Supplementary Tables for "Using Data Augmentation to Facilitate Conduct of Phase I/II Clinical Trials with Delayed Outcomes"

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Table S1: Additional simulation results for comparing five phase I-II designs in Case 2 under Scenarios 5 and 7. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
Method		1	2	3	4	5	None	N_E/N_T	(Days)
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
LO-EffTox	% selected	13.0	48.7	32.7	5.0	0.4	0.2	21.6/10.4	246
	# patients	9.75	17.11	14.75	4.93	1.37			
One Down	% selected	8.2	13.3	77.9	0.6	0.0	0.0	12.5/5.6	246
	# patients	38.75	9.22	0.03	0.00	0.00			
Look Ahead	% selected	10.1	37.3	46.6	5.1	0.8	0.1	22.4/10.9	394
	# patients	7.22	15.53	18.87	5.46	0.90	(46.2)		
Complete Case	% selected	19.4	30.2	35.6	12.4	2.4	0.0	14.5/7.3	246
	# patients	32.06	6.48	5.96	2.87	0.62			
TiTE-CRM	% selected	0.1	3.2	38.5	51.6	5.7	0.9	23.9/16.3	239
	# patients	4.33	5.64	12.33	16.82	8.51			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ	0.43	0.34	0.42	0.31	0.27			
LO-EffTox	% selected	0.0	3.6	60.8	6.4	1.0	28.2	11.3/14.7	205
	# patients	3.25	6.58	22.17	6.55	3.78			
One Down	% selected	15.3	7.7	75.5	0.3	0.0	1.2	9.5/9.9	246
	# patients	38.87	8.98	0.01	0.00	0.00			
Look Ahead	% selected	7.0	8.3	23.0	47.9	12.8	1.0	25.8/14.9	442
	# patients	7.88	6.89	10.79	15.93	6.15	(60.8)		
Complete Case	% selected	27.8	40.2	22.8	7.1	2.0	0.1	14.4/7.6	246
	# patients	32.84	7.63	5.38	1.82	0.33			
TiTE-CRM	% selected	1.5	18.5	59.2	18.7	0.1	2.0	12.2/17.5	236
	# patients	5.20	9.38	17.95	11.26	3.38			

Table S2: Sensitivity analysis of the LO-EffTox design under different degrees of late-onset events, i.e., $\pi_{j,late}(d)^{true}$=Pr$(U_j/2 \leq X_j \leq U_j|d)^{true}$, in Case 1. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
$\pi_{j,late}(d)^{true}$		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
10%	% selected	0.0	0.3	3.3	4.5	90.2	1.7	11.5/3.7	37.2
	# patients	6.11	6.78	7.55	5.31	22.02			
30%	% selected	0.1	0.3	2.1	2.7	92.0	2.8	11.6/3.7	36.9
	# patients	6.16	6.74	7.05	5.25	22.44			
70%	% selected	0.0	0.2	1.8	2.5	91.6	3.9	11.6/3.7	36.9
	# patients	6.09	6.59	6.89	4.90	22.96			
90%	% selected	0.1	0.2	2.1	2.9	89.8	4.9	11.5/3.7	36.7
	# patients	6.06	6.59	7.34	5.08	22.25			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
10%	% selected	0.0	9.9	55.0	25.7	8.4	1.0	15.4/12.5	37.2
	# patients	6.09	8.96	15.05	10.13	7.48			
30%	% selected	0.1	9.7	57.9	23.5	8.0	0.8	15.6/12.9	37.3
	# patients	6.03	8.57	14.27	10.57	8.37			
70%	% selected	0.0	12.4	65.0	17.4	4.6	0.6	15.4/13.2	37.3
	# patients	6.05	9.46	13.75	8.76	9.79			
90%	% selected	0.0	16.3	64.7	15.1	2.9	1.0	15.4/13.5	37.4
	# patients	6.07	9.41	13.54	8.03	10.72			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
10%	% selected	71.1	24.1	3.6	0.8	0.0	0.4	16.0/8.1	37.4
	# patients	28.13	14.16	4.39	1.00	0.15			
30%	% selected	72.3	23.0	3.3	0.6	0.0	0.8	16.1/8.6	37.3
	# patients	26.58	14.09	5.14	1.55	0.36			
70%	% selected	74.7	22.0	2.9	0.1	0.0	0.3	16.4/9.3	37.1
	# patients	25.79	13.52	5.58	2.14	0.88			
90%	% selected	78.6	19.5	1.6	0.2	0.0	0.1	16.3/9.0	36.0
	# patients	27.60	12.51	4.90	2.11	0.84			

