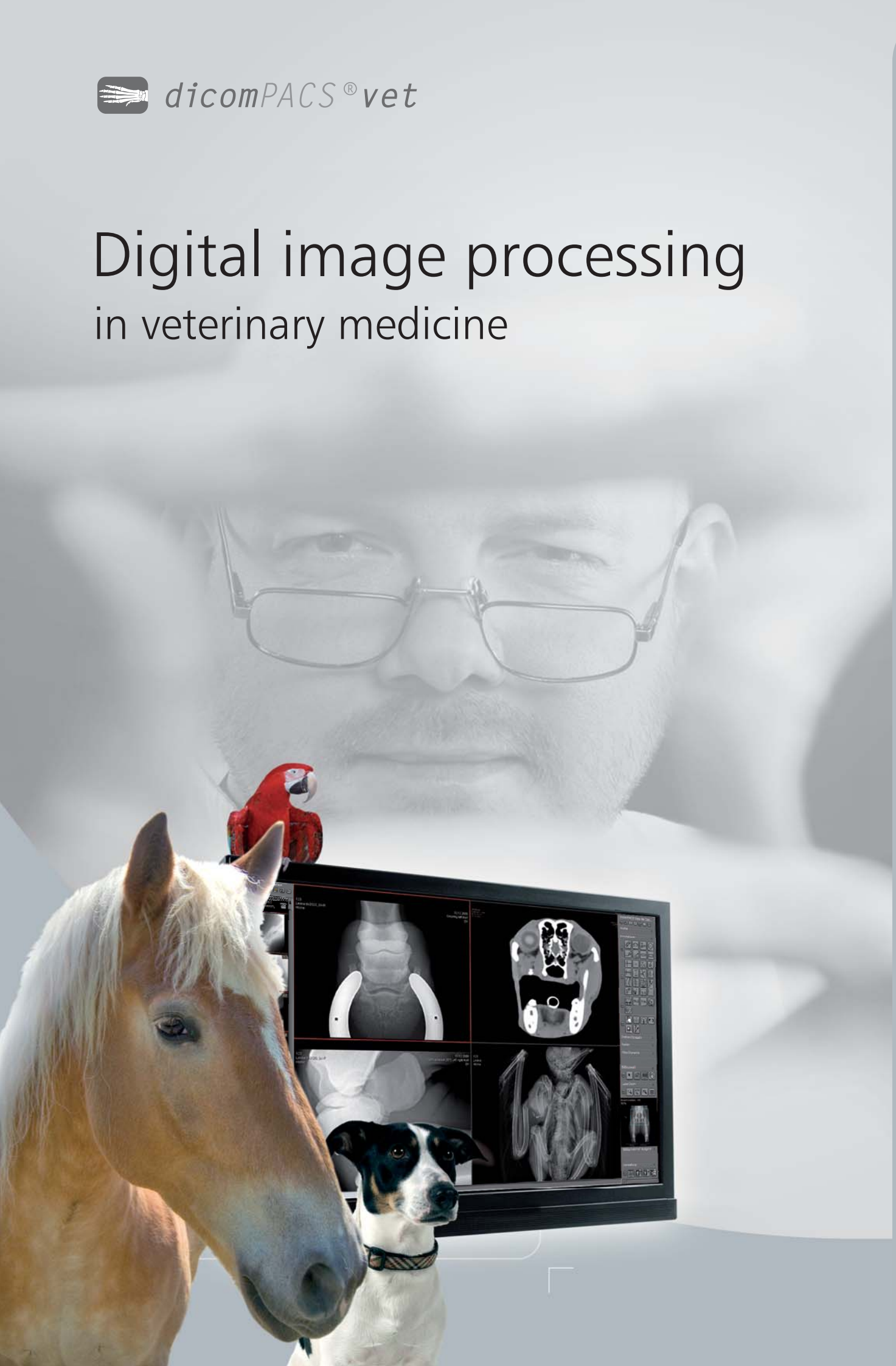
dicomPACS®vet

# Digital image processing
## in veterinary medicine



Digital image processing with **dicomPACS®vet**


Jan 01, 2013
HD/ED
PELVIS
100mm
74.7°/105.3°
A = 407mm²
DX
2924:2352
Praxis

dicomPACS®vet

# Professional image processing in veterinary medicine

***dicom**PACS®**vet*** will make your dream of a paperless veterinary practice come true. All images as well as any type of document (e.g. diagnostic reports, records of healing processes, faxes) are stored by ***dicom**PACS®**vet*** in a digital patient file and can be accessed immediately with a simple mouse click.

Well designed archiving and backup solutions guarantee fast access to all data while observing the highest security standards in accordance with the internationally recognised guidelines for human medicine. In addition, ***dicom**PACS®**vet*** can be integrated easily with all the popular practice management systems.

The ***dicom**PACS®**vet*** software includes acquisition, diagnosis, transfer and archiving of image material. Since it has been designed and developed in close cooperation with practising vets, you will find it easy to operate and well suited to daily diagnosis.

Boasting several thousands installed workstations locally and abroad (as of March 2013), the system has proven itself many times over. ***dicom**PACS®**vet*** handles simple image processing requirements as brilliantly as complex radiological networks.

