dicomPACS®

Digital X-ray and image management in radiology and hospital

CE 0482 **FDA** 510(k) application has been cleared by the FDA No. K070618 Health Canada CMDCAS certification QMS Iso 13485

Digital image management

made
in
Germany

dicomPACS®

Innovative image management for the highest demands

Nowadays, diagnostic investigation with the help of digital image solutions plays an important role in the daily work of every modern practice or hospital. As the use of these modern technologies will continue to increase during the next few years, we would like to give you an understanding of our PACS software ***dicom****PACS*®.

dicom*PACS*® is an innovative and intelligent high tech solution for image processing as well as practice and hospital management. With the help of ***dicom****PACS*® a paperless daily working routine can become reality. All types of images (X-rays, CT, MRI, digital camera, ultrasound) as well as all kinds of documents (doctors' letters, diagnoses, recovery processes, faxes) can be acquired, diagnosed and then filed in the digital patient file, only one mouse click away, with ***dicom****PACS*®.

With our well designed archive and backup solutions, we guarantee quick access to all data in accordance with the highest international security standards. Moreover, ***dicom****PACS*® can be integrated effortlessly with management systems via HL7 or BDT/GDT communication or using an invidual solution.

Advantages and functionality

- Developed by doctors for doctors
- Easy handling
- Flexibility as a result of individual customisation
- Very cost effective
- Integrated web server
- Many specialised measuring functions
- Integrated MIP/MPR function
- Integrated pre-operative planning

Software

dicom*PACS*® in radiology and hospital

A ***dicom****PACS*® system will finally put your dream of a digital patient file into practice:

- ***dicom****PACS*® can communicate in accordance with all common standards, such as HL7 or other internationally recognised standards.
- All data is archived in DICOM format in an SQL database. It is available at any place and any time.
- Due to the DICOM format, you are able to exchange your data worldwide via internet, e-mail or telephone. With our ***dicom****PACS*® system, you gain independence from separate and incompatible solutions.
- ***dicom****PACS*® ***MobileView*** is a web based viewer, that contains all the basic functions for viewing images. The viewing can take place virtually indpendant from the browser on mobile devices, such as an iPad.
- ***dicom****PACS*® allows the integration of nearly all digital or analogue modalities into your administration system. Data from the modalities can be transferred easily and archived comfortably in DICOM format.
- ***dicom****PACS*® displays cutlines of CT or MRI slices in overview images, generating the necessary data itself, and provides a number of further useful slice image tools.

dicomPACS®

Digital image management by OR Technology

***dicom**PACS®* has proved itself thousends of times all over the world.

Structure

Professional work flow with ***dicom****PACS*®

dicom*PACS*® encompasses the acquisition, processing, communication and archiving of image material.

Thanks to its versatility and many specialised features, ***dicom****PACS*® allows you to perfectly customise each workstation to your individual needs. Our software has been devised and developed in close consultation with specialist doctors, which enables us to offer you a versatile and easy to use tool for daily diagnosis. Its success up to now has given us something to be proud of.

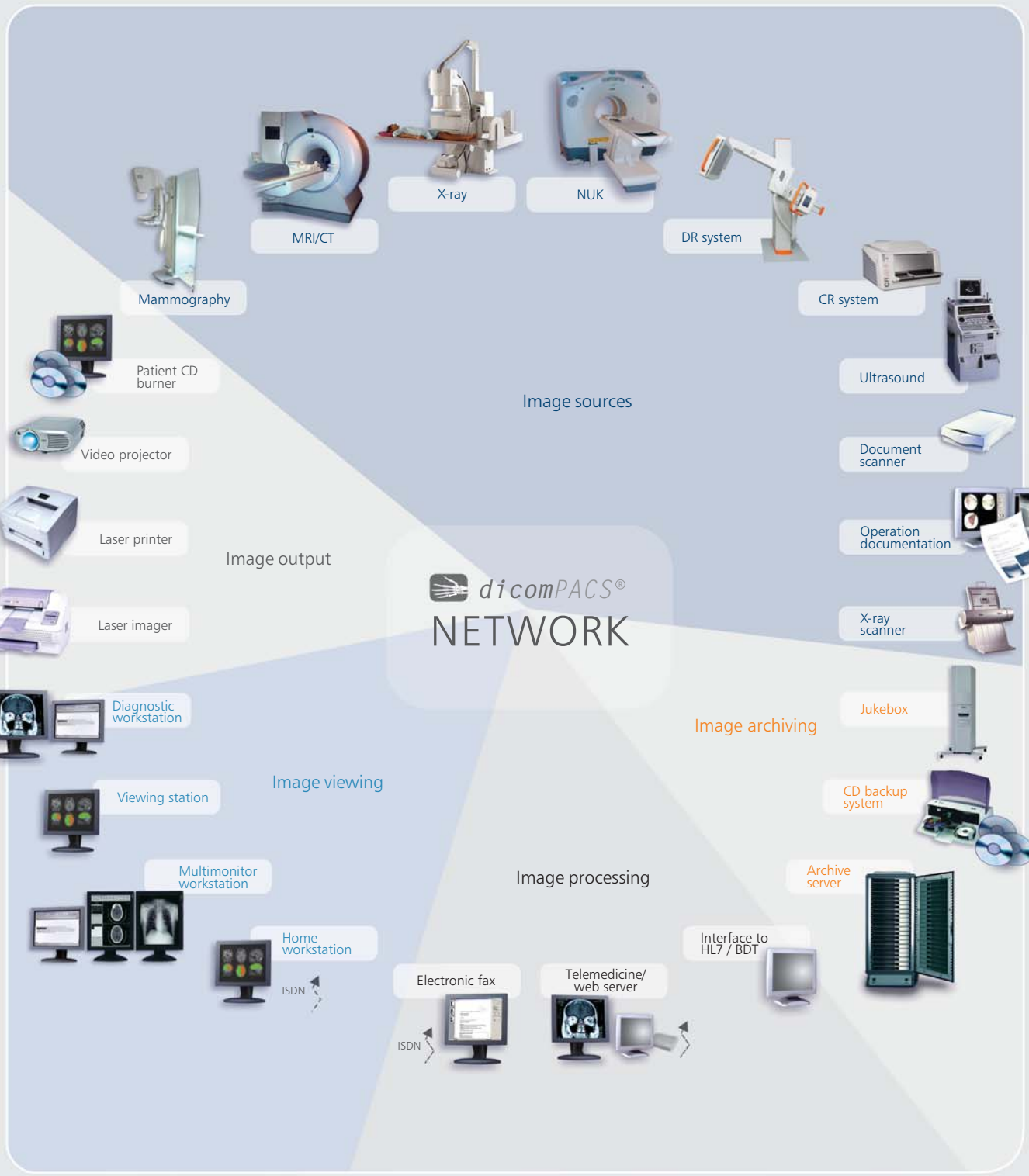
With several thousand workstations installed nationally and abroad, our system has proved itself over and over and has shown every day what it is capable of.

dicom*PACS*® masters simple image processing requirements as competently as it does those of complex radiological networks.

Thanks to its modular design a ***dicom****PACS*® network can grow as needed. It can be expanded and amended to incorporate special eatures such as telemedicine, pre-operative planning or 3D reconstruction into your system.

Connectivity

The diversity of ***dicom**PACS*®



Interaction

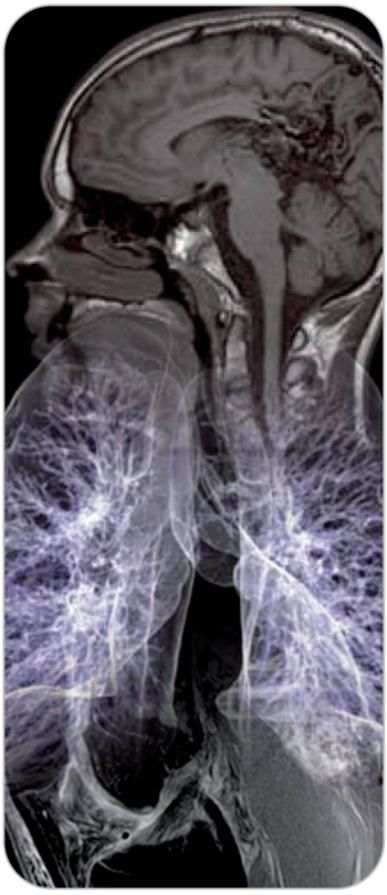
HIS / RIS interface

One of the areas with the biggest scope for economies in the healthcare system is the optimisation of the operational procedure.

