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La Biopsia prostatica

Giuseppe Canovaro
Ospedale S.Jacopo Pistoia

Attualità diagnostiche e terapeutiche sulle patologie prostatiche
III Convegno annuale Assoprost
Viareggio 28/10/2023

La diagnosi di adenocarcinoma prostatica è solo anatomopatologica

Biopsia

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Diagnostica ideale del carcinoma prostatico

- ✔Procedura Mininvasiva
- ✔Capacità di individuare tumori clinicamente significativi
- ✔Ridurre riscontro di tumori non significativi
- ✔Scarse complicazioni

- ✔Disponibilità
- ✔Costo accessibile

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Quando eseguire una BXP

- Elevazione del PSA
  - Rapporto libero/totale
  - PSA Density
  - PSA velocity
- Esporazione rettale
- Diagnostica per immagini
- Predisposizione genetica (?)

Come eseguire una biopsia prostatica

Ecoguidata

Fusione d'immagini

RMN guidata

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Come eseguire una biopsia ecoguidata

Transrettale

Tranperineale

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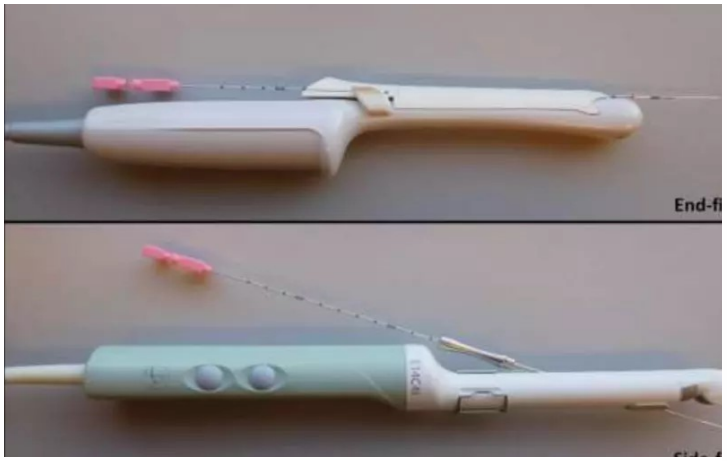
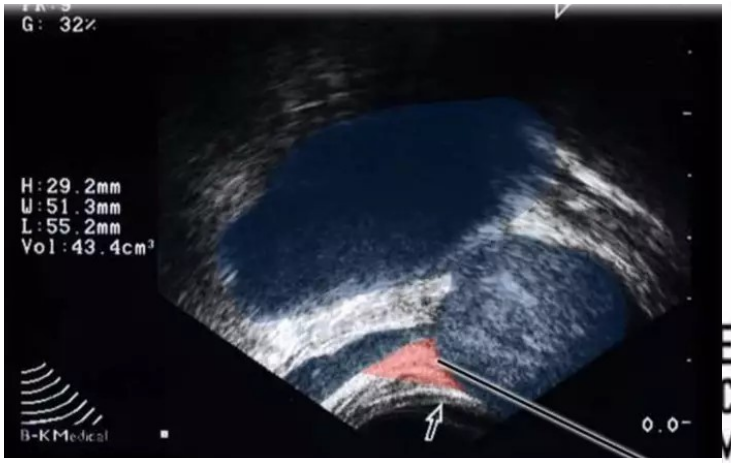
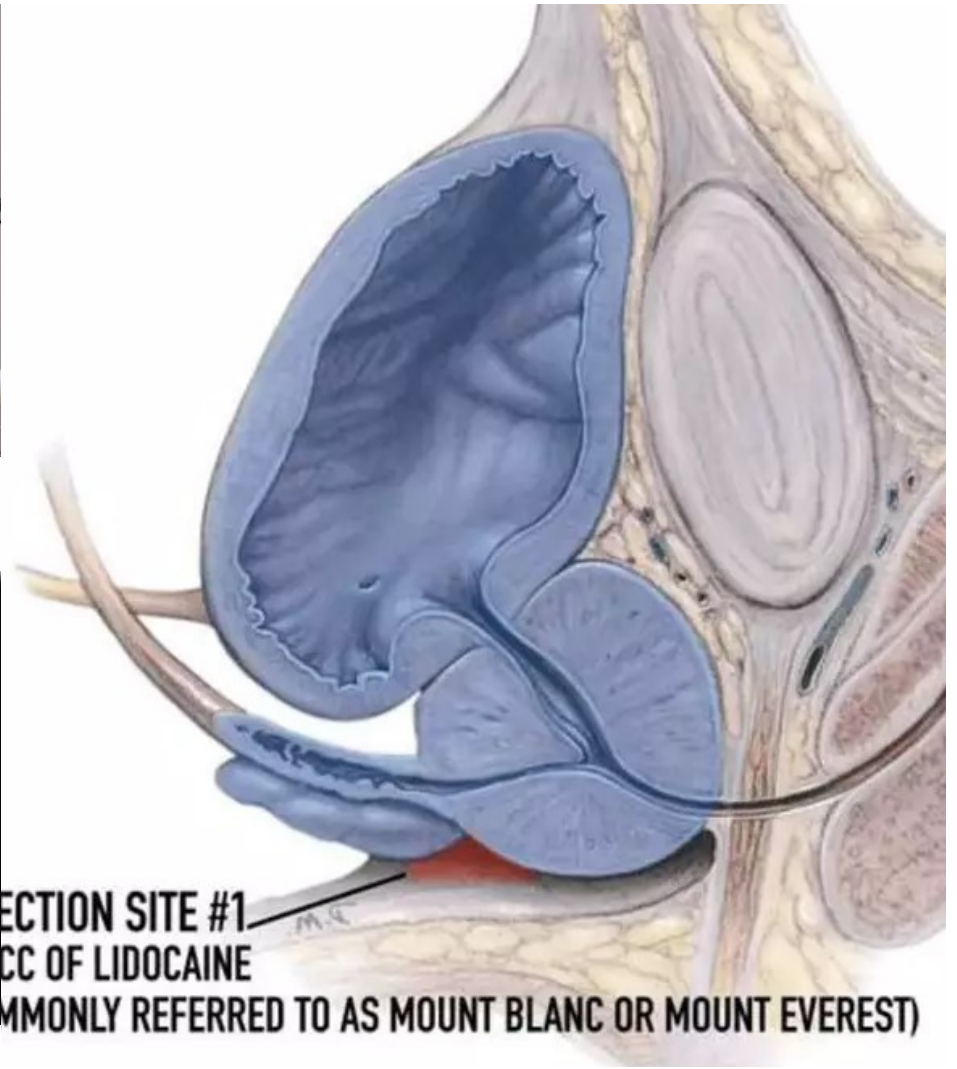
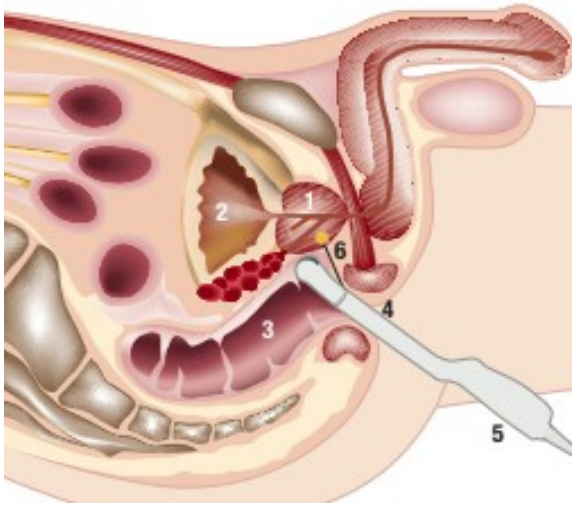
Biopsia transrettale







