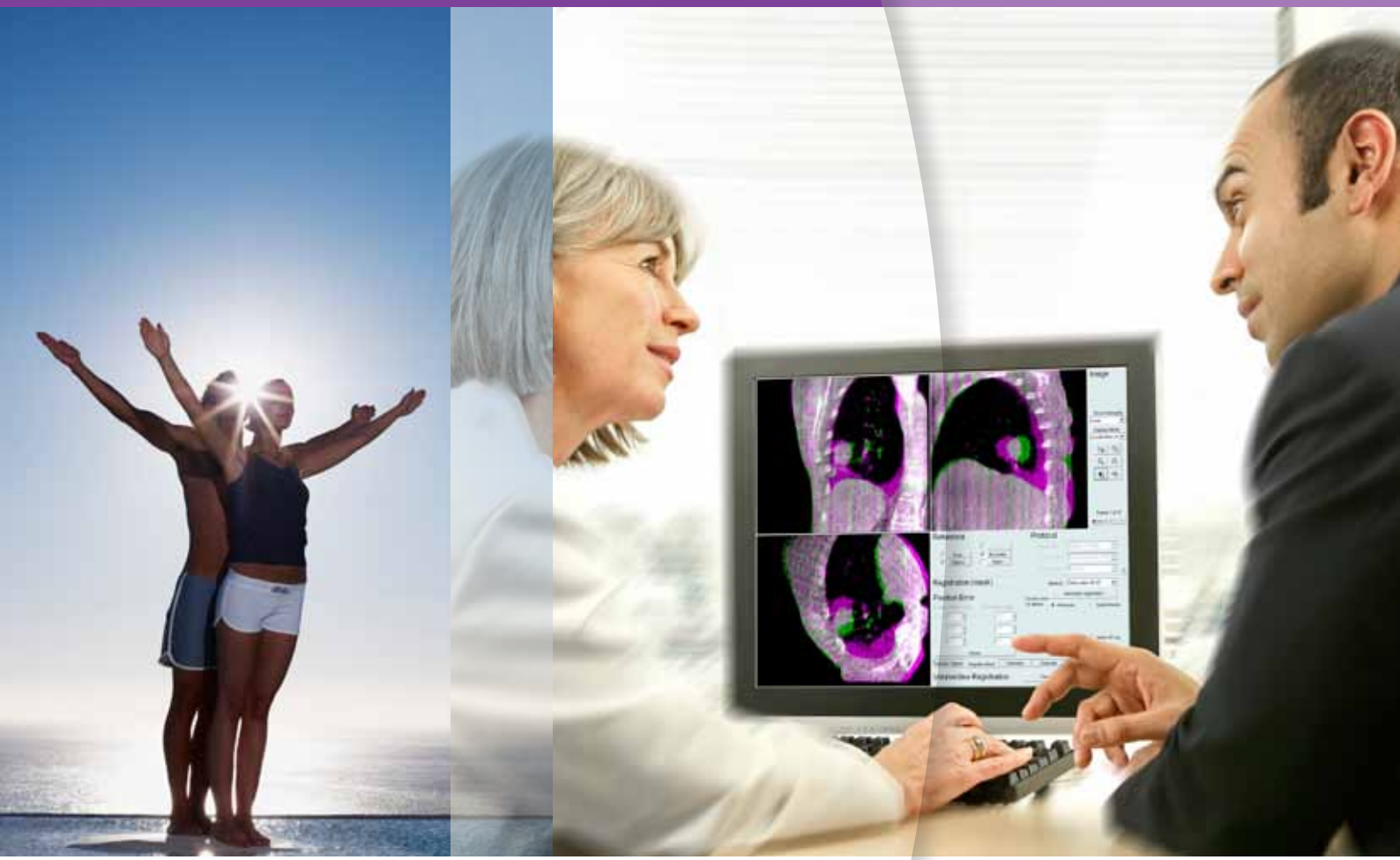
# XVI Symmetry™

## Managing respiratory motion



*Margin reduction enabled by 4D image guidance without external markers*

ELEKTA

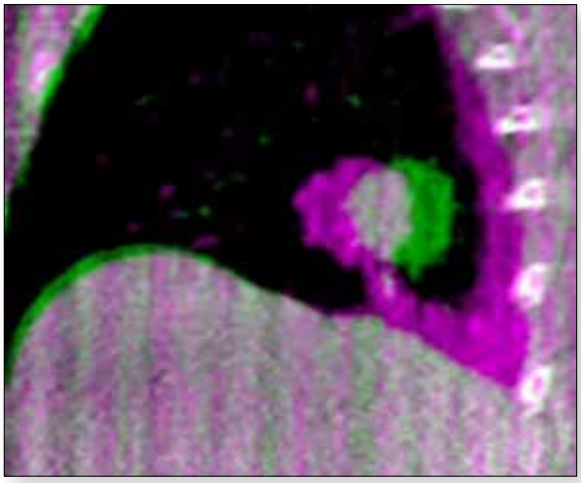
# Symmetry™

## Managing respiratory motion

### A new approach to the treatment of thoracic cancers

While the use of surrogate markers for respiratory tracking initially held promise, subsequent studies have demonstrated an unstable relationship with real anatomy[1] and failure to account for the baseline shifts exhibited by lung cancer patients during the course of their treatment[2]. Now Symmetry has the answer.

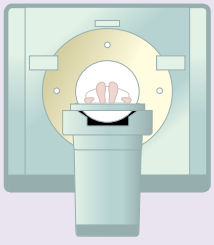
Symmetry uses unique anatomically correlated 4D image guidance at the time of treatment to give volumetric visualization of respiratory motion and the ability to correct for baseline shifts. Accounting for baseline shift will support delivery of treatments with only small margins required for free breathing[3]. Gating or tracking are not required.



Baseline shift

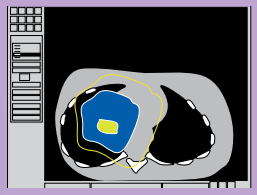