The use of fully automated documentation, as well as the permanent availability of data, accelerates the daily workflow enormously and extensively contributes to saving costs.

The pre-condition: All systems need to merge smoothly, because only then a raise in effectiveness could be materialised. To ensure that all software components like HIS and RIS work perfectly together, sophisticated and optimal structured interfaces are required.

If you want to be sure that everything matches, you should decide in favour of ***dicom****PACS*®. It supports all standard interfaces like HL7, DICOM or others. We can also integrate individual interfaces on request.



Overview

Advantages at a glance

Modular structure

- Easy to adapt to any size of practice or hospital
- User friendly, clearly laid out structure, low training expenses and short training periods
- Individual customisation of the user interface in accordance with your specialisation and requirements
- Flexible allocation of hot keys for many functions enables the user to work fast without a mouse

Flexibility and user orientated features

- Specially geared to the needs of radiologists, orthopaedists and surgeons
- Parallel processing (possibility of continuing work while, for instance, a CD is being burnt)
- „Perfect memory" - repeated opening of an image with all the previous markings and settings, incl. zoom and alignments
- Parallel compiling of diagnostic reports for several patients is possible - any number of program windows may be opened without loss of speed (depending on the size of the working memory)

Integration

- Easy integration into existing HIS or RIS
- Storage of all images and documents exclusively in the international DICOM standard

Variety

- Wide range of tools, features and add-ons e.g.:
  - Windowing, zoom, filters
  - Integration of web server
  - Operation reports
  - Special measurement functions
  - Pre-operative planning
  - Integration of dictation and speech recognition systems etc.

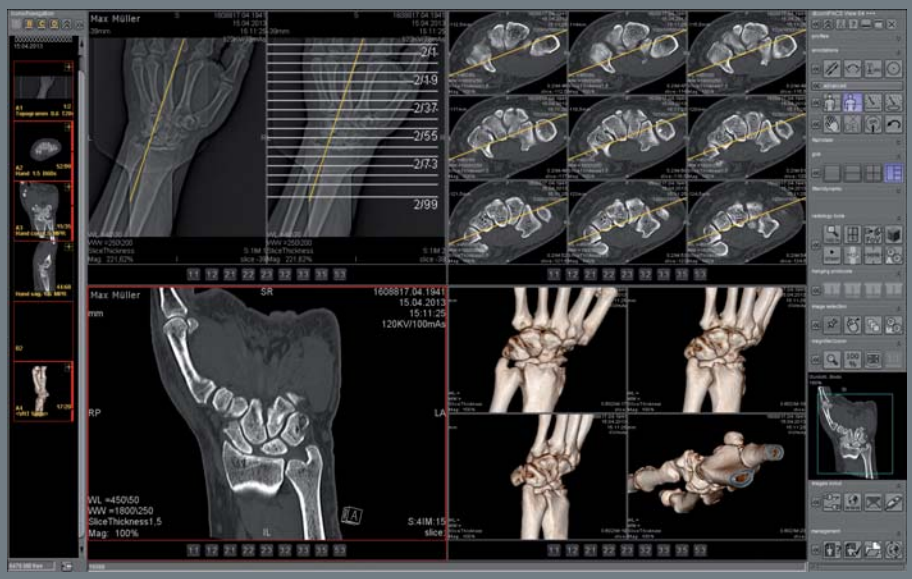
Costs and depreciation of *dicom*PACS®

- Can be built up over time to meet changing needs - thanks to its modular structure
- Has extremely favourable price-performance ratio - depreciation takes a very short time
- Help is at hand at any time via remote maintenance
- Includes a large number of highly useful tools even with the standard modules

Wide range of tools and user orientated features

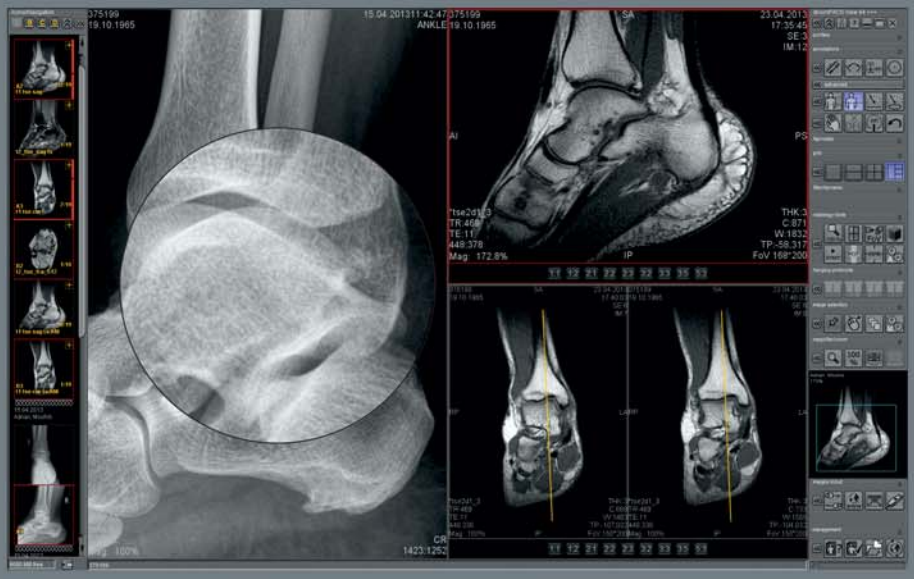
The user friendly, clearly laid out structure requires only low training expenses and short training periods.

Parallel compiling of diagnostic reports for several patients is possible - any number of program windows may be opened without loss of speed.



The system enables fast and easy customisation of the operating interface for individual customer preferences.

Useful tools such as the configurable measuring magnifier make diagnosis much easier.



Comprehensive search tools enable the comparison of X-ray examinations of one or more patients.

Value

dicom*PACS*® features

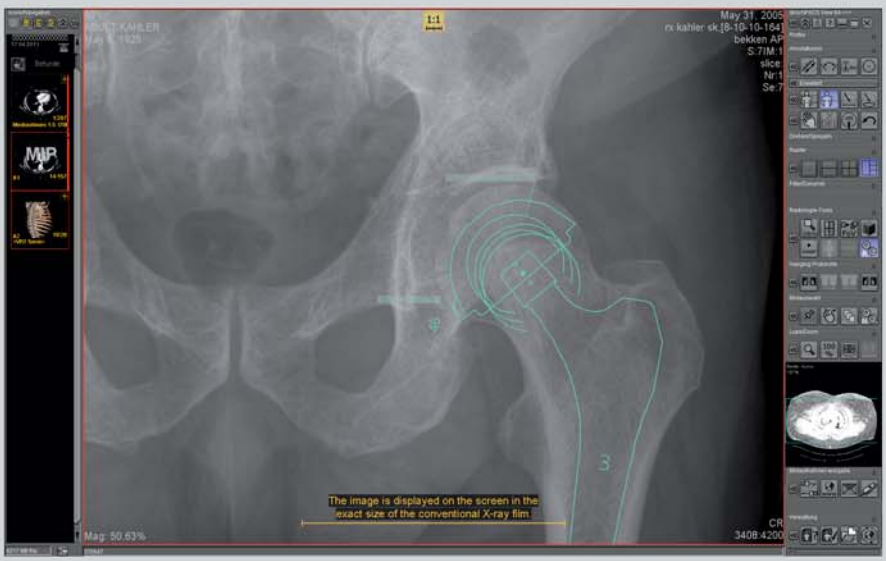
dicom*PACS*® is a so called „Picture Archiving and Communication System", acronym: PACS, and it performs many different, at times highly complex tasks. It connects, controls and administrates everything related to your images: from the acquisition of images and the compilation of diagnostic reports to the archiving and transfer of image data.

It ensures that the images can be distributed quickly and without complications and viewed e.g. via the web server. In addition, the system is extremely flexible and open for many applications.

