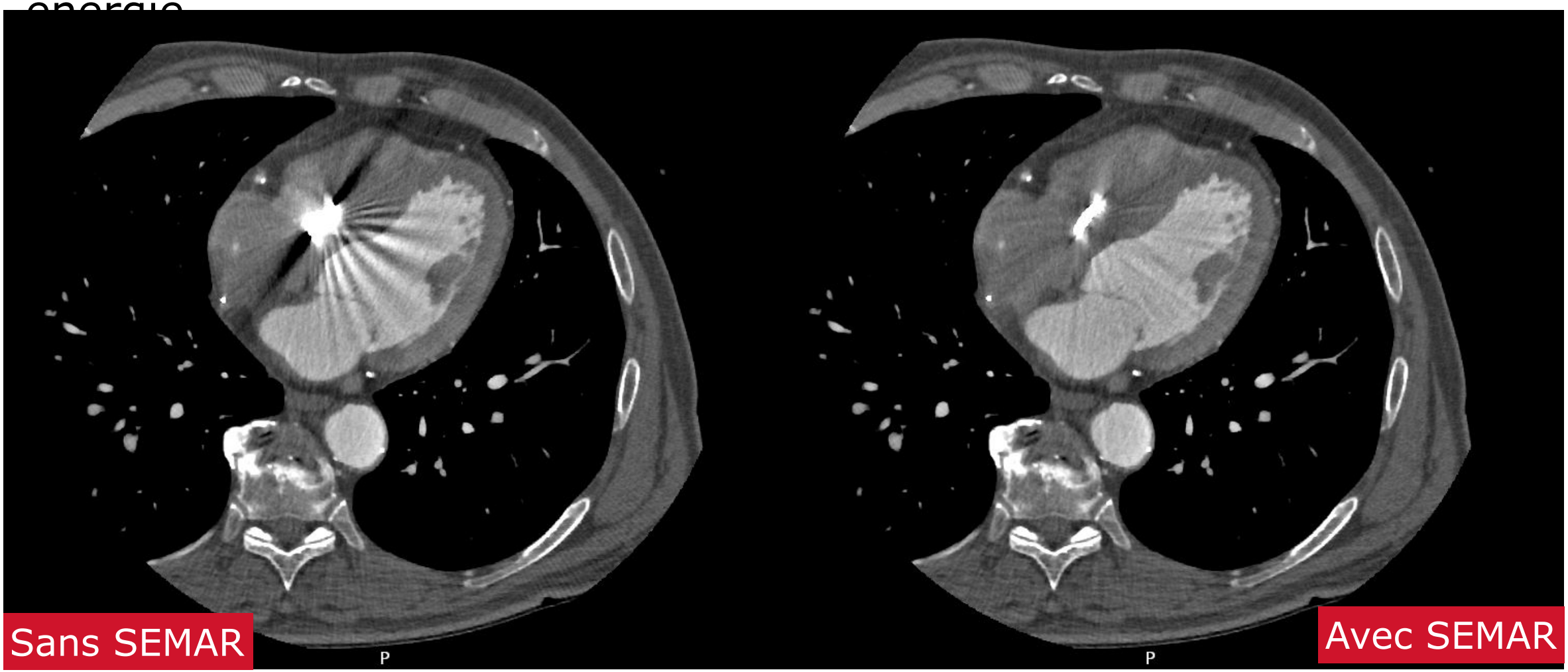
VHP’3 – Protocole Marfan

Courtesy University Hospital of Paris-Bichat, Pr. Khalil

Canon *(DLP : 509.5 mGy.cm CTDIvol : 4.1 mGy)*

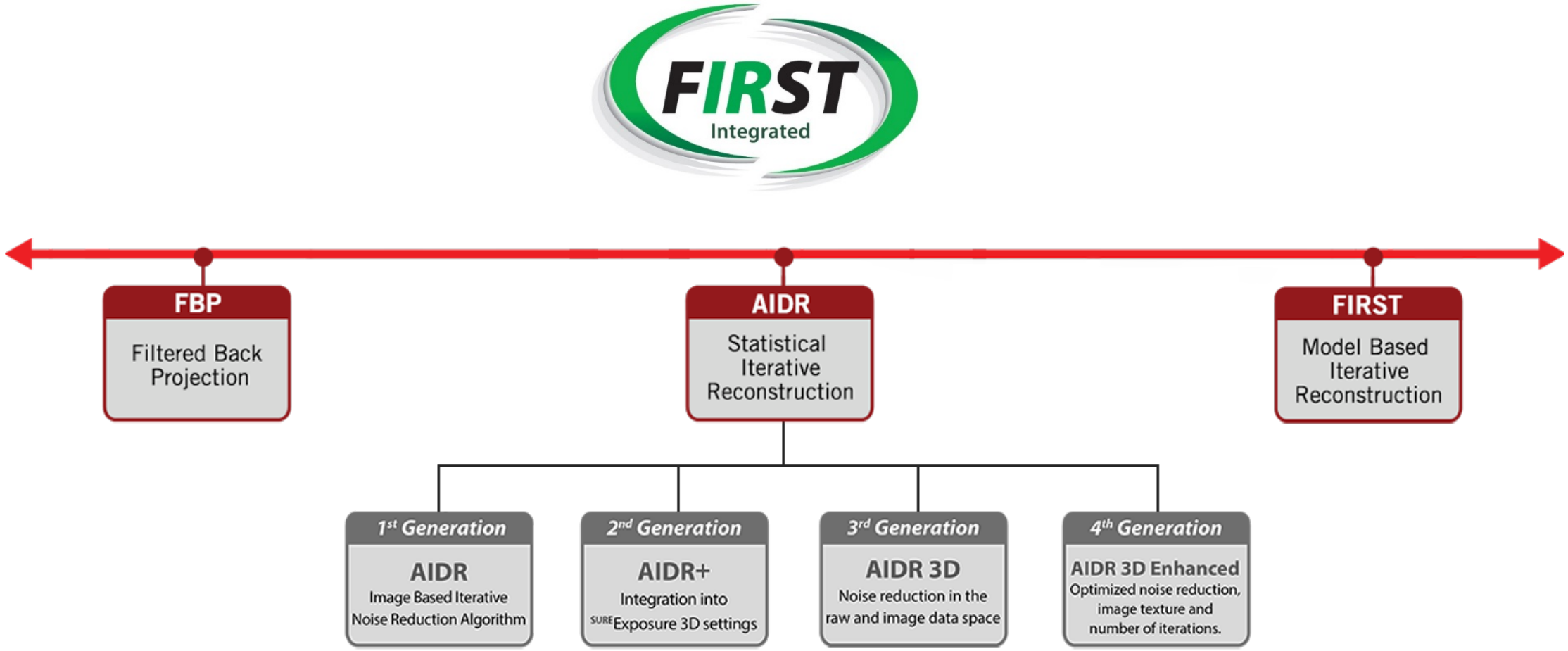
SEMAR

> Correcteur d’artéfact métallique simple énergie



Courtesy University Hospital of Poitiers , Pr. Christiaens & Pr. Guillevin

MBIR : FIRST Integrated



FIRST

FIRST: *Forward projected model-based Iterative Reconstruction SoluTion*

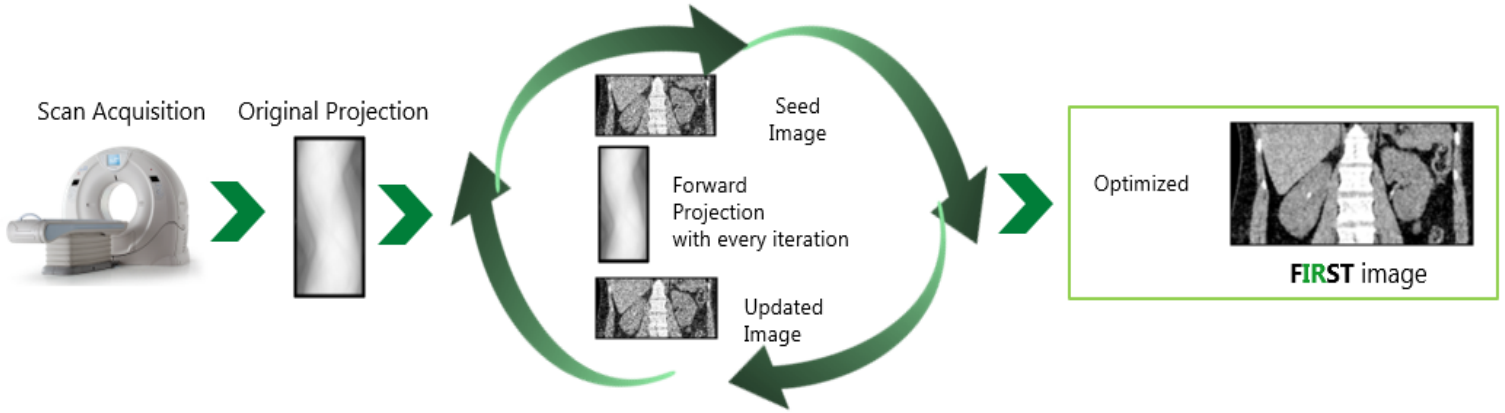
> **Première technique de reconstruction MBIR ou "full itératives" utilisable en routine clinique**

> **Totalement intégré au Sure Exposure 3D – jusqu'à 84,6% de réduction de dose**

