FUTURE TECHNOLOGIES

Grace™

UPRIGHT PHOTON THERAPY

MORE HUMAN. BY DESIGN.

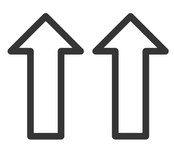
Please note: Leo Cancer Care's Grace solution is under development and is not cleared or approved for sale.
It is presented for research and discussion purposes only.

LEO CANCER CARE IS CHALLENGING THE CONVENTIONS OF RADIOTHERAPY BY REINTRODUCING UPRIGHT PATIENT POSITIONING

With one change...

We've changed everything.

A paradigm shift that we believe will unlock a breadth of potential benefits:



Remaining upright for treatment - our natural position - could support more consistent anatomical positioning. Emerging research in this area increasingly supports the case for greater organ stability and reproducibility. (page 8)

Improving access to radiation therapy with fixed-beam technology that lowers shielding requirements, reduces costs, and prepares centers for the healthcare economy of tomorrow.

Our goal is and always will be to make the treatment experience more human, by empowering patients and clinicians to face Radiation Therapy together, eye-to-eye.

MORE HUMAN. BY DESIGN.

INTRODUCING

Grace™

Our unapologetically bold upright photon therapy system, Grace, named after Grace Hopper, an American computer scientist, mathematician and United States Navy rear admiral, features a fan beam CT, enabling simulation, replanning and treatment all in one room.

The stationary photon beam delivery system with rapid multi-leaf collimator aims to optimize dose conformity and treatment efficiency. Decoupling radiation delivery from rotation simplifies system design, to optimize on both fronts. Improving both performance and reliability in beam delivery and putting the patient at the heart of their treatment.

OUR INSPIRATION

// THE MOST DANGEROUS PHRASE IN LANGUAGE IS: ‘WE’VE ALWAYS DONE IT THIS WAY’ //

GRACE HOPPER

FEATURES AND BENEFITS

SETTING NEW TECHNOLOGY STANDARDS

FAN BEAM CT AT THE ISOCENTER

Grace provides the ability to obtain planning-quality CT imaging throughout the entire workflow. We imagine a future enabling online adaptive radiotherapy and ensuring optimal treatment outcomes for patients.

FASTER SETUP TIMES

Patients tell us how easy it is to move in and out of our upright positioning system. The natural position and movement, paired with reduced manual handling by staff means treatment set up time can be reduced.

RAPID, LARGE-SCALE MLC

Utilizing a fixed radiation beam and increasing the size of lead motors, we achieve a faster multi-leaf collimator (MLC). We believe this innovation, combined with the benefits of upright patient positioning, will allow us to increase treatment efficiency.

FOSTERING PATIENT CONNECTION

The ability to remain at eye level with a patient throughout their treatment set up allows for greater patient-therapist connection. This connection helps to foster greater rapport and trust at a time when many patients feel vulnerable.

