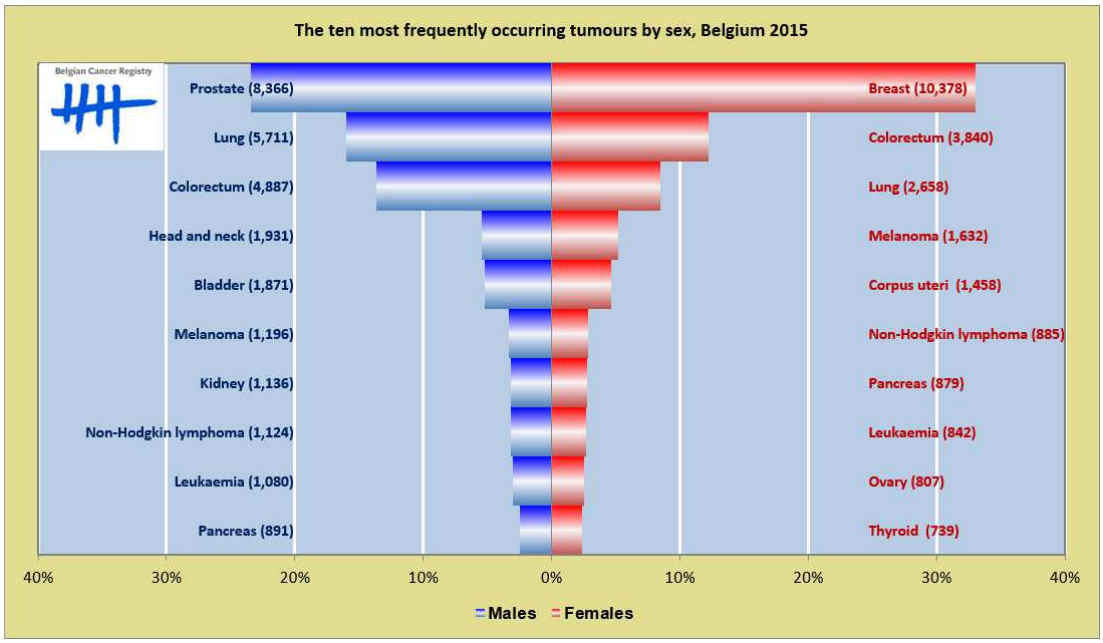
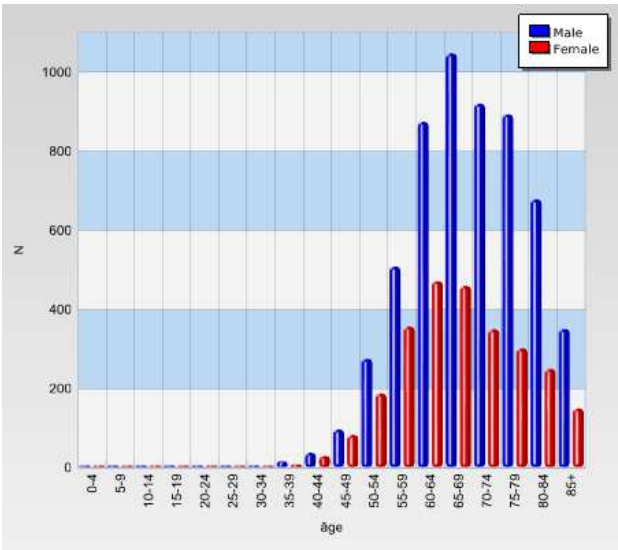
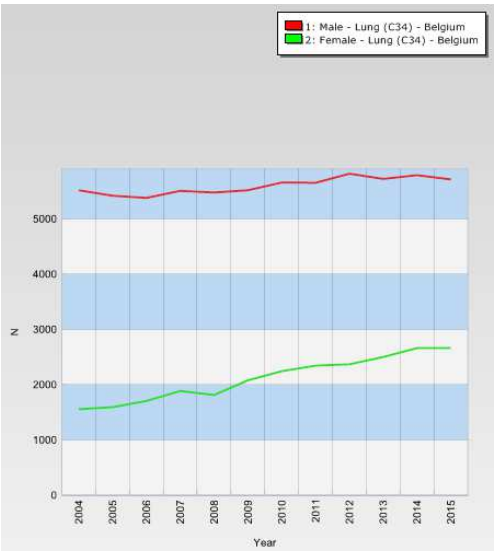
# Radiotherapie bij longtumoren

