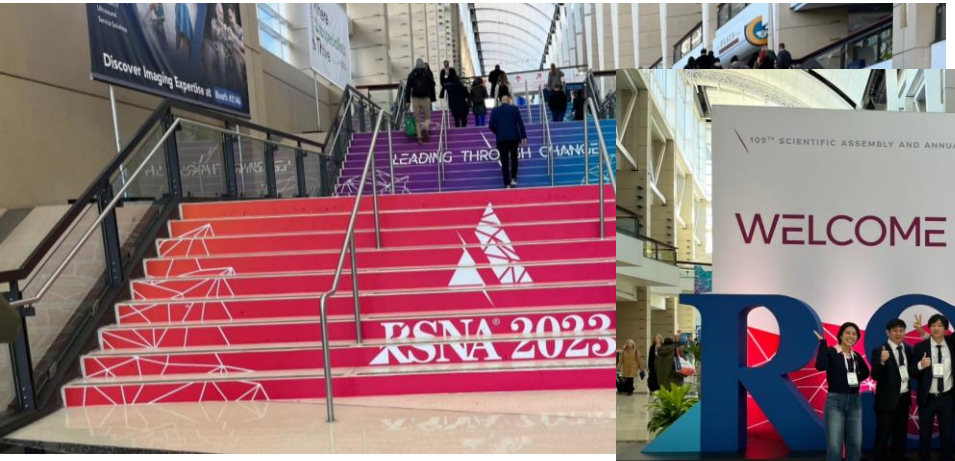
第20回中四国放射線医療技術フォーラム

2024年10月19日



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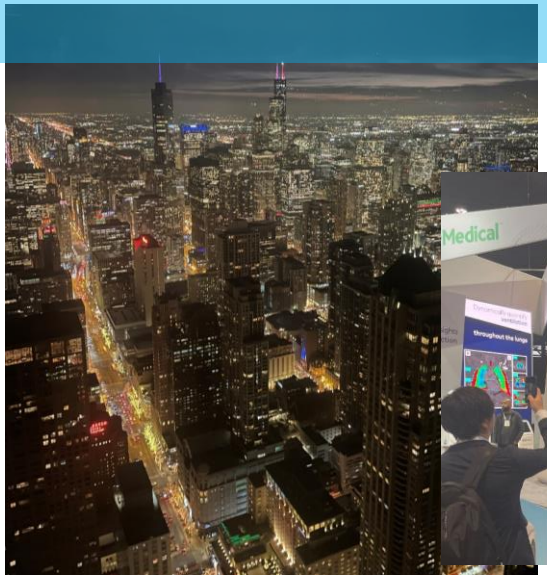

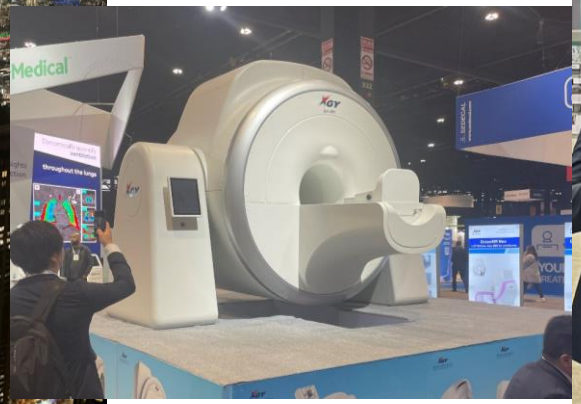

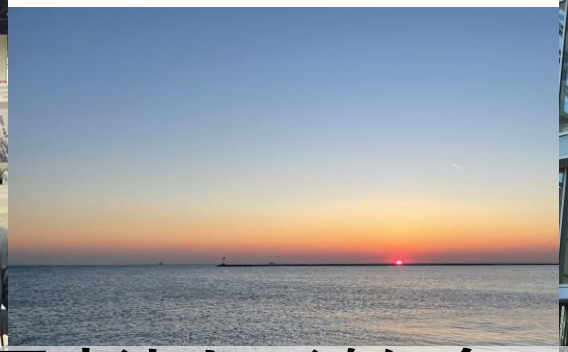

社会医療法人　鴻仁会　岡山中央病院
診療技術部　診療放射線科　上堀内善紀

自己紹介

＜略歴＞

平成25年3月　岡山大学医学部保健学科放射線技術科学専攻　卒業

平成25年4月　岡山中央病院　診療放射線技師として入職

平成30年4月　同施設　診療技術部　放射線科リーダー

＜主な保有資格等＞

・診療放射線技師

・第1種作業環境測定士

＜発表経験＞

・第79回　日本放射線技術学会総会学術大会

・第109回　Radiological Society of North America

RSNAとは

- Radiological Society of North America（北米放射線学会）
- 毎年11月末頃にアメリカのイリノイ州シカゴで開催される放射線学術集会および最新の放射線機器展示会
- 2023年大会は世界中から約3万4千人の放射線技師や放射線科医、医学物理士などが参加
- 会場となるMcCormic Placeは総面積約46755㎡で東京ドーム5個分の広さ
- 応募演題数は約11000演題　（採択率は3割程）


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機器展示
West Building
South Building
Lake side
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サウス・ミシガン・アベニュー
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McCormick Place Bird Sanctuary
Advocate Sykes Outpatient Center
医療センター
55
41

学術プログラム

- plenary sessions：7セッション
- Scientific Paper：851題（19分野）
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- Education Exhibit：1654題
- Scientific Poster：1419題
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●機器展示　670社

スケジュール

- 5/2 • 抄録提出期限
- 7/18 • 合格発表
- 10/30 • 参加登録期限
- 11/8 • 演題登録期限
- 11/26-30 • RSNA

抄録

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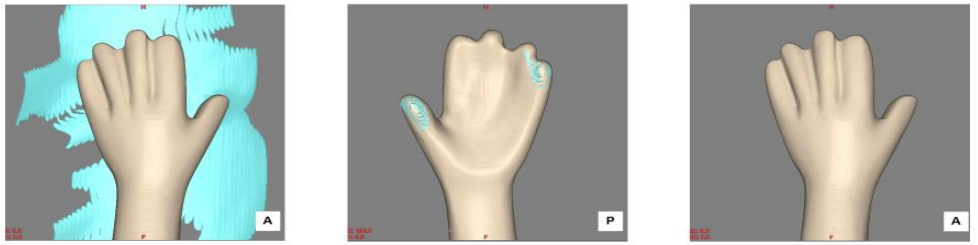

Fig.1 Visualization scores were evaluated at three levels to assess the degree of artifacts caused by the CT table mat during 3D image creation

Investigation of Buffer Thickness for Reducing Artifact … **nities Three-Dimensional Imaging**

Author Block: Y. Kamihoriuchi[1], Y. Fujiwara[1], F. Higuchi[2],

[1]Okayama Central Hospital, Okayama-Shi, JAPAN, [2]Okaya… …APAN.

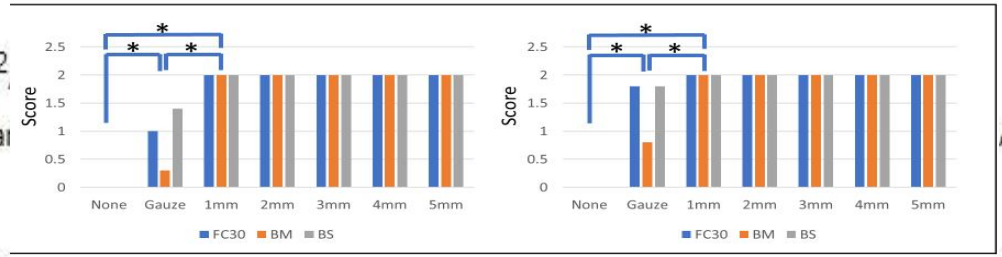

Fig.2 Visualization score

Abstract:

***Purpose:** If the hand is directly positioned on the compu… …CT table mat due to artefacts from the CT table mat at the three-dimensional (3D) imaging. The objective of this inve… …or 3D imaging, to alleviate artifact generation consequent to hand separation from the CT table mat.