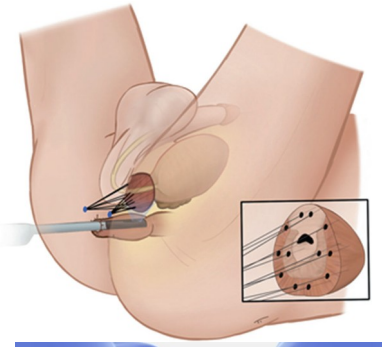
Biopsia transrettale



- Ambulatoriale
- Clistere sera prima e mattina esame
- Profilassi con Fosfomicina 3 g la sera prima e dopo 24 ore
- Decubito laterale
- Betadine endorettale
- Anestesia locale 5 ml lidocaina 2% per ogni lato (infiltrazione del plesso periprostatico)

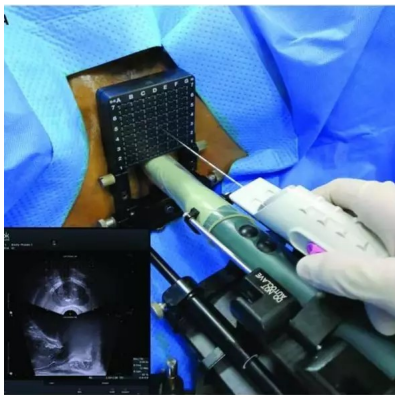
Biopsia tansperineale

- A MANO LIBERA
  - biopsia sistematica
  - con ausilio software



- CON COLLIMATORE
  - biopsia cognitiva
  - fusion

- GRIGLIA
  - biopsia a saturazione



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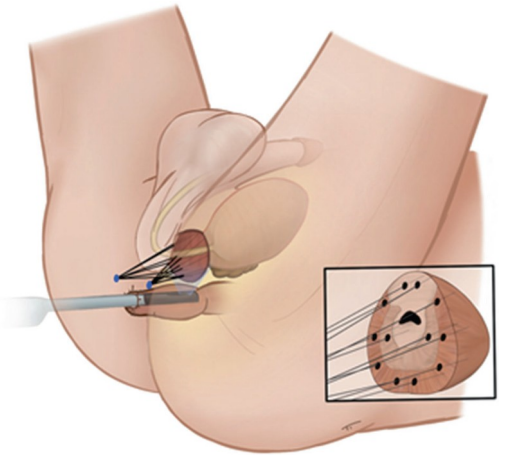
Biopsia transperineale



- Ambulatoriale
- Clistere sera prima e mattina esame
- Profilassi ?
- Posizione litotomica
- Tricotomia perineale
- Disinfezione cute con Betadine

- Anestesia locale 10 ml lidocaina 2% per ogni lato (anestesia perineale e del plesso periprostatico)

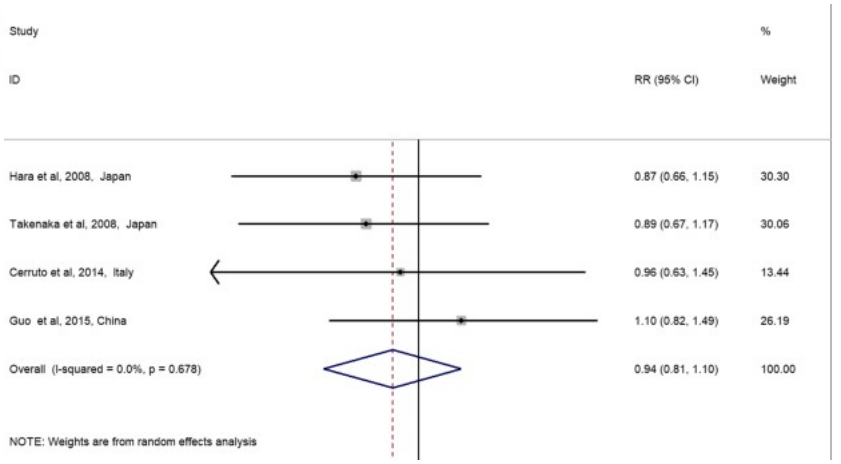
Xiang et al. World Journal of Surgical Oncology (2019) 17:31
https://doi.org/10.1186/s12957-019-1573-0