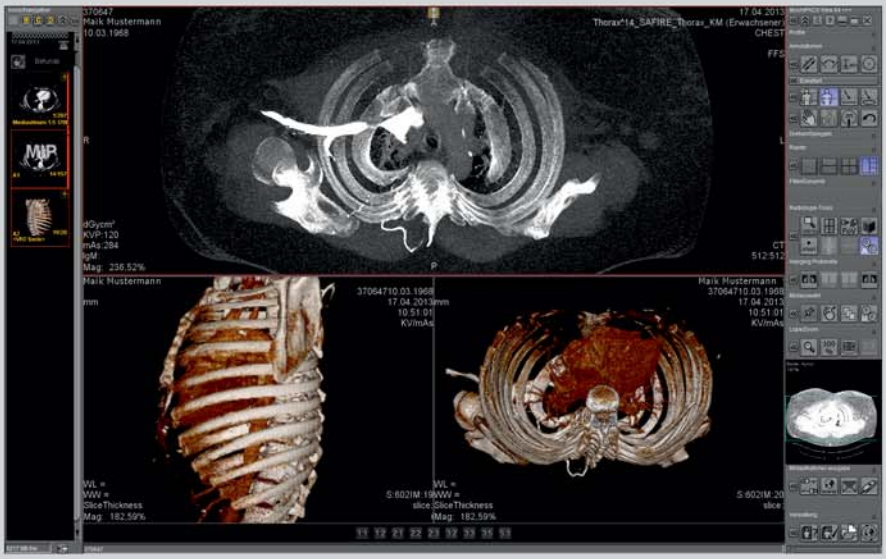
Selection of features:

- **Prosthesis documentation** - enables the user to plan operations with digital prosthesis templates by different manufacturers
- **Report Module** - for easy preparation of different reports (e.g. operation reports, ultrasound reports etc.) incl. Word macros with images and a digital dictation system
- **Statistics Module** - enables freely configurable analyses of the complete database
- **Video Modules** - enable standard and non-standard video signals to be recorded as single images and video sequences
- ***dicom****PACS*®***MobileView*** - enables image distribution within the hospital or to referring doctors via the internet and guarantees very fast image accessibility in original DICOM quality
- **Processing of CT and MRI series** - ***dicom****PACS*® includes professional tools such as MPR and MIP to evaluate cross section series
- **Hanging protocols**
- **Special function for mammography analysis**
- **Integration of speech processing systems**
- **Telemedicine**
- **Special solution for multiple archives**

MPR
(Multi planar reconstruction)



Prosthesis documentation



Processing of MRI and CT series

Mobile

Web-based viewer ***dicom**PACS*®***MobileView*** for mobile and stationary devices (optional)

The web-based viewer ***dicom**PACS*®***MobileView*** counts among the many extension modules of ***dicom**PACS*® diagnostic software. As a virtually independent browser, it allows the viewing of image material on mobile devices also outside a clinic or a practice. The doctor or the nursing staff can access all image material from the ***dicom**PACS*® system worldwide via a network connection.

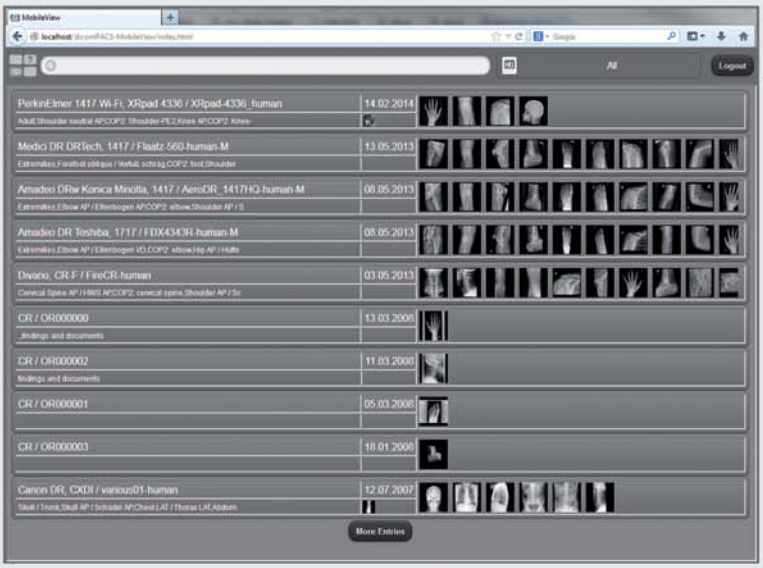
In addition to mere diagnostic evaluation of images, the ***dicom**PACS*®***MobileView*** viewer allows diagnostic reports to be captured and exported. Documents may be attached and exchanged. All diagnostic reports of a patient are always displayed. Individual diagnostic reports of a patient may be selected for exporting and formatted.

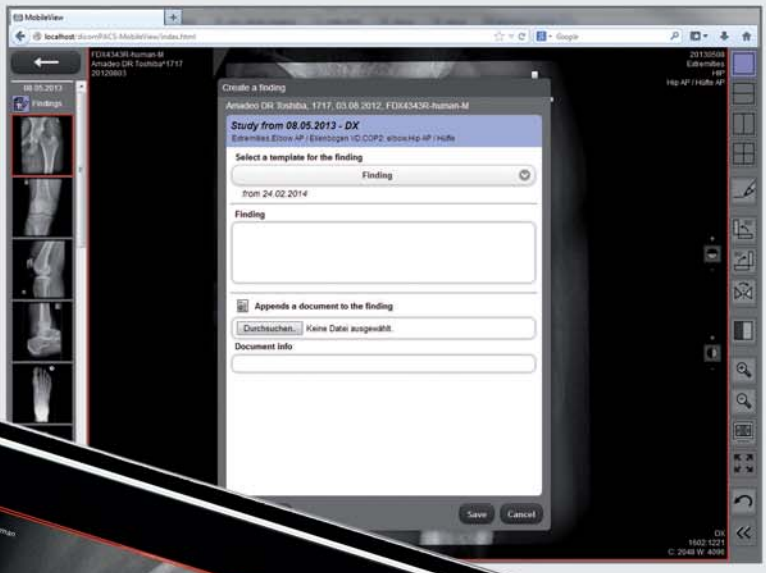
There are many applications. On-call hospital doctors can promptly make a first diagnostic thanks to ***dicom**PACS*®***MobileView***. This saves the patient a lot of time and additional visits. But also during a ward round, further treatment can be discussed together with the patient or colleagues directly at the bedside using a mobile device.

dicom**PACS*®MobileView*** can be installed in addition to existing ***dicom**PACS*® diagnostic modules (diagnostic workstations). It is irrelevant whether the ***dicom**PACS*®***MobileView*** software is used on a network PC (pure viewing workstation) or/ and on a mobile device.
Worldwide access to all image material is available via a network connection, e.g. VPN access via the internet, of the used mobile device to the central ***dicom**PACS*® system in the office or clinic.

The main advantages at a glance:

- High flexibility through the use within various internet browsers, including Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Safari, Safari for iPad and Android browser
- Intuitive operation
- Supports the multi-touch operating technology (e.g. zoom in and out with two-fingers)
- Supports full screen mode
- Allows accessing the ***dicom**PACS*®***DX-R*** or ***dicom**PACS*® database without any additional modules
- Allows playing series (e.g. ultrasound)
- High loading speed with modern streaming technology





Features of
dicom*PACS® *MobileView

The web based viewer offers an important range of functions of a professional PACS viewer:

- Draw annotations
- Measurements
- Registration of diagnostic findings
- Attach documents
- Draw lines and arrows (multi-coloured)
- Compare images in different grids
- Adjust brightness/ contrast
- Flip and rotate images
- Adjust brightness / contrast
- Invert, zoom in / out
- Full screen, fit image
- PAN
- Scroll through image series
- Cine loop for multi frame series and CT/ MRI
- Export images and documents
- Print images and documents

Cloud based

Cloud based telecommunication solution and data archiving for images, documents and diagnostic evaluations for stationary and mobile applications

Even for state of the art practices and hospitals, the rapidly rising data flood of digital images, diagnostic reports and other documents is becoming increasingly challenging. Current legislation demands safe and long term storage of patient data which generally requires investing in expensive hardware infrastructure as well as maintenance and corresponding staff costs.

To this end, we developed the ***ORCA*** Cloud archiving solution, thus paving the way for cost-effective and safe Cloud-based data archiving in practices and clinics. ***ORCA*** offers two application options:

- → **Archive function:** Safe, long term archiving of patient data with intelligent usage of internal databases
- → **Share function:** Communication platform (exchange of images and diagnostic reports) with colleagues and specialists or as an easy way to forward image data to patients (an alternative to creating patient CDs)

Data is **exclusively** archived on European servers with the relevant safety certificates.