***Methods and Materials:** The wrist phantom was placed … …h with no buffer (none), one piece of gauze (gauze) and 1, 2, 3, 4 and 5 mm of Styr… …itch 0.637, slice thickness 1.0 mm, field of view 150). For the 3D image, we… …AIDR3D mild: FC30, Aice Bone mild: BM, and Aice Bone standard: BS). Th… …rofoam buffer. Subsequently, profile curves were measured and the maxi… …onducted among three scenarios: no buffer, gauze, and 1 mm buffe… …age creation.

***Results:** The results obtained indicate statistically signific… …aximum CT values at the phantom edges, the following comparisons v… …HU), and BS (none: 269 (227-275) HU, 5 mm: 219 (215-222) HU) (p < 0.05 fo… …mm: 1.08 (1.07-1.18) mm), Bone Mild (gauze: 0.72 (0.63-0.81) mm, 1 mm: 1.00 (0.99-1…

***Conclusions:** By inserting a buffer material with a thickne… …ng, the separation of the hand and the CT table mat can be achieved easier for regardless of the conditions.

***Clinical Relevance/Application:** It was confirmed that u… …facts from the CT table mat, which can improve the quality of 3D imaging of the hand and increase flexibility in positi…

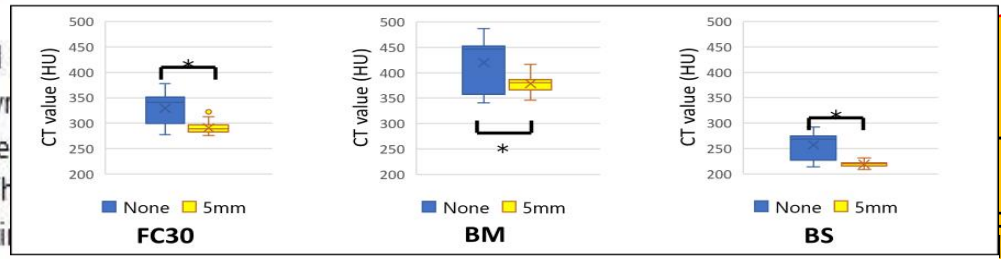

Fig.3 Comparison of maximum CT values of phantom edges

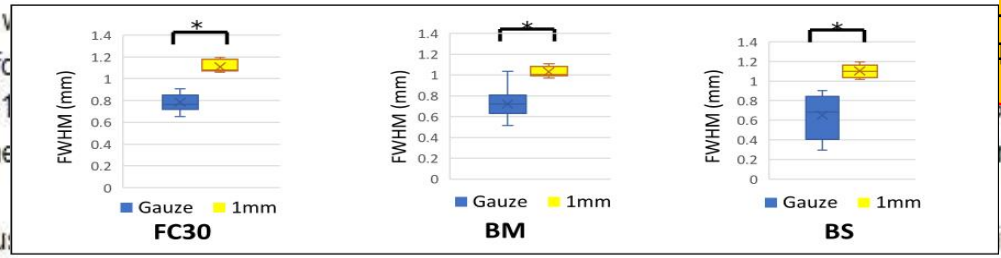

Fig.4 Compared for the FWHM

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Title: *Investigation of Buffer Thick*

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I am pleased to inform you that y
Chicago, Illinois. From over 11,00

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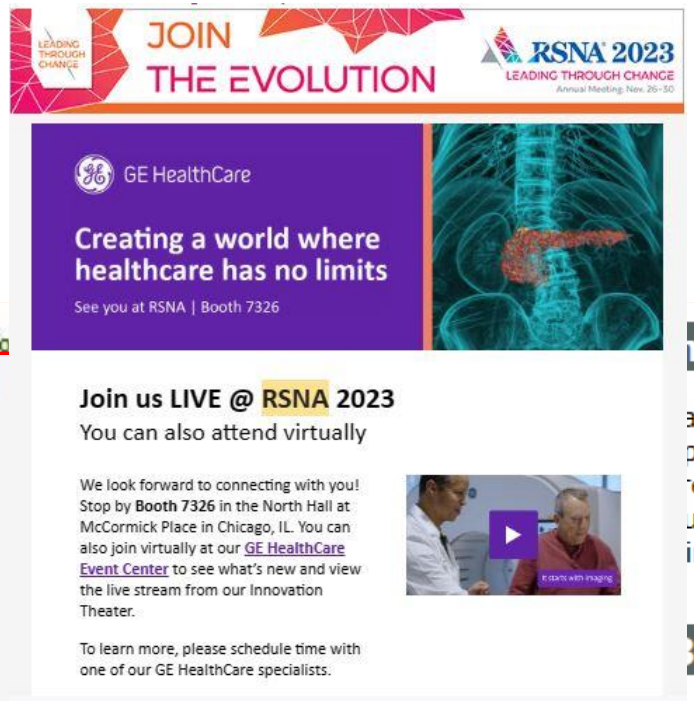
Sincerely,

Jorge A. Soto, MD
Chair, Annual Meeting Program Planning Committee



Extremities Three-Dimensional
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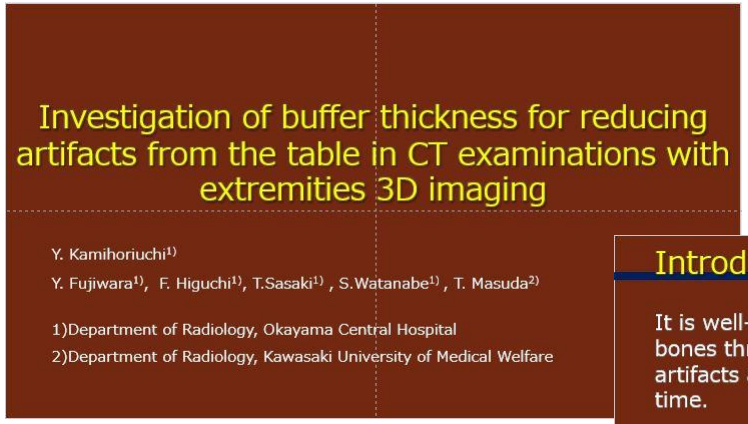

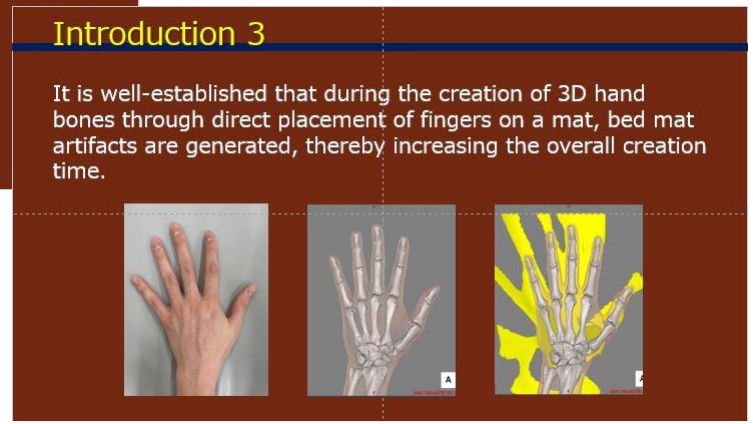

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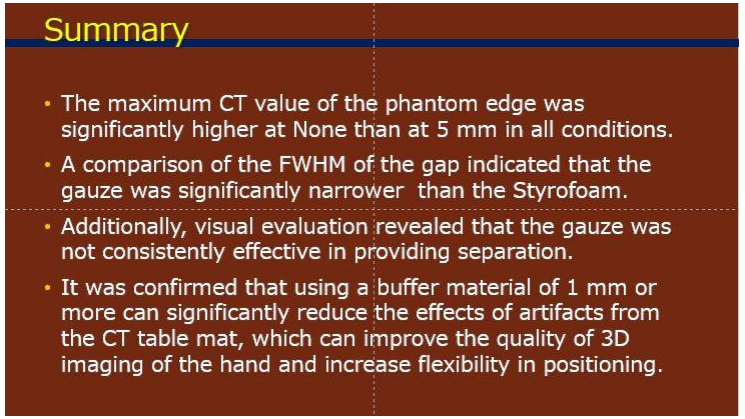