Digital image processing with ***dicom**PACS®**vet***

# Benefits

## of ***dicom****PACS*® at one glance

- Full diagnostic software for all workstations in your practice (no 'light' versions)
- User friendly and clearly arranged structure, minimal training requirements and short familiarisation period
- Individual adjustment of the user interface to your field of specialisation and individual requirements
- Flexible allocation of shortcut keys for many functions to allow fast work without a mouse
- Parallel processing (e.g. option to continue working during a CD burning process)
- Permanent online availability of all images and data in the network – no need to store old images on CDs
- "Perfect memory" – re-opening of images with all previous markings and settings incl. zoom and orientation
- Parallel diagnostic evaluation of several patients made possible by opening any number of programme windows without loss of speed - depending on the size of the working memory
- Import of any external documents such as doctors' letters, faxes or X-ray images – no additional module required
- Installation with Windows, UNIX, LINUX or Apple Macintosh
- Optimal data security, speed and compatibility by using standardised SQL database technology
- All images and documents are filed in the international DICOM standard at all times


Boasting several thousand installed workstations locally and abroad (as of April 2014), the system has proven itself many times over.

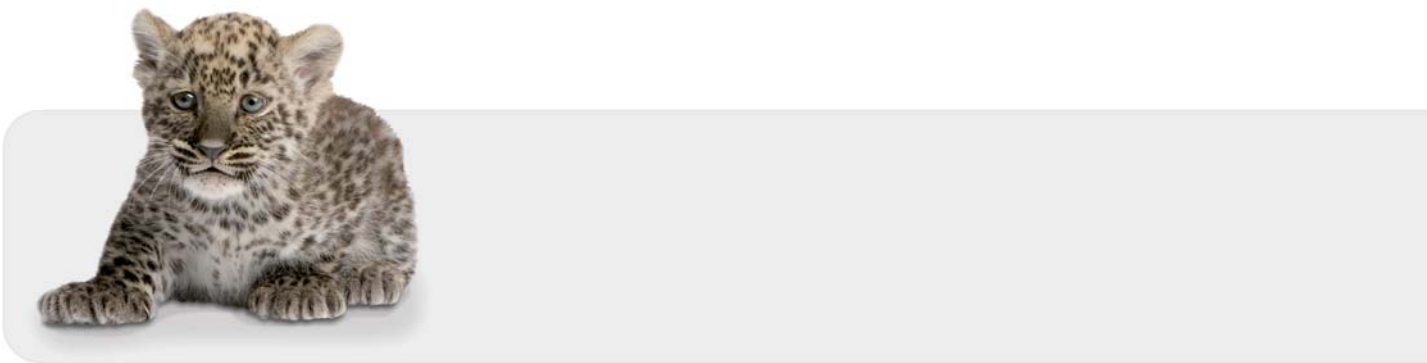
# Services offered

## Integrated modules and tools

Perfect integration of all imaging devices into your existing computer network is an important condition for a smooth and reliable workflow. Apart from X-ray systems, a wide range of devices including ultrasound, endoscopy, fluoroscopy, CT and MRI systems as well as digital cameras can be connected.

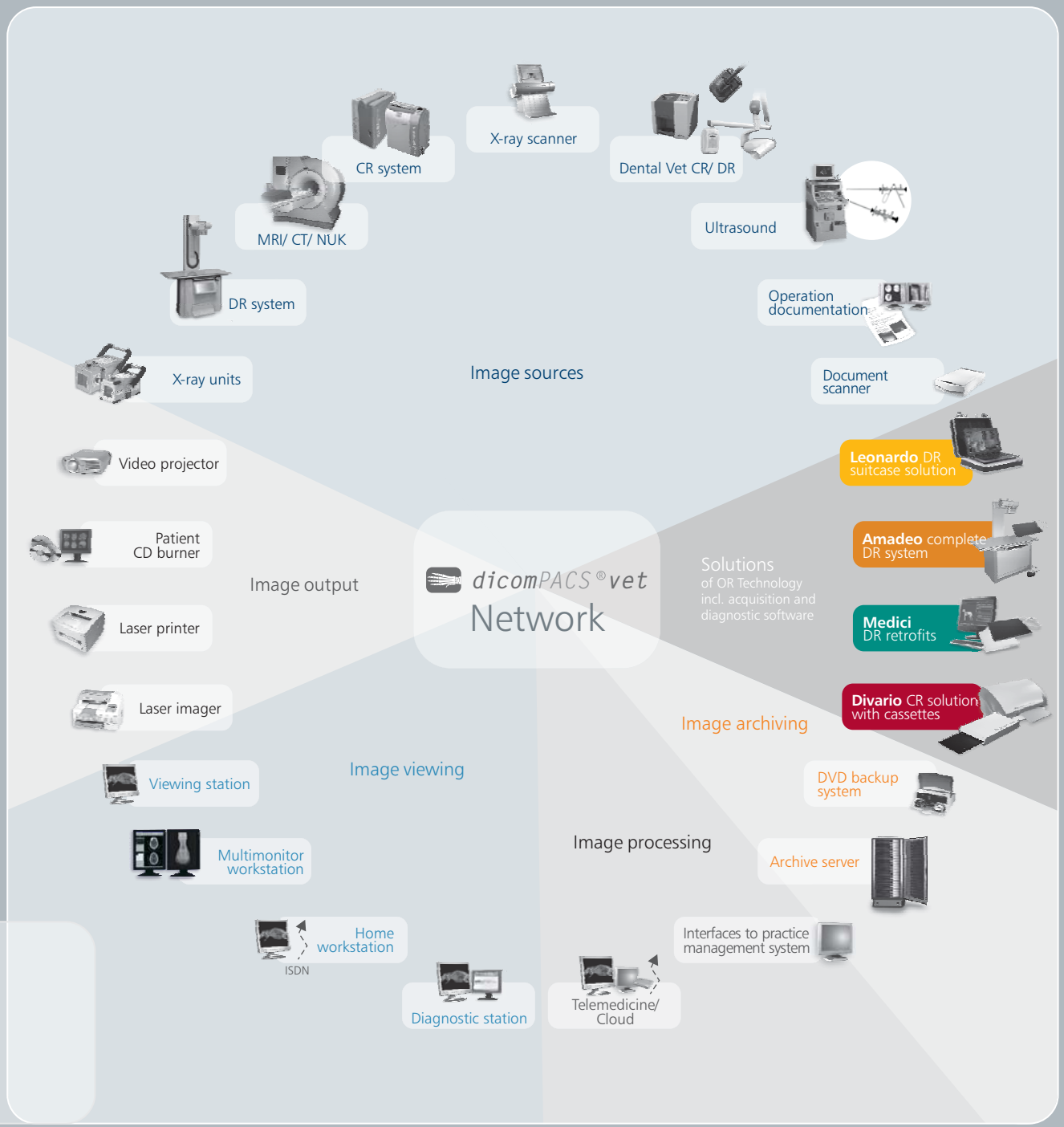
In addition to imaging devices, you can also store documents such as faxes and letters digitally in the digital patient file of your practice management system. With ***dicom****PACS*®***vet***, all data is immediately available and can even be easily forwarded on request.