PRODUCT SPECIFICATIONS

UPRIGHT PATIENT POSITIONING SYSTEM

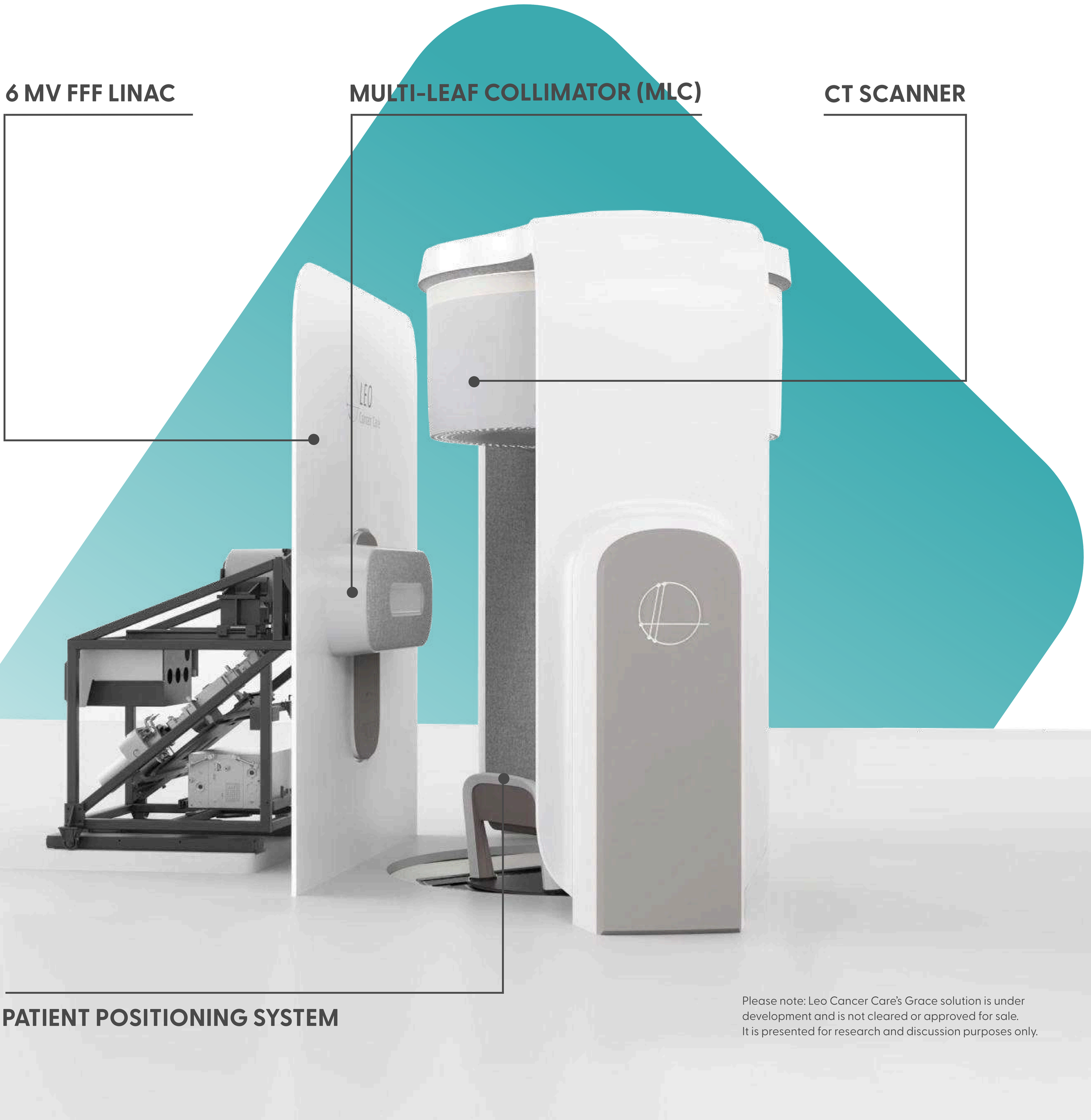
Isocenter Accuracy: <1 mm
X Translation: ±13.5 cm
Y Translation: +15 cm/-35 cm
Z Translation: 70 cm
Pitch & Roll: ±3°
Backrest Angle: ±15°
Rotation: Continuous 360°

CT SCANNER

Bore Size: 84 cm
Field of View: 62.3 cm
Imaging Energies: 120 kV
Gantry Tilt Angle: ±15°
Slice Thickness: 0.625, 1, 2, 4, 5 mm

LINEAR ACCELERATOR

Energy Beam: 6 MV FFF
Dose Rate: 1200 cGy/min
Source to Isocenter: 100 cm
Field Size: 30 x 30 cm
MLC speed: 10 cm/s
Collimator Rotation: ± 15°
BDS travel range: 50 cm



