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LUNA 3D

Surface imaging for patient positioning and monitoring in radiation therapy

Simply
Precise


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LUNA 3D makes precision effortless

At LAP, our legacy of innovation in laser-based patient positioning has set the standard for precision in radiotherapy for decades. Building on this foundation, we developed LUNA 3D, a cutting-edge SGRT system designed to revolutionize patient positioning and motion monitoring in radiation therapy.

LUNA 3D leverages high-resolution stereoscopic cameras and advanced blue speckle light projection to deliver submillimeter accuracy in patient setup and continuous realtime monitoring. This allows for precise patient positioning for each treatment fraction, enabling focused patient care.

LUNA 3D simplifies workflows with its user-friendly interface and support of ergonomic setup positions, allowing focused patient care. The real-time monitoring capabilities provide peace of mind by instantly detecting and correcting patient movement. Its seamless integration and browser-based architecture offer easy access to critical data, supporting informed decision-making and continuous improvement of treatment protocols.

LUNA 3D embodies LAP's commitment to precision and safety in radiation therapy. Embrace the future with LUNA 3D for superior patient positioning and motion monitoring.

Precise

LUNA 3D's high-resolution stereoscopic cameras and blue speckle light projection offer submillimeter accuracy in patient positioning and continuous motion monitoring. The system remains consistent across different applications due to its robust camera pod calibration and advanced GPU-powered calculations.

Safe

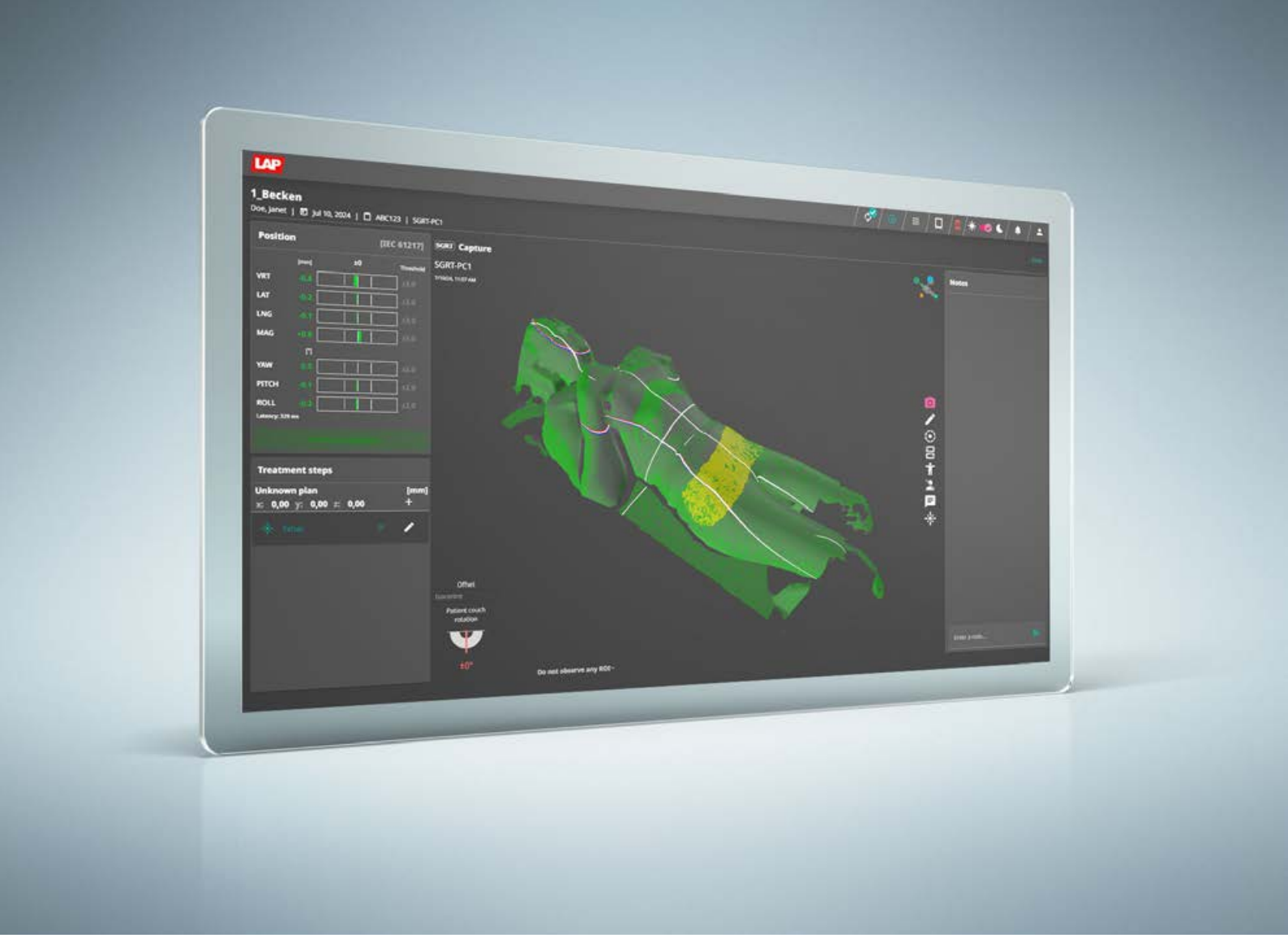
Continuous real-time monitoring with low latency enables immediate detection of patient movement during treatment. This enhances patient safety and treatment effectiveness, allowing for consistent care and adherence to planned parameters.