> **Améliore la résolution spatiale**

> **] de reconstruction**

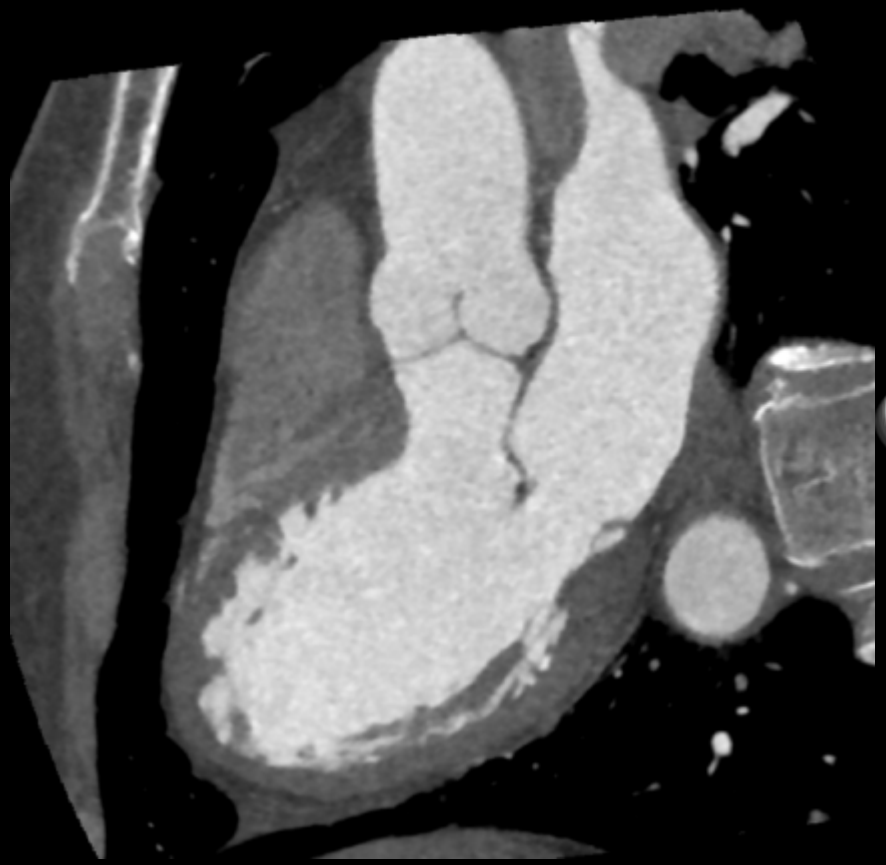
> **I**



Réduction du Bruit / Dose

DLP = 27,3 mGy.cm, 0.38 mSv

FBP

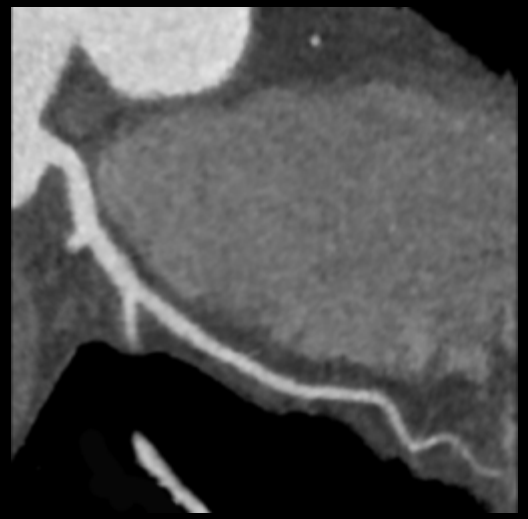


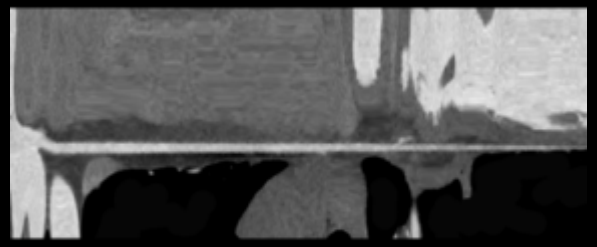
FIRST integrated

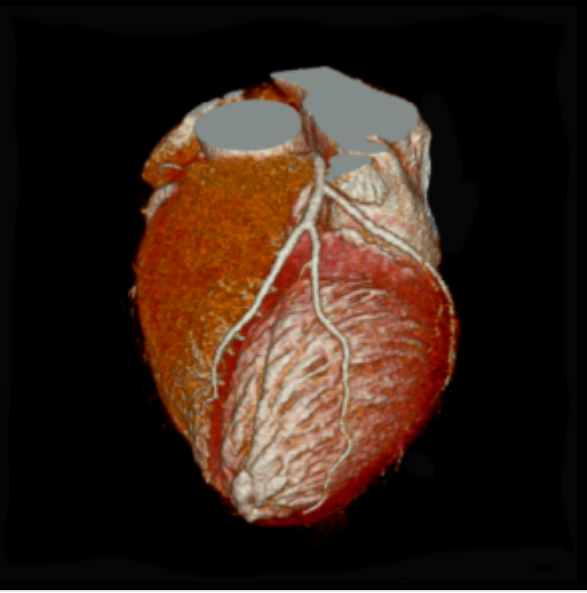
Courtesy of Dr. Chen, NIH, U

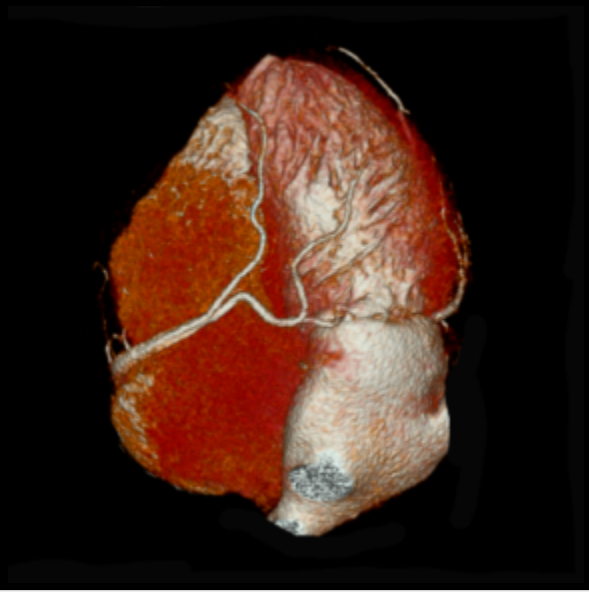
Réduction du Bruit / Dose

DLP = 27,3 mGy.cm, 0.38 mSv





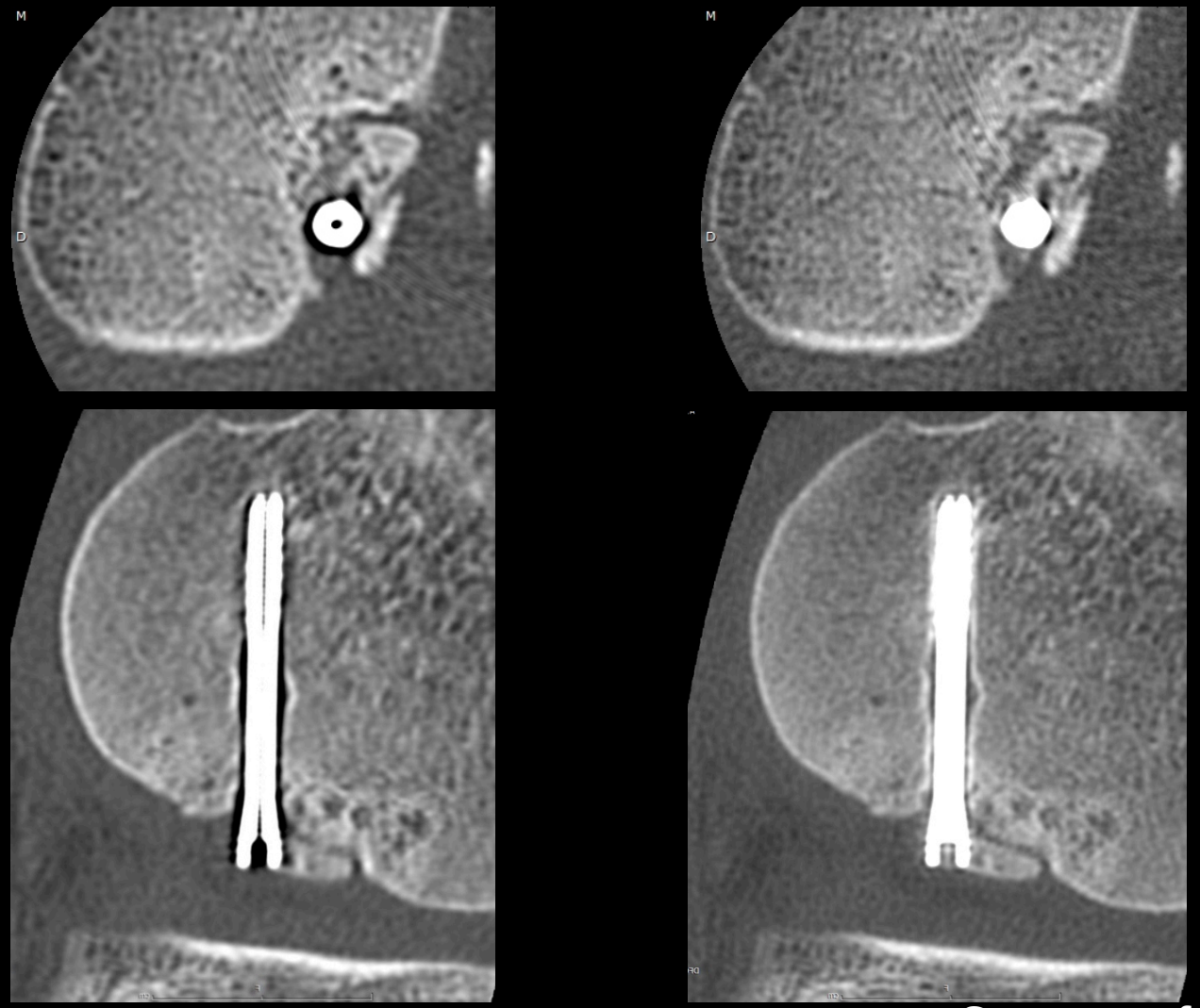




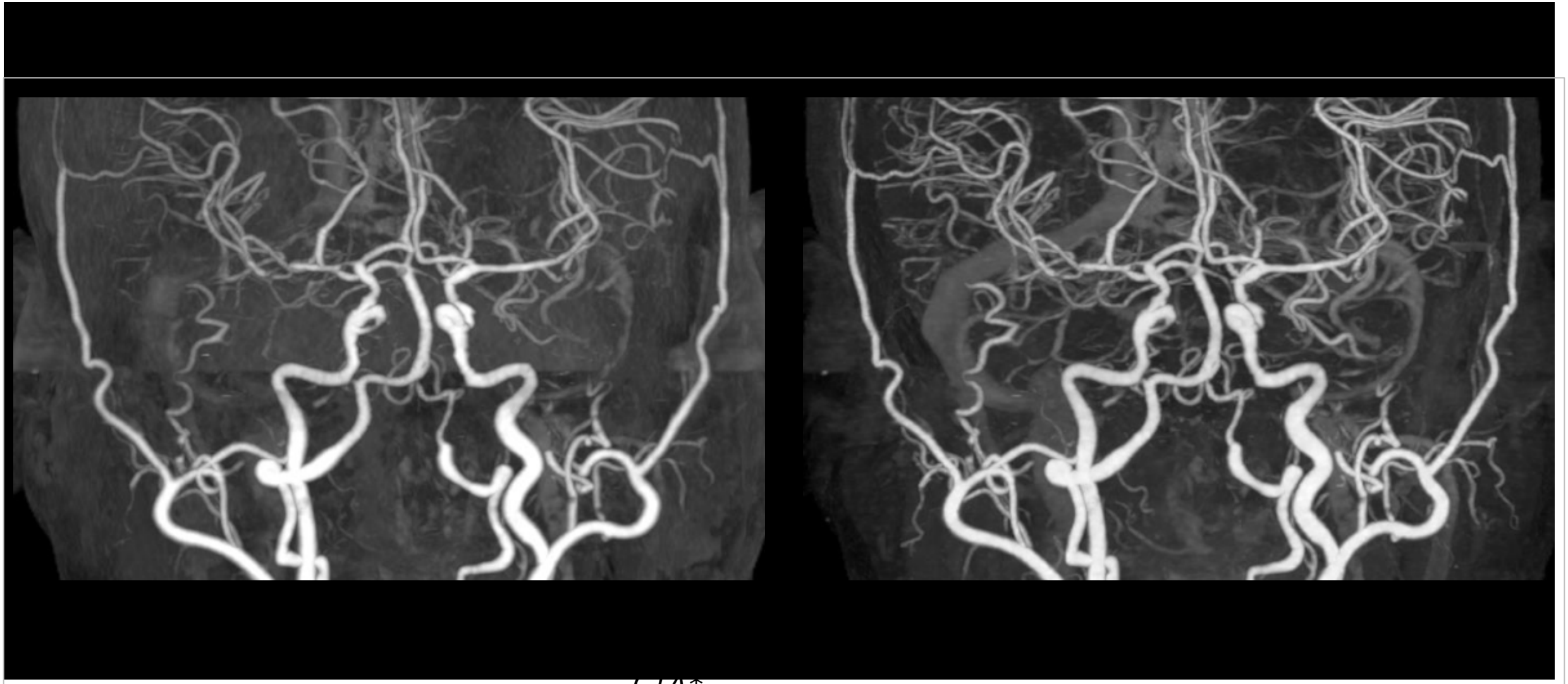
Courtesy of Dr. Chen, NIH, U

Artefacts de FBP / Ostéo-Articulaire

FBP



Courtesy of Prof. Blum , Nancy University, F

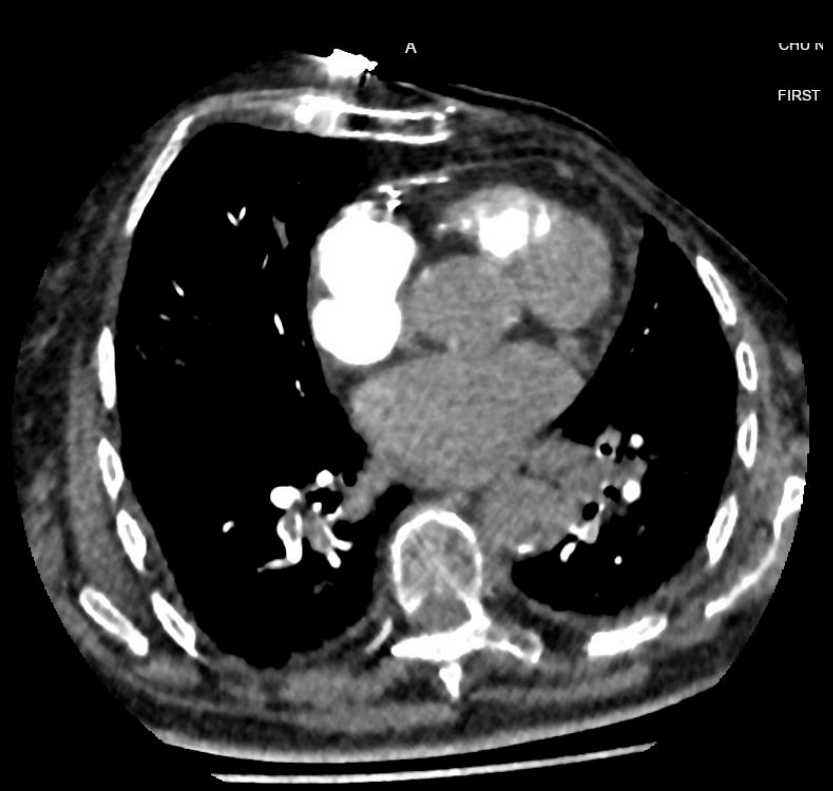


CTA*

* Option

Case 2

➢ 80 kV ; 20 ml Contrast ; DLP: 67.7 mgy.cm ; CTDIvol : 4.2 mgy



Courtesy University Hospital of Nancy, Pr. Blum

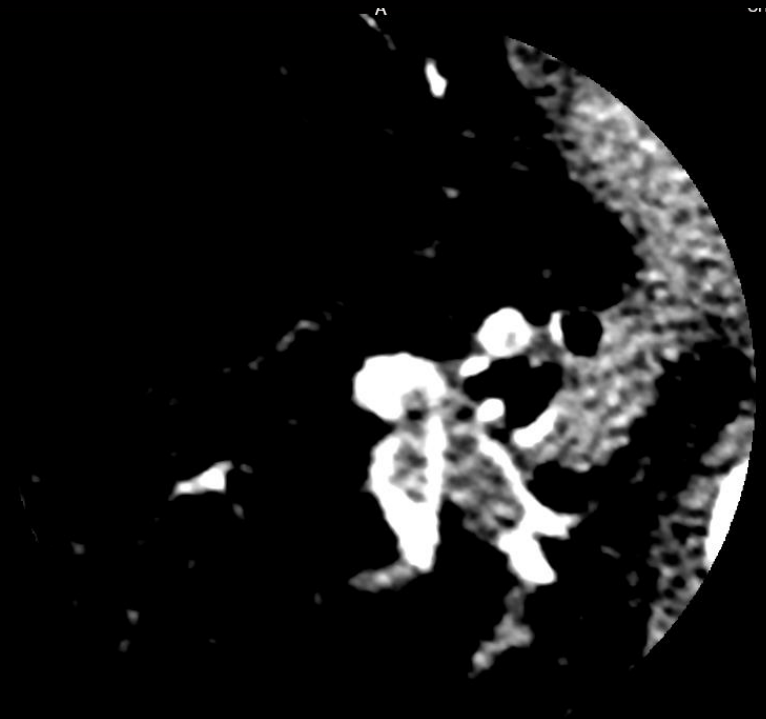
Case 2

➢ 80 kV ; 20 ml Contrast ; DLP: 67.7 mgy.cm ; CTDIvol : 4.2 mgy

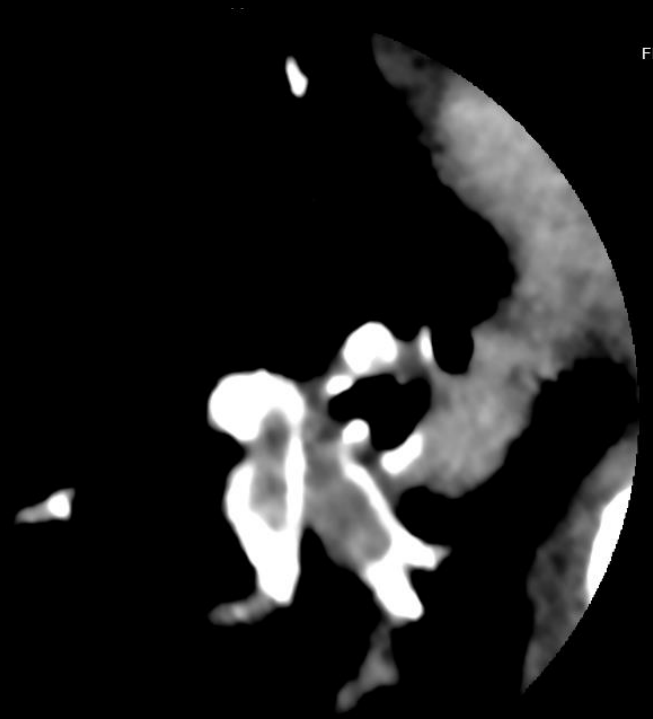
Courtesy University Hospital of Nancy, Pr. Blum

Case 2

➢ 80 kV ; 20 ml Contrast ; DLP: 67.7 mgy.cm ; CTDIvol : 4.2 mgy



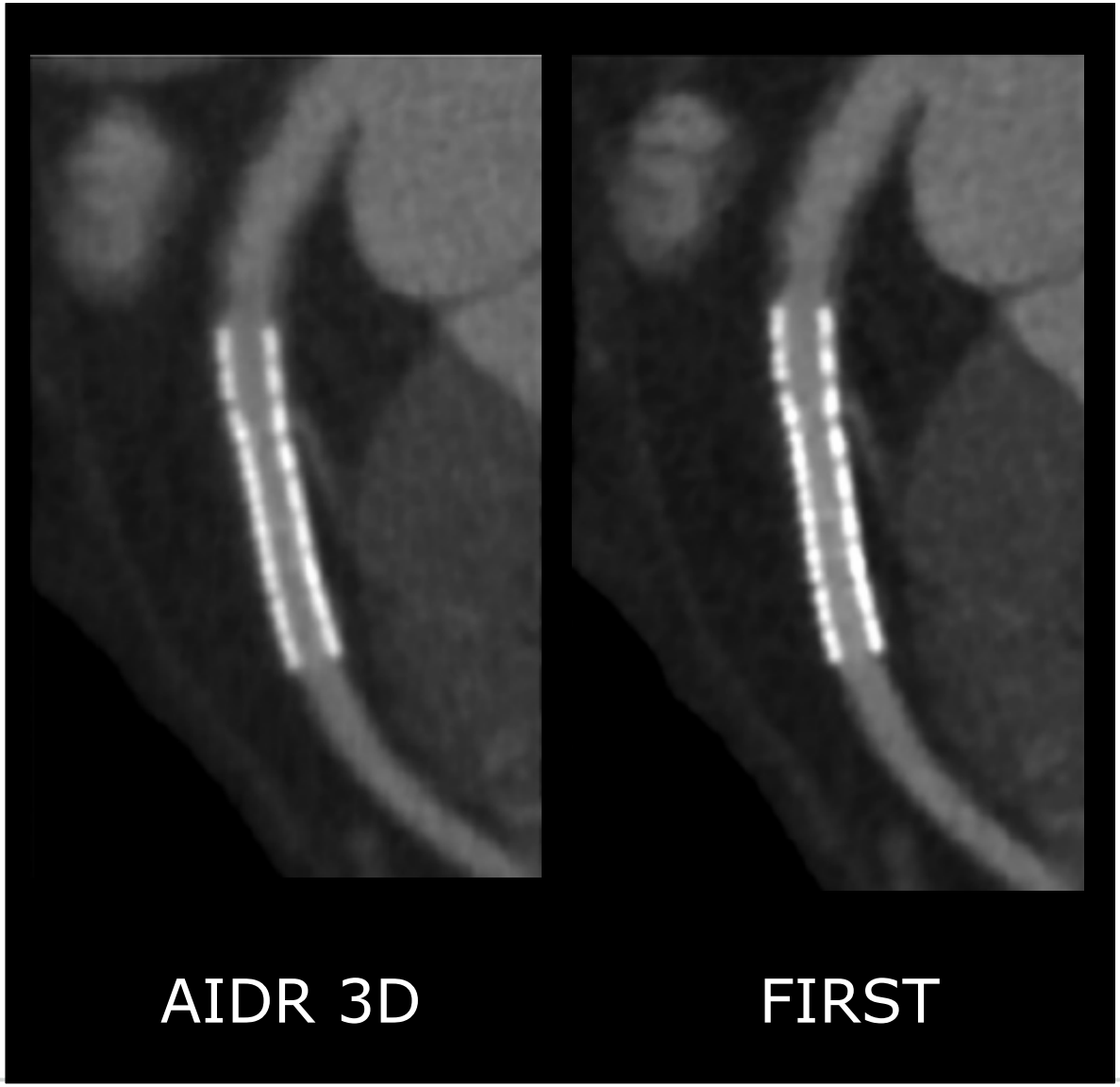
AIDR 3D integrated

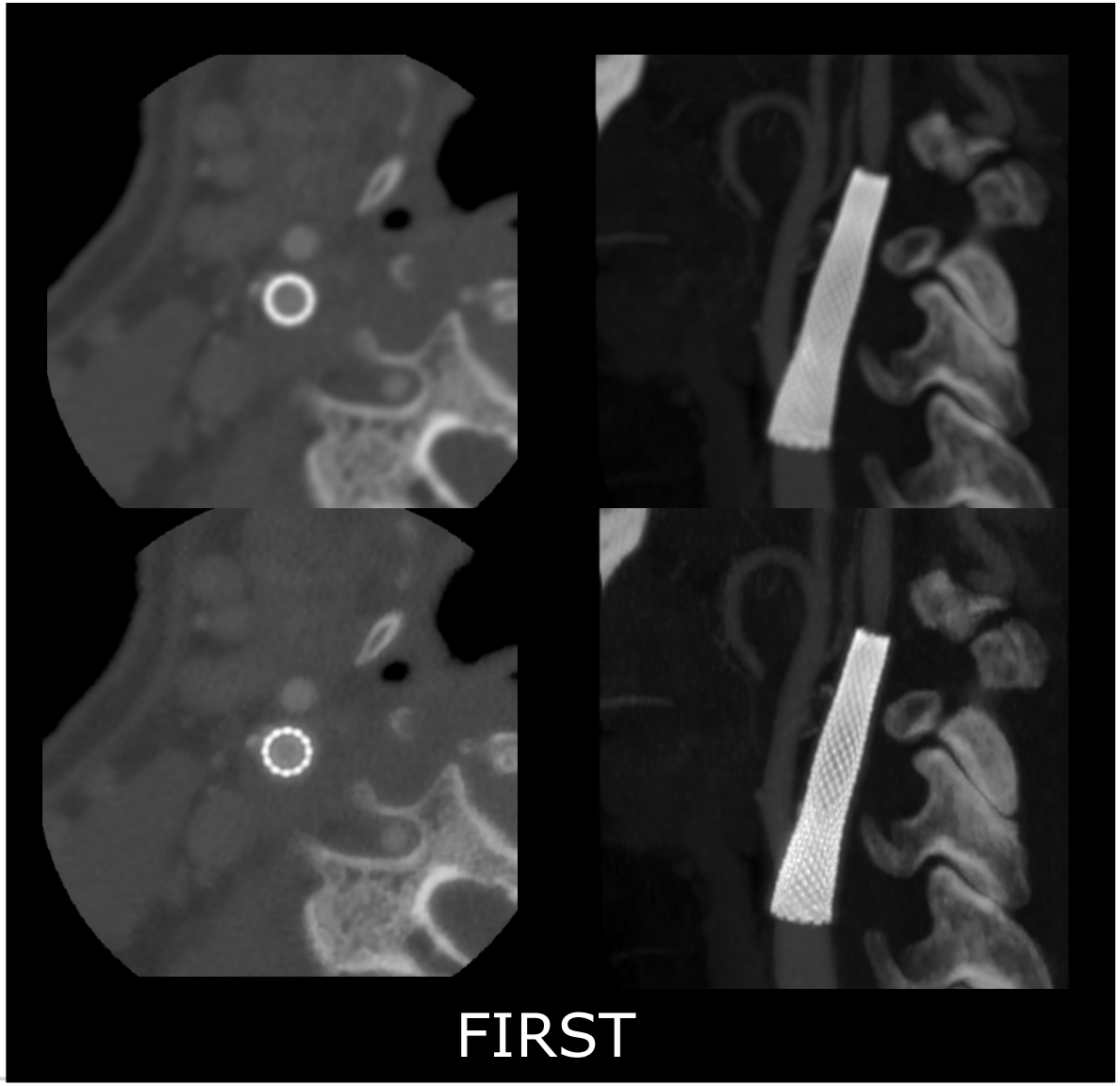


FIRST Integrated

Courtesy University Hospital of Nancy, Pr. Blum

FIRST





Courtesy University Hospital of Poitiers , Pr. Christiaens & Pr. Guillevin

FIRST

European Journal of Radiology

The feasibility of Forward-projected model-based Iterative Reconstruction SoluTion (FIRST) for coronary 320-row computed tomography angiography: A pilot study

Eriko Maeda [a,*], Nobuo Tomizawa [b], Shigeaki Kanno [a], Koichiro Yasaka [a], Takatoshi Kubo [a], Kenji Ino [c], Rumiko Torigoe [d], Kuni Ohtomo [a]

J Cardiovasc Comput Tomogr. 2017 Jan - Feb;11(1):40-45

FIRST is compared to AIDR3D reconstruction for coronary CTA scanned on Aquilion ONE ViSION Edition. FIRST allowed 28% dose reduction while improving image quality. Despite reduced radiation exposure, blooming artifacts, image sharpness, image noise, and overall image quality were significantly better with FIRST.

Academic Radiology

Improved Estimation of Coronary Plaque and Luminal Attenuation Using a Vendor-specific Model based Iterative Reconstruction Algorithm in Contrast-enhanced CT Coronary Angiography

Yoshinori Funama, Daisuke Utsunomiya, Kenichiro Hirata, Katsuyuki Taguchi, Takeshi Nakaura, Seitaro Oda, Masafumi Kidoh, Hideaki Yuki, Yasuyuki Yamashita

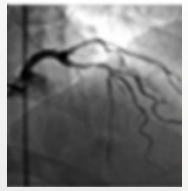
Acad Radiol, 2017, DOI: 10.1016/j.acra.2017.02.006

This phantom and limited patient study showed that FIRST reduces the plaque density and lumen to plaque contrast, therefore improving visualization of coronary plaques in CTA

Canon

CORE 320

ANALYSE MORPHOLOGIE

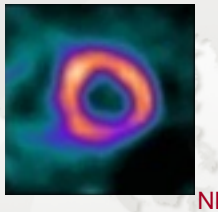


Coronarographie

CT angiographie

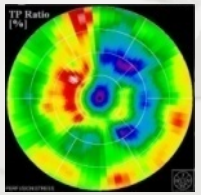
TGH
NHLBI
BWH
LUMC
JHU
Rigshospitalet
Charité
InCor

ANALYSE FONCTIONNELLE



Scintigraphie SPECT

Keio
Iwate
St. Luke's
Mie
NHC



CT perfusion

Etude multicentrique 8 pays 16 Hopitaux 381 patients

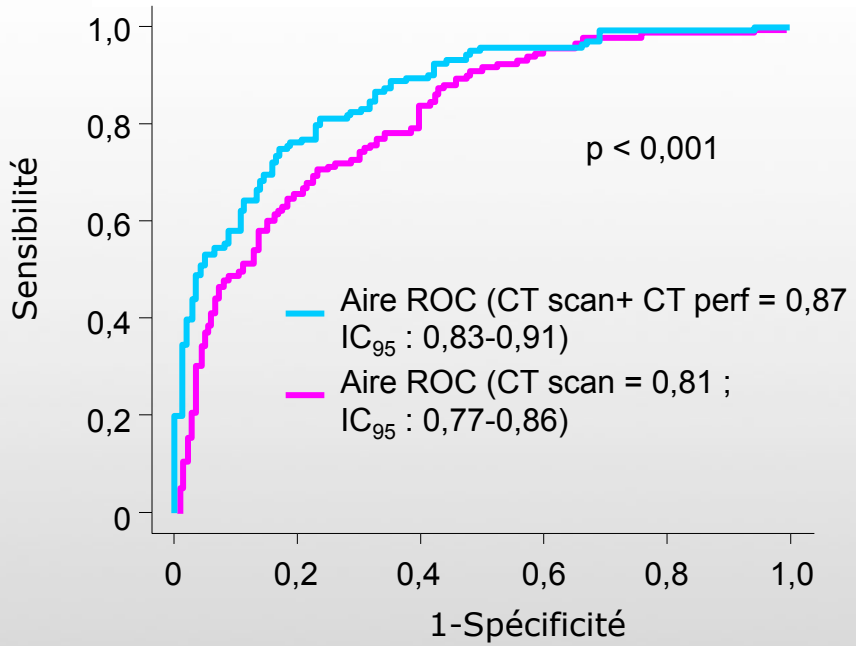
» **Evaluation du scanner / coronarographie associée à la scintigraphie**