$\pi_{j,late}(d)^{true}$		Dose Level						N_E/N_T	Duration (Weeks)
		1	2	3	4	5	None		
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
10%	% selected	4.6	4.0	8.1	17.9	62.1	3.3	24.9/12.8	36.4
	# patients	9.90	7.15	8.06	9.81	11.90			
30%	% selected	3.7	3.3	8.4	20.2	61.6	2.8	24.9/12.9	36.6
	# patients	10.07	7.02	7.99	10.18	11.72			
70%	% selected	1.9	2.5	6.6	20.0	67.2	1.8	25.8/13.1	36.9
	# patients	9.45	6.87	7.75	9.49	13.79			
90%	% selected	2.2	2.5	8.4	15.2	71.1	0.6	26.2/13.4	37.3
	# patients	9.17	7.12	7.55	8.96	14.98			
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
10%	% selected	13.0	41.6	33.7	10.5	0.8	0.4	20.5/ 9.4	37.2
	# patients	12.88	17.94	13.45	3.18	0.40			
30%	% selected	12.0	44.1	35.9	6.6	1.1	0.3	21.0/10.0	37.4
	# patients	11.12	16.58	14.97	4.26	0.96			
70%	% selected	14.4	51.4	28.7	5.2	0.3	0.0	21.1/10.5	37.5
	# patients	11.30	16.33	13.80	4.86	1.70			
90%	% selected	15.5	52.4	27.7	3.8	0.4	0.2	21.3/10.9	37.2
	# patients	10.77	16.26	13.21	5.39	2.31			
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
10%	% selected	19.9	55.8	19.9	3.5	0.5	0.4	19.9/ 9.8	37.3
	# patients	14.74	21.46	9.60	1.79	0.27			
30%	% selected	21.1	58.5	16.2	3.1	0.8	0.3	20.4/10.5	37.4
	# patients	13.63	20.44	10.62	2.57	0.61			
70%	% selected	20.3	62.2	13.9	2.9	0.6	0.1	20.6/11.0	37.5
	# patients	13.36	18.84	10.90	3.65	1.21			
90%	% selected	24.0	60.2	13.9	1.4	0.4	0.1	20.3/11.0	37.2
	# patients	13.68	17.89	10.60	4.09	1.70			

$\pi_{j,late}(d)^{true}$		Dose Level						N_E/N_T	Duration (Weeks)
		1	2	3	4	5	None		
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
10%	% selected	0.0	3.7	65.6	8.0	1.2	21.5	10.8/14.8	33.7
	# patients	6.53	9.00	18.23	6.70	3.93			
30%	% selected	0.0	3.4	58.9	8.6	1.4	27.7	10.5/14.9	33.2
	# patients	6.44	9.53	16.80	6.34	4.77			
70%	% selected	0.0	4.3	61.9	8.0	1.5	24.3	11.5/15.9	34.0
	# patients	6.07	9.19	16.92	6.02	6.56			
90%	% selected	0.0	4.8	59.4	7.5	1.6	26.7	11.6/16.3	33.5
	# patients	5.83	8.83	16.37	6.46	7.09			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
10%	% selected	0.0	0.9	18.6	0.4	0.1	80.0	7.6/13.9	25.6
	# patients	6.50	10.80	13.03	3.76	1.78			
30%	% selected	0.0	1.5	17.4	0.7	0.4	80.0	8.5/15.0	26.5
	# patients	6.09	9.72	13.78	4.24	2.87			
70%	% selected	0.0	1.3	14.8	0.6	0.4	82.9	7.6/14.0	24.8
	# patients	6.41	10.30	12.90	3.77	1.92			
90%	% selected	0.0	2.4	16.4	1.0	0.0	80.2	8.8/15.5	26.6
	# patients	5.87	9.80	13.71	4.54	3.05			

Table S 3: Sensitivity analysis of the LO-EffTox design under different values of the logistical difficulty index (LDI) in Case 1. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
LDI		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
3.0	% selected	0.0	0.3	2.5	2.5	90.5	4.2	12.8/4.0	97.8
	# patients	4.16	4.83	5.56	4.62	27.86			
4.5	% selected	0.0	0.4	2.8	2.1	90.9	3.8	12.2/3.7	67.6
	# patients	4.88	5.57	6.01	4.72	26.13			
6.0	% selected	0.0	0.1	2.1	2.5	91.9	3.4	12.3/3.9	52.4
	# patients	5.25	5.88	6.11	4.78	25.36			
12.0	% selected	0.0	0.6	2.1	2.7	91.3	3.3	11.1/3.5	29.2
	# patients	6.74	7.43	7.61	5.29	20.57			
18.0	% selected	0.0	0.5	1.7	3.4	90.9	3.5	10.2/3.5	21.3
	# patients	8.07	8.50	8.25	5.76	17.16			
24.0	% selected	0.0	0.5	1.6	2.9	92.2	2.8	9.8/3.2	17.6
	# patients	9.47	9.15	8.56	5.75	14.84			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
3.0	% selected	0.0	8.4	65.6	21.5	3.4	1.1	16.1/12.6	98.3
	# patients	4.16	8.38	17.23	10.27	7.64			
4.5	% selected	0.0	11.0	62.0	23.0	3.3	0.7	16.0/12.7	68.2
	# patients	4.82	8.75	16.15	10.05	7.96			
6.0	% selected	0.0	11.3	63.3	19.1	5.5	0.8	15.6/12.9	52.8
	# patients	5.24	9.39	15.04	9.53	8.57			
12.0	% selected	0.1	13.5	61.2	18.3	6.6	0.3	15.1/13.2	29.4
	# patients	6.65	9.43	12.86	9.26	9.70			
18.0	% selected	0.0	12.8	53.2	23.1	9.8	1.1	14.7/13.2	21.6
	# patients	8.24	9.21	11.05	9.11	10.25			
24.0	% selected	0.1	10.9	50.6	22.7	14.4	1.3	14.0/12.9	17.6
	# patients	9.57	9.74	10.02	8.87	9.52			