Benefits of Cloud archiving with *ORCA*

Minimal expenditure: *ORCA* does not require investing in expensive infrastructure such as server and data cables.

Scalability: The amount of memory required when using ***ORCA*** is determined by the demand.

Long-term security: *ORCA* archives data on many individual European servers in professional and air-conditioned data centres. Server technology is continuously updated.

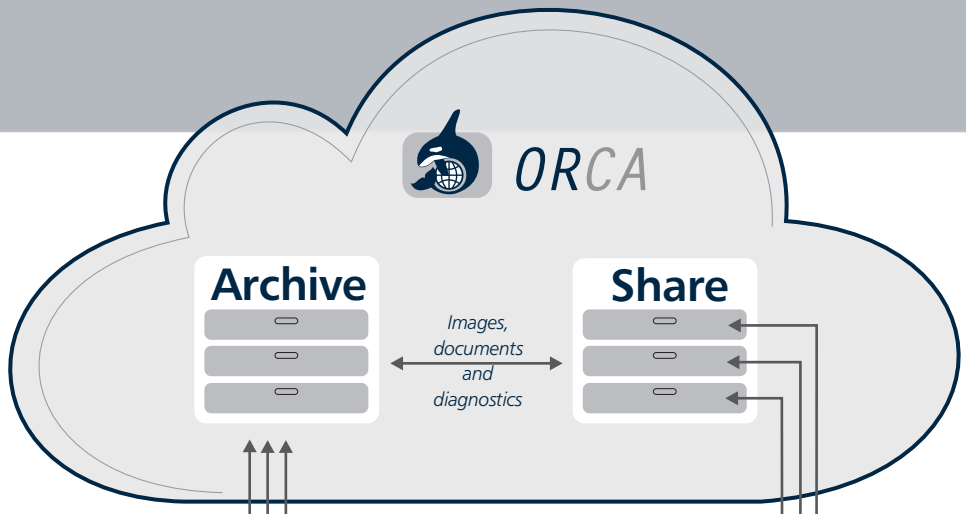
Accessibility: *ORCA* stands out by being highly accessible. Since data is saved with multiple redundancy, ***ORCA*** guarantees more continuity than a mere server solution.

Environmentally friendly: *ORCA* is sustainable – through the optimised use of resources and their distribution.

Location independent: *ORCA* guarantees access to archived patient data – worldwide.

Simplicity: *ORCA* allows easy access to data from any computer – from your workplace, from the comfort of your home or from any other computer or tablet PC.

Stress free: *ORCA* deals with everything – no need to struggle with loose network cables, removed hard drives or software problems.



„Archive" function

Safe long term archiving of patient data with intelligent use of professional data storage

Big and small hospitals, doctor's practices, medical centres and medical facilities on ships, oil platforms etc.

***dicom*PACS®** image management system

***dicom*PACS®** viewer Tablet-PC / Laptop

Images, documents and diagnostics

***dicom*PACS®** viewer home workstation

„Share" function

Communication platform for colleagues and specialists as well as an easy way to forward image data to patients

Colleagues

Referring physicians / patients

Password protected remote access via mobile or stationary devices

Diagnostic centres

Share functionality

1. Authorise access to a report in the cloud with the help of the integrated address book
2. Automatic e-mail notifications
3. Diagnosis by referring physicians, diagnostic centres, or colleagues (second opinion)
4. Automatic e-mail notification with diagnostic report transfer

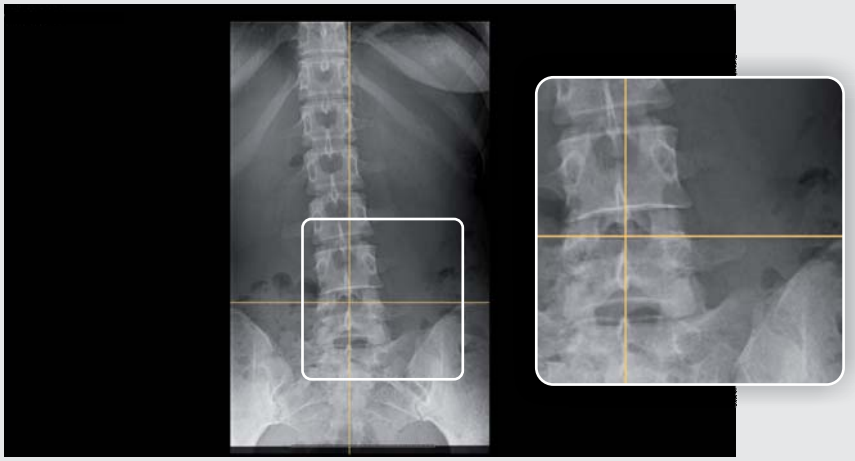
Special Chiro Tools

Diagnostic tools for optimal treatment

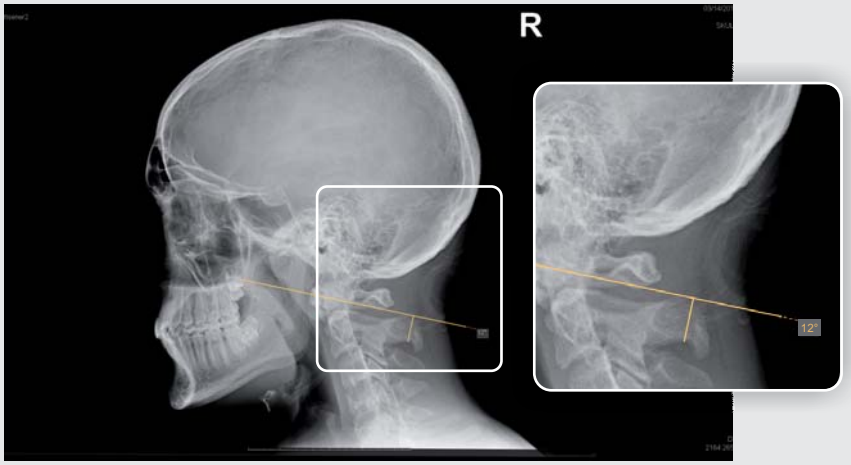
The Chiro Tools have been developed in cooperation with experts from the USA and Canada and offer great possibilities for diagnosing accurately as well as for planning further treatment. With these tools, automated center lines and points, defined curves, angle measurements etc., are generated after the manual selection of the points of interest.

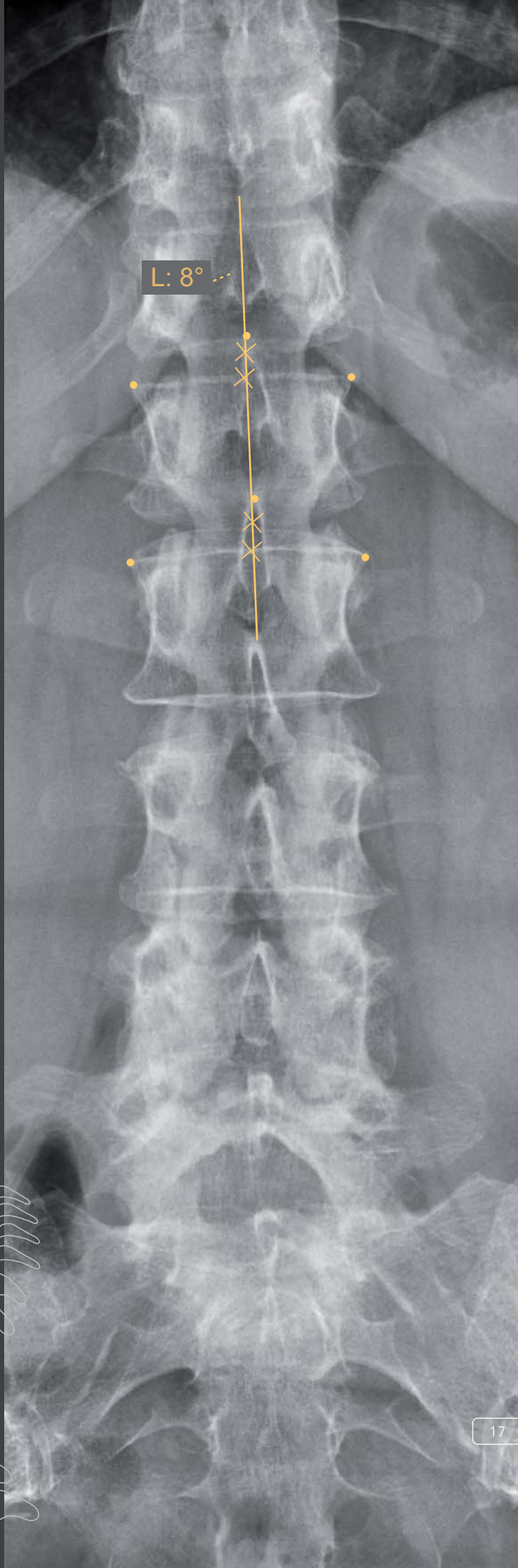
Of course all the standard tools (like distance measurement, angle and Cobb angle, mark spots etc.) are also included.

