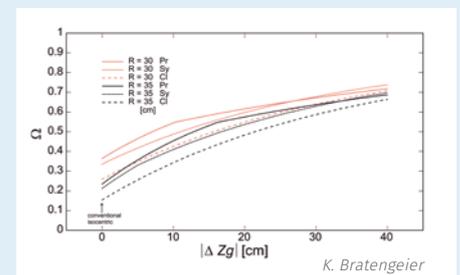
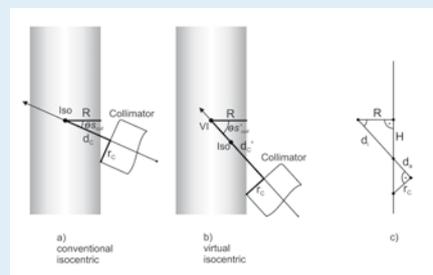
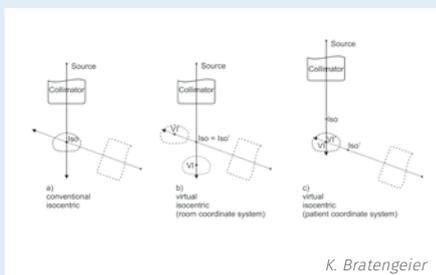


Virtual isocenter for enabling large spatial angles for **non-co-planar radiation**.

gKteso presents the virtual isocenter with RPS automatic: For more accuracy in stereotactic.

RPS manufactured by gKteso is a innovative robot couch system with almost unlimited possibilities and consequent advantages.



Synchronization of the **gantry and couch movement** allows the definition of a virtual isocenter. The distance between the patient and the radiation device can be altered in this manner. The system behaves as though there were an increased distance between the radiation source and the isocenter.*

The figure shows a concept cylinder around the patient lying on the radiation couch. The mechanical parts of the radiation device may also not penetrate this protected space, whatever the radiation situation.

This means that the range of permitted, non-co-planar radiation directions is restricted.

A virtual isocenter allows greater distances between the patient and the radiation device, thereby offering a larger accessible spatial angle range.*

Accessible spatial angle for enlargements of the source - isocenter distance by ΔZg .

$\Omega = 1$ corresponds to the full angle.
R: Radii of a safety cylinder around the patient.

Pr - Siemens PRIMUS™ ; Sy - Elekta Synergy with AGILITY™ collimator...;
Cl-Varian CLINAC™ 2100

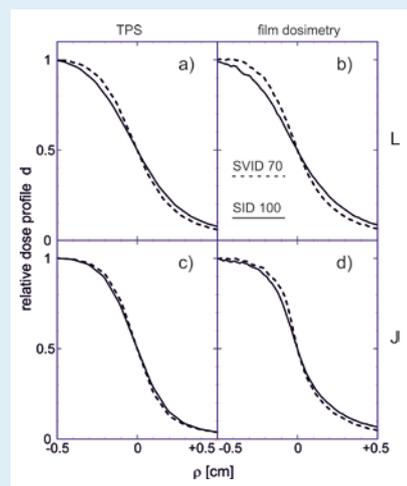
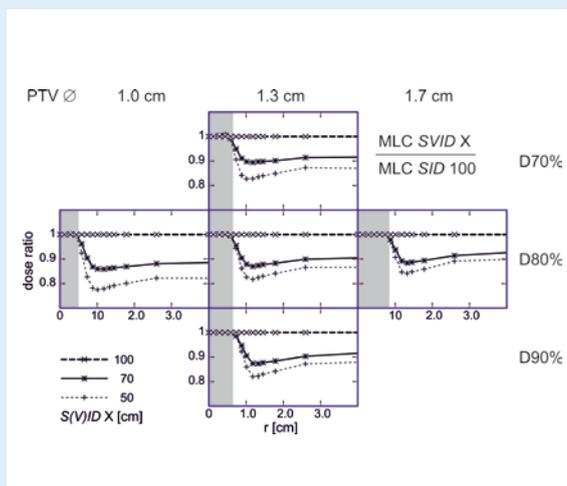
The scope for non-co-planar radiation can be multiplied compared to the classic isocenter of $\Delta Zg = 0$.*

* K. Bratengeier und S. Wegener, S., submitted to „Strahlentherapie und Onkologie“

The following advantages can be achieved:

- penumbra effects are significantly reduced
- exact radiation through smaller leafs
- reduced risks for non-coplanar radiation

Virtual isocenter for more accuracy in **stereotactic radiosurgery**.



Stereotactic irradiation and “source to virtual isocentre distance” (SVID)

Radial dose depending from SVID, using a 5 mm MLC.

Radial dose distribution for MLC at SVID 70 cm (continuous) and 50 cm (thin dashed), normalized to the distribution for MLC at SID 100 cm.

Shaded area: (Circular) PTV, Quasi-isotropic irradiation in 2π geometry.

Left: PTV \varnothing 1.0 cm; middle: PTV \varnothing 1.3 cm; right: PTV \varnothing 1.7 cm.

Prescriptions: top: D70%; middle: D80%; bottom: D90%. S(V)ID: SID or SVID.*

*K.Bratengeier, submitted to ‘Radiation Oncology’

Varying “source to virtual isocentre distance” (SVID):

Measured and calculated beam edges.

Source to isocentre distance (SID) 100 cm (continuous line) and source to virtual isocentre distance (SVID) 70 cm (dashed line):

Beam edges are set to 50% point for beams of effective $10 \times 10 \text{ mm}^2$ (nominally $10 \times 10 \text{ mm}^2$ for SID 100 cm, $14 \times 14 \text{ mm}^2$ for SVID 70 cm, respectively). Left side (a+c): planned in TPS. Right side (b+d): film measurements.

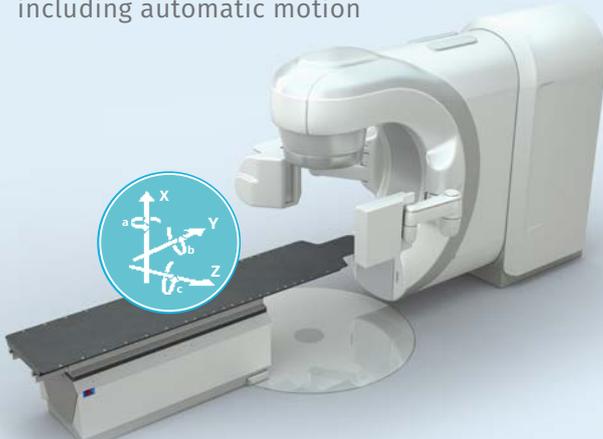
Upper row L (a+b): leaf direction; lower row J (c+d): jaw direction.

Depth 10 cm, central axis dose is normalized to 1.0.*

Virtual isocenter for enabling large spatial angles for **non-co-planar radiation**.

6 DoF-Couch

including automatic motion



with Siemens



with Best Theratronics

RPS automatic is a robot couch system with almost unlimited possibilities and consequent advantages:

- **exact positioning**
- **6 degrees of freedom for optimized positioning**
- **motion with extremely gentle movements**
- **perfect base for stereotactic radiosurgery**
- **reduced risks for collisions by non-coplanar irradiation**



Find more Information under:

www.radiotherapy-patient-system.com/more-accuracy-in-stereotactic-radiosurgery

www.radiotherapy-patient-system.com/products/rps-automatic