Efficient

The browser-based user interface and seamless integration into existing workflows make it easy to use and access data. This intuitive interface streamlines daily tasks, reduces setup times, and enhances overall efficiency.

Detailed

LUNA 3D's comprehensive reporting tools and SGRT data interface provide seamless documentation and easy access to patient positioning and motion data, thus enhancing collaboration and informed decision-making.



Enhanced visibility and access

The advantages of LUNA 3D's large field of view

LUNA 3D sets a new benchmark in SGRT with its large field of view, enabling superior patient positioning and monitoring with greater ease and precision. This feature enhances visibility and access, significantly improving the ergonomics of patient setup and treatment delivery.

It allows for comprehensive surface imaging, capturing extensive patient data and monitoring accurate positioning even in non-coplanar couch angles. This innovation facilitates precise treatment and streamlines workflows, making the process more efficient and less physically demanding.

Enhanced ergonomics

The large field of view enables therapists to perform patient setups more ergonomically, reducing physical strain. Pre-positioning patients at a couch loading position or outside the LINAC's bore facilitates a more comfortable workflow.

Improved workflow efficiency

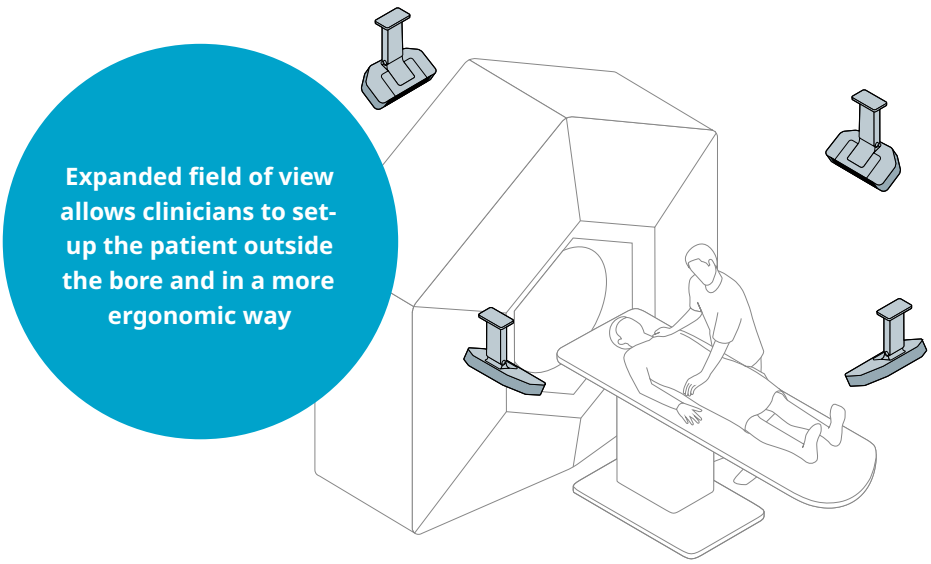
By providing a comprehensive view of the patient's surface, LUNA 3D minimizes the need for repositioning and adjustments, speeding up the patient setup process and allowing for more treatments within the same period.

