Table S1 Univariable logistic regression analysis for dosimetric parameters of esophagus.

Parameter	Coefficient	Odds ratio (95% CI)	*p* value
D_{mean}	0.085	1.088 (0.882-1.343)	<0.001
D_{max}	0.058	1.059 (0.874-1.284)	<0.001
V10	0.041	1.042 (0.888-1.223)	<0.001
V15	0.042	1.043 (0.889-1.224)	<0.001
V20	0.044	1.046 (0.890-1.228)	<0.001
V25	0.046	1.047 (0.891-1.231)	<0.001
V30	0.048	1.050 (0.892-1.236)	<0.001
V35	0.051	1.052 (0.892-1.241)	<0.001
V40	0.052	1.053 (0.892-1.244)	<0.001
V45	0.055	1.056 (0.892-1.251)	<0.001
V50	0.059	1.061 (0.891-1.262)	<0.001
V55	0.065	1.067 (0.891-1.278)	<0.001
V60	0.069	1.071 (0.887-1.294)	<0.001
V65	0.070	1.073 (0.878-1.310)	<0.001
V70	0.082	1.086 (0.866-1.361)	<0.001
V75	0.133	1.142 (0.824-1.582)	<0.001

CI = confidence interval; D_{mean} = mean dose; D_{max} = maximum dose; V*x* = the percentage of the volume receiving a dose higher than *x* Gy (RBE)

Table S2 LL, AUC, HL test *p* values, and AIC differences of models generated by updating one or two parameters of the 3DCRT-based and IMRT-based LKB models with the parameters fit to the current PSPT cohort. The check mark denotes the selected parameters.

		n = 0.24	m = 0.51	TD_{50} = 44.83 Gy (RBE)	LL	AUC	HL test p value	ΔAIC*
3DCRT-based	n = 0.44		x	x	−191.357	0.777	<0.001	25
model	m = 0.32	x		x	−189.567	0.785	<0.001	21
parameter set	TD_{50} = 51 Gy (RBE)	x	x		−183.527	0.785	0.013	9
	LL	−197.556	−205.894	−220.281				
	AUC	0.785	0.777	0.777				
	HL test p value	<0.001	<0.001	<0.001				
	ΔAIC*	37	54	83				
IMRT-based	n = 0.69		x	x	−220.838	0.768	<0.001	84
model	m = 0.36	x		x	−184.409	0.785	<0.001	11
parameter set	TD_{50} = 47 Gy (RBE)	x	x		**−179.527**	**0.785**	**0.153**	**1**
	LL	−184.942	−227.517	−265.092				
	AUC	0.785	0.768	0.768				
	HL test p value	<0.001	<0.001	<0.001				
	ΔAIC*	12	97	172				

*$\Delta AIC = AIC_{new} - AIC_{optimal}$, where $AIC_{optimal}$ is the AIC of the optimal model with n = 0.24, m = 0.51, TD_{50} = 44.83 Gy (RBE).

LL = log likelihood; AUC = area under the receiver operating curve; HL = Hosmer-Lemeshow; AIC = Akaike information criterion; 3DCRT = three-dimensional conformal radiotherapy; IMRT = intensity-modulated radiotherapy; PSPT = passive-scattering proton therapy.

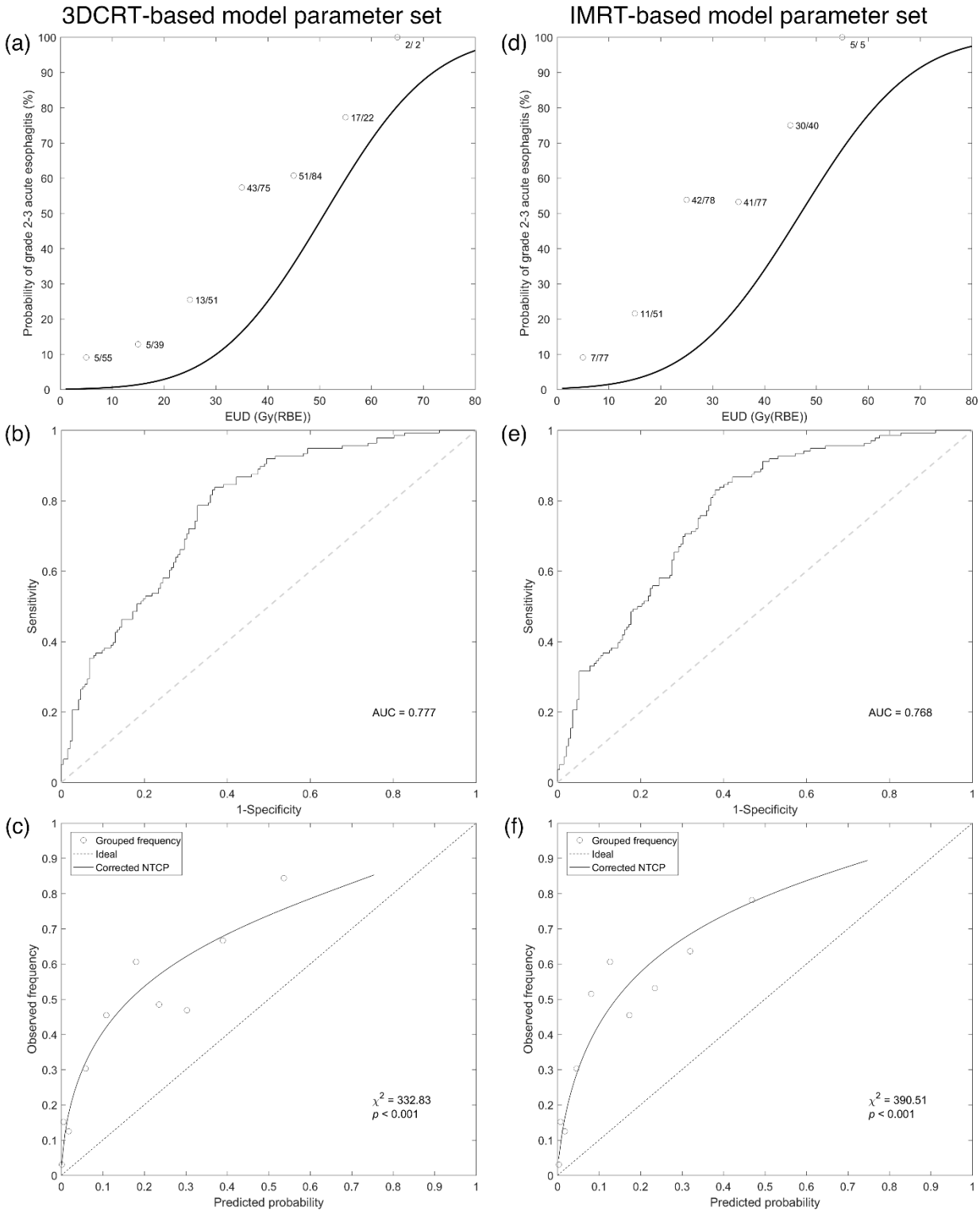

Figure S1 External validation results of the Lyman-Kutcher-Burman normal tissue complication probability (NTCP) models developed for three-dimensional conformal radiotherapy (a-c) and intensity-modulated radiotherapy (d-f). (a) and (d) NTCP curve based on equivalent uniform dose (EUD). Dose range was divided into eight equal parts with a EUD bin of 10 Gy (RBE). For each bin, the circle represents the actual incidence. (b) and (e) Receiver operating characteristic curve. Areas under the curve are given. (c) and (f) Calibration plot with Hosmer-Lemeshow test results.