M. van Eijkeren





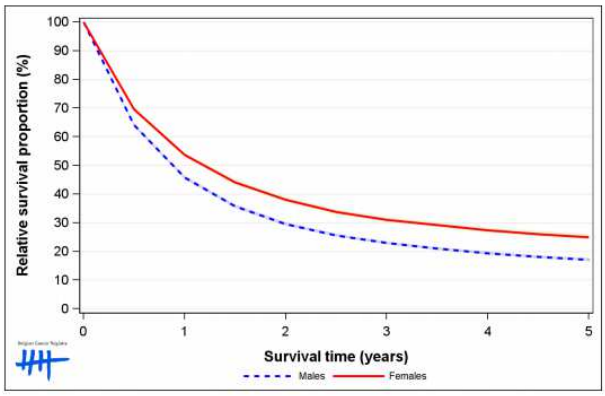

# Stadium / Overleving

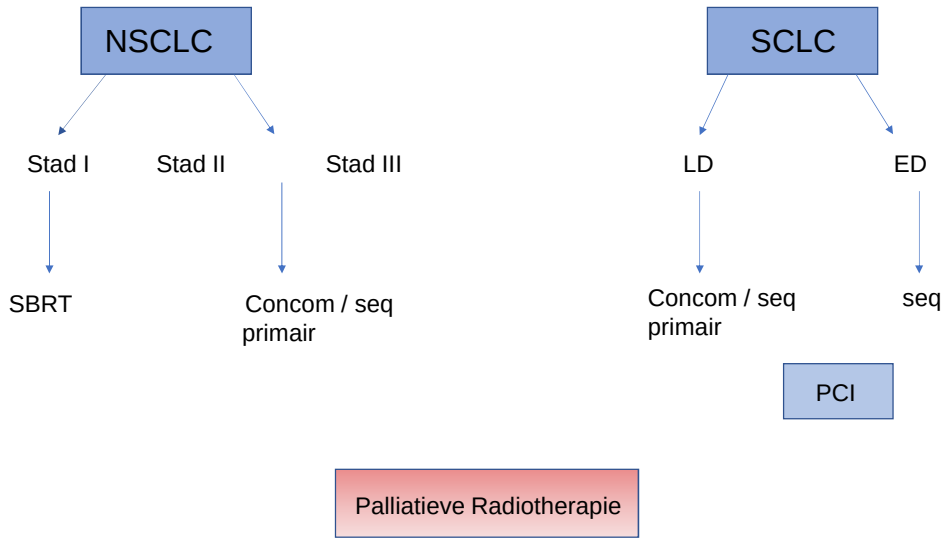
***Table 3:*** Lung Cancer: Distribution of combined stage by sex, Belgium 2015

| | Stage I | Stage II | Stage III | Stage IV | Stage X | Stage NA | Total |
|---|---|---|---|---|---|---|---|
| **Males** | | | | | | | |
| N | 971 | 457 | 1,233 | 2,521 | 521 | 8 | 5,711 |
| % | 17.0 | 8.0 | 21.6 | 44.1 | 9.1 | 0.1 | 100 |
| **Females** | | | | | | | |
| N | 523 | 179 | 471 | 1,224 | 250 | 11 | 2,658 |
| % | 19.7 | 6.7 | 17.7 | 46.0 | 9.4 | 0.4 | 100 |

Staging according to the TNM 7th edition (Ref:Sobin LH, Gospodarowicz MK, Wittekind Ch. TNM classification of malignant tumours, UICC 7th edition)
Combined TNM stage : compilation of pathological (pTNM) and clinical (cTNM) stage.
pTNM prevails over cTNM, except when cTNM stage is IV
Stage X: diagnoses with an unknown stage
Stage NA: diagnoses with a histological diagnosis where no stage can be evaluated (Not Applicable)

