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Wat is state of the art radiotherapie?

Mogelijkheden van hoge precisie bestraling:

Klinische relevantie ?

Katrien Erven, MD, PhD

Bestralingen op specifieke stereotaxie unit



TrueBeam
STx

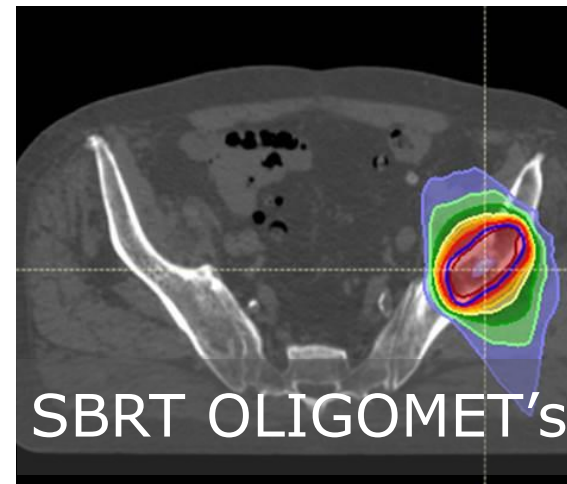
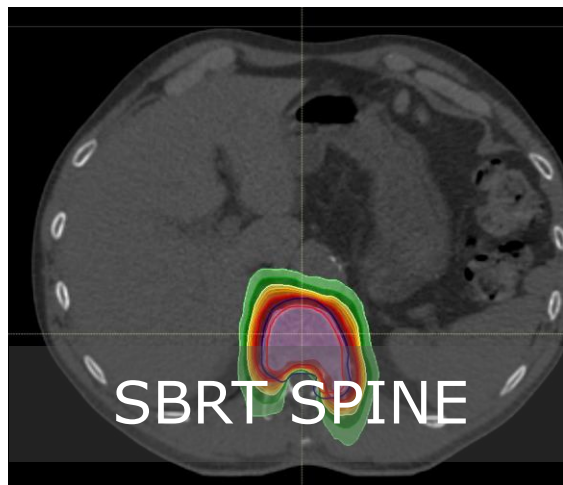
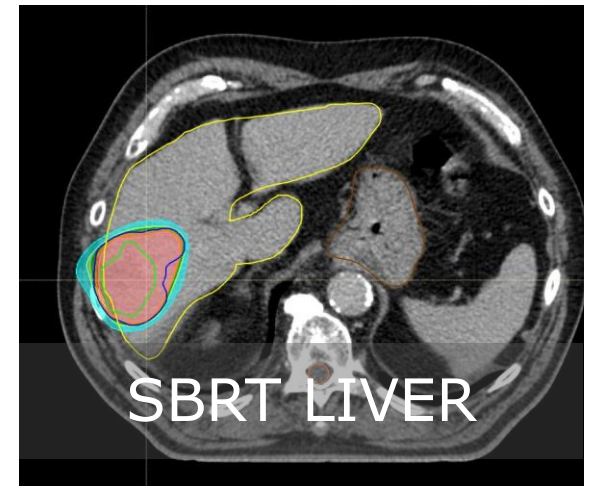
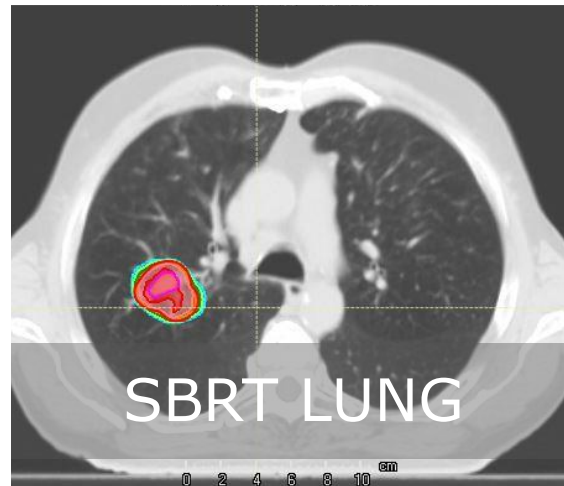
TPS =
RAYSTATION