World Journal of Surgical Oncology

REVIEW Open Access

Transperineal versus transrectal prostate biopsy in the diagnosis of prostate cancer: a systematic review and meta-analysis

Jianjian Xiang[1], Huaqing Yan[2], Jiangfeng Li[2], Xiao Wang[2], Hong Chen[2*] and Xiangyi Zheng[2*]



- MINOR RISCHIO INFEZIONI
- MIGLIOR ACCESSO ALLE PORZIONI ANTERIORI
- MIGLIOR CAPACITA' DI RILEVARE TUMORI CS(86% VS 73 %)
- MIGLIOR CONCORDANZA CON ISTOLOGICO DEFINITIVO

- POSIZIONE LITOTOMICA
- MAGGIOR USO DI ANESTETICO LOCALE

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complicanze

Urologic Clinics of North America

Incidence of prostate biopsy complications

Complication	Incidence
Hematuria	23–84%
Rectal bleeding	17–45%
Hematospermia	12–93%
Urinary tract infection	2–6%
Bacteremia	0.1–2.2%
Hospitalization	0.6–4.1%
Erectile dysfunction	2.2%
Urinary retention	1–7%
Vasovagal response	1.4–5.3%

Optimization of Prostate Biopsy: Review of Technique and Complications

Marc A. Bjurlin[1,†], **James S. Wysock**[1,†], and **Samir S. Taneja**[1,*,‡]

[1]Division of Urologic Oncology, Department of Urology, New York University Langone Medical Center, New York, New York

Urol Clin North Am. 2014 May ; 41(2): 299–313. doi:10.1016/j.ucl.2014.01.011.

Table 3 Comparison of complications of TP and TR prostate biopsy

Study	Total population		Rectal bleeding		Acute retention of urine		Hematuria		Fever		Pain	
	TP	TR	TP	TR	TP	TR	TP	TR	TP	TR	TP	TR
Hara et al., 2007, Japan [21]	126	120	0	0	2	3	13	11	0	2	NA	
Takenaka et al., 2008, Japan [22]	100	100	0	1	2	3	11	12	1	2	NA	
Tian et al., 2014, China [31]	175	137	0	7	10	8	12	11	6	13	16	11
Yuan et al., 2014, China [13]	59	97	2	49	4	7	25	53	2	15	NA	
Cerruto et al., 2014, Italy [23]	54	54	0	4	0	1	5	0	0	1	NA	
Guo et al., 2015, China [20]	173	166	0	16	NA		33	37	2	9	58	26
Franco et al., 2017, Italy [17]	125	132	0	4	2	3	3	3	NA		0	3
Total Number	812	806	2	81	20	25	102	127	11	42	74	40
RR (95% CI), TR as the control group	/		0.02 (0.01–0.06)		0.89 (0.50–1.59)		0.79 (0.63–1.01)		0.26 (0.14–0.48)		1.83 (1.27–2.65)	

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Rischio infezioni

Transizione da biopsia transrettale

#TR-EXIT

Recommendations	Strength rating*
Perform prostate biopsy using the transperineal approach due to the lower risk of infectious complications.	Strong
Do not use fluoroquinolones for prostate biopsy in line with the European Commission final decision on EMEA/H/A-31/1452.	Strong

