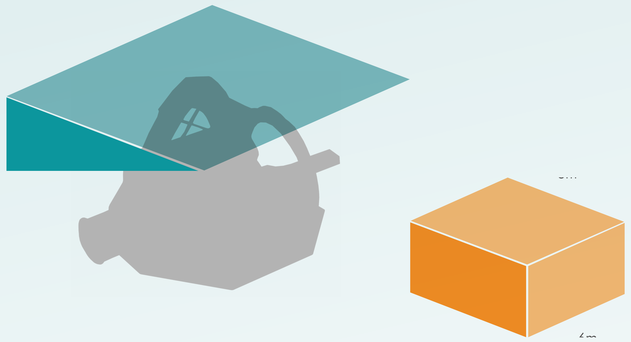
# CHANGING PARTICLE THERAPY FOR **GOOD**

## SIMPLY ROTATING **THE LIGHTER OBJECT**

Today, centers looking to introduce particle therapy treatments, are recognizing the benefits of this concept, which has the potential to make particle therapy more effective, more accessible and much more patient friendly. In a sense, rotating the patient is logical - after all, if you need to change a lightbulb, you don't hold the lightbulb and rotate the house. It always makes sense to rotate the lighter object. We're applying that simple concept to modern radiation therapy by rotating, for example, a 100lb patient instead of a 100-tonne gantry.



# WHAT **MORE HUMAN** MEANS TO US

### GIVING BACK MOMENTS OF CONTROL

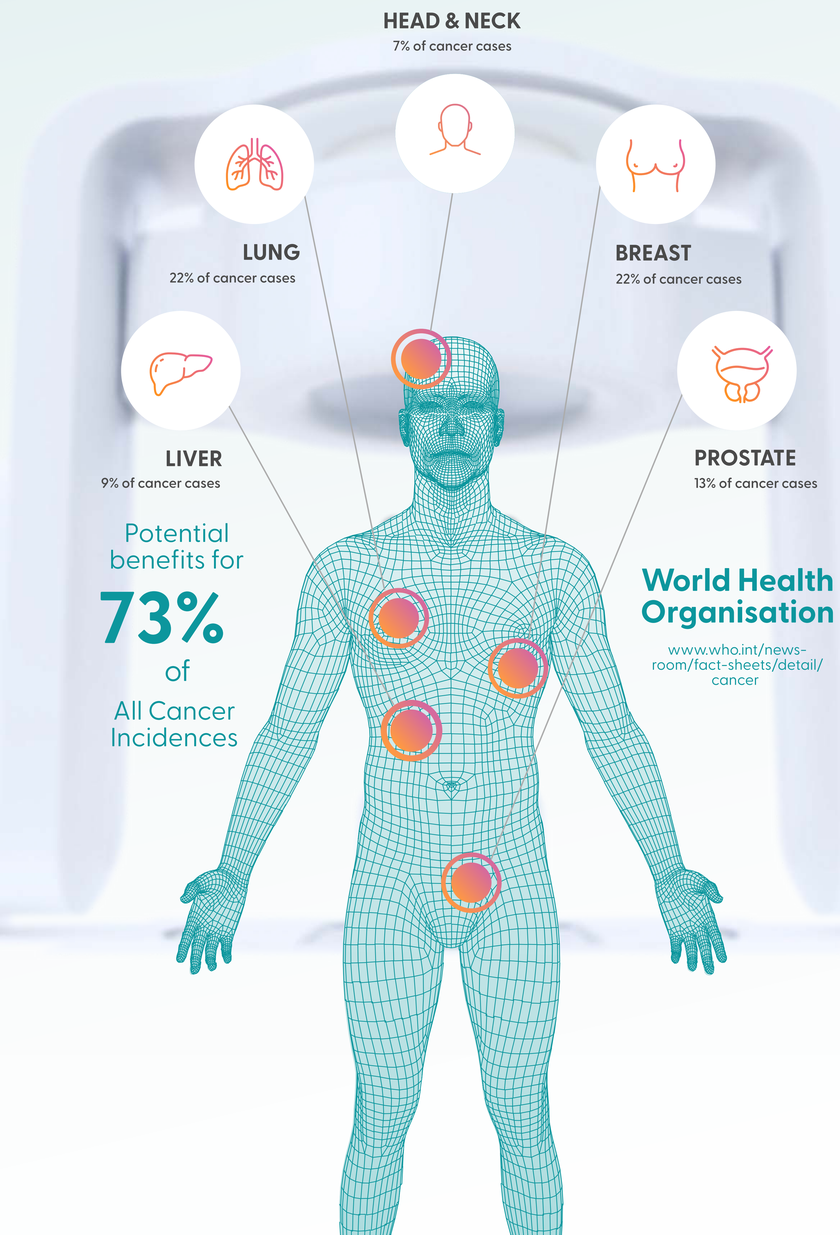
We hear from patients that the treatment journey is an extremely vulnerable time. Even the smallest moments of feeling in control can be empowering. Our aim has always and will always be to be the more human way to treat cancer, beginning with how patients feel during your treatment. With patient's feet 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. [6] An upright treatment position allows patients to self-position, minimizing manual handling by radiographers.