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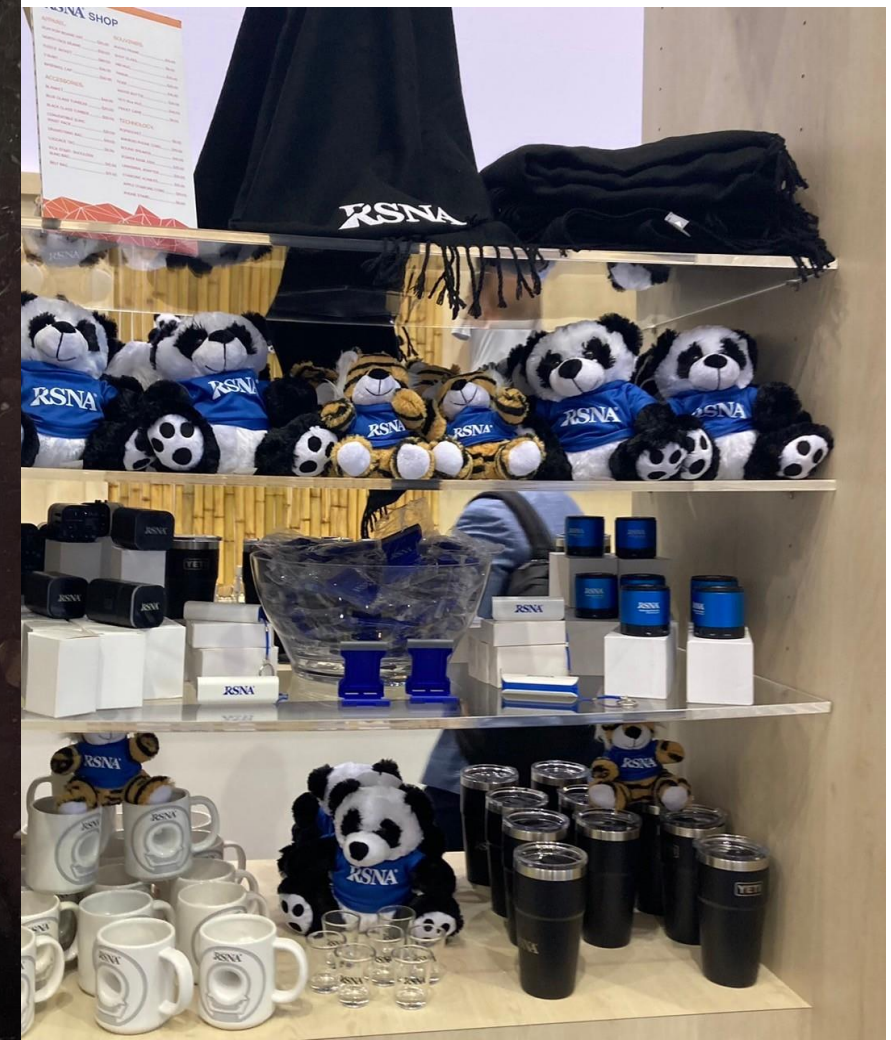
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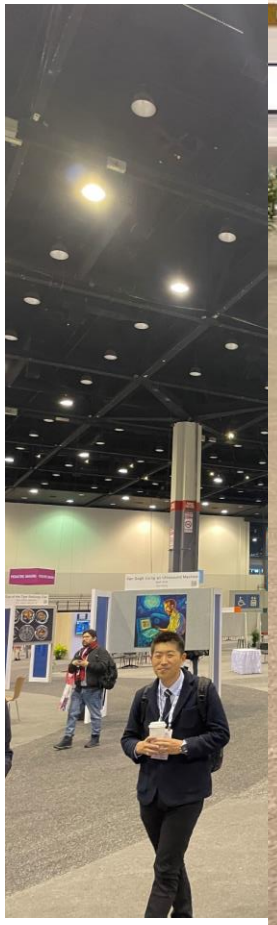


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Investigation of buffer thickness for reducing artifacts from the table in CT examinations with extremities 3D imaging

Y. Kamihoriuchi[1)]

Y. Fujiwara[1)], F. Higuchi[1)], T.Sasaki[1)] , S.Watanabe[1)] , T. Masuda[2)]

1)Department of Radiology, Okayama Central Hospital

2)Department of Radiology, Kawasaki University of Medical Welfare

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COI Disclosure

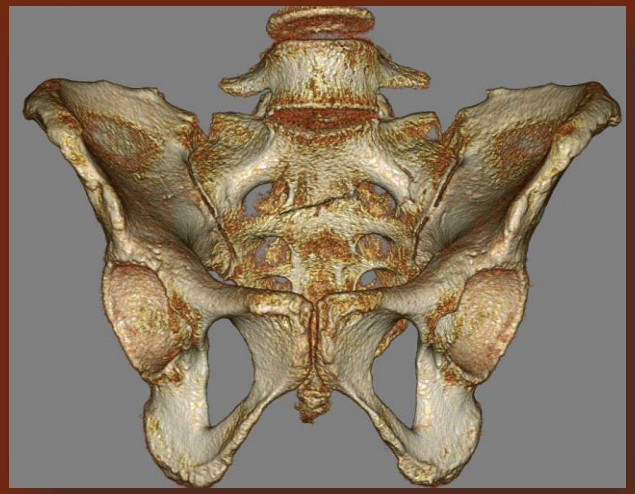
Name of Lead Presenter: Y. Kamihoriuchi
Affiliation: Department of Radiology, Okayama Central Hospital

The Lead Presenter has completed COI disclosure to the Radiological Society of North America.

There are no entities or relationships, etc. presenting a potential conflict of interest requiring disclosure in relation to this presentation.

Introduction 1

Computed tomography (CT) volume data can be utilized to effortlessly generate multi-planar reconstruction(MPR) and volume rendering (VR) images, which serve as beneficial resources for treatment selection and surgical support.



Introduction 2

In trauma examinations, the creation of three dimensional (3D) images can be a valuable tool for confirming the presence, size, and depth of foreign bodies and bones.

Introduction 3

It is well-established that during the creation of 3D hand bones through direct placement of fingers on a mat, bed mat artifacts are generated, thereby increasing the overall creation time.

Purpose

The purpose of this study is to investigate the optimal thickness of the buffer material using at the 3D creation, in order to mitigate any artifact generation resulting from the separation of the hand from the CT table mat.

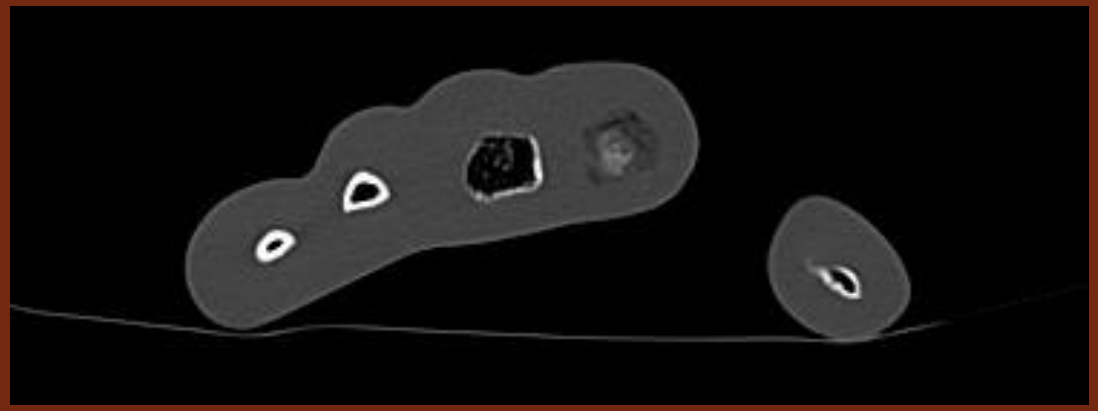
Materials

- CT System：Aquilion Prime SP/iEdition (Canon Medical Systems)
- Phantom：Forearm Human Body Phantom (Kyoto Kagaku)
- Buffer：Styrofoam 1, 2, 3, 4, 5mm,and non-woven gauze for medical used
- 3D Workstation：Ziostation2 Plus ver. 2.9.8.4




Method 1: Scan parameter

- Tube voltage : 135 kVp
- Tube current : 100 mA
- Rotation time : 1.0 s
- Helical pitch : 0.637
- Slice thickness : 1.0 mm
- Field of view : 150 mm
- Reconstruction interval : 0.5 mm
- Number of scans : 10



Method 2: Reconstruction

- FC30 AIDR3D mild : FC30

  For Commonly used bone functions.