Scalability and versatility

LUNA 3D's ability to adapt to different treatment environments demonstrates its versatility. Its scalable design means it can be tailored to various clinical needs and budgets.

Increased treatment precision

The extensive coverage makes it possible that even subtle patient movements are detected in real-time, maintaining high precision in patient positioning and improving treatment accuracy.





LUNA 3D's browser-based user interface

Streamlining efficiency and usability

LUNA 3D's browser-based user interface is designed for ease of use and flexibility, providing seamless access across multiple devices.

The interface adapts to different devices, offering slightly varied layouts on tablets compared to larger screens, offering high usability.

Clinicians can access SGRT data from existing clinic workstations via pre-installed browsers, reducing the need for additional hardware and software installations in the hospital network.

This setup supports efficient patient positioning and monitoring, with synchronized data presentation across all connected devices, facilitating smooth treatment workflows.

The system's robust reporting tools and SGRT data interface provide seamless documentation and secure access to patient positioning data, ensuring that critical information is readily available for decision-making.

Intuitive and flexible interface

LUNA 3D's browser-based user interface is adaptable and easy to use. The interface supports synchronization across multiple devices, including setup screens, tablets in the treatment rooms, and control room monitors. This way, therapists can interact with the system seamlessly from various locations, enhancing flexibility during patient setup process.

Seamless data access and security

The browser-based architecture of LUNA 3D allows users to access data through pre-installed browsers on existing clinic workstations. This eliminates the need for additional software installations, thereby reducing cybersecurity risks. Clinicians can perform SGRT preparations, such as drawing regions of interest or accessing reports directly from their standard workstations, streamlining the workflow and maintaining high data security standards.

Enhanced workflow efficiency

LUNA 3D facilitates a friction-free workflow with features like virtual lasers for quick and accurate patient setup. The system supports ergonomic patient positioning by allowing pre-positioning at a comfortable loading height, thus minimizing the need for rotations before shifting the couch to the treatment isocenter. This not only speeds up the setup process but also reduces physical strain on therapists.

Robust multi-device synchronization

The system's ability to synchronize multiple user interfaces without merely mirroring information is a significant advantage. The layout adapts to the end device, providing a customized user experience on tablets versus larger screens. Like this, critical data is presented optimally, whether accessed from a tablet in the treatment room or a desktop PC in the control room.

Bring your own device (BYOD) compatibility

LUNA 3D supports the concept of BYOD for certain system components, allowing clinicians to use their preferred devices within the hospital network. This flexibility helps maintain consistency in hardware usage and allows seamless integration with a variety of devices, enhancing overall system adaptability. As a result, departments can manage their hardware more efficiently, ensuring that the system adapts to their existing infrastructure.

Choose between light and dark screen mode according to your preferences

As easy as a laser

LUNA 3D's virtual laser tool

LUNA 3D’s virtual laser tool supports therapists transitioning to the SGRT technology by replicating known procedures.

By projecting laser lines onto the patient's body, it ensures precise alignment to the treatment isocenter and adjustments, saving time, and minimizing patient exposure to radiation.

The virtual laser tool clearly indicates the direction for necessary corrections, with the congruence of markings and laser projections providing intuitive visual feedback.

Furthermore, the system supports ergonomic patient setup by allowing pre-positioning at a lower loading height, thereby enhancing therapist comfort and improving workflow efficiency. This alignment mechanism simplifies the understanding of positional adjustments, ensuring that therapists can quickly and accurately position patients.

