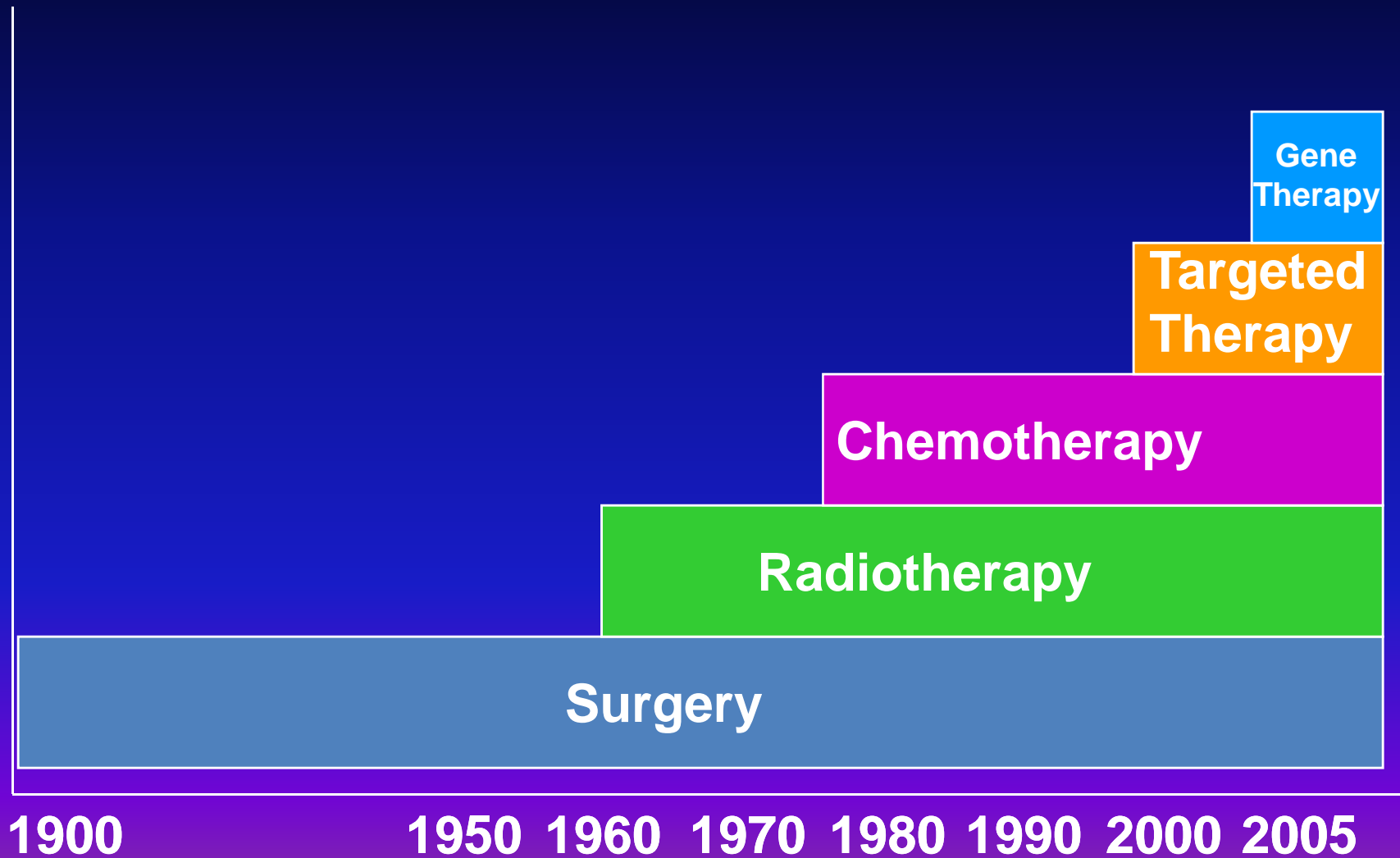


# Chemoradiotherapy of Laryngeal Cancers

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Safdarjang Hospital & VMMC  
New Delhi

# Development of Multimodal Therapy for Head & Neck Cancer



# Multimodal Treatment Combinations

- RT → Surg
- Surg → RT
- RT → Surg → RT
- Surg → RT → Chemo
- Chemo → Surg → RT ( $\pm$  Chemo)
- Chemo → RT ( $\pm$  Chemo)
- Concurrent Chemo & RT
- Intraarterial Chemo
- Brachytherapy

# Development of Multimodal Therapy for Head and Neck Cancer

20<sup>th</sup>  
century

Single modality treatments  
Surgery – RT – Chemo Rx

1960's

Pre-operative radiotherapy

1970's

Post-operative radiotherapy

1980's

Induction chemotherapy with  
surgery + RT

1990's

Neoadjuvant chemo Rx

2002

Organ preservation strategies

Concurrent chemo Rx & RT

# Larynx

Larynx : Protective sphincter at the inlet of air passage.

Responsible for voice production.

Divided into-

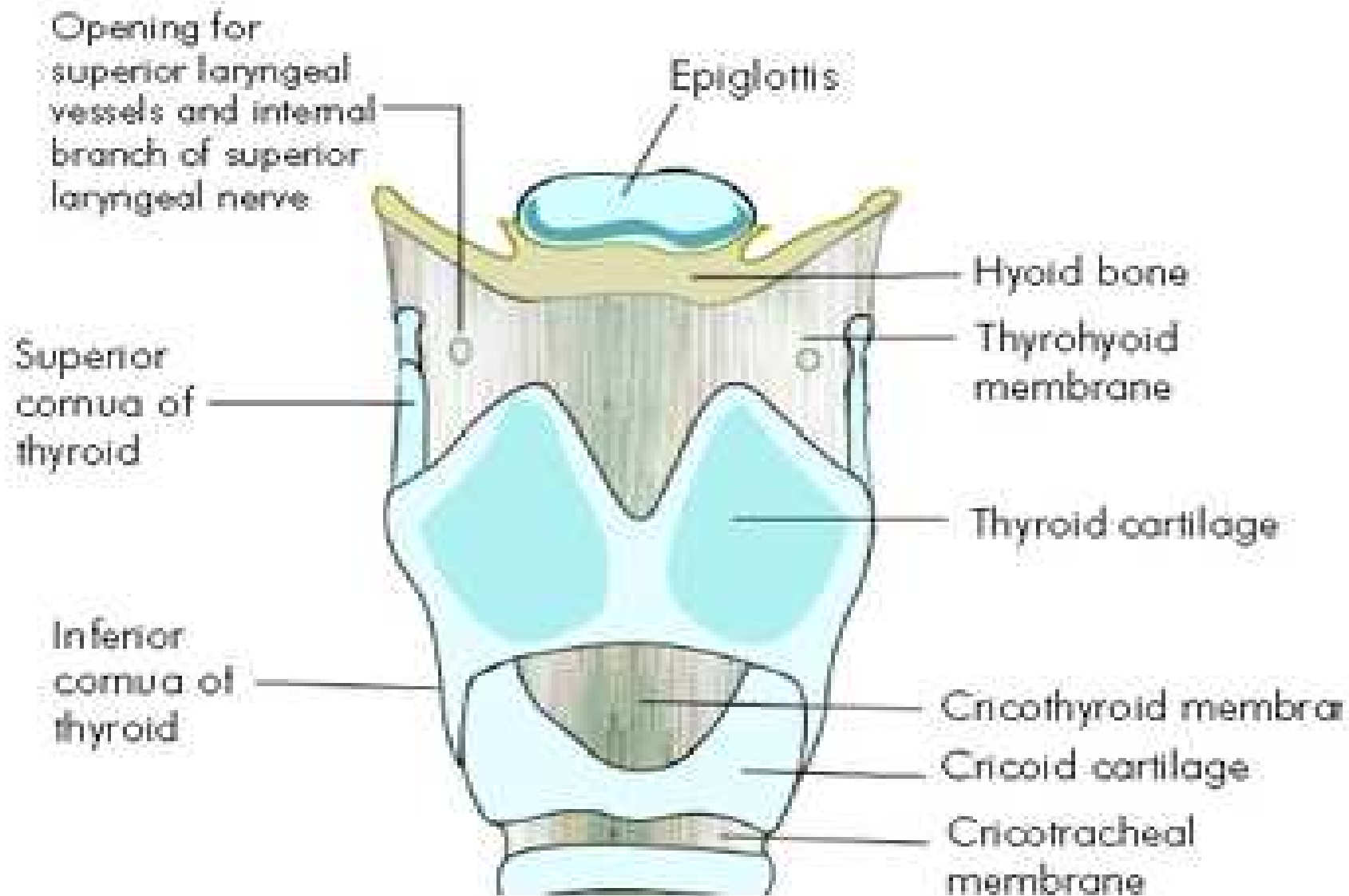
Supraglottis –epiglottis,false cords,ventricle,  
arytenoids,aryepiglottic folds.

Glottis-true vocal cords , the ant.commissures.

Subglottis –below the vocal cords.

# Situation and extent

- The larynx lies in the midline of the neck, extending from the root of the tongue to the trachea.
- In adult male it lies in front of the 3<sup>rd</sup>, 4<sup>th</sup> 5<sup>th</sup> and 6<sup>th</sup> cervical vertebrae.
- In children and adult female it lies at a higher level.
- Length-44mm in males,36mm in females



**Fig. 54.1.** Laryngeal framework.

# Lymphatic drainage

- Supraglottis has a rich capillary lymphatic plexus.
- Pass through preepiglottic space and the thyrohyoid membrane and terminate mainly in the subdigastic nodes.
- Few drain to middle internal jugular nodes.
- Essentially no lymphatic capillary in the vocal cord.
- The subglottic area has few lymphatic capillaries.
- Lymphatic trunk pass through the cricothyroid membrane to the pretracheal (delphian) lymph node, some go to the paratracheal and inferior jugular nodes.



# RADIOTHERAPY

- ❑ Primary treatment – typical dose 66Gy in 33 fractions over 6½ weeks
- ❑ Post-operative (adjuvant) – indications include close or involved resection margins, poorly differentiated tumours, extensive lymph node involvement
- ❑ Palliative e.g. bleeding, pain

# Is there a survival benefit for combining CT with locoregional treatment of SCCHN?

- Meta-analysis of CT in head and neck cancer (MACH-NC)
- 87 trials: 17,858 patients

Timing of CT	Absolute benefit after 5 years
Adjuvant	-2%
Neoadjuvant	2%
Concomitant CRT*	8%
Total*	5%

\*p<0.0001 for effect of CT + logoregional treatment vs logoregional treatment alone

## Need for update of MACH-NC 2000

- The IPD meta-analysis (63 trials) showed that chemotherapy improved survival (4% at 5 years) in patients curatively treated for HNSCC with a higher benefit (8%) with concomitant chemotherapy.
- However the heterogeneity of the results limited the conclusions and prompted the group to confirm the results on a more complete database by adding the randomized trials conducted between 1994 and 2000.

# Methods

## (MACH-NC 2009, Pignon et al)

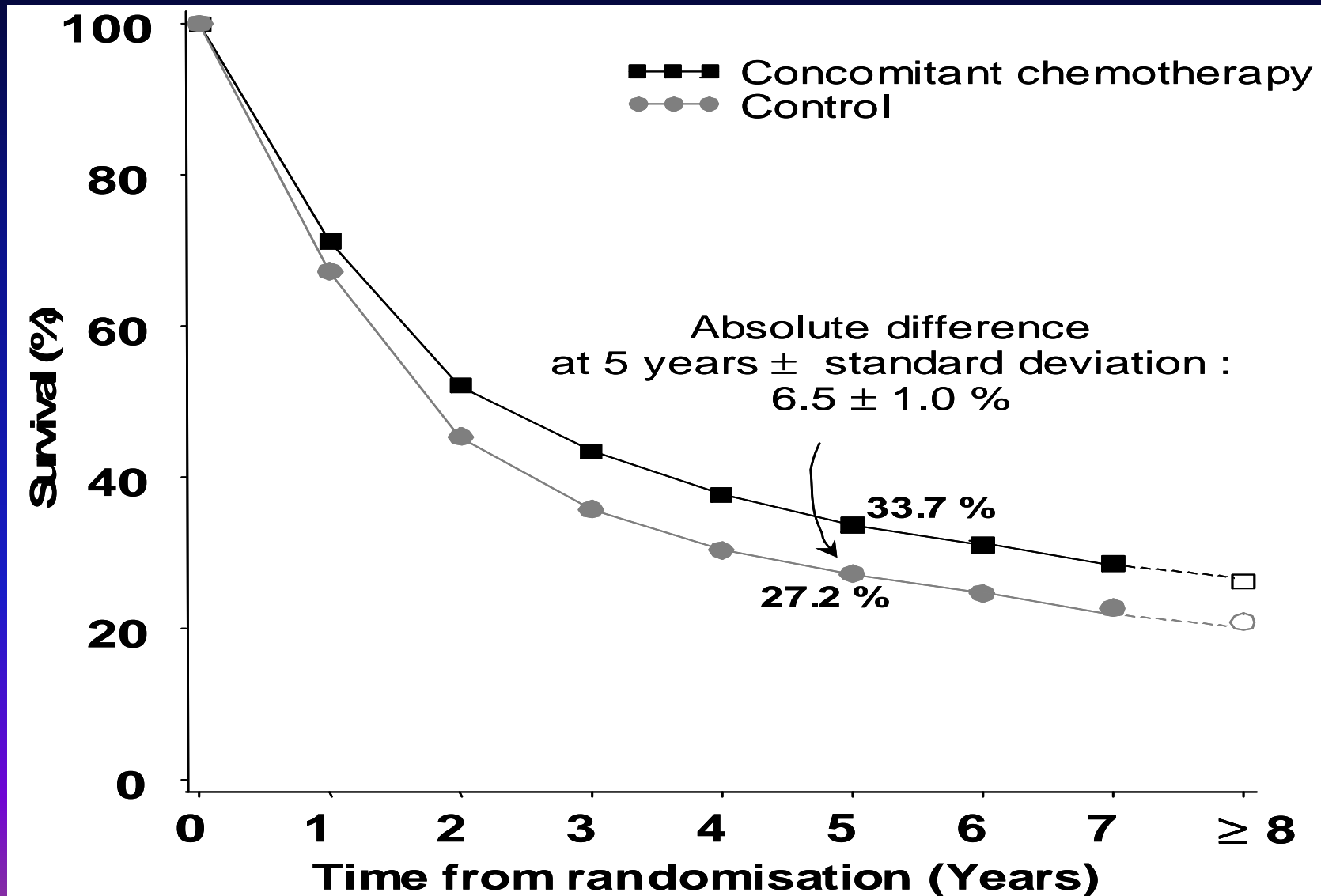
- The updated IPD meta-analysis included trials comparing loco-regional treatment to loco-regional treatment + chemotherapy in HNSCC patients and conducted between 1965 and 2000
- The log rank-test, stratified by trial, was used to compare treatments
- The hazard ratios of death or relapse were calculated