Patient Arrives → Rest Scan → Stress Injection → Stress Scan

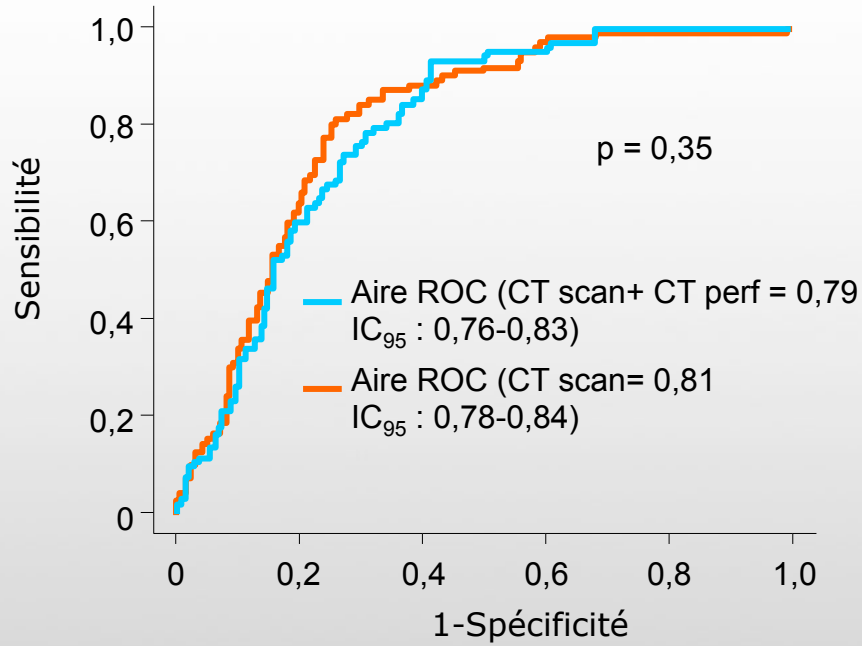
Canon

CORE 320

Amélioration CT scanner + CT perfusion vs CT scanner seul



CT scanner + CT perfusion vs coro + scintigraphie SPECT



- Le scanner de perfusion améliore la capacité diagnostique par comparaison au scanner seul
- La combinaison scanner / scanner de perfusion identifie les patients nécessitant une revascularisation
- Etude anatomique et viabilité lors d'un même examen avec une dose totale modérée (< 5 mSv)

ESC 2012 - D'après Lima J et al., abstract 3936,

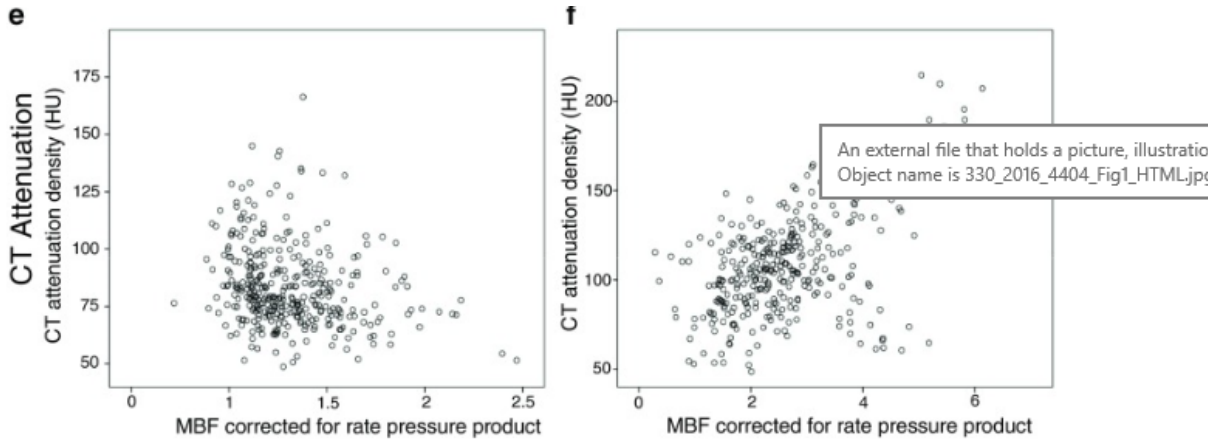
Canon

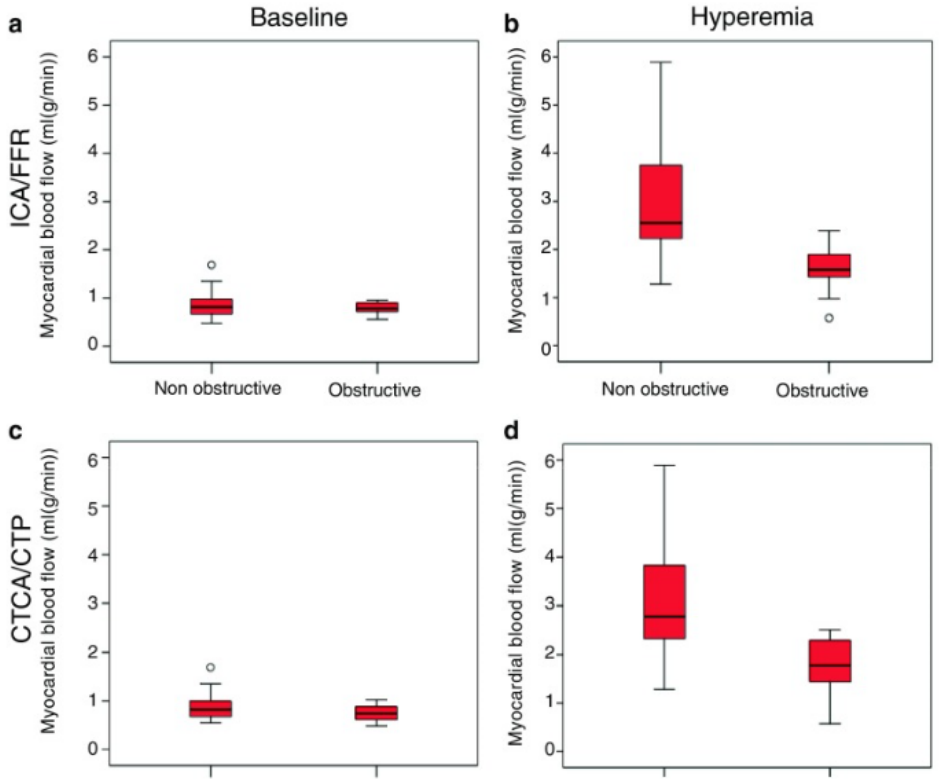
e scanner Volumique dynamique

Eur Radiol. 2017; 27(3): 1114–1124.
Published online 2016 Jun 22. doi: 10.1007/s00330-016-4404-5
PMCID: PMC5306314
PMID: 27334015

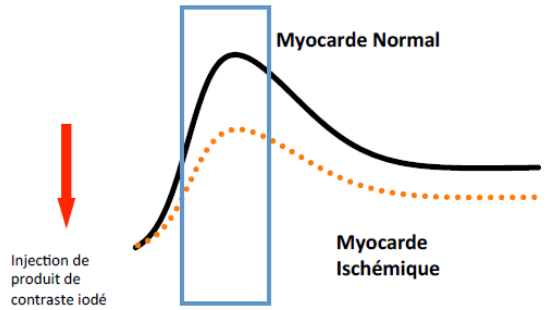
Computed tomography myocardial perfusion vs ^{15}O-water positron emission tomography and fractional flow reserve

Michelle C. Williams,[1] Saeed Mirsadraee,[2] Marc R. Dweck,[1] Nicholas W. Weir,[2] Alison Fletcher,[2] Christophe Lucatelli,[2] Tom MacGillivray,[1,2] Saroj K. Golay,[1] Nicholas L. Cruden,[3] Peter A. Henriksen,[3] Neal Uren,[3] Graham McKillop,[4] João A. C. Lima,[5] John H. Reid,[2] Edwin J. R. van Beek,[1,2] Dilip Patel,[4] and David E. Newby[1,2]





Imagerie classique au pic d'atténuation attendu



Canon

e scanner Volumique dynamique

Radiology. 2018 Feb;286(2):461-470. doi: 10.1148/radiol.2017162447. Epub 2017 Sep 25.

Coronary Artery Disease: Analysis of Diagnostic Performance of CT Perfusion and MR Perfusion Imaging in Comparison with Quantitative Coronary Angiography and SPECT-Multicenter Prospective Trial.

Rief M[1], Chen MY[1], Vavere AL[1], Kendziora B[1], Miller JM[1], Bandettini WP[1], Cox C[1], George RT[1], Lima J[1], Di Carli M[1], Plotkin M[1], Zimmermann E[1], Laule M[1], Schlattmann P[1], Arai AE[1], Dewey M[1].

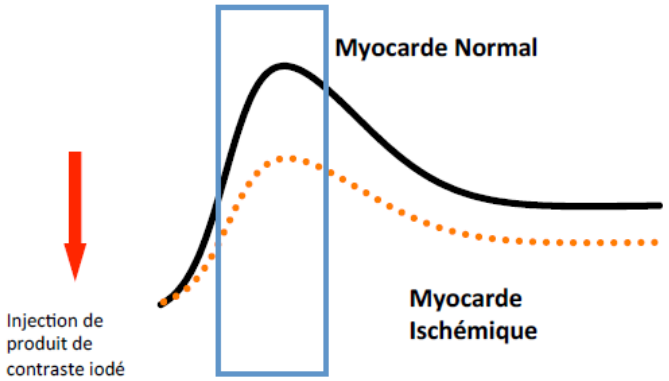
Radiology. 2017 Jul;284(1):55-65. doi: 10.1148/radiol.2017161565. Epub 2017 Mar 14.

Prognostic Value of Combined CT Angiography and Myocardial Perfusion Imaging versus Invasive Coronary Angiography and Nuclear Stress Perfusion Imaging in the Prediction of Major Adverse Cardiovascular Events: The CORE320 Multicenter Study.

Chen MY[1], Rochitte CE[1], Arbab-Zadeh A[1], Dewey M[1], George RT[1], Miller JM[1], Niinuma H[1], Yoshioka K[1], Kitagawa K[1], Sakuma H[1], Laham R[1], Vavere AL[1], Cerci RJ[1], Mehra VC[1], Nomura C[1], Kofoed KF[1], Jinzaki M[1], Kuribayashi S[1], Scholte AJ[1], Laule M[1], Tan SY[1], Hoe J[1], Paul N[1], Rybicki FJ[1], Brinker JA[1], Arai AE[1], Matheson MB[1], Cox C[1], Clouse ME[1], Di Carli MF[1], Lima JAC[1].

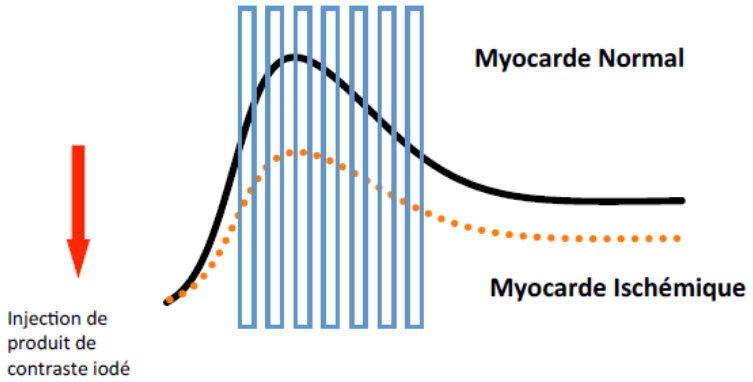
Cardio ONE GENESIS – Perfusion Myocardique 4D

Imagerie classique au pic d'atténuation attendu



25 à 32 secondes

Imagerie de perfusion dynamique: échantillonnage du volume à différents instants post injection

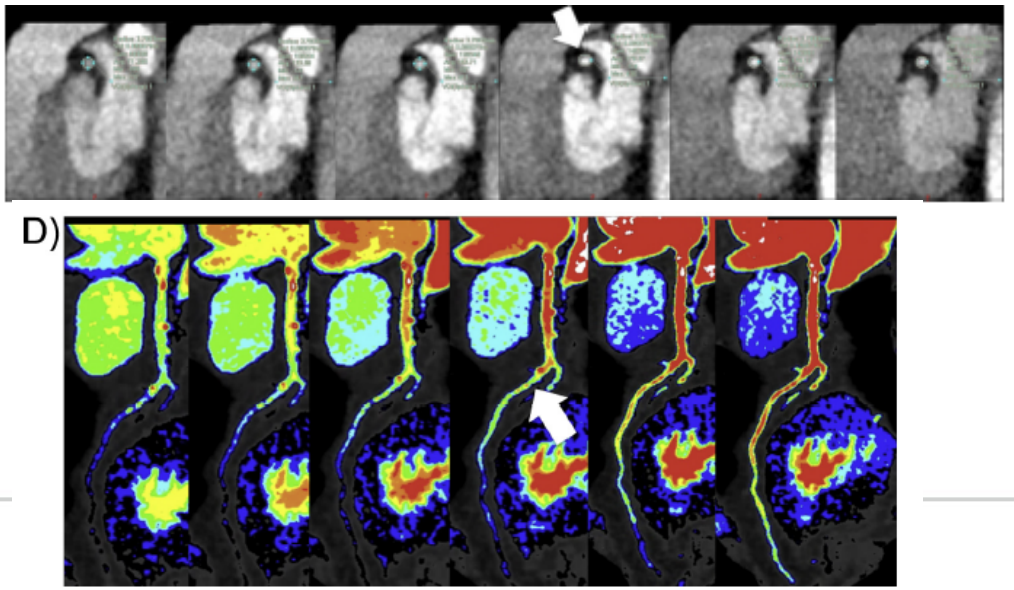


Méthode quantitative : flux sanguin myocardique, volume sanguin myocardique ,....

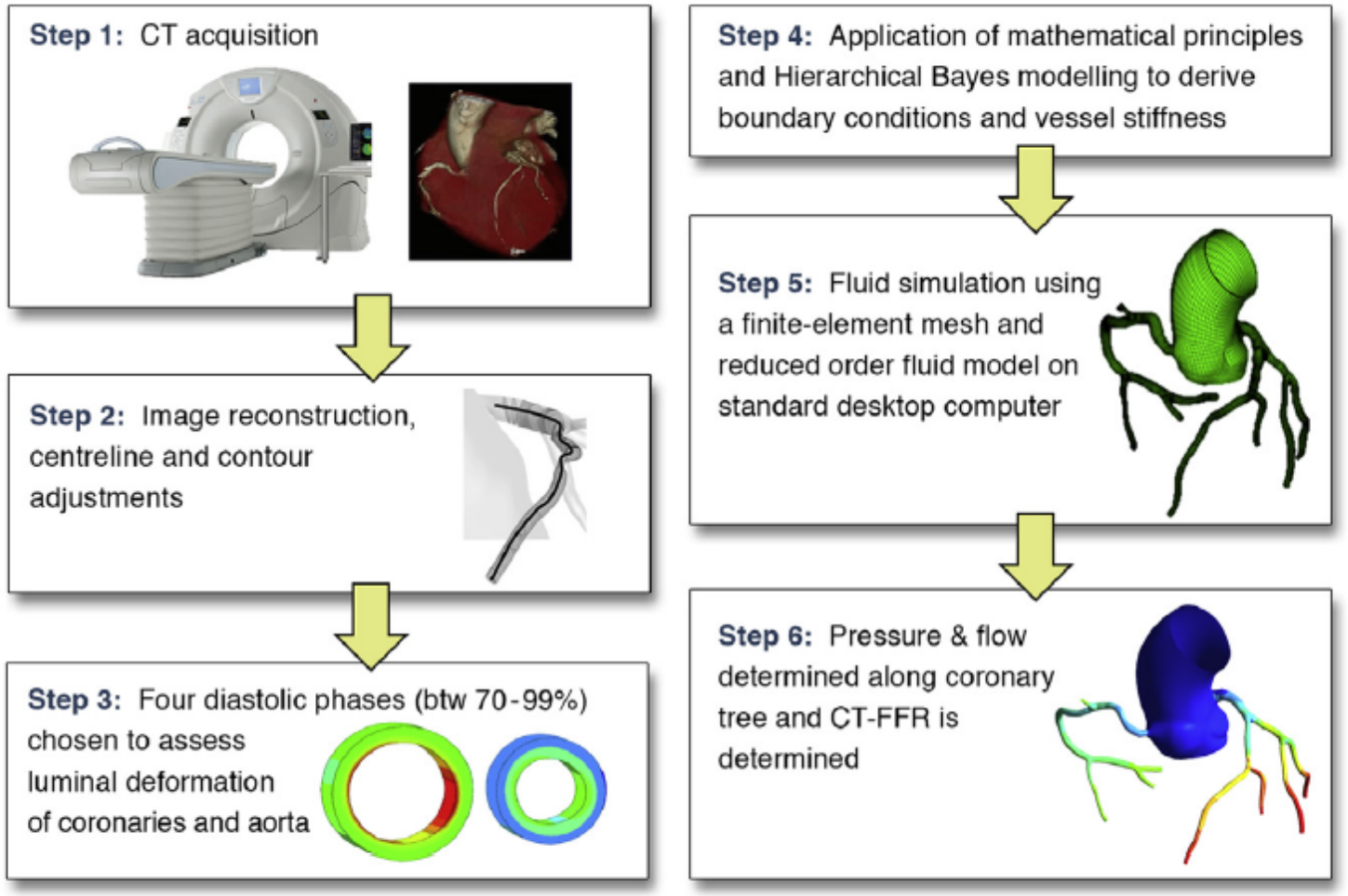
Quantification of coronary flow using dynamic angiography with 320-detector row CT and motion coherence image processing: Detection of ischemia for intermediate coronary stenosis

Michinobu Nagao[a,*], Yuzo Yamasaki[b], Takeshi Kamitani[b], Satoshi Kawanami[a], Koji Sagiyama[b], Torahiko Yamanouchi[b], Yamato Shimomiya[c], Tetsuya Matoba[d], Yasushi Mukai[d], Keita Odashiro[e], Shingo Baba[b], Yasuhiro Maruoka[b], Yoshiyuki Kitamura[b], Akihiro Nishie[b], Hiroshi Honda[b]

[a] *Departments of Molecular Imaging & Diagnosis, Graduate School of Medical Sciences, Kyushu University, Japan*
[b] *Departments of Clinical Radiology, Graduate School of Medical Sciences, Kyushu University, Japan*
[c] *Departments of Medical Technology, Graduate School of Medical Sciences, Kyushu University, Japan*
[d] *Departments of Cardiovascular Medicine, Graduate School of Medical Sciences, Kyushu University, Japan*
[e] *Departments of Medicine and Biosystemic Science, Graduate School of Medical Sciences, Kyushu University, Japan*



CT-FFR: WIP



- FFR CT calculée sur la déformation de la lumière des coronaires et de l'aorte puis mécanique des fluides

Canon

CT-FFR: WIP

JACC: CARDIOVASCULAR IMAGING
VOL. ■, NO. ■, 2016

ISSN 1936-878X/$36.00
PUBLISHED BY ELSEVIER
http://dx.doi.org/10.1016/j.jcmg.2016.07.005

Noninvasive CT-Derived FFR Based on Structural and Fluid Analysis

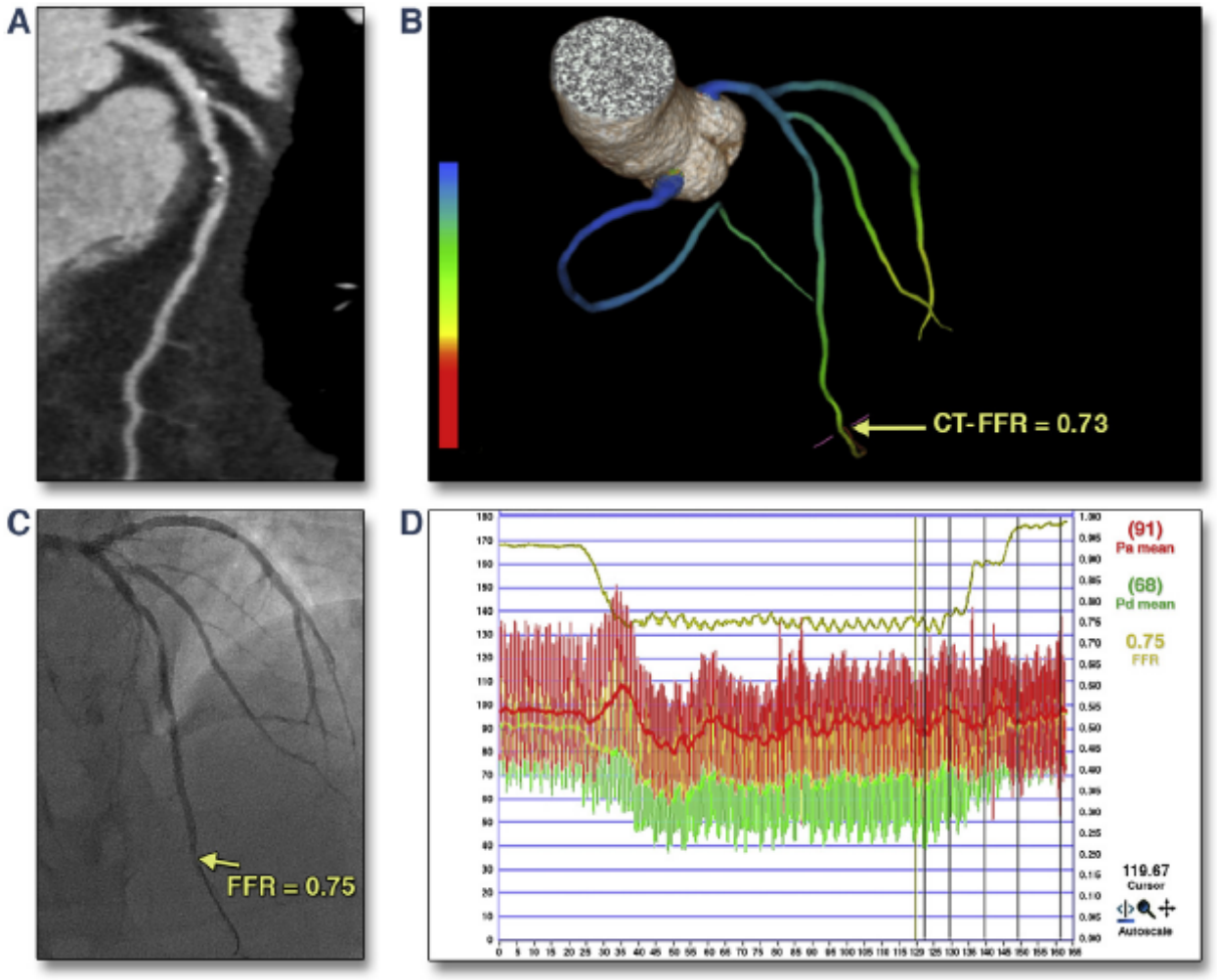
A Comparison With Invasive FFR for Detection of Functionally Significant Stenosis