		Dose Level							Duration
LDI		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
3.0	% selected	71.4	25.9	2.1	0.3	0.0	0.3	16.4/8.7	100.1
	# patients	26.88	14.01	5.12	1.61	0.32			
4.5	% selected	70.5	26.1	2.7	0.4	0.0	0.3	16.2/8.7	68.7
	# patients	26.39	14.23	5.20	1.70	0.40			
6.0	% selected	75.3	22.3	2.0	0.3	0.0	0.1	16.0/8.7	53.0
	# patients	27.03	13.70	5.09	1.67	0.48			
12.0	% selected	77.9	18.6	2.0	0.6	0.0	0.9	16.3/8.9	29.1
	# patients	26.81	13.15	5.30	1.84	0.57			
18.0	% selected	78.4	17.6	2.9	0.3	0.0	0.8	16.3/9.2	21.6
	# patients	26.12	13.33	5.62	2.07	0.65			
24.0	% selected	79.9	15.6	2.8	1.0	0.0	0.7	16.4/9.3	17.7
	# patients	25.42	13.59	5.79	2.33	0.69			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
3.0	% selected	4.5	3.8	8.4	21.2	61.3	0.8	27.5/13.6	99.1
	# patients	8.17	5.64	7.31	10.41	16.17			
4.5	% selected	3.9	4.5	8.0	17.9	65.0	0.7	26.9/13.4	68.6
	# patients	8.44	6.32	7.31	10.00	15.65			
6.0	% selected	2.7	3.8	7.9	18.7	65.3	1.6	26.4/13.3	52.2
	# patients	8.97	6.41	7.63	9.81	14.61			
12.0	% selected	3.0	2.7	7.9	18.5	65.8	2.1	24.4/12.9	29.0
	# patients	10.92	7.49	8.55	9.33	10.98			
18.0	% selected	2.0	2.0	7.6	19.5	65.2	3.7	22.4/12.5	21.0
	# patients	12.37	8.60	8.81	8.98	8.08			
24.0	% selected	2.4	2.3	7.2	19.2	60.2	8.7	19.9/12.0	16.6
	# patients	14.77	9.47	8.58	7.43	5.50			
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
3.0	% selected	14.0	49.8	32.9	2.8	0.4	0.1	21.6/10.5	99.5
	# patients	9.87	17.36	14.80	4.65	1.30			
4.5	% selected	11.7	49.9	33.6	4.0	0.6	0.2	21.4/10.3	68.1
	# patients	10.19	16.93	14.89	4.68	1.24			
6.0	% selected	11.5	49.5	32.9	5.6	0.3	0.2	21.3/10.5	52.6
	# patients	10.39	16.70	14.66	4.87	1.30			
12.0	% selected	13.4	45.9	32.8	6.9	0.8	0.2	20.8/10.2	29.3
	# patients	12.17	16.11	13.49	4.62	1.54			
18.0	% selected	13.4	41.1	32.3	10.7	2.0	0.5	20.5/10.0	21.6
	# patients	13.26	16.12	12.86	4.39	1.22			
24.0	% selected	14.0	37.6	31.4	13.9	2.1	1.0	19.7/ 9.6	17.6
	# patients	15.40	15.38	11.45	4.17	1.34			

