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

European Association of Urology

EAU Guidelines View

Transperineal Prostate Biopsy Without Antibiotic Prophylaxis: The New Gold Standard? Recommendations from the European Association of Urology Guidelines on Prostate Cancer and Urological Infections

Adrian Pilatz [a], *Philip Cornford* [b], *Gernot Bonkat* [c,*], *Jennifer Kranz* [d,e]

[a] *Department of Urology, Pediatric Urology and Andrology, Justus-Liebig-University Giessen, Giessen, Germany;* [b] *Bon Secours Hospital, University College Cork, Cork, Ireland;* [c] *alta Uro AG, Merian Iselin Klinik, Center of Biomechanics and Calorimetry, University of Basel, Basel, Switzerland;* [d] *Department of Urology and Pediatric Urology, RWTH Aachen University, Aachen, Germany;* [e] *Department of Urology and Kidney Transplantation, Martin-Luther-University, Halle, Germany*

Prostate cancer is the second most common cancer among men worldwide. Despite significant advances in magnetic resonance imaging–based diagnostics, prostate biopsy with corresponding histopathology analysis remains essential for definitive diagnosis.

In 2015, the European Association of Urology (EAU) Urological Infections Guidelines Panel initiated a systematic review with meta-analysis, which was first published in two parts (antibiotic and nonantibiotic interventions) in 2020 and has since been updated annually as part of the guideline development process. The initial meta-analysis included seven randomized controlled trials (RCTs) involving 1330 patients comparing infectious complications between different biopsy routes. Significantly fewer infectious events occurred with transperineal biopsy (TPBx; 22 events among 673 men) than with transrectal biopsy (TRBx; 37 events among 657 men), with a risk ratio of 0.55 [1]. As a result, the EAU guidelines were revised to prioritize the TPBx route.

This shift coincided with the TREXIT initiative (EXIT from TRansrectal biopsy), which further reinforced the global move towards TPBx [2]. With growing adoption of the TPBx approach, the focus of current research has shifted. While infectious outcomes were initially central, emerging studies now prioritize cancer detection rates, cost effectiveness, and other clinically relevant endpoints such as urinary retention after biopsy [3].

In the past year, results from five major randomized trials (ProBE-PC [4], PERFECT [5], PREVENT [6], TRANSLATE [7], and Tricard et al [8]) have been published (Table 1), with findings consistently confirming the disadvantages of TRBx in terms of postbiopsy infection. Consequently, the EAU recommendation to favor TPBx as the first-line option remains unchanged. This position is further supported by a recent meta-analysis [9] that solidifies the trajectory of TPBx towards becoming the new gold standard.

Interestingly, in three of the recent trials (TRANSLATE [7], PREVENT [6], and ProBE-PC [4]), no antibiotic prophylaxis was used in the TPBx arm, despite the absence of formal guideline support at the time of study initiation (Table 1). Nevertheless, infection rates remained lower than in the TRBx group. How can this be explained?

To date, only two RCTs have addressed the role of antibiotic prophylaxis (yes vs no) in TPBx [10,11]. One study from Russia, published in 2021, included 85 patients and reported no postoperative infections [10]. In the larger NORAPP trial, conducted in Norway and Germany, 277 patients received antibiotic prophylaxis (cefuroxime 1.5 g intravenously 30 min before biopsy) and were compared to 276 patients who underwent biopsy without prophylaxis [11]. No hospital admissions for urinary tract infection (UTI) occurred in either group. Outpatient UTI was diagnosed in one patient in the prophylaxis group and in three patients in the no-prophylaxis group. On the basis of these findings,

* Corresponding author. alta Uro AG, Merian Iselin Klinik, Center of Biomechanics and Calorimetry, University of Basel, Basel, Switzerland.
E-mail address: bonkat@alta-uro.com (G. Bonka.

https://doi.org/10.1016/j.eururo.2025.10.002
0302-2838/© 2025 European Association of Urology. Published by Elsevier B.V. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

Table 1Recent randomized controlled trials comparing transperineal versus transrectal prostate biopsy

Study	Country	Pts	Antibiotic prophylaxis		Infectious complications	
			Transperineal	Transrectal	Transperineal	Transrectal
TRANSLATE Bryant 2025 [7]	UK	1126	None	SOC antibiotics before and after procedure	2/562 [a]	9/565 [a]
PREVENT Hu 2024 [6]	USA	875	None	Targeted prophylaxis	0/372 [b]	6/370 [b]
ProBE-PC Mian 2024 [4]	USA	763	None Pts at risk (1%): ceftriaxone 1 g i.m.	Augmented prophylaxis (ciprofloxacin 500 mg + cotrimoxazole 960 mg) for 1 d Pts at risk (23%): ceftriaxone 1 g i.m.	10/367 [c]	9/351 [c]
PERFECT Ploussard 2025 [5]	France	270	Standard FQL	Standard FQL	0/136 [d]	1/134 [d]
Tricard 2025 [8]	France	90	FQL for 1 d	FQL for 3 d	1/43 [e]	3/41 [e]

FQL = fluoroquinolone; i.m. = intramuscularly; Pts = patients; SOC = standard of care at the individual center.
[a] Infectious complications requiring hospital admission.
[b] Infection (grade ≥2).
[c] Composite infectious complication event.
[d] Sepsis.
[e] Infections.

the authors estimated that 137 patients would need to receive antibiotic prophylaxis to prevent a single outpatient UTI [11]. However, a meta-analysis of these trials is not feasible, as one study reported no infectious complications in either arm [10].