# MACH-NC 2009: Results

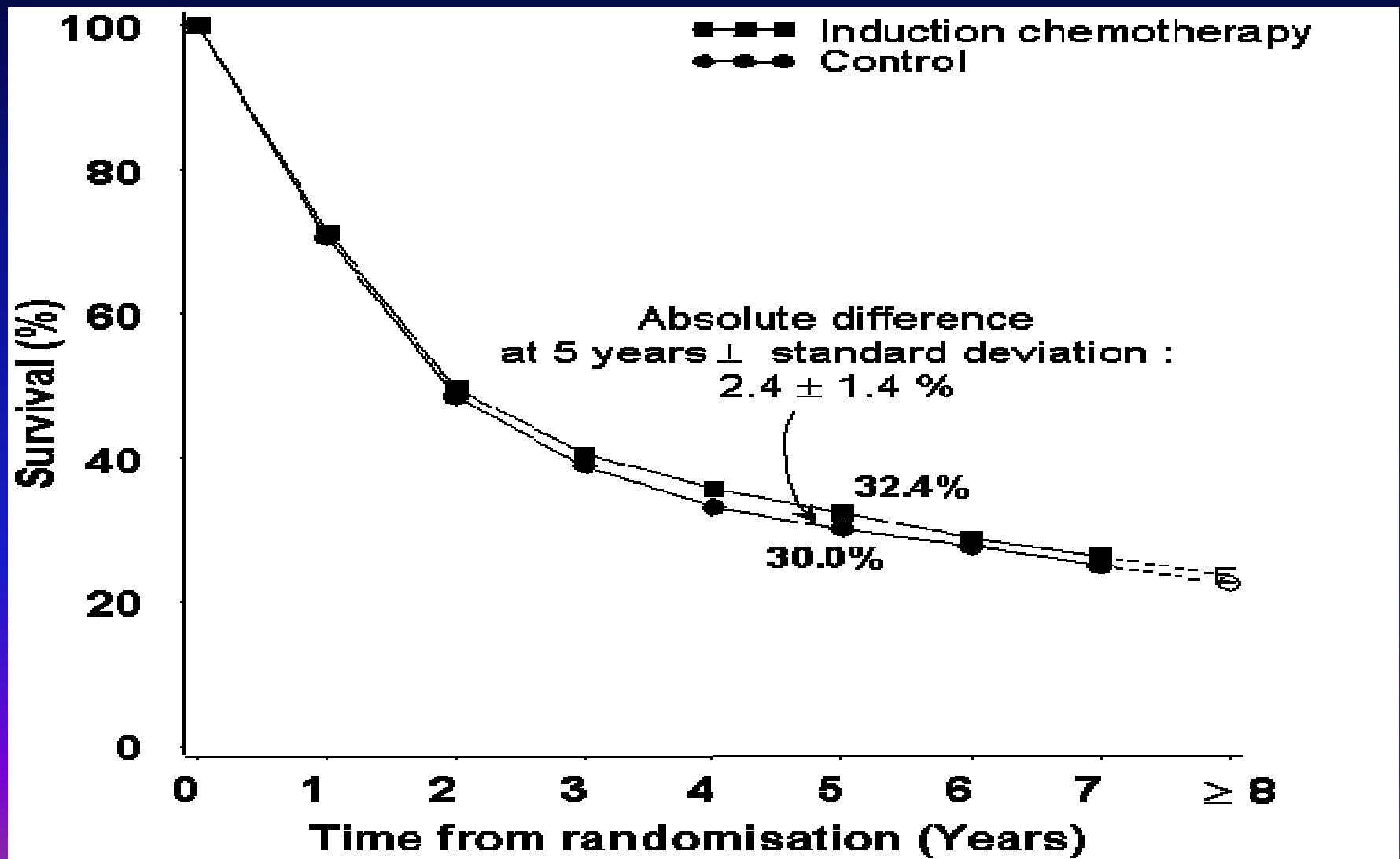
- Absolute benefit of CT at 5 years: 6.5 %
- No difference between:
  - conventional vs. altered fractionation
  - Single agent vs. Multiple agent CT
- Decreasing effect of CT on survival with increasing age

# Overall survival

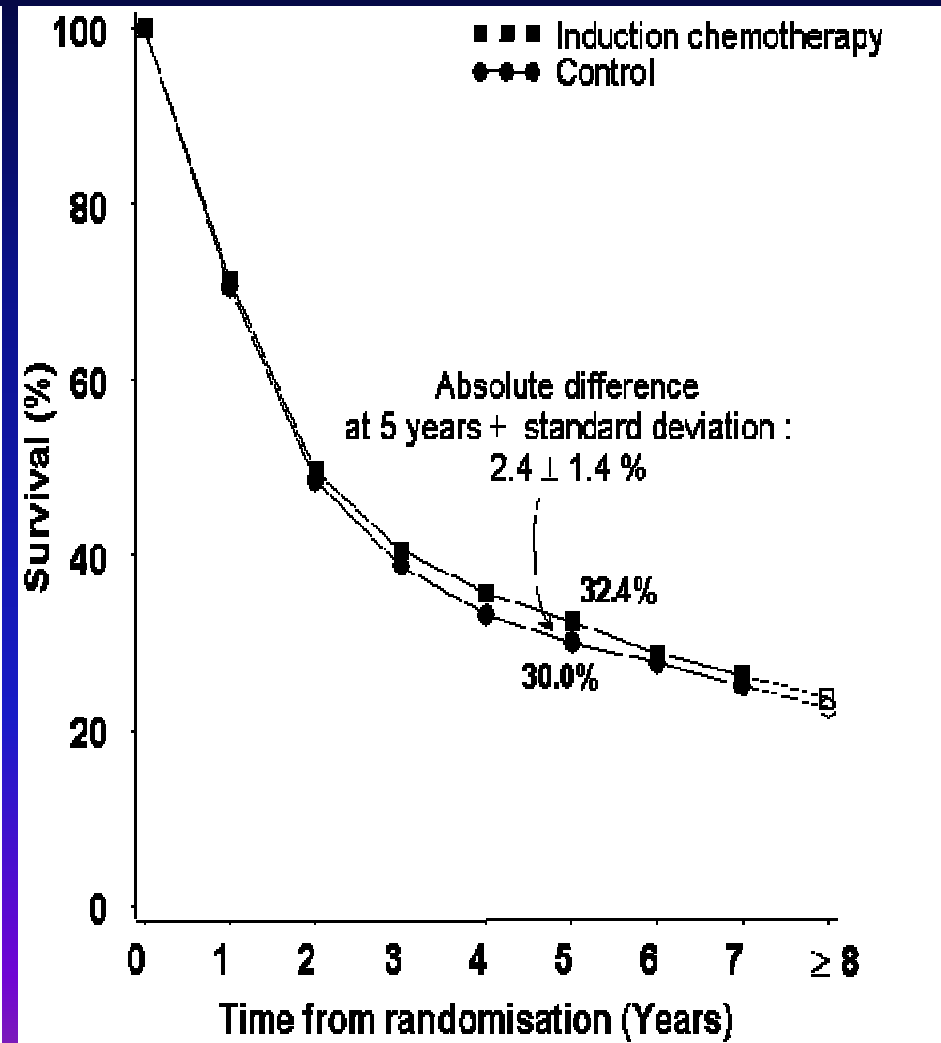
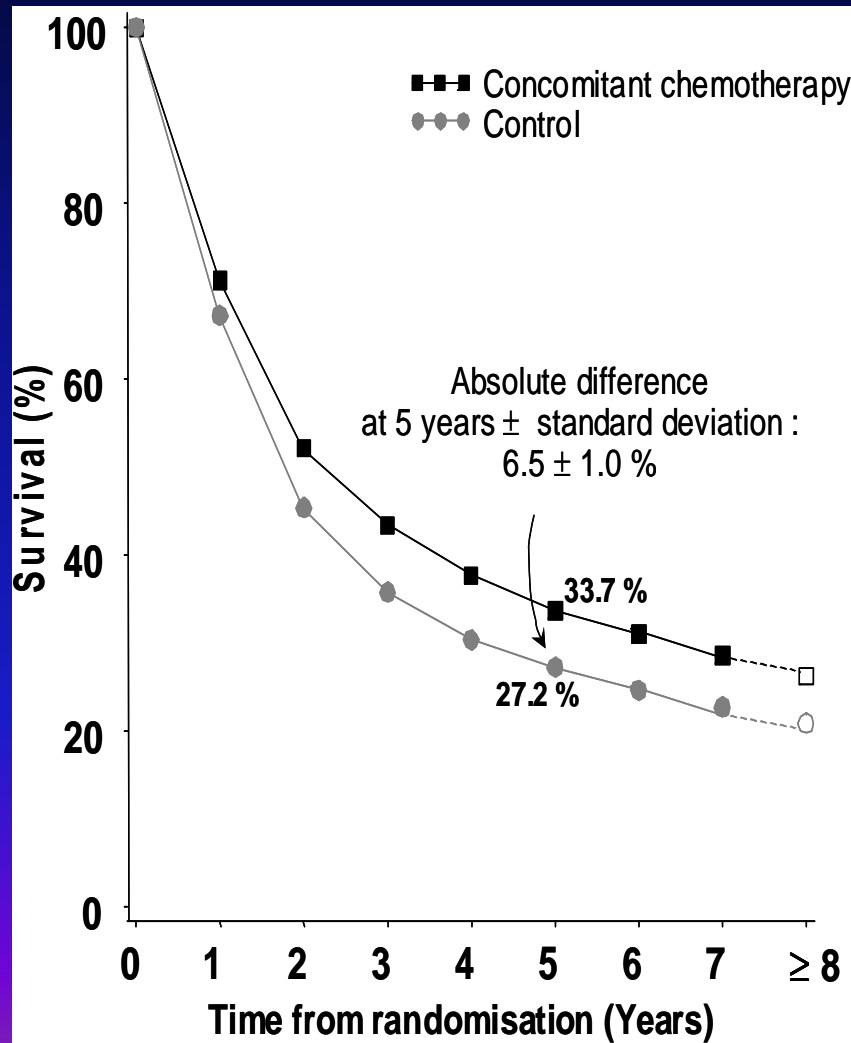
## Concomitant chemotherapy