***Figure 6:*** Lung Cancer: relative survival proportion by sex, Belgium 2011-2015






# NSCLC

SBRT

Primaire Radiotherapie

Postoperatieve Radiotherapie

Concomitante / Sequentiele Radiotherapie

## NSCLC - SBRT

SBRT (Stereotactic Body Radiotherapy)

SABR (Stereotactic Ablative Radiotherapy)

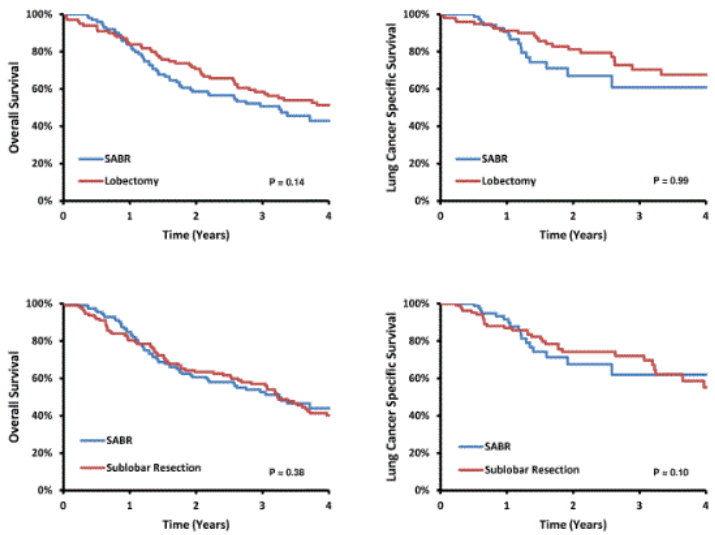
= EBRT voor een extracraniële target

- zeer nauwkeurig
- hoge dosis per fractie
- 3 tot 8 fracties ( 3 * 20 Gy, 4 * 15 Gy, 5 * 12 Gy, 8 * 7,5 Gy)

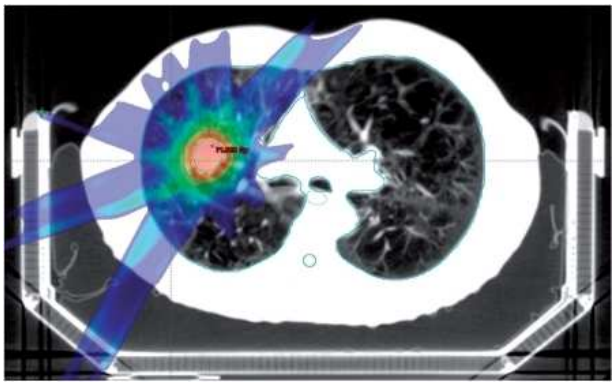
## Indicaties SBRT

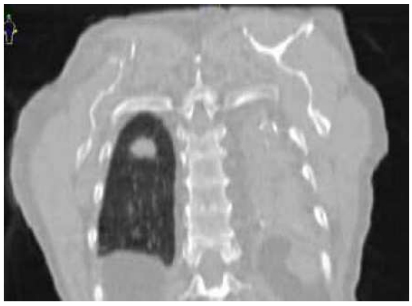
Patiënten met perifeer gelegen vroegtijdig NSCLC

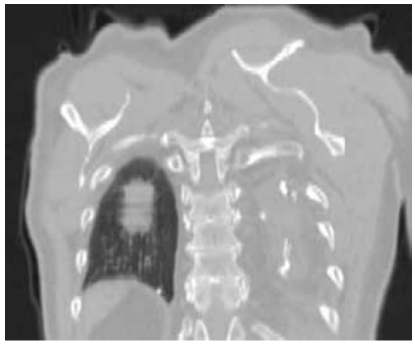
- niet fit genoeg voor chirurgie
- welke ingreep weigeren.




