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Brain Image Analysis Program

PMAneo

Product pamphlet



PMAneo is a medical image analysis program which automatically analyzes cerebral blood flow information.



PMA by ASIST-Japan (Acute Stroke Imaging Standardization Group - Japan) has become a medical device.



Developed by a physician! Intuitive and user friendly MR/CT brain image analysis program.

The predecessor to PMAneo,

PMA (Perfusion Mismatch Analyzer) image analysis software for research was available from ASIST-Japan, from 2006 to 2019. Subsequently, the software has been renewed as "Brain Image Analysis Program PMAneo" with improved functions and easy-to-use interface.

PMAneo

"Brain Image Analysis Program PMAneo" is an application which provides information for making decisions, evaluations, and diagnosis related to pathological conditions using CT Perfusion images (CTP) and MR Diffusion weighted images (DWI) / Perfusion weighted images (PWI).

PMAneo accepts and automatically analyzes CTP/DWI/PWI images sent from external linked devices such as CT/MRI scanners.

It generates various brain image maps. A Mismatch Map provides volumetric readings corresponding to the ischemic core and hypoperfusion region including the penumbra, calculating the mismatch volume and ratio.

Results can be viewed on PACS in the hospital.

By providing useful quantitative and visual information, PMAneo helps physicians make decisions related to endovascular therapy.

Analysis Procedures

Send DICOM images from CT/MR to PMAneo.



Perform CTP or DWI/PWI analysis, depending on the sent images.



Based on the CTP/DWI/PWI analysis results, automatically measure blood flow information, process, and calculates volumes.



Display highlighted and colored images, and /or subtraction processed images.



Save all the results in DICOM format files.



Send analysis results from PMAneo to the hospital's PACS system.



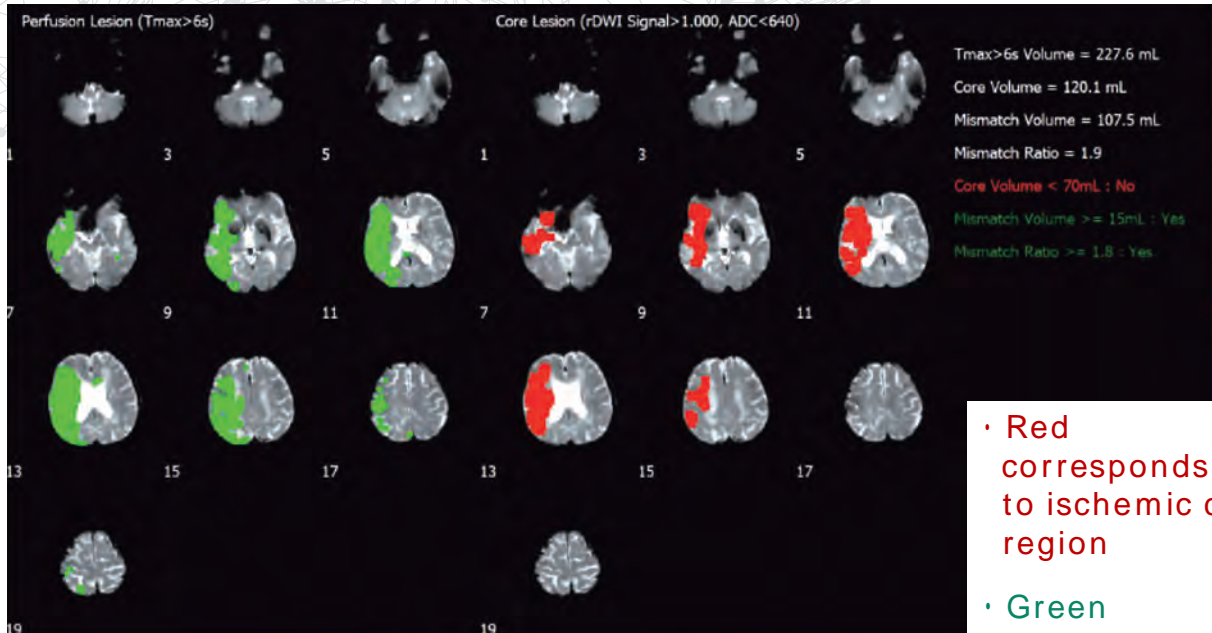
Analysis results can be viewed on any PACS viewer in the hospital.