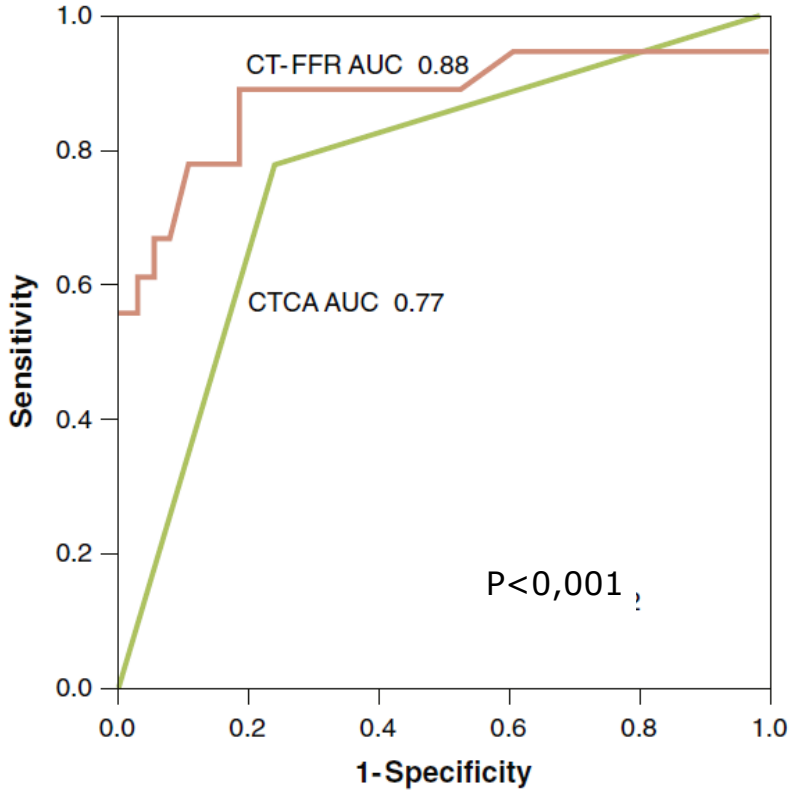
Brian S. Ko, MBBS (Hons), PhD,[a] James D. Cameron, MBBS, BE, MD,[a] Ravi K. Munnur, MBBS,[a]
Dennis T.L. Wong, MBBS (Hons), PhD,[a] Yasuko Fujisawa, BSci,[b] Takuya Sakaguchi, PhD,[b] Kenji Hirohata, PhD,[c]
Jacqui Hislop-Jambrich, PhD,[d] Shinichiro Fujimoto, MD, PhD,[e] Kazuhisa Takamura, MD, PhD,[e]
Marcus Crossett, BSc,[a,f] Michael Leung, MBBS (Hons), PhD,[a] Ahilan Kuganesan, BSc,[a,f] Yuvaraj Malaiapan, MBBS,[a]
Arthur Nasis, MBBS (Hons), PhD,[a] John Troupis, MBBS,[a,f] Ian T. Meredith, MBBS (Hons), PhD,[a]
Sujith K. Seneviratne, MBBS[a]

From the [a]Monash Cardiovascular Research Centre, MonashHEART, Department of Medicine, Monash Medical Centre, Monash Health, and Monash University, Melbourne, Victoria, Australia; [b]Toshiba Medical Systems Corporation, Otawara, Japan; [c]Toshiba Corporation, Kawasaki, Japan; [d]Toshiba Medical Australia, North Ryde, Australia; [e]Department of Cardiovascular Medicine, Juntendo University Graduate School of Medicine, Tokyo, Japan; and the [f]Department of Diagnostic Imaging, Monash Medical Centre, Monash Health, Melbourne, Clayton, Victoria, Australia. Drs. Ko and Wong are funded by the National

- 42 Patients
- FFR invasive en référence
- 30 minutes de calcul en loca

CT-FFR: WIP

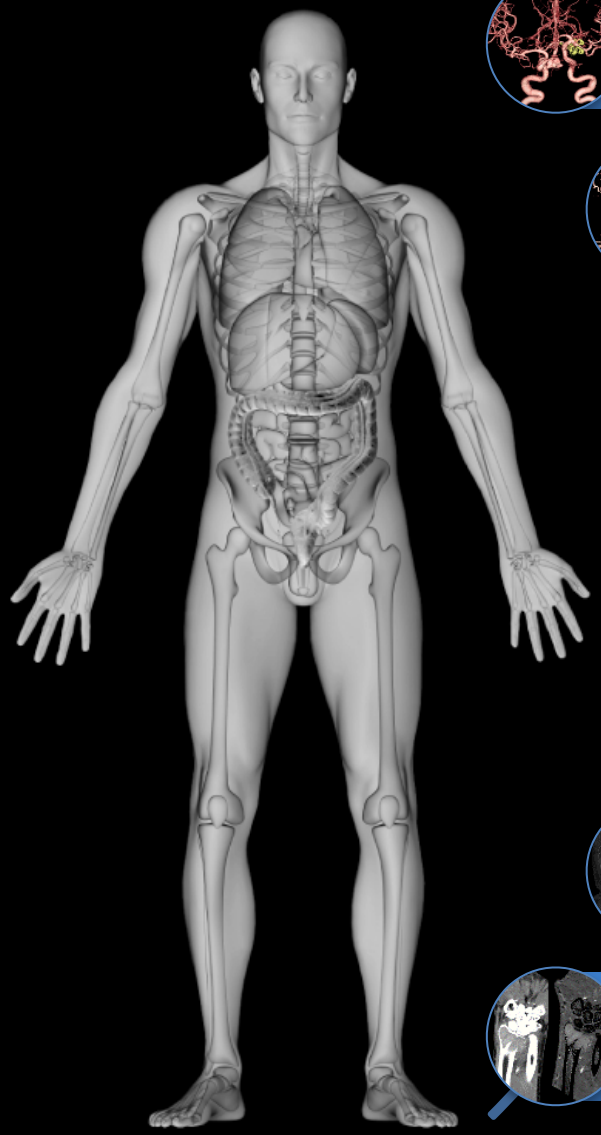




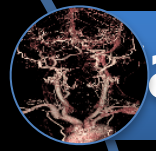
Canon

SureSoustraction

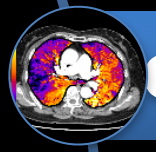
SureSoustraction



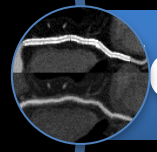
Villis



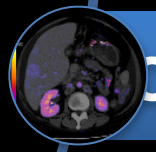
arotides



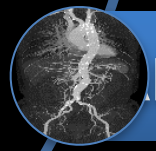
oumons



oronaires



odine Mapping

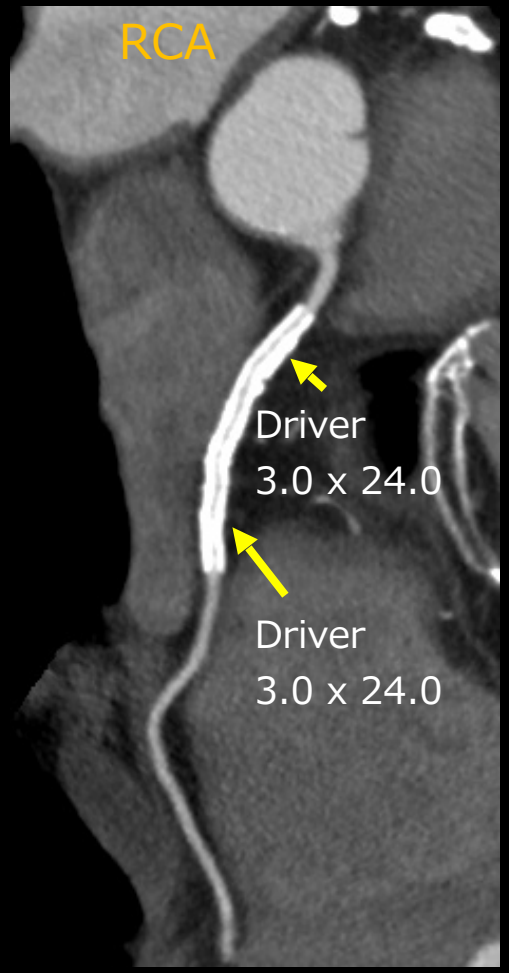


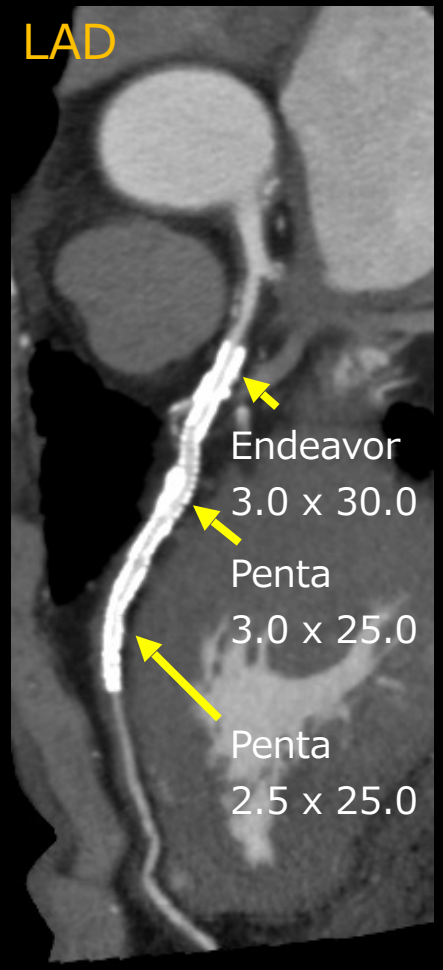
ngio

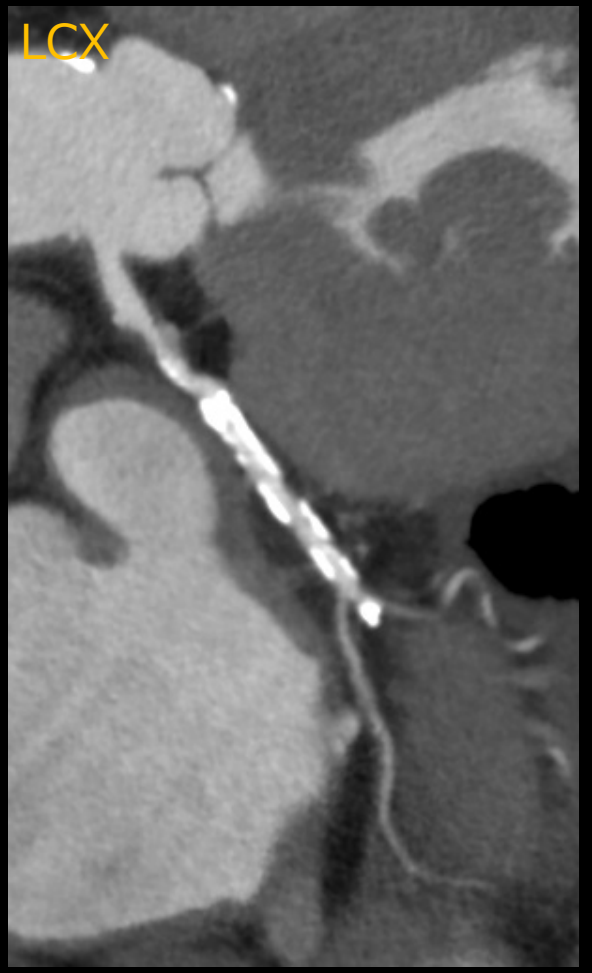
stéo

SureSoustraction Coronaire

Images originales

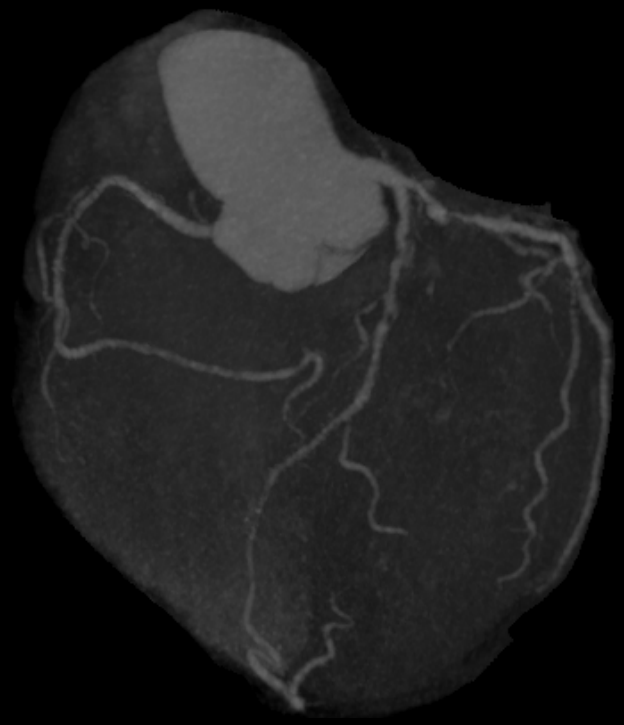




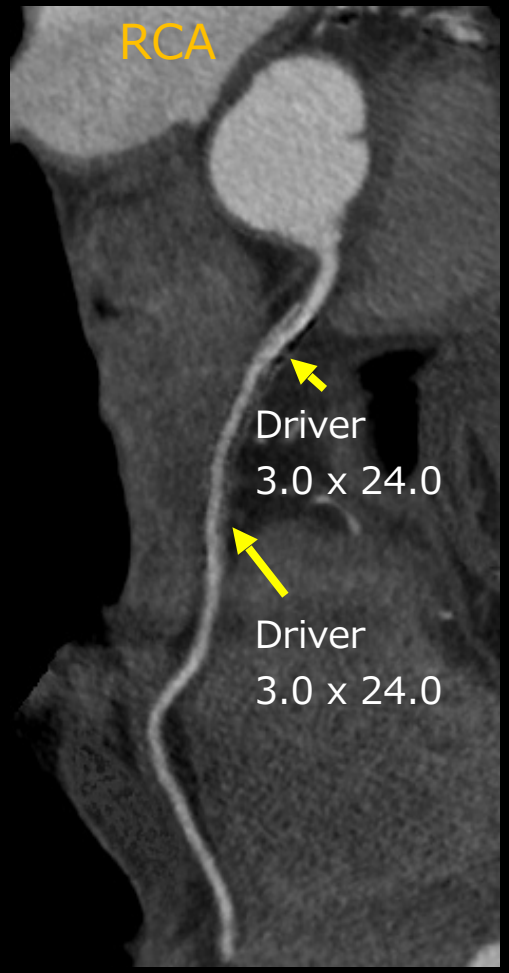


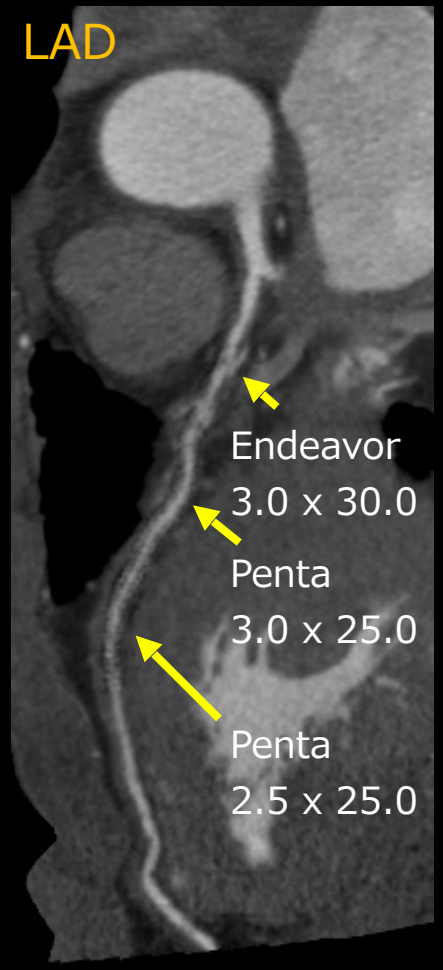
Courtesy of Takase clinic, Japan.

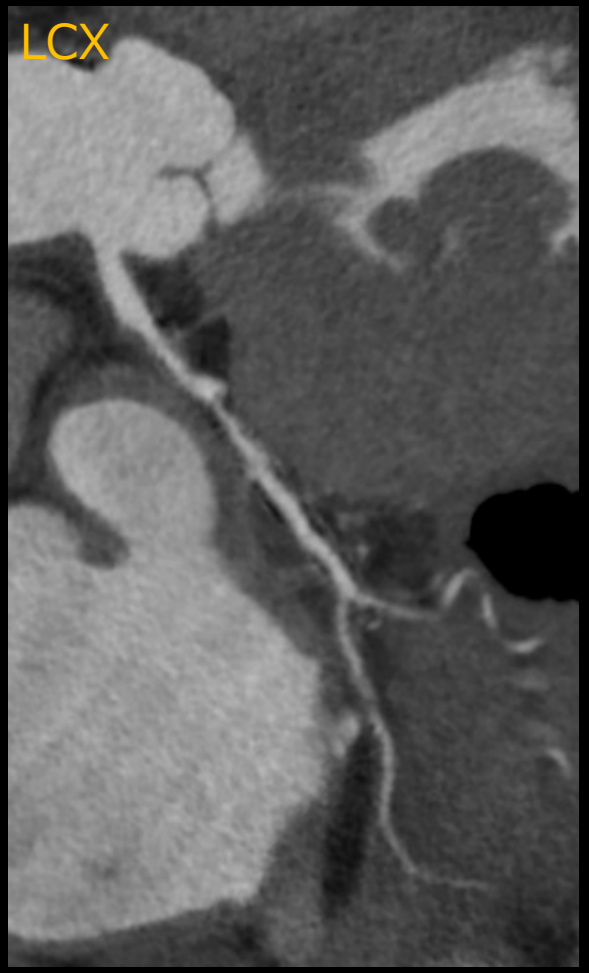
SureSoustraction Coronaire



Images soustraites







Courtesy of Takase clinic, Japan.