Shirvani et al, IJROBP, 2012







Høyer M et al. Cancer Imaging (2011)

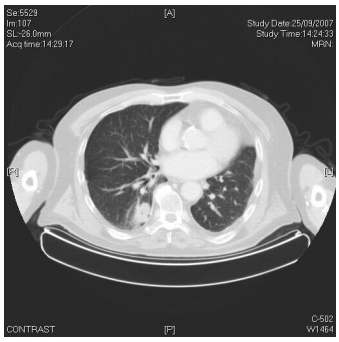
# Bijwerkingen SBRT

>>> Radiatiepneumonitis

gerelateerd aan voorafbestaande ILD / longfibrose

LFT voor behandeling = minder impact op bijwerkingen.

Thoraxwand : pijn in 2 %; ribfracturen 3%



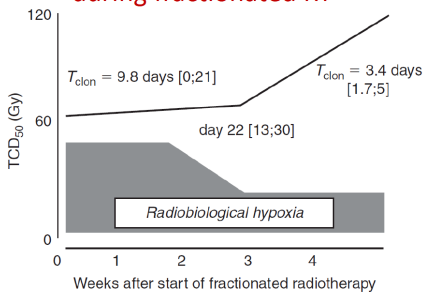

2007

2009

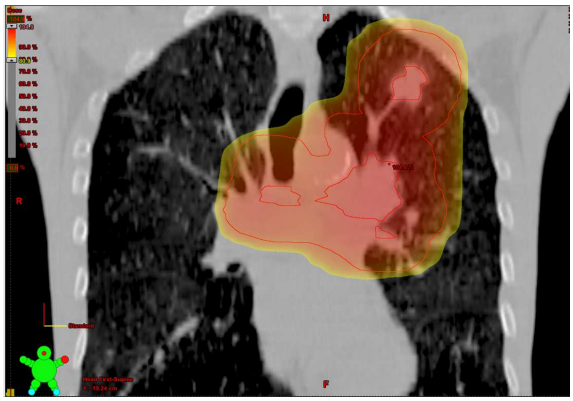
# NSCLC – Primaire Radiotherapie

- 24 * 2,75 Gy

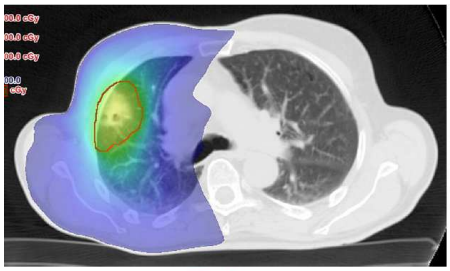
Biphasic course of clonogen **repopulation** during fractionated RT




Petersen *et al*. IJROBP (2001) 51: 483–93.

