

XXXIII CONGRESSO NAZIONALE AIRO

AIRO2023

BOLOGNA,
27-29 OTTOBRE 2023

PALAZZO DEI CONGRESSI

Radioterapia Oncologica: l'evoluzione al servizio dei pazienti



Associazione Italiana
Radioterapia e Oncologia clinica

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Genetically-based Cox-NTCP models for late toxicity after prostate cancer RT

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Aim of Requite: Validation of predictive models and biomarkers for radiotherapy (RT) toxicity to reduce side effects and improve quality of life in cancer survivors

Prospective multi-centre observational study

1482 prostate cancer patients undergoing RT recruited between 2014 and 2017 in eight countries

Standardized collection of clinical, dosimetric, toxicity, patient reported outcome data, DNA

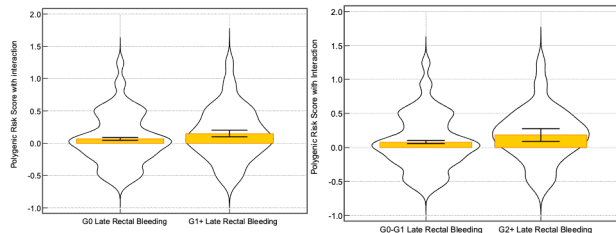
Long-term follow-up: min 12 months, median 24 months, 75th perc 60 months

We propose **Cox-NTCP models** for late toxicity including genetic information in a **polygenic risk score (PRS),** that incorporates SNP-SNP interactions (PRSi).

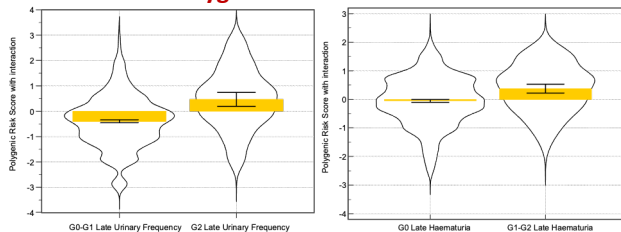


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Polygenic risk score - Rectal tox



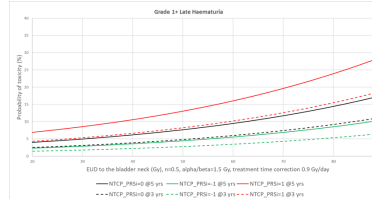
Polygenic risk score - GU tox



$p < 0.001$ in all cases

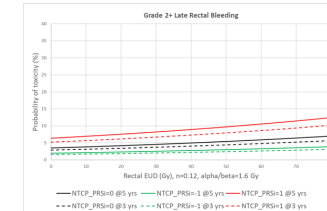
The previously defined PRSi (at 2 yrs) were still associated to toxicity in the long term. For rectal bleeding the best dosimetric descriptor was the rectal EUD from DVH, for urinary frequency it was the whole bladder EUD from DSH, while for haematuria the bladder neck EUD from DSHs.

Cox-NTCP for grade 1+ haematuria



TURP (OR yes vs no)	4.3
Prostatectomy (OR yes vs no)	2.2

Cox-NTCP for grade 2+ late rectal bleeding



Cardiovascular diseases	1.9
Abdominal surgery	1.9

Conclusions The present analysis showed for the first time the benefit of adding PRSi Cox-NTCP prediction models. These models allow both a patient-specific tailoring of prediction and accounting of follow-up time. All models were based on a large modern multicenter prospective cohort with long term standardized follow-up.