Continuous documentation and access to data over a period of many years is only possible as a result of optimal integration of all information on your animal patient.



# Connectivity

## The diversity of *dicomPACS®vet*



# Value

## ***dicom****PACS*®***vet*** features

**Prosthesis documentation** - enables the user to plan operations with digital prosthesis templates by one or more manufacturers
→ see page 18/ 19

**Report module for X-ray services relating to equine prepurchase examinations** [currently only available for Germany] - enables the quick compilation of reports by automatically assembling X-ray images. It follows the "X-ray guideline" by the German organisations "Gesellschaft für Pferdemedizin e.V." (non-profit organisation for equine medicine) and "Bundestierärzte-kammer e.V." (Federal association of veterinarians).
→ see page 8 - 11

**Special filter for the optimization of bones and soft parts** - details of interest may be made visible by means of special filter magnifiers

**TPLO measuring function** (Tibial Plateau Leveling Osteotomy) - it serves to theoretically optimise the existing slope of the tibial plateau in domestic dogs
→ see page 18/ 19

**TTA measuring tool** (Tibial Tuberosity Advancement) - the TTA measuring technique is used to apply the translated length measurements at the tuberositas tibiae in dogs
→ see page 18/ 19

**HD measuring technique for dogs** - ***dicom****PACS*®***vet*** provides a special tool to guarantee very fast and reliable determination of the Norberg angle, including documentation
→ see page 18/ 19

**Measuring the distraction index** - This measuring tool serves to determine the displacement of the femoral head from the joint socket of the hip joint in dogs
→ see page 18/ 19

**Buchanan's Vertebral Heart Score** - This annotation is a simple and reliable method to determine the size of the heart - it has been desiged specifically for cats and dogs
→ see page 18/ 19

**Modified Maquet Procedure (MMP) -** The MMP is a method of measurement for dogs with a cruciate ligament disorder, in which the distance for the placement of the MMP Wedge is determined.
→ see page 18/19

**Statistics Module** - enables freely configurable analysis of the complete database

**Video Modules** - enable standard and non-standard video signals to be recorded as single images and video sequences

**Web Server** - enables image distribution within the hospital or to referring doctors via the internet and guarantees very fast image accessibility in original quality (DICOM)
→ see page 14

**Processing of CT and MRI series** - ***dicom****PACS*®***vet*** includes professional tools such as MPR and MIP to evaluate cross section series
→ see page 16/ 17

**Telemedicine & Hanging protocols**

**Special solution for multiple archives**

**Cloud archiving**
→ see page 15




# Report module

## for X-ray services relating to equine prepurchase examinations

[currently only available for Germany]

Presale and prepurchase examinations for horses are always particularly challenging for veterinarians. Such specialised examinations must be

- carried out swiftly yet very meticulously
- documented very well, in great detail and extremely consistently.

After all, the owner of the animal justifiably expects optimal service when it comes to undertaking the examination and presenting the results in a professional and comprehensible fashion. Since administrative work is bothersome yet vital for veterinarians, too, we have developed a report module specifically for X-ray services relating to prepurchase examinations in cooperation with renowned specialists.

This module enables the quick compilation of reports by automatically assembling X-ray images. It follows the "X-ray guideline" by the German organisations "Gesellschaft für Pferdemedizin e.V." (non-profit organsation for equine medicine) and "Bundestierärztekammer e.V." (Federal association of veterinarians).

Benefits:

**Time-saving:**
The ***dicom****PACS*®***vet*** prepurchase examination report module allows very fast and professional preparation of reports on the prepurchase examination, including perfect layout and documentation in ***dicom****PACS*®***vet***.

**Easy to follow:**
***dicom****PACS*®***vet*** guarantees complete implementation of the wording and the structure of diagnostic reports in accordance with the "Guideline for pre-purchase X-ray examinations" by the German "Gesellschaft für Pferdemedizin e.V." and "Bundestierärztekammer e.V.". The texts can be easily edited and included in the report to be compiled.