# Overall survival - Induction chemotherapy

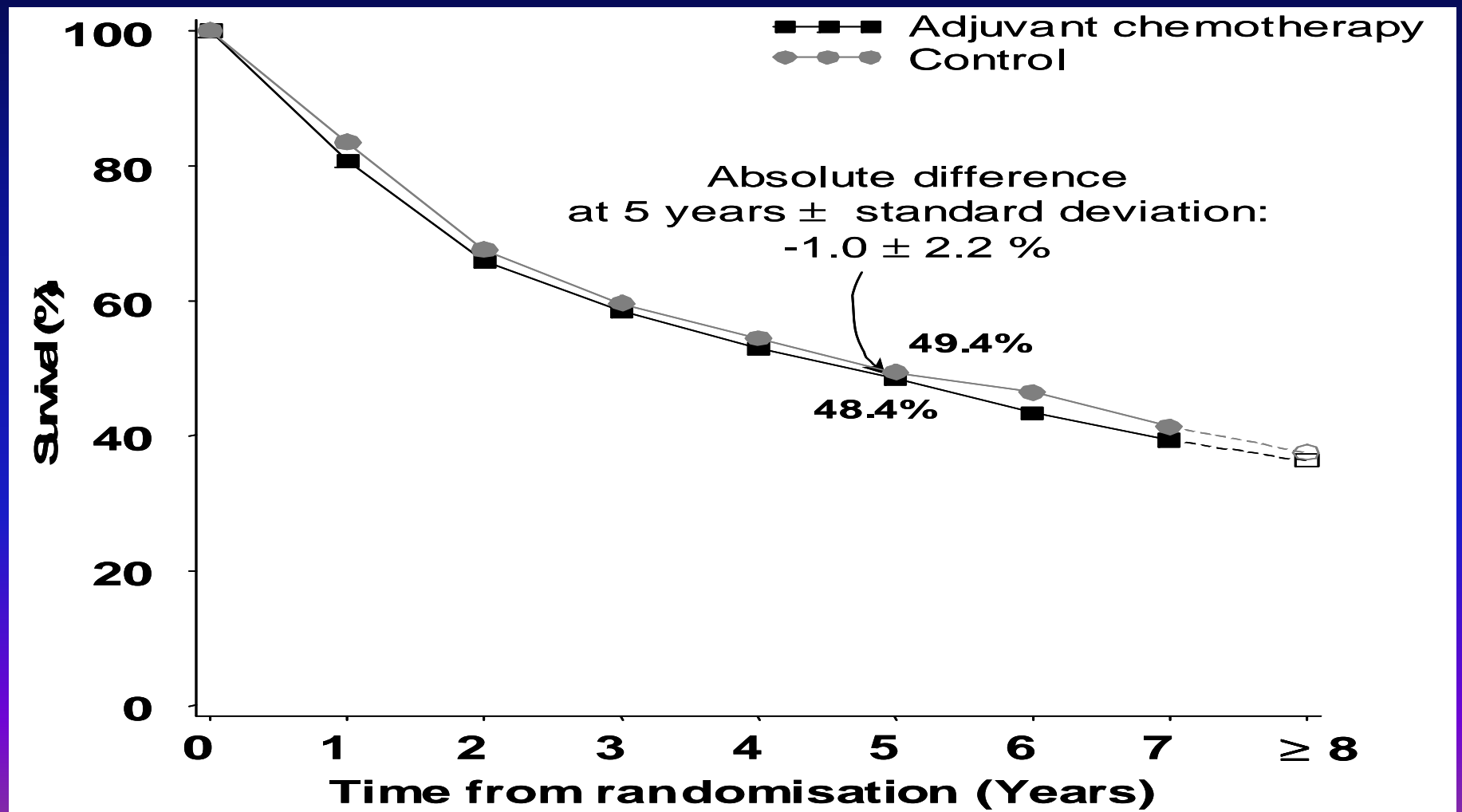


# CCRT vs. Induction

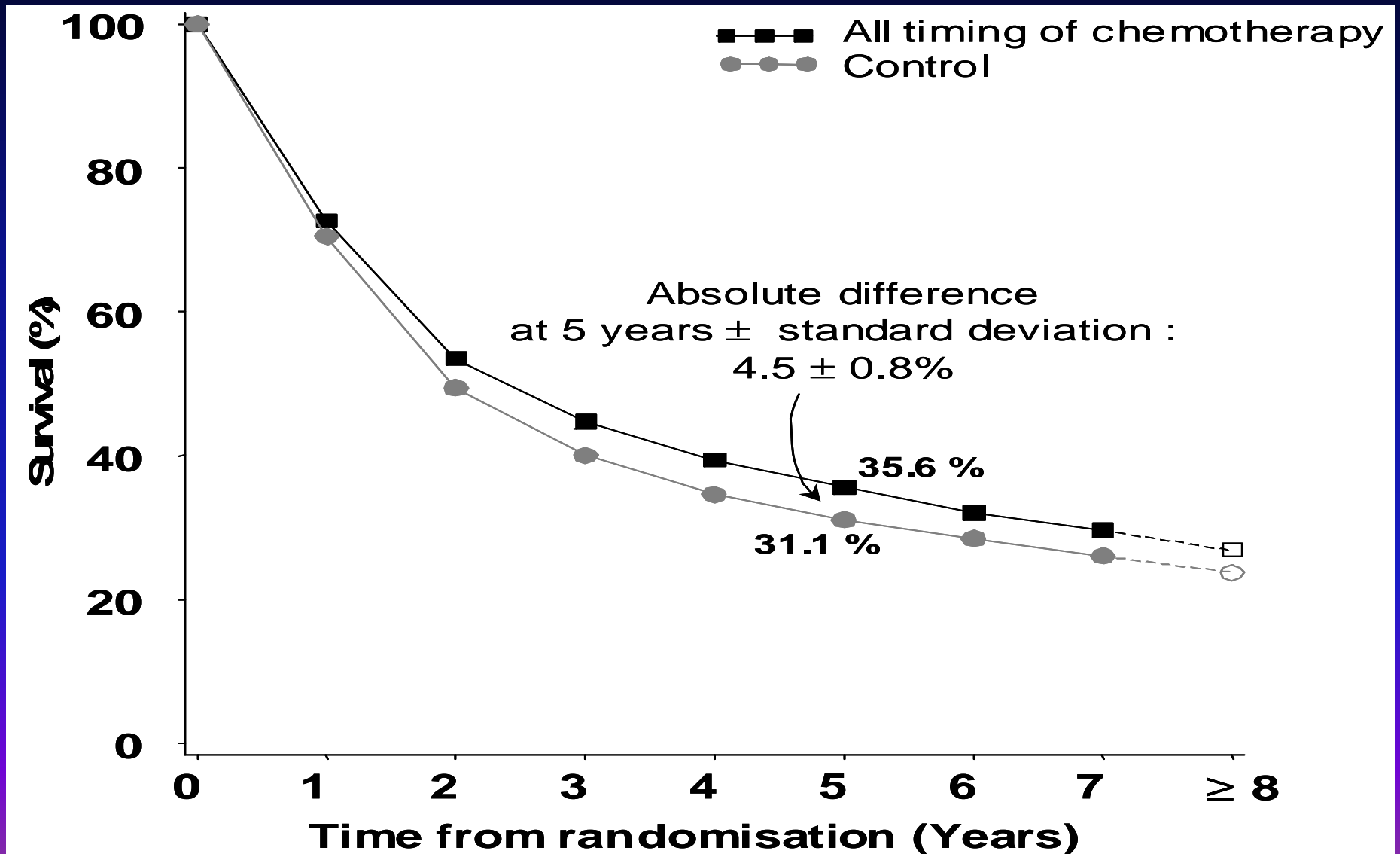




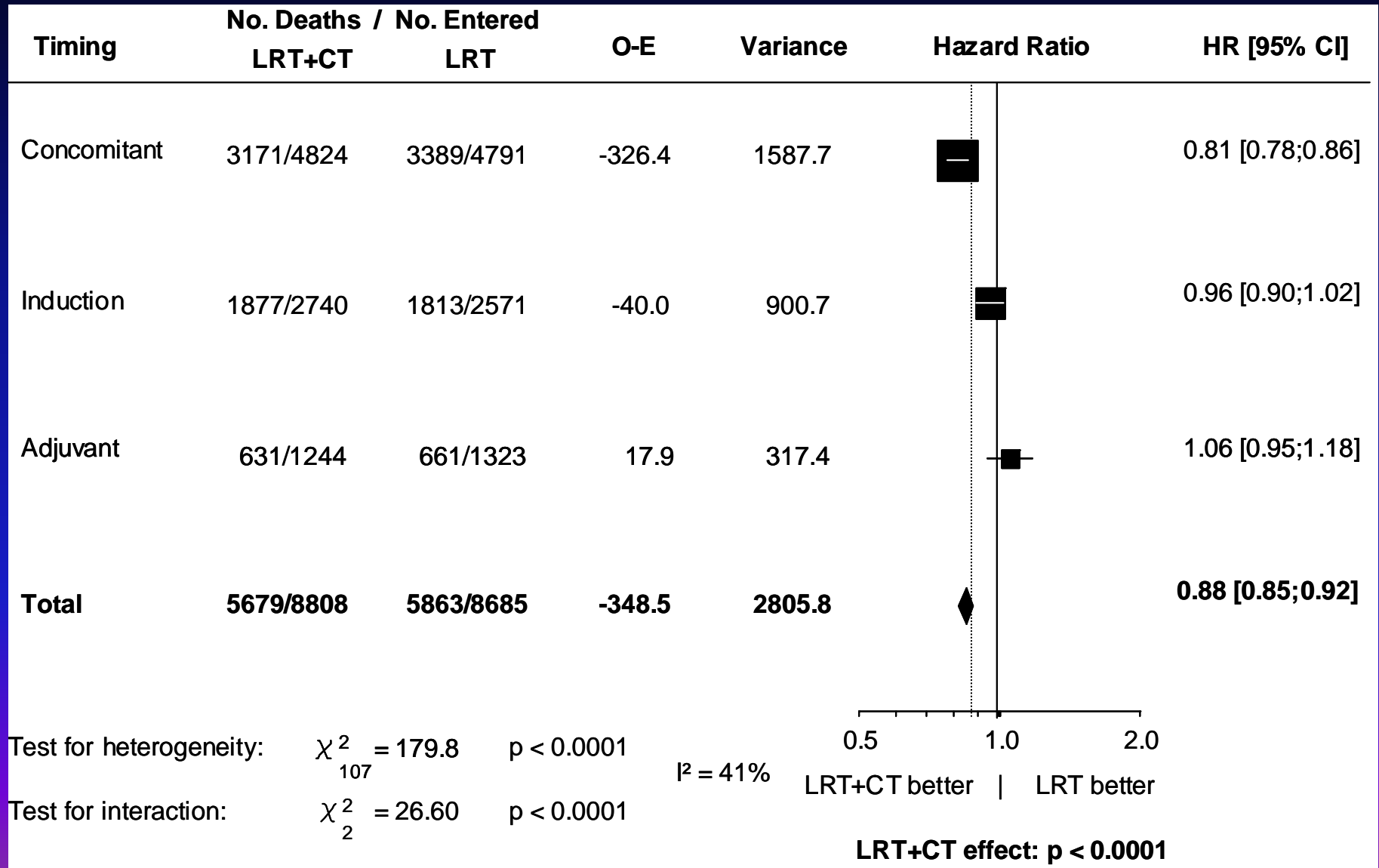
# Overall survival -Adjuvant chemotherapy



# Overall Survival: All sequence of CT

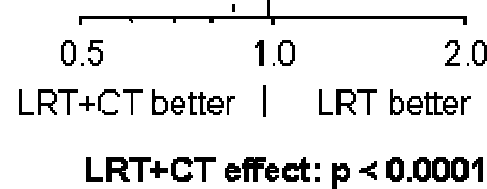


# Death: CCRT vs. RT alone



## Recurrence: CCRT vs. RT alone

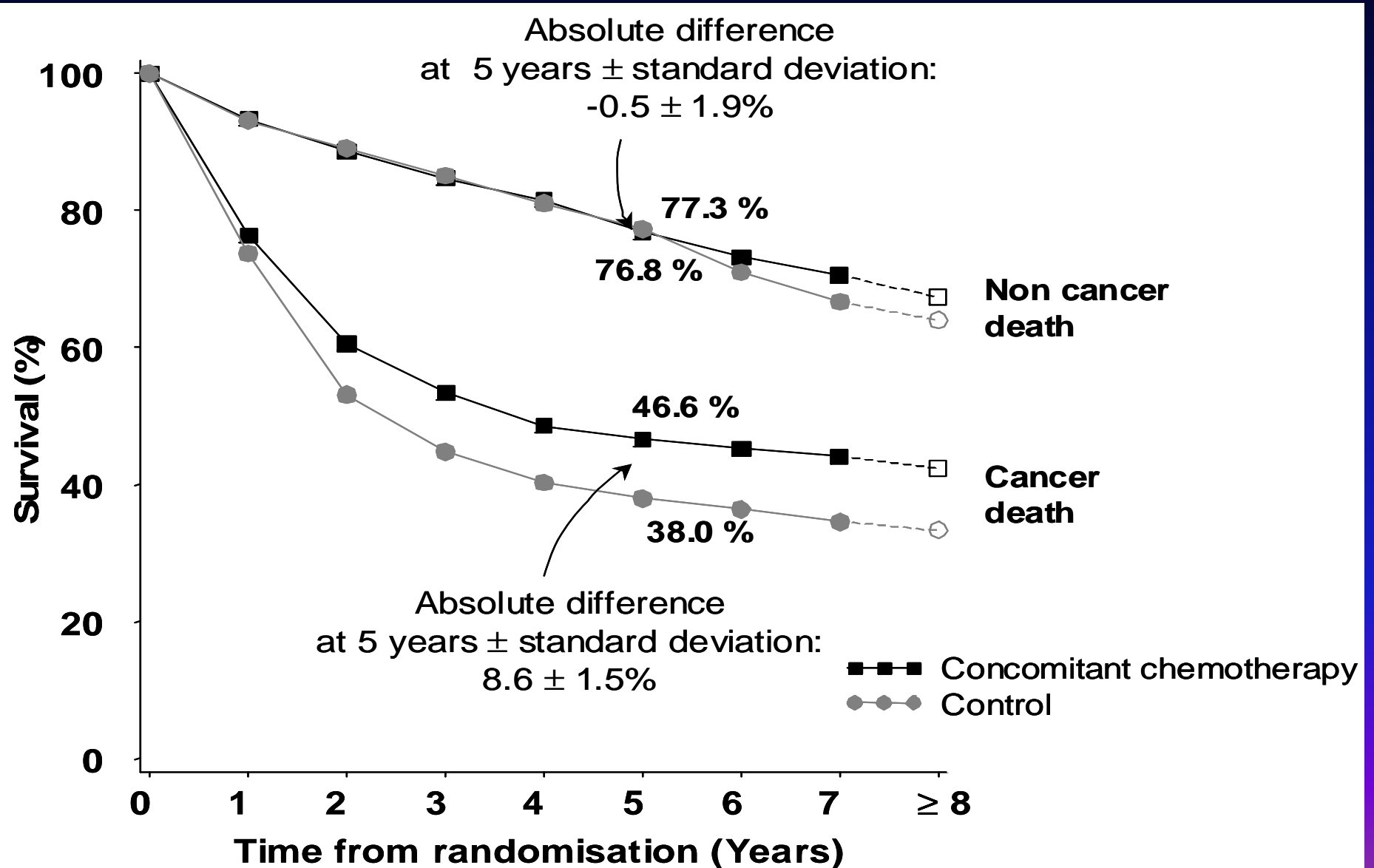
Timing	No. Deaths / No. Entered LRT+CT	No. Entered LRT	O-E	Variance	Hazard Ratio	HR [95% CI]
Concomitant	3447/4824	3735/4791	-401.7	1742.6		0.79 [0.76;0.83]
Induction	2036/2740	1924/2571	-13.3	956.7		0.99 [0.93;1.05]
Adjuvant	703/1244	762/1323	-4.2	360.9		0.99 [0.89;1.10]
<b>Total</b>	<b>6186/8808</b>	<b>6421/8685</b>	<b>-419.3</b>	<b>3060.2</b>		<b>0.87 [0.84;0.90]</b>