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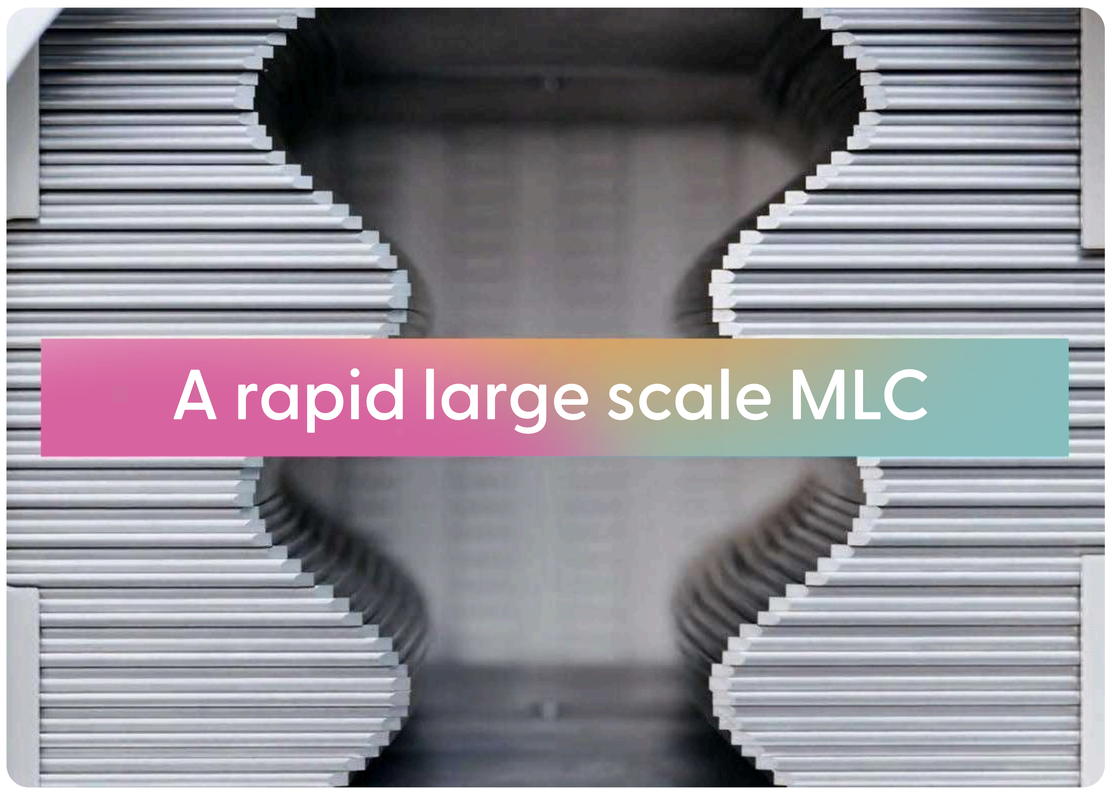