**Reports with images:**
The required X-ray images, including all modifications such as zoom, measurements and annotations, and are automatically added to the respective diagnosis (e.g. fetlock joint) for documentation in the prepurchase report. The layout is automatically compiled (page breaks, image positioning etc.)

**Safe:**
The complete report (WYSIWYG principle) is automatically stored with the X-ray images. Of course, these reports are also available for patient CDs. This guarantees that images and reports are always kept together.

**Presentation:**
***dicom****PACS*®***vet*** is a professional marketing tool for referring doctors.

Equine Clinic Cardiff

Dr John Sample
Dr Harriet McConnor
Veterinarian specializing in horses

## X-ray protocol for prepurchase examinations

Owner: Joe Bloggs
Name of horse: Demo horse, *01.04.1998
UELN number: 013412

Prepurchase examination number: PE-4163786
**Overall evaluation: II - III**


| Limbs | Projection | Grade |
|---|---|---|
| Left front | Foot 90° | II - III |

1.4.1: measured at right angle/ middle of Pedal bone < 1,5 cm - 2 cm; 1.7.5: longitudinal-oval opacity with different interpretation

Image: 1002 (I_00010267_S1_0002.dcm)


| Limbs | Projection | Grade |
|---|---|---|
| Left front | Oxspring 0° | II - III |

2.2.4: contour margo solearis - irregular ; 2.3.3: aligned - difference left from right

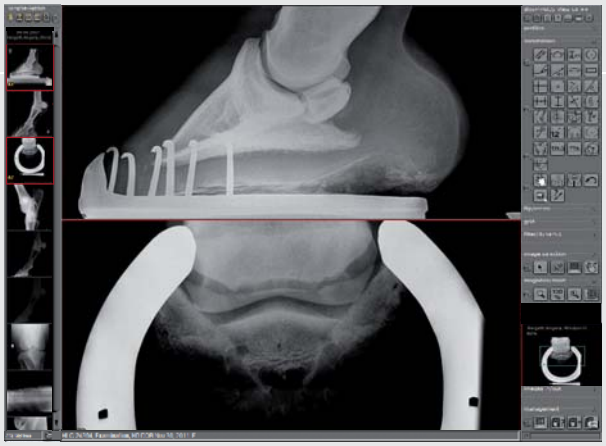
Image: 1004 (I_00010267_S1_0007.dcm)

Size 1

X-ray protocol

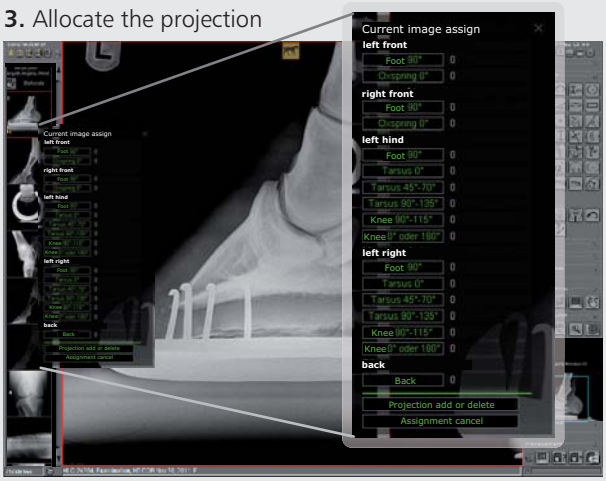
# Workflow for a prepurchase horse examination

**1.** Call up the examination



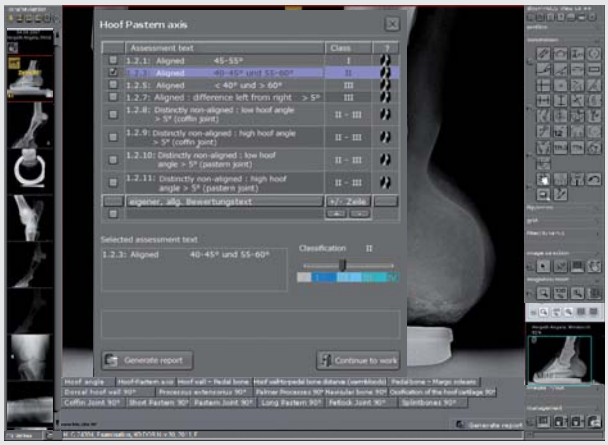
**2.** Start report module

**3.** Allocate the projection

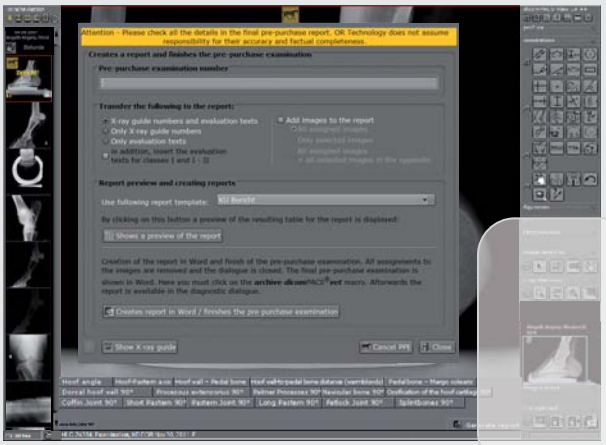



**4.** Display diagnostic report options

**5.** Diagnostic report/ evaluation




**6.** Report preparation




By means of a single click, the completed prepurchase examination report is stored together with the examination images in ***dicom**PACS®**vet***, where it can be accessed again in the original version at any point in time.