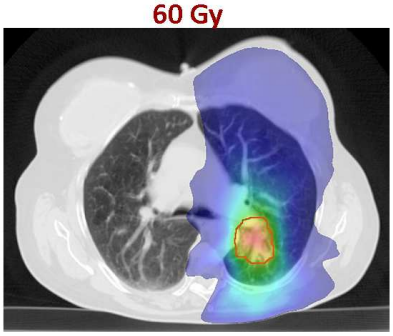


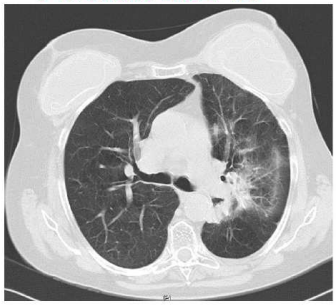
# Pneumonitis



60 Gy

3 Months after RT



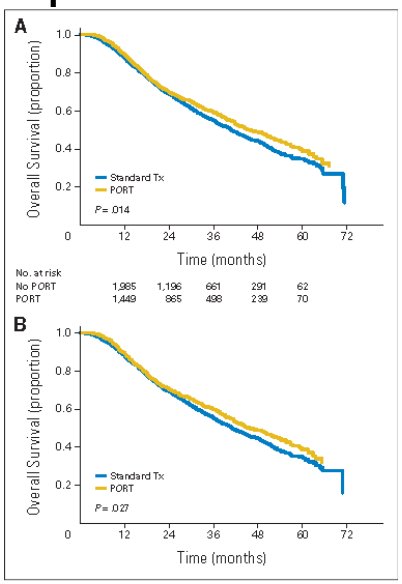


# NSCLC – PORT (POstop RadioTherapy)

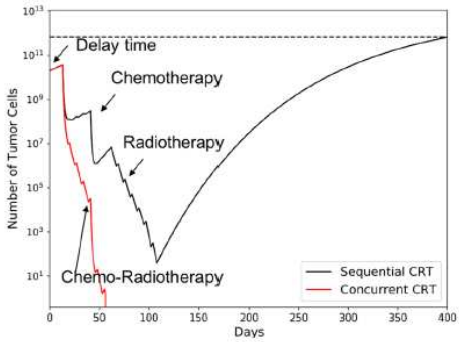
28 * 2 Gy

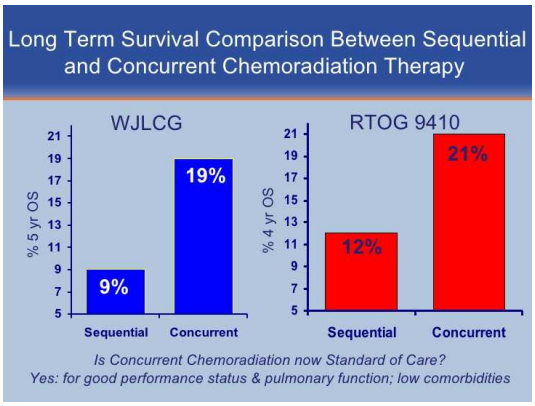
R1

Unforseen N2

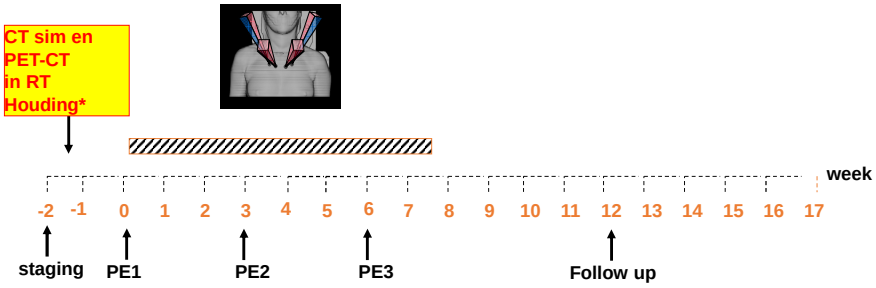


# NSCLC – combinatie met chemotherapie



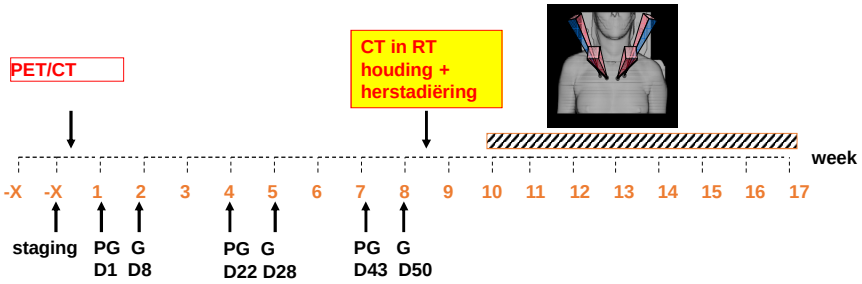

## Concomitante chemo-radiotherapie bij stadium III NSCLC




**Chemotherapie:** Cisplatine (P) 80 mg/m², d1, 22, 43; Etoposide (E) 100 mg/m², D 1-3, 22-24 en 43-45.
**Radiotherapie:** 70 Gy in 35 fracties, 2 Gy per fractie, 1 fractie per dag, 5x/ week start dag 1 van kuur 1

* CT sim en PET-CT worden typisch niet op zelfde dag uitgevoerd

Sequentiële chemoradiotherapie bij stadium III NSCLC




**Chemotherapie:** cisplatine (P) 80 mg/m2, d1, 22, 43; gemcitabine (G) 1250 mg/m2, d1,8, 22, 29, 43, 50
**Radiotherapie:** 66 Gy, 24 fracties van 2,75 Gy, 1x/dag; 5 fracties/ week; start week 10 tot 17
**Restaging:** PET-CT na 2 cycli: bij PD: stop chemo en TRT voor lokale controle (13 x 3 Gy)