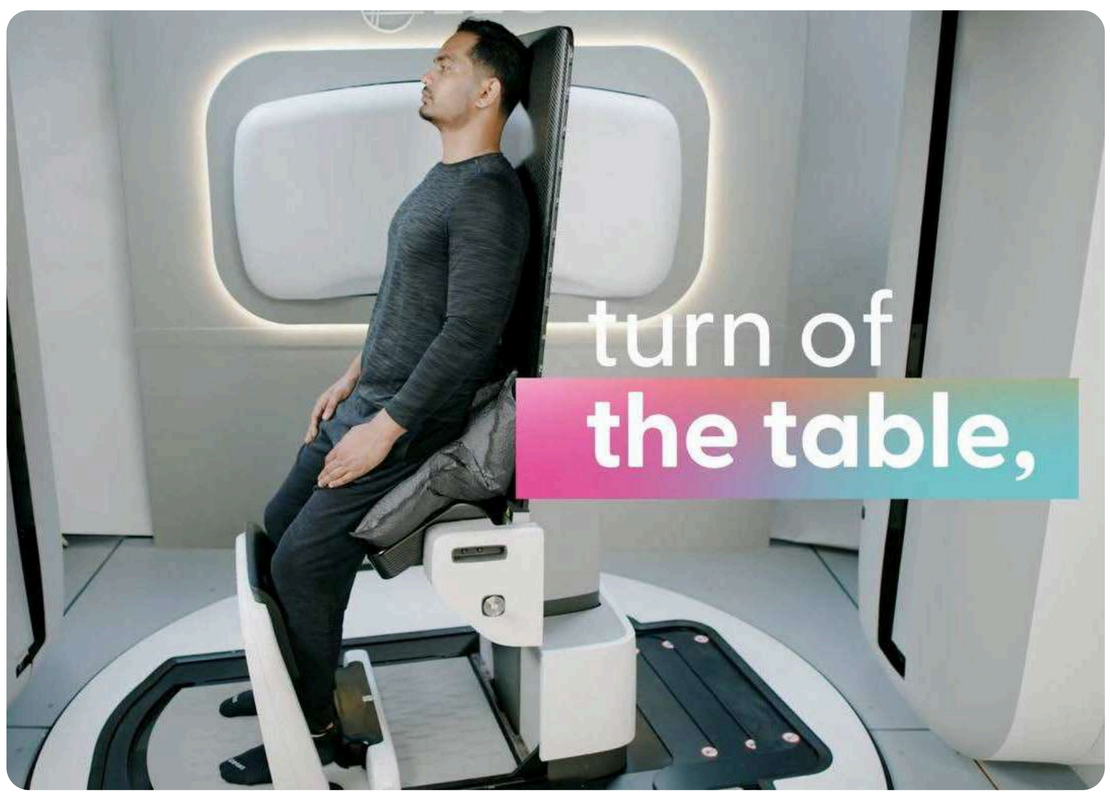
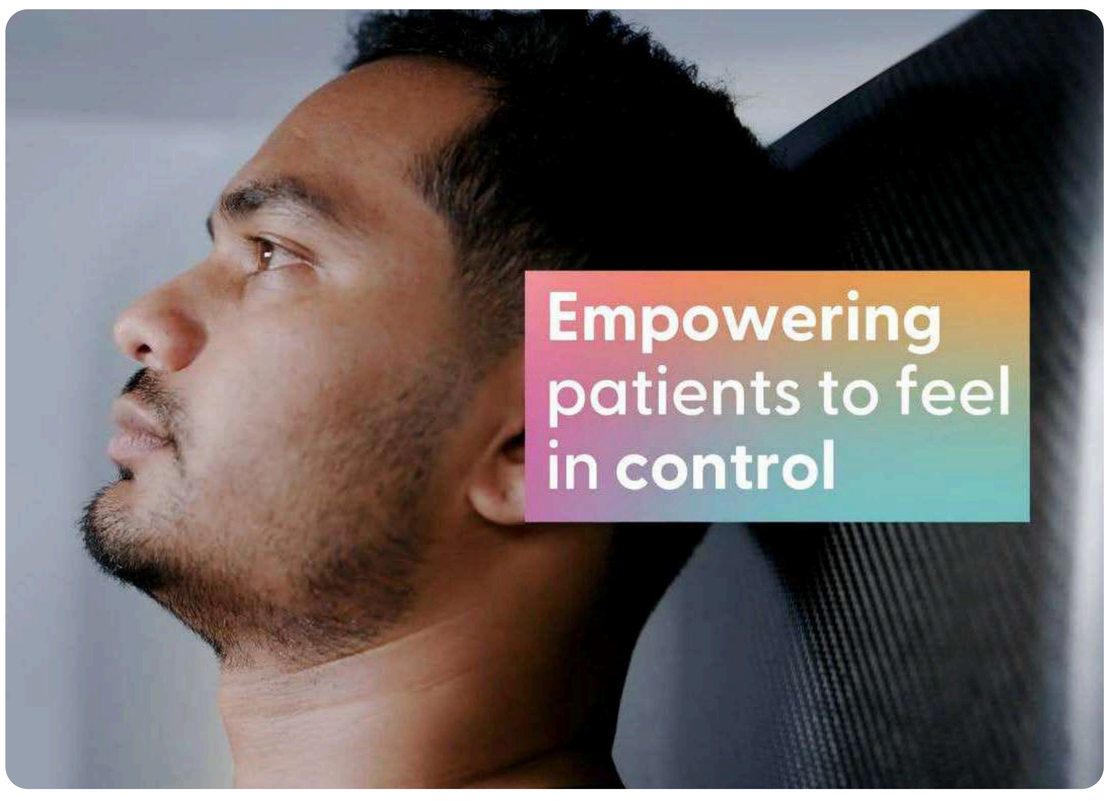
see Grace™ in action