Iterative Recon.

- Aice Bone mild , Post-processing Filter(+) : BM

  For Bone function used for bone observation in our hospital

- Aice Bone standard , Post-processing Filter(+) : BS

  For Bone function used for 3D in our hospital

Deep Learning Recon.

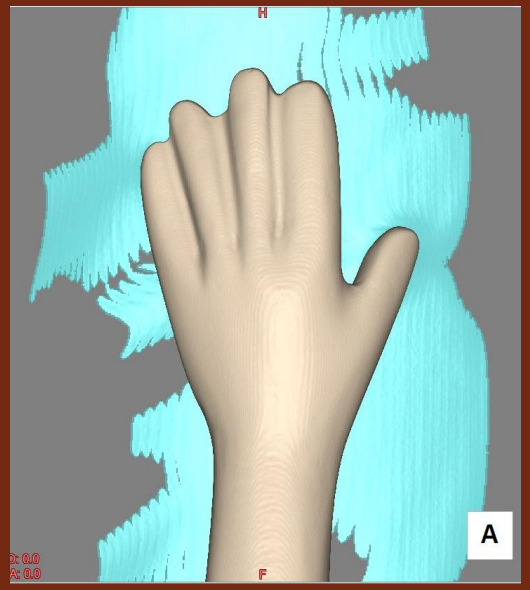
Method 3 : Positioning

- Placement of the phantom in the center of CT gantry
- The phantom's thumb and little finger were positioned on the CT table mat

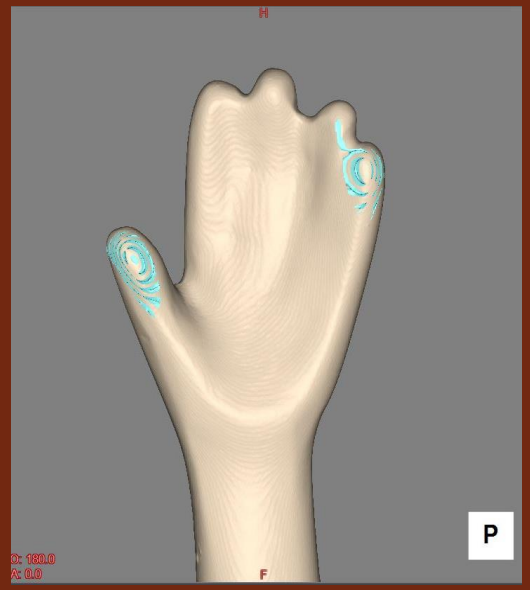
- No buffer （None）
- 1 piece of gauze （Gauze）
- Styrofoam 1, 2, 3, 4, and 5 mm

Method 4: Visual evaluation

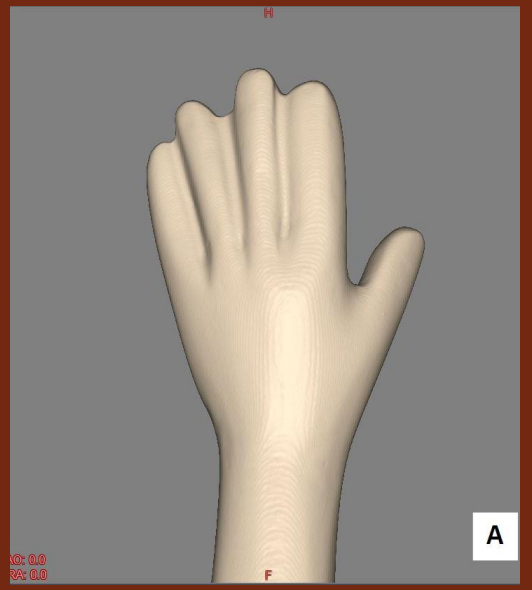
- A radiology technologist with 7 and 9 years of experience qualitatively evaluated in this study.
- Artifacts were evaluated using a 3-point scale at the 0 or 100 threshold.