		Dose Level							Duration
LDI		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
3.0	% selected	19.1	63.7	15.3	1.7	0.2	0.0	20.9/10.7	100.4
	# patients	11.73	21.16	10.96	3.21	0.94			
4.5	% selected	18.4	63.5	16.0	2.0	0.1	0.0	20.7/10.7	68.8
	# patients	12.15	20.72	11.06	3.17	0.90			
6.0	% selected	19.9	62.1	16.1	1.4	0.4	0.1	20.3/10.7	53.0
	# patients	13.25	19.94	10.57	3.27	0.92			
12.0	% selected	24.7	54.5	17.0	3.1	0.4	0.3	19.9/10.7	29.5
	# patients	14.40	18.41	10.96	3.21	0.94			
18.0	% selected	20.9	56.8	17.4	3.6	0.7	0.6	19.7/10.4	21.6
	# patients	14.87	17.69	10.83	3.44	0.98			
24.0	% selected	18.9	52.0	20.6	5.7	0.8	2.0	19.3/10.3	17.4
	# patients	16.37	16.83	9.93	3.47	0.88			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
3.0	% selected	0.0	4.3	61.2	6.9	1.1	26.5	11.2/14.9	88.9
	# patients	4.09	7.84	20.54	6.61	3.84			
4.5	% selected	0.0	4.3	60.1	6.7	1.1	27.8	11.1/15.0	60.2
	# patients	4.72	8.13	19.11	6.60	4.28			
6.0	% selected	0.0	3.1	61.2	7.9	1.0	26.8	11.1/15.1	47.2
	# patients	5.13	8.55	18.47	6.75	4.79			
12.0	% selected	0.0	4.0	57.6	8.8	2.3	27.3	10.8/15.6	26.4
	# patients	7.03	9.79	15.11	6.23	6.26			
18.0	% selected	0.0	4.3	55.4	10.4	3.3	26.6	10.5/15.7	19.8
	# patients	8.84	10.39	13.07	6.08	7.06			
24.0	% selected	0.0	4.6	56.4	10.7	5.7	22.6	10.1/15.5	16.6
	# patients	10.62	11.55	11.32	6.21	6.79			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
3.0	% selected	0.0	1.3	10.6	0.5	0.0	87.6	7.2/12.8	61.4
	# patients	4.14	8.01	13.18	3.56	1.57			
4.5	% selected	0.0	1.8	11.8	0.3	0.1	86.0	7.3/13.1	42.9
	# patients	4.75	8.74	13.02	3.35	1.57			
6.0	% selected	0.0	1.5	13.8	0.6	0.4	83.7	7.6/13.6	34.0
	# patients	5.22	8.77	13.33	3.82	2.02			
12.0	% selected	0.0	2.5	16.0	1.4	0.2	79.9	8.4/15.2	20.7
	# patients	6.93	10.50	13.13	4.33	2.82			
18.0	% selected	0.0	2.7	23.1	1.7	0.6	71.9	8.7/15.9	16.5
	# patients	8.98	12.11	12.10	4.80	3.44			
24.0	% selected	0.0	3.4	26.8	3.5	1.3	65.0	8.8/16.3	14.7
	# patients	10.68	13.08	11.79	5.03	3.61			

Table S 4: Sensitivity analysis of the LO-EffTox design under different values of the logistical difficulty index (LDI) in Case 2. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
LDI		1	2	3	4	5	None	N_E/N_T	(Days)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
9.0	% selected	0.0	0.1	1.7	2.8	88.5	6.9	13.0/4.0	535
	# patients	3.39	3.62	4.88	4.41	29.75			
18.0	% selected	0.0	0.3	1.7	3.6	87.0	7.4	12.6/3.8	308
	# patients	3.55	4.01	5.62	4.73	28.13			
36.0	% selected	0.0	0.6	2.2	2.8	89.1	5.3	12.2/3.8	198
	# patients	3.72	4.94	7.26	5.68	24.92			
54.0	% selected	0.0	0.2	1.8	4.9	86.9	6.2	12.0/3.7	159
	# patients	3.54	4.90	8.79	6.73	22.26			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
9.0	% selected	0.0	8.6	68.6	19.0	3.1	0.7	16.8/12.5	560
	# patients	3.31	7.70	19.65	10.51	6.57			
18.0	% selected	0.0	10.5	64.1	18.7	5.4	1.3	16.3/12.6	320
	# patients	3.38	8.39	18.69	10.07	7.00			
36.0	% selected	0.1	12.5	60.6	20.9	5.0	0.9	16.2/12.7	207
	# patients	3.35	8.92	18.25	9.88	7.32			
54.0	% selected	0.0	10.5	58.3	21.8	8.2	1.2	16.0/12.4	166
	# patients	3.38	9.71	17.88	9.47	7.21			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
9.0	% selected	68.3	27.6	3.6	0.3	0.0	0.2	16.3/8.8	561
	# patients	26.32	14.43	5.30	1.56	0.32			
18.0	% selected	70.1	26.4	2.9	0.2	0.0	0.4	16.5/9.1	325
	# patients	26.21	13.76	5.64	1.83	0.45			
36.0	% selected	70.9	25.7	3.1	0.0	0.0	0.3	16.5/9.2	206
	# patients	25.78	13.93	5.59	2.08	0.52			
54.0	% selected	68.2	27.4	3.0	1.0	0.0	0.4	16.6/9.4	168
	# patients	25.26	14.09	5.87	2.19	0.52			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
9.0	% selected	5.6	4.8	8.8	20.2	59.7	0.9	27.3/13.6	561
	# patients	8.66	5.34	7.23	10.06	16.37			
18.0	% selected	3.9	3.7	8.2	21.6	61.7	0.9	27.1/13.4	324
	# patients	8.87	5.71	6.86	11.12	15.11			
36.0	% selected	4.7	4.8	8.2	24.0	57.3	1.0	26.2/13.5	206
	# patients	9.78	6.08	7.81	11.89	12.12			
54.0	% selected	3.9	3.0	9.3	20.2	62.7	0.9	25.4/13.1	167
	# patients	10.01	6.82	8.69	11.01	11.21			