Integrated into LUNA 3D’s browser-based user interface, the virtual laser facilitates a smooth setup process and readily available data for preparation, reporting, and decision-making, with synchronized interfaces helping therapists manage patient positioning effectively from any location within the treatment area.



“One standout feature of LUNA 3D is its virtual laser technology. This innovation has been particularly well-received by our radiation therapists, as it closely mimics the traditional laser positioning workflow while providing enhanced visual clarity and precision.”

Dr. Hui Khee Looe

Deputy Head of Medical Physics at Pius-Hospital in Oldenburg



Simply precise

Calibration and alignment

The initial calibration of the LUNA 3D system is performed after installation by the LAP service team. During the calibration procedure all camera pods are calibrated in parallel with a calibration board captured in various positions.

This method ensures a precise calibration of the entire system with all connected camera pods and also saves time, as only one calibration run needs to be performed for all pods. An acceptance protocol documents that the system performance is as expected.

Daily verification of the system (daily QA) is conducted by placing the calibration board at the isocenter position and start the verification process in the LUNA 3D software. Potential deviations from the calibrated position are immediately displayed and also saved to a QA report.

The system can be used following the successful QA procedures. If the deviations exceed predefined thresholds, the calibration and isocenter alignment needs to be repeated to maintain accuracy. A recalibration and isocenter alignment can be easily performed by the clinical staff.

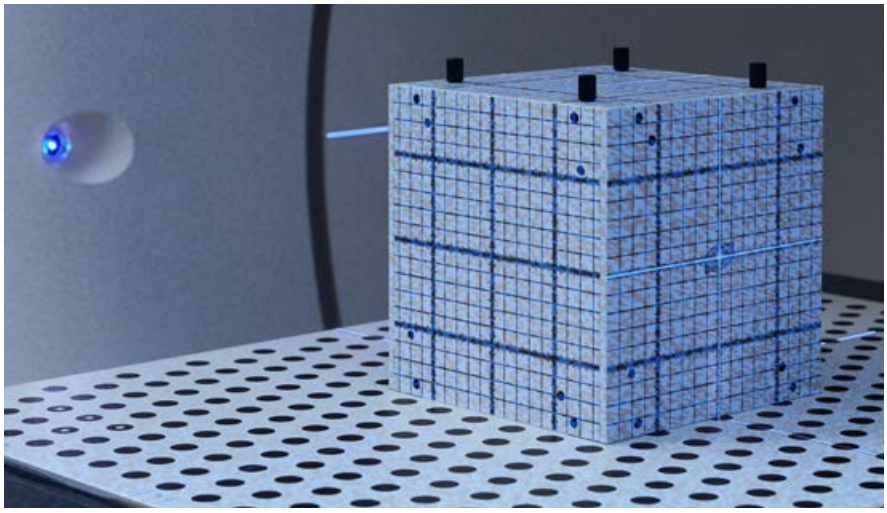
The LUNA 3D system delivery includes all necessary calibration and quality assurance tools, such as the



LAP EASY CUBE phantom. These tools facilitate comprehensive testing and ensure the system's performance aligns with clinical requirements.

The calibration tools are designed to be user friendly, enabling clinical staff to perform full recalibration by their own, saving time and ensuring the best performance of the system.

All calibration and quality assurance activities are saved to calibration and QA reports. With those reports, a proven record of the quality assurance activities is available. Also trend charts are available to e.g. detect potential exceeding of thresholds before they occur.



System calibration with the EASY CUBE

LUNA 3D workflow

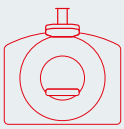
Streamlining patient positioning and monitoring

During CT simulation, LUNA 3D captures the patient's body data using high-resolution CMOS stereoscopic cameras, which provide detailed 3D imaging.

The system measures the patient's surface and breathing motion and displays this data to the clinician. Identifying regions with significant movement and those that remain stable is essential, and capturing motion traces for breath-hold coaching ensures reproducibility during treatment.