Dedicated
STX-SBRT
unit

OIS =
RAYCARE

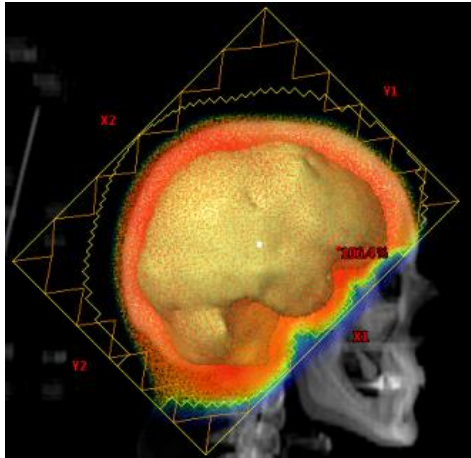
Surface
scanner

5 belangrijke toepassingsgebieden



Bestraling van hersenmetastasen

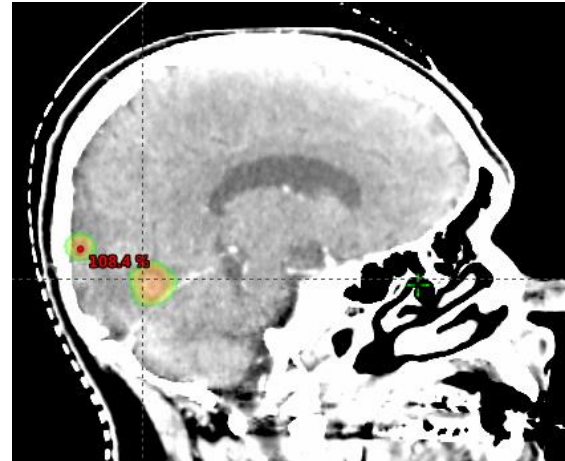
Van **pancraniële (WBRT)** naar **stereotactische (SRS)** hersenRT



Groot volume

Lage dosis

Respons: **60%**



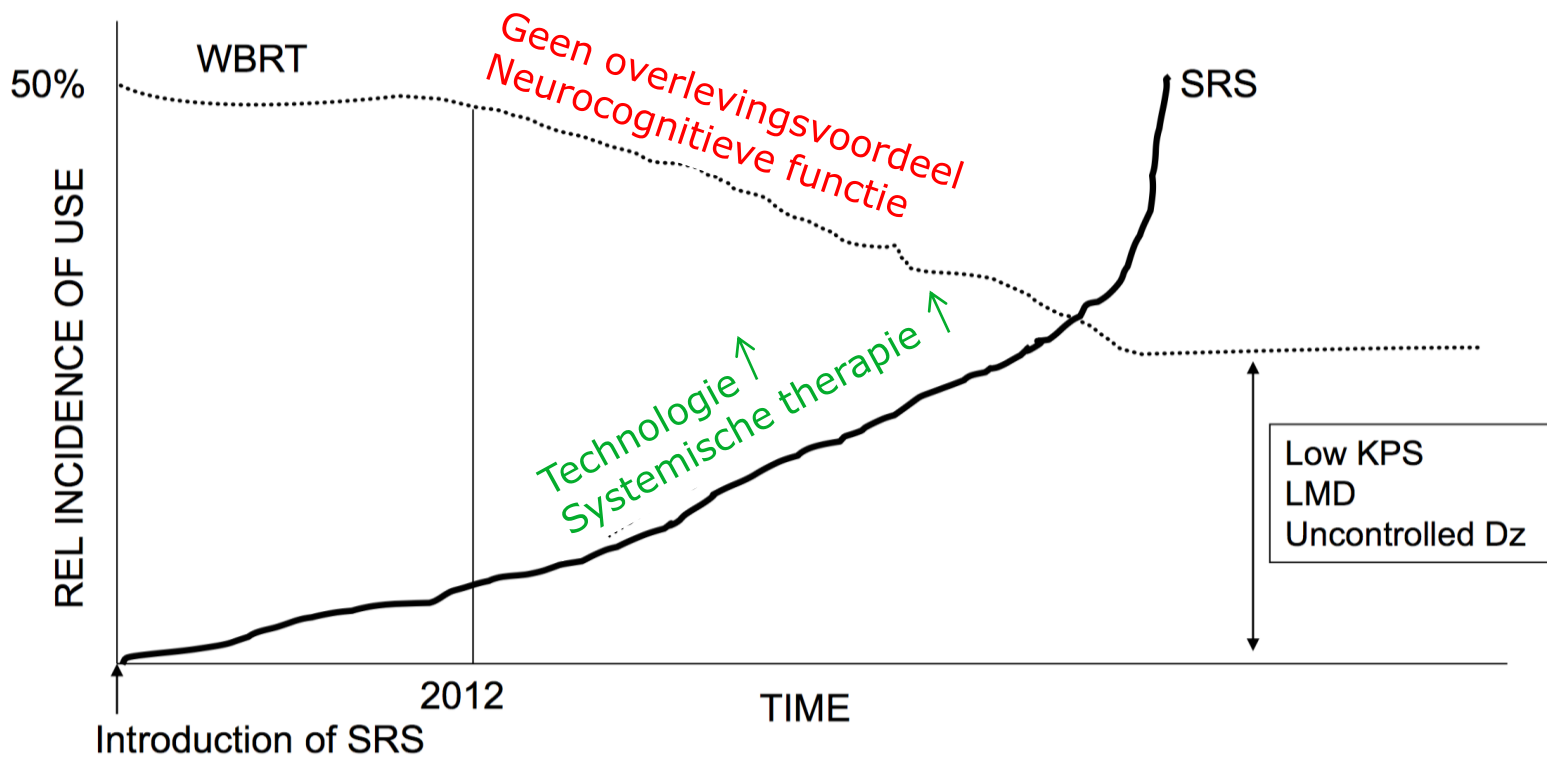
Klein volume

Hoge dosis

Respons: **>90%**

Bestraling van hersenmetastasen

Laatste 10 jaar: afname **WBRT**, toename **SRS**



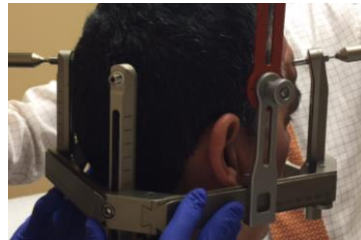
Van frame-based naar frame-less stereotactische hersenbestraling