0 : Poor



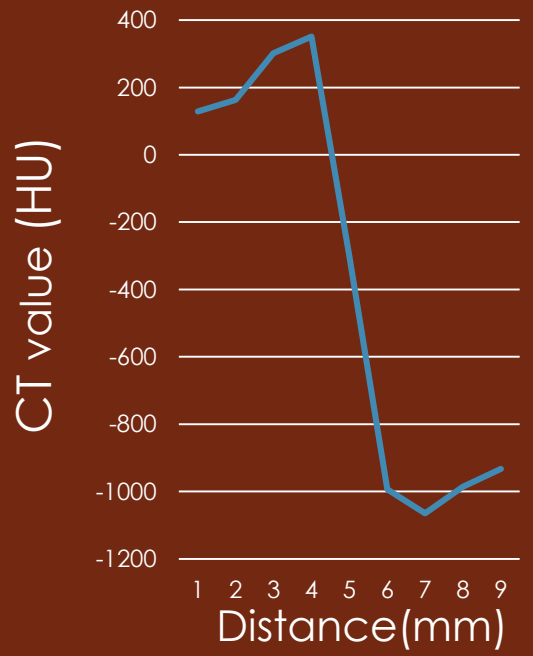
1 : Good

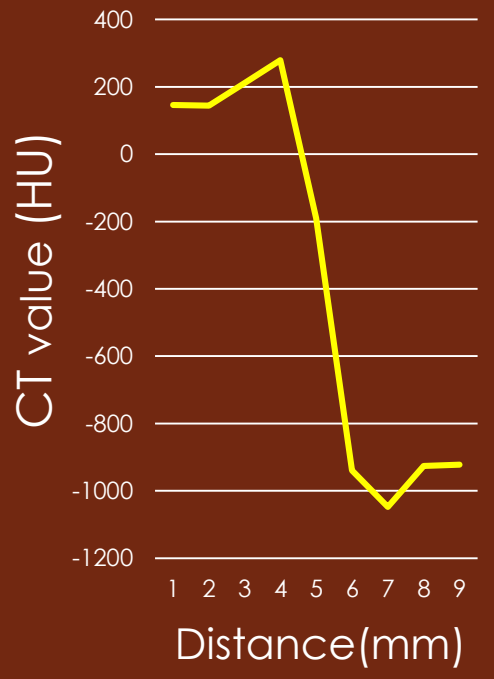


2 : Excellent

Method 5: Maximum CT values

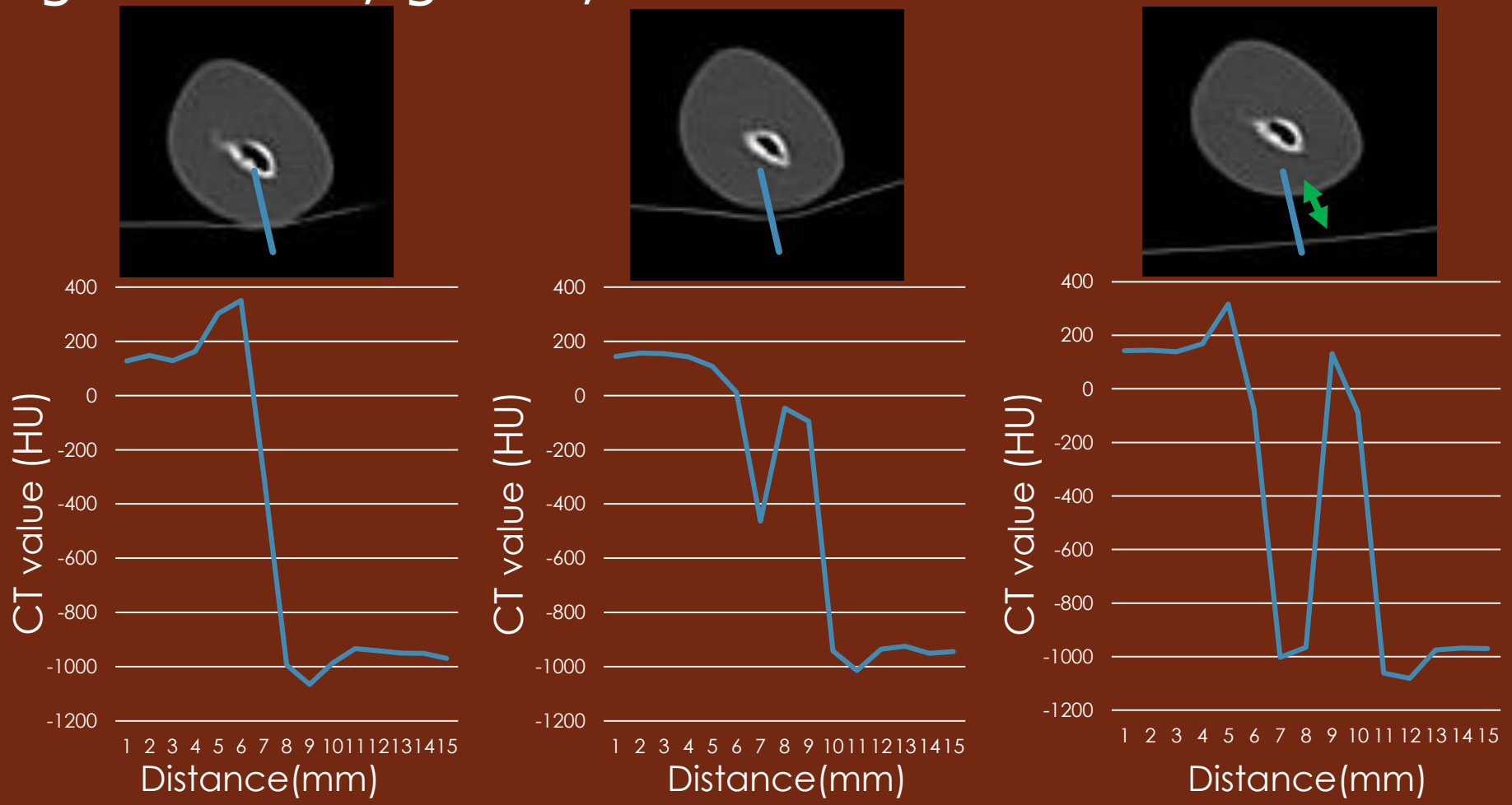
- Place three region of interest (ROIs) on the same slice of both the unbuffered and 5mm buffered images
- Created profile curves
- Compared for the maximum CT values of phantom edge





Method 6: FWHM of gap

- Compared for the full width at half maximum (FWHM) among no buffer, gauze, buffer 1mm



Method 7: Statistical analysis

- EZR Ver.1.55

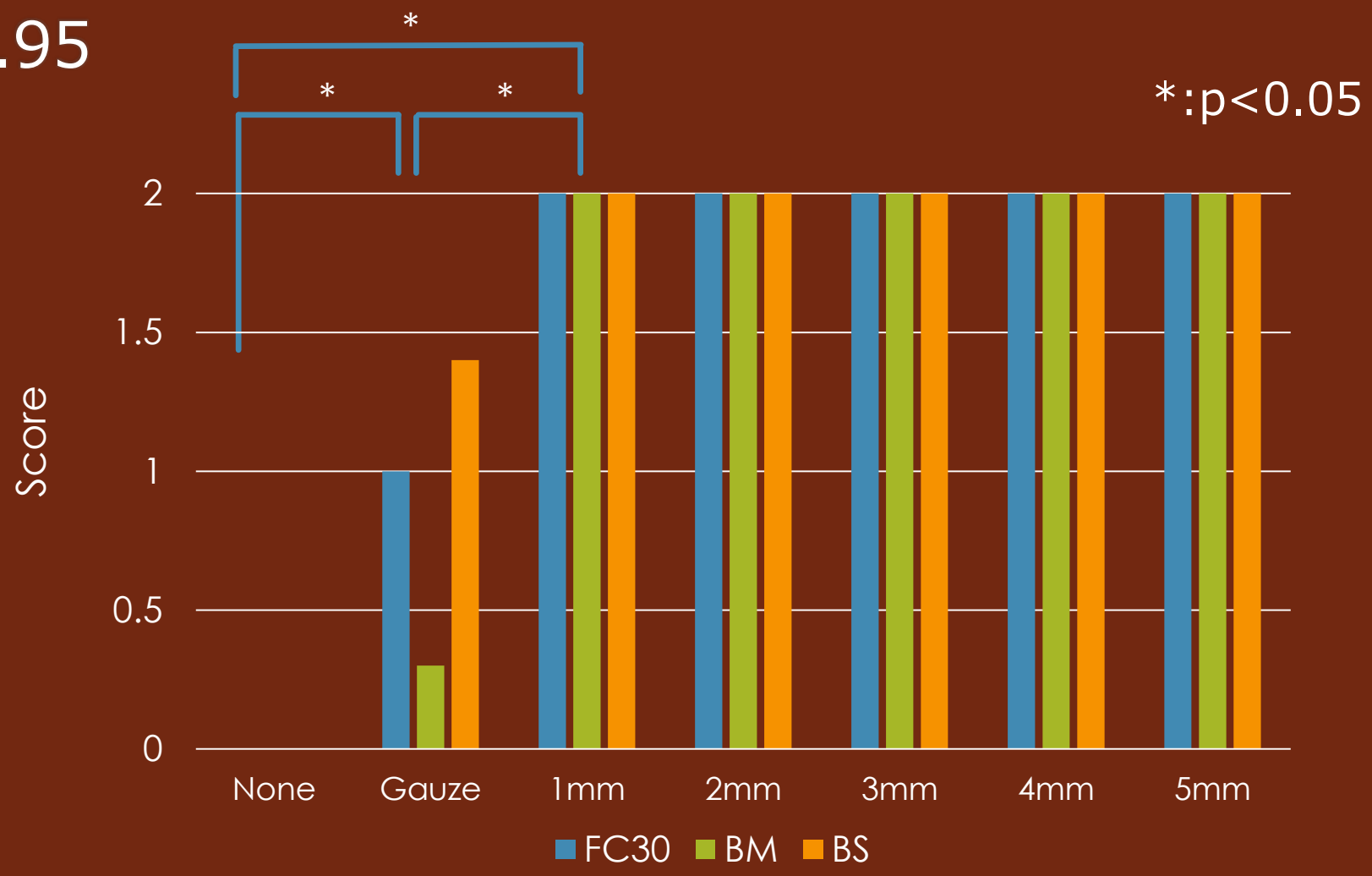
  Kruskal-Wallis test or Mann–Whitney U test

  Differences were considered statistically significant at $p < 0.05$
- Cohen's kappa coefficient