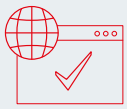
For Deep Inspiration Breath Hold (DIBH), LUNA 3D's coaching screen guides patients to achieve and maintain the required breath-hold level and support reproducibility through multiple breathing cycles.

After CT simulation, LUNA 3D integrates seamlessly with the treatment planning system (TPS) to import DICOM data, including patient contours and isocenter information. This data is used to generate refe-rence surfaces, which are essential



Imaging

- Coaching patients for efficient DIBH treatment and breath cycle recording as preparation for treatment at the LINAC.
- Monitor patient position during CT imaging procedure.



Treatment preparation

- A browser-based interface and the concept of “bring your own device” enable a modern and flexible work.
- Treatment preparation from any existing workstation connected to the LUNA 3D Server.
- Multiple ROI´s, workflow templates and the standardization of treatment steps facilitate the planning process.



Initial set-up and inter-fraction positioning

- As easy as a laser supported by virtual lasers and comfortable for the therapist by offering a large Field of View builds the new standard for patient positioning.
- Different tools and functions support the therapist in efficiency, effectiveness and accuracy.

for precise patient positioning during treatment. The system supports the automatic import of patient and treatment data, facilitating a smooth transition from planning to execution.

On treatment days, patients are set up using immobilization devices. LUNA 3D captures live 3D surface data and compares it with the pregenerated reference surface for a precise alignment. This process can reduce the need for multiple CBCT scans, thereby minimizing radiation exposure and saving time.

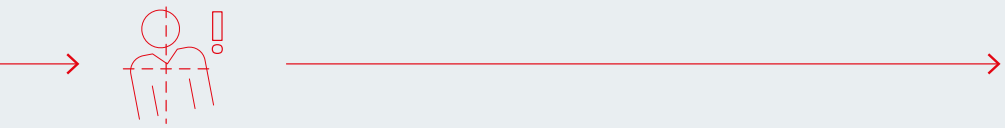
The system's virtual laser tool projects positional data onto the patient's surface, mimicking traditional laser systems. This allows for ergonomic patient setup.

LUNA 3D continuously monitors the patient's position in real-time with submillimeter accuracy.

Each camera pod in the system includes a blue light projector and dual CMOS cameras, providing robust performance against ambient light changes and patient skin tone variations.

If the patient moves beyond predefined thresholds, the system alerts the clinical team to pause treatment and reposition the patient if necessary. This continuous monitoring is critical for high precision treatments, such as Stereotactic Radiosurgery (SRS).

For treatments involving respiratory motion, like DIBH, LUNA 3D continuously monitors and checks if the patient remains within the planned position. Comprehensive reporting tools and the SGRT data interface provide seamless documentation of each treatment session, facilitating continuous improvement of clinical processes and robust quality assurance measures.



Intra-fraction motion management

SRS technique

- High precision and accuracy enable SRS treatment without upgrades of the treatment room.
- Accurate motion management using open-face masks enable a safe and optimized treatment.