'FRAME-BASED'

'FRAMELESS'

IMMOBILISATIE

Invasief kader



Masker

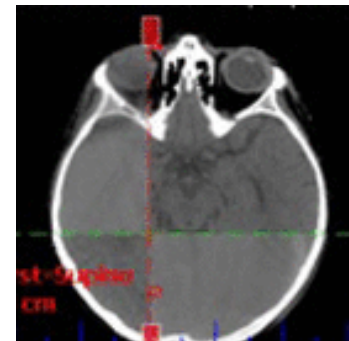


LOKALISATIE

Stereotactisch
reperage systeem

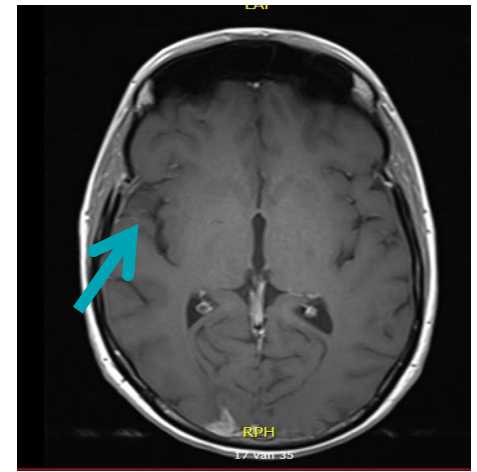
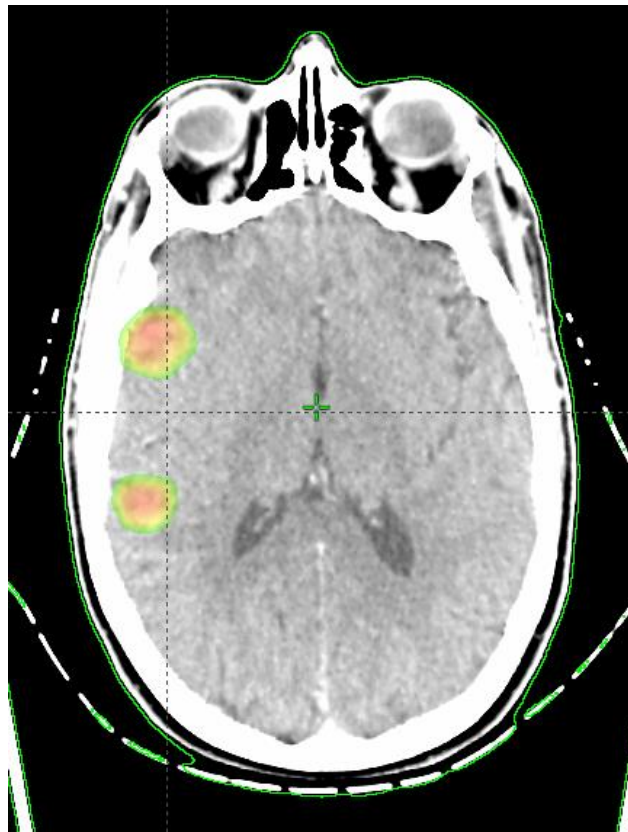
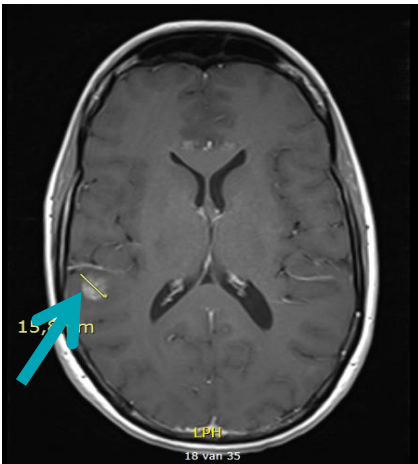
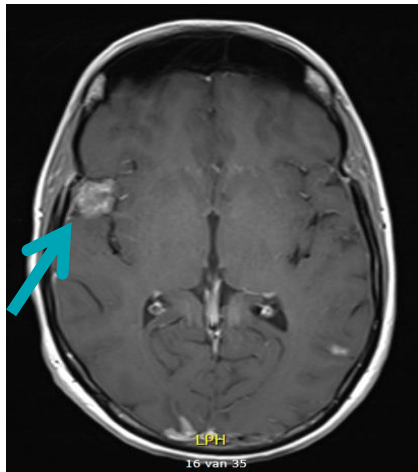


Beeldvorming / OSMS



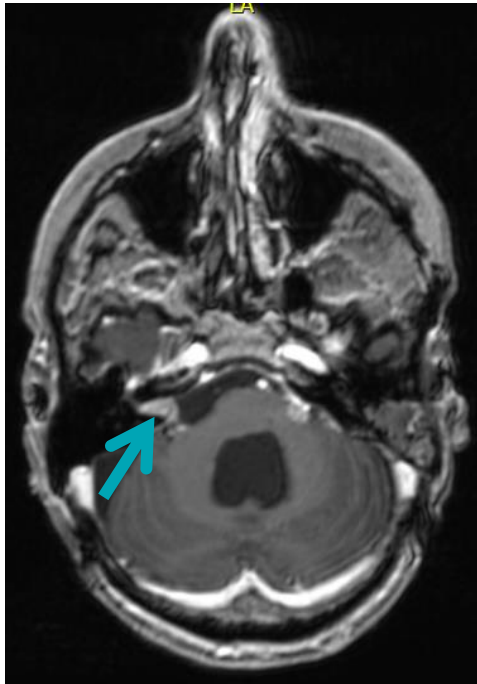
Enkele casussen

♀ 36 j, **Her 2+** borstcarcinoma, **multiple** hersenmetastasen
Extracraniële ziekte onder controle met anti-Her2 medicatie

