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**Late rectal toxicity after prostate cancer 3DCRT:  
preliminary results from a prospective  
multi-centric study (AIROPROS 01-02)**

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## AIROPROS01- 02: PURPOSE

- Clear relationship between dose-volume parameters/some clinical variables and late rectal bleeding from a previously completed retrospective investigation , (Fiorino 2002, 2003; Rancati: 2004).....available NTCP best fit
- **Prospective investigation of clinical and dosimetric parameters affecting late rectal toxicity treated with high dose 3DCRT**
- Late toxicity evaluated through a self reported questionnaire
- Acute tox was found to be highly correlated with DVHs and a number of clinical variables (...results reported in this session and tomorrow)

**Here: ad interim analysis on late toxicity**

## AIRO PROS 01-02 TRIAL: PREREQUISITES

- ✓ validated self-assessed questionnaire on rectal tox (15 items on: stool frequency, tenesmus, soiling, pain, bleeding, drug prescription....before RT, end RT, every 6 m up to 36 m)
- ✓ contouring consistency
- ✓ dosimetric consistency in dose and DVH calculation
- ✓ Emptied rectum at planning CT scan

✧ prostate dose	70-80 Gy (median 74 Gy)
✧ dose per fraction	1.8-2.0 Gy

### AVAILABLE PATIENT DATA (Sept 06)

509 pts, 21 month follow-up

# ENDPOINT DEFINITION

## FREQUENCY:

grade 2  $\Rightarrow$

intermittent urgency  
> 4 bowel movements per day  
intermittent and tolerable pain

**21/509 grade  $\geq 2$  in the frequency group**

## INCONTINENCE:

grade 2  $\Rightarrow$

intermittent soiling  
intermittent mucosal loss  
intermittent use of sanitary pads

**9/509 grade  $\geq 2$  in the incontinence group**

## BLEEDING:

grade 2  $\Rightarrow$

occasional bleeding (>2 times/week)  
1-2 transfusions

grade 3  $\Rightarrow$

persistent bleeding (daily)  
>2 transfusions  
surgical intervention

**15/509 grade 2 and 9/509 grade 3 in the late rectal bleeding group**

## **PRE-TREATMENT CHARACTERISTICS:** **DOSIMETRIC VARIABLES (n = 509)**

	yes (%) / median value
✓ pelvic irradiation	5.8 %
✓ seminal vesicles irradiation	81.1 %
✓ dose to the pelvis (mean)	46.8 Gy
✓ dose to the seminal vesicles (mean)	66.2 Gy
✓ dose to the prostate (mean)	74.4 Gy
✓ PTV volume (mean)	172 cc
✓ rectal volume (mean)	63 cc
✓ mean dose to the rectum (mean)	50.1 Gy
✓ maximum dose to the rectum (mean)	74.9 Gy

## PRE-TREATMENT CHARACTERISTICS: POTENTIAL RISK FACTORS

	yes (%)
✓ androgen deprivation	74.2
> 3 mos	40.8
✓ haemorrhoids	21.1
✓ anticoagulants	21.0
✓ antihypertensive drugs	45.6
✓ hypoglycemic drugs	8.4