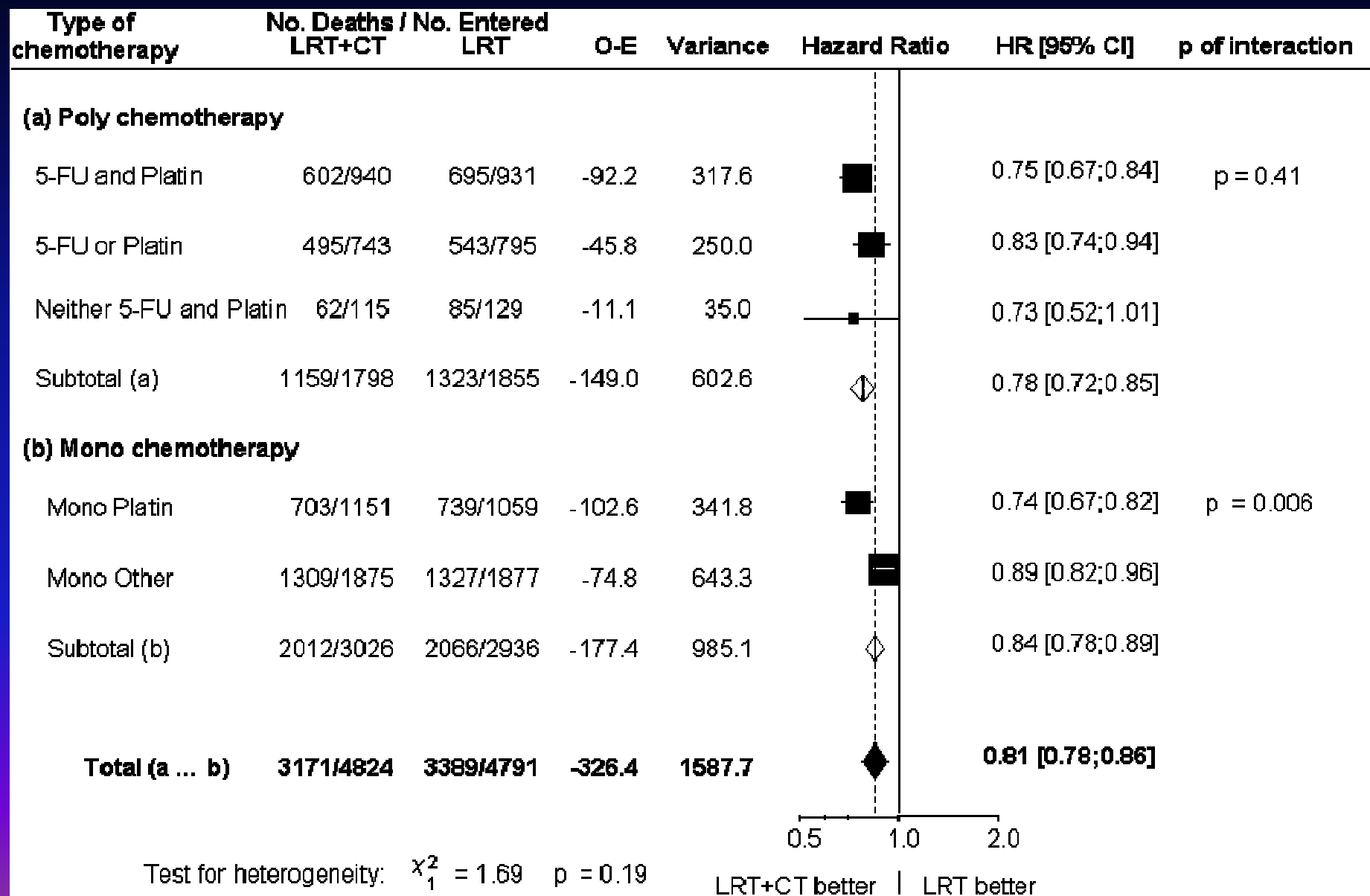
Test for heterogeneity:  $\chi^2_{107} = 187.7$      $p < 0.0001$      $I^2 = 43\%$

Test for interaction:  $\chi^2_2 = 35.40$      $p < 0.0001$

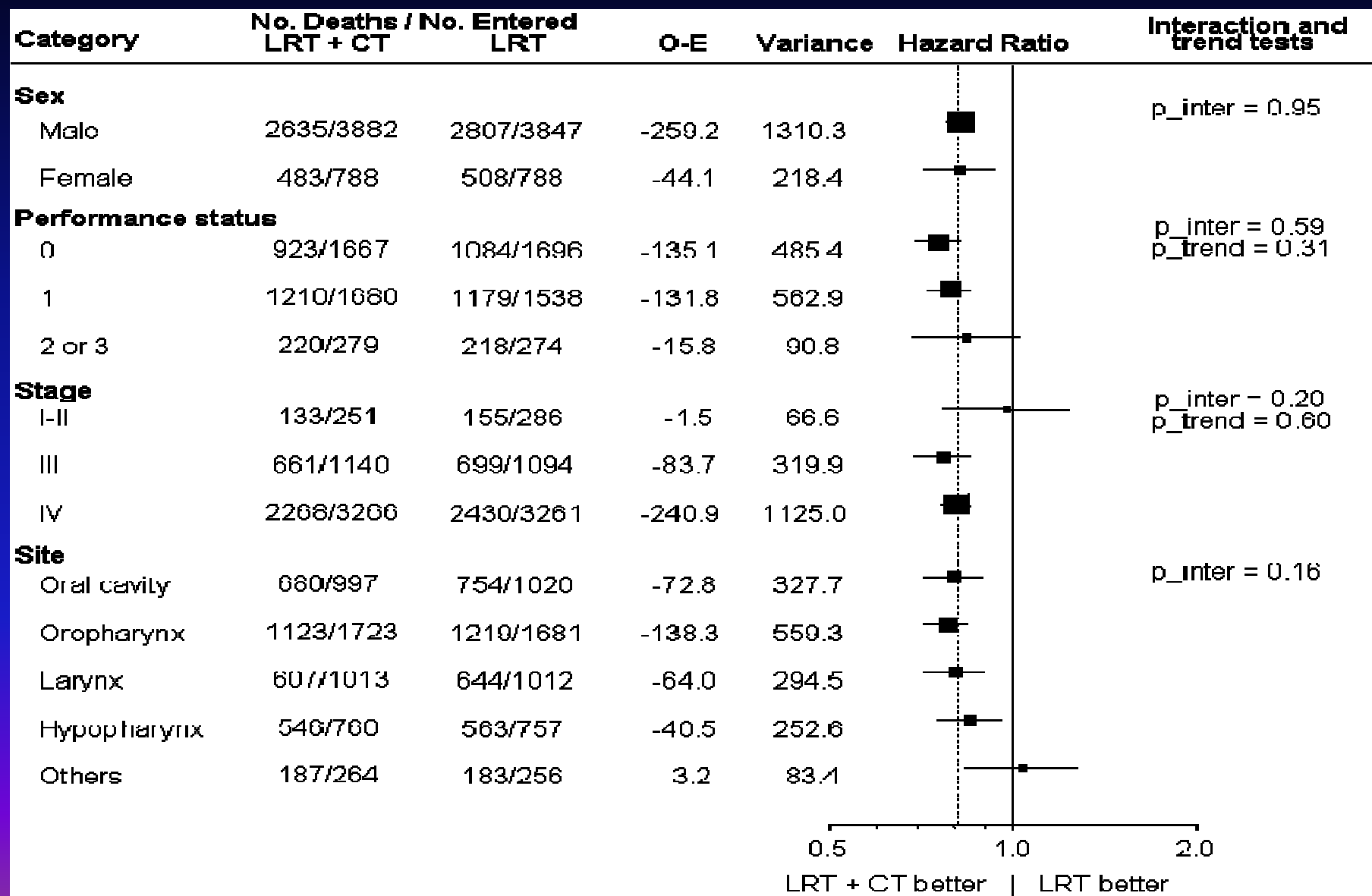
# Impact of CT on Cancer vs. Non-Cancer Deaths