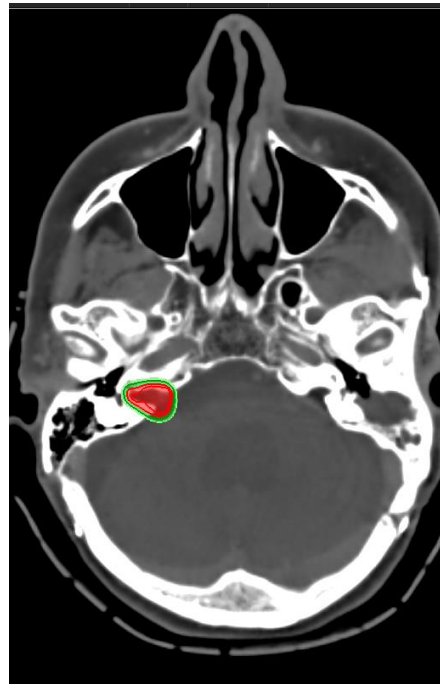


Enkele casussen

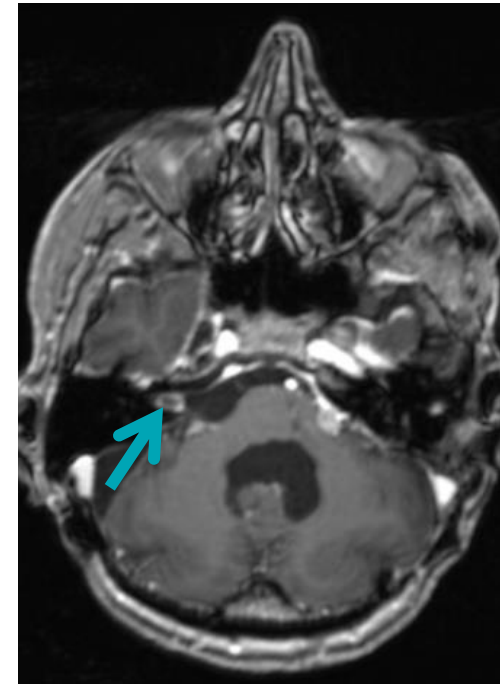
♀ 44 j, benigne zenuwtumor met multipele letsels, reeds doof links na chirurgie, nu **letsel re gehoorszenuw** waardoor volledig **doof**



1/2018
DOOF !



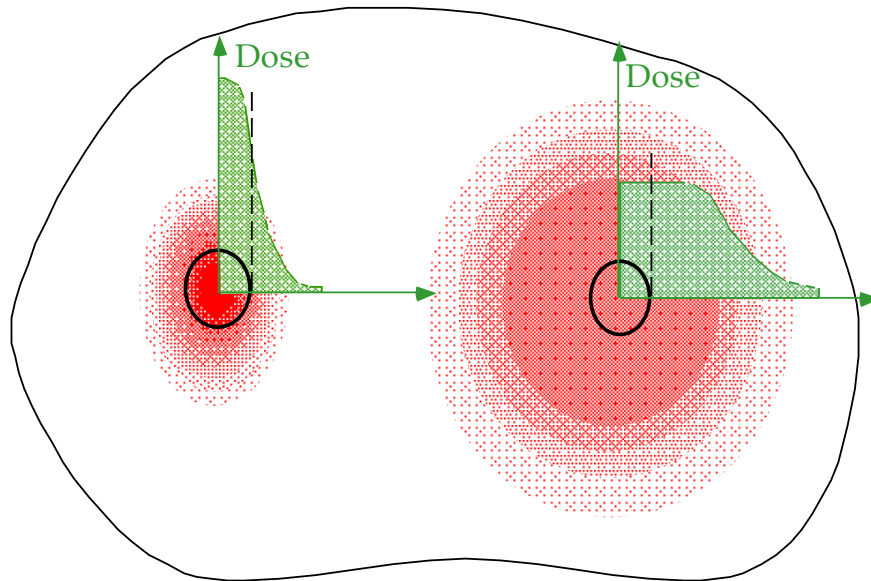
1/2018
SRS 12,5 Gy
geen nevenwerkingen
Na 3 weken:
recuperatie gehoor



8/2018
letsel afgenomen
gehoor links 80%

Bestraling van kleine longtumoren 'coin lesions'