Images courtesy of NKI-AvL Hospital, Amsterdam

- Helps achieve symmetrical dose distribution
- Uninterrupted patient set-up and treatment delivery
- Accounts for baseline shift for a variety of planning techniques, including ITV
- Enables margin reduction
- Simple intuitive workflow

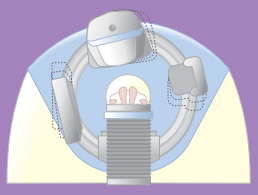


Patient has a planning CT scan

4D CT scanner exports the respiratory phase closest to the average position



Exported 3D image is utilized for planning, with no change to normal procedure

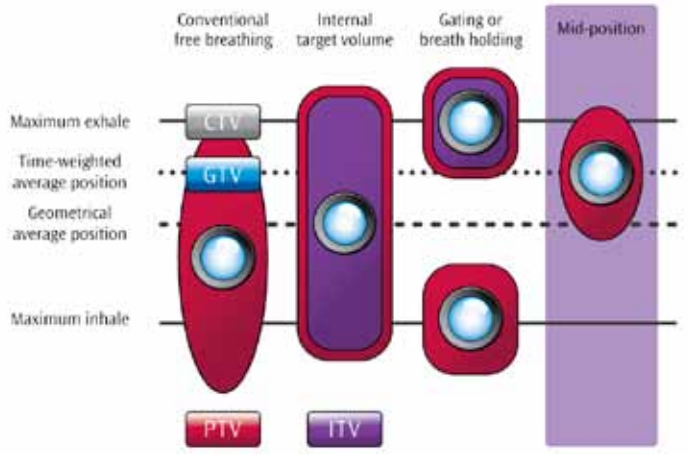


Symmetry acquisition and inline reconstruction

## What is Symmetry?

Symmetry is the cutting-edge solution from Elekta to help manage the effects of respiratory motion. It includes 4D image acquisition, in-line reconstruction and automated anatomically correlated 4D registration to find a time weighted average position of the tumor for each treatment. This solution is unique to Elekta and differs from all other systems on the market, which use external surrogates such as a belt or reflective markers.