# MobileView

## Browser-based viewer ***dicom**PACS*®***MobileView*** for mobile devices

***dicom**PACS*®***MobileView*** is a web-based viewer, that contains all the basic functions for viewing images. The viewing can take place virtually independent from the browser on mobile devices, such as an iPad. ***dicom**PACS*®***MobileView*** offers doctors and nursing staff a previously unknown, mobile freedom in the workplace inside and outside of hospitals or practices, with the radiological image material available at all times.

**Fields of application of *dicom**PACS*®*MobileView***

***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.

**Licensing model**

***dicom**PACS*®***MobileView*** is used on a concurrent user licensing model. This means that the number of concurrent users is pre-defined.

**Features:**

- Drawing of annotation
- Performance of measurements
- Registration of diagnostic findings
- Drawing Lines and Arrows (multi-colored)
- Image comparison by choosing different grids
- 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


**The main advantages below at a glance:**

- High flexibility through the use within various internet browsers, including Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Safari 5, 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
- Uses concurrent user licenses

# Cloud-based

## Digital access and archiving of images and diagnostic reports via intranet and internet

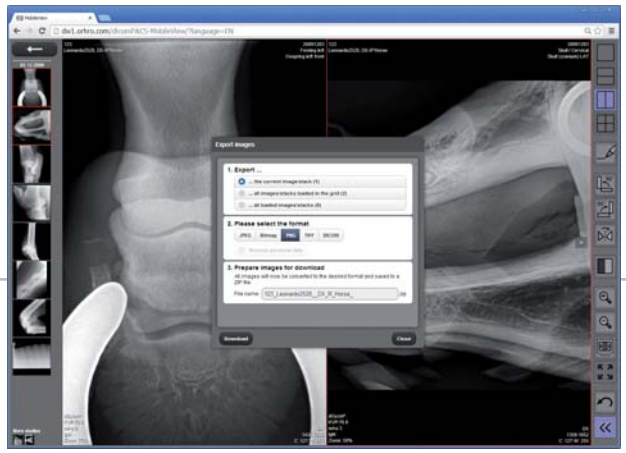
**Web server for internal image sharing and external distribution to referring doctors**

Making images available via the internet (or intranet) is an increasingly important daily requirement in the medical practice. One purpose is the distribution of images or other documents in a larger clinic. Equally important is the integration of external referring parties (hospitals, medical practices) or home workstations.

The intention is always the same: faster, cheaper downloading of archived images and diagnoses via the internet or intranet (also via slow internet connections), in diagnostic quality if possible, to every clinic or internet PC. The use of older PCs, thin clients or terminal servers must also be made possible.

To accommodate as many requests as possible from the medical practice and hospital, we have developed our ***dicom**PACS*® Web Server in cooperation with respected doctors.

Web viewer



Web viewer with image export tool

**ORCA - the Cloud-based archive solution by OR Technology**

Even for state-of-the-art veterinary clinics and other veterinary facilities, 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 big veterinary practices and clinics. ***ORCA*** offers two application options:

→ Safe, long-term archiving of patient data with intelligent usage of internal databases
→ 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 through *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 place of work, from the comfort of your home or from any other computer or tablet PC.

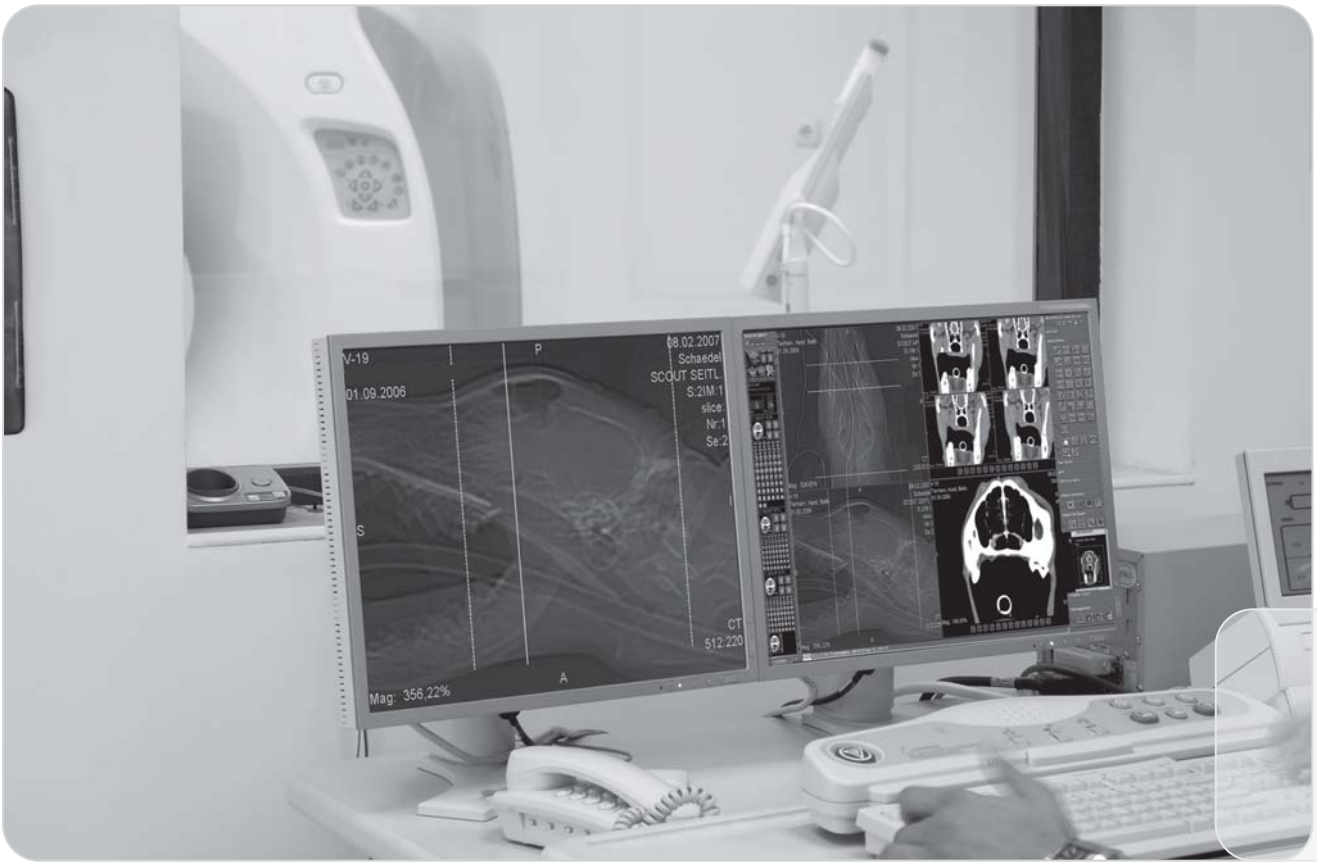
**Stress-free:** ***ORCA*** deals with everything – no need to struggle with loose network cables, removed hard drives or software problems.