Results 1: Visualization score

Threshold : 0

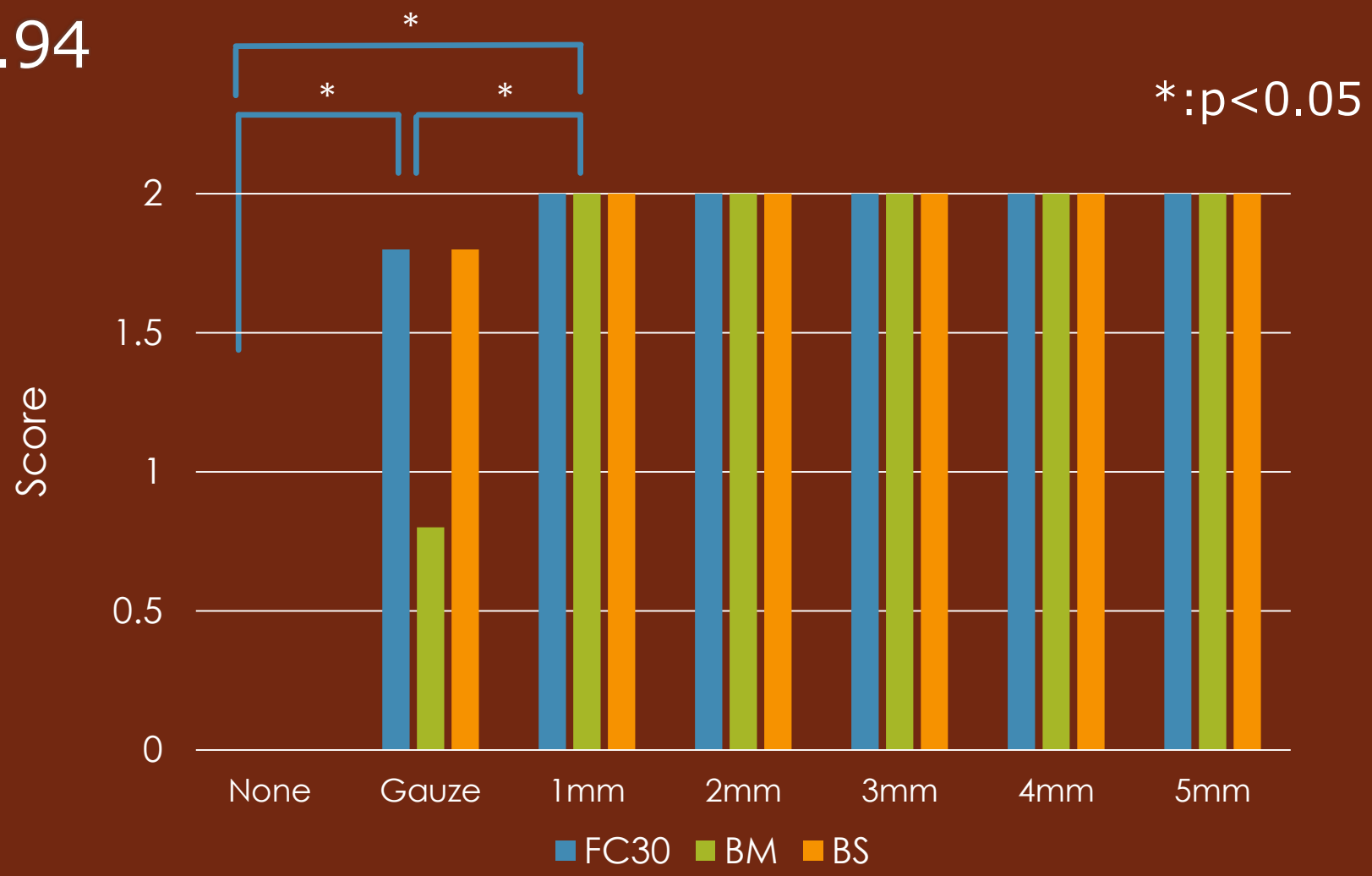
k = 0.95



Results 2: Visualization score

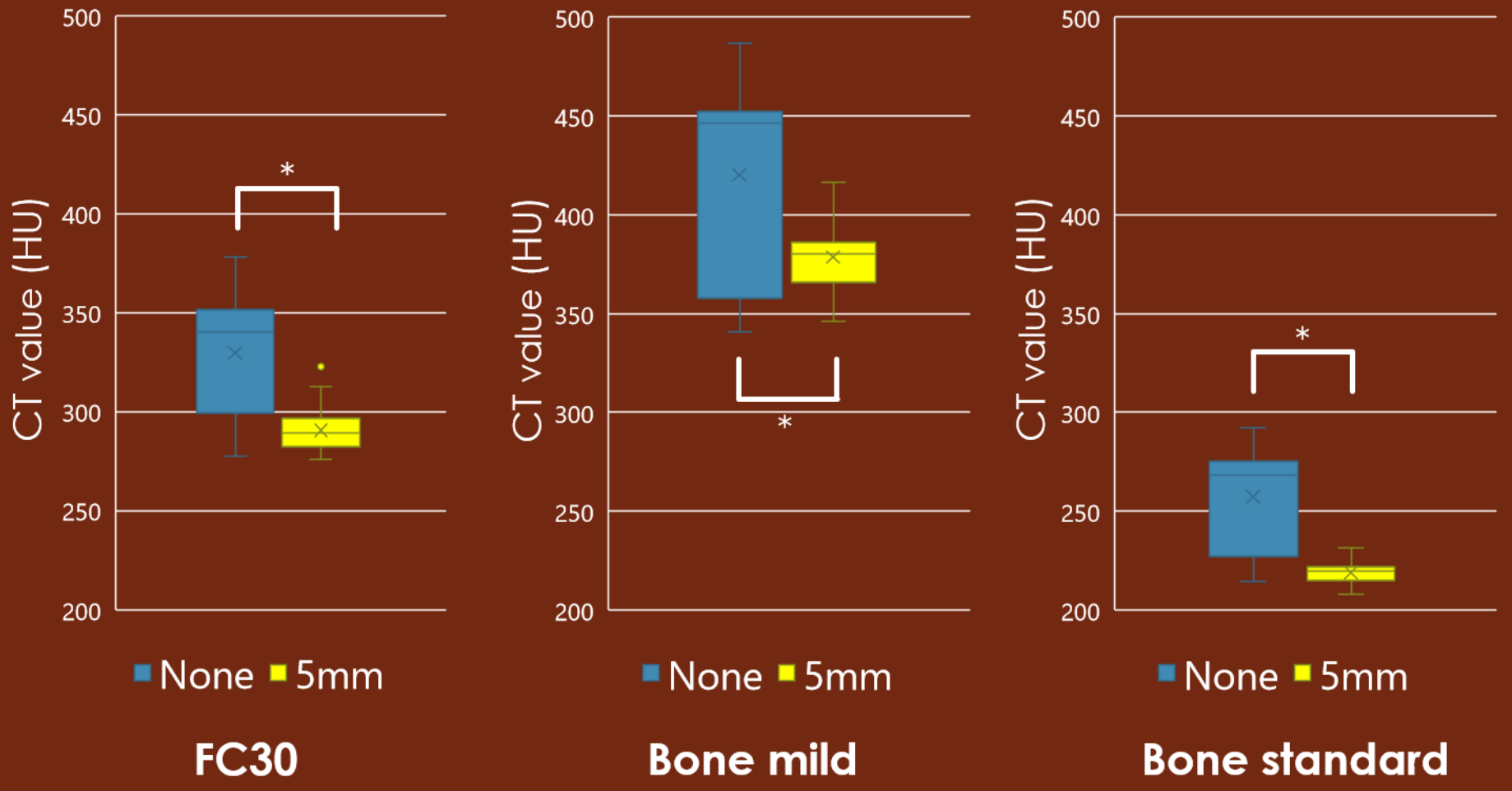
Threshold : 100

k = 0.94



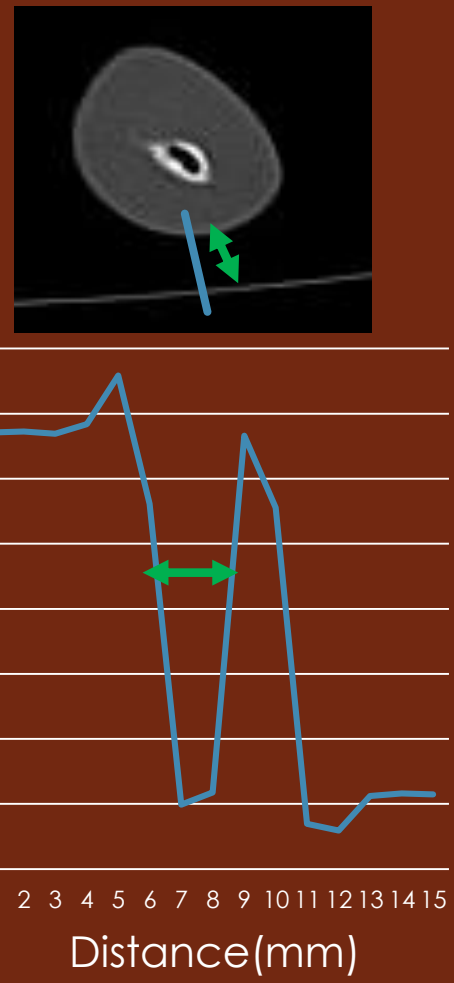
Results 3: Maximum CT values

*:p<0.05



Results 4: FWHM of gap

	Gauze	1mm	p value
FC30	0.77(0.71-0.85)	1.08(1.07-1.18)	< 0.05
Bone mild	0.72(0.63-0.81)	1.00(0.99-1.08)	< 0.05
Bone standard	0.70(0.41-0.82)	1.10(1.04-1.16)	< 0.05



None : No gaps were detected by the method of this study.