*Display may vary depending on the type of PACS viewer.

Map Result Examples

Each threshold can be changed as needed.



- Red corresponds to ischemic core region
- Green corresponds to hypoperfusion region including penumbra

Mismatch Map

Each type of volume, as well as **Mismatch volumes** and **ratios**, are automatically calculated and displayed.

Acquisition protocol

CT image

Sequence	Imaging Range	Contrast agent concentration
1 CT perfusion	Whole brain coverage is recommended.*1 Shuttle scan data is acceptable.*2 (Confirmed on GEHC and Siemens scanners.)	Contrast agent of 350mgI/mL or more is recommended. Secure a route in the upper right arm. Inject 40mL of contrast followed by 40mL Saline Chase for 3-5mL/sec each. Scan starts 5-10 sec after the start of contrast injection. Scan duration is 60 sec.

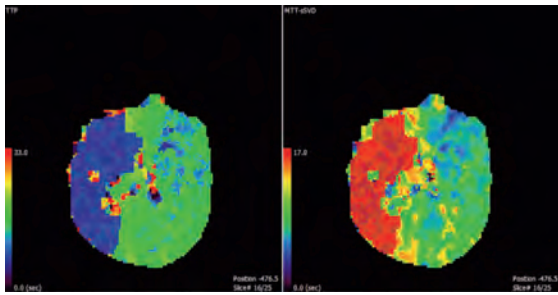
Caution: Do not use images with artifacts as it may affect the analysis results.

: To avoid excessive x-ray exposure, consult with your CT manufacturer for the proper acquisition procedures.

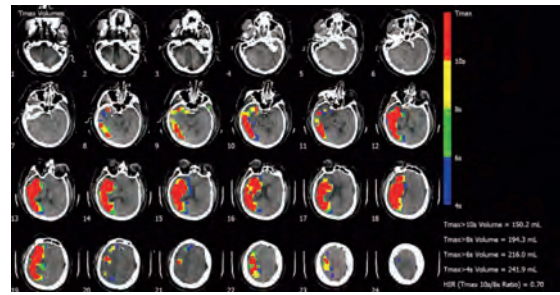
*1 Reconstruction of about 3mm thickness is recommended for the volume scan.

*2 PMAneo may need to be updated or adjusted for analysis with shuttle scans.

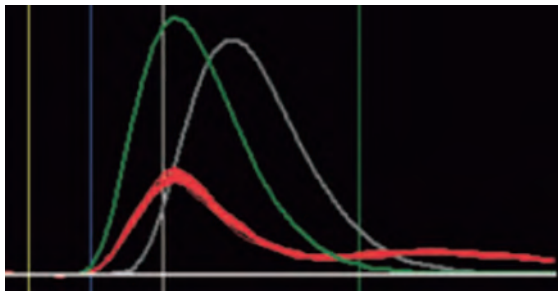
Large Map



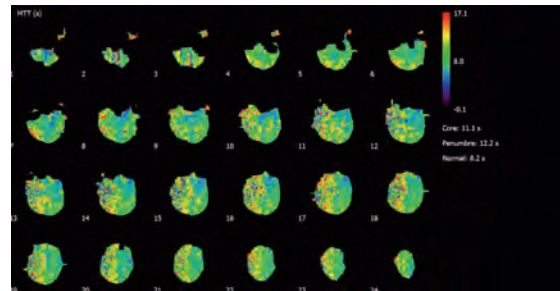
Tmax Volume



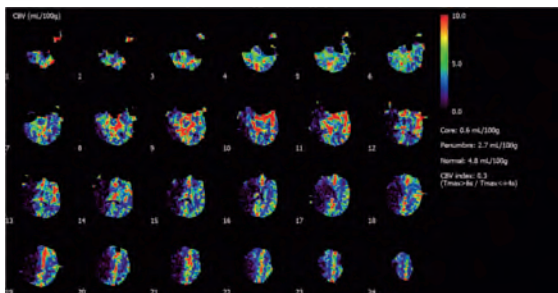
AIF/VOF



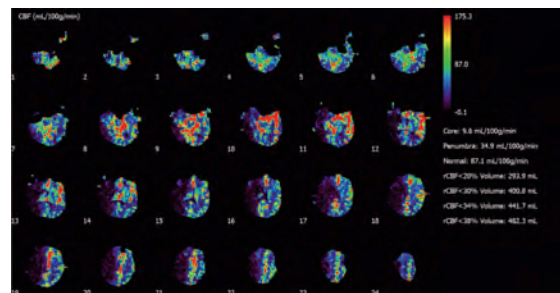
MTT(s)



