

MRI to fit your planning

Philips Panorama HFO Oncology Configuration

PHILIPS

sense and simplicity

MR Imaging that fits

Philips' Panorama HFO Oncology Configuration allows radiation oncologists to take full advantage of MRI's excellent soft-tissue contrast for delineating the target volume, organs at risk and other critical structures. The system's spacious 160 cm wide patient aperture and dedicated tools support repeatable patient positioning through the entire scanning, planning and treatment process.

Features dedicated to therapy planning

- Imaging in treatment position: flat table top with indexed edges; laser positioning system.
- Streamlined Workflow integration: ExamCards - customized imaging for radiation treatment planning; coil solutions for brain, head/neck, prostate and female pelvis; connectivity with planning software.
- Facilitates accurate planning with geometric deformation evaluation and correction.

Standard features of Panorama HFO

- Wide-open patient aperture.
- High image quality.
- Spacious coil solutions.
- Excellent patient access, e.g. for biopsies and brachytherapy.



your planning



Versatile Oncology Configuration

Panorama HFO is a natural choice when it comes to imaging for therapy planning. Its 1.0T field strength offers optimum tissue contrast and its unique Solenoid Technology (ST) coils provide SNR equivalent to conventional 1.5T systems. With a 160 cm wide patient aperture and flat tabletop, it allows fast, high quality imaging in the treatment position. Moreover, its excellent patient access provides the potential for applications such as imaging guided brachytherapy and biopsies.

Spacious ST coils

The spacious and unique ST coils can be used with Radiation Oncology accessories such as fixation and immobilization devices. ST coils are unique in that they do not need to be positioned tightly around the patient's body. This means that they do not affect body contours, thereby supporting accuracy of the therapy planning and treatment.

ST coils support fast, high-resolution imaging of the brain, head & neck, pelvis and other body areas. Offering high SNR, easy patient set-up and exceptional patient comfort, the coils are also valuable in extended coverage studies, including head/neck exams, with a field of view extending to the clavicle.

Wide-open 160 cm patient aperture: work in the MRI system similar to the way you do in the treatment setup.



Spacious ST coils are easily positioned and do not affect the patient's body contours.



Options for enhanced imaging

SmartExam Brain

Philips' SmartExam is a powerful automated technology that provides reproducible, consistent clinical images with identical slice positioning, facilitating longitudinal evaluation of the patient's response to the radiation treatment. With SmartExam Brain, all brain studies can be consistently reproduced with exceptional scan quality and reproducibility, independent of patient, patient positioning or operator.

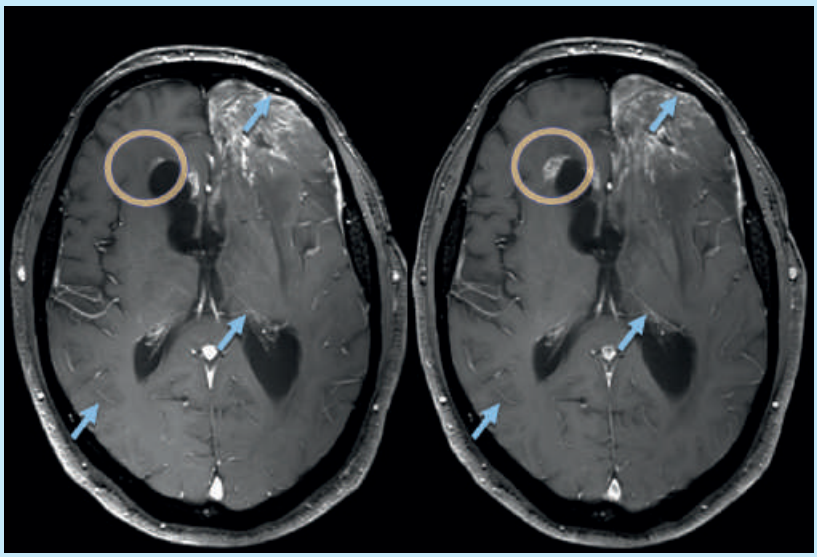
Advanced imaging

In addition to superb anatomical contrast, Panorama HFO also allows functional evaluation by means of diffusion, perfusion and contrast enhanced imaging. A variety of imaging options can be combined for advanced analysis of the treatment target volume and to support your assessment of therapy response.