A recent comprehensive systematic review with meta-analysis that included both RCTs and observational studies provides additional insights [12]. Across 23 studies, 6520 patients received antibiotic prophylaxis, while 5804 did not. There were no significant differences for any infection-related endpoints, including genitourinary infections, fever, sepsis, and hospital readmission (all $p > 0.25$). Notably, the absolute sepsis rate was extremely low in both groups (0.16% vs 0.13%). These findings clearly demonstrate that infectious complications after TPBx—regardless of prophylactic antibiotic use—are exceedingly rare.

In summary, TPBx is a demonstrably safe procedure, and current evidence indicates that perioperative antibiotic prophylaxis offers no meaningful benefit in further reducing infectious complications. The omission of antibiotics represents a significant step forward in terms of antimicrobial stewardship. With its dual advantages of markedly lower infection rates in comparison to TRBx and the elimination of unnecessary antibiotic use, TPBx without prophylaxis represents an emerging trend that is supported by encouraging first data from the two RCTs available. For patients at low risk of infectious complications, perioperative antibiotic prophylaxis may be omitted in TPBx (weak recommendation, based on low-quality evidence from two RCTs).

Conflicts of interest: The authors have nothing to disclose.

References

[1] Pradere B, Veeratterapillay R, Dimitropoulos K, et al. Nonantibiotic strategies for the prevention of infectious complications following prostate biopsy: a systematic review and meta-analysis. J Urol 2021;205:653–63.

[2] Grummet J, Gorin MA, Popert R, et al. "TREXIT 2020": why the time to abandon transrectal prostate biopsy starts now. Prostate Cancer Prostat Dis 2020;23:62–5.

[3] Roberts MJ, Arora S, Yao HH, et al. Transperineal prostate biopsy under local vs general anaesthesia: a cost-effectiveness analysis. BJU Int 2025;136:128–34.

[4] Mian BM, Feustel PJ, Aziz A, et al. Complications following transrectal and transperineal prostate biopsy: results of the ProBE-PC randomized clinical trial. J Urol 2024;211:205–13.

[5] Ploussard G, Barret E, Fiard G, et al. Transperineal versus transrectal magnetic resonance imaging-targeted biopsies for prostate cancer diagnosis: final results of the randomized PERFECT trial (CCAFU-PR1). Eur Urol Oncol 2024;7:1080–7.

[6] Hu JC, Assel M, Allaf ME, et al. Transperineal vs transrectal prostate biopsy—the PREVENT randomized clinical trial. JAMA Oncol 2024;10:1590–3.

[7] Bryant RJ, Marian IR, Williams R, et al. Local anaesthetic transperineal biopsy versus transrectal prostate biopsy in prostate cancer detection (TRANSLATE): a multicentre, randomised, controlled trial. Lancet Oncol 2025;26:583–95.

[8] Tricard T, Cazzato RL, Poussot B, et al. Transperineal MR imaging-guided prostate biopsy: a prospective randomized controlled study on safety and effectiveness compared with transrectal biopsy. J Vasc Interv Radiol 2025;36:1278–84.

[9] Stangl FP, Day E, Vallee M, et al. Infectious complications after transrectal versus transperineal prostate biopsy: a systematic review and meta-analysis. Eur Urol Focus. In press. https://doi.org/10.1016/j.euf.2025.07.005.

[10] Chernysheva DY, Popov SV, Orlov IN, Tsoy AV, Neradovskiy VA. The first experience of transperineal prostate biopsy without antibiotic prophylaxis. Onkourologiya 2021;17:46–52.

[11] Jacewicz M, Günzel K, Rud E, et al. Antibiotic prophylaxis versus no antibiotic prophylaxis in transperineal prostate biopsies (NORAPP): a randomised, open-label, non-inferiority trial. Lancet Infect Dis 2022;22:1465–71.

[12] Wolff I, Buchner M, Hauner K, et al. Infectious complications following transperineal prostate biopsy with or without periprocedural antibiotic prophylaxis-a systematic review including meta-analysis of all comparative studies. Prostate Cancer Prostat Dis. In press. https://doi.org/10.1038/s41391-024-00934-9.