


XXXII CONGRESSO NAZIONALE AIRO
XXXIII CONGRESSO NAZIONALE AIRB
XII CONGRESSO NAZIONALE AIRO GIOVANI

AIRO2022

Radioterapia di precisione per un'oncologia innovativa e sostenibile

BOLOGNA, 25-27 NOVEMBRE
PALAZZO DEI CONGRESSI

 Associazione Italiana
Radioterapia e Oncologia clinica

 Società Italiana di Radiobiologia

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ADDED VALUE OF MRI RADIOMICS TO PREDICT PATHOLOGICAL STATUS OF PROSTATE CANCER PATIENTS

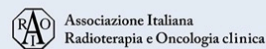


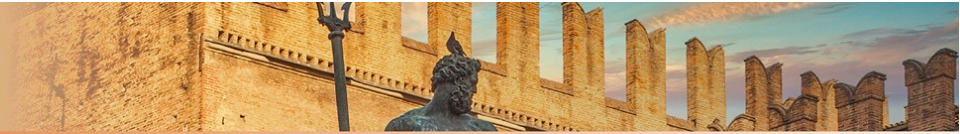
Dr Maria Giulia Vincini



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IEO, European Institute of oncology, IRCSS, Milan, Italy



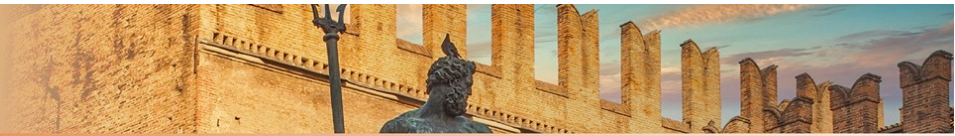


DICHIARAZIONE

Relatore: MARIA GIULIA VINCINI

Come da nuova regolamentazione della Commissione Nazionale per la Formazione Continua del Ministero della Salute, è richiesta la trasparenza delle fonti di finanziamento e dei rapporti con soggetti portatori di interessi commerciali in campo sanitario.

- Posizione di dipendente in aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Consulenza ad aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Fondi per la ricerca da aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Partecipazione ad Advisory Board **(NIENTE DA DICHIARARE)**
- Titolarità di brevetti in compartecipazione ad aziende con interessi commerciali in campo **(NIENTE DA DICHIARARE)**
- Partecipazioni azionarie in aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**



Background & Methods

Input

Clinical variables: Age, Comorbidities, risk class, PSA, cT, cN, GS pre-op, ISUP pre-op

Radiomic features

Radiological variables (mpMRI): pirads, EPE, ADC, volume

M1. *Clinical features*

M2. *Clinical + radiological*

M3. *Clinical + radiomics*

M4. *Clinical + radiological + radiomics*

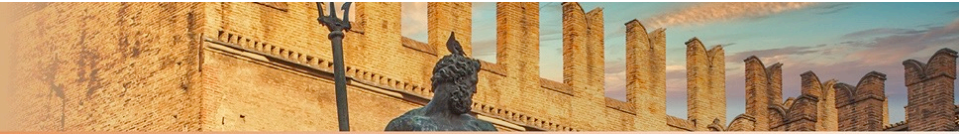
Output

- pT
- pN
- Residual surgical margin
- Post-op GS
- Post-op ISUP
- Biochemical progression
- Clinical progression

949 prostate cancer patients

- ✓ radical prostatectomy performed c/o IEO
- ✓ multiparametric magnetic resonance (mp-MRI) performed c/o IEO

Primary endpoint: to test the ability of common high-performance mathematical models to improve the accuracy of non-invasive prediction of pathological features of PCa