Summary

- The maximum CT value of the phantom edge was significantly higher at None than at 5 mm in all conditions.
- A comparison of the FWHM of the gap indicated that the gauze was significantly narrower than the Styrofoam.
- Additionally, visual evaluation revealed that the gauze was not consistently effective in providing separation.
- It was confirmed that using a buffer material of 1 mm or more can significantly reduce the effects of artifacts from the CT table mat, which can improve the quality of 3D imaging of the hand and increase flexibility in positioning.

Conclusion

By inserting a buffer material with a thickness of at least 1mm between the hand and the CT table mat at creating 3D imaging, the separation of the hand and the CT table mat can be achieved easier for regardless of the conditions.

Thank You

- If you have any further questions or comments, please don't hesitate to contact me by e-mail

✉ : y.kamihoriuchi@gmail.com

https://www.kohjin.ne.jp/contact/


MK
Investigation of buffer thickness for reducing artifacts from the table in CT examinations with extremities 3D imaging
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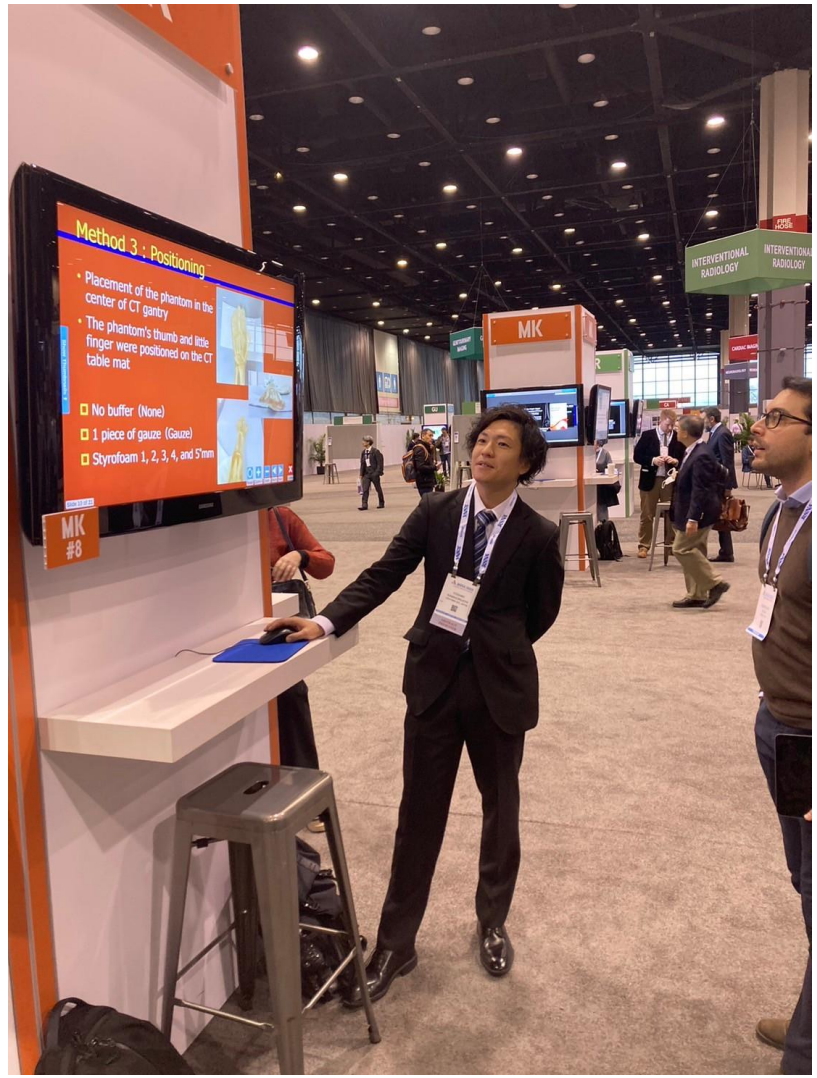
Method 3 : Positioning
Placement of the phantom in the center of CT gantry
The phantom's thumb and little finger were positioned on the CT table mat
No buffer (None)
1 piece of gauze (Gauze)
Styrofoam 1, 2, 3, 4, and 5mm
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enough room for


Meaningful innovation.
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Made For life


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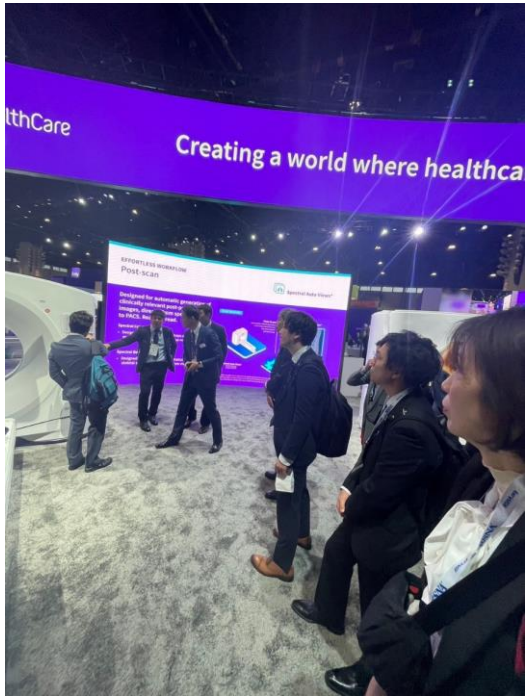
Neusoft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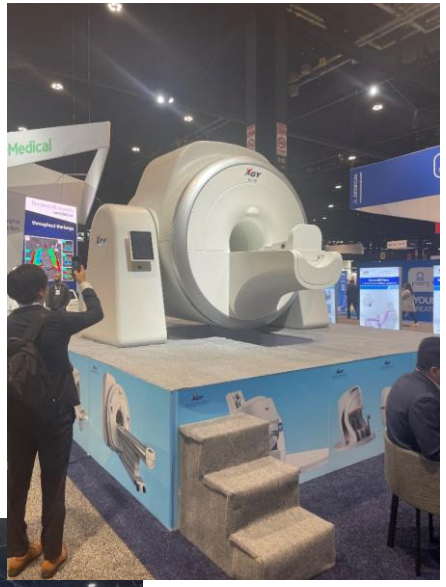