# WHY UPRIGHT?

## POTENTIAL BENEFITS FOR



# KEY INDICATIONS **UPRIGHT**

## BREAST

Increased lung volumes upright 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].

## HEAD AND NECK

A study by Alghadir *et al* found that difficulty swallowing was 6 times greater when a patient is lying down with their neck extended compared to upright [3].  Suggesting that being treated in an upright position will help patients better manage thick oral secretions and reduce the risk of aspiration and patient anxiety.

## 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.

## 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.

## PROSTATE

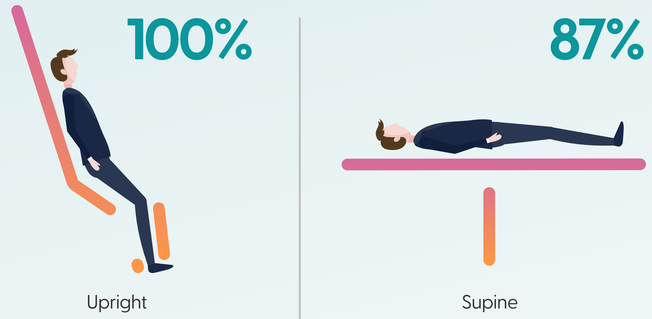
Recent data indicated that when upright, the prostate has been shown to move less. Its position is unaffected by changes in bladder fill, the seminal vesicles are pushed down by the bladder allowing them to be included in treatment volumes without compromising on healthy tissue, the space between sacrum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

## REFERENCES

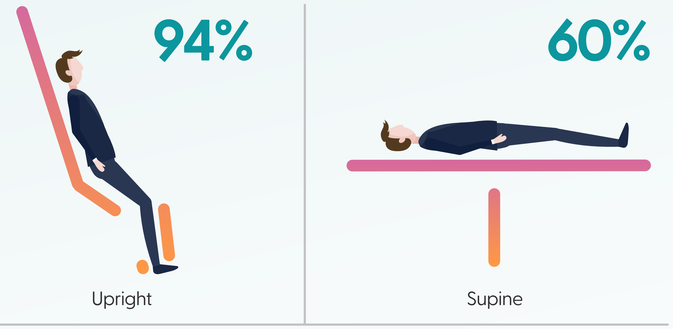

1. Boisbouvier, S., et al (2023). Upright patient positioning for gantry-free breast radiotherapy: feasibility tests using a robotic chair and specialised bras.
2. Siebenthal, M., et al. (2007) Systematic errors in respiratory gating due to intrafraction deformations of the liver
3. Alghadir, A., Zafar, 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. (2023) Advantages of simulating thoracic cancer patients in an upright position.


# RESEARCH INTO **PATIENT COMFORT**

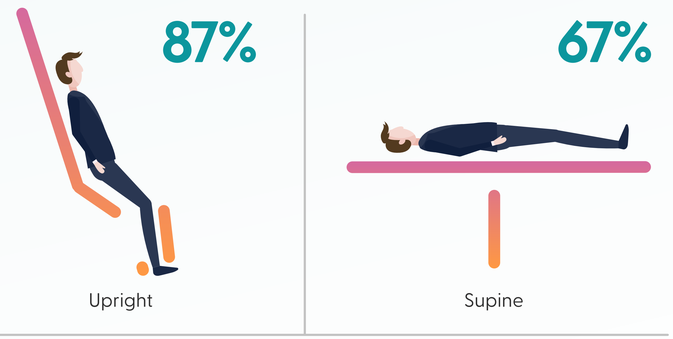
Patients found it comfortable to breathe




Patients felt it easy to get out of the system




Patients felt stable




Boisbouvier S, Boucaud A, Tanguy R, Grégoire V. (2022) Upright patient positioning for pelvic radiotherapy treatments.