SmartExam Brain: patient with Glioblastoma Multiforme.

Post surgery & radiation.
Intera 3.0T, Tech. A, December 2006.

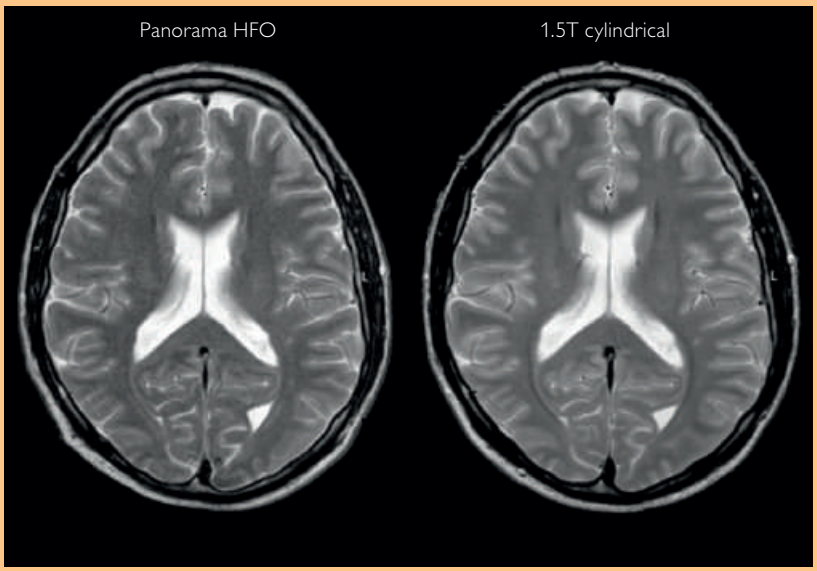
Follow-up 6 months later.
Achieva 3.0T, Tech. B.



Excellent access to the patient from all angles.



Panorama HFO provides image quality comparable to 1.5T cylindrical systems



Imaging in treatment

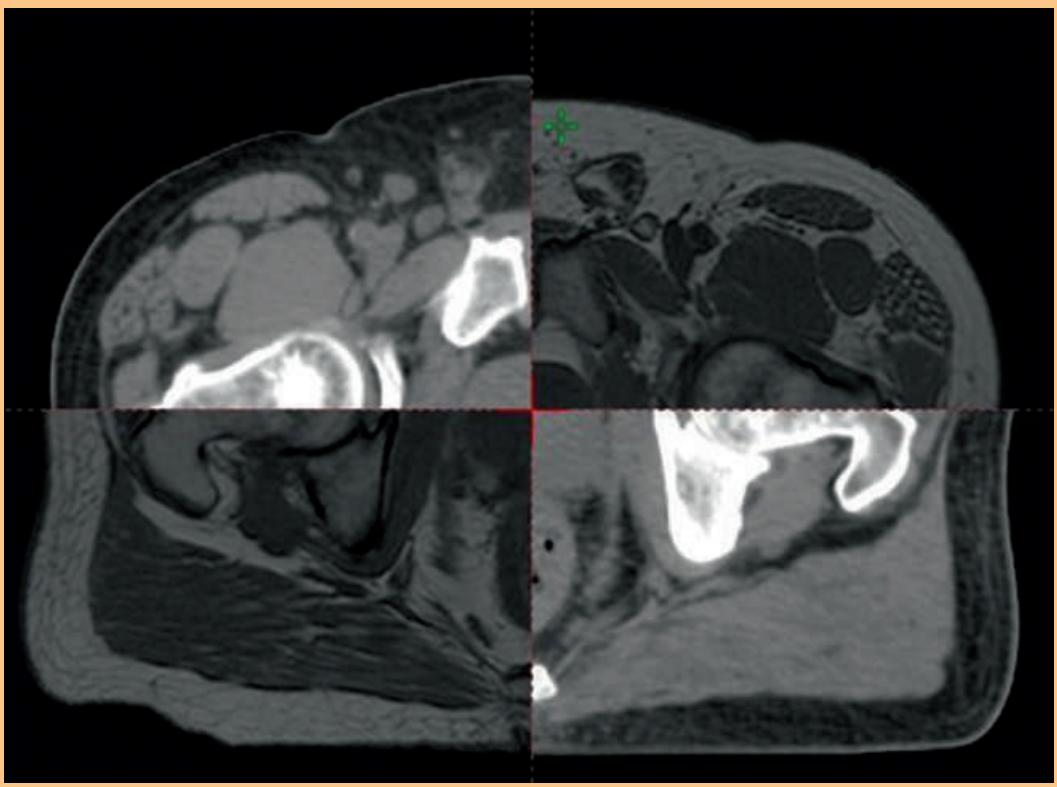
Reproducing the patient treatment position in the imaging system is crucial for high accuracy planning and treatment. Panorama HFO Oncology Configuration provides a set of tools to support imaging the patient in the treatment position.