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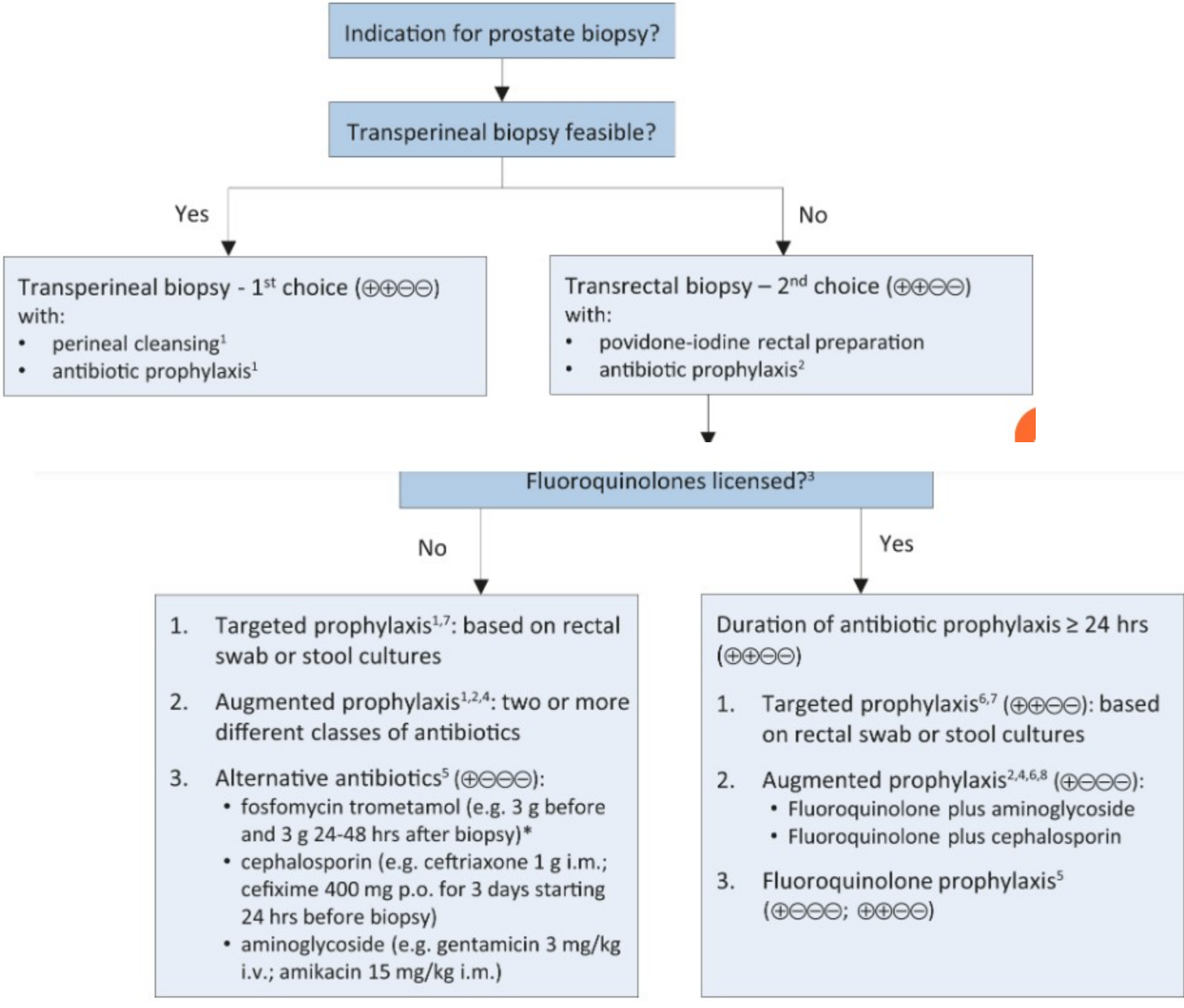
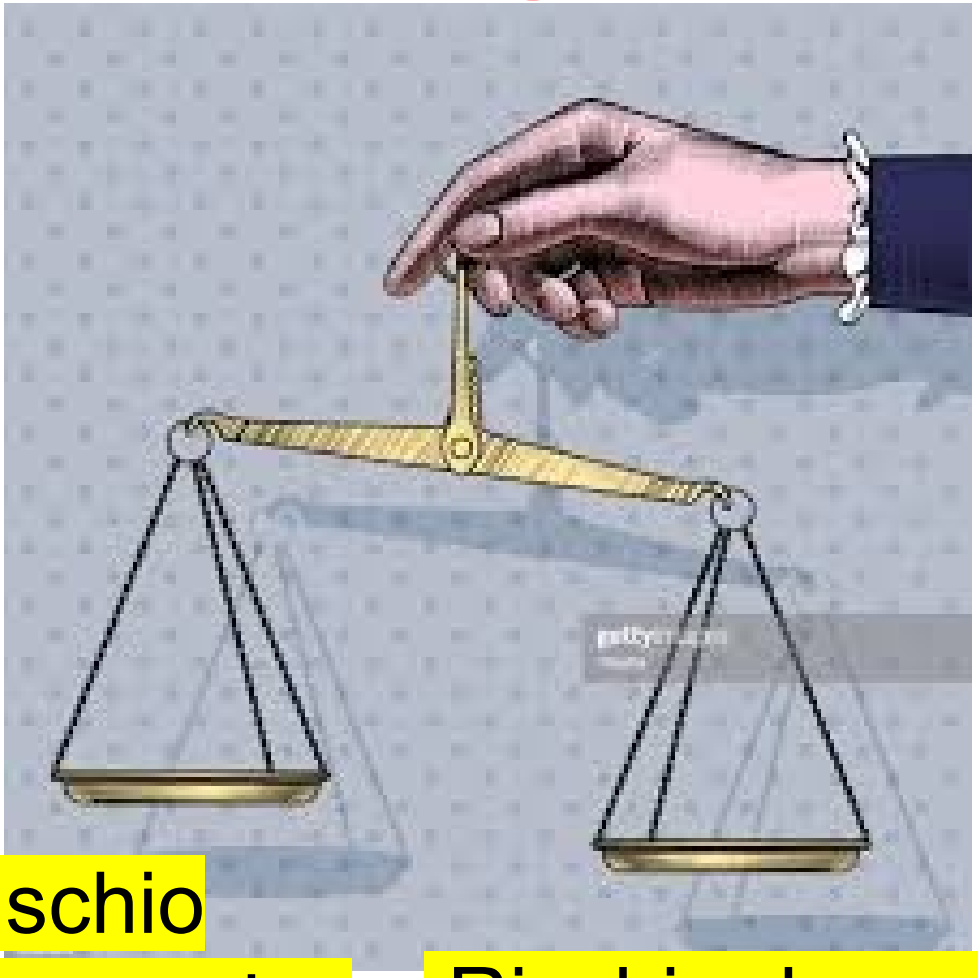

Indication for prostate biopsy?
Transperineal biopsy feasible?
Yes
No
Transperineal biopsy - 1st choice (⊕⊕⊖⊖)
with:
• perineal cleansing[1]
• antibiotic prophylaxis[1]
Transrectal biopsy – 2nd choice (⊕⊕⊖⊖)
with:
• povidone-iodine rectal preparation
• antibiotic prophylaxis[2]
Fluoroquinolones licensed?[3]
No
Yes
1. Targeted prophylaxis[1,7]: based on rectal swab or stool cultures
2. Augmented prophylaxis[1,2,4]: two or more different classes of antibiotics
3. Alternative antibiotics[5] (⊕⊖⊖⊖):
• fosfomycin trometamol (e.g. 3 g before and 3 g 24-48 hrs after biopsy)*
• cephalosporin (e.g. ceftriaxone 1 g i.m.; cefixime 400 mg p.o. for 3 days starting 24 hrs before biopsy)
• aminoglycoside (e.g. gentamicin 3 mg/kg i.v.; amikacin 15 mg/kg i.m.)
Duration of antibiotic prophylaxis ≥ 24 hrs (⊕⊕⊖⊖)
1. Targeted prophylaxis[6,7] (⊕⊕⊖⊖): based on rectal swab or stool cultures
2. Augmented prophylaxis[2,4,6,8] (⊕⊖⊖⊖):
• Fluoroquinolone plus aminoglycoside
• Fluoroquinolone plus cephalosporin
3. Fluoroquinolone prophylaxis[5] (⊕⊖⊖⊖; ⊕⊕⊖⊖)