Axis line
The tool creates a vertical or horizontal axis, depending on the direction in which the mouse pointer is moved.



Orthogonal line
This tool is used to mark perpendicular lines on existing or yet to be drawn baselines. The divergence from the x/y-axis (nearer axis) is displayed by default.





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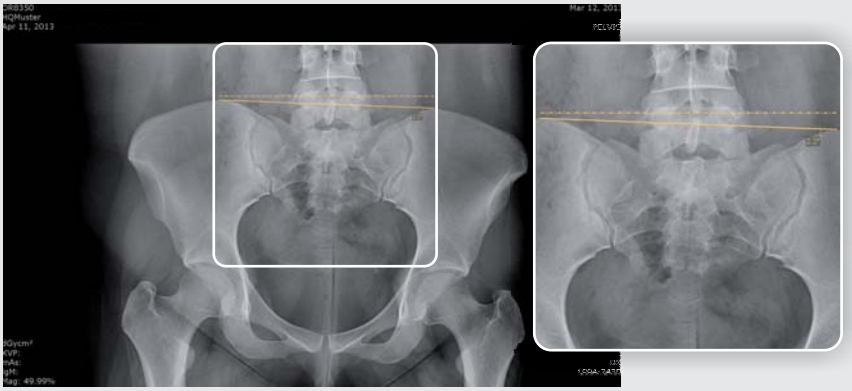
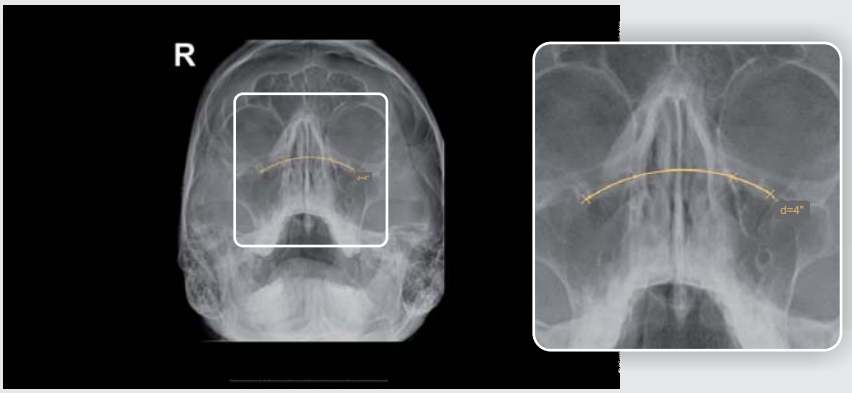
Chiro tools

George's line
This tool is used to draw vertical lines on each vertebra along the spine in a lateral view and to calculate their distances (in mm or inch).

Horizontal or vertical level
This tool calculates the horizontal or vertical level. By default the nearer axis is used for calculation.

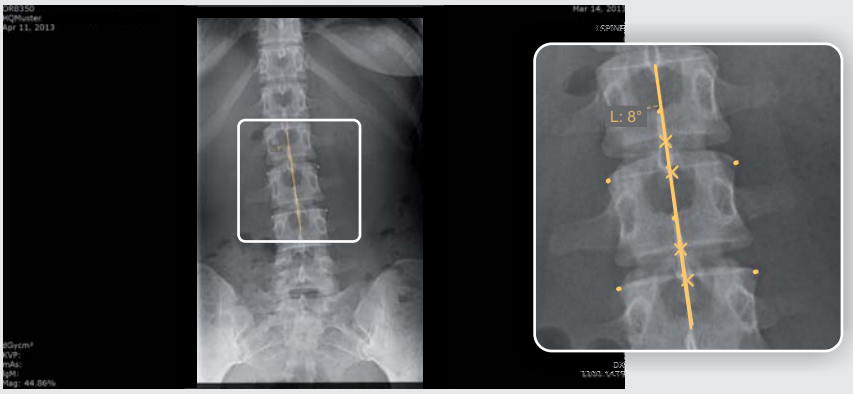


Circumscale
An arc is drawn through three defining points and the diameter of the corresponding circle is displayed by default.

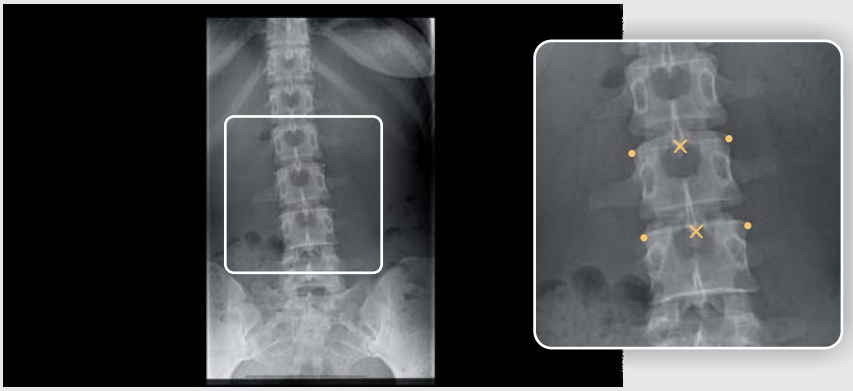


Spinal curve
This tool is used to draw an arc in the lateral view of the spine. The annotation uses a fixed radius set by default to 220 mm. Radius or degree can be adjusted manually.

Vertebrae line
This tool generates a vertical line of six points (2x3) along the spinal canal and displays the lateral divergence and side of laterality in degrees.

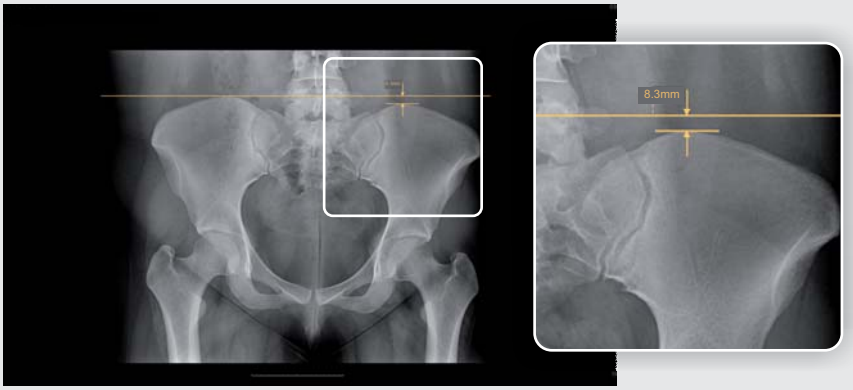


Center point
This tool calculates the center point between two points.



Distance comparison
This tool compares the distances between three set points (between point 1and point 2 and between point 2 and point 3) and shows the longer distance.

Pelvic obliquity
This tool is a measurement that is calculated automatically after two simple clicks which generate two horizontal lines showing the distance between these two parallels.

