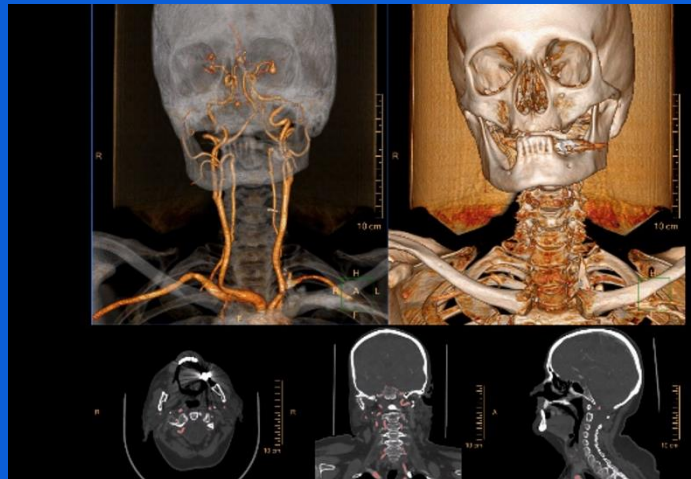# Comprehensive vascular analysis and planning

Multimodality Advanced Vessel Analysis

The most common vascular diseases include cerebrovascular disease, carotid artery disease (CAD), peripheral artery disease (PAD), thoracic aortic aneurysm and dissection, abdominal aortic aneurysm (AAA), atherosclerosis, arteriovenous malformation (AVM), deep vein thrombosis (DVT), among others. Currently, computed tomography angiography (CTA) and magnetic resonance angiography (MRA) are used mainly for the diagnosis of primary vascular conditions or other clinical conditions.

Highlights

The Multi-Modality Advanced Vessel Analysis (MM AVA) application is intended for visualization, assessment, and quantification of vessels in computed tomography angiography (CTA) and magnetic resonance angiography (MRA) data with a unified workflow for both modalities.

For conventional and spectral CTA data, it provides automatic segmentation including extraction of vessel centerlines, lumen contours and vessel contours. For both modalities, it provides tools for extracting and editing centerlines.

MM AVA offers inspection views for local analysis of the dataset (also available as a standalone AVA Quick Vessel Analysis module for endovascular procedures and stent placement[1]) and for the overview of a selected vessel centerline. It allows creating, storing, and reviewing basic vascular measurements, as well as customizable measurement templates.

Features

• Automated registration and image subtraction between contrast-enhanced and non-contrast enhanced series, for the purpose of creating a bone-removed image
• In addition to bone removal, the application offers vessels extraction and labeling, automatic lumen and centerline calculations.
• Features findings management for capturing and communication in a structured manner
• Supports template-based measurements tailored to various pathologies and Stent planning
• It has inspection views for selected vessels centerlines and local analysis

Overview

Multimodality Advanced Vessel analysis is intended to assist the user in viewing, processing and quantifying vascular conventional or spectral CTA and MRA datasets of patients with suspected or diagnosed vascular diseases, for the analysis of vessel anatomy.

This includes vascular lesions including cerebral and carotid stenosis, aortic aneurysm, as well as peripheral arterial disease and segmentation including spectral CT. Inspect a vessel or vessel location in more detail and optionally create annotations or perform measurements and perform a set (batch) of measurements. The application also enables collaboration with other physicians by generating 3D views of the vascular anatomy (with the ability to suppress the bone anatomy in case of CT) for the purpose of case overview.