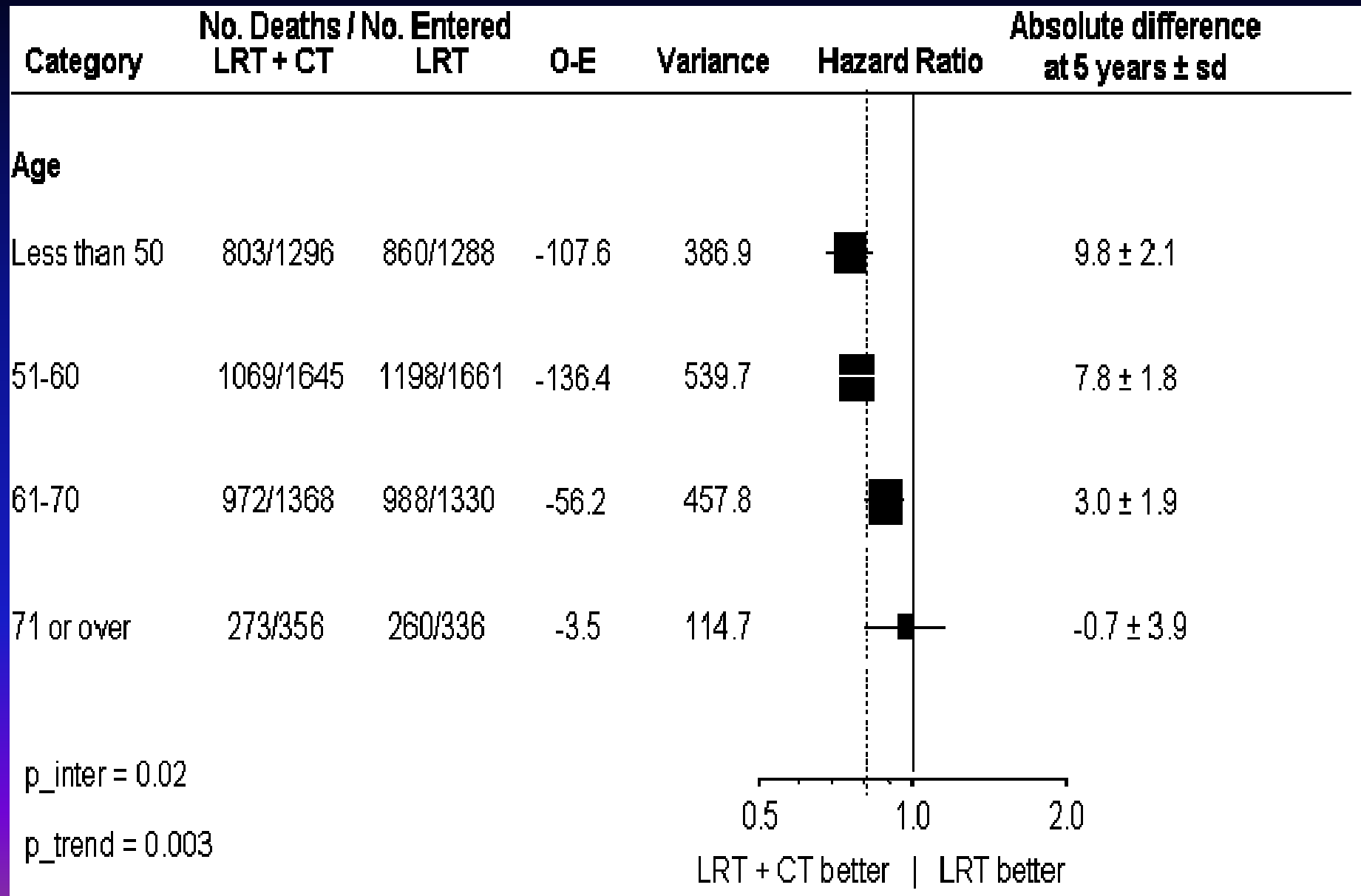
## CT Drugs used: CCRT vs. RT alone



# Patient Characteristics: CCRT vs. RT alone

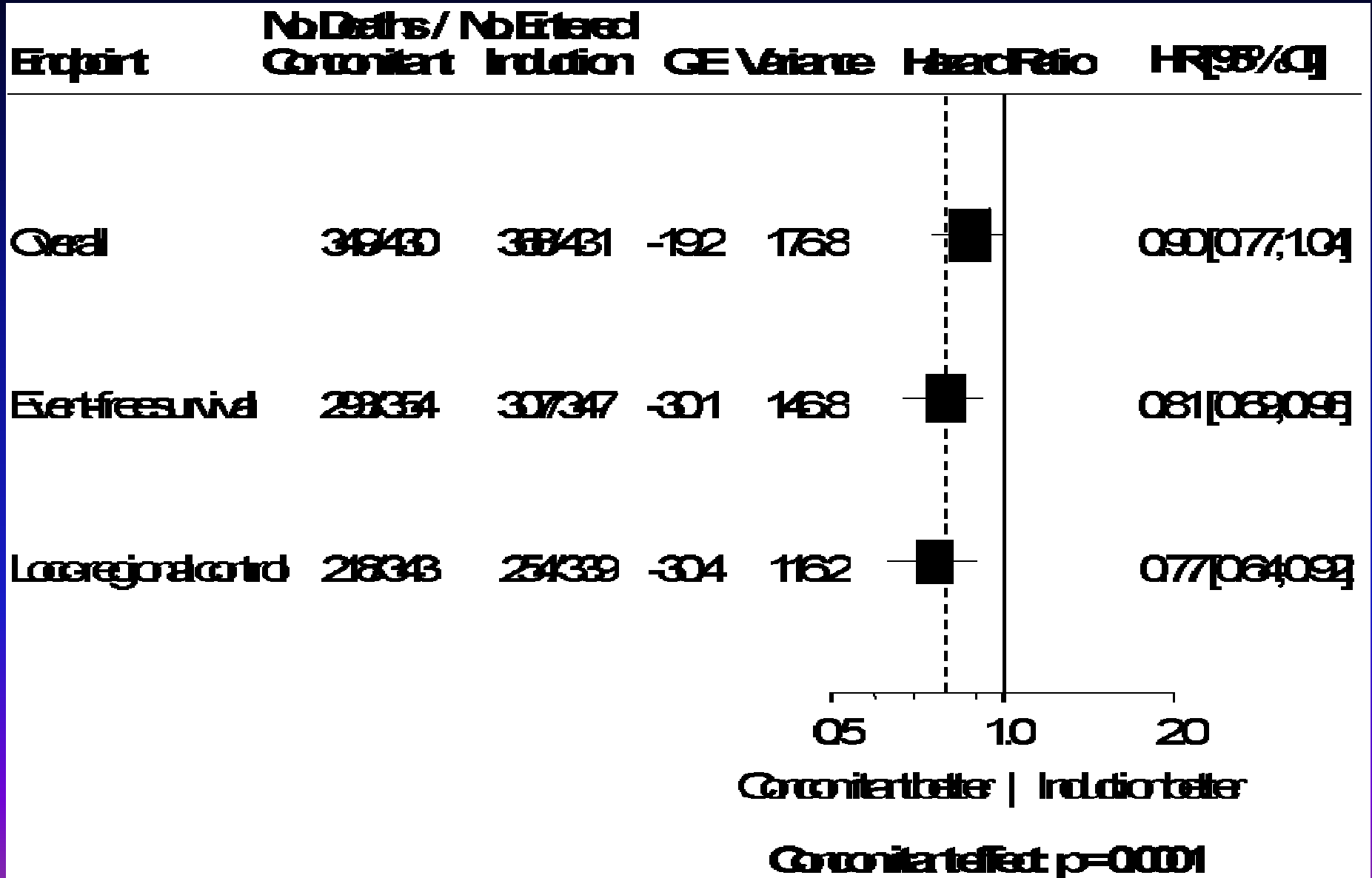


## Age: CCRT vs. RT alone

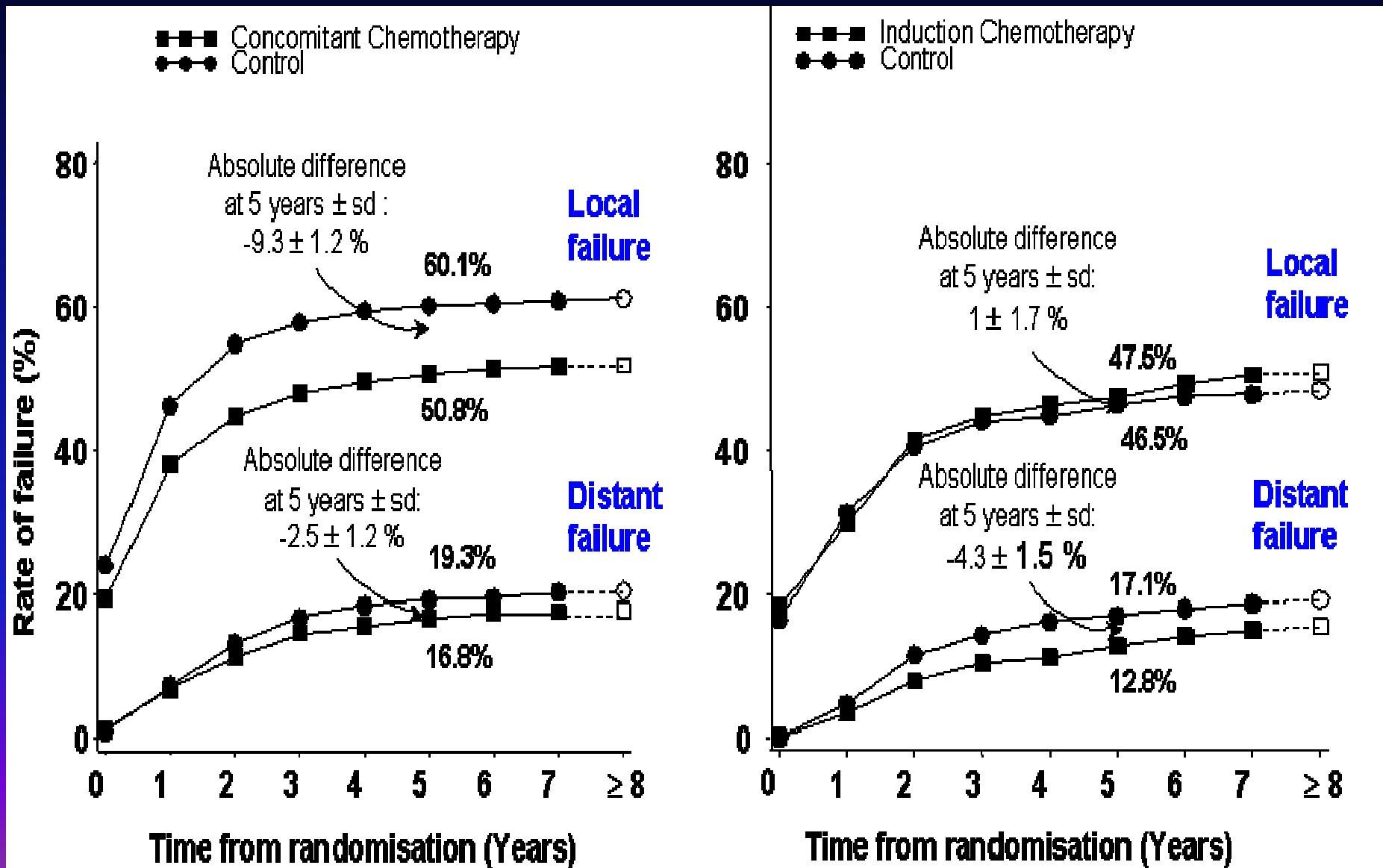




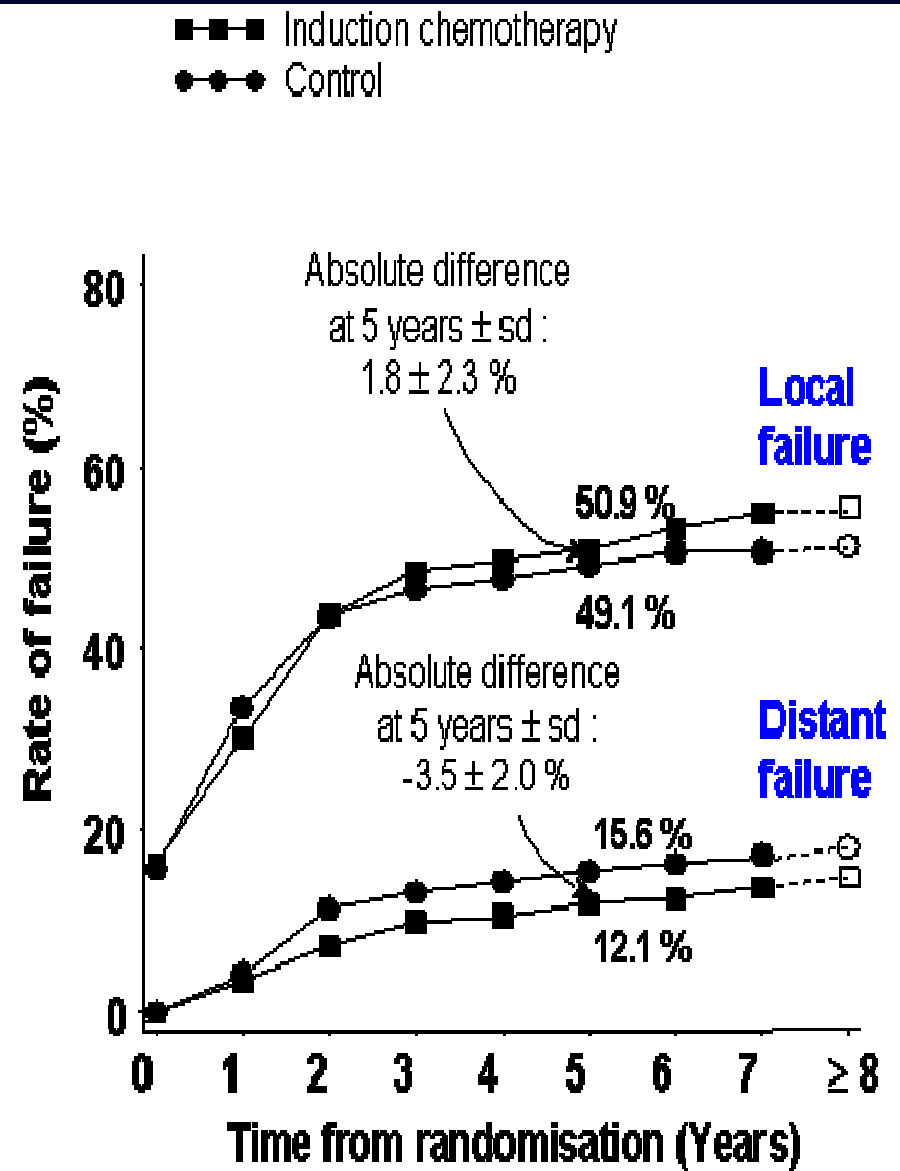
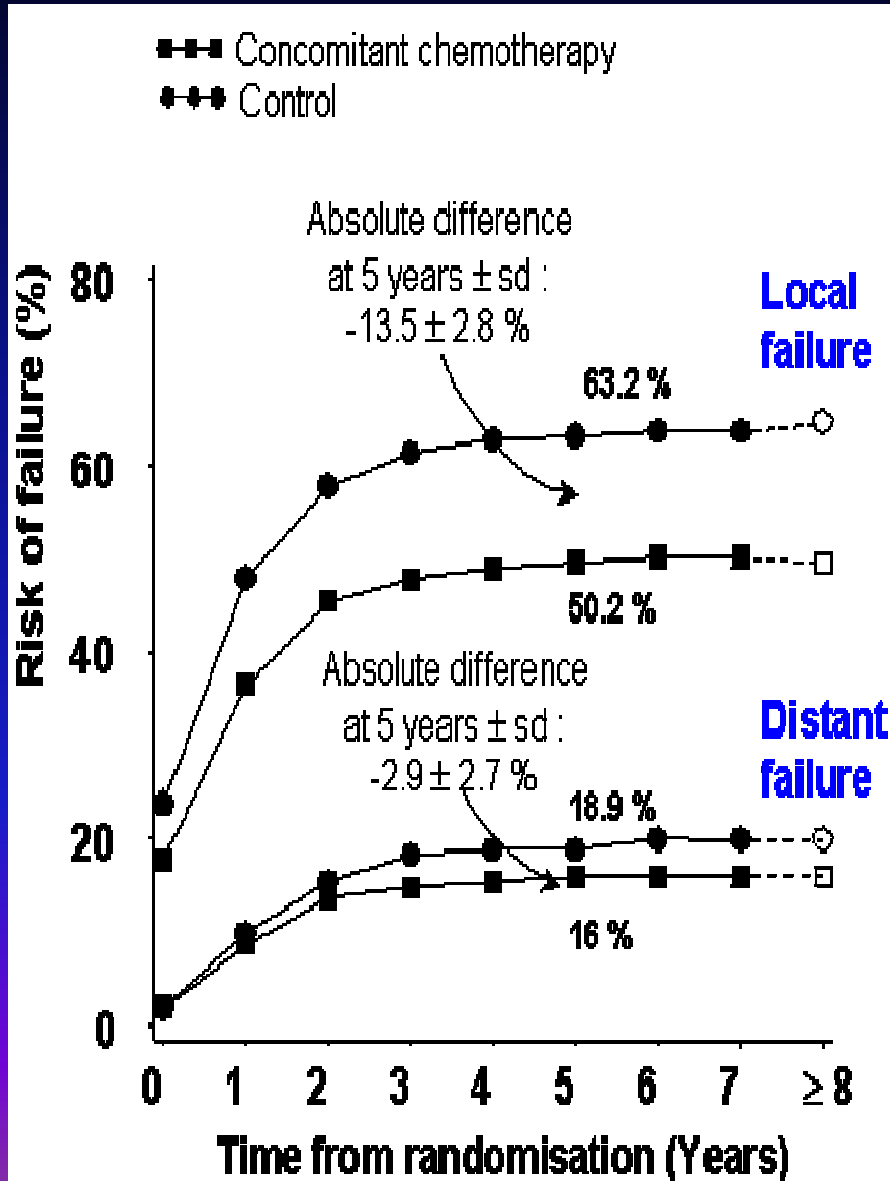
# End Points



# Failure Rates: CCRT vs. Induction



# Failure Rates: CCRT vs. Induction: 5FU + Platinum



# Outlook

- **This meta-analysis clearly demonstrates that Radiotherapy with PF chemotherapy can contribute substantial clinical benefit to the management of patients with locally advanced head and neck cancer.**
- **However, there remains considerable room for improvement, particularly in terms of long-term survival outcomes , treatment induced side effects /complications**

# Concurrent chemoradiotherapy

# CONCURRENT CHEMOTHERAPY

- Most commonly single agent Cisplatin for 2–3 doses if given every 3 weekly
- Pignon meta-analysis showed an 8% absolute survival benefit when chemo added to RT
- Several randomised trials in unresectable disease show significant improvement in local control and survival
- Regarded by most clinicians as the best time to give chemotherapy
- Increased toxicity (especially mucositis) means only suitable for fit patients

Sanchiz F et al.