## RESULTS - 1

**FREQUENCY, GRADE  $\geq 2$  21/509 (4.1%)**

No correlation between toxicity and clinical/dosimetric variables

**INCONTINENCE, GRADE  $\geq 2$  9/509 (1.8%)**

No correlation between toxicity and clinical variables

Mean rectal dose                      p=0.001                      OR=1.12

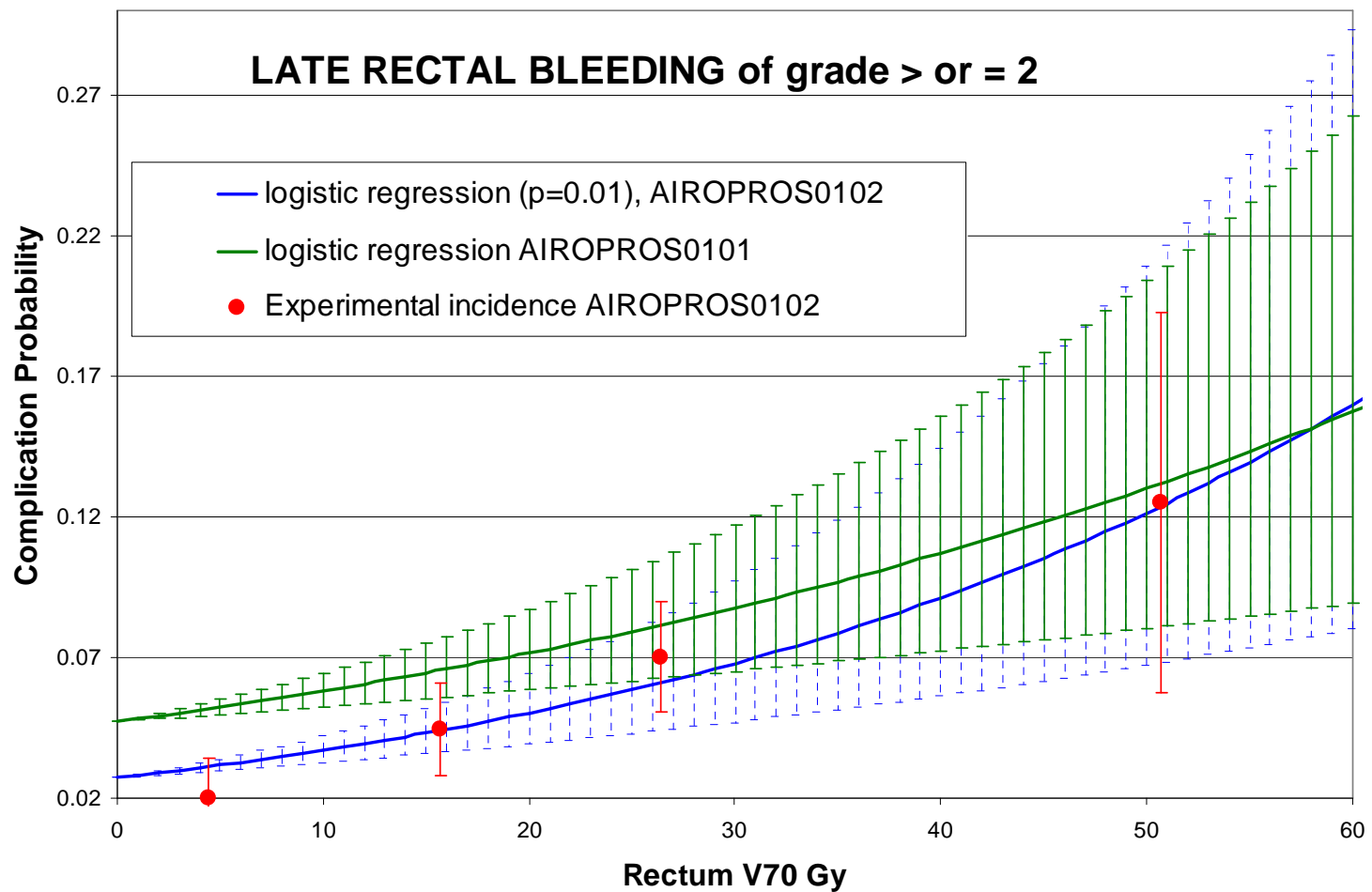
V40Gy                                      p=0.0088                      OR=1.15