Stereotactische (SBRT) longRT vervangt conventionele RT



- Hoge dosis per fractie (3-8 fracties)
- Zeer scherpe dosisgradiënt

Stereotactische longbestraling

Lokale controle en complicaties

Study	Number of patients	Dose	Central or peripheral lesion	Local control	Complications
Onishi et al. 21	257	1-14 fractions (30-84 Gy)	both	84% (5 years) BED \geq 100 Gy	\geq grade 3: pulmonary complications, in 5.4%; esophageal complications, in 1.0%; dermatitis, in 1.2%
Nagata et al. 22	104	4 \times 12 Gy	both	3-year progression-free survival, 69%	grade 3: dyspnea, in 9%; pneumonitis, in 7%; intercostal pain, in 2%; cough, in 1% grade 4: dyspnea, in 1%
Baumann et al. 23	57	3 \times 15 Gy	peripheral	92% (3 years)	grade 3: 28% grade 4: 1.7%
Senthi et al. 24	676	3-8 fractions (54-60 Gy)	both	89% (5 years)	-
Timmerman et al. 18	70	3 \times 20-22 Gy	both	95% (2 years)	pneumonitis, in 6%; rib fractures, in 3%
Brown et al. 25	59	1-5 fractions (15.0-67.5 Gy)	both	disease-free survival, 90%	grade 3: pneumonitis, in 7%
Van der Voort et al. 26	70	3 \times 12-15 Gy	peripheral	96% (2 years if dose was = 60 Gy)	late toxicity, in 10%

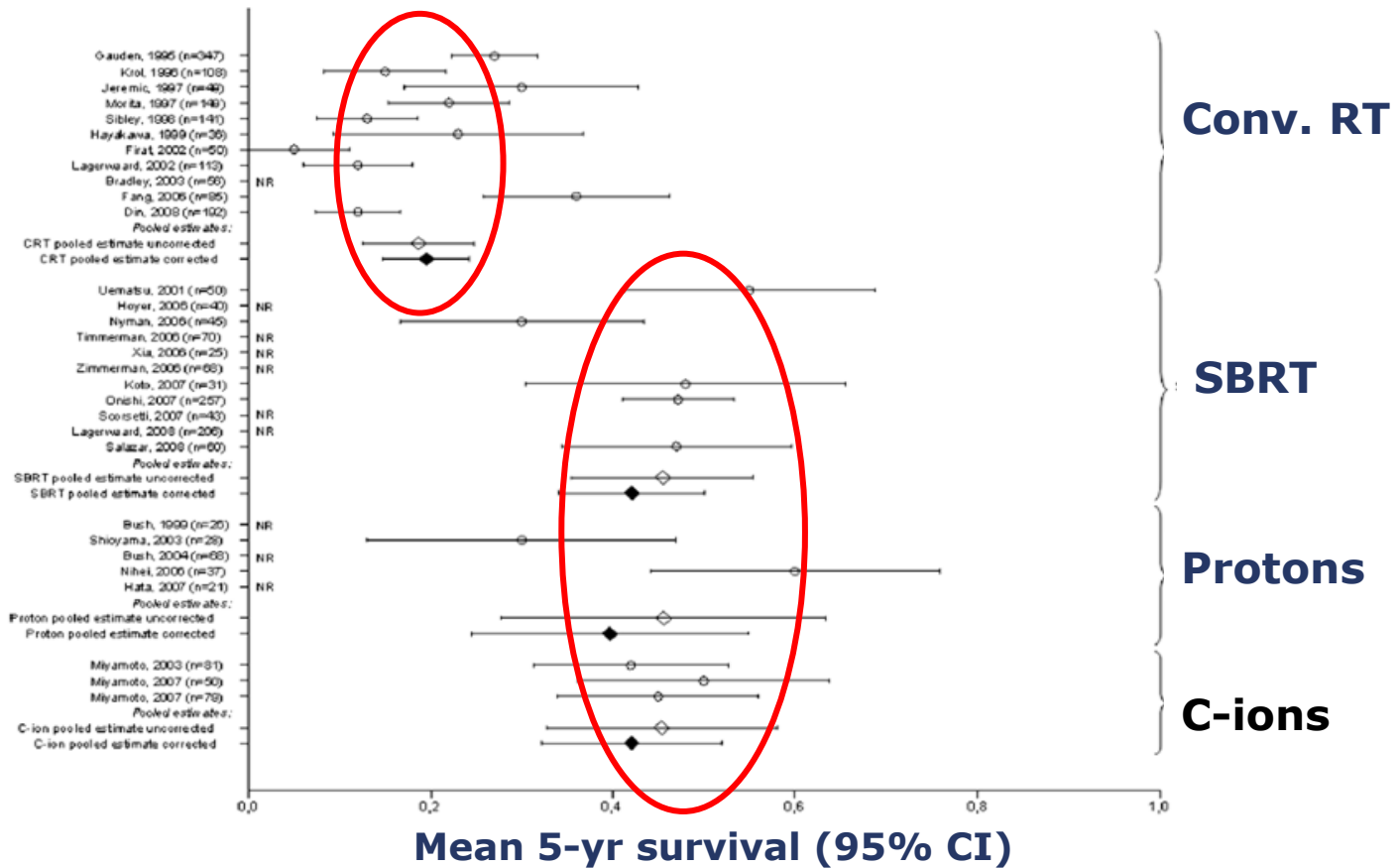
BED: biological equivalent dose.