859 pts, HNSCC  
stage III/IV

Conventional RT

60Gy/30fx, 2Gy/d

HfXRT

70.4Gy, 1.1Gy bid

CCRT (conventional RT)

5FU 250mg/m<sup>2</sup>, qod

Oral cavity	29%
Nasopharynx	11%
Hypopharynx	14%
Larynx	36%
Other	10%

	RR	10yr OS	10yr DFS
A: RT	67.8%	17%	17%
B: HfXRT	90%	40%	31%
C: CCRT	96.3%	42%	37%
p		<0.01(A v B) <0.01(A v C)	<0.01(A v B) <0.01(A v C)

*Int J Radiat Oncol Biol Phys. 1990; 19: 1347-1350*

Browman GP et al

175 pts, HNSCC  
T3/T4

CCRT

RT alone

Identical RT in both arms  
RT: 60Gy/30fx, conventional  
C/T: 5-FU 1200mg/m<sup>2</sup>/d, infusion  
D1-D3, D22-D24

Oral cavity	12%
Oropharynx	42%
Hypopharynx	14%
Larynx	27%
Other	5%

	Complete response	3yr PFS	3yr OS
CCRT	68%	40%	58%
RT	56%	30%	42%
p value	0.04	0.057	0.08

More mucositis, weight loss, and skin toxicity in CCRT arm

*Journal of Clinical Oncology 1994; 12: 2648-2653*



Aldelstein DJ et al

100 pts, HNSCC stage III/IV

RT alone

CCRT

RT: 66-72Gy, conventional, 1.8-2Gy/fx

Cisplatin: 20mg/m<sup>2</sup>/d

5FU: 1000mg/m<sup>2</sup>/d

Infusion,  
D1-D4  
D22-D25

Residual dz  
or recurrence

Oral cavity	4%
Oropharynx	44%
Hypopharynx	16%
Larynx	36%

Primary site resection +/- neck dissection

5yr	OS	RFS	Dist. Mets-free survival	OS with primary site preserve	Local control without resection
RT	48%	51%	75%	34%	45%
CCRT	50%	62%	84%	42%	77%
p value	0.55	0.04	0.09	0.004	<0.001

→ Survival benefit from better local control

*Cancer 2000; 88: 876-883*

**Aldelstein DJ et al**

100 pts, HNSCC stage III/IV

RT alone

CCRT

RT: 66-72Gy, conventional, 1.8-2Gy/fx

Cisplatin: 20mg/m<sup>2</sup>/d  
5FU: 1000mg/m<sup>2</sup>/d

Infusion,  
D1-D4  
D22-D25

Residual dz  
or recurrence

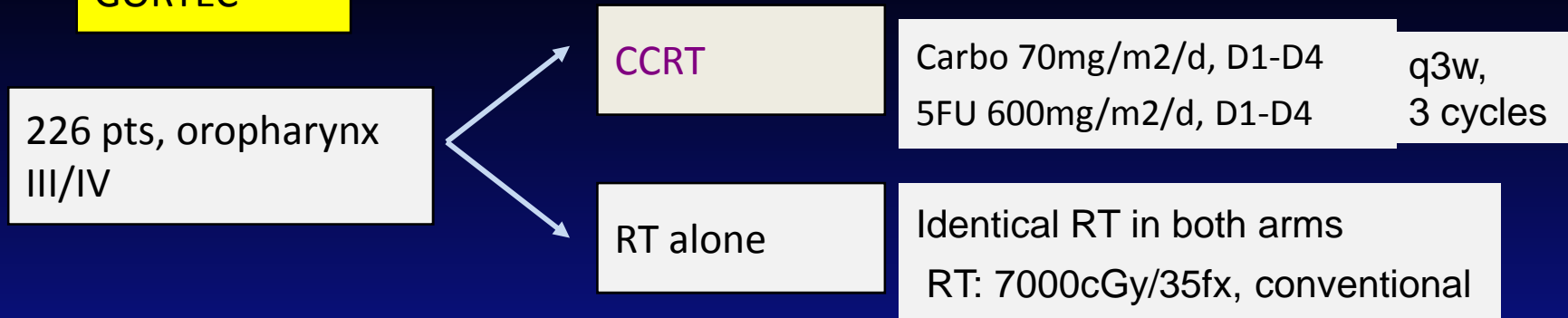
Primary site resection +/- neck dissection

Oral cavity	4%
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Larynx	36%

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RT	48%	51%	75%	34%	45%
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p value	0.55	0.04	0.09	0.004	<0.001

→ Survival benefit from better local control

## GORTEC



## Dose delivery

	RT dose
RT	6920 cGy
CCRT	6960 cGy

	1st	2nd	3rd
Carbo	98%	86%	66%
5FU	98%	88%	67%

3yr	DFS	OS	Dist. mets	LR control
CCRT	31%	51%	11%	66%
RT	20%	42%	11%	42%
p value	0.04	0.02	NS	0.02

Jeremic B et al, Japan

130 pts, HNSCC  
stage III/IV

CCRT (HFxRT)

HFxRT alone

Identical RT in both arms

RT: 77Gy/70fx/35d, 1.1Gy bid

C/T: 5FU 6mg/m<sup>2</sup>/d, 5days/wk

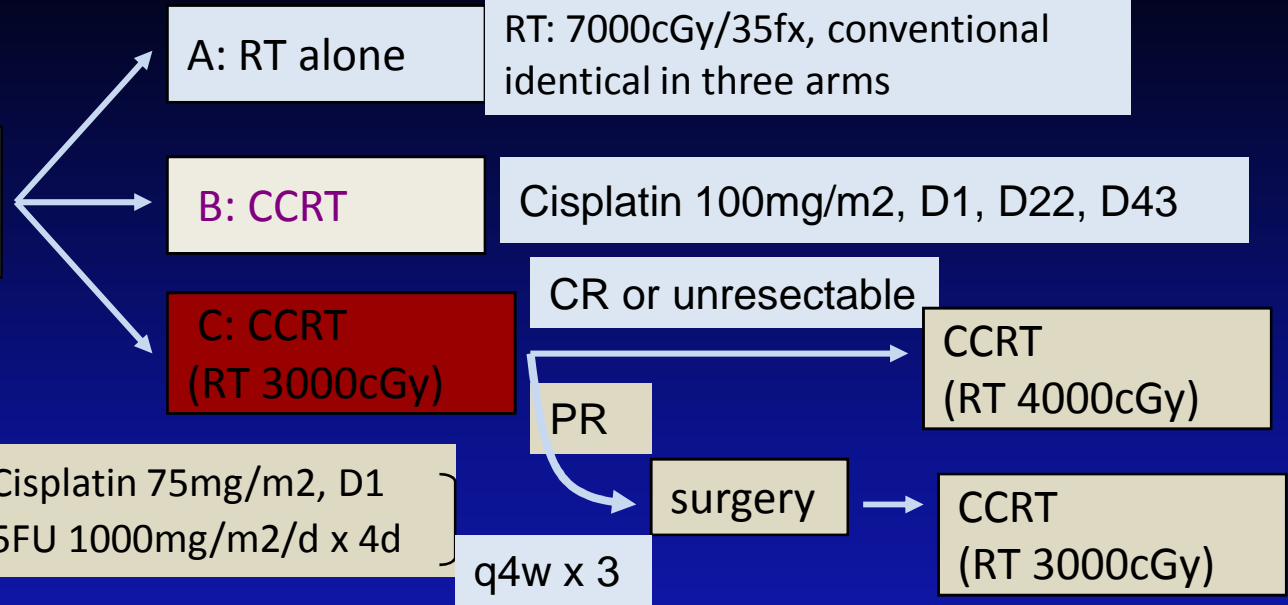
Oral cavity	21%
Oropharynx	37%
Hypopharynx	16%
Larynx	17%
Nasophaynx	9%

5yr	OS	PFS	Local recur.- PFS	Dist. Mets- PFS
CCRT	46%	41%	50%	86%
RT	25%	25%	36%	57%
p value	0.0075	0.0068	0.041	0.0013

Similar stomatitis, esophagitis in both arm,  
more leukopenia and thrombocytopenia in CCRT arm

ECOG RTOG

295 pts, HNSCC unresectable III/IV



Oral cavity	13%
Oropharynx	59%
Hypopharynx	19%
Larynx	9%

	3y OS	Dist. Mets as first site	Treatment compliance
A	23%	17.9%	92.6%
B	37%	21.8%	85.1%
C	27%	19.1%	73%
p	0.014 (A vs B)	NS	0.001(A vs C) 0.05(B vs C)

Taylor SG et al

215 pts, HNSCC  
stage III/IV,  
unresectable

RT 70Gy/35fx

C/T → RT (A)

Cisplatin 100mg/m<sup>2</sup>, D1  
5-FU 1000mg/m<sup>2</sup>, D1-D5 } Q3w x 3

CCRT (B)

Cisplatin 60mg/m<sup>2</sup>, D1  
5-FU 800mg/m<sup>2</sup>, D1-D5 } Qw x 7

Sinus	1%
Oral	32%
Oropharynx	23%
Nasopharynx	6%
Hypopharynx	27%
Larynx	11%

	LR recurrence	Dist Mets	3-yr OS	3-yr dz specific survival
A	55%	10%	36%	41%
B	41%	7%	42%	55%

NS

p=0.011

	A	B
% Cisplatin	97%	88%
% 5-FU	97%	79%
% RT(>65Gy)	78%	81%
% RT delay	No difference	

*Journal of Clinical Oncology 1994; 12: 385-395*

# Concurrent chemoradiotherapy

- Enhance locoregional control
- Minimal effect in distant metastasis
- Improve survival
  - Superior than sequential chemoradiotherapy
  - Disease nature: local recurrence predominant
- Enhance RT toxicity
  - Mucositis, skin toxicity, BW loss
  - Leukopenia depends on C/T type

Brockstein B et al

PFLI

Cisplatin 100mg/m<sup>2</sup>, D1  
5FU 640mg/m<sup>2</sup>/d, CVI, D1-D5  
Leucovorin 100mg q4h po, D1-D6  
INF- $\alpha$  2MU/m<sup>2</sup>/d, D1-D6

q3w

PFLI-FHX

164 pts

Induction C/T x 3

CCRT

FHX

5FU 800mg/m<sup>2</sup>/d x 5/wk  
Hydroxyurea 1000mg q12h, 11doses/wk  
RT 6000cGy/30fx

(C/T)HF2X

230 pts

Intensified CCRT

Cisplatin 100mg/m<sup>2</sup>, D1  
or  
Paclitaxel 100mg/m<sup>2</sup>, D1  
q3w x 3