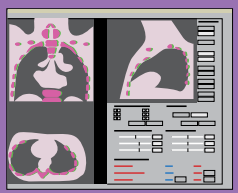
Symmetry can be utilized to support advanced margin reduction protocols or in addition to current planning practices to ensure baseline shifts as well as trajectory, amplitude and frequency of motion are being accounted for when making adjustments to patient set-up.



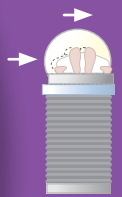

Alternative planning approaches
Adapted from Wolthaus et al[3]

## *Why Symmetry?*

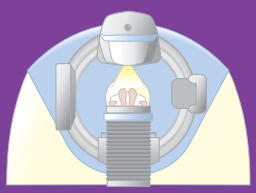
- New approach to the treatment of thoracic cancers
- Uniquely efficient in addressing baseline shifts
- Enables margin reduction without complex set-up or external markers
- Maximizes the possibility of symmetrical dose distribution to moving targets
- Simple and intuitive workflow for uninterrupted treatment delivery



Automated Symmetry registration



Patient shift is performed



Patient is treated with no interruption to the treatment beam

*Symmetry is not available for sale or distribution in all regions. Please contact your local Elekta representative or authorized distributor for more information. Symmetry is a feature set of XVI R4.5.*

References

1. *CORRELATION OF LUNG TUMOUR MOTION WITH EXTERNAL SURROGATE INDICATORS OF RESPIRATION. JEREMY D.P. HOISAK, KATHARINA E. SIXEL, ROMEO TIRONA, PATRICK C.F. CHEUNG, JEAN-PHILIPPE PIGNOL. Int. J. Radiation Oncology Biol. Phys., Vol. 60, No. 4, pp. 1298–1306, 2004*
2. *VARIABILITY OF FOUR-DIMENSIONAL COMPUTED TOMOGRAPHY PATIENT MODELS JAN-JAKOB SONKE, PH.D., JOOS LEBESQUE, PH.D., M.D., AND MARCEL VAN HERK, PH.D. Int. J. Radiation Oncology Biol. Phys., Vol. 70, No. 2, pp. 590–598, 2008*
3. *COMPARISON OF DIFFERENT STRATEGIES TO USE FOUR-DIMENSIONAL COMPUTED TOMOGRAPHY IN TREATMENT PLANNING FOR LUNG CANCER PATIENTS. JOCHEM W. H. WOLTHAUS, M.SC., JAN-JAKOB SONKE, PH.D., MARCEL VAN HERK, PH.D., JOSE´ S. A. BELDERBOS, M.D., PH.D., MADDALENA M. G. ROSSI, D.C.R. (R.), R.T.T., JOOS V. LEBESQUE, M.D., PH.D., AND EUGE`NE M. F. DAMEN, PH.D. Int. J. Radiation Oncology Biol. Phys., Vol. 70, No. 4, pp. 1229–1238, 2008*

## The Elekta commitment to Oncology

Elekta product and service development is driven by a commitment to deliver on five core values in order to offer our customers an enhanced partnership for the fight against cancer. Symmetry delivers against those values in the following ways:

### Innovation
By providing unique anatomically correlated 4D image at the time of treatment and utilizing exclusive technology to determine a time-weighted average position for moving tumors, new opportunities for margin reduction can be facilitated.

### Efficiency
By maintaining a practical and efficient workflow with in-line reconstruction, elegant registration tools and uninterrupted treatment delivery, complexity in set up and treatment time are reduced when compared to gating.

### Flexibility
By offering a more open system approach we support a variety of planning tools and approaches. Faster ungated delivery maximizes patient comfort and compliance in support of personalized medicine.

### Evidence
By utilizing research conducted at leading cancer clinics with Elekta Synergy machines, an improved understanding of the complexity of respiratory motion was gained, which led to the development of Symmetry.

### Confidence
By enabling visualization of the moving tumor at the time of treatment, oncologists will now have the confidence to reduce margins and increase dose without compromising the safety of adjacent critical structures.

For further information, please visit www.elekta.com/symmetry.

www.elekta.com

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