WATCH THE VIDEO

HIGHEST POTENTIAL INDICATIONS FOR UPRIGHT

BREAST

Increased upright lung volumes suggest that improved cardiac and lung sparing could be achievable for breast radiotherapy. A recent study concluded that, upright body positioning for breast radiotherapy appears to be comfortable and feasible. [1]

LIVER

A research paper by the Paul Scherrer Institute identified that when a patient lies down the liver can drift and deform in position up to 20mm over 35 minutes, [2] This could affect tumour location and accuracy during treatment when patients are in the supine position.

HEAD AND NECK

A study by Alghadir et al. found that swallowing while lying supine with the neck extended was six times more difficult compared to swallowing upright [3]. This suggests that treating patients in an upright position may help them better manage thick oral secretions, while also reducing the risk of aspiration and anxiety.

PROSTATE

Recent data indicated that when upright, the prostate has been shown to move less. Its position is unaffected by changes in bladder fill, the seminal vesicles are pushed down by the bladder allowing them to be included in treatment volumes without compromising on healthy tissue, the space between sacrum and anterior bladder wall is also significantly smaller. [4]

LUNGS

A study by a team at MD Anderson suggested that in the upright orientation, lung volume was on average 25% larger but in some cases up to 50% larger. [5] This increased lung volume suggested a reduction in breathing motion, allowing clinicians to challenge current treatment margins for thoracic tumours.

References

1. Boisbouvier, S., et al. Upright patient positioning for gantry-free breast radiotherapy: feasibility tests using a robotic chair and specialised bras.
2. Siebenthal, M., et al. (2007) Systematic errors in respiratory gating due to intrafraction deformations of the liver
3. Alghadir, A., Zafar, H., Al-Eisa, E., Iqbal, Z. (2017) Effects of posture on swallowing.
4. Schreuder, N., et al (2023) Anatomical changes in the male pelvis between the supine and upright position
5. Yang J, Chu D, Dong L, Court LE. Advantages of simulating thoracic cancer patients in an upright position.

WHAT **MORE HUMAN** MEANS TO US

GIVING BACK MOMENTS OF CONTROL

We hear from patients that the treatment journey is an extremely vulnerable time. Even the smallest moments of feeling in control can be empowering. Our aim has always and will always be to be the more human way to treat cancer, beginning with how patients feel during your treatment. With patient's feet firmly on the ground, looking out, eye-to-eye with their clinician, we believe will help them to feel less like a passenger on their treatment journey.

WE'VE GOT YOUR BACK

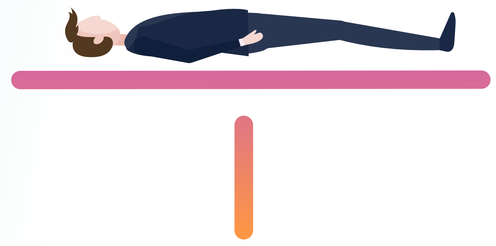
Approximately 80% of radiation therapists face musculoskeletal disorders, mainly in the neck, wrists, and lower back, due to repetitive movements during patient positioning. [1] An upright treatment position allows patients to self-position, minimizing manual handling by radiographers.