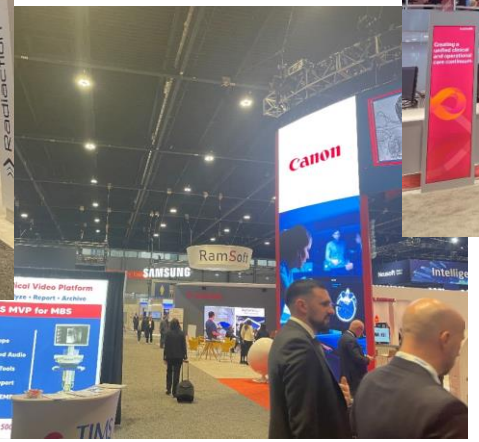
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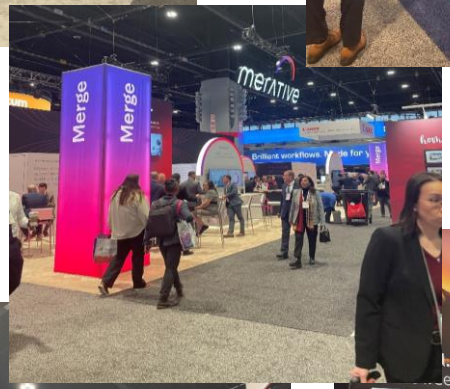
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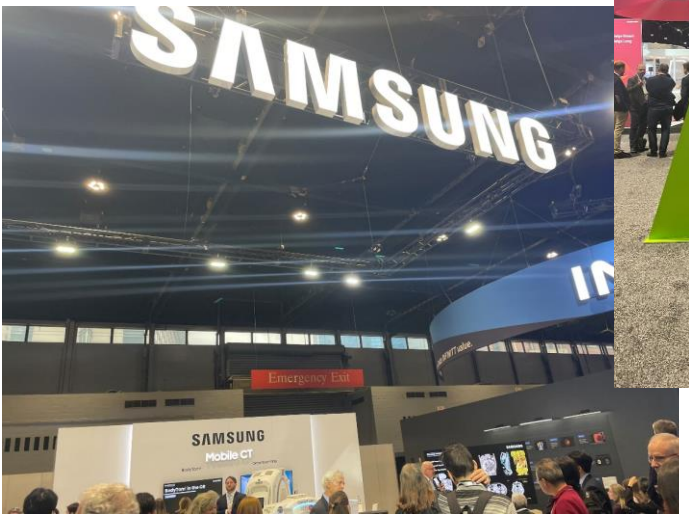
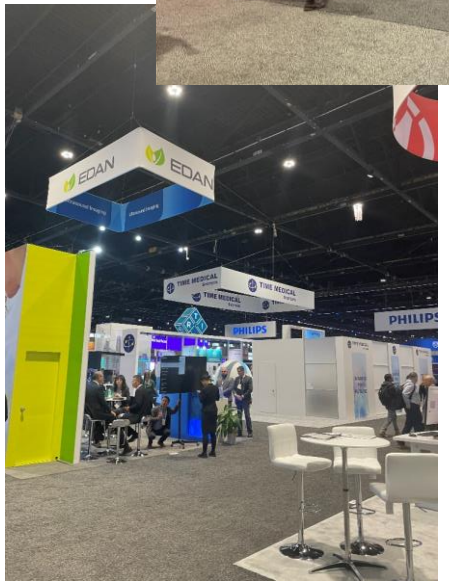
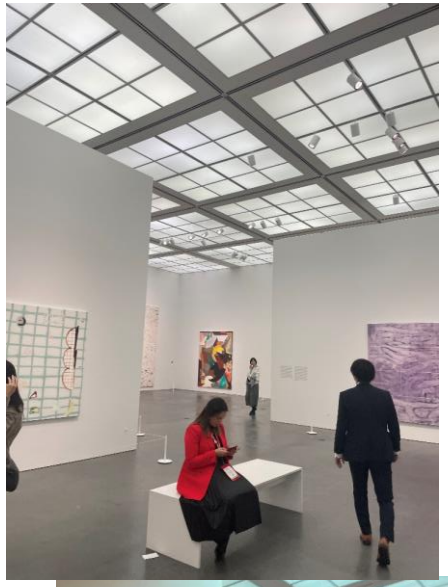

SAMSUNG
Emergency Exit
SAMSUNG
Mobile CT


Optum
Optum

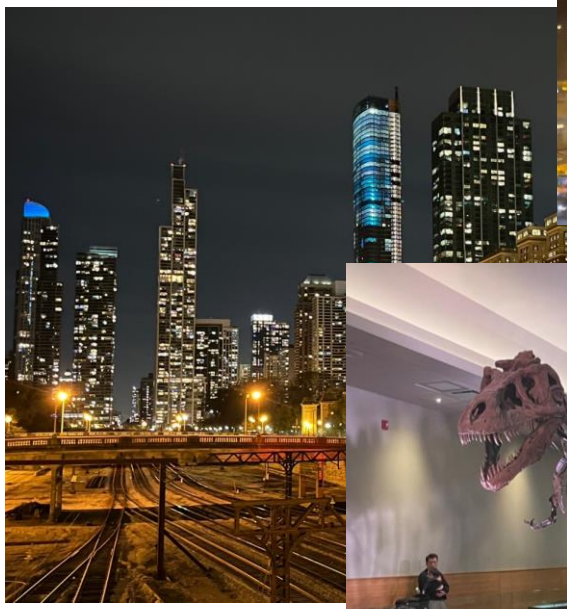

EDAN
EDAN
PHILIPS

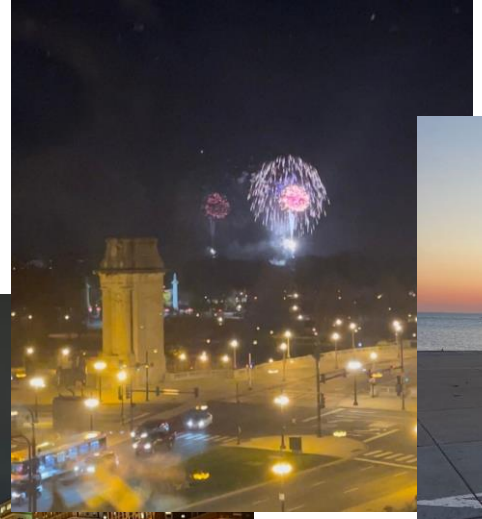

Welcome to
Canon Medical Event
CT/MRI

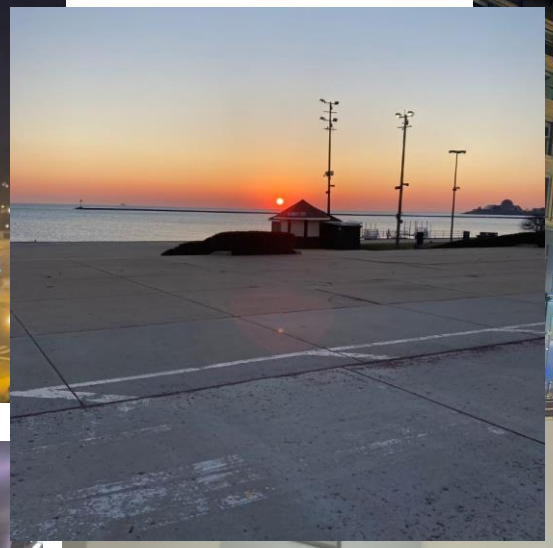


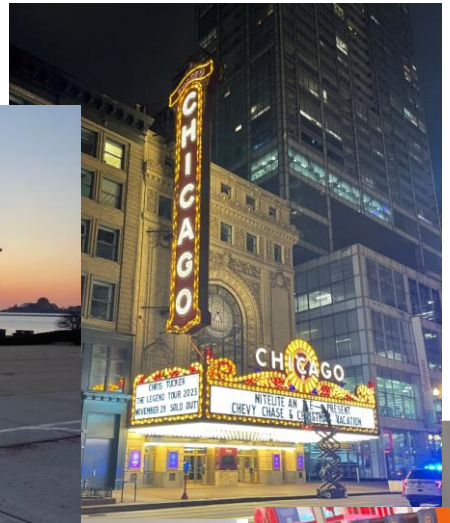

EXIT

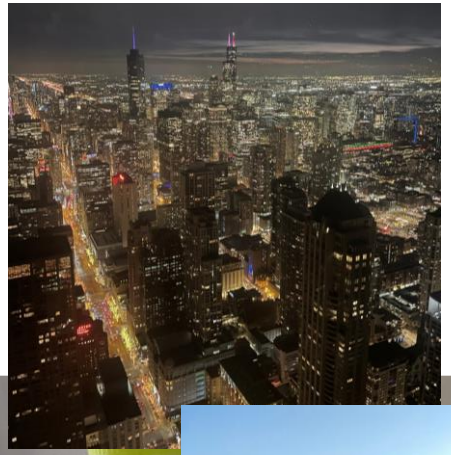
観光











RSNAの発表を経験して

- 英語での抄録やスライドの作成
  ⇒時間と労力がとても必要、できないことに自己嫌悪
- 英語での発表
  ⇒何を聞かれるか、どんな雰囲気か分からない不安と緊張
- 学会発表の経験不足
  ⇒国内での発表経験が少ないことへの劣等感
- 海外渡航
  ⇒海外に対する恐怖や心配

RSNAの発表を経験して

- 英語での抄録やスライドの作成
  ⇒時間はかかりましたが、できた時の充実感
- 英語での発表
  ⇒海外の方は意外と優しい、終わったときの達成感
- 学会発表の経験不足
  ⇒関係ない！自信を持てば、何とかいける
- 海外渡航
  ⇒楽しい！！！満足感

まとめ

- 学会発表経験が乏しい私ですが、
国際学会への参加はできました！！！

- 抄録の作成やスライドの作成は、時間も労力も必要でした
特に英語という点がとても大変・・・

- 発表後の達成感やご褒美の観光、ごはんは最高でした！

- ぜひ、チャレンジしてみてください


ご清聴ありがとうございました
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