Flat table top overlays

Specially designed flat tabletop overlays support reproducible patient positioning and the use of fixation devices through indexing.

- 40 cm wide overlay for brain and head/neck imaging in combination with ST Body/Spine coil M, L and XL.
- 50 cm wide overlay for wider body support in combination with ST Body/Spine coil XL, e.g. for pelvic imaging.
- The flat tabletop overlays are compatible with industry-standard immobilization and fixation devices.

Prostate patient imaged in CT and MR (T1W-FFE-3D).
Deformable MR and CT registration
Courtesy: Henry Ford Hospital, Detroit, USA



position

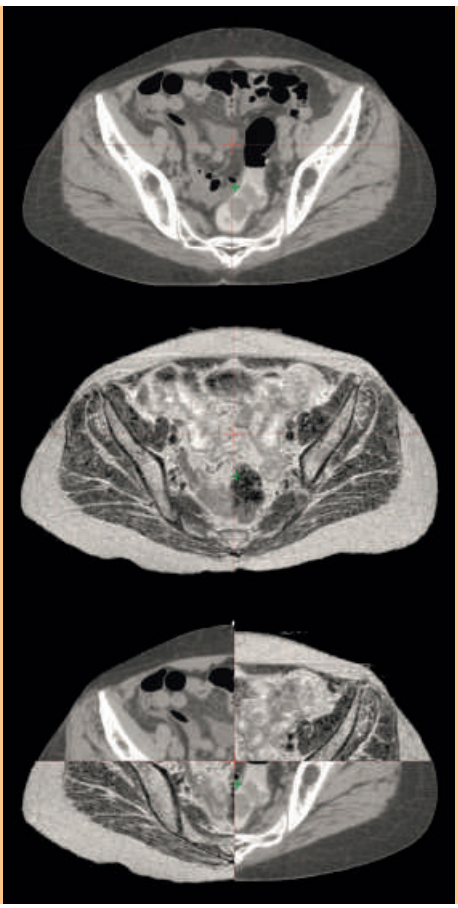


Laser positioning system

The MR-compatible external laser positioning system supports registration of MR and CT images and allows:

- Patient alignment in left-right and foot-head direction.
- Correcting for rotation and tilting of patient's body.
- Patient marking.

The laser system comes with a dedicated calibration package, comprised of a laser alignment phantom with intuitive and easy-to-use calibration software on the MR console.



Automated CT/MR image registration.

Top: CT image

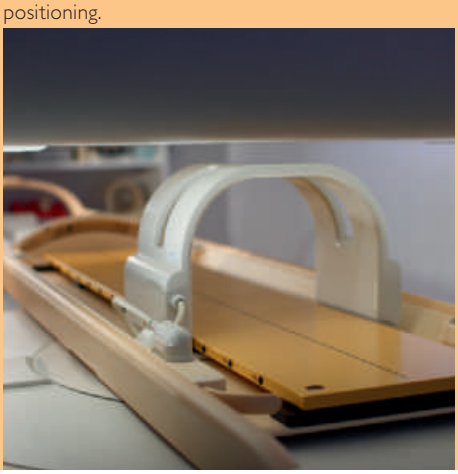
Center: MR image

Bottom: CT and MR registration with:

- Automated rigid registration.
- No manual adaptations.
- Matching body contours.

Courtesy: St. Luke's Episcopal Hospital, Houston, USA.

Flat tabletop overlayfor reproducible patient positioning.



Laser positioning system allows accurate and reproducible patient alignment.