RESEARCH INTO PATIENT COMFORT

Patients felt it easy to get out of the system

94%

Upright



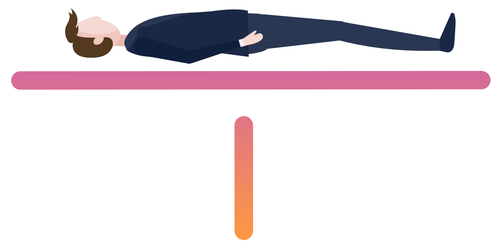
60%

Supine

Patients found it comfortable to breathe

100%

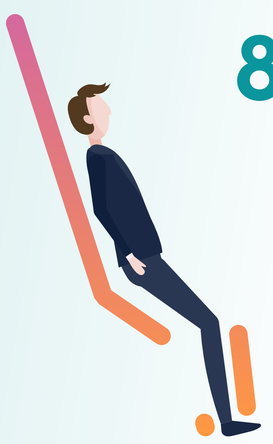
Upright



87%

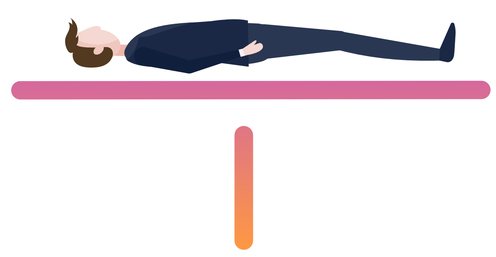
Supine

Patients felt stable



87%

Upright



67%

Supine

References

1. Hannia, A., et al. (2020) Prevalance of Musculoskeletal Work-related Injuries Among Radiation Therapists.
2. Boisbouvier S, Boucaud A, Tanguy R, Grégoire V. Upright patient positioning for pelvic radiotherapy treatments.

PIONEERING WITH PURPOSE

UPRIGHT PHOTON ALLIANCE | LEO CANCER CARE

"THE ALLIANCE'S MISSION IS TO CHALLENGE THE NORMS OF CONVENTIONAL RADIOTHERAPY, TO RECOGNIZE UPRIGHT RADIOTHERAPY'S CONTRIBUTION TO IMPROVING THE PATIENT EXPERIENCE AND IMPROVING ACCESS TO CARE ON A GLOBAL SCALE"

OUR FOUNDING PIONEERS:

Centre de lutte contre le cancer Léon Bérard | Cone Health | IHH Healthcare | OncoRay National Center for Radiation Research in Oncology Dresden

The Upright Photon Alliance was formed in October 2024. It is a unique research group consisting of global healthcare providers; Centre Léon Bérard, Cone Health, IHH Healthcare, Mayo Clinic and OncoRay.

This group has embarked on a research collaboration to investigate Leo Cancer Care's latest photon therapy product, dedicated to challenging the norms of conventional radiotherapy for cancer patients worldwide.

2025 marks an exciting year for the Alliance as it held its very first international upright workshop and construction and installation plans are underway for some of the founding members.

"It's an exciting time to collect evidence which should enable us to offer state-of-the-art radiotherapy treatments to many more patients worldwide"

Vincent Gregoire, Head of the Radiation Oncology Department

"Upright therapy stood out as one of the most innovative and potentially beneficial therapies that have been developed in recent times. This made Cone Health excited to explore the possibilities through a research partnership with Leo Cancer Care"

BJ Sintay, Executive Director of Radiation Oncology

UNTRODDEN GROUND WAITING TO BE DISCOVERED

Upright Radiotherapy is a new concept that will provide a whole new era of research opportunities. Below are just a few of the topics the Upright Photon Alliance will be discovering together.

1. Psychology of Upright Imaging and Radiation Therapy
2. Anatomical changes - Recumbent vs Upright
3. Optimized IMRT using a Fixed Beam + Helical IMRT
4. Adaptive Therapy (Off-line, On-line, Progressive) and Autonomous RT
5. Mobile RT units
6. Cost Reduction and Workflow improvements
7. AI techniques in Imaging

To inquire about the Upright Photon Alliance and how to join scan here:

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CANCER CARE

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