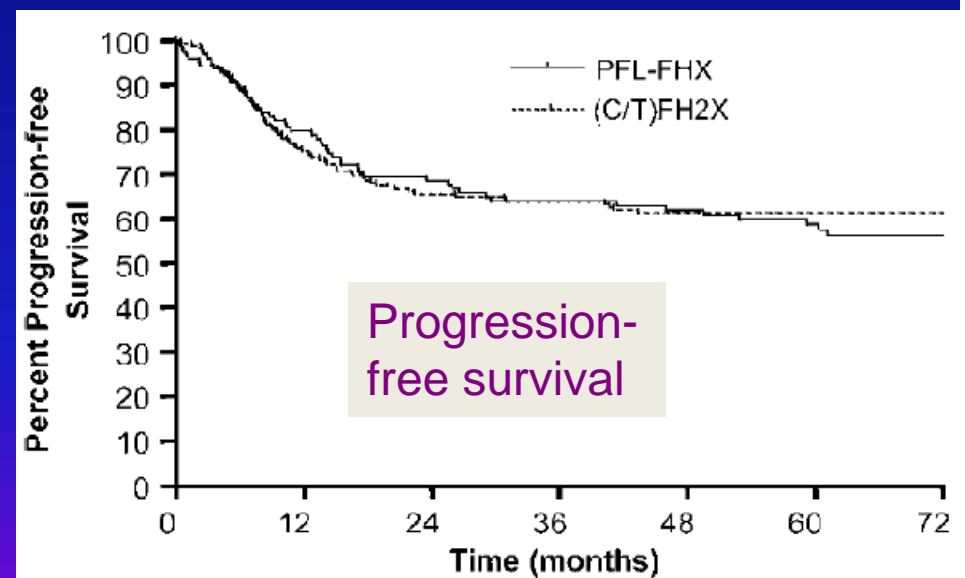
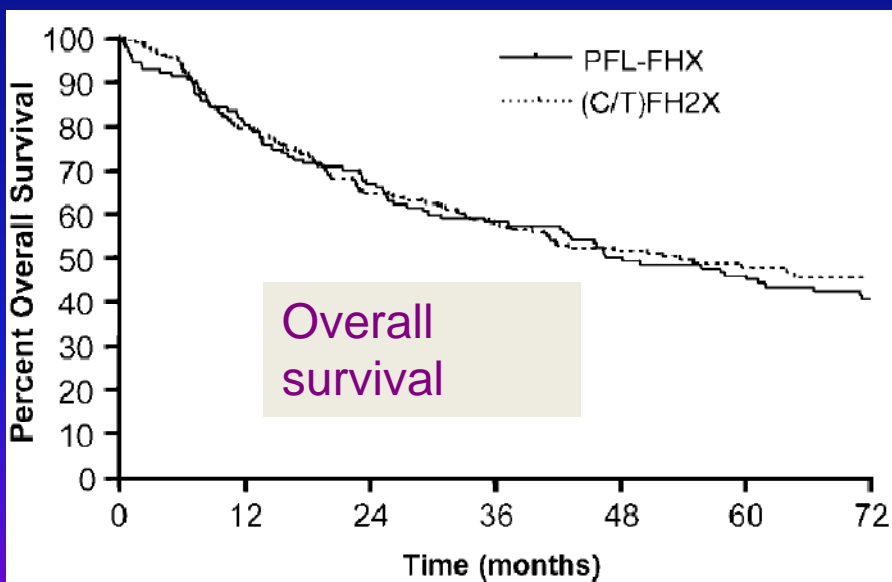
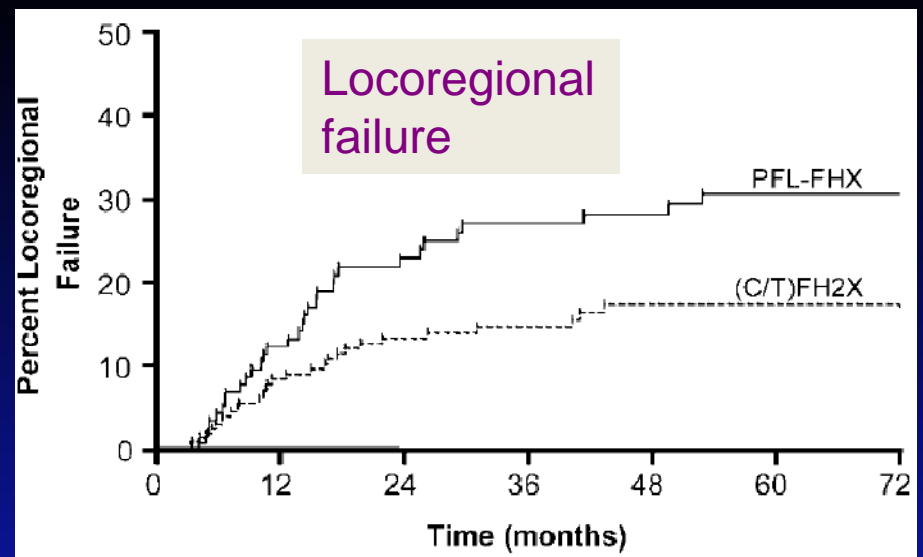
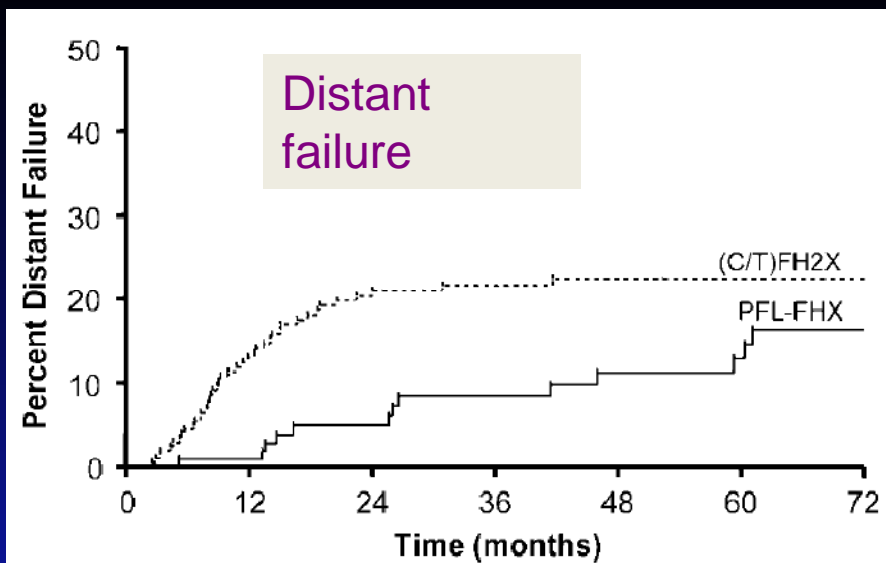
+

5FU 800mg/m<sup>2</sup>/d x 5/wk  
Hydroxyurea 1000mg q12h, 11doses/wk  
RT 6000cGy/30fx

*J Clin Oncol. 1995; 13: 876-83*

*Annals of Oncology 2004; 15: 1179-1186*





*J Clin Oncol.* 1995; 13: 876-83  
*Annals of Oncology* 2004; 15: 1179-1186

## Yale 6557 protocol

Cisplatin 20mg/m<sup>2</sup>/d x 4d  
 C/T: 5FU 800mg/m<sup>2</sup>/d x 4d  
 LV 500mg/m<sup>2</sup>/d x 4d

q4w

CCRT:  
 RT: 70Gy/35fx  
 Cisplatin 100mg/m<sup>2</sup>, q3w

42 pts, HN cancer,  
 stage III/IV  
 resectable/unresectable

C/T x 2

CCRT

Non-responder

operation

Hypopharynx	24%
Larynx	38%
NPC	9.5%
Tongue base	19%
Tonsil	7.5%
Unknown	9%

- Induction C/T: RR 76%
- C/T → CCRT: 67% CR

5y PFS	5y OS	2y Local control	2yr Distant control
54%	52.4%	76.3%	79%

**SWOG**

C/T: Cisplatin 100mg/m<sup>2</sup>  
5FU 1000mg/m<sup>2</sup>/d x 5d } q3w

CCRT:  
RT: 72Gy/36fx  
Cisplatin 100mg/m<sup>2</sup>, q3w

59 pts, HN cancer,  
resectable stage III/IV

C/T x 2

CCRT

Non-responder

operation

Non-responder

operation

Hypopharynx	22 pts
Tongue base	37 pts

- Induction C/T: RR 78%
- C/T → CCRT: 54% CR

3y PFS	3y OS	3y PFS with Organ preservation
57%	64%	52%

*Journal of Clinical Oncology 2005; 23: 88-95*

Post-op CCRT

# Risk factors of post-op recurrence

- Primary tumor
  - Positive or close margin
- Neck
  - Multiple LN: >2
  - Extracapsular extension
  - Perineural invasion
  - Vascular embolism
- Both locoregional and distant

*Annals of Oncology 2004; 15: 1179-1186*  
*Head and Neck 2000; 22: 680-686*

# Adjuvant RT

- For possible residual disease
  - Positive margin or close margin
  - Multiple neck LN
- Attempt to decrease local failure
  - Decrease subsequent distant failure
- CCRT better than RT ?

*Radiology 1970; 95: 185-188*

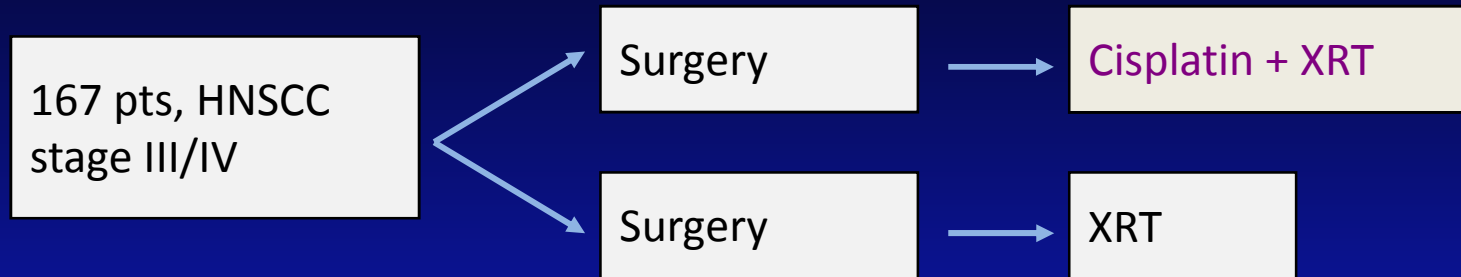
*Clinical Otolaryngology 1982; 7: 185-192*

*Head and Neck Surgery 1984; 6: 720-723*

*Head and Neck Surgery 1987; 10: 19-30*

EORTC 22931

Cisplatin 100mg/m<sup>2</sup>, D1, D22, D43  
XRT 54Gy/27fx, Boost 12Gy/6fx



pT3/T4 + any N  
pT1/T2 + N2/N3  
pT1/T2 + N0/N1 + unfavorable patho

	Margin	Perineural invasion	Extracapsular spread	Vascular embolism
Positive	28%	13%	57%	20%
Negative	71%	85%	43%	80%
Unknown	1%	2%		

Oral cavity	26%
Oropharynx	30%
Hypopharynx	20%
Larynx	22%
Unknown	1%

*N Eng J Med 2004; 350: 1945-1952*

## EORTC 22931

	C/T on time without delay
1st	88%
2nd	66%
3rd	49%

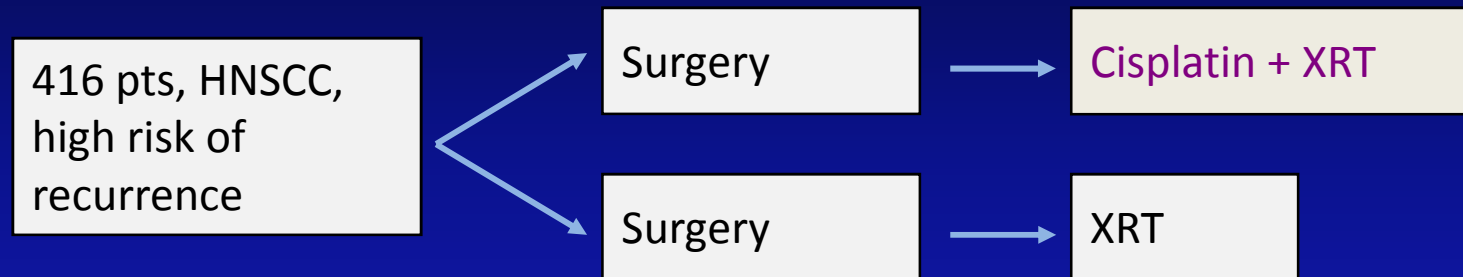
	5yr PFS	5yr OS	LRR	Dist Mets
CCRT	47%	53%	18%	21%
RT	36%	40%	31%	25%
p value	0.04	0.02	0.007	0.61

	Acute mucosa reaction	Mucosa fibrosis	Xerostomia	Severe leukopenia
CCRT	41%	10%	14%	16%
RT	21%	5%	20%	-
p value	0.001			



RTOG 9501

Cisplatin 100mg/m<sup>2</sup>, D1, D22, D43  
XRT 60Gy/30fx, Boost 6Gy/3fx



Positive margin	17%
LN>2 or extracapsular extension	83%

Oral cavity	27%
Oropharynx	42%
Hypopharynx	10%
Larynx	21%

RTOG 9501

45.9 months follow-up time

	DFS	OS	LRR	Dist Mets as 1st event
CCRT	40%	52.5%	19%	23%
RT	30%	45%	30%	20%
p value	0.01	0.19	0.01	0.46

	Acute adverse effect	Late adverse effect
CCRT	77%	21%
RT	34%	17%
p value	0.001	0.29

hematological,  
mucosa,  
GI tract

*N Eng J Med 2004; 350: 1937-1944*

# Post-op adjuvant CCRT

- Decrease locoregional recurrence
- Not affect distant metastasis
  - Though systemic side-effect
  - Insufficient dose delivery?
  - Single agent not enough?
- Actually improve survival
  - Locoregional recurrence dominant in HNSCC

# Organ preservation

# Organ Preservation

- Laryngeal cancer as an example
  - Supraglottic
  - Subglottic
    - T1: limited, not extend to glottis
    - T2: extend to glottis, but normal cord mobility
    - T3/T4: cord fixation, invade adjacent tissue
  - Glottic
    - T1a/b: limited to one/both sides, no cord fixation
    - T2: impair cord motility, to supra- or subglottis
    - T3/T4: cord fixation, invade adjacent tissue/organ

# Laryngeal cancer

- Historically
  - Early: T1, T2
    - RT alone, surgical salvage, or
    - Surgical → adjuvant RT
    - Larynx usually preserved
  - Advance: T3, T4
    - RT alone not sufficient
    - Surgical resection, usually total laryngectomy