LDI		Dose Level 1	2	3	4	5	None	N_E/N_T	Duration (Days)
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
9.0	% selected	10.8	49.0	37.4	2.6	0.2	0.0	21.8/10.5	562
	# patients	8.80	17.56	16.06	4.39	1.19			
18.0	% selected	14.7	48.5	33.2	3.0	0.6	0.0	21.7/10.4	322
	# patients	9.55	17.45	14.88	4.87	1.25			
36.0	% selected	13.1	47.3	33.4	5.4	0.8	0.0	21.6/10.4	207
	# patients	9.62	17.22	14.60	5.20	1.36			
54.0	% selected	12.2	46.1	32.7	7.9	1.1	0.0	21.2/10.2	169
	# patients	10.93	16.54	14.51	4.85	1.17			
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
9.0	% selected	17.7	65.3	15.1	1.8	0.1	0.0	21.2/11.0	560
	# patients	10.96	22.05	10.81	3.28	0.90			
18.0	% selected	17.3	68.0	12.9	1.3	0.5	0.0	20.9/10.8	326
	# patients	11.32	21.77	10.67	3.33	0.92			
36.0	% selected	20.5	62.9	14.0	1.8	0.7	0.1	20.9/10.8	207
	# patients	12.10	20.59	10.73	3.56	0.99			
54.0	% selected	20.9	58.8	15.9	3.5	0.9	0.0	20.3/10.8	168
	# patients	13.27	19.14	11.20	3.54	0.86			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
9.0	% selected	0.0	3.1	63.9	5.6	0.6	26.8	11.1/14.3	479
	# patients	3.20	6.60	22.56	6.48	3.06			
18.0	% selected	0.0	3.5	61.1	5.3	0.7	29.4	11.2/14.5	268
	# patients	3.20	6.76	21.64	6.31	3.49			
36.0	% selected	0.0	4.1	58.2	6.5	0.9	30.3	11.3/14.6	166
	# patients	3.25	6.79	20.82	6.39	4.07			
54.0	% selected	0.0	4.2	58.7	5.3	1.0	30.8	11.5/15.0	134
	# patients	3.28	6.95	20.98	6.41	4.52			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
9.0	% selected	0.0	2.1	9.7	0.1	0.0	88.1	7.2/12.5	299
	# patients	3.30	7.29	13.37	3.48	1.27			
18.0	% selected	0.0	1.5	8.8	0.3	0.1	89.3	7.2/12.6	156
	# patients	3.23	7.14	13.05	3.74	1.38			
36.0	% selected	0.0	1.7	10.1	0.2	0.0	88.0	8.0/13.8	93
	# patients	3.33	7.17	13.93	4.37	1.94			
54.0	% selected	0.0	2.6	9.5	0.2	0.0	87.7	8.9/15.0	75
	# patients	3.21	7.42	15.24	4.53	2.56			

Table S5: Sensitivity analysis of the LO-EffTox design under different $N_{\max}$ in Case 1. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
$N_{\max}$		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
24	% selected	0.1	2.3	4.8	11.4	80.0	1.4	4.0/1.4	21.2
	# patients	5.94	6.17	5.39	3.41	3.09			
36	% selected	0.0	1.0	2.7	3.4	90.5	2.4	7.7/2.6	28.9
	# patients	6.11	6.55	6.44	4.45	12.31			
60	% selected	0.0	0.1	1.7	3.0	90.3	4.9	15.4/4.7	44.1
	# patients	6.00	6.69	7.10	5.60	33.52			
72	% selected	0.0	0.1	1.5	3.1	91.6	3.7	19.5/6.1	52.7
	# patients	5.92	6.61	7.63	6.18	44.35			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
24	% selected	0.4	10.9	21.7	24.7	42.1	0.2	5.9/ 5.3	21.3
	# patients	5.92	6.38	5.38	3.69	2.60			
36	% selected	0.0	15.4	49.7	23.6	10.6	0.7	10.8/ 9.9	29.3
	# patients	5.90	7.49	8.33	6.34	7.78			
60	% selected	0.0	8.3	70.1	15.9	4.3	1.4	19.8/15.7	45.1
	# patients	6.11	10.41	21.88	11.66	9.40			
72	% selected	0.0	6.4	72.8	17.7	2.1	1.0	24.6/18.5	52.6
	# patients	6.08	11.85	29.08	14.34	10.10			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
24	% selected	64.4	24.5	7.8	2.6	0.5	0.2	8.6/ 5.2	21.4
	# patients	10.59	7.51	3.89	1.57	0.41			
36	% selected	72.9	22.7	3.2	0.9	0.0	0.3	12.5/ 7.2	29.2
	# patients	18.23	10.71	4.76	1.68	0.55			
60	% selected	75.6	22.4	1.5	0.2	0.0	0.3	19.9/10.4	45.5
	# patients	35.42	16.43	5.58	1.90	0.60			
72	% selected	81.1	17.8	0.8	0.3	0.0	0.0	23.9/12.0	53.2
	# patients	45.72	18.19	5.71	1.89	0.49			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
24	% selected	7.7	4.7	11.6	29.1	45.7	1.2	9.6/ 6.0	21.1
	# patients	8.01	5.86	4.92	3.35	1.69			
36	% selected	3.9	3.1	8.9	21.9	61.0	1.2	17.6/ 9.6	29.2
	# patients	8.92	6.43	6.71	7.30	6.36			
60	% selected	2.9	2.5	7.5	17.0	69.0	1.1	34.1/16.8	45.0
	# patients	10.52	7.06	9.29	12.49	20.13			
72	% selected	1.9	3.1	6.2	19.1	66.9	2.8	42.2/20.5	51.9
	# patients	9.98	8.07	10.26	15.19	26.81			