V50Gy                                      p=0.008                      OR=1.05

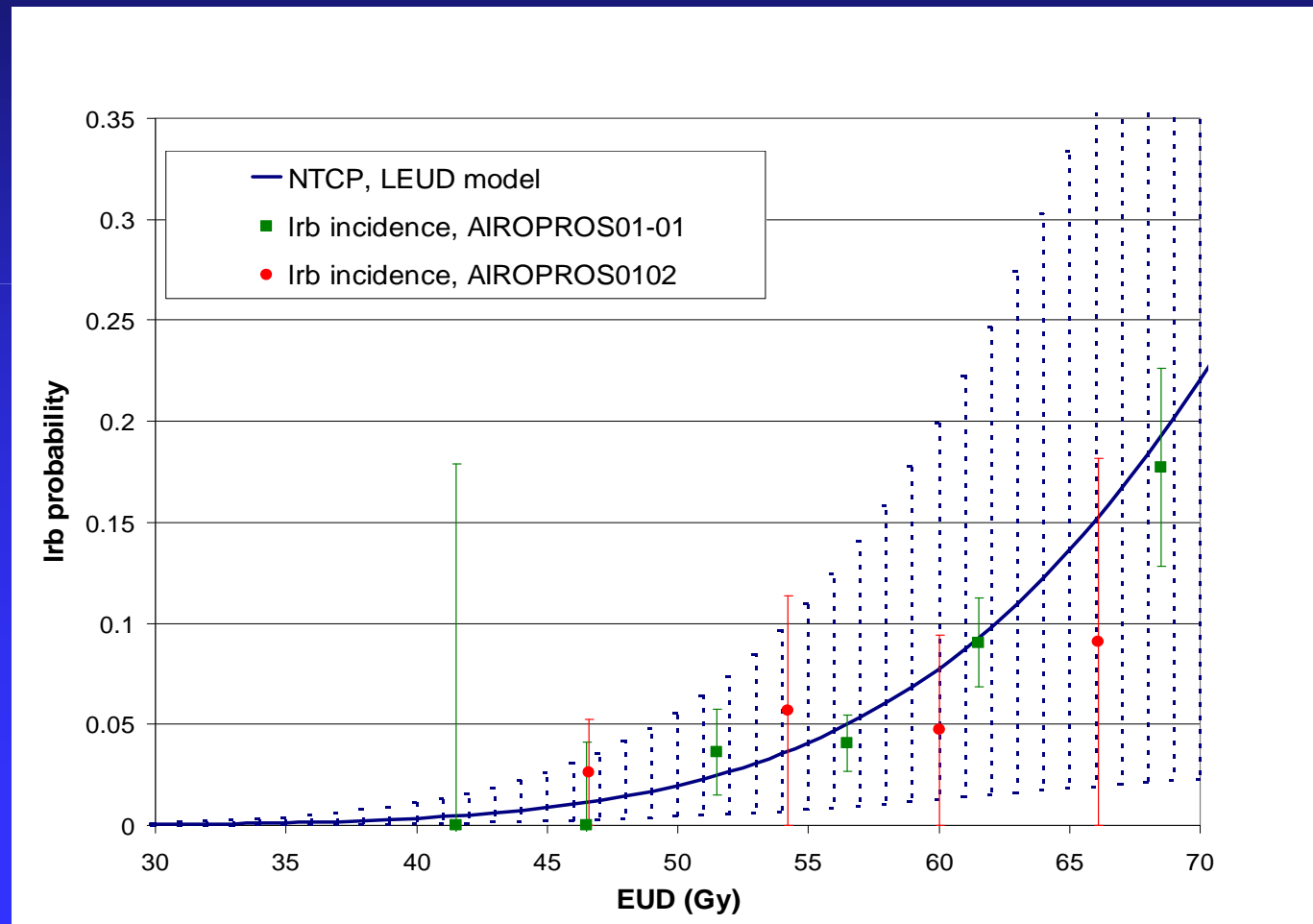
All tox in pts  
with V40Gy > 70%



### LATE RECTAL BLEEDING of grade $\geq 2$



**LATE RECTAL BLEEDING, grade  $\geq 2$**   
**LEUD model: D50=81.9 Gy, m=0.19, n=0.23**  
**(Rancati et al. RO 2004)**



# Conclusions

- ✓ Prospective confirmation of correlation between rectal DVH parameters and late rectal toxicity. Different volume effects were found for different complications
- ✓ late rectal bleeding: the findings of the AIROPROS0101 retrospective study seem to be substantially confirmed
- ✓ late rectal incontinence: focusing the attention on the low-intermediate dose region (V40)

## Conclusions 2

- ✓ The application of previously assessed DVH constraints within the involved Institutions reduced rectal toxicity (around 5 % @ 21 months)!
- ✓ Final results expected in 2008
- ✓ In progress: dose map analysis on a > 300 pts subgroup (“Vodca” dedicated SW, Gianolini 2006)  
.....spatial effects

## ACKNOWLEDGMENTS:

### AIROPROS 0102 PROSPECTIVE TRIAL PARTECIPATING CENTERS

- ↵ Ospedale Bellaria, Bologna
- ↵ Ospedale Sant'Orsola Malpighi, Bologna
- ↵ Ospedale Civile, Busto Arsizio
- ↵ IRCCS, Candiolo
- ↵ Ospedale Civile, Carrara
- ↵ REM, Catania
- ↵ Ospedale Pugliese Ciaccio, Catanzaro
- ↵ Ospedale Sant'Anna, Como
- ↵ Casa di Cura Santa Chiara, Firenze
- ↵ IST, Genova
- ↵ Ospedale Civile, Ivrea
- ↵ Ospedale Manzoni, Lecco
- ↵ Casa di Cura San Pio X, Milano
- ↵ Ospedale San Raffaele, Milano
- ↵ Policlinico, Monza
- ↵ Ospedale San Gerardo, Monza
- ↵ Villa Maria Cecilia, Cotignola Ravenna
- ↵ Ospedale Fatebenefratelli, Roma
- ↵ Ospedale Santa Maria della Misericordia, Udine



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