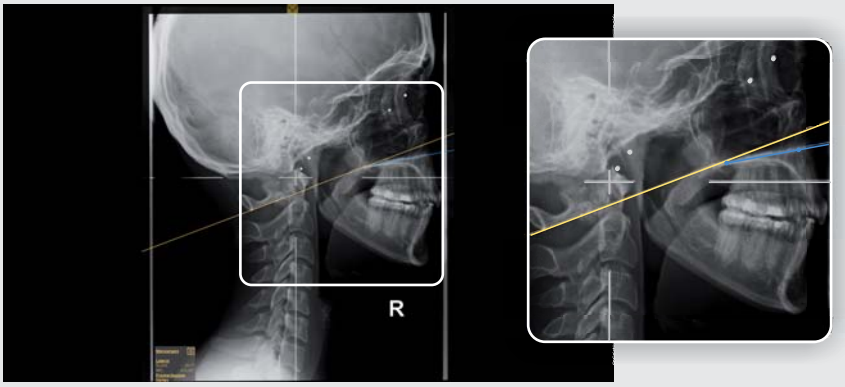


Special Tools

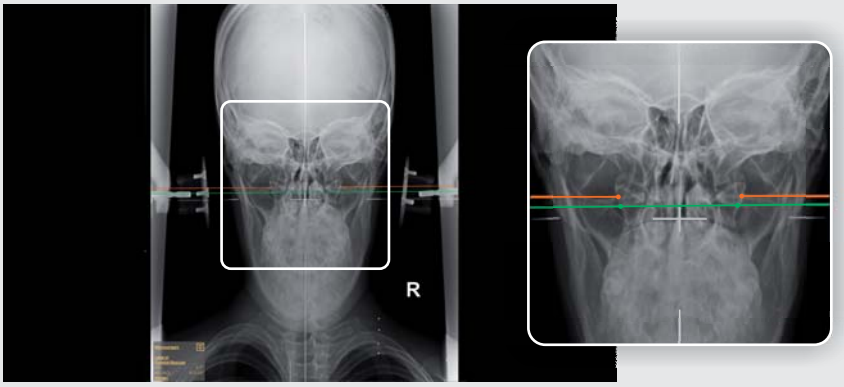
*dicom*PACS® Diagnostic tools for Upper Cervical Chiropractic

The Upper Cervical Chiropractic tool set has been created in cooperation with leading experts from the US and Canada. It offers a variety of ways to reach a fast and accurate diagnosis. Templates like the Cephalometer, Grid, Circumscale, and Relatoscope enable you to continue working as you are used to.

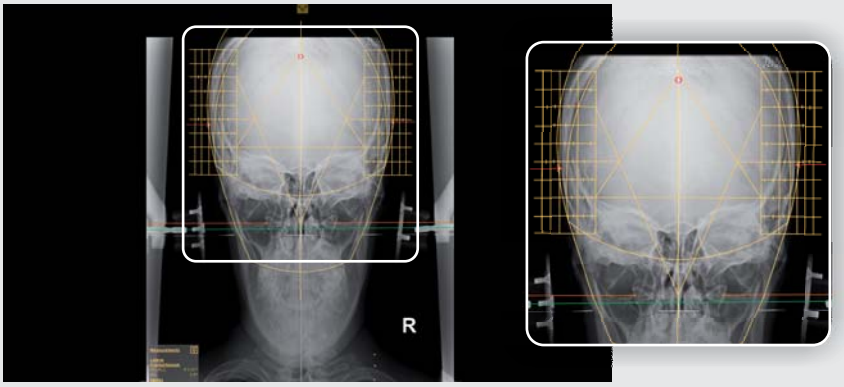
S-Line and Hard Palate Line and Raw Data Box
You simply set two points each on C1 and the hard palate to create the S-Line and the Hard Palate Line. We will show you the horizontal angles. All measured values will be shown in the raw data box. You can also show and hide values manually.

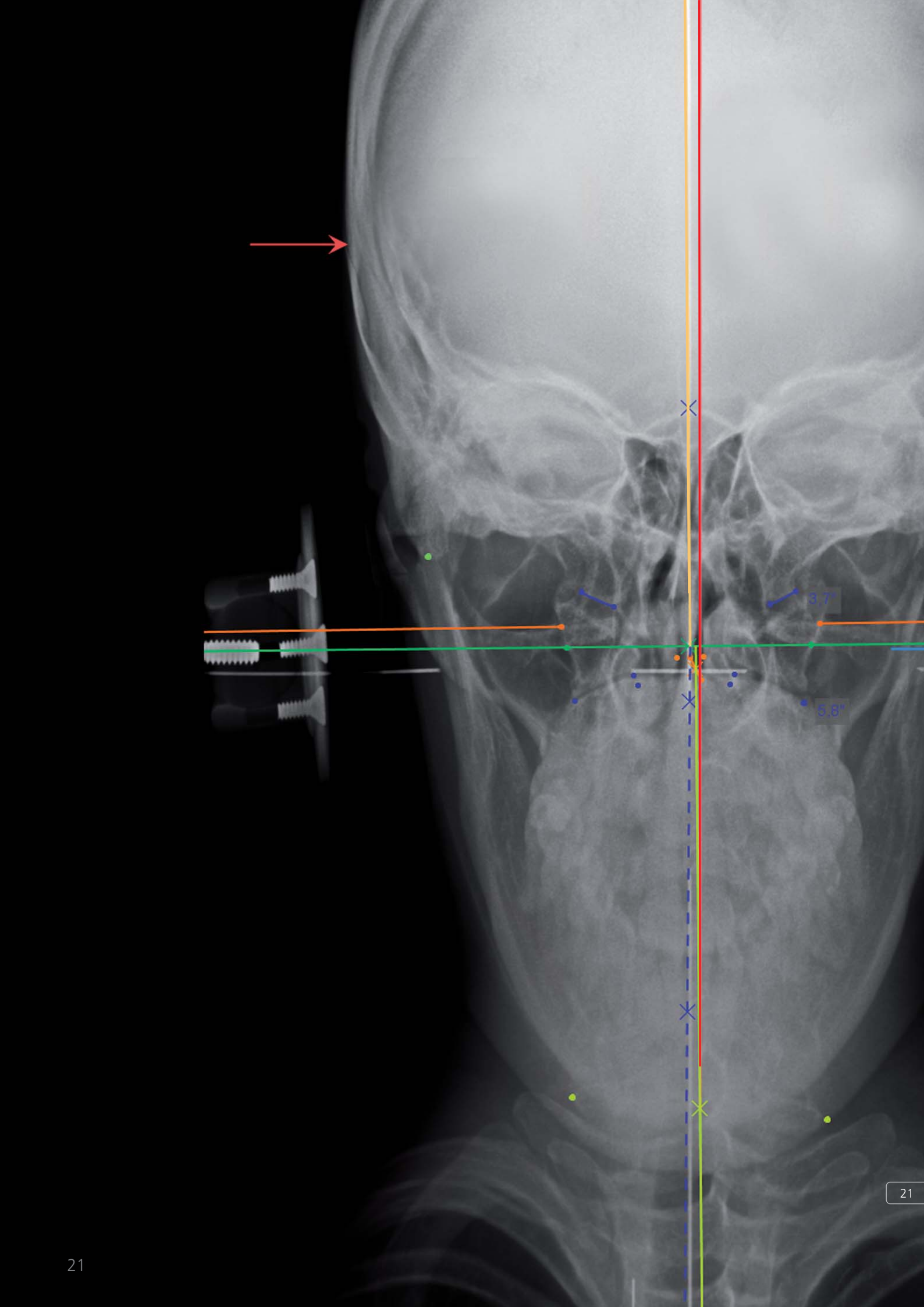


Atlas Plane Line and Atlas Check Line
The horizontal angle and the angle between Atlas Plane Line and Atlas Check Line will be shown in the raw data box.



Cephalometer and Central Skull Line
Use the Cephalometer to draw the Central Skull Line. Laterality and Skull Tippage will be calculated automatically. The Four Elements and Listing Information will be inserted and are completely editable.