Streamlined workflow



Patient Positioning



Patient alignment



Coil placement

Streamlined integration of MRI in the clinical workflow contributes to efficiency. Fast and intuitive examination procedures help to streamline the scanning procedure. Panorama HFO Oncology Configuration therefore provides a set of MRI ExamCards (examination protocols) and a validated workflow description dedicated for Radiation Therapy planning.

Application areas

The RT ExamCards are available for a range of body areas, including the main applications for MRI in Radiation Oncology:

- Brain
- Head & neck
- Prostate
- Female pelvis
- Pediatrics

Animated workflow description

An animated workflow description provides recommendations for each application on the choice of:

- Patient position, with potential use of immobilization and fixation tools.
- RF coils.
- ExamCards.

Radiation Therapy ExamCards

Dedicated ExamCards are provided which match RT planning requirements:

- Excellent geometric fidelity.
- Complete imaging protocol in less than 30 minutes.
- High contrast, high resolution.
- Axial image plane.

Single-step Travel-to-Scan

Full connectivity between the MR system and the laser positioning system form the basis for Philips' dedicated Travel-to-Scan program. With one push of a button your patient is transported from the laser system isocenter directly into the MR image isocenter.

Connectivity with planning software

Streamlining the workflow extends further than the MR imaging only. By combining our Panorama HFO Oncology Configuration with AcQSim³ simulation, Syntegra registration and our Pinnacle³ radiation therapy planning system, you can fully integrate your MR image into your daily workflow. Moreover, the DICOM MR output of our MRI system provides connectivity to any software planning system of your choice.

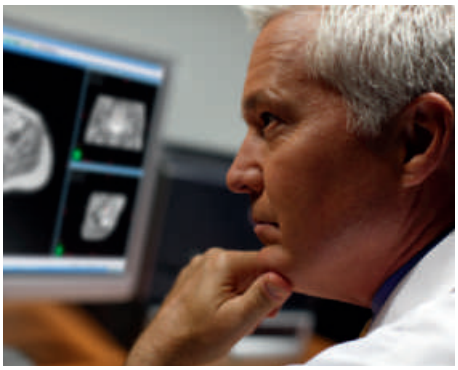
integration



Travel to scan



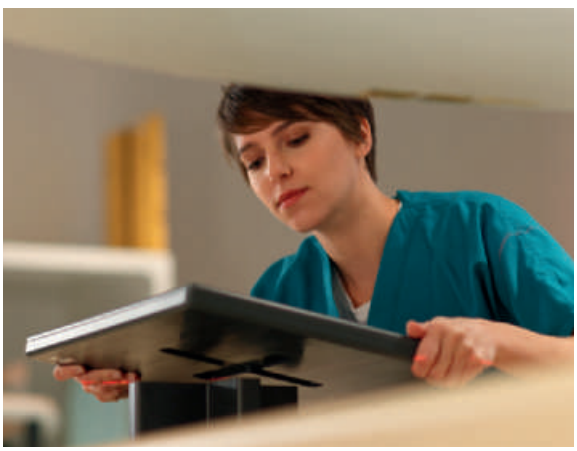
Image acquisition



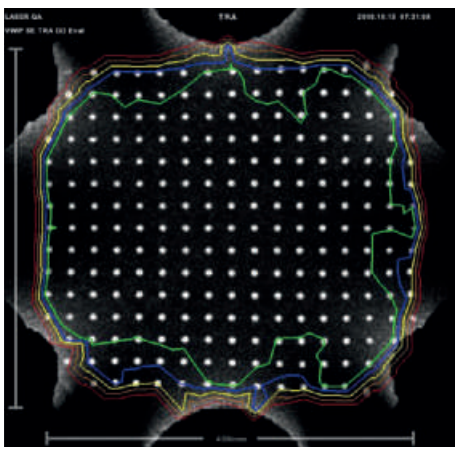
Fusion and planning

Correction and evaluation of geometric fidelity

Geometric fidelity in the image is crucial for providing accuracy of the radiation planning and treatment. The Panorama HFO Oncology Configuration is equipped with correction tools to support geometric accuracy of the images. Moreover, a unique quality assurance package allows evaluation of the geometric deformation of the MRI system.



Geometric fidelity evaluation phantom.



Contour map of geometric deformation in MR image.

