



# Risk of Thrombosis and Bleeding in Urological Surgery (ROTBUS)



Visual summary by  
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This graphic gives a visual overview of the results of the ROTBUS project, which has established the absolute risks for different types of urological surgery. These results formed the evidence base for the European Association of Urology (EAU) Guidelines on Thromboprophylaxis in Urological Surgery.

## Recommendations

Solid arrows represent recommendations from the EAU Guidelines for pharmacological prophylaxis. These recommendations take into account the risks of VTE and bleeding, quality of evidence, and overall patient preferences. Individual patient preferences should be taken into account, particularly in the case of weak recommendations.

Strong recommendation → 1.5% | 0.5%

Weak recommendation → 1.3% | 0.5%



4 weeks

The optimal duration of pharmacological prophylaxis after surgery for all recommendations\*

## Establishing risk of venous thromboembolism (VTE)

### Risk factors

Age 75+

BMI 35+ kg/m<sup>2</sup>

VTE in first-degree relative

Parent, full sibling, or child

0  
risk factors

1  
risk factor

2+  
risk factors  
or prior VTE

Low  
risk

Med.  
risk

High  
risk

x1

x2

x4

## Harms vs benefits

Pharmacological thromboprophylaxis reduces risk of VTE but increases risk of bleeds

	VTE risk	Bleed risk
Without prophylaxis	10%	2%
	-50%	+50%
With prophylaxis	5%	3%

## Patient preferences

Our recommendations assume that avoiding major bleeding is twice as important as avoiding a symptomatic VTE

VTE

1x

Bleed

2x

## Evidence quality

★★★★ High  
★★★★ Moderate  
★★★ Low  
★★ Very low

VTE Bleeds

## Cancer surgery

		Low risk		Medium risk		High risk		Evidence quality		
		No prophylaxis	Prophylaxis	No prophylaxis	Prophylaxis	No prophylaxis	Prophylaxis	VTE	Bleeds	
		VTE risk	Bleed risk	VTE risk	Bleed risk	VTE risk	Bleed risk	VTE risk	Bleed risk	
Radical prostatectomy	Radical cystectomy	Open	2.9%   0.3%	1.5%   0.5%	5.8%   0.3%	2.9%   0.5%	11.6%   0.3%	5.8%   0.5%	★★★★	★★★★
		Robotic	2.6%   0.3%	1.3%   0.5%	5.2%   0.3%	2.6%   0.5%	10.3%   0.3%	5.2%   0.5%	★★★★	★★★★
	Laparoscopic	Without PLND**	0.4%   0.7%	0.2%   1.1%	0.8%   0.7%	0.4%   1.1%	1.5%   0.7%	0.8%   1.1%	★★★★	★★★★
		Standard PLND**	0.8%   1.0%	0.4%   1.5%	1.5%   1.0%	0.8%   1.5%	3.0%   1.0%	1.5%   1.5%	★★★★	★★★★
		Extended PLND**	1.5%   1.4%	0.8%   2.1%	3.0%   1.4%	1.5%   2.1%	6.0%   1.4%	3.0%   2.1%	★★★★	★★★★
	Open	Without PLND**	1.0%   0.1%	0.5%   0.2%	2.0%   0.1%	1.0%   0.2%	3.9%   0.1%	2.0%   0.2%	★★★★	★★★★
		Standard PLND**	2.0%   0.2%	1.0%   0.3%	4.0%   0.2%	2.0%   0.3%	7.9%   0.2%	3.9%   0.3%	★★★★	★★★★
		Extended PLND**	3.9%   0.2%	2.0%   0.3%	7.9%   0.2%	4.0%   0.3%	15.7%   0.2%	7.9%   0.3%	★★★★	★★★★
	Robotic	Without PLND**	0.2%   0.4%	0.1%   0.6%	0.5%   0.4%	0.2%   0.6%	0.9%   0.4%	0.5%   0.6%	★★★★	★★★★
		Standard PLND**	0.5%   0.6%	0.3%   0.9%	0.9%   0.6%	0.5%   0.9%	1.9%   0.6%	1.0%   0.9%	★★★★	★★★★
		Extended PLND**	0.9%   0.8%	0.5%   1.2%	1.9%   0.8%	1.0%   1.2%	3.7%   0.8%	1.9%   1.2%	★★★★	★★★★
Partial Nephrectomy	Laparoscopic	1.1%   1.7%	0.6%   2.6%	2.1%   1.7%	1.1%   2.6%	4.2%   1.7%	2.1%   2.6%	★★★★	★★★★	
	Open	1.0%   0.1%	0.5%   0.2%	2.0%   0.1%	1.0%   0.2%	3.9%   0.1%	2.0%   0.2%	★★★★	★★★★	
	Robotic	1.0%   0.5%	0.5%   0.8%	1.9%   0.5%	1.0%   0.8%	3.9%   0.5%	2.0%   0.8%	★★★★	★★★★	
Radical Nephrectomy	Laparoscopic	0.7%   0.5%	0.4%   0.8%	1.3%   0.5%	0.7%   0.8%	2.6%   0.5%	1.3%   0.8%	★★★★	★★★★	
	Open	1.1%   0.1%	0.6%   0.2%	2.2%   0.1%	1.1%   0.2%	4.4%   0.1%	2.2%   0.2%	★★★★	★★★★	
	With thrombectomy	2.9%   2.0%	1.5%   3.0%	5.8%   2.0	2.9%   3.0%	11.6%   2.0%	5.8%   3.0%	★★★★	★★★★	
Nephroureterectomy		Open	1.6%   0.1%	0.8%   0.2%	3.1%   0.1%	1.6%   0.2%	6.2%   0.1%	3.1%   0.2%	★★★★	★★★★
Radical penectomy with inguinal LND†			0.8%   NR‡	0.4%   NR‡	1.6%   NR‡	0.8%   NR‡	3.1%   NR‡	1.6%   NR‡	★★★★	NR‡
Primary nerve-sparing RPLND‡			2.3%   0.2%	1.2%   0.3%	4.5%   0.2%	2.3%   0.3%	9.1%   0.2%	4.5%   0.3%	★★★★	★★★★