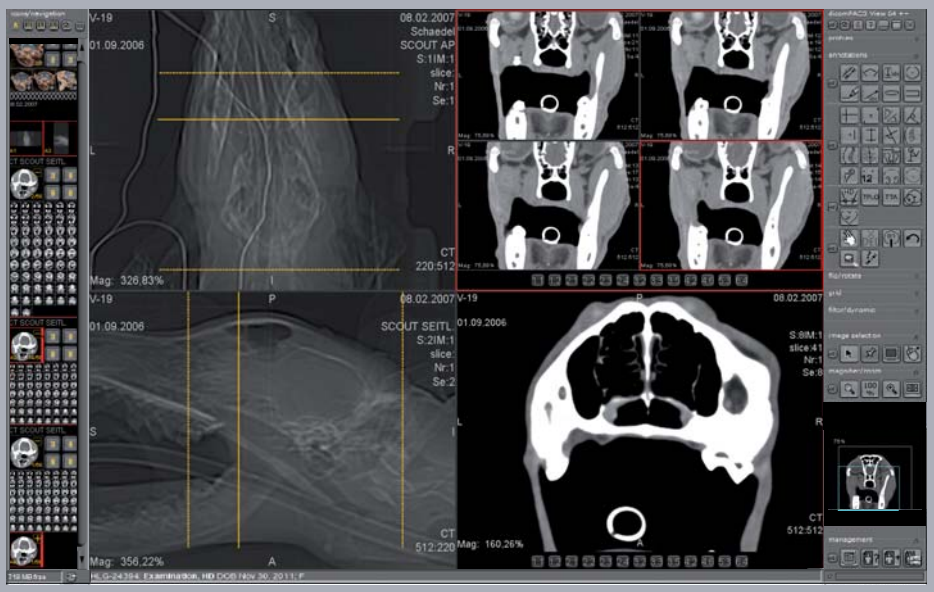
# Cross section

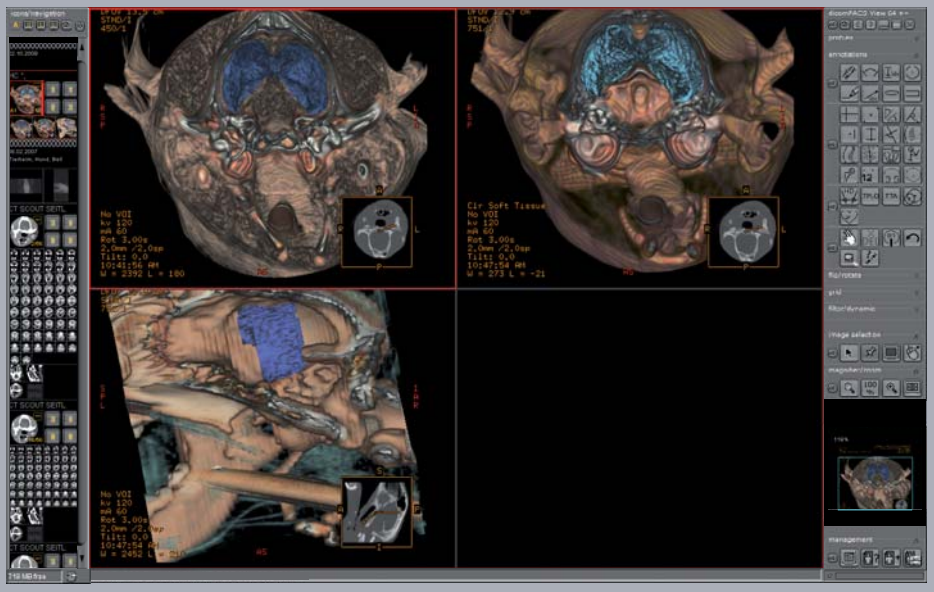
## Administration and diagnostic

***dicom**PACS®**vet*** includes all the necessary tools for the professional diagnostic evaluation of slices, such as CT or MRI. Functions like hanging protocols, cine loop, manual scrolling through series, and the visualisation of current and delimiting outlines allow the user to work fast and professionally.