>90%

<10%

Stereotactische longbestraling

Overlevingscijfers verschillende technieken stadium I-II longca

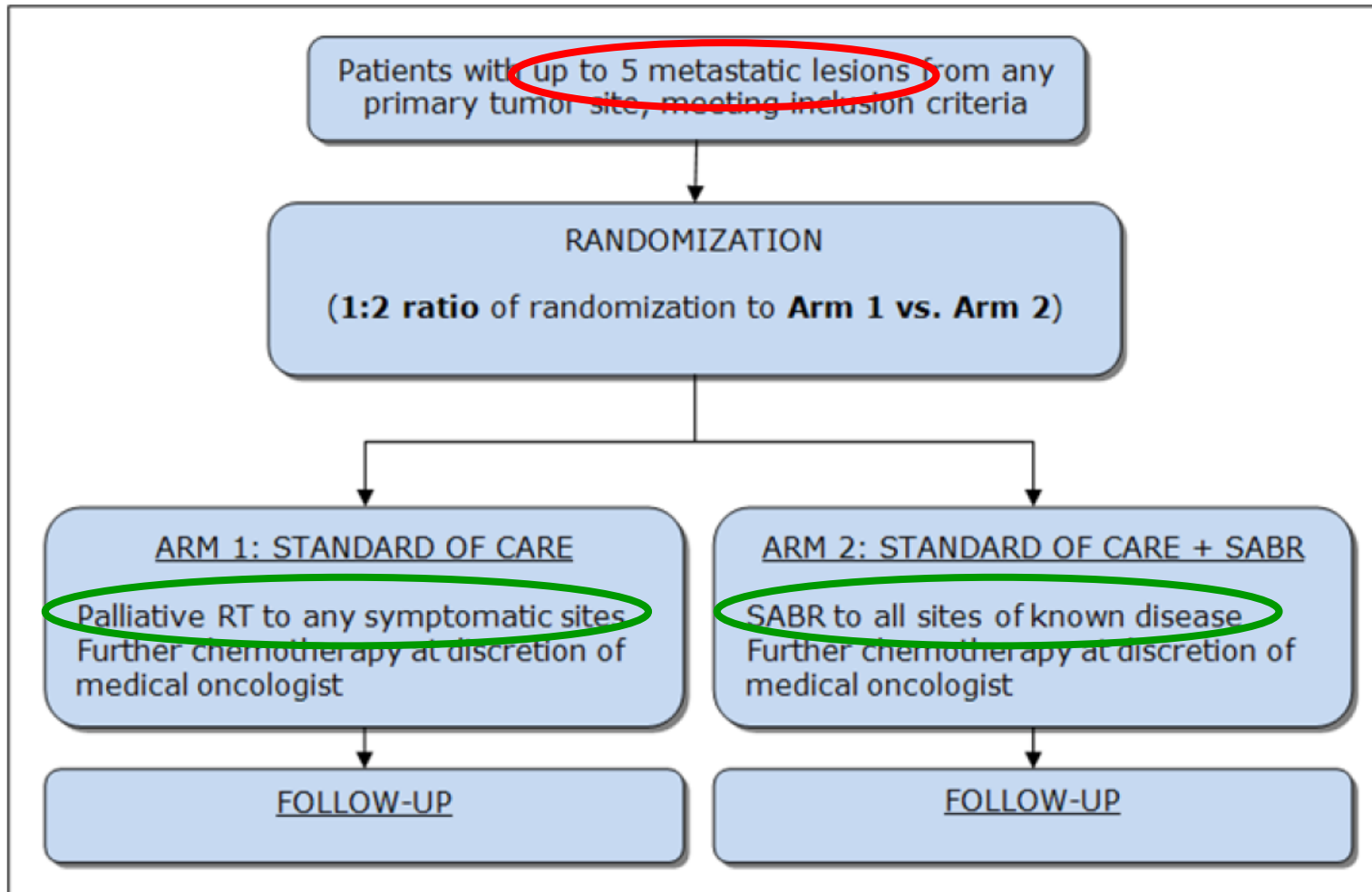


Oligometastatische ziekte

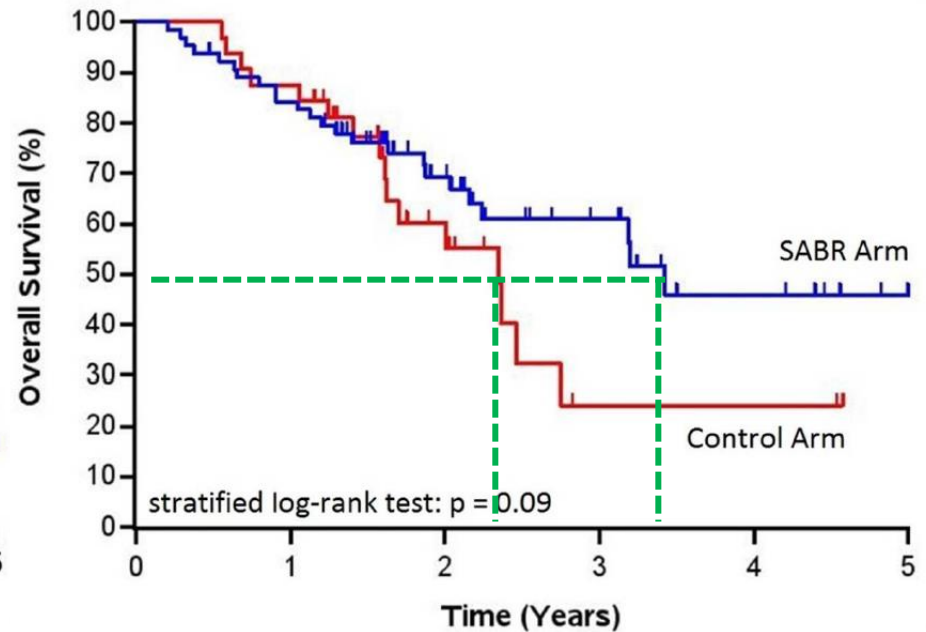
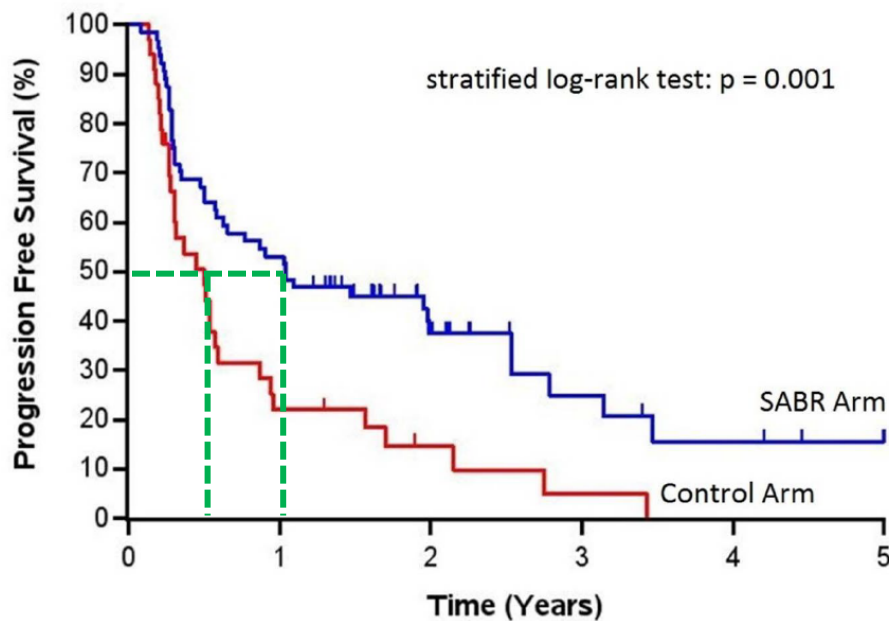
- **Beperkt** aantal metastasen (< 5)