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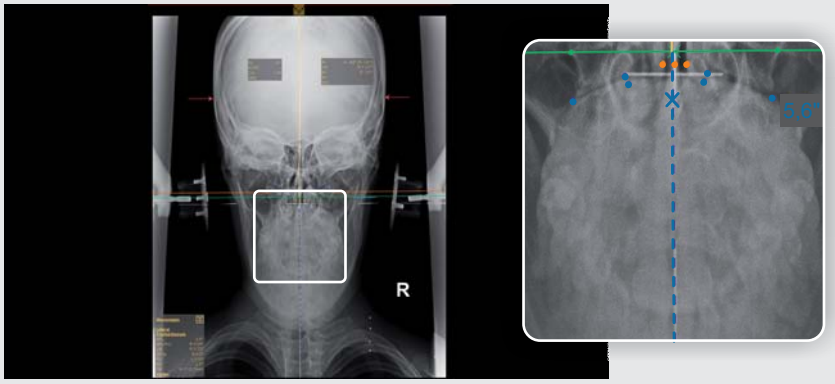
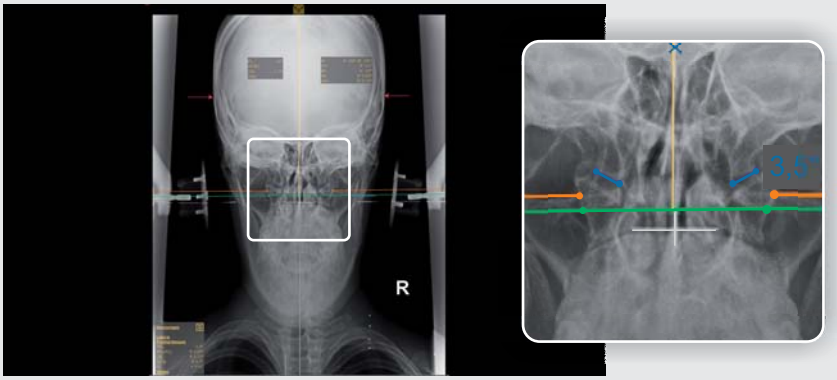
Diagnostic tools for Upper Cervical Chiropractic

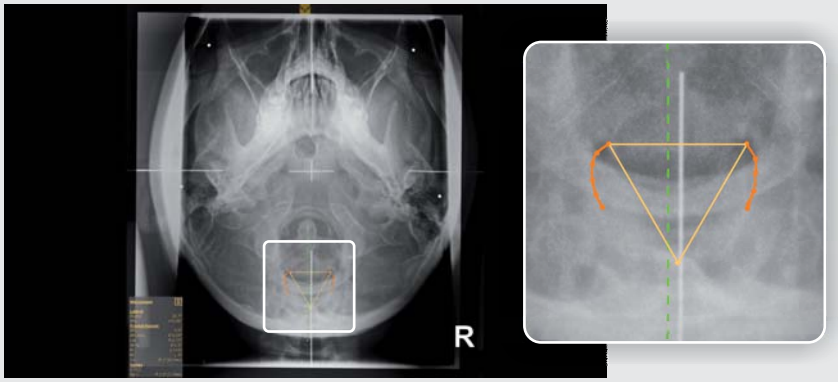
Axial Circle
The Body Center Line will be set automatically and the Axial Circle will be calculated and shown on the side of laterality. You can set the calculated measurement manually to the value you prefer.



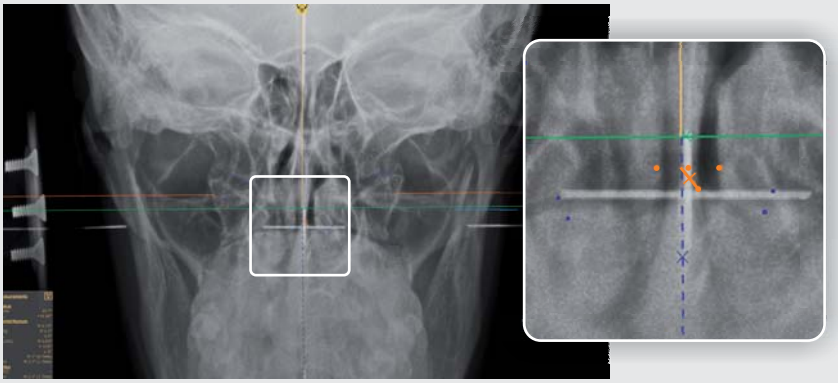
Condylar Circle
Choose between the three point and four point Condylar Circle. The middle point will be shown. You can set the calculated measurement manually to the value you prefer. The Relatoscope will use the shown value.



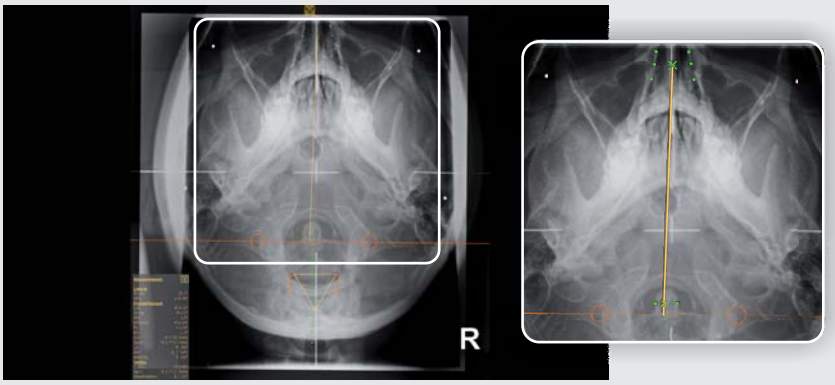
Odontoid Center and Vertex Square
Mark the lateral aspects of the dens and the Odontoid Center Line will be inserted. After marking the C2 canal, the Vertex Square will be inserted and the Spinous value will be calculated depending on the Condylar Circle.



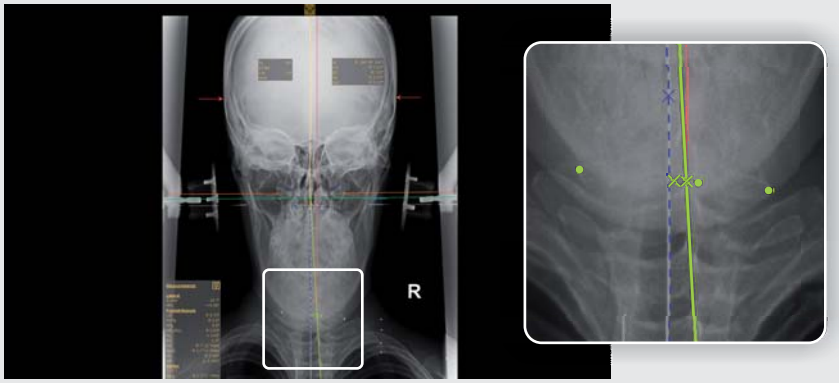
Odontoid, Spinous and Relatoscope
Use the Relatoscope to apply the Spinous value from Vertex to Nasium View. Mark the lateral aspects of the dens and the (corrected) Odontoid will be inserted automatically.



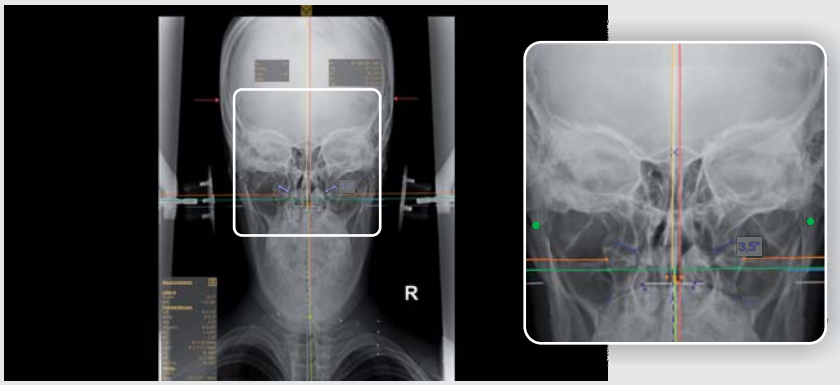
Vertex Skull Line
After marking the nasal structures, click the Inferior Point button. The point will be set automatically depending on the Listing Information value and the Vertex Skull Line will be inserted. Atlas Rotation will be calcuated.



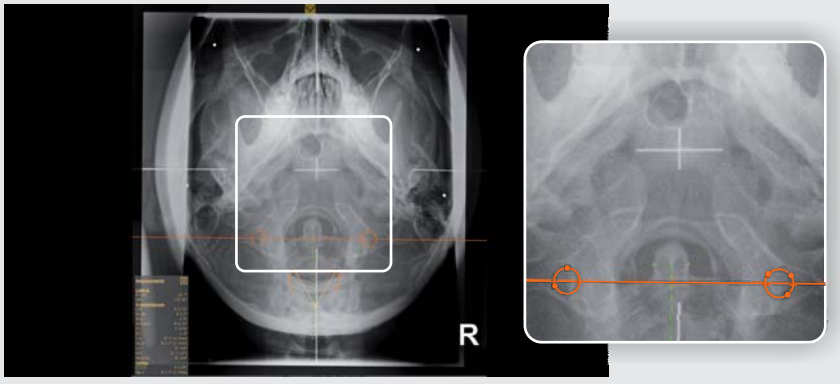
Lower Angle and Angular Rotation
The Lower Angle and Angular Rotation will be calculated automatically after setting the Inferior Point. You can also set a corrected Inferior Point.