The MPR (multi-planar reconstruction) and MIP (maximum intensity projection) functions offer the doctor increased options.







# Features

## Special functions for digital X-ray imaging

Digital X-ray images have the advantage that exact measurements can be taken at the monitor and the image quality can be improved by a number of manipulations. ***dicom****PACS*®***vet*** now offers some special functions.

**Modified Maquet Procedure (MMP)**
The MMP (Modified Maquet Procedure) is a method of measurement for dogs with a cruciate ligament disorder, in which the distance for the placement of the MMP Wedge is determined.

**Pre-operative planning with the prosthesis documentation module**
This module allows the user to plan and document an operation. After activating this function, the active image is displayed in its original film-identical size. The prosthesis template is displayed in the image as an annotation, or the existing prosthesis template films are overlaid on the monitor.

**TTA (Tibial Tuberosity Advancement) measuring tool**
The TTA measuring technique is used to apply the translated length measurements at the tuberositas tibiae in dogs.

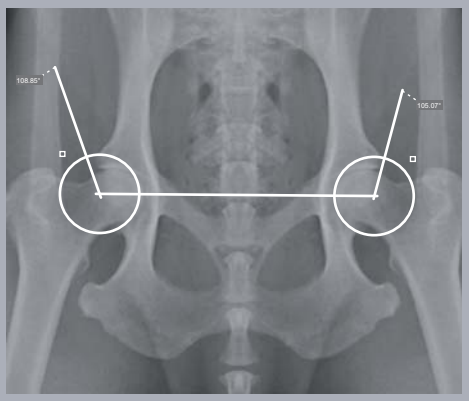
**HD measuring technique for dogs**
***dicom****PACS*®***vet*** provides a special tool to guarantee very fast and reliable determination of the Norberg angle, including documentation. One click suffices to insert all relevant lines and angles into the image, where they can then be positioned as required.

**TPLO (Tibial Plateau Leveling Osteotomy) measuring tool**
It serves to theoretically optimise the existing slope of the tibial plateau in domestic dogs.

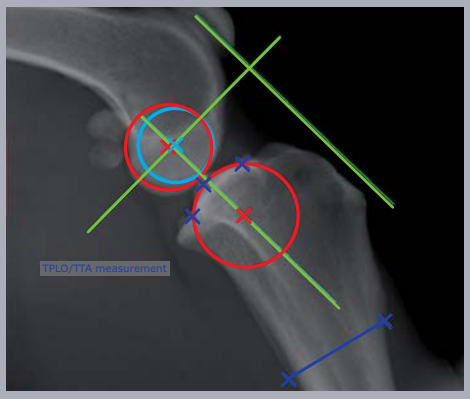
**Measuring the distraction index**
This measuring tool serves to determine the displacement of the femoral head from the joint socket of the hip joint in dogs.

**Buchanan's Vertebral Heart Score**
This annotation is a simple and reliable method to determine the size of the heart. It has been designed specifically for cats and dogs. The height and width of the heart are put into relation to the individual animal's vertebral body width. Therefore, racial distinctions are brought to bear on the examinations results.

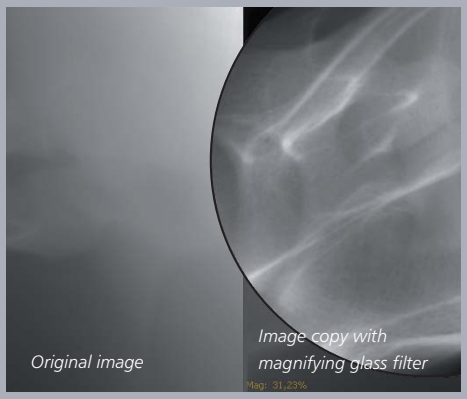
MMP (Modified Maquet Procedure)



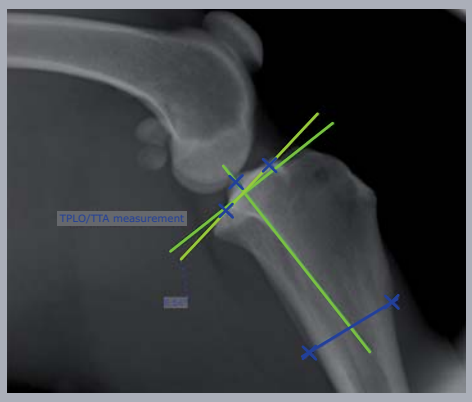
HD measuring technique for dogs



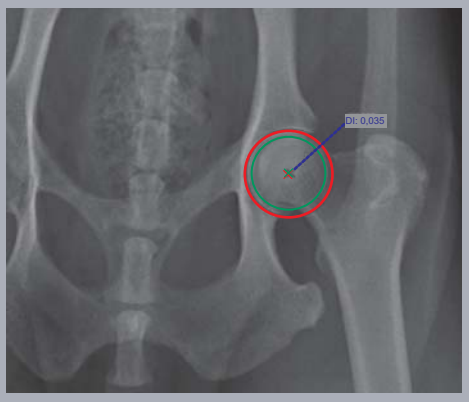

TTA measuring tool



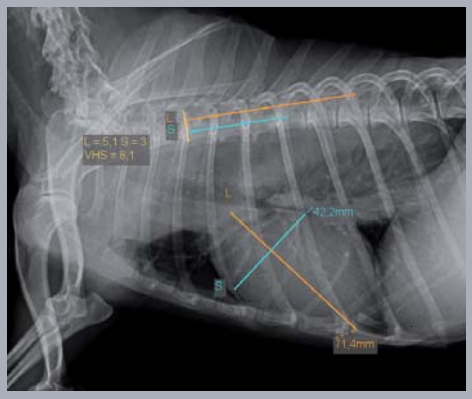

Special filter for the optimization of bones and soft parts




TPLO measuring tool




Measuring the distraction index




Buchanan's Vertebral Heart Score

Integrated prosthesis documentation module

# Integration

## Seamless integration with the administration software

Only an optimal interface guarantees perfect networking of all systems such as the integration of the image archive with the specific administration software. With a single mouse click you have immediate access to patient data to prepare an imaging request or to load archive images.