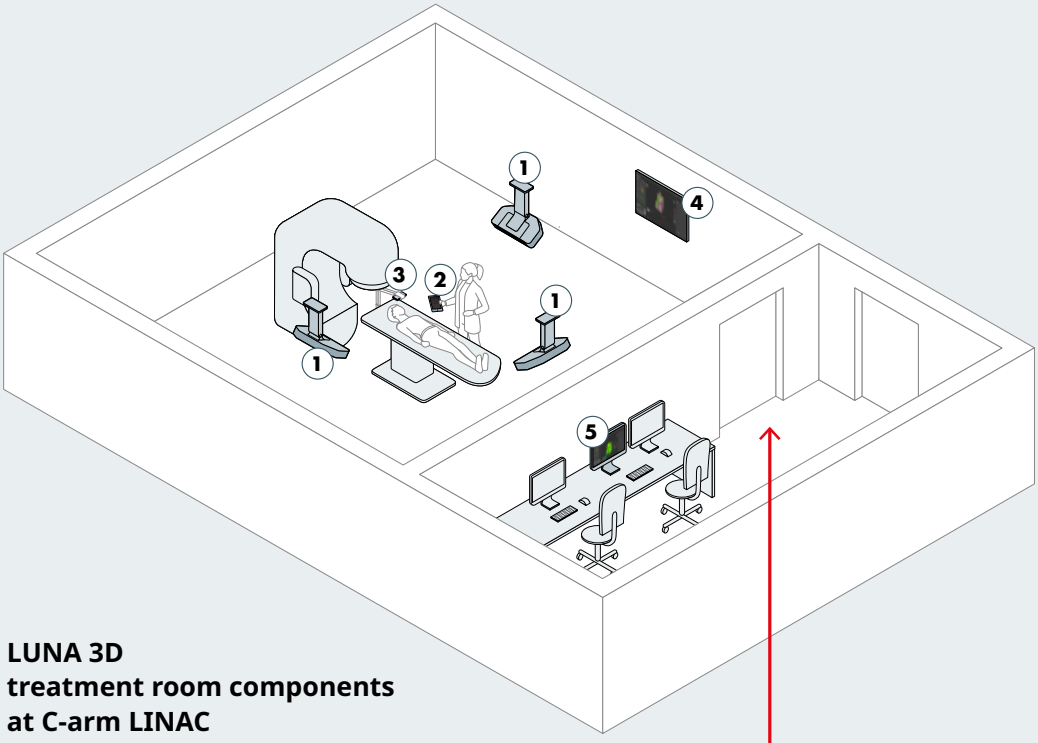
DIBH technique

- Patient engagement improves treatment success and increases the trust of the patient.
- Different screens and views support patient coaching, explicit decision making for therapists and sparing organs at risk.

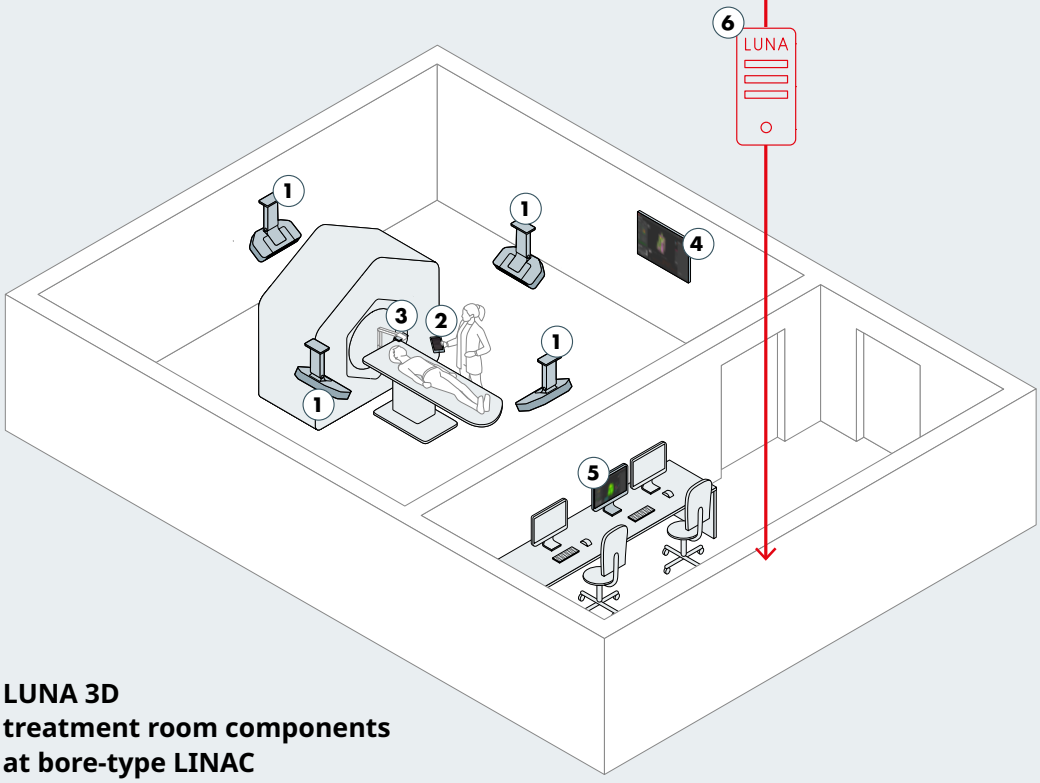
Reporting

- Convenient reporting options adapted to the individual needs.
- Templates for efficient reporting of the entire patient journey.