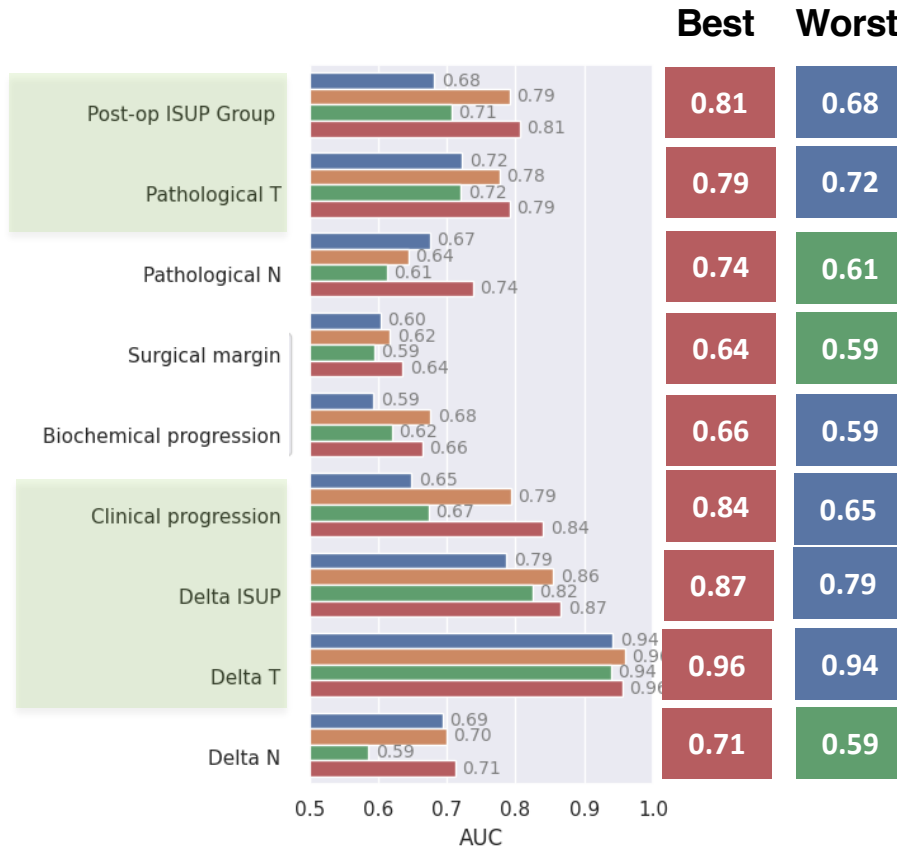


Results

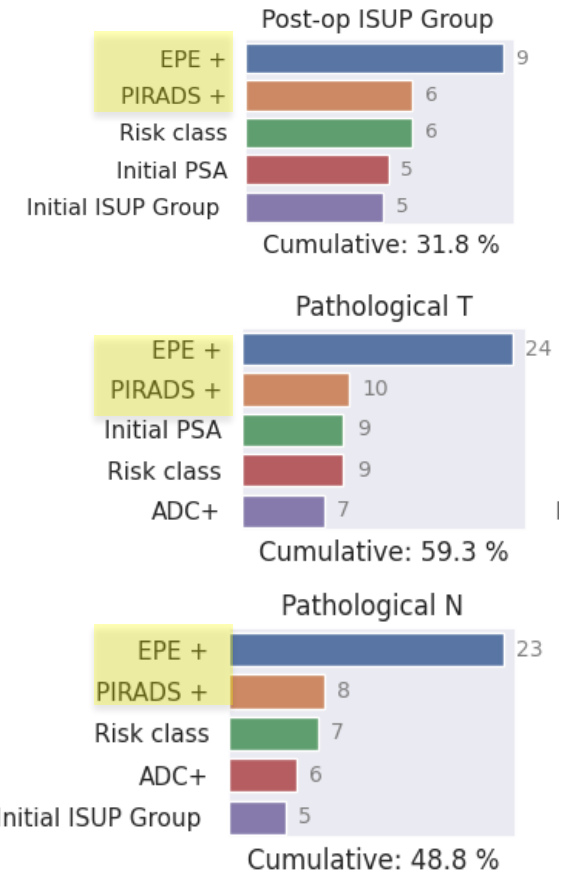


M4 (all variables) was the best model in most endpoints.

Radiomics appear to bring a measurable boost in model performances, although small.



Model performances



Conclusions

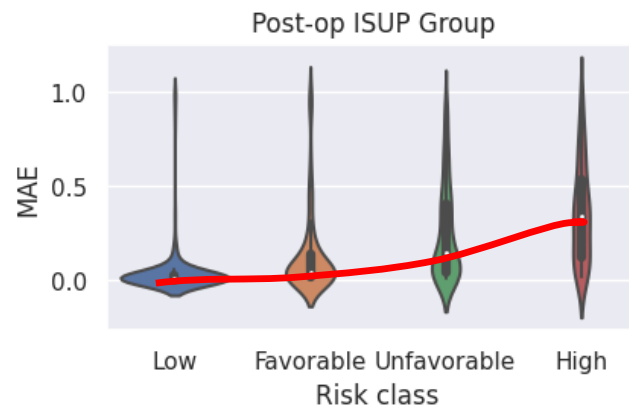
- **MODEL 4** performs better than clinical workflow (**better ability not to under-estimate**) → **potential benefit of mathematical models for pathological features prediction in PCa.**
- Models can provide clinicians with pathological information prior to surgery → **personalizing therapy**, helping identify the correct stage of the disease and guiding the clinical course.

Clinical workflow	≤ 2 predicted	≥ 3 predicted	Model 4	≤ 2 predicted	≥ 3 predicted
≤ 2 true	568	14	cT ≤ 2 true	463	119
≥ 3 true	319	48	cT ≥ 3 true	141	226

Confusion matrices for **pathological T (pT)** prediction

Clinical workflow	0 predicted	1 predicted	Model 4	0 predicted	1 predicted
0 true	493	2	cN = 0 true	408	87
1 true	76	0	cN = 1 true	36	40

Confusion matrices for **pathological N (pN)** prediction



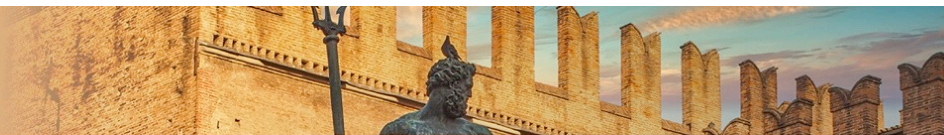
Mean absolute error (MAE) values resulted lower in low-risk and low-PIRADS classes

→ the possibility shown by these models to improve risk stratification and drive treatment-decision process is promising and warrant further efforts

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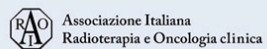
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*Thank you for your
kind attention*



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