## Non-cancer surgery

Artificial urinary sphincter		0.3%   NR <sup>§</sup>	0.2%   NR <sup>§</sup>	0.5%   NR <sup>§</sup>	0.3%   NR <sup>§</sup>	1.0%   NR <sup>§</sup>	0.5%   NR <sup>§</sup>	★★★★	NR <sup>§</sup>	
Simple prostatectomy		Open	2.7%   NR <sup>§</sup>	1.4%   NR <sup>§</sup>	5.4%   NR <sup>§</sup>	2.7%   NR <sup>§</sup>	10.8%   NR <sup>§</sup>	5.4%   NR <sup>§</sup>	★★★★	NR <sup>§</sup>
Sling surgery for male SUI <sup>§</sup>			0.4%   NR <sup>§</sup>	0.2%   NR <sup>§</sup>	0.8%   NR <sup>§</sup>	0.4%   NR <sup>§</sup>	1.6%   NR <sup>§</sup>	0.8%   NR <sup>§</sup>	★★★★	NR <sup>§</sup>
TURP <sup>  </sup> or equivalent			0.2%   0.2%	0.1%   0.3%	0.4%   0.2%	0.2%   0.3%	0.8%   0.2%	0.4%   0.3%	★★★★	★★★★
Urethroplasty			0.3%   NR <sup>§</sup>	0.2%   NR <sup>§</sup>	0.6%   NR <sup>§</sup>	0.3%   NR <sup>§</sup>	1.1%   NR <sup>§</sup>	0.6%   NR <sup>§</sup>	★★★★	NR <sup>§</sup>
Donor nephrectomy	Laparoscopic		0.4%   0.1%	0.2%   0.2%	0.7%   0.1%	0.4%   0.2%	1.4%   0.1%	0.7%   0.2%	★★★★	★★★★
	Open		0.3%   0.1%	0.2%   0.2%	0.7%   0.1%	0.4%   0.2%	1.3%   0.1%	0.7%   0.2%	★★★★	★★★★
Prolapse surgery		Open	0.2%   0.4%	0.1%   0.6%	0.3%   0.4%	0.2%   0.6%	0.7%   0.4%	0.4%   0.6%	★★★★	★★★★
Reconstructive pelvic surgery			0.1%   0.3%	0.1%   0.5%	0.3%   0.3%	0.2%   0.5%	0.5%   0.3%	0.3%   0.5%	★★★★	★★★★
Percutaneous nephrolithotomy			0.2%   0.9%	0.1%   1.4%	0.4%   0.9%	0.2%   1.4%	0.7%   0.9%	0.4%   1.4%	★★★★	★★★★

\* See the EAU Guidelines for recommendations on mechanical prophylaxis

\*\* PLND = pelvic lymph node dissection

† LND = lymph node dissection

‡ RPLND = retroperitoneal lymph node dissection

|| TURP = Transurethral resection of the prostate

§ SUI = stress urinary incontinence

¶ NR = not reported