

**Supplementary Table S1.** Univariate and multivariate analysis of SIS on survival outcomes in UTUC patients.

Variables	Overall survival				Cancer-Specific Survival				Progression-free survival			
	Univariable		Multivariable		Univariable		Multivariable		Univariable		Multivariable	
	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
Age	1.00(0.98, 1.03)	0.6661			1.00(0.97, 1.02)	0.8583			1.00 (0.98, 1.02)	0.6743		
Body mass index	1.04(0.96,1.12)	0.3598			1.05 (0.98, 1.14)	0.1838			1.03 (0.97, 1.10)	0.3300		
Gender												
Female	Reference				Reference				Reference			
Male	0.72(0.45, 1.13)	0.1555			1.31 (0.81, 2.12)	0.2650			0.78 (0.51, 1.18)	0.2376		
Smoking												
None/Former	Reference				Reference				Reference			
Current	0.86(0.51,1.45)	0.5805			0.86 (0.49, 1.48)	0.5801			0.76 (0.46, 1.24)	0.2722		
Tumor stage												
<T3	Reference		Reference		Reference				Reference		Reference	
≥T3	4.22(2.53,7.03)	<0.0001	2.59 (1.34, 5.03)	0.0049	5.01 (2.87, 8.75)	<0.0001	2.88 (1.49, 5.57)	0.0016	3.01 (1.95, 4.65)	<0.0001	2.57 (1.45, 4.56)	0.0012
Tumor grade												
Low	Reference		Reference		Reference				Reference		Reference	
High	5.14(2.23,11.86)	0.0001	2.58 (0.86, 7.75)	0.0910	5.64 (2.26, 14.05)	0.0002	5.08 (1.65, 15.64)	0.0046	2.03 (1.20, 3.46)	0.0087	0.91 (0.46, 1.83)	0.8011
LNM												
pN0	Reference		Reference		Reference				Reference		Reference	
pN+	2.88(1.06,7.82)	0.0376	2.06 (0.60, 7.09)	0.2504	7.37(1.61, 33.69)	0.0100	5.96 (1.18, 30.03)	0.0304	11.00 (2.43, 49.80)	0.0019	4.26 (0.91, 19.95)	0.0660
pNx	0.78(0.33,1.80)	0.5571	1.08 (0.35, 3.30)	0.8986	2.26 (0.55, 9.27)	0.2575	4.33 (0.96, 19.57)	0.0572	3.25 (0.80, 13.22)	0.1005	2.68 (0.64, 11.29)	0.1796
LVI												
No	Reference		Reference		Reference				Reference		Reference	
Yes	2.31(1.26,4.21)	0.0065	1.83 (0.91, 3.70)	0.0917	2.64 (1.44, 4.86)	0.0018	1.51 (0.77, 2.98)	0.2308	1.48 (0.79, 2.78)	0.2257	1.51 (0.77, 2.98) 0.2308	
Tumor site												
Renal pelvis	Reference		Reference		Reference				Reference			
Ureter	1.16(0.71,1.90)	0.5424	1.21 (0.66, 2.21)	0.5411	1.13 (0.67, 1.89)	0.6450	0.90 (0.50, 1.64)	0.7414	1.06 (0.70, 1.63)	0.7726		
Both	4.83(1.98,11.77)	0.0005	13.54 (4.49, 40.86)	<0.0001	5.26 (2.15, 12.91)	0.0003	17.38 (5.89, 51.33)	<0.0001	3.03 (0.73, 12.59)	0.1273		
Tumor size												
<3	Reference		Reference		Reference				Reference		Reference	
≥3	1.79(1.04,3.08)	0.0361	1.05 (0.47, 2.36)	0.9070	1.83 (1.03, 3.25)	0.0404	0.97 (0.49, 1.91)	0.9230	1.69 (1.03, 2.77)	0.0364	1.49 (0.79, 2.82)	0.2203
Multifocal												
No	Reference				Reference				Reference		Reference	
Yes	0.67(0.37,1.21)	0.1827			0.75 (0.41, 1.38)	0.3631	0.42 (0.23, 0.75)	0.0035	1.01 (0.62, 1.65)	0.9746	1.10 (0.65, 1.86)	0.7275
Tumor necrosis												
No	Reference				Reference				Reference			
Yes	0.47(0.11,1.91)	0.2889			0.51 (0.13, 2.09)	0.3511			0.85 (0.31, 2.31)	0.7473		
Blood type												
A	Reference				Reference				Reference			

B	0.67(0.35,1.28)	0.2275			0.63 (0.31, 1.27)	0.1969			1.14 (0.63, 2.05)	0.6653		
AB	1.57(0.77,3.21)	0.2190			1.38 (0.63, 3.05)	0.4206			1.25 (0.59, 2.66)	0.5587		
O	0.79(0.45,1.38)	0.4027			0.86 (0.49, 1.53)	0.6168			1.27 (0.76, 2.12)	0.3541		
Hematuria												
No	Reference		Reference		Reference				Reference		Reference	
Yes	0.46(0.28,0.74)	0.0015	0.48 (0.26, 0.86)	0.0136	0.46 (0.28, 0.76)	0.0026			0.67 (0.42, 1.07)	0.0950	0.65 (0.40, 1.07)	0.0922
Surgery margin												
Negative	Reference		Reference		Reference				Reference		Reference	
Positive	2.84(1.40,5.73)	0.0037	2.30 (0.99, 5.31)	0.0515	3.18 (1.57, 6.47)	0.0014	1.99 (0.91, 4.34)	0.0837	2.22 (1.11, 4.44)	0.0237	2.16 (0.99, 4.70)	0.0535
Bladder irrigation												
No	Reference				Reference				Reference			
Unilateral	1.51(0.54,4.25)	0.4365			1.63 (0.57, 4.65)	0.3606			1.44 (0.47, 4.42)	0.5221		
Bilateral	0.55(0.24,1.25)	0.1534			0.46 (0.19, 1.14)	0.0925			0.71 (0.32, 1.55)	0.3851		
Tumor architecture												
Sessile	Reference		Reference		Reference				Reference		Reference	
Papillary	0.19(0.09,0.42)	<0.0001	0.24 (0.08, 0.75)	0.0137	0.18 (0.08, 0.42)	<0.0001	0.43 (0.17, 1.10)	0.0787	0.54 (0.33, 0.89)	0.0155	0.91 (0.47, 1.75)	0.7735
BCM												
No	Reference				Reference				Reference			
Yes	0.70(0.28, 1.73)	0.4380			0.80 (0.32, 1.99)	0.6274			1.21 (0.60, 2.41)	0.5946		
Co-bladder cancer												
No	Reference				Reference				Reference		Reference	
Yes	0.58(0.35, 0.95)	0.0288	0.58 (0.33, 1.03)	0.0641	0.69 (0.41, 1.15)	0.1550			0.36 (0.23, 0.57)	<0.0001	0.41 (0.25, 0.67)	0.0004
SIS(0 vs. 1)												
Low	Reference		Reference		Reference				Reference		Reference	
High	1.60(1.00,2.54)	0.0481	1.45 (0.84, 2.49)	0.1827	1.60 (0.98, 2.60)	0.0595	1.55 (0.90, 2.67)	0.1122	1.55 (1.02, 2.37)	0.0422	1.27 (0.79, 2.04)	0.3318

<sup>a</sup>**Abbreviations:** UTUC = upper tract urothelial carcinoma, HR = hazard ratio, CI = confidence interval, SIS = systemic inflammation score, LNM = lymph node metastasis, LVI = lymphovascular invasion, BCM = bladder cuff management.