CBV(mL/100g)



CBF(mL/100g/min)



MR image

	Sequence	Imaging Range	Contrast agent concentration
1	Diffusion weighted imaging (SE-EPI) b-factor=0 and 1000 should be in the same series.	Whole brain	_____
2	MR perfusion imaging (GRE-EPI) TE: Shortest TR: Around 1500ms	Whole brain coverage is recommended.	Secure a route in the upper right arm. Start injecting Gd contrast 15-20 sec after the start of the scan. Inject 0.2mL/Kg body weight* ³ followed by 15-20mL saline chase for 3-5mL/sec each. Scan duration is 90 sec.

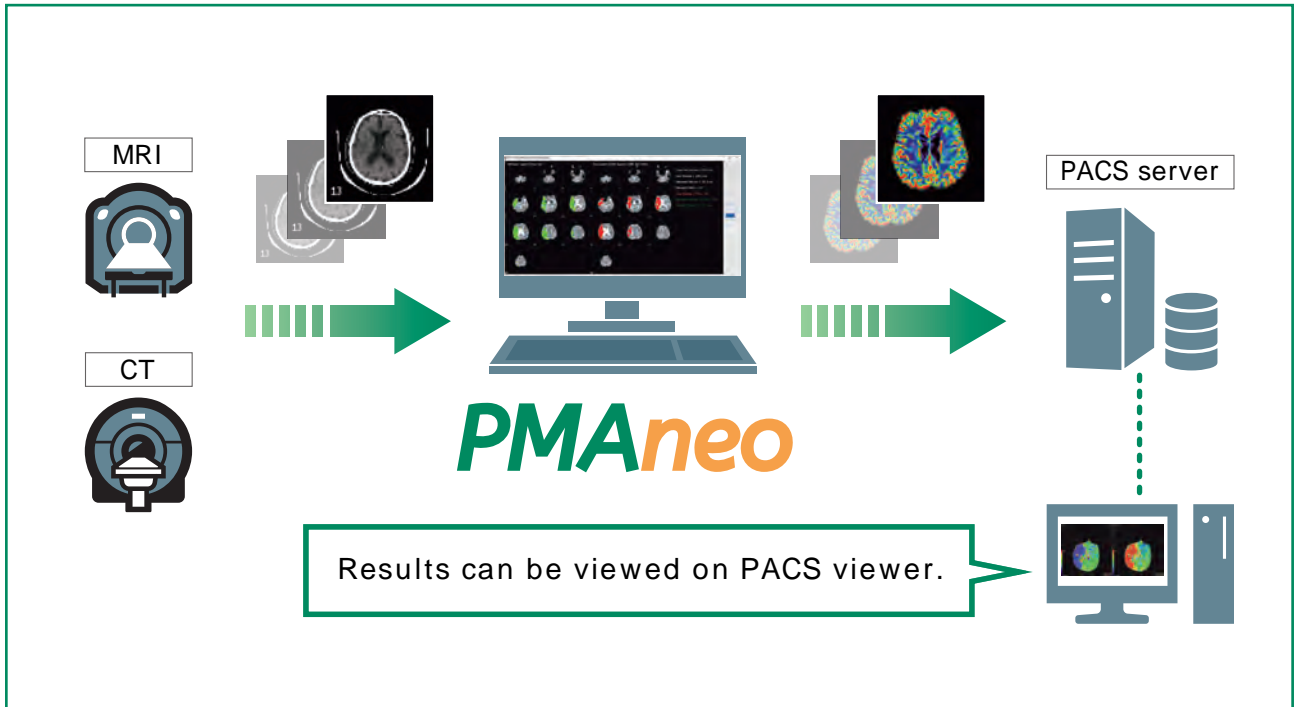
Caution: Do not use images with artifacts as it may affect the analysis results.

*³ Inject 0.1mL/Kg body weight for Gadovist (1.0M formulation).

System Configuration

PMAneo can be installed on Windows OS machines.