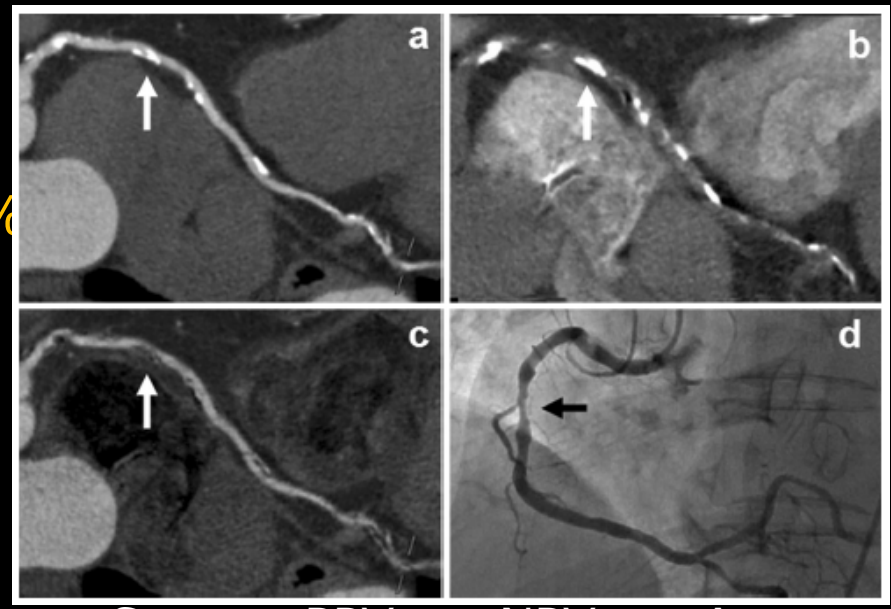
SureSoustraction Coronaire

Etude: 78 patients (47 hommes, 31 femmes), Ca Score > 300 , 174 segments

HR:53±5 bpm, dose (Mask+Contrast): 5.1 ± 2.9 mSv

Ca score **1336** ±1056

Segments non interprétables: ConCTA:42.5% → SubCTA:12%



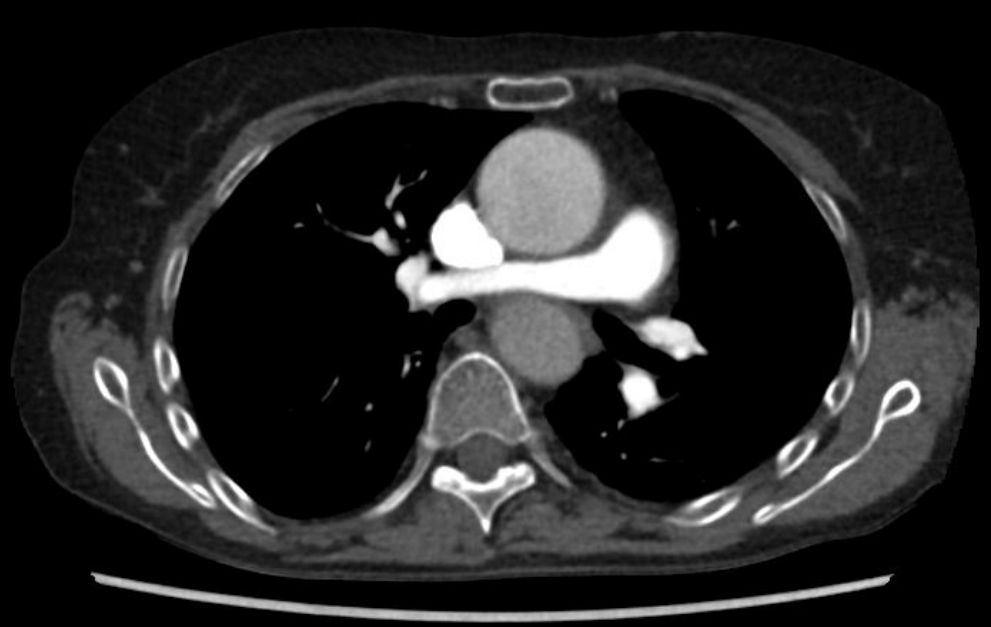
	ICA		Total
	Stenosis (+)	Stenosis (−)	
Conventional CCTA			
Stenosis (+)	24	10	34
Non-assessable	34	40	74
Stenosis (−)	6	60	66
Total	64	110	174
Subtraction CCTA			
Stenosis (+)	46	15	61
Non-assessable	12	9	21
Stenosis (−)	6	86	92
Total	64	110	174

	Sen	Spe	PPV	NPV	Acc
ConCTA	90.6%	54.5%	53.7%	90.9%	67.8%
SubCTA	90.6%	**78.5%**	**70.7%**	**93.5%**	82.8%

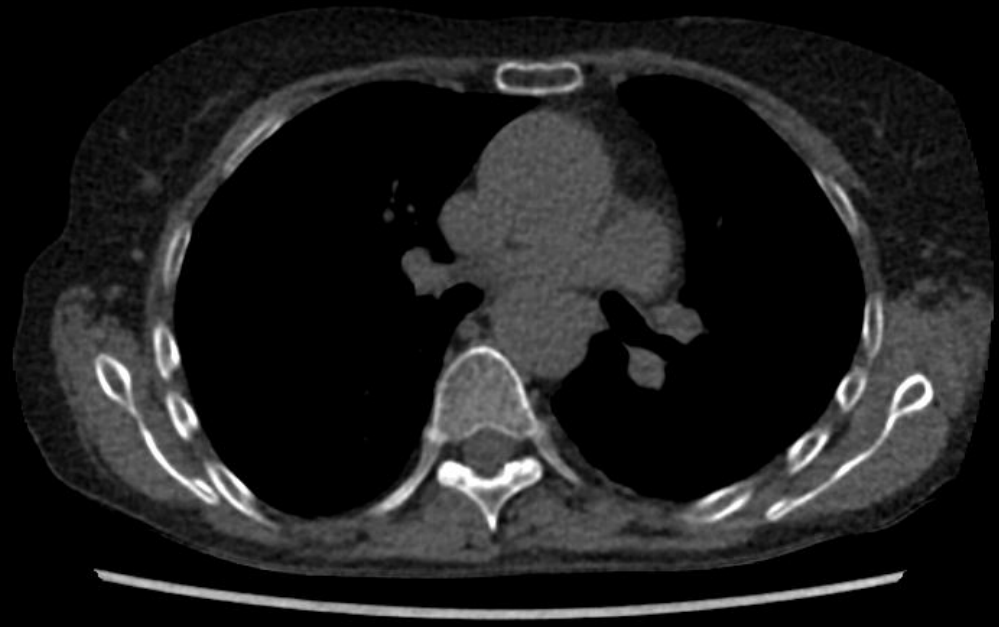
Amanuma. Takase-clinic. Subtraction coronary computed tomography in patients with severe calcification. Int J Cardiovasc Imaging. 2015.

SureSubtraction

Patiente de 63 ans – Suspicion d'embolie Pulmonaire (35ml Contraste et DLP totale = 155.1 mgy.cm)



Acquisition artérielle



Acquisition sans IV

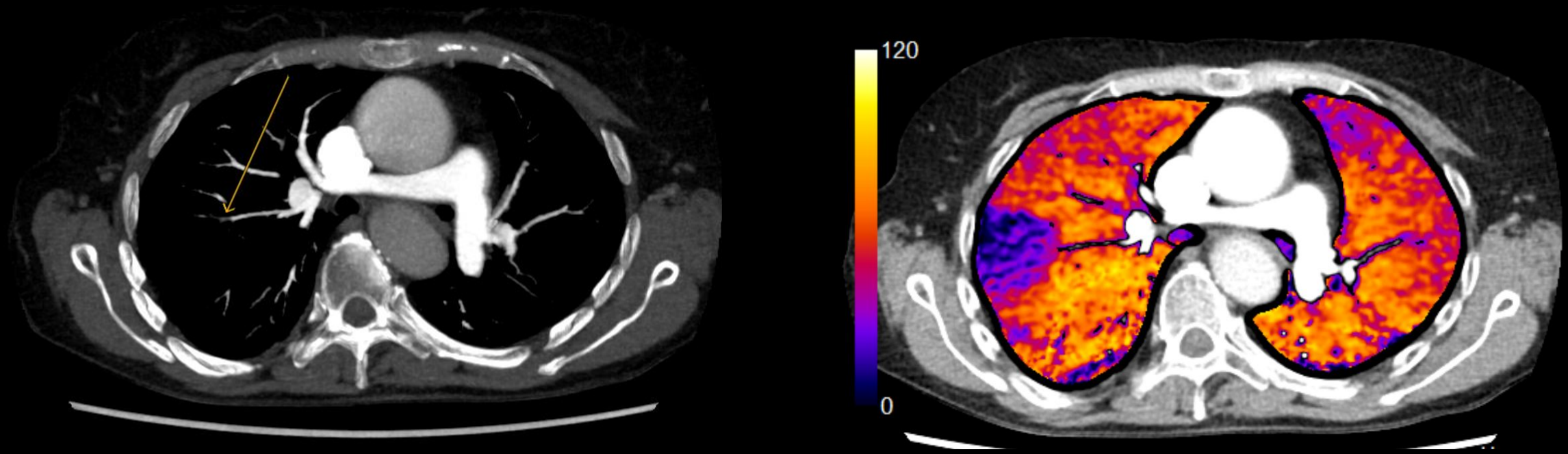
	Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time	Scan Range	Dose Reduction	CTDIvol (mGy)	DLP mGy.cm	Effective Dose	K
Pre Contrast	Helical	0.5mm x 80	0.813	100	SUREExposure UltraLow Dose	0.275s	291 mm	AIDR 3D Enhanced	0.70	23	0.32	0.014
Post Contrast	Helical	0.5mm x 80	0.813	100	SUREExposure Quality	0.275s	291 mm	AIDR 3D Enhanced	3.30	112.5	1.57	0.014

Canon

Courtesy Dr. Paul, Institut Mutualiste Montsouris, Paris

SureSubtraction

Patiente de 63 ans – Suspicion d'embolie Pulmonaire (35ml Contraste et DLP totale = 155.1



Embolie Pulmonaire sous-segmentaire droite

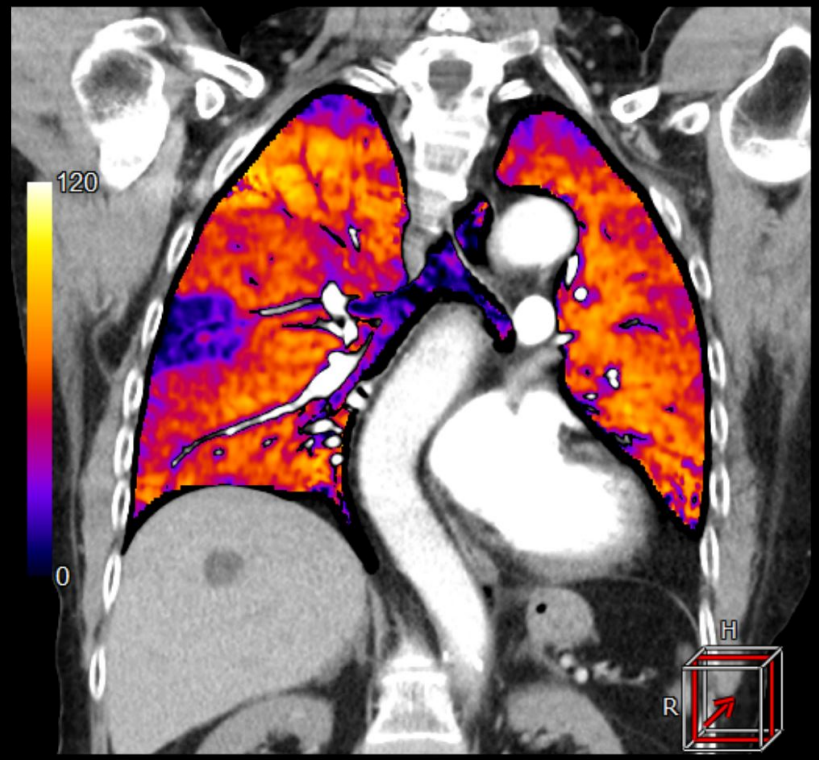
	Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time	Scan Range	Dose Reduction	CTDIvol (mGy)	DLP mGy.cm	Effective Dose	K
Pre Contrast	Helical	0.5mm x 80	0.813	100	SUREExposure UltraLow Dose	0.275s	291 mm	AIDR 3D Enhanced	0.70	23	0.32	0.014
Post Contrast	Helical	0.5mm x 80	0.813	100	SUREExposure Quality	0.275s	291 mm	AIDR 3D Enhanced	3.30	112.5	1.57	0.014

Canon

Courtesy Dr. Paul, Institut Mutualiste Montsouris, Paris

SureSubtraction

Patiente de 63 ans – Suspicion d'embolie Pulmonaire (35ml Contraste et DLP totale = 155.1



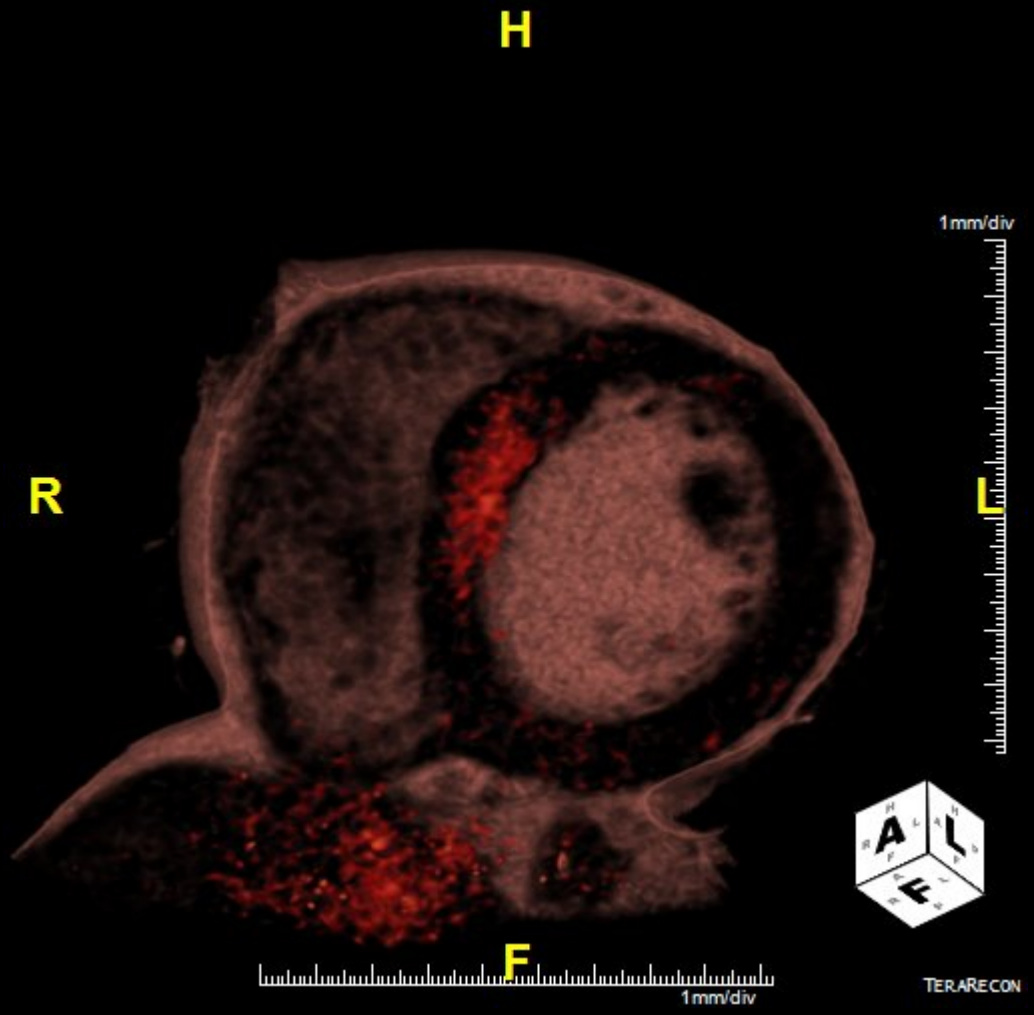
Virtuel Contrast Boost

	Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time	Scan Range	Dose Reduction	CTDIvol (mGy)	DLP mGy.cm	Effective Dose	K
Pre Contrast	Helical	0.5mm x 80	0.813	100	SUREExposure UltraLow Dose	0.275s	291 mm	AIDR 3D Enhanced	0.70	23	0.32	0.014
Post Contrast	Helical	0.5mm x 80	0.813	100	SUREExposure Quality	0.275s	291 mm	AIDR 3D Enhanced	3.30	112.5	1.57	0.014

Canon

Courtesy Dr. Paul, Institut Mutualiste Montsouris, Paris

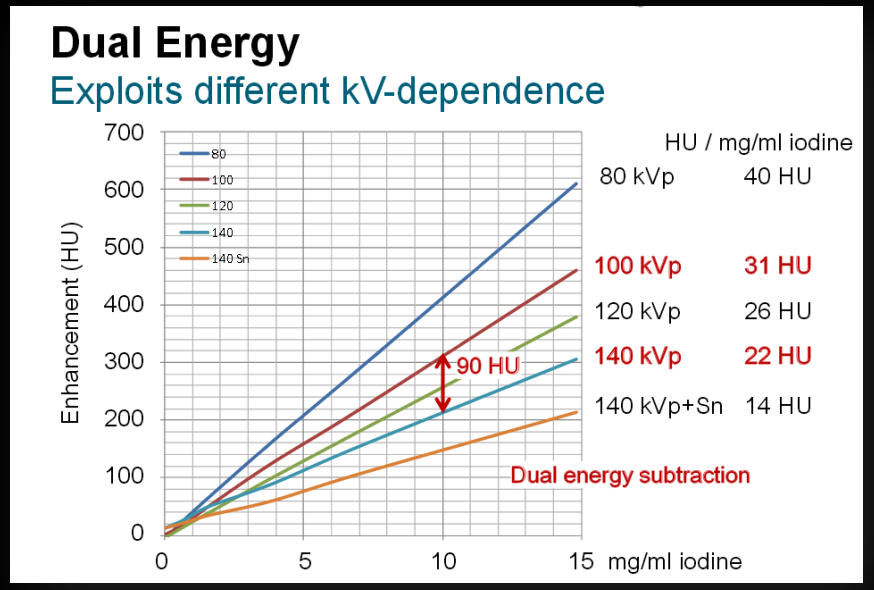
SureSubtraction

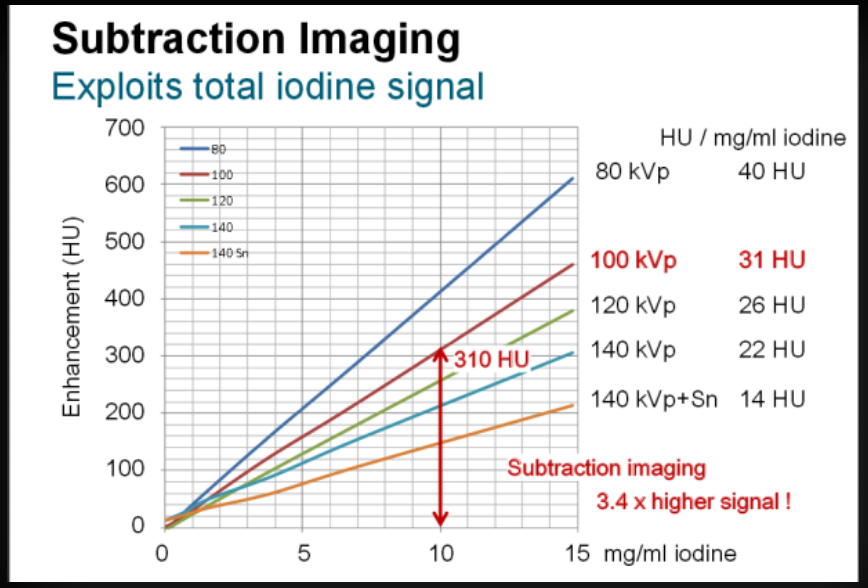


Courtesy Dr. Paul, Institut Mutualiste Montsouris, Paris

SURESubtraction vs Bi-Energie

- Signal gain over Dual Energy is in the range 1.5 - 3.4






SFR
Société Française de Radiologie

65èmes Journées Francophones de Radiologie

Prix des Posters Électroniques

QUELLES APPLICATIONS DU SCANNER LARGE COUVERTURE 320 BARRETTES EN PATHOLOGIE THORACIQUE ?