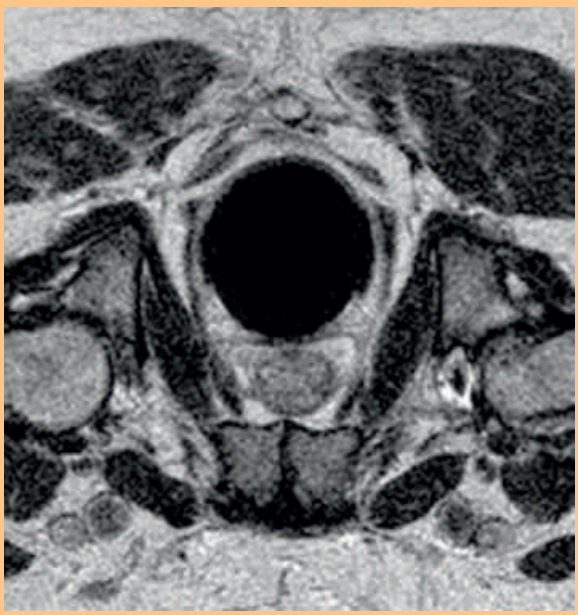
Superb soft tissue

MRI is considered the gold standard for soft tissue visualization. Superb visualization of the tumor and surrounding critical structures supports delineation and target definition for accurate radiation therapy planning.

Soft tissue visualization

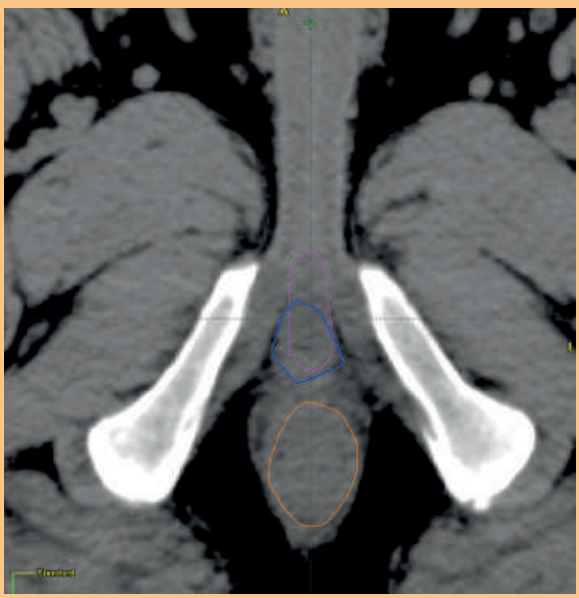
Left: CT image of the prostate of a patient diagnosed with prostate cancer.
Right: MRI image (T2W-TSE) of the same patient using the integrated T/R body coil. Note the visibility in the MRI of the prostate, the seminal vesicles and surrounding structures.
Courtesy: St. Luke's Episcopal Hospital, Houston, USA.

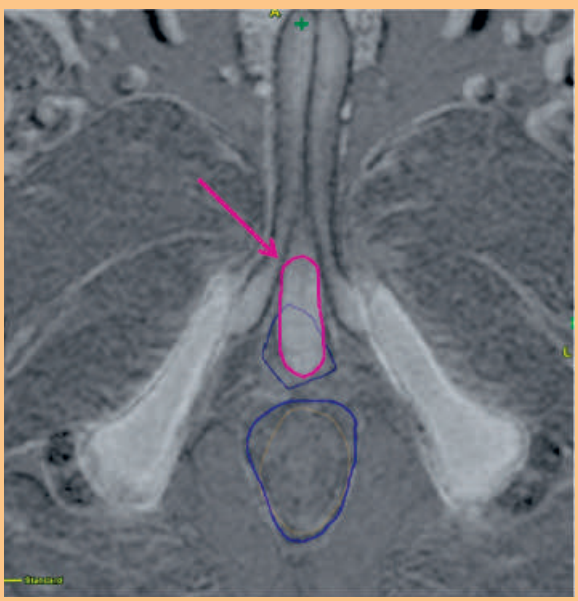




Visualization of organs at risk

Left: CT of a patient diagnosed with prostate cancer.
Right: fused MR (T2W) and CT of the same section in the same patient, where the penile bulb is delineated based on the MR information (pink contour and arrow).
Courtesy: Henry Ford Hospital, Detroit, USA.