# SCLC

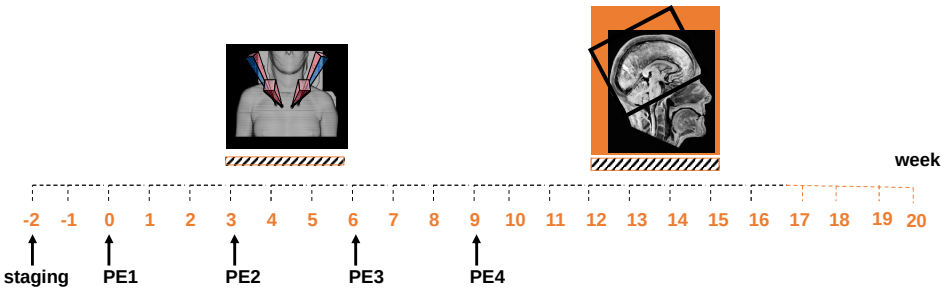
Limited

Concomitant / sequentieel

Extensive

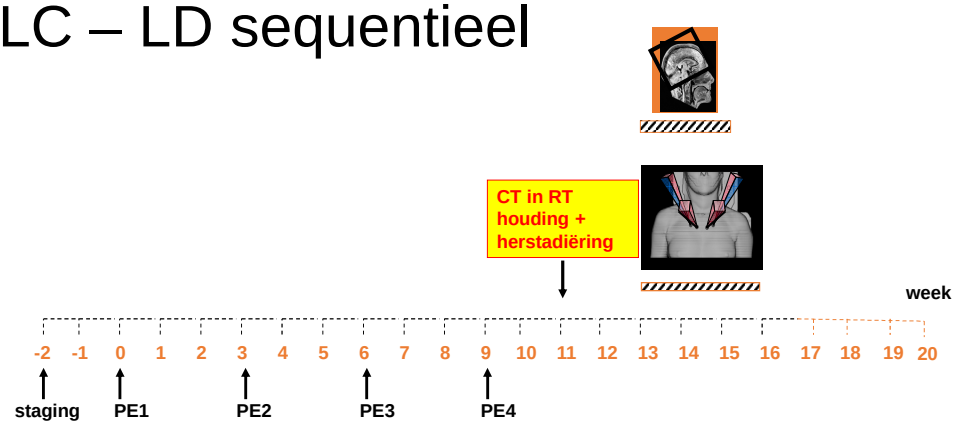
Preventieve hersenbestraling

# SCLC – Limited Disease




| | |
|---|---|
| **Chemotherapie:** | **Cisplatine 80 mg/m², D 1, 23, 43, 64 i.v.** |
| | **Etoposide 100 mg/m², D 1-3, 23-25, 43-45, 64-66 i.v.** |
| **Radiotherapie:** | **45 Gy in 30 fracties, 1.5 Gy per fractie, 2 fracties per dag met minimaal interval van 6 uur, 5x/ week start dag 1 van kuur 2, einde dag 22** |
| | **PCI: 3-4 weken na dag 1 van laatste chemotherapie** |
| **Evaluatie:** | **anamnese, LO, WHO PS, labo wekelijks week 1-12, nadien 6 wekelijks** |
| **Respons:** | **X-thorax voor elke kuur; Ct-scan thorax na week 16** |

# SCLC – LD sequentieel




| | |
|---|---|
| **Chemotherapie:** | **Cisplatine 80 mg/m², D 1, 23, 43, 64 i.v.** |
| | **Etoposide 100 mg/m², D 1-3, 23-25, 43-45, 64-66 i.v.** |
| **Radiotherapie:** | **40 Gy in 15 fracties, 2.67 Gy per fractie, 5x/ week** |
| | **PCI: 10 * 2.5 Gy** |
| **Evaluatie:** | **anamnese, LO, WHO PS, labo wekelijks week 1-12, nadien 6 wekelijks** |
| **Respons:** | **X-thorax voor elke kuur; Ct-scan thorax na week 16** |