Terapia antiaggregante anticoagulante



Rischio emorragico

Rischio da sospensione antiaggreganti/anticoagulanti

Come eseguire una biopsia ecoguidata

Sistematica

Target

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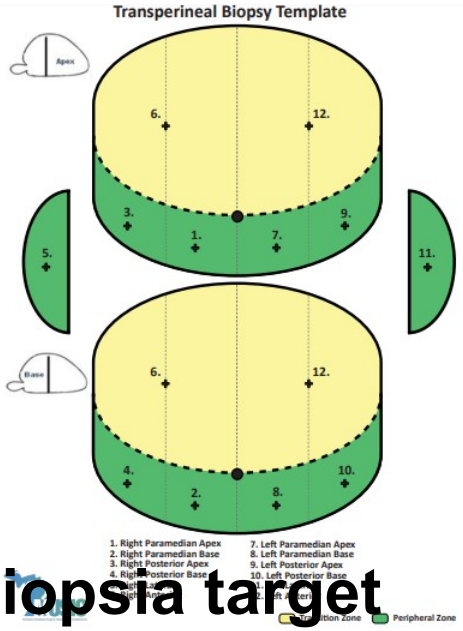
Biopsia sistematica

Standard : **12 prelievi**
Almeno 8 prelievi in ghiandole di 30 ml
Prelievi bilaterali dall' apice alla base
porzione posteriore



Compensativo per imprecisione della biopsia target

systematic and targeted biopsy currently recommended as the diagnostic work-up in men with positive MRI scans.

Eichler, K., et al. Diagnostic value of systematic biopsy methods in the investigation of prostate cancer: a systematic review. J Urol, 2006. 175: 1605.

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Biopsia target

Optimizing the Number of Cores Targeted During Prostate Magnetic Resonance Imaging Fusion Target Biopsy

Alexander P. Kenigsberg [a], Audrey Renson [b,c], Andrew B. Rosenkrantz [d], Richard Huang [a], James S. Wysock [a], Samir S. Taneja [a], Marc A. Bjurlin [a,]*

[a] *Division of Urologic Oncology, Department of Urology, New York University Langone Health, New York, NY, USA;* [b] *Department of Population Health, NYU Langone Hospital–Brooklyn, Brooklyn, NY, USA;* [c] *Department of Epidemiology and Biostatistics, Graduate School of Public Health and Health Policy, The City University of New York, New York, NY, USA;* [d] *Department of Radiology, New York University Langone Health, New York, NY, USA*

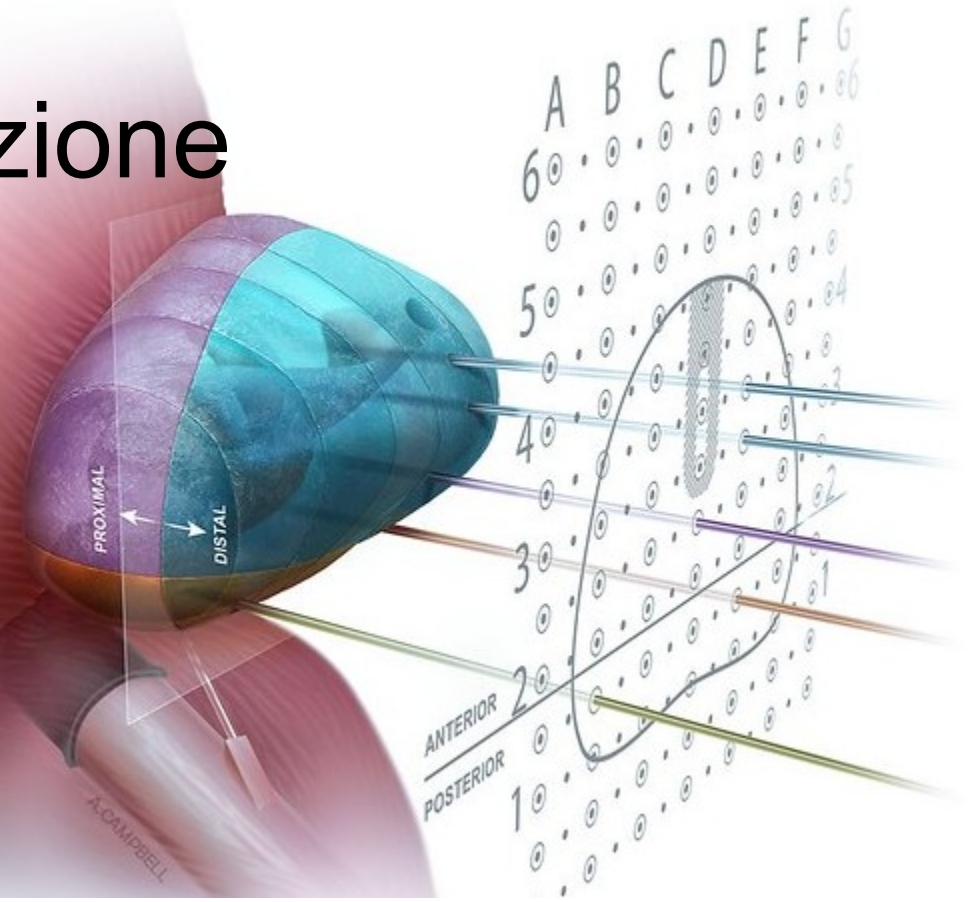
Increasing the number of cores taken per target may partially compensate for guiding imprecision, and a minimum of 3 to 5 cores is required for proper sampling of the lesions

Eur Urol Oncol. 2018 Oct;1(5):418-425.