- **lokale** therapie
- Met oog op **curatie**

Stereotactische bestraling van oligometastasen

SABR COMET studie



SABR COMET studie : resultaten

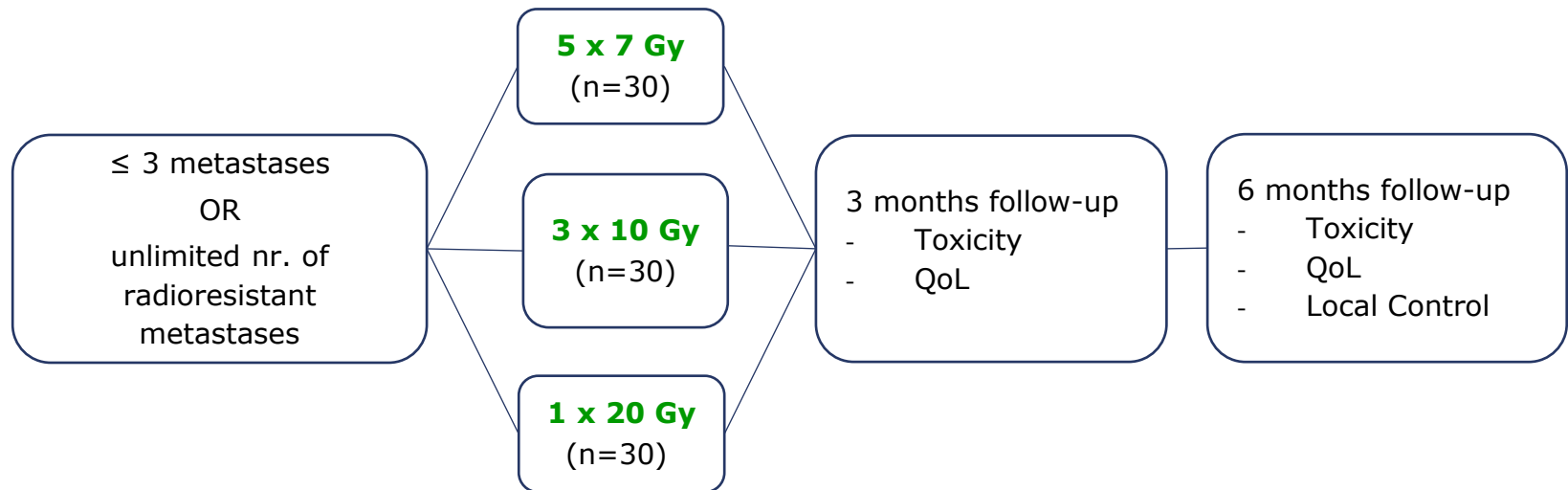
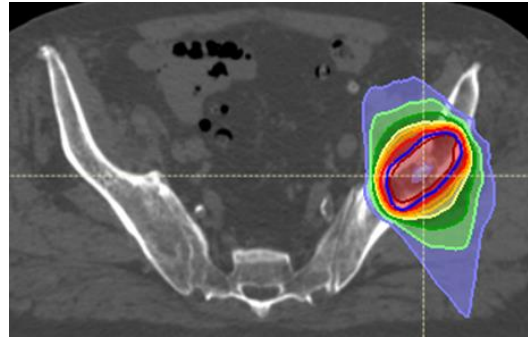
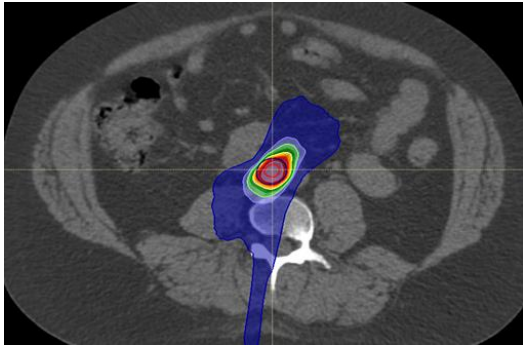