LUNA 3D system components



LUNA 3D
treatment room components
at C-arm LINAC



LUNA 3D
treatment room components
at bore-type LINAC



1

LUNA 3D camera pod
The LUNA 3D system is equipped with one or multiple camera pods, each containing a speckle pattern projector and two CMOS camera units.

2



Tablet
The tablet offers a flexible interface for the therapist to access and control LUNA 3D whilst positioning the patient in the treatment room.

3



Coaching screen
For treatments involving breath-hold techniques, LUNA 3D's patient coaching screen helps engage and guide patients, facilitates precise dose delivery and patient cooperation.

4



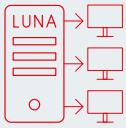
Setup screen
A 43" diagonal in-room monitor which is synchronized and presents information in a personalized screen configuration. Benefit from the bring your own device option.

5



Control Room Screen
The LUNA 3D desktop PC includes a Mini PC and a 27" monitor to access LUNA 3D from the control room. The desktop PC is the main workstation and interface for positioning and treatment.

6



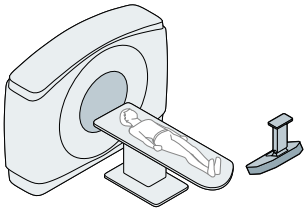
LUNA 3D Server
The LUNA 3D Server offers seamless communication across multiple devices through a browser-based interface. The server also supports efficient data storage, retrieval, and secure access.

Clinical set-up for LUNA 3D

Various options that fit your needs

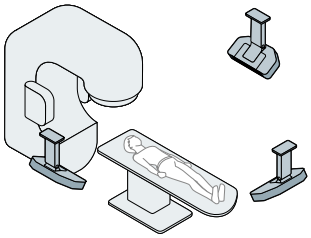
Several configurations are available for LUNA 3D at CT, bore-type and C-arm LINACs. LUNA 3D offers built-in scalability for new CT and LINAC installations or upgrades of existing imaging and treatment rooms.

Configurations



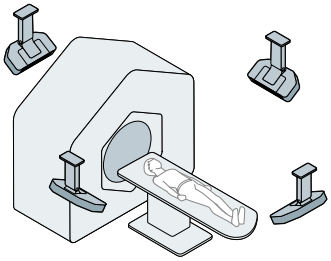
LUNA 3D for imaging rooms

In the CT simulation environment, LUNA 3D utilizes a single centrally mounted camera pod to measure patient respiratory motion during imaging procedures.



LUNA 3D for C-arm LINACs

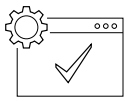
In C-arm LINAC environments, a three-camera pod system is used. This system supports patient positioning and monitoring even during non-coplanar treatments. Support of pre-positioning the patient in a pre-setup position below isocenter height.



LUNA 3D for bore-type LINACs

For bore-type LINAC installations, LUNA 3D employs a four-camera pod system to ensure maximum surface coverage during alignment and treatment. This system allows reliable patient pre-positioning outside the bore without the need for any in-bore installations.

Our services at a glance



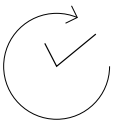
Installation

Our dedicated LUNA 3D service and clinical application team conducts a thorough site survey and provides detailed room planning drawings. We coordinate with facilities to ensure minimal downtime, delivering seamless system integration.



Training and Go-Live

LAP offers comprehensive training and go-live support, including consultation, remote and onsite training, and dedicated training materials and checklists. Our team ensures a smooth transition with advanced training and support during go-live, enabling efficient and effective system use.