Marie-Pierre Debray, Fouad Senhadji, Carsten Ehmer, Agathe Hess, Karim Haioun, Antoine Khalil

Paris, le vendredi 13 octobre 2017

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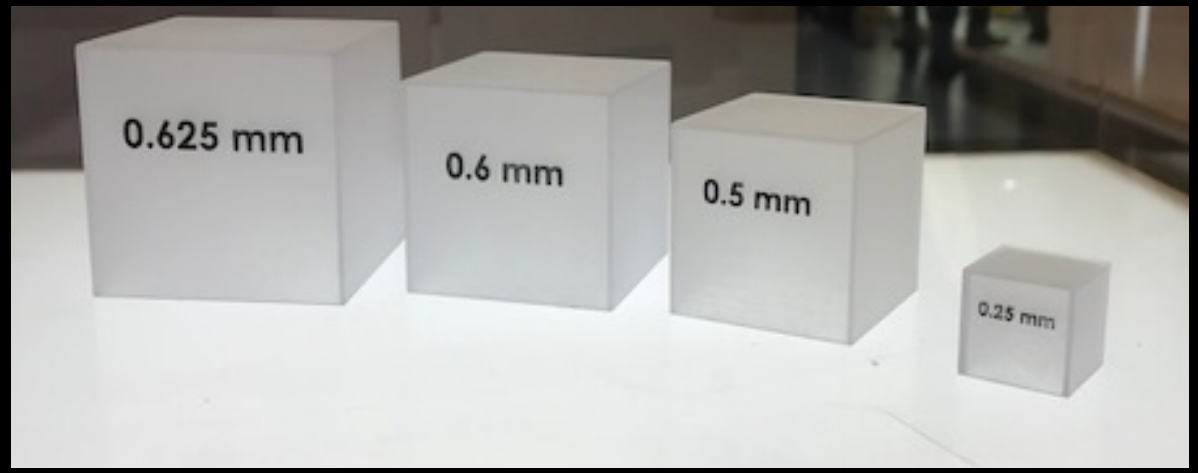
Responsable de l'exposition scientifique

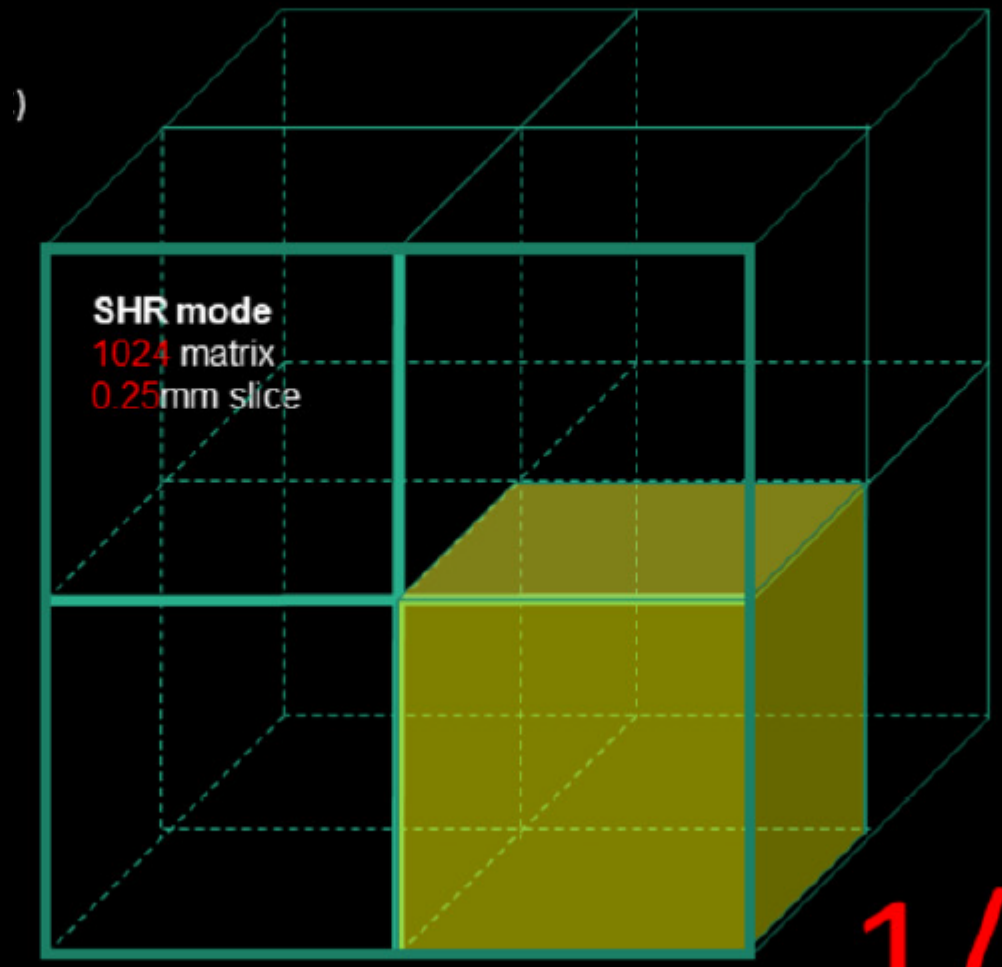
Pr. Jean-Michel Bartoli
Président des Journées Francophones de Radiologie

Courtesy Prof Prokop, UMC Radboud, Nijmegen

Ultra Haute Resolution

AQUILION PRECISION



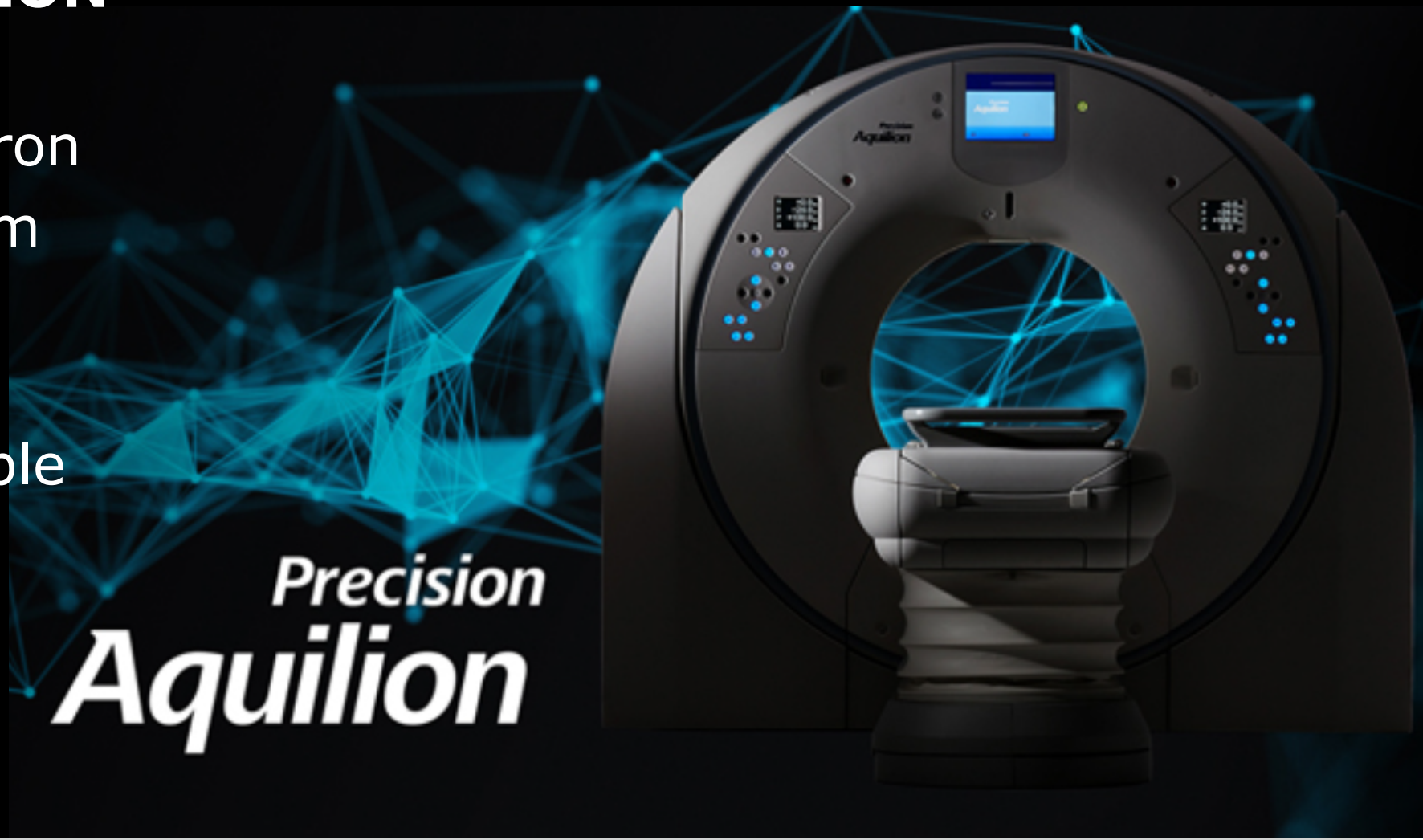


1/8

Ultra Haute Resolution

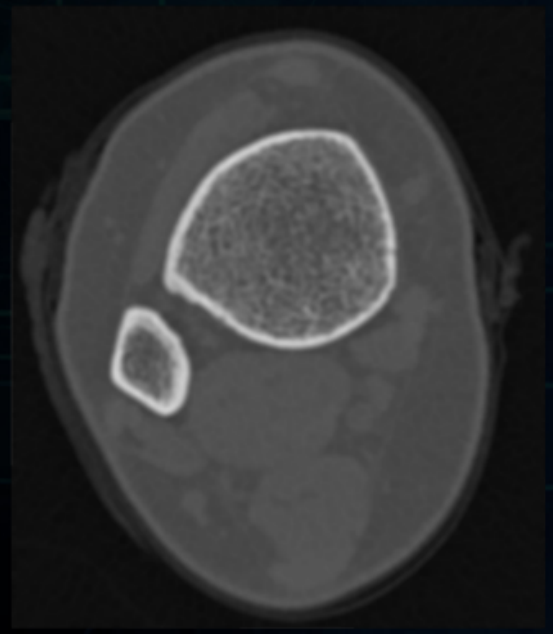
AQUILION PRECISION

- 50 lp/cm. 150 Micron
- Détecteurs 0.25mm
- 6 focal spots.
- 160 rows.
- +/- 42 mm lat. table movement*.