AVA demonstrated to reduce the post-processing time by 50% when compared to manual Head & Neck CT angiography (CTA) analysis.[2]

System Level Features

• Worklist: The Worklist function allows designation of the patient studies to be listed in the Directory.
• Patient list / directory: Automatic display of studies from selected devices (from local or remote lists) in the Patient List within the Patient Directory.
• Reporting: Customized reports using preformatted templates.
• Smart Preprocessing: Automatic pre-processing based on prior usage of the server.
• Storing data
• Producing a CD
• Dicom printing ("filming")

Carotids visualization on Advanced Vessel Analysis
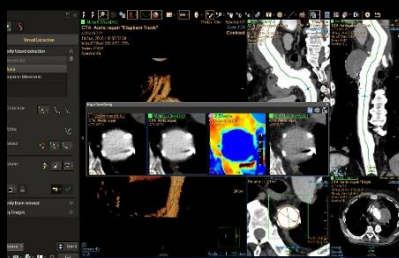
Advanced Vessel Analysis with spectral data

Features (continued)

- It allows creating, capturing, and reviewing of basic user selected endovascular measurements (and calculations when applicable), as well as predefined measurements sets and measurements correlations.
- Quick Vessel Analysis supporting pre-procedural stent planning[1]
- Supports Philips spectral CT data analysis and workflows, including tools like monoenergetic keV slider, Magic Glass, Spectral Image Fusion, Scatter Plots, spectral result creation and more
- Discreate results sharing[3] enables automatic transfer of structural results between the Workspace and reporting solutions, reducing reporting time and optimizing AV reporting workflow.

Your Hospital Environment

PACS and 3rd Party Integration
Desktop integration with 3rd Party PACS vendors to enable the launch of AV client (and load data to selected application) directly via 3 types of integration:
- URL Integration (loose integration)
- AV API (tight integration)
- 3rd Party PACS API

Advantages
- Launching advanced clinical applications directly from PACS based on study selection (no need to launch patient directory for study selection) including load/save bookmarks
- Allow PACS users working with AVl to use Film application to send images to printers and organize key images sent from applications
- Default Storage Device for result saving
- Automatic storage DICOM images and series as an output of Preprocessing to PACS if configured

Report Application
Generating, editing, and printing reports, the application is accessed through the Report Workflow button. The report draft can be edited after images and information application have been stored in the Reporting database. The Report application includes information from the patient's scan into the report as well as additional content such as: analysis results, sample images, recommendations and comments

Additional enhancements
- Usability improvements within report editor – within TEDIT tool bars, editor space
- User-friendly Template Editor
- Support CT, MR and NM report templates
- Changing between JPEG and TIFF formats for summary images optional

Presentation States
Saving & loading Presentation States from/to clinical & viewing applications
Film & Report applications support loading and applying presentation state on the images sent by applications to Film & Report

Pre-Processing and Background Processing
Pre-Processing functionality by enabling pre-processing of data and automatic creation of results/processed data for applications

Processing Mechanisms
1. Pre-Processing: Enabling processing data (run algorithms according to pre-defined conditions/parameters
2. Background Processing: Enabling applications to initiate processing tasks in the background
3. Supporting Preprocessing on multiple series
4. Pre-processing will be triggered/enabled to onsite configuration
5. Pre-processing and background processing will be able to run on both master and slave servers in the EX-configuration

System Requirements

Configuration Options:
The product can be operated in the following configurations:
1. Standalone workstation
2. Client-Server scenario (HX/EX) : Multiple concurrent users connected to the server using hospital LAN or home network connection via VPN.
3. Client – multi-server scenario (Concerto) for enterprise-sized hospitals: deployed as a multi-server system that is spread across the main hospital and satellite sites, connecting to a Global Worklist (GWL) and view each study across the system.

For system requirements please consult the Advanced Visualization Workspace Technical Datasheet available at www.philips.com/avw15.

Footnotes

1. This feature is part of CT Pre-Procedural Stent Planning and it's an optional add-on on top of Multimodality Advanced Vessel Analysis (MM AVA) application
2. Ardley N et al. Efficacy of a new post processing workflow for CTA head and neck. ECR 2013 / C-1760
3. The integration of the solution is via IBE services or via customer home-grown solutions. Please contact Philips representative for more details.

How to reach us
Please visit www.philips.com/advanced-visualization