# Veterans Affairs Laryngeal Cancer Study Group

332 pts,  
laryngeal SCC  
stage III/IV

Surgery → Adjuvant RT  
RT: 5000cGy/25fx

C/T x 2 → C/T x 1 → Definitive RT  
RT: 6600-7600cGy

Poor  
respond

Surgery +/- RT

Residual  
disease

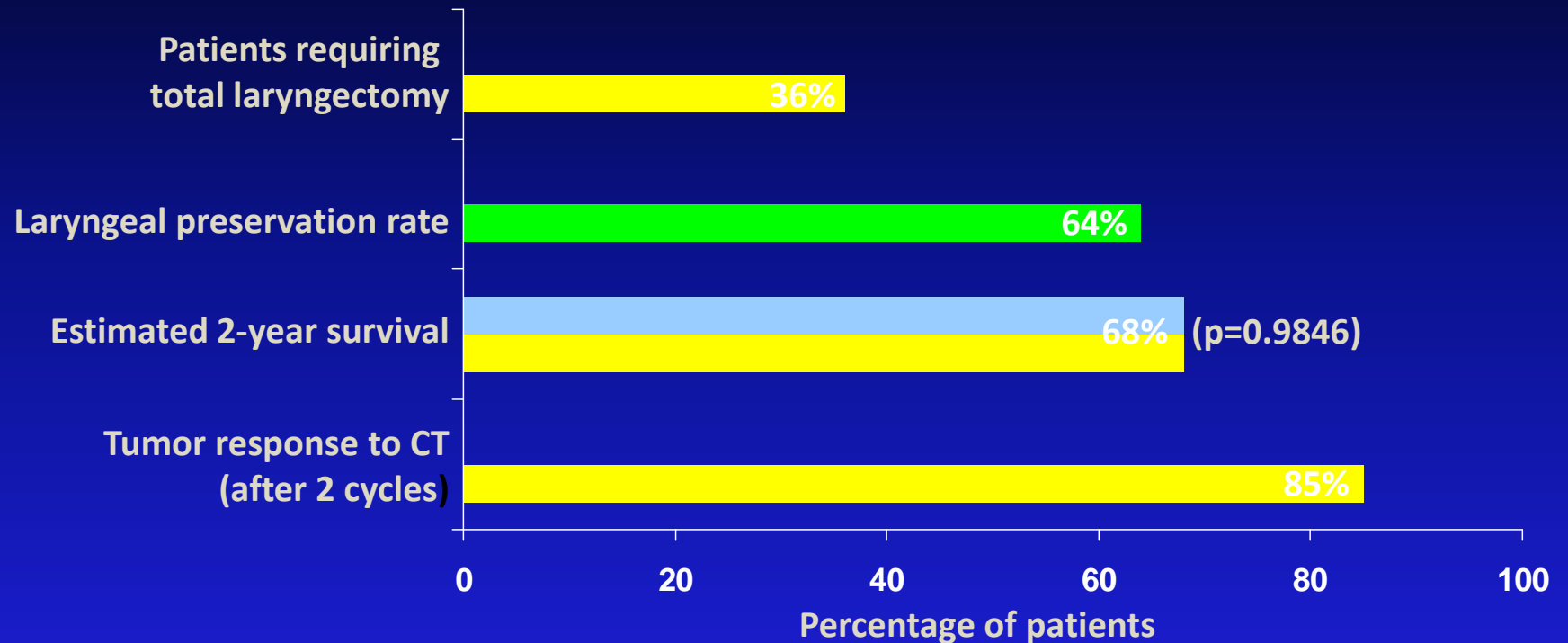
Cisplatin 100mg/m<sup>2</sup>, D1  
5FU 1000mg/m<sup>2</sup>/d x 5d  
q3w

T1/T2	9%
T3	65%
T4	26%

Glottis	37%
Supraglottis	63%

2yr	DFS	OS	Recur at primary	Recur at regional	Distant mets	Laryngectomy-free survival
Surgery	75%	68%	2%	5%	17%	
C/T → RT	65%	68%	12%	8%	11%	39%
p value	0.12	0.98	0.001	NS	0.001	

# VALSG study



- 2-year and 10-year follow up show significant difference in survival
- More local recurrences ( $p=0.0005$ ) but fewer distant metastases ( $p=0.0016$ ) in experimental arm



## VALSG study

- **Laryngeal preservation achieved in 64% of patients in the CT arm**
- **Fewer distant metastases in the CT arm**
- **Overall survival rates for the two groups were similar, suggesting that chemotherapy could be used effectively for organ preservation without compromising overall survival.**

# QOL assessment

- Veterans Affairs Laryngeal Cancer Study Group
- C/T → RT vs. Surgery → RT
  - “pain”, “mental health”, “bother”
- Laryngectomy vs. Laryngeal preserve
  - “pain”, “mental health”, “bother”
  - “role physical”, “social function”, “emotion”, “response”
- No difference in speech and eating

# EORTC

194 pts,  
hypopharynx SCC  
stage II/III/IV

Surgery

Adjuvant RT

RT: 5000cGy/25fx

C/T x 2

C/T x 1

Definitive RT

RT: 7000cGy

Residual  
disease

Surgery +/- RT

Poor  
respond

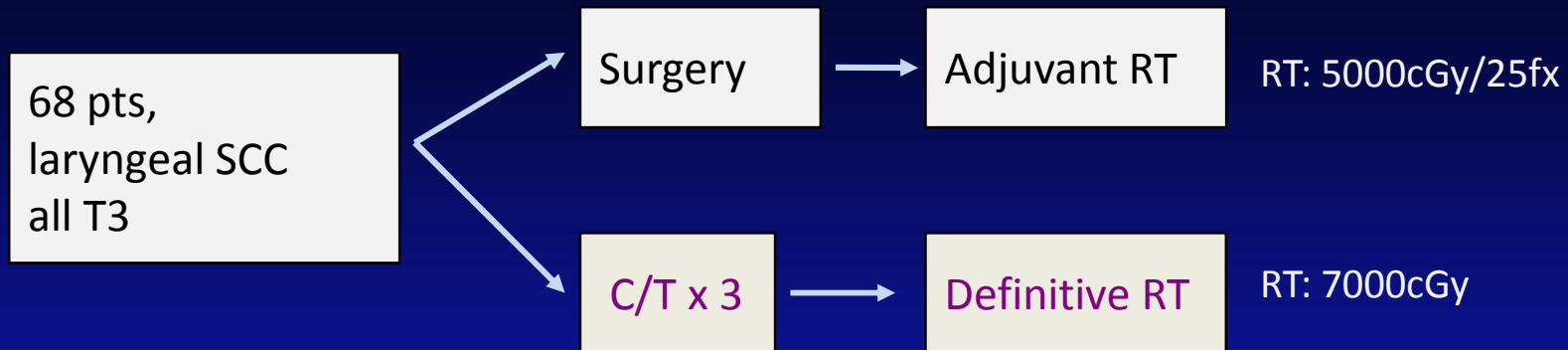
Cisplatin 100mg/m<sup>2</sup>, D1  
5FU 1000mg/m<sup>2</sup>/d x 5d } q3w

T2	20%
T3	75%
T4	5%

Pyriiform sinus	78%
Aryepiglottic fold	22%

5yr	DFS	OS	Recur at local	Recur at regional	Distant mets	Laryngectomy-free survival
Surgery	32%	35%	17%	23%	36%	
C/T → RT	25%	30%	12%	19%	25%	35%
p value	NS	NS	NS	NS	0.041	

## GETTEC, French



Cisplatin 100mg/m<sup>2</sup>, D1  
5FU 1000mg/m<sup>2</sup>/d x 5d } q3w

Supraglottis	31%
Glottis	41%
Unknown	28%

	2yr DFS	2yr OS	8yr Laryngectomy-free survival
Surgery	78%	84%	
C/T → RT	62%	69%	42%
p value	0.02	0.006	

**Inferior outcome !!**

**RTOG 91-11**

518 pts,  
laryngeal SCC  
III/IV

RT alone

CCRT

C/T x 2

C/T x 1

RT

CCRT:  
RT 7000cGy/35fx  
Cisplatin 100mg/m<sup>2</sup>, q3w

Residual disease

T2	12%
T3	78%
T4	10%

Cisplatin 100mg/m<sup>2</sup>, D1  
5FU 1000mg/m<sup>2</sup>/d x 5d  
q3w

Poor  
respond

Surgery +/- RT

Supraglottis	69%
Glottis	31%

Speech/swallow :  
similar

0.02(C v A) 0.006(B v A)	NS	0.005(B v C) 0.001(B v A)	0.004(B v C) 0.001(B v A)	0.03(B v A)	Distant mets
A: RT	27%	56%	70%	56%	22%
B: CCRT	36%	54%	88%	78%	12%
C: C/T→RT	38%	55%	75%	61%	15%
p					

# Laryngeal preservation

- Chemoradiotherapy becomes standard
  - No negative survival impact, at most series
- Organ preserved, but function?
  - Fibrosis, choking, difficult speech
  - Reconstructed organ followed by rehabilitation
    - Function may be better
    - Loss of organ, psychological stress
- ASCO guideline
  - CRT for T3/T4 to preserve larynx (Aug. 2006)

## **CCRT, H&N, SJH\***

### **PROTOCOL**

- **Arm I (Control)**                      **Radiotherapy alone**
- **Arm II**                                      **RT+CDDP 70mg/m<sup>2</sup> D1&21**
- **Arm III**                                      **RT+CDDP 100mg/m<sup>2</sup> D1&21**
- **Arm IV**                                      **RT+CDDP 30mg/m<sup>2</sup> D1,8,15,21,28**
- **Arm V**                                      **RT+CDDP 70mg/m<sup>2</sup> D1&21**  
**+5FU 1000mg/m<sup>2</sup> D1,2,3 &21,22,23**

**\*Kumar T Bhowmik, N Das, Rajiv Sharma, JS Bhatia, Daulat Singh, Shantanu Sharma, Vikas Madholia, Surbhi Gupta, A Safaya, VP Venkatachalam, Jyotsna Pandey et. al. 2000**

## **CCRT, H&N, SJH**

### **PROTOCOL**

- **Radiotherapy**

**Cobalt 60, 80 cm SSD**

**Tumor dose 60-65Gy in  
30-32 #**

**Portals reduced at 44Gy**

- **Chemotherapy**

**Cisplatin after adequate  
hydration and antiemetic  
therapy**

**5FU in a 4hour infusion**



## **CCRT, H&N, SJH**

### **PATIENT CHARACTERISTICS**

	<b>CONTROL</b>	<b>RT+CDDP70 D1,21</b>	<b>RT+CDDP100 D1,21</b>	<b>RT+CDDP30 D1,8,15,21,28</b>	<b>RT+CDDP +5FU</b>
<b>ENROLLED</b>	<b>1800</b>	<b>749</b>	<b>350</b>	<b>498</b>	<b>528</b>
<b>EVALUABLE</b>	<b>1640</b>	<b>528</b>	<b>276</b>	<b>369</b>	<b>425</b>
<b>MALE</b>	<b>1476</b>	<b>475</b>	<b>248</b>	<b>332</b>	<b>386</b>
<b>FEMALE</b>	<b>164</b>	<b>53</b>	<b>28</b>	<b>67</b>	<b>39</b>
<b>MEAN AGE</b>	<b>52</b>	<b>54</b>	<b>51</b>	<b>53</b>	<b>52</b>

## CCRT, H&N, SJH

### SITE OF LESION

	CONTROL	RT+CDDP70 D1,21	RT+CDDP100 D1,21	RT+CDDP30 D1,8,15,21,28	RT+CDDP +5FU
ORAL CAVITY	391	186	89	96	122
OROPHARYNX	429	197	104	162	171
LARYNX	436	195	106	159	158
HYPOPHARYNX	384	171	51	81	77

# CCRT, H&N, SJH

## RESULTS

	CONTROL	RT+CDDP70 D1,21	RT+CDDP100 D1,21	RT+CDDP30 D1,8,15,21,28	RT+CDDP +5FU
<b>No.</b>	1640	528	276	369	425
<b>C.R.</b>	161(10%)	132(25%)	71(26%)	114(31%)	127(30%)
<b>P.R.</b>	246(15%)	153(29%)	93(34%)	132(36%)	148(35%)
<b>N.C.</b>	230(14%)	105(20%)	55(20%)	55(15%)	63(15%)
<b>P.D.</b>	1003(61%)	138(26%)	57(20%)	68(18%)	87(20%)

## CCRT, H&N, SJH

### RESULTS Contd.

	CONTROL	RT+CDDP70 D1,21	RT+CDDP100 D1,21	RT+CDDP30 D1,8,15,21,28	RT+CDDP +5FU
Locoregional Control(%) (at 1 year)	42	55 P=0.05	62 P=0.01	73 P=0.005	77 P=0.001
Progression Free Survival(mo)	8.2	11.6 P=0.01	13.4 P=0.01	18.3 P=0.005	21.8 P=0.001
Actuarial Survival (2 years)	25%	40% P=0.01	45% P=0.005	60% P=0.001	62% P=0.001

## CCRT, H&N, SJH

### TOXICITIES (Grade III & IV)

	CONTROL	RT+CDDP70 D1,21	RT+CDDP100 D1,21	RT+CDDP30 D1,8,15,21,28	RT+CDDP +5FU
MUCOSITIS	820(50%)	316(60%)	179(65%)	258(70%)	297(70%)
NEUTROPENIA	33(2%)	53(10%)	41(15%)	73(20%)	106(25%)
NEPHRO- TOXICITY	0(0%)	0(0%)	0(0%)	18(5%)	42(10%)
TRT.INTURRPT.					
0-7 DAYS	156(9%)	26(5%)	14(5%)	37(10%)	64(15%)
8-14 DAYS	82(5%)	11(2%)	5(2%)	55(15%)	65(15%)

# Conclusions

- Carcinoma of larynx has a very good control rates
- Both radiotherapy and surgery gives good results in early stages
- Combined modality treatment gives optimum results in advanced stages
- Presently the focus is on use of modalities with best cure rates and organ preservation

**Thank You**