Intrahospital network



Hardware Requirements

OS: Windows 10

RAM: 8GB

HDD: 500GB (free space)

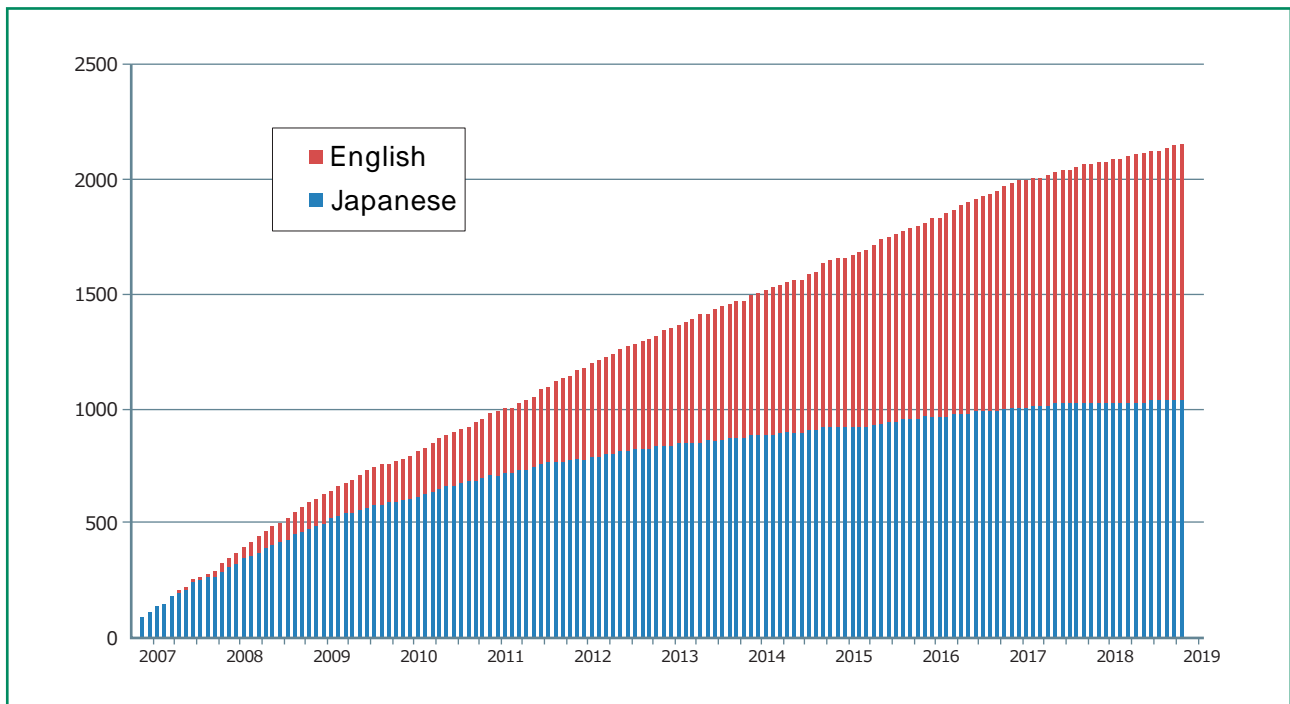
Monitor: 1600x900 (length x width)

Registered Users for PMA (research)

PMA was developed in 2006 and available as software for research until January 2019.

More than 2000 users were registered for the English and Japanese versions. (As of March 2018)

Registered Users



References

1. Kudo K, Christensen S, Sasaki M, et al. Accuracy and reliability assessment of CT and MR perfusion analysis software using a digital phantom. *Radiology*. 2013;267(1):201-11.
2. Kudo K, Sasaki M, Yamada K, et al. Differences in CT perfusion maps generated by different commercial software: quantitative analysis by using identical source data of acute stroke patients. *Radiology*. 2010;254(1):200-9.
3. Kudo K, Sasaki M, Ogasawara K, Terae S, Ehara S, Shirato H. Difference in tracer delay-induced effect among deconvolution algorithms in CT perfusion analysis: quantitative evaluation with digital phantoms. *Radiology*. 2009;251(1):241-9.
4. Kudo K, Terae S, Katoh C, et al. Quantitative cerebral blood flow measurement with dynamic perfusion CT using the vascular-pixel elimination method: comparison with H₂(15)O positron emission tomography. *AJNR Am J Neuroradiol*. 2003;24(3):419-26.

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