		Dose Level							Duration
$N_{\max}$		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
24	% selected	12.8	30.4	33.5	19.5	3.7	0.1	10.0/ 4.9	21.3
	# patients	7.66	7.14	6.15	2.35	0.68			
36	% selected	14.1	41.1	31.8	11.7	1.2	0.1	15.5/ 7.7	29.2
	# patients	9.30	11.21	10.37	3.95	1.16			
60	% selected	12.9	52.3	29.5	4.8	0.3	0.2	26.9/12.9	45.2
	# patients	13.19	22.78	17.58	5.01	1.34			
72	% selected	11.1	53.7	31.5	3.5	0.2	0.0	32.3/15.1	53.2
	# patients	14.75	28.54	21.64	5.53	1.54			
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
24	% selected	21.3	40.5	25.2	10.6	2.3	0.1	9.9/ 5.4	21.3
	# patients	7.95	7.84	5.66	2.04	0.49			
36	% selected	21.7	50.3	22.4	4.4	1.2	0.0	15.2/ 8.1	29.4
	# patients	10.74	13.19	8.58	2.66	0.83			
60	% selected	18.1	65.6	14.3	1.6	0.0	0.4	25.8/13.1	45.4
	# patients	15.63	26.57	13.04	3.55	1.05			
72	% selected	17.5	70.2	10.8	0.9	0.2	0.4	30.8/15.3	53.0
	# patients	18.36	34.74	14.06	3.56	1.03			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
24	% selected	0.1	10.8	37.2	23.6	19.0	9.3	4.2/ 6.9	20.7
	# patients	6.13	6.97	5.91	2.92	1.70			
36	% selected	0.0	7.2	55.7	13.1	5.9	18.1	8.0/11.9	27.7
	# patients	6.21	8.51	10.04	4.91	4.93			
60	% selected	0.0	2.1	61.3	6.0	0.4	30.2	13.5/18.2	38.7
	# patients	6.11	9.62	24.20	7.05	5.87			
72	% selected	0.0	1.7	60.4	3.1	0.2	34.6	15.9/20.8	44.3
	# patients	6.26	10.13	30.86	7.80	6.00			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
24	% selected	0.4	12.5	40.0	13.3	5.6	28.2	4.2/ 8.0	20.4
	# patients	6.10	7.61	6.32	2.38	0.91			
36	% selected	0.0	5.4	31.0	2.4	0.8	60.4	6.8/12.4	24.1
	# patients	6.15	9.03	10.30	3.71	2.40			
60	% selected	0.0	0.5	7.0	0.3	0.0	92.2	8.6/15.5	25.6
	# patients	5.96	9.93	15.10	3.82	2.48			
72	% selected	0.0	0.3	3.6	0.1	0.0	96.0	9.3/16.4	26.4
	# patients	6.08	10.69	15.84	4.29	2.52			