Biopsia a saturazione

TEMPLATE BIOPSY ZONES			
DISTAL PROSTATE		PROXIMAL PROSTATE	
PERIPHERAL ZONE CENTRAL ZONE TRANSITIONAL ZONE	PERIPHERAL ZONE	PERIPHERAL ZONE CENTRAL ZONE TRANSITIONAL ZONE	PERIPHERAL ZONE

RECTAL BIOPSY ZONES			
DISTAL PROSTATE		PROXIMAL PROSTATE	
	PERIPHERAL ZONE		PERIPHERAL ZONE



- Solo approccio transperineale con stepper e griglia
- Anestesia generale
- Ritenzioni urinarie fra 2-10%
- Aumentato rilievo di tumori non clinicamente significativi

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Definition of image fusion technique

Image fusion technique	Definition	Reported benefits	Reported negatives
Cognitive (visually estimated) fusion	The operator forms a visual link between the MRI images and the real time ultrasound pictures then targeting the suspected areas	Low cost	Very operator-dependent
Software assisted fusion	The MRI images are uploaded and registered to the real time ultrasound by a software. Using this combined picture, a target area requiring biopsy is projected	High costs	Moderately operator dependent
In-bore MRI biopsy	Fusion between prior MRI images and a real time MRI during the procedure	Specific material for MR environment, cost and time intensive	Little operator dependent

Biopsia Fusion

TABLE 1: Comparison of MRI Targeted Prostate Biopsy Techniques

Feature	Cognitive Biopsy	Fusion Biopsy	MRI In-Bore Biopsy
Cost	Most favorable	Moderately favorable	Least favorable
Availability	Most favorable ✓	Moderately favorable	Least favorable
Quickness of procedure	Most favorable ✓	Moderately favorable	Least favorable
Ease of performing concurrent systematic biopsy	Most favorable ✓	Most favorable ✓	Least favorable
Ease of learning	Moderately favorable	Moderately favorable	Least favorable
Reduction in overall number of cores obtained[a]	Least favorable	Least favorable	Most favorable ✓
Recording of biopsy site for future reference	Least favorable	Moderately favorable	Most favorable ✓

TABLE 2: Fusion and MRI In-Bore Biopsy Systems

Vendor	Approach (Transrectal, Transperineal, or Both)	Registration (Rigid, Elastic, or Both)	Tracking System
Fusion biopsy systems			
UroNav (Philips Healthcare)	Both	Both	Electromagnetic
Artemis (Eigen)	Both	Both	Electromechanical with mechanical arm and encoders
Trinity (Koelis)	Both	Elastic	Software image organ-based
HI RVS (Hitachi)	Both	Rigid	Electromagnetic
BioJet (MTT)	Both	Rigid	Mechanical arm with encoders
BiopSee (MedCom)	Both	Both	Two built-in encoders
Logiq 9 (GE Healthcare)	Both	Rigid	Electromagnetic
bkFusion (MIM Software)	Both	Rigid	Electromagnetic
Smart Fusion (Canon Medical Systems)	Both	Rigid	Electromagnetic
MRI in-bore biopsy systems			
DynaTRIM (Philips Healthcare)	Transrectal	NA	NA
RCM (Soteria Medical)	Transrectal	NA	NA
Visualase (Medtronic)[a]	Transperineal	NA	NA
MR PING[b]	Transperineal	NA	NA

Note—NA = not applicable, MR PING = MRI-compatible prostate intervention and needle guidance device.