Ongoing support

A dedicated support team provides timely assistance during treatment hours via phone and email. Our remote support and clinical application team provide continuous guidance, helping to maintain high system performance and addressing potential issues.

Maintenance contracts



Regular maintenance protects your investment goods. Our maintenance contracts fulfill your individual needs and adapt to your requirements.

Find out more about our maintenance contracts

LAP Plus

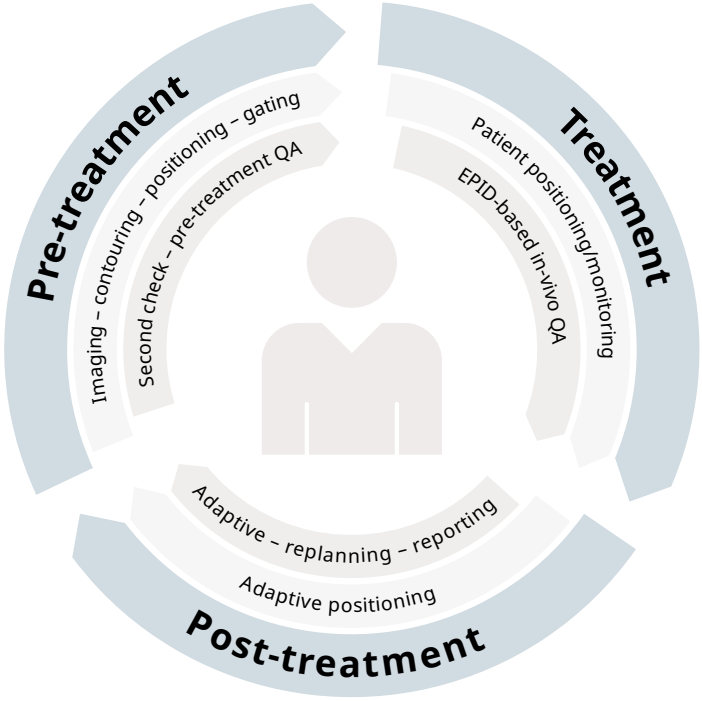
A patient-centric ecosystem

At the heart of LAP Plus are three fundamental goals. First and foremost, we are committed to empowering clinicians through collaboration and innovation, recognizing that improved patient outcomes start with an empowered healthcare workforce.

Secondly, LAP Plus stands out by actively integrating with leading technology partners, ensuring we stay at the cutting edge of advancements. Through strategic alliances, we accelerate innovation and equip clinicians with advanced capabilities rooted in real-world clinical experience.

Lastly, LAP Plus is dedicated to bridging the gap between quality assurance and patient treatment.
Our focus is on delivering personalized, efficient, and accessible cancer care, with a continuous commitment to improve patient safety throughout the pre-treatment, treatment, and post-treatment phases.

From a visionary perspective, LAP Plus aspires to enhance individualized patient care, provide advanced decision-support capabilities, and ensure efficient and accessible cancer care, all contributing to an elevated standard of patient safety.



About us

LAP is one of the world's leading suppliers of systems that increase quality and efficiency through laser projection, laser measurement, and other processes. Every year, LAP supplies 15,000 units to customers in industries as diverse as radiation therapy, steel production, and composite processing. LAP employs 300 people at locations in Europe, America, and Asia.

90+
Partners

300
Employees

8
Locations





Quality

We work to uniform standards and with certified processes. For us, "Made in Germany" means the highest precision in manufacturing and quality inspection of each device. For our customers, this means planning and process certainty.

All our worldwide locations use a quality management system according to EN ISO 13485 or EN ISO 9001. Our products have all the necessary approvals and registrations almost everywhere in the world.

Service

We ensure the maximum availability of your equipment so you can concentrate on your core process. Wherever you need us, our certified service technicians are quickly on site in any time zone. We support you from installation and commissioning, through user training, up to maintenance, repair, or unit replacement.

Our efficient logistics ensure the fast availability of spare parts worldwide. For technical questions and support, our helpdesk is at your disposal by telephone, via e-mail, or remote diagnosis.

More about our global QM system

made in Germany

Contact us
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