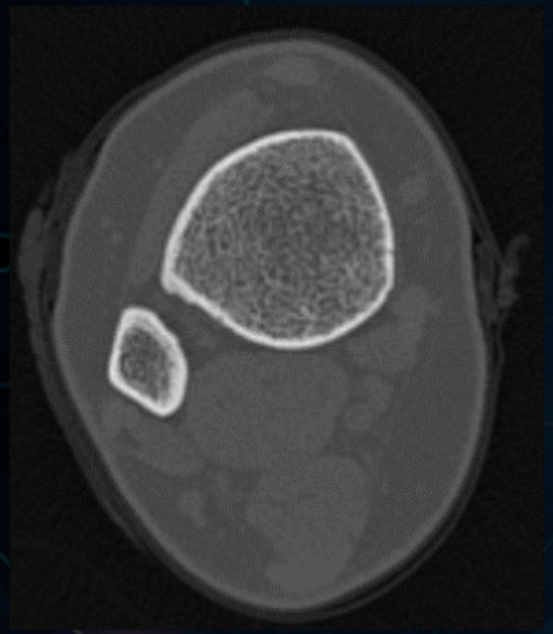


Ultra Haute Resolution

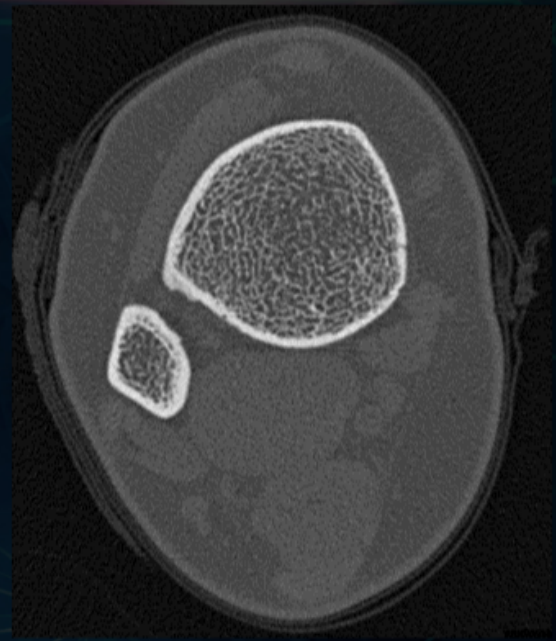
New Reconstruction Matrix



512
x
512

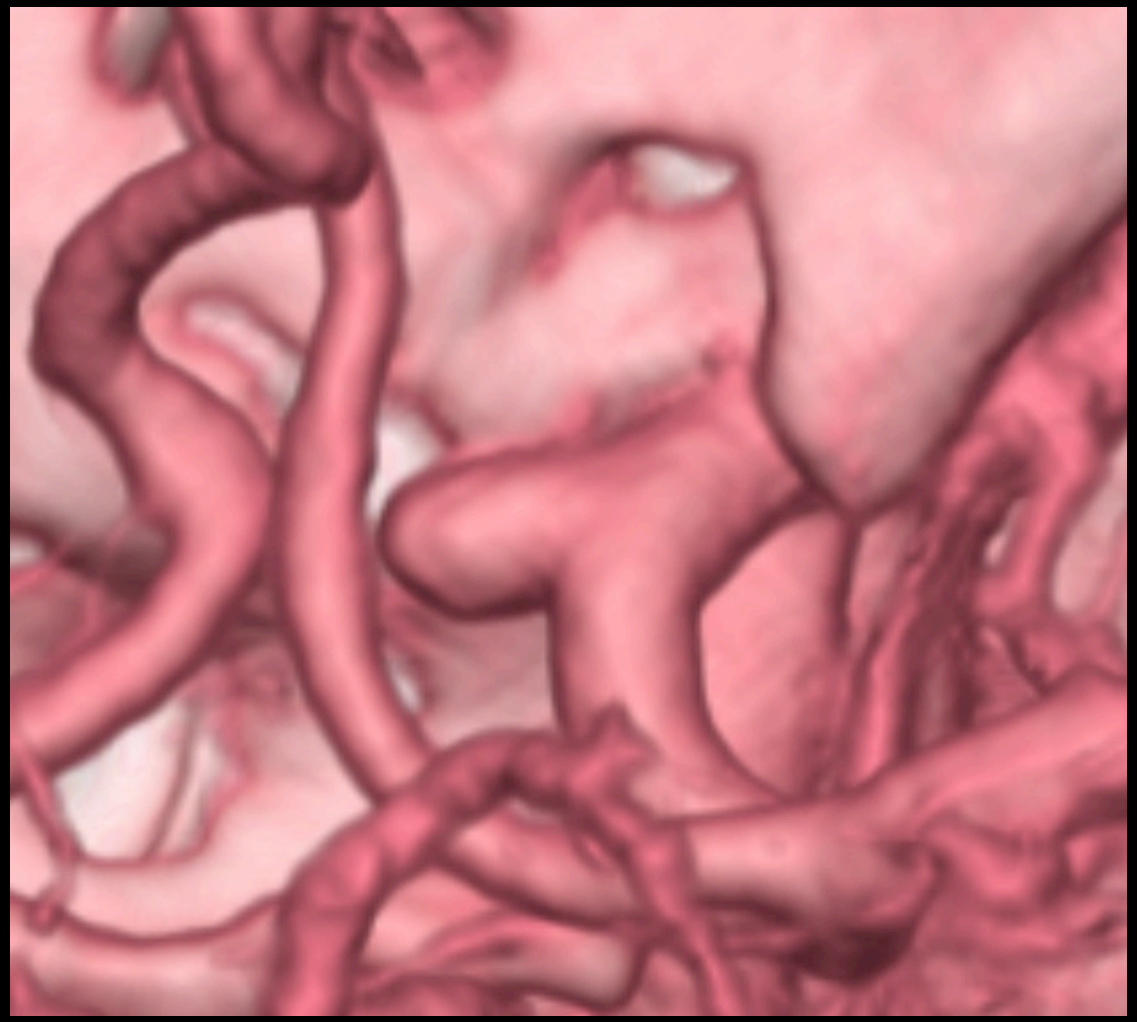


1024
x
1024

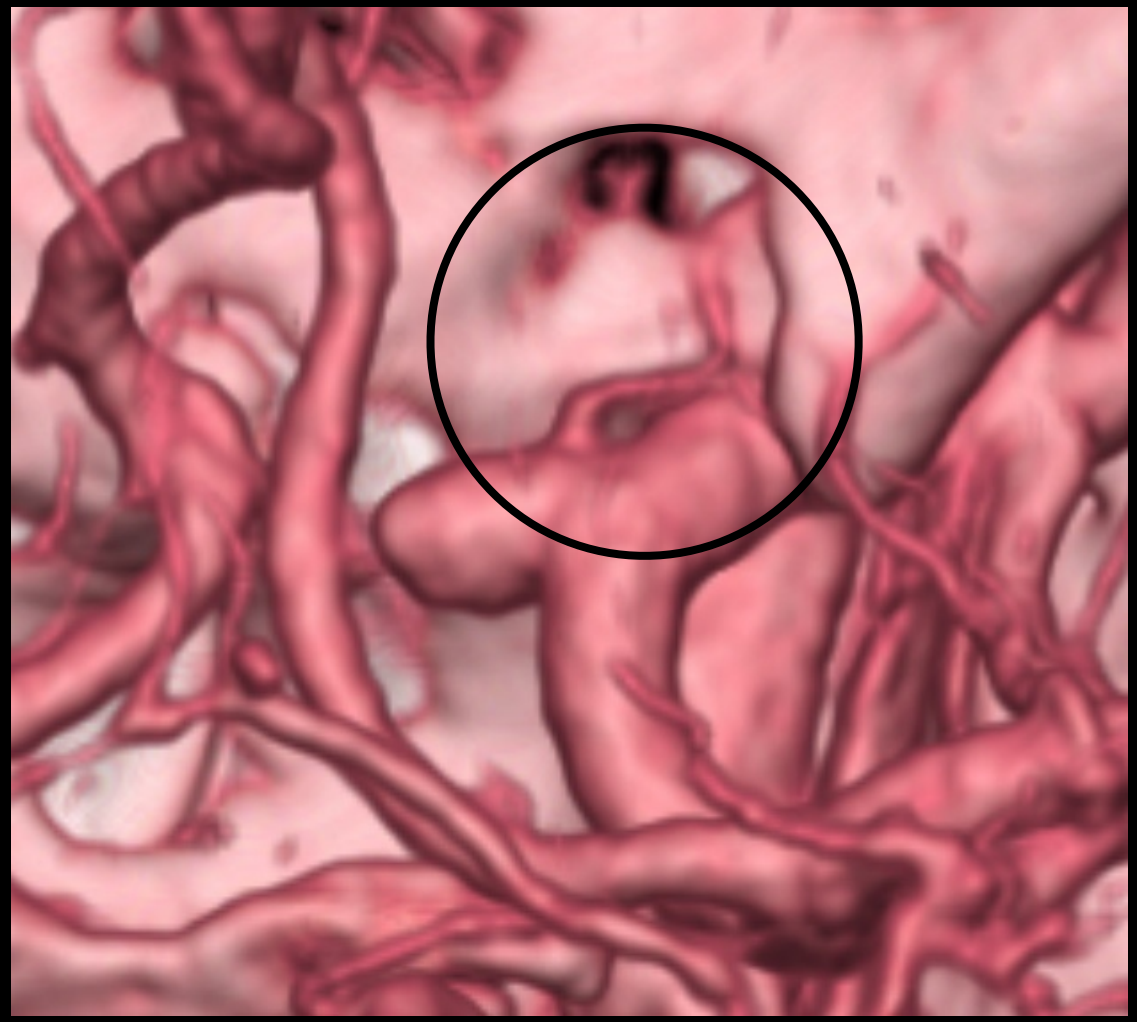


2048
x
2048

Precision | THE POWER OF 0,25mm



Normal

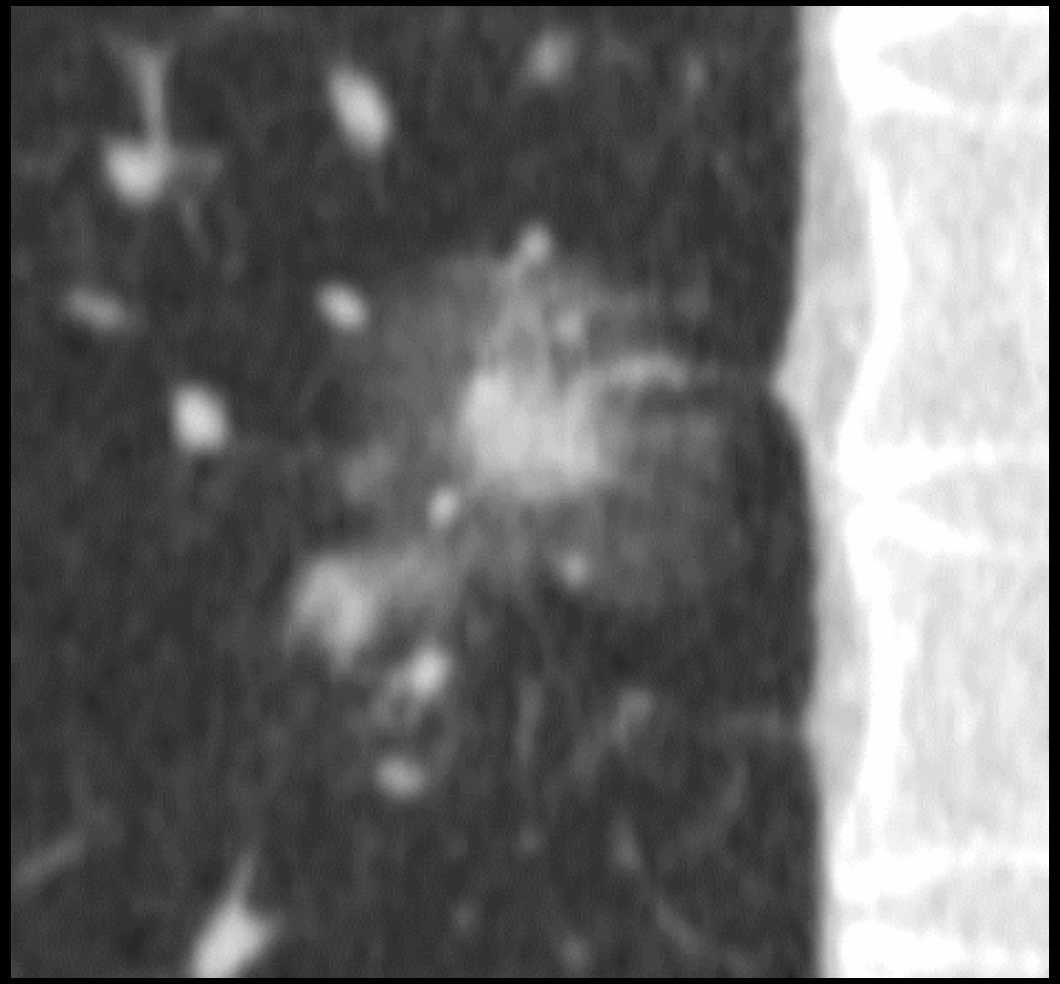


Aquilion Precision

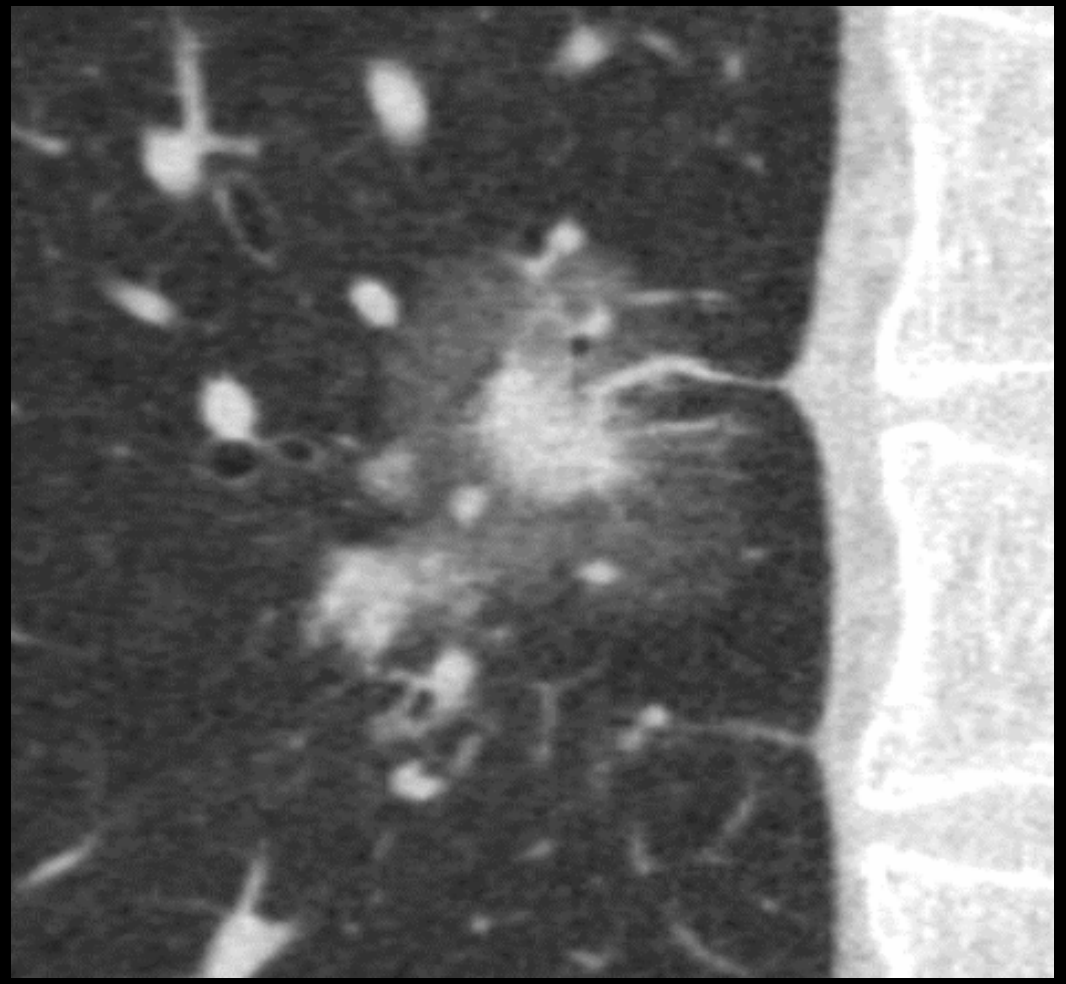
Canon

Courtesy Fujita Health University, Japan

Precision | ONCOLOGIE



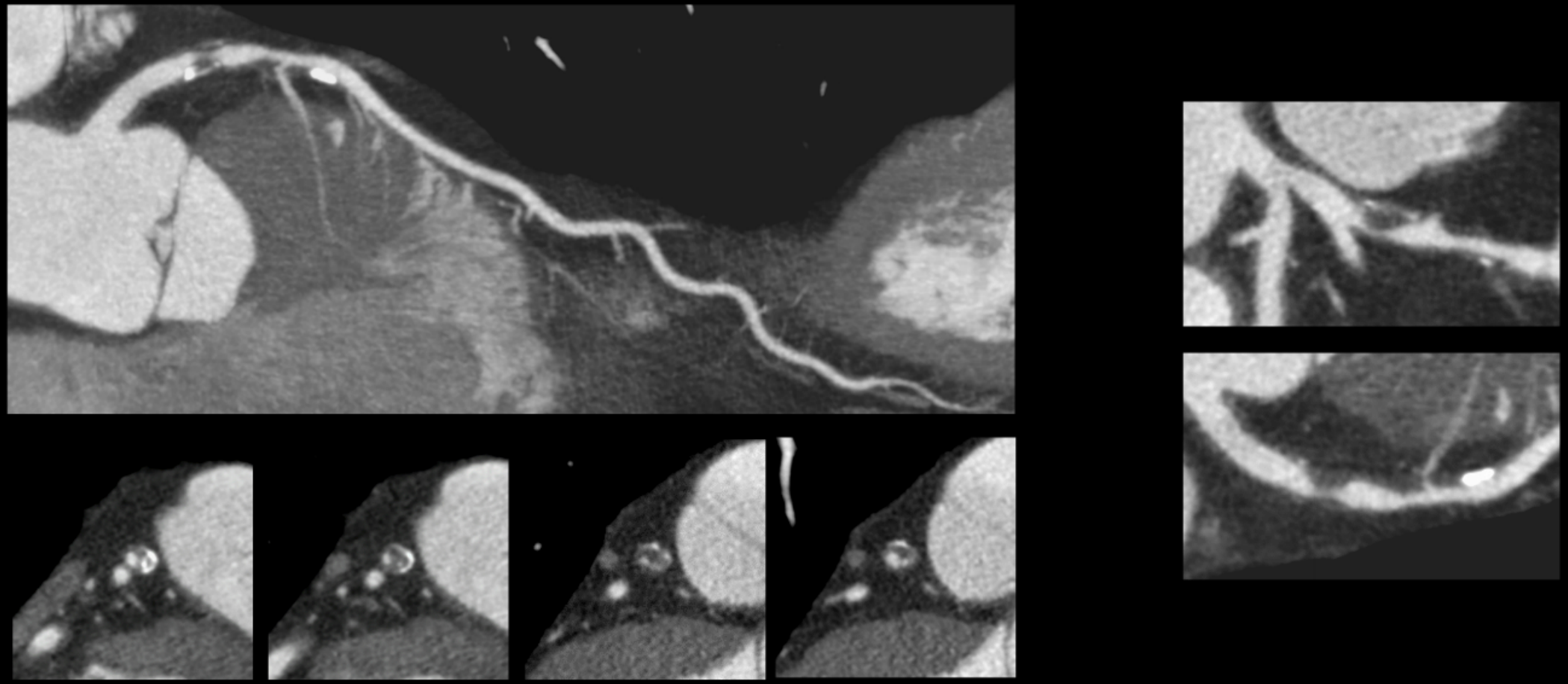
Normal



Aquilion Precision

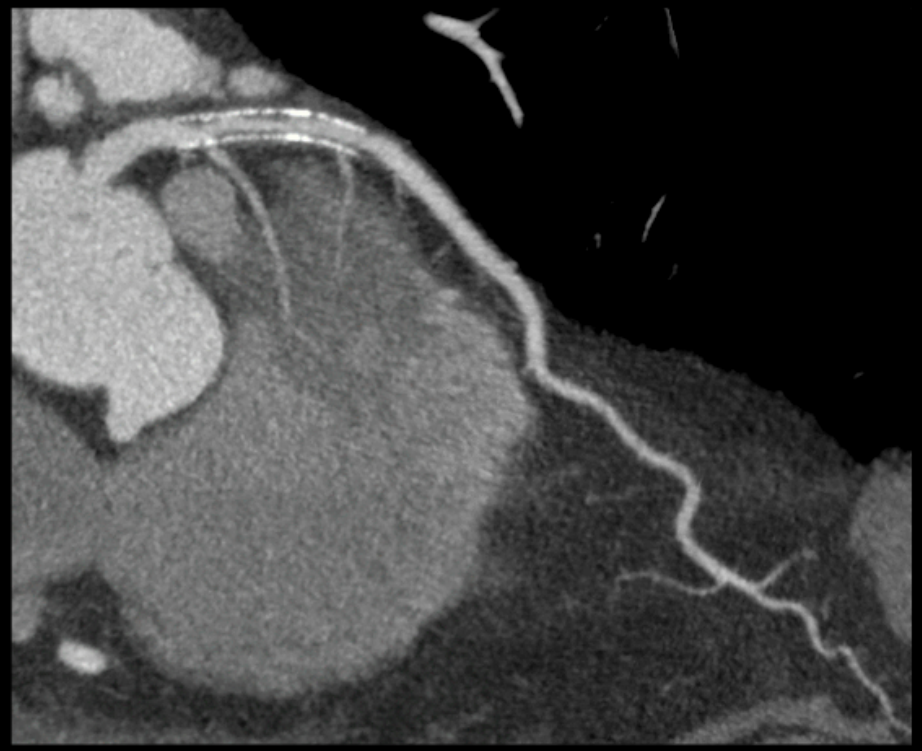
Precision | THE POWER OF 0,25mm

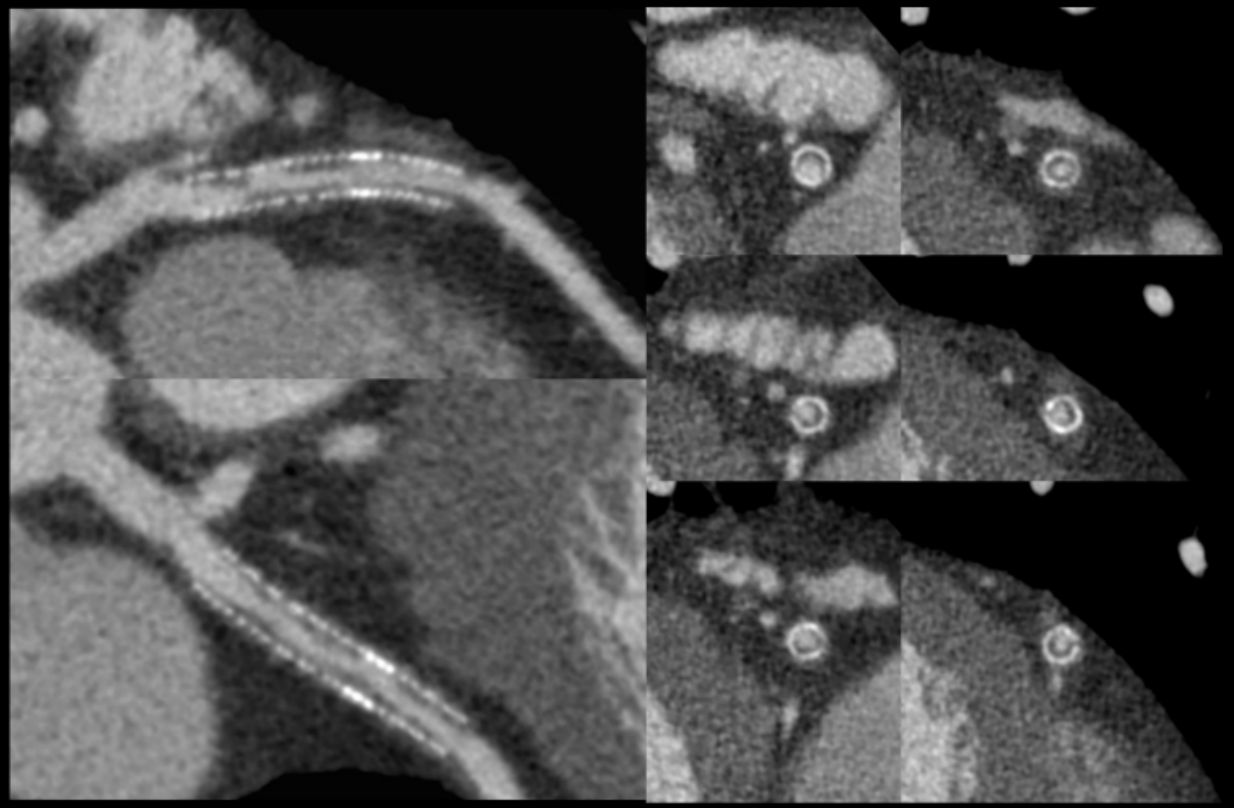
LAD Stenosis



Precision | THE POWER OF 0,25mm

Coronary Stent Restenosis

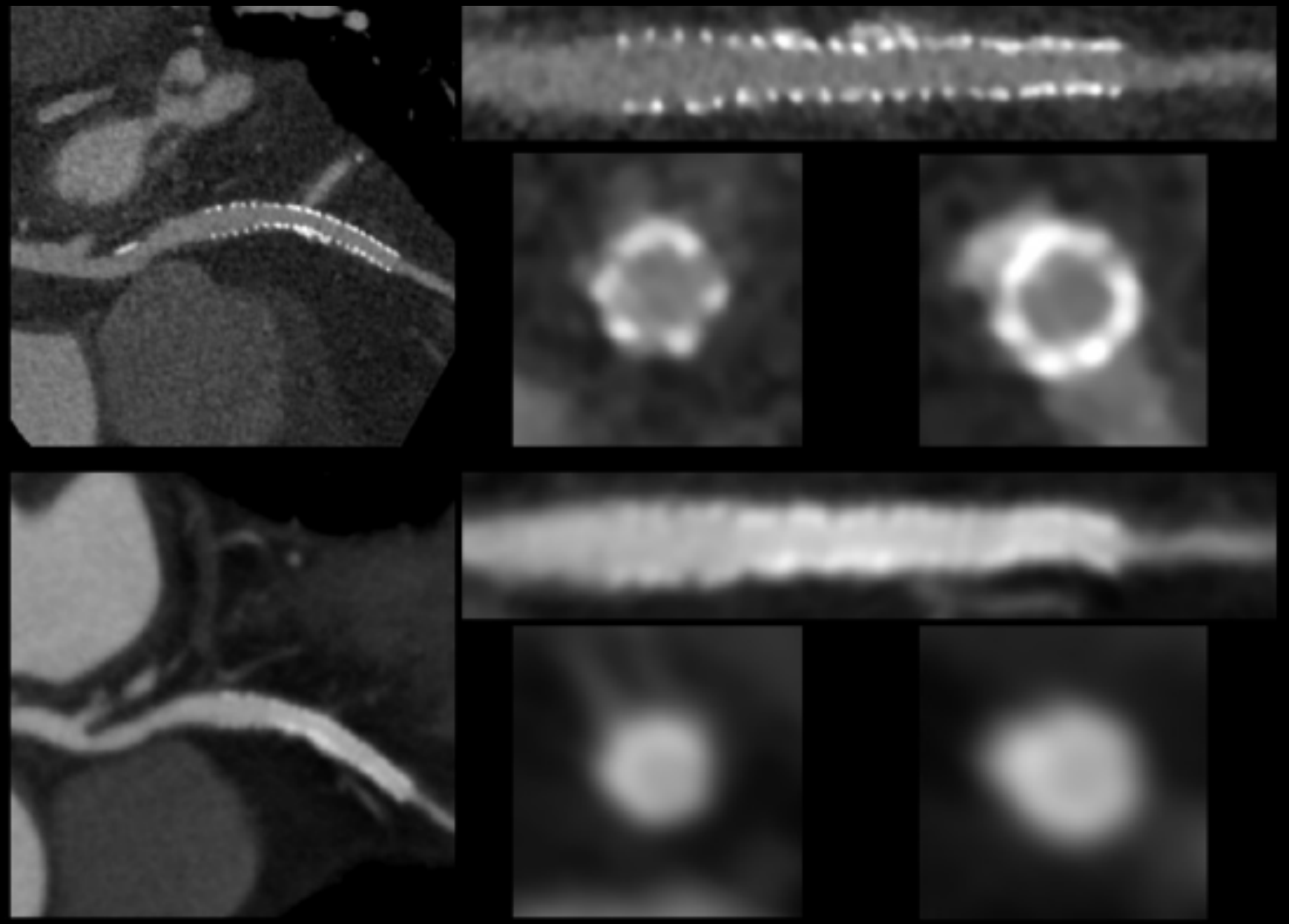




Precision | THE POWER OF 0,25mm

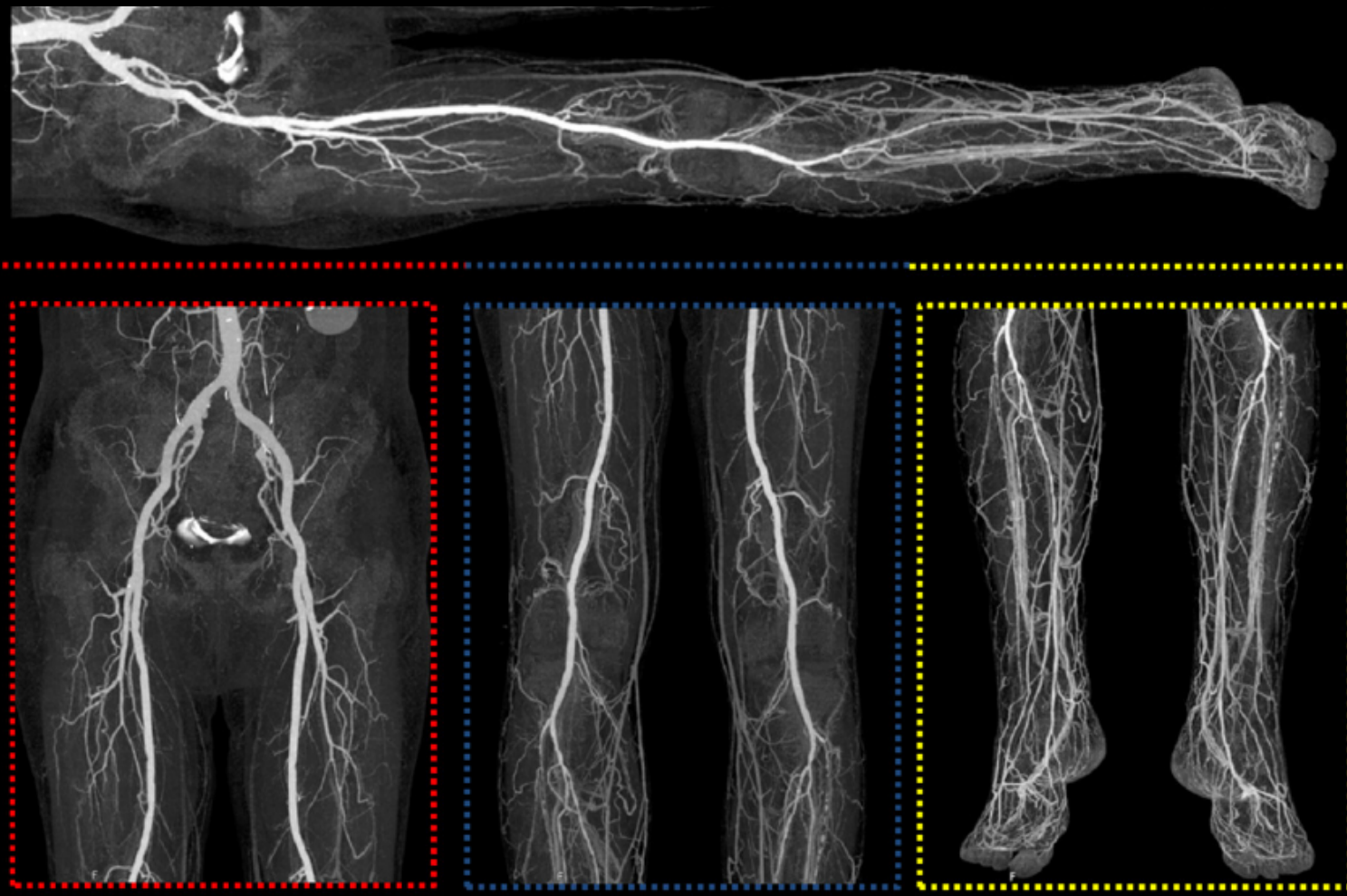
UHRCT + full IR

Standard MDCT

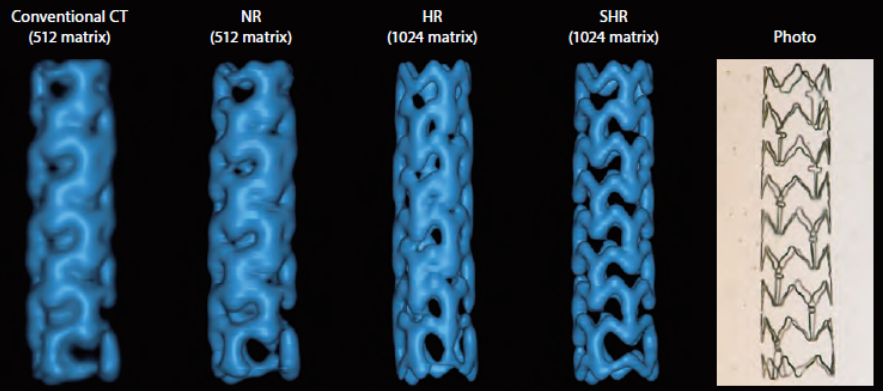


Courtesy Kyorin University, Japan

Precision | THE POWER OF 0,25mm



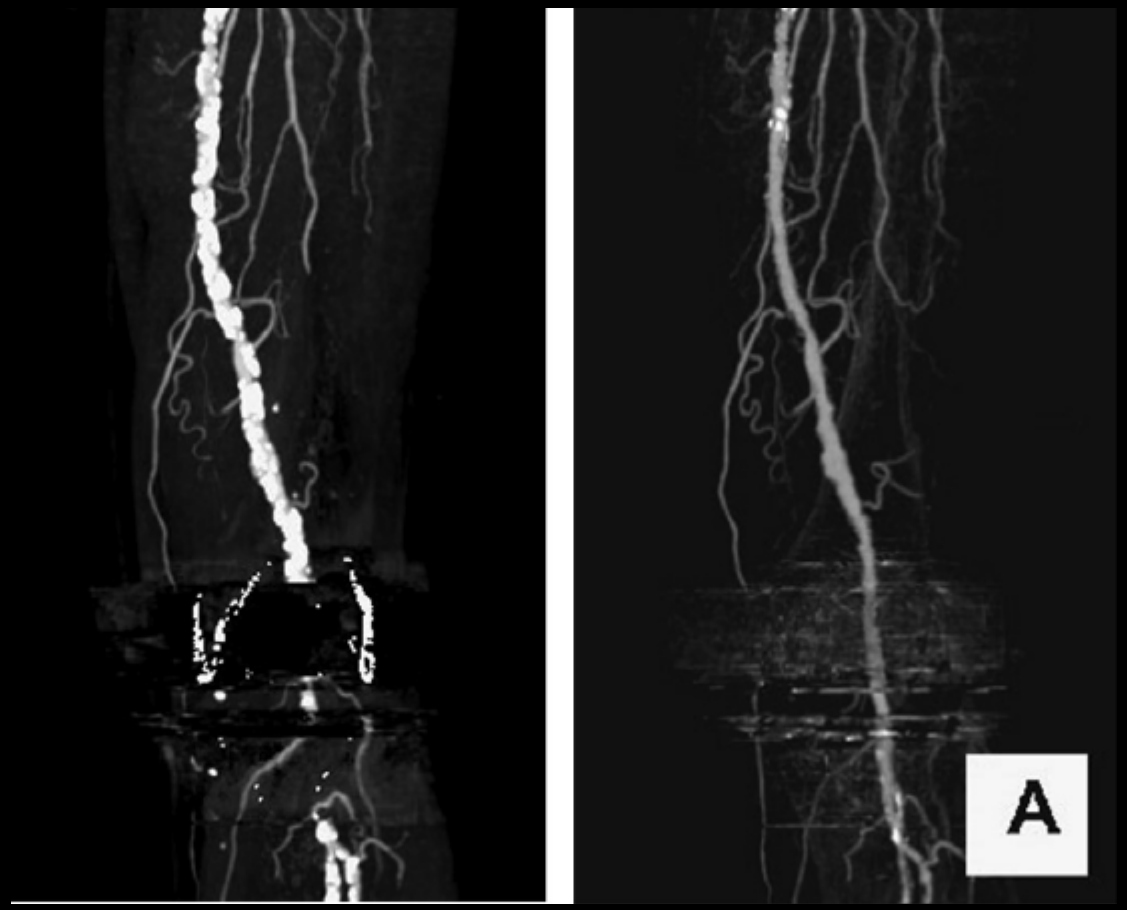
STENT 2,75mm



Canon

Courtesy Kyorin University, Japan

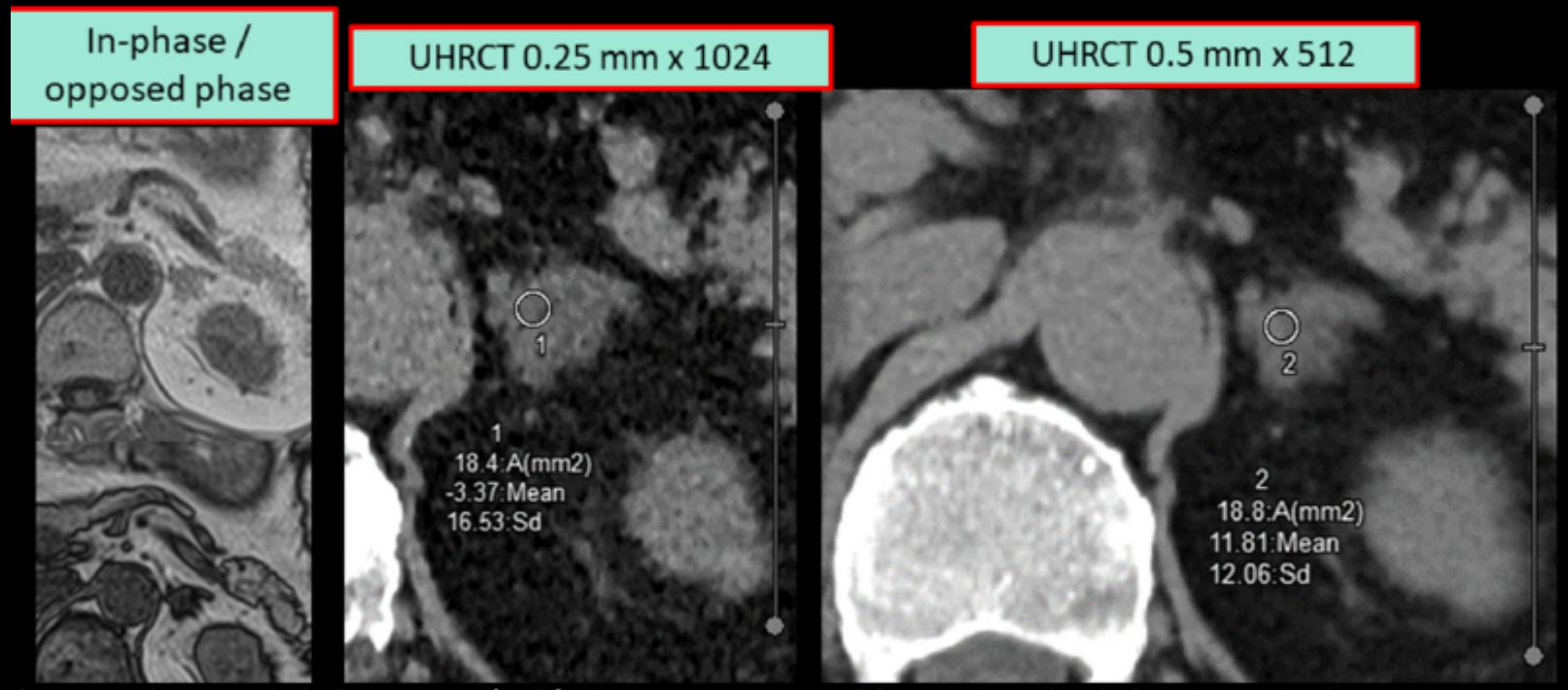
Precision | Soustraction plus precise



Courtesy Kyorin University, Japan

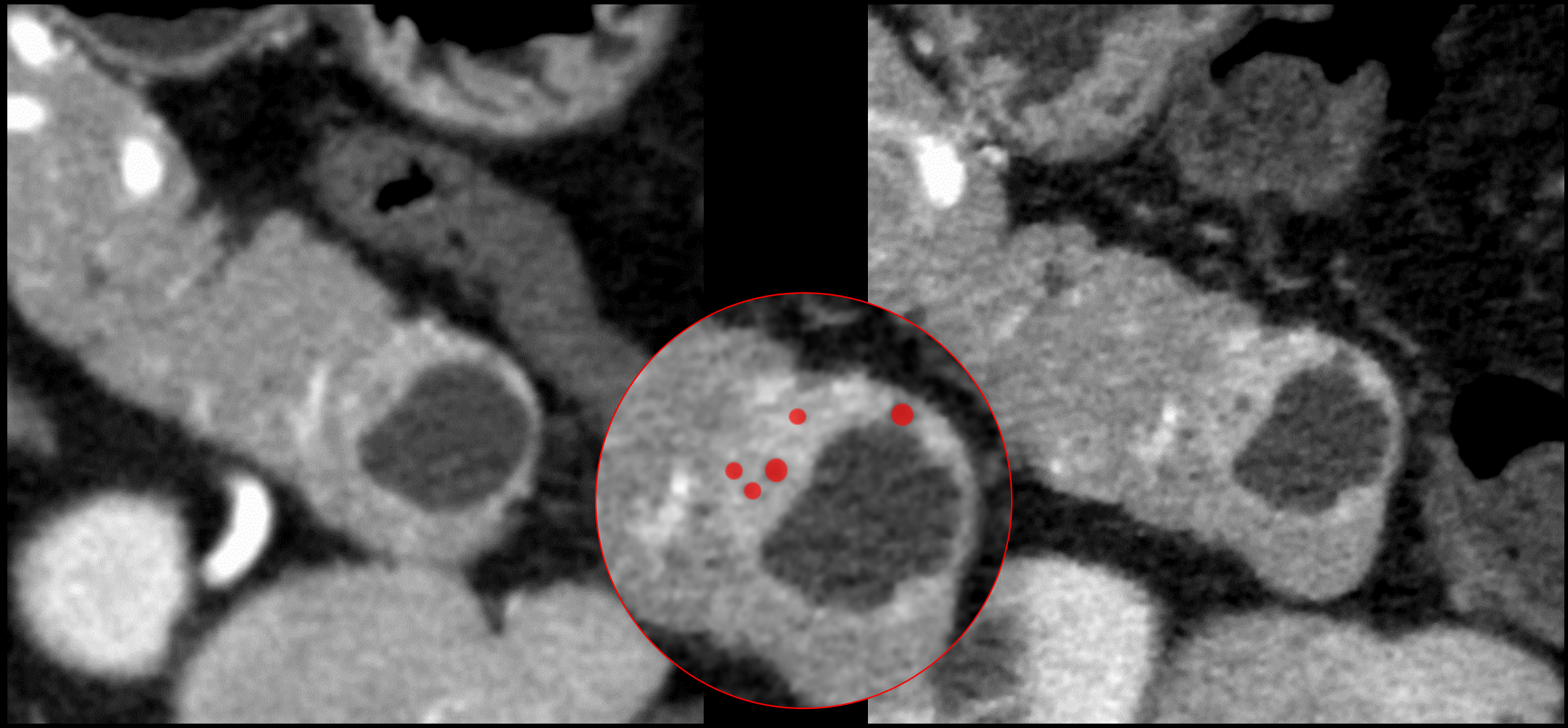
Precision | RESOLUTION EN CONTRASTE

Accurate CT value measurement : sensitive detection of subtle fat



- MR chemical shift images (left) show presence of fat within the left adrenal adenoma. Note that the signal decreased from in-phase (upper) to opposed-phase (lower). UHRCT scan with 0.25-mm slice thickness & 1024 matrix (center) showed mean CT value of -3.4 HU within the adenoma, accurately suggesting the presence of fat, which was different from UHRCT scan with 0.5-mm thickness & 512 matrix (right) showing the CT value of 11.8 HU, because of its partial volume effect.