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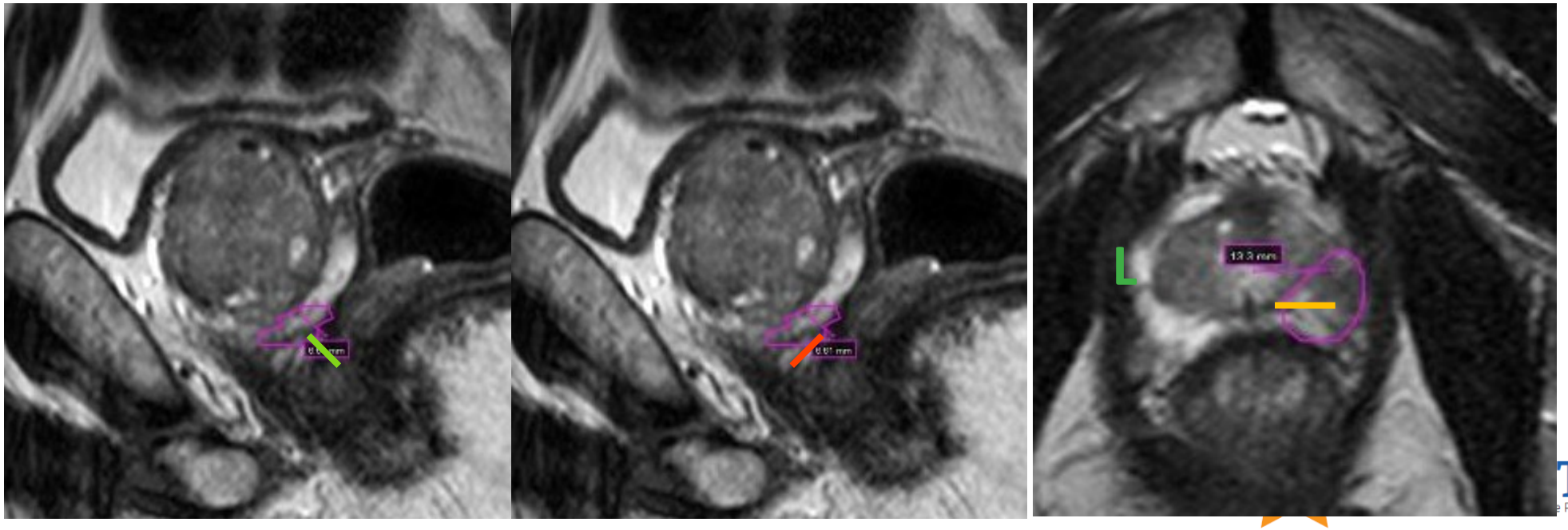
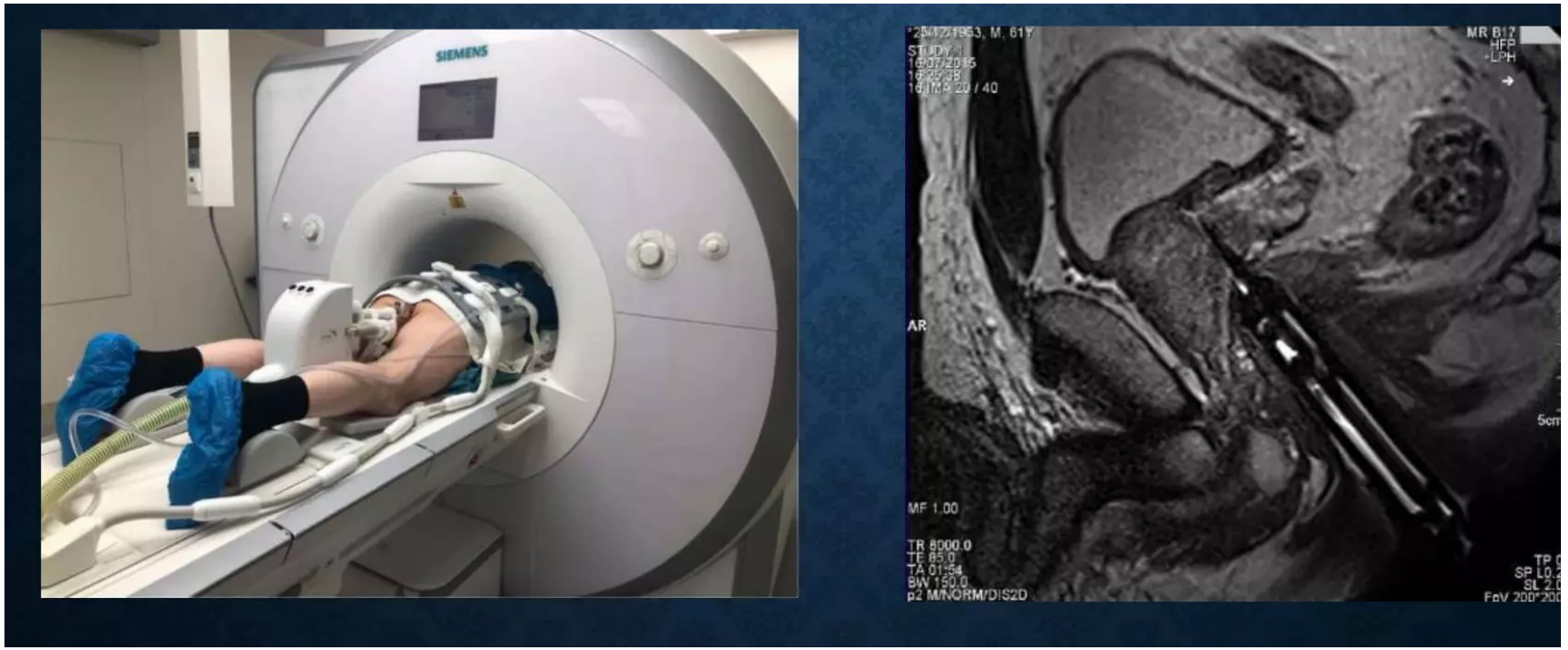
Biopsia cognitiva

- Importazione immagini mpRMN su MIMS
- Determinazione target e sua localizzazione su 3 piani

1. Distanza dalla linea mediana **L**
2. Distanza dal retto **H**
3. Distanza dall' ingresso nella prostata **P**



BIOPSIA RMN GUIDATA IN BORE



ALTO COSTO
POCA DISPONIBILITA’
SOLO SU TARGET

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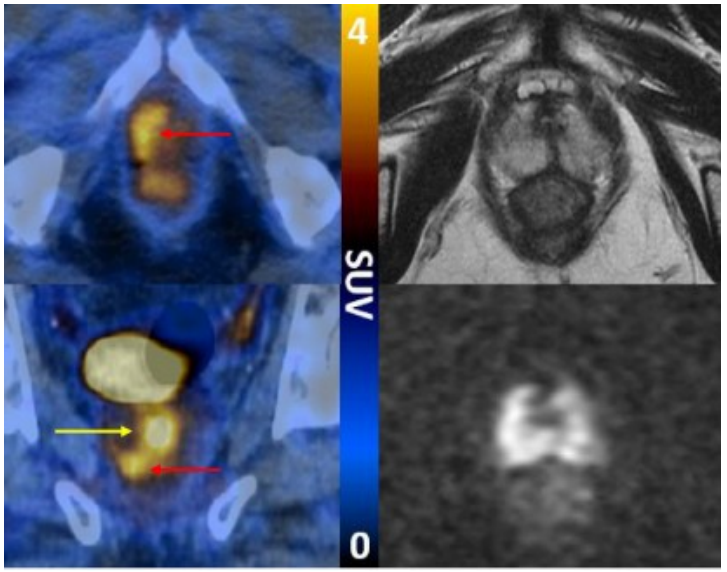
available at www.sciencedirect.com
journal homepage: euoncology.europeanurology .com

European Association of Urology

Review – Priority Article

Editorial by Jochen Walz on pp. 401–402 of this issue

Diagnostic Performance of Prostate-specific Membrane Antigen Positron Emission Tomography–targeted biopsy for Detection of Clinically Significant Prostate Cancer: A Systematic Review and Meta-analysis



PSMA + MRI improved NPV and sensitivity for csPCa in an
MRI triaged population.