# SCLC – Extensive Disease

* 4-6 cycli platinum-etoposide

* Patiënten met respons en goede PS moeten PCI krijgen tot een dosis 20 Gy in 5 fracties van 4 Gy
Thoracale radiotherapie tot een dosis van 30 Gy in 10 dagelijkse fracties van 3 Gy (conform CREST studie)

1-yr OS:
33% (TRT) vs. 28% (no TRT)
HR 0.84, p=0.066

2-yr OS:
13% (TRT) vs. 3% (no TRT)
p=0.004

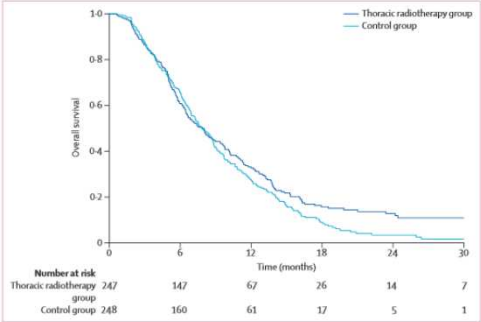



Figure 2: Kaplan-Meier curves for overall survival

# SCLC – PCI (Preventive Cranial Irradiation)

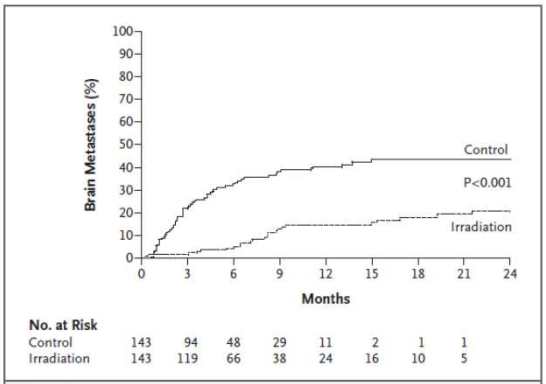



**Figure 1. Cumulative Incidence of Symptomatic Brain Metastases.**
The difference in the cumulative incidence of brain metastases between the irradiation group and the control group was significant (P<0.001, by Gray's method).

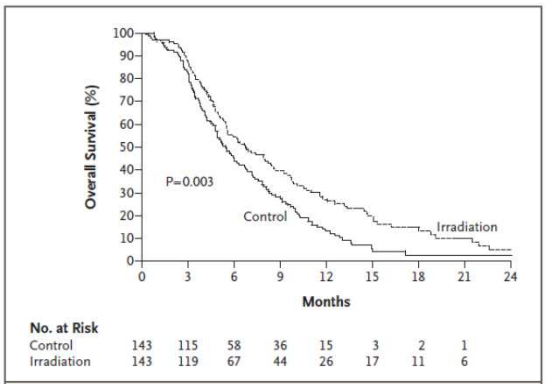
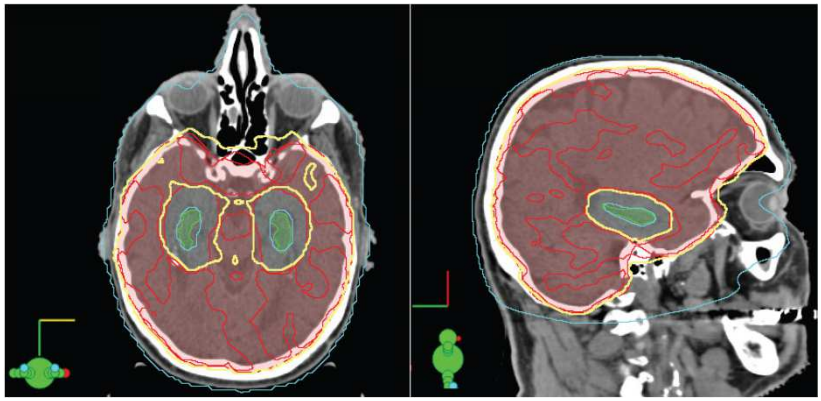



**Figure 3. Overall Survival.**
Patients in the irradiation group had a longer median overall survival (6.7 months) than did those in the control group (5.4 months) (P=0.003; hazard ratio, 0.68; 95% CI, 0.52 to 0.88).

# SCLC – PCI cognitieve stoornissen