Precision | RESOLUTION BAS CONTRASTE



Normal

Aquilion Precision

Canon

Courtesy of National Cancer Center, Japan

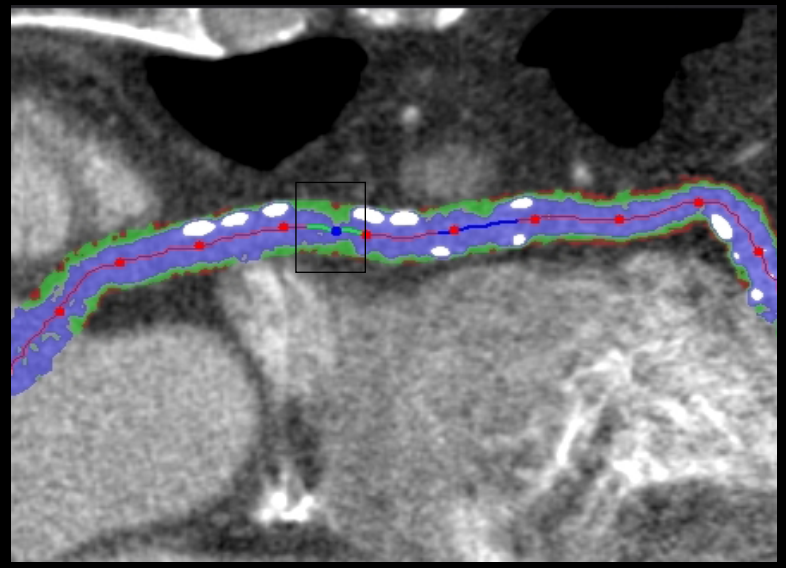
Precision | Caractérisation de la plaque?

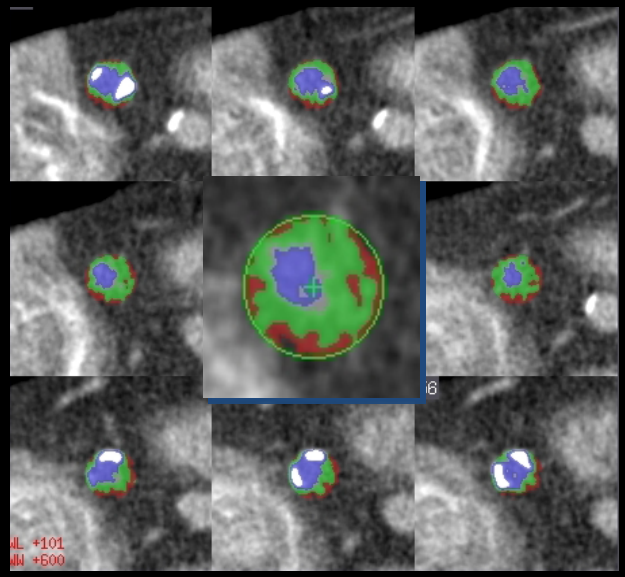
Plaque molle
(-100 ~ 20HU)

Plaque fibreuse
(20 ~ 130HU)

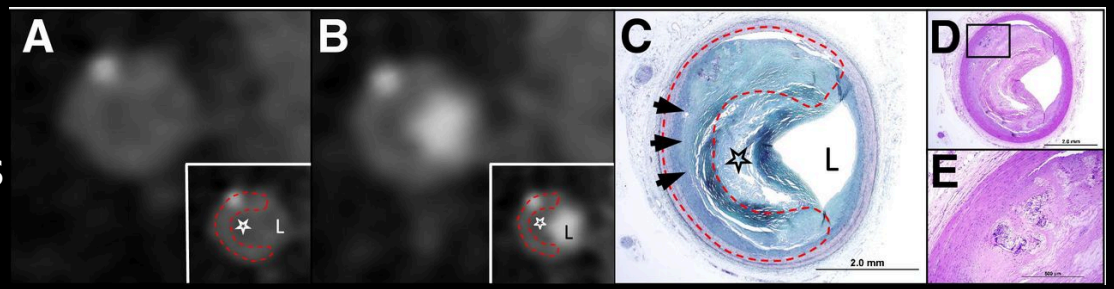
Lumiere
(150 ~ 350HU)

Plaque calcifiée
(350 ~1000HU)





- Réduction du volume partiel : Précision des mesures des valeurs de densité
- Amélioration de la résolution spatiale : 150 micron
- Réduction de l'effet de blooming des hautes densités
- Imagerie de soustraction? Bi-energie?



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AiCE : Advanced Intelligence Clear IQ Engine

- **Réduction de la dose / DLR**
- **Gestion de la base de données UHR, Big Data**

Technologie unique UHR :

- Détecteur de 0,25 mm x 160
- Foyer de 0,4 x 0,5 mm
- Nouvelles matrices 1024^2 et 2048^2
- Résolution spatiale 50 pl/cm – 150 micron

Applications uniques UHR :

- Imagerie de précision
- Imagerie de texture
- Imagerie radiomique, Détection, Caractérisation..
- FFR-CT

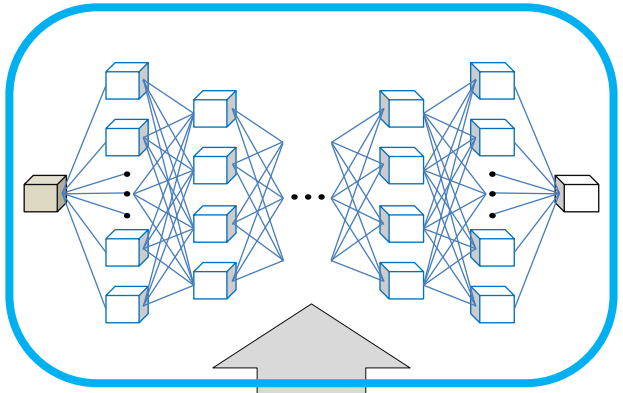
Canon

AiCE : Advanced Deep Convolutional Neural Network

Recon process

Data acquisition

Deep Convolution Neural Network

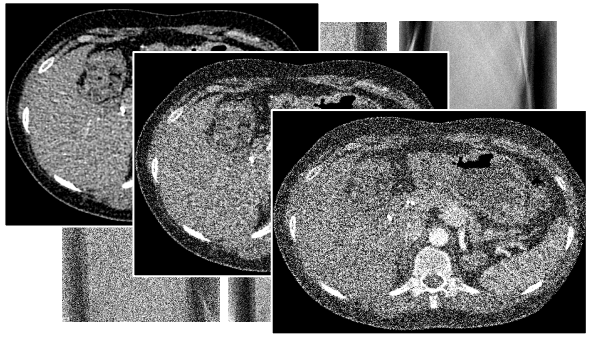


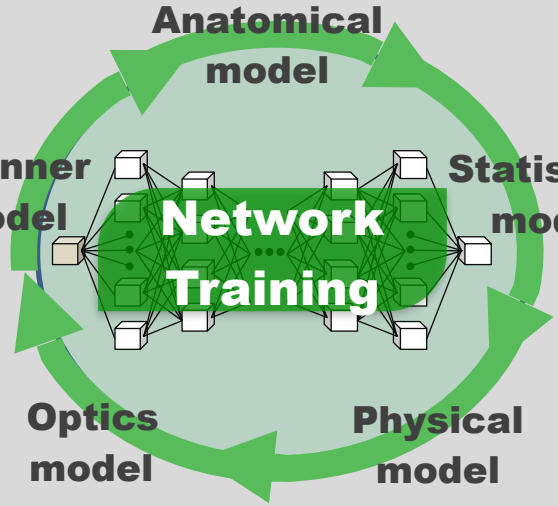
High Quality Output

Training process

INPUT

Lots of low quality data





TARGET

High quality FIRST data

MERCI DE VOTRE ATTENTION

« Rien ne remplace l'Expérience »