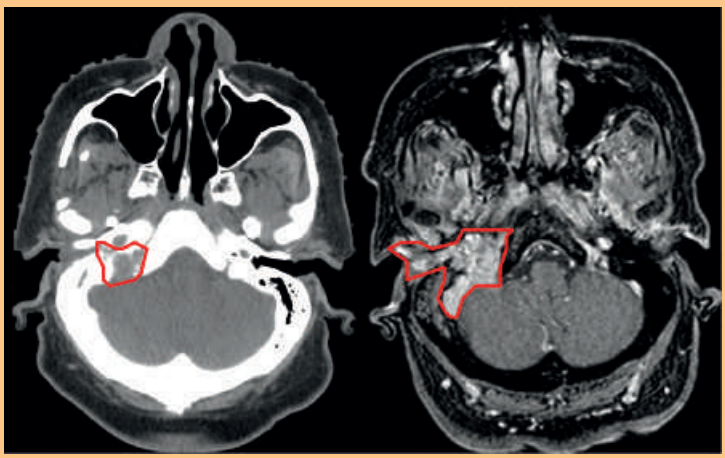


contrast

Target visualization and definition

Based on the image information, delineation of a glomus tumor in a head & neck patient differs in the MR (right) and CT (left) image; the delineation was performed by an experienced radiation oncologist.

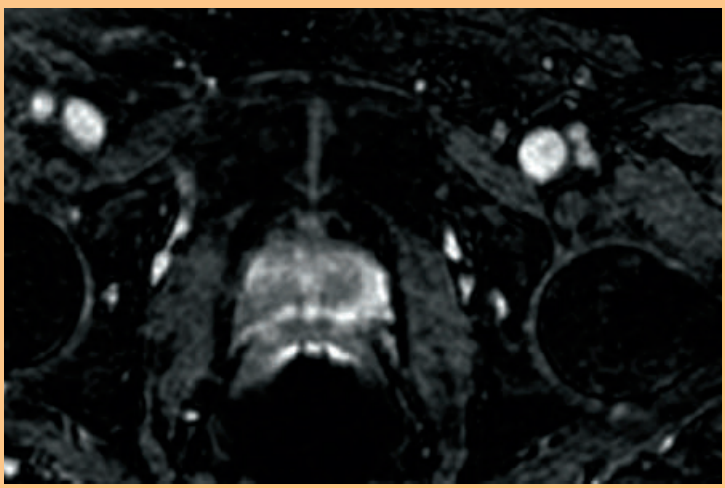
Courtesy: St. Luke's Episcopal Hospital, Houston, USA.



Flexibility in contrast selection

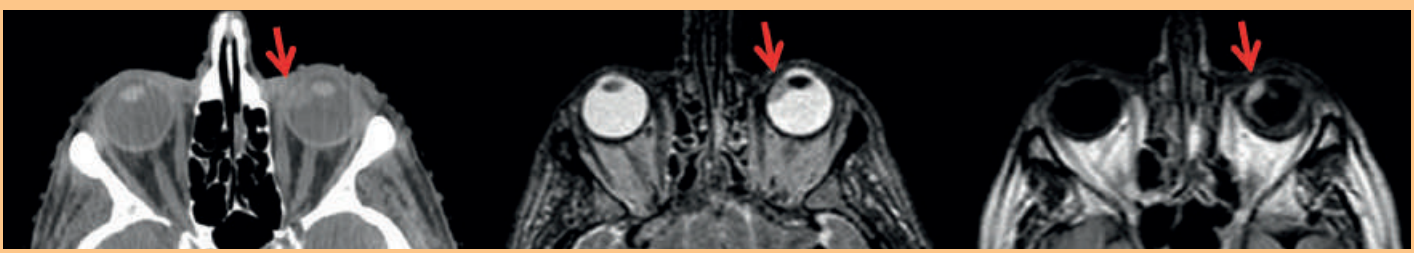
Different MR examination protocols provide differences in contrast, which can be used to enhance visualization of the structures (tumor, surrounding tissue) of interest.

Right: MR (Balanced-FFE) of a patient diagnosed with prostate cancer. Note the enhancement of intensity in the right part of the prostate.



Below: Patient with Ocular Melanoma; the red arrows indicate the tumor.
Left: CT image.
Center: MR (T2W-TSE).
Right: MR (T2W-FLAIR)

Courtesy: St. Luke's Episcopal Hospital, Houston, USA.



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