PFS: 6m → 12m

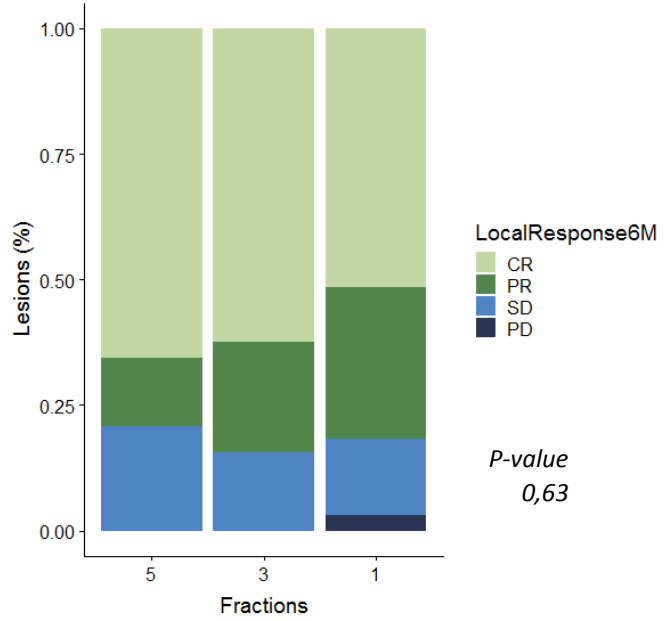
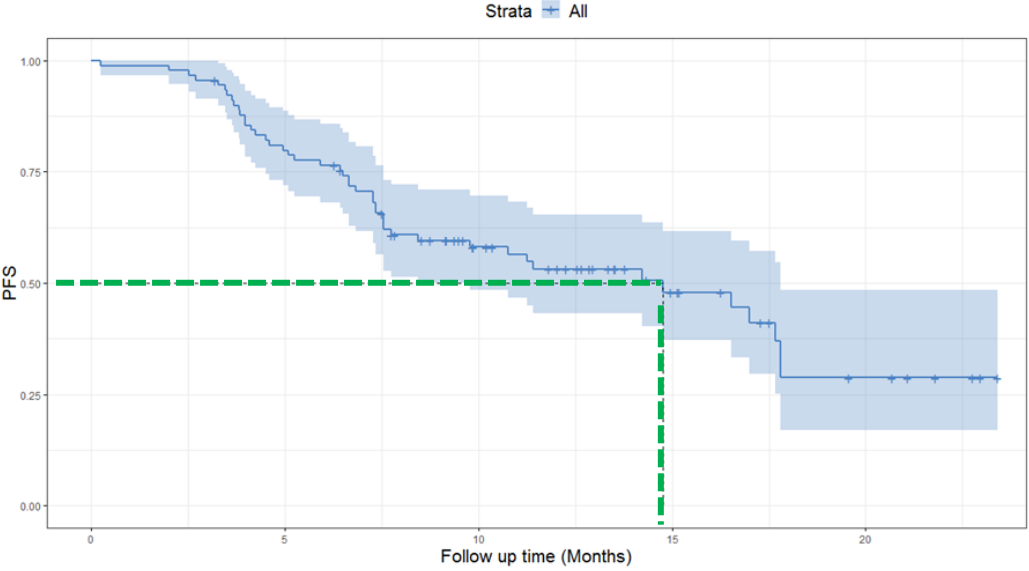
OS: 28m → 41m

DESTROY studie @ iridium: opzet

- Stereotactische bestraling van **oligometastasen**
 - Lymfeklier- of botmetastasen (geen wervelmetastasen)



DESTROY studie @ iridium: resultaten



ROBOMET studie @ iridium

- Phase 3 gerandomiseerde studie
- Stereotactische bestraling van **pijnlijke botmetastasen**