Kawadaet al . Diagnostic Performance of Prostate-specific Membrane Antigen Positron Emission Tomography-targeted biopsy for Detection of Clinically Significant Prostate Cancer: A Systematic Review and Meta-analysis. Eur Urol Oncol. 2022 Aug;5(4):390-400.

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PROMIS
Prostate MRI Imaging Study

THE LANCET

"What if, after you got promoted, the idea of what a full professor looks like and contributes is expanded because of you?"

Diagnostic accuracy of multi-parametric MRI and TRUS biopsy in prostate cancer (PROMIS): a paired validating confirmatory study

Hashim U Ahmed, Ahmed El-Shater Bosaily*, Louise C Brown*, Rhian Gabe, Richard Kaplan, Mahesh K Parmar, Yolanda Collaco-Moraes, Katie Ward, Richard G Hindley, Alex Freeman, Alex P Kirkham, Robert Oldroyd, Chris Parker, Mark Emberton, and the PROMIS study group†*

Riduzione di biopsie non necessarie del 27%
Riduzione del 5% della diagnosi di carcinoma non significativo

Alto livello di evidenza che supporta l'uso della mp-RMN prima di una biopsia prostatica

Lancet. 2017 Feb 25;389(10071):815-822.
doi: 10.1016/S0140-6736(16)32401

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The NEW ENGLAND JOURNAL of MEDICINE

PRECISION 2018

ORIGINAL ARTICLE

MRI-Targeted or Standard Biopsy for Prostate-Cancer Diagnosis

Veeru Kasivisvanathan, M.R.C.S., Antti S. Rannikko, Ph.D., Marcelo Borghi, M.D., Valeria Panebianco, M.D., Lance A. Mynderse, M.D., Markku H. Vaarala, Ph.D., Alberto Briganti, Ph.D., Lars Budäus, M.D., Giles Hellawell, F.R.C.S.(Urol.), Richard G. Hindley, F.R.C.S.(Urol.), Monique J. Roobol, Ph.D., Scott Eggener, M.D., et al., for the PRECISION Study Group Collaborators*

The detection of ISUP grade group 2 or higher cancers was significantly higher in men assigned to multiparametric MRI and targeted biopsy (38%) than in those assigned to systematic biopsy (26%))

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THE LANCET
Oncology

MRI FIRST 2019

Use of prostate systematic and targeted biopsy on the basis of multiparametric MRI in biopsy-naive patients (MRI-FIRST): a prospective, multicentre, paired diagnostic study

*Olivier Rouvière, Philippe Puech, Raphaële Renard-Penna, Michel Claudon, Catherine Roy, Florence Mège-Lechevallier, Myriam Decaussin-Petrucci, Marine Dubreuil-Chambardel, Laurent Magaud, Laurent Remontet, Alain Ruffion, Marc Colombel, Sébastien Crouzet, Anne-Marie Schott, Laurent Lemaitre, Muriel Rabilloud, Nicolas Grenier, for the MRI-FIRST Investigators**

Multiparametric MRI before biopsy in biopsy-naive patients can improve the detection of clinically significant prostate cancer but does not seem to avoid the need for systematic biopsy

only a third of clinically significant tumours were detected by either biopsy technique alone, which argues in favour of combining the two methods

Lancet Oncol. 2019 Jan;20(1):100-109.
doi: 10.1016/S1470

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Future Trial

European Association of Urology

Platinum Priority – Prostate Cancer
Editorial by XXX on pp. x–y of this issue

The FUTURE Trial: A Multicenter Randomised Controlled Trial on Target Biopsy Techniques Based on Magnetic Resonance Imaging in the Diagnosis of Prostate Cancer in Patients with Prior Negative Biopsies

Olivier Wegelin[a,], Leonie Exterkate[b], Marloes van der Leest[c], Jean A. Kummer[d], Willem Vreuls[e], Peter C. de Bruin[d], J.L.H.Ruud Bosch[f], Jelle O. Barentsz[c], Diederik M. Somford[b,†], Harm H.E. van Melick[a,†]*

	FUS-TB (n = 79)	COG-TB (n = 78)	MRI-TB (n = 77)	p value
Days between mpMRI and biopsy, median (IQR)	53 (41–70)	27 (20–35)	39 (27–53)	<0.05[a]
Biopsy cores				
Total TB cores, n	358	275	197	
Per subject, median (IQR)	4 (3–5)	3 (3–4)	2 (2–3)	<0.05[a]
Per CSR, median (IQR)	4 (3–5)	3 (3–3)	2 (2–3)	<0.05[a]
PCa-positive cores, n	128	88	94	
Positivity rate, mean (SD)	31.3% (37.8)	33.3% (42.1)	47.7% (46.4)	<0.05[b]
Detection rate of PCa, n (%)	39 (49.4)	34 (43.6)	42 (54.5)	0.4[c]
Detection rate of csPCa[d], n (%)	27 (34.2	26 (33.3)	25 (32.5)	>0.9[c]

no significant differences in the detection rates of (cs)PCa among the three techniques of mpMRI-based TB.

Consequently, other factors (such as local experience, availability, and costs) should be evaluated when determining which technique(s) to implement

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eau Guidelines 2022

Recommendations in biopsy-naïve patients	Strength rating
Perform MRI before prostate biopsy.	Strong
When MRI is positive (i.e., PI-RADS ≥ 3), combine targeted and systematic biopsy.	Strong

Quando ripetere una biopsia

- Aumento o PSA persistentemente elevato
- DRE sospetta
- Asap (Atypical Small Acinar Proliferation)
- high-grade prostatic intraepithelial neoplasia (HGPIN) estensivo
- Carcinoma intraduttale
- mpMRI

Sorvegliaza attiva