***dicom**PACS®**vet*** is well designed, sophisticated and flexible. It can be integrated easily with any veterinary administration programme.

### Basic functions

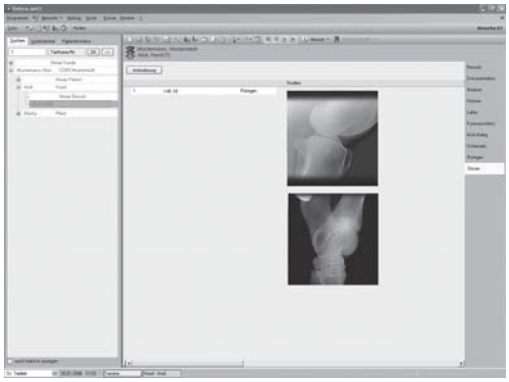
The way we configure an interface in detail so that everything works perfectly depends on the existing administration system. We would like to present three examples of frequently used functions below:

**Example 1:** Patient data is made directly available from the index card for the examination instruction for e.g. a digital X-ray, MRI or similar.

**Example 2:** The examination instruction is allocated to the digital patient register of that particular patient, where it is stored and archived.

**Example 3:** The archived data - X-rays or documents - is called up directly from the patient register. You can proceed as you wish, directly choose a particular image or document, or decide on a specific selection, e.g. the last week's exposures or just the ultrasound exposures of a patient.

However you want to proceed, you can be sure that it will work, because we have already successfully integrated ***dicom**PACS®**vet*** into many administration systems.



Connection - example Vetera

Connection - example AVImark

# Satisfied Customers

## ***dicom**PACS®**vet*** in veterinary practice and hospital

**Equine Clinic Burg Müggenhausen, Germany, Dr Thomas Weinberger:**
"The prepurchase examination module of ***dicom**PACS®**vet*** proves to be a great help with X-ray examinations and diagnostic ... This tool provides an enormous reduction in work and liability risks. Moreover, it is great that the current X-ray Code of Practice (German X-ray guide 07) is provided ... Overall, we wish to repeat that we are very happy with the investment and the changeover to ***dicom**PACS®**vet***."

**Laboratory for Radiology and Ultrasonography of the University of Life Sciences in Lublin, Poland, Dr Renata Komsta:**
„... The ***dicom**PACS®**vet*** image management software ensures that all images are automatically filed and can be found easily. Using analog technology, archiving of images was not that easy and we often spent a long time looking for a specific image in the archive. Special measuring functions of the software (allowing length, angle and other measurements) as well as digital image quality are an enormous improvement to our diagnostic options, which is extremely beneficial to our research work. We are highly content with the **Medici** DR system including the ***dicom**PACS®**vet*** software and we can recommend it without any reservations to all veterinarians."

**Dierenkliniek Kerkelanden, Hilversum, Netherlands, veterinarian Dr Erik Schurer:**
"Due to high-speed image creation and improved image quality it is now much easier for us to come to a diagnosis. ... We have the option to improve the image quality and we can try out a variety of image processing tools such as contrast/ exposure and window leveling. In addition, a professional image quality also contributes decisively to customer satisfaction and customer loyalty. It is now possible to capture an image spontaneously during an appointment and prepare a diagnostic report immediately thereafter. The new X-ray system has therefore allowed us to increase our diagnostic options considerably", says Dr. Schurer expressing his satisfaction ...

**Equine Center „Centro de Diagnóstico e Terapia Equina" in Sao Paulo, Brazil, Dr. Fernanda Manzano de Campos:**
"We are also very satisfied with the ***dicom**PACS®**vet*** image management system. The images are archived, we can take measurements and send images via e-mail. It is also easy to operate. All in all, we are delighted with the system by OR Technology"

*Dr Thomas Weinberger*


*Assistant Anna Lojszczyk-Szczepaniak*

*Dr Erik Schurer*

*Dr Manzano de Campos, Equine Center „Centro de Diagnóstico e Terapia Equina"*

*You can find the extensive references here*
*www.or-technology.com --> Veterinary medicine --> References*

Version 002_04_2014

# **Vet** portfolio

## Overview - products of OR Technology

**Medici DR Systems *vet***

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

**Leonardo DR Systems *vet***

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

**Amadeo X-ray Systems *vet***

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

**Divario CR Systems *vet***

**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

***dicom**PACS*® ***vet***

**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

***dicom**PACS*® ***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

**Info hotline: +49 381 36 600 600**

**OR Technology** (Oehm und Rehbein GmbH)
18057 Rostock, Germany, Neptunallee 7c
Tel. +49 381 36 600 500, Fax +49 381 36 600 555
www.or-technology.com, info@or-technology.com

[Stamp of distribiution partner]