Table S 6: Sensitivity analysis of the LO-EffTox design under different time-to-event distributions in Case 1. In the first column, the first and second letters indicate the distributions for time to efficacy and toxicity, respectively, with "W" and "L" denoting the Weibull and log-logistic distributions. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
Dist.		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
LL	% selected	0.0	0.3	2.2	2.8	91.6	3.1	11.6/3.7	36.9
	# patients	6.02	6.65	6.81	4.90	23.19			
LW	% selected	0.1	0.2	3.0	2.4	91.7	2.6	11.6/3.6	36.9
	# patients	6.06	6.65	6.89	4.94	23.16			
WL	% selected	0.0	0.1	2.5	2.4	91.3	3.7	11.7/3.7	36.6
	# patients	6.11	6.50	7.02	4.82	22.96			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
LL	% selected	0.0	10.9	59.6	23.5	5.7	0.3	15.6/13.2	37.1
	# patients	5.97	9.17	14.05	9.65	9.08			
LW	% selected	0.1	12.1	63.2	18.9	5.1	0.6	15.4/13.1	37.4
	# patients	5.89	9.51	14.08	9.46	8.88			
WL	% selected	0.1	11.8	63.3	20.1	4.3	0.4	15.6/13.2	37.1
	# patients	6.02	9.01	13.96	9.52	9.38			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
LL	% selected	75.5	22.3	1.8	0.2	0.0	0.2	16.5/ 8.9	37.5
	# patients	26.64	13.58	5.42	1.79	0.49			
LW	% selected	78.4	18.4	2.3	0.7	0.0	0.2	16.4/8.8	37.3
	# patients	27.53	12.88	5.20	1.81	0.51			
WL	% selected	79.1	17.2	3.0	0.5	0.0	0.2	16.3/8.8	37.5
	# patients	27.47	12.92	5.21	1.81	0.54			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
LL	% selected	3.1	3.0	9.6	17.5	64.9	1.9	25.6/13.2	36.8
	# patients	9.57	7.01	7.94	9.96	12.82			
LW	% selected	4.1	3.4	6.5	20.6	63.9	1.5	25.5/13.2	37.1
	# patients	9.97	6.96	8.12	10.14	12.27			
WL	% selected	3.8	3.0	8.4	19.0	64.6	1.2	25.4/13.1	36.8
	# patients	10.04	7.33	8.13	9.36	12.68			

Dist.		Dose Level 1	2	3	4	5	None	N_E/N_T	Duration (Weeks)
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
LL	% selected	13.3	48.0	33.9	4.1	0.5	0.2	21.1/10.3	37.3
	# patients	11.53	16.48	14.14	4.47	1.30			
LW	% selected	11.1	47.6	35.0	5.2	1.0	0.1	21.1/10.3	37.3
	# patients	11.19	16.60	13.97	4.84	1.36			
WL	% selected	13.3	48.0	32.8	5.0	0.5	0.4	21.0/10.3	37.2
	# patients	11.26	16.84	13.86	4.55	1.34			
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
LL	% selected	21.6	59.0	16.3	2.7	0.2	0.2	20.2/10.7	37.2
	# patients	13.88	18.23	11.32	3.43	1.06			
LW	% selected	18.9	64.5	14.1	2.0	0.2	0.3	20.3/10.6	37.3
	# patients	13.24	19.69	10.48	3.44	1.04			
WL	% selected	19.5	60.9	16.9	2.0	0.6	0.1	20.4/10.8	37.2
	# patients	13.33	19.09	11.24	3.32	0.98			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
LL	% selected	0.0	4.5	58.1	8.1	1.4	27.9	11.1/15.7	33.1
	# patients	5.98	9.61	16.35	6.29	5.71			
LW	% selected	0.0	4.4	59.5	9.0	1.0	26.1	10.9/15.3	33.4
	# patients	6.20	9.14	16.60	6.52	5.55			
WL	% selected	0.0	3.2	59.5	9.4	1.4	26.5	10.8/15.3	33.5
	# patients	6.14	9.48	16.42	6.34	5.68			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
LL	% selected	0.0	2.5	16.7	0.8	0.3	79.7	8.3/14.9	25.9
	# patients	6.28	9.94	13.63	4.12	2.55			
LW	% selected	0.0	2.4	15.3	0.8	0.3	81.2	8.3/14.8	25.9
	# patients	6.38	9.82	13.41	4.17	2.67			
WL	% selected	0.0	2.0	16.6	0.9	0.3	80.2	8.2/14.8	25.9
	# patients	6.23	9.58	13.77	4.23	2.52			

Table S 7: Sensitivity analysis of the LO-EffTox design under different numbers of partitions for the piecewise exponential model in Case 1. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

# of partitions		Dose Level 1	2	3	4	5	None	N_E/N_T	Duration (Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
9	% selected	0.1	0.8	2.4	2.7	90.8	3.2	11.7/3.8	36.8
	# patients	5.89	6.68	6.95	4.89	23.09			
12	% selected	0.0	0.6	2.4	2.5	90.1	4.4	11.6/3.7	36.8
	# patients	5.70	6.63	6.71	4.94	23.49			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
9	% selected	0.0	13.5	62.9	17.7	5.3	0.6	15.4/13.0	37.1
	# patients	5.71	9.26	14.29	9.22	9.35			
12	% selected	0.1	12.7	62.1	18.6	5.4	1.1	15.5/13.2	37.0
	# patients	5.74	9.20	14.39	9.13	9.24			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
9	% selected	77.8	19.2	1.9	0.6	0.0	0.5	16.4/8.9	37.1
	# patients	27.06	13.47	4.97	1.81	0.52			
12	% selected	74.8	22.2	2.3	0.6	0.0	0.1	16.3/8.9	37.3
	# patients	26.82	13.55	5.17	1.85	0.57			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
9	% selected	2.8	3.0	8.5	20.0	63.4	2.3	25.7/13.2	36.8
	# patients	9.45	6.79	8.14	10.10	12.67			
12	% selected	2.9	3.1	7.1	19.7	66.0	1.2	25.8/13.2	37.1
	# patients	9.18	6.96	7.91	9.99	13.50			
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
9	% selected	14.7	48.3	30.8	5.0	0.9	0.3	21.2/10.4	37.2
	# patients	11.27	16.43	14.24	4.55	1.41			
12	% selected	13.3	48.6	32.3	5.0	0.8	0.0	21.3/10.4	37.3
	# patients	11.01	16.76	13.89	4.89	1.46			