Intermastoid Line
Mark the inferior tips of the mastoid processes. The measured value, its orthogonal divergence from the Central Skull Line, will also appear in the raw data box.



Vertex Atlas Line
After marking the transverse foramina of the atlas with three points each, we will draw the Vertex Atlas Line and show the convergence of C1 and C2.



Network

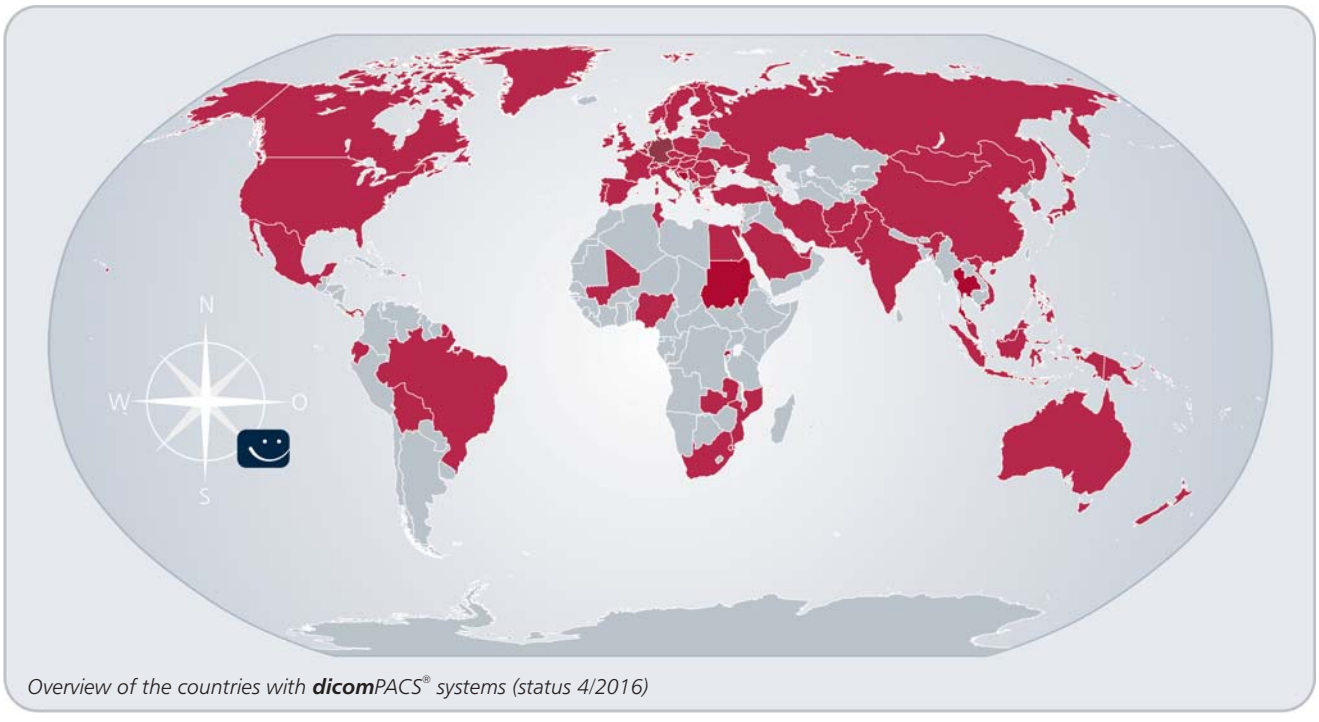
Global Competence

Our users come from all areas of medicine, particularly radiology, cardiology, orthopaedics and surgery. All of them work with our ***dicom***PACS® image processing system and they are very enthusiastic about its multi-faceted services.

However, it is not only the product that will satisfy you, but also the cooperation with a team that strives to treat their clients as partners. This attitude is necessary because we can only find the perfect solution together.

It is important that our clients can be sure that we will always do our best; but this works only if we approach even the smallest task with the highest possible concentration, while being as highly motivated as ever.

OR Technology has set up a global competence network of local partners who will provide quick assistance should any problems occur after installation. You, as our valued customer, are investing in a high quality product "made in Germany" while making use of the service and support provided by one of our qualified and authorised local partners.



*Overview of the countries with **dicom**PACS® systems (status 4/2016)*

Satisfied Customers

Reference Hospital Jekabpils, Latvia
Dr Igors Malikovs and Dr Ivars Zvidris

Extensive *dicom*PACS® installation at a Latvian hospital:
The hospital in Jekabpils, situated 150 km from the capital Riga, was completely refurbished during the past year and is now equipped with the most up to date technology in all departments. As many as five new operating theatres were established during the refurbishment process. The hospital boasts 350 beds and employs 65 doctors – seven doctors are on stand-by for 24-hour emergency service.

In the summer of 2009, OR Technology implemented the digitalisation of the X-ray department in cooperation with its Latvian distribution partner. A Siemens CT unit, three CR systems, three ultrasound units and two C-arm X-ray systems were integrated. The ***dicom***PACS® webserver controls image distribution via the intranet.

Dr Igors Malikovs, head of the radiology department, comments on digital X-ray imaging with *dicom*PACS®:
„We are very happy about changing over from analog to digital imaging in our department. Initially, we were a bit concerned about how this change over could be implemented without interfering too much with our daily work routine. Now that the system has been installed successfully, we know that this worry was unfounded. The entire change over was effected in a most professional way without us having to cancel any examinations.

The greatest benefit for us is the DICOM worklist integrated in the PACS and RIS. Now imaging requests can be sent from all of our three reception desks to the respective diagnostic unit – fast and easily, avoiding many mistakes that used to happen in the past.

In addition, we save costs since we don't have to print out images any more. Our printing volume now amounts to only 10 % of what it was previously."

Dr Igors Malikovs comments on the *dicom*PACS® Webserver:
„We use the webserver at 30 workstations in all our departments and at a few home offices. All the doctors who are involved in the evaluation of an examination or require access to the images, can keep themselves informed without delay.

In the past that could take up to several days. Calling up images via the webserver is so easy that some of our doctors use this access from home when they are on call-up. We've had emergencies when the radiologist was able to make a diagnosis from his home office within a few minutes. Prior to the change over, when X-ray images were only available on film, such fast evaluation was an impossibility."

The director of the hospital of Jekabpils, Dr Ivars Zvidris comments on the decision for *dicom*PACS®:
„The Latvian health system is currently experiencing great difficulties. In such difficult times it is essential for hospitals to be up to date in terms of technology. Our investment into digital X-ray imaging gives our hospital in Jekabpils the edge in a competitive market. An increase in diagnostic quality coupled with cost efficiency was of utmost importance for us. After having looked at various installations offered by other firms, we decided on OR Technology's ***dicom***PACS® and webserver solution. The comprehensive offer and the good price-performance ratio won us over."

Dr Igors Malikovs

Dr Ivars Zvidris

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Portfolio

Overview - products of OR Technology

Medici DR Systems

DR retrofits - digital upgrade set for existing X-ray systems incl. ***dicom**PACS®**DX-R*** acquisition software, also available for stationary and mobile X-ray machines

Leonardo DR Systems

DR suitcases - compact suitcase solutions for portable X-ray incl. ***dicom**PACS®**DX-R*** acquisition software

Amadeo X-ray Systems

Complete digital X-ray systems (incl. stand, bucky, generator, flat panel incl. ***dicom**PACS®**DX-R*** acquisition software etc.) as well as mobile and portable X-ray solutions

Divario CR Systems

CR solutions - CR systems for digital X-ray with cassettes incl. ***dicom**PACS®**DX-R*** acquisition software

X-ray Accessories

Accessories for X-ray
(e.g. radiation protection walls, gloves etc.)

dicomPACS®

Image management (PACS) - comprises acquisition, processing, diagnosis, transfer and archiving of image material

ORCA

Cloud-based archive solution - safe, long term archiving of patient data with intelligent usage of internal databases, communication platform with colleagues and specialists and transfer of image data to patients

dicomPACS® DX-R

X-ray Acquisition Software

X-ray acquisition software [only for OEMs] - acquisition and diagnostic software for X-ray images from flat panels or CR systems

OR Technology
Digital X-ray and
Imaging Solutions

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