# of partitions		Dose Level 1	2	3	4	5	None	N_E/N_T	Duration (Weeks)
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
9	% selected	17.4	63.3	17.3	1.7	0.1	0.2	20.4/10.7	37.3
	# patients	12.81	19.57	11.21	3.23	1.09			
12	% selected	23.1	61.0	13.6	2.0	0.2	0.1	20.4/10.7	37.2
	# patients	13.43	19.52	10.73	3.28	1.01			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
9	% selected	0.0	4.4	61.3	8.6	1.5	24.2	11.1/15.4	33.5
	# patients	5.76	9.26	17.26	6.19	5.75			
12	% selected	0.0	3.6	61.2	8.2	1.7	25.3	11.1/15.5	33.8
	# patients	5.63	9.15	17.00	6.64	5.79			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
9	% selected	0.0	2.0	12.8	0.7	0.4	84.1	8.2/14.6	25.4
	# patients	5.91	9.81	13.41	4.15	2.28			
12	% selected	0.0	1.9	14.8	0.8	0.0	82.5	8.0/14.5	24.9
	# patients	5.71	9.60	13.02	4.07	2.60			

Table S8: Sensitivity analysis of the LO-EffTox design under different values of the correlation parameter ϕ in Case 1. The probability pairs given in parentheses for each dose level are $(\pi_E(d_r)^{true},\ \pi_T(d_r)^{true})$.

		Dose Level							Duration
ϕ		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
0.1	% selected	0.0	0.3	1.5	3.0	92.3	2.9	11.7/3.7	37.0
	# patients	6.06	6.58	6.85	5.06	23.02			
2.5	% selected	0.0	0.5	2.3	3.8	90.8	2.6	11.6/3.7	37.0
	# patients	6.04	6.80	6.88	4.97	22.98			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
0.1	% selected	0.0	11.3	61.5	20.9	5.4	0.9	15.4/13.2	37.0
	# patients	27.11	13.15	5.41	1.73	0.45			
2.5	% selected	0.0	11.2	63.6	19.2	5.3	0.7	15.5/13.1	37.3
	# patients	6.02	9.40	13.74	9.49	9.16			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
0.1	% selected	77.3	19.3	2.5	0.4	0.0	0.5	16.4/8.7	37.1
	# patients	26.86	13.74	4.96	1.78	0.45			
2.5	% selected	77.3	21.1	1.3	0.2	0.0	0.1	16.6/8.9	37.3
	# patients	27.11	13.43	5.10	1.85	0.49			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
0.1	% selected	3.6	2.9	9.0	18.1	63.9	2.5	25.3/13.2	36.6
	# patients	9.94	7.10	7.83	9.61	12.65			
2.5	% selected	2.9	3.7	7.7	18.6	65.0	2.1	25.4/13.1	36.7
	# patients	9.71	6.95	8.04	9.78	12.74			
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
0.1	% selected	13.4	48.1	31.4	5.9	1.0	0.2	21.0/10.3	37.2
	# patients	11.37	16.48	13.85	4.69	1.52			
2.5	% selected	14.2	47.4	31.8	6.0	0.4	0.2	21.0/10.2	37.3
	# patients	11.35	16.60	14.09	4.59	1.29			

		Dose Level							Duration
ϕ		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
0.1	% selected	22.0	59.6	15.1	2.0	0.7	0.6	20.4/10.8	37.5
	# patients	13.19	19.44	10.79	3.38	0.98			
2.5	% selected	20.4	60.6	16.2	2.2	0.2	0.4	20.3/10.7	37.1
	# patients	13.01	19.63	10.82	3.39	1.00			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
0.1	% selected	0.0	3.4	62.4	8.0	1.1	25.1	10.9/15.4	33.8
	# patients	6.24	8.89	16.91	6.42	5.88			
2.5	% selected	0.0	4.1	61.0	8.5	0.8	25.6	11.1/15.4	33.5
	# patients	6.12	9.12	16.93	6.39	5.62			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
0.1	% selected	0.0	1.7	13.8	1.0	0.2	83.3	8.0/14.5	25.2
	# patients	6.13	10.10	13.01	4.18	2.33			
2.5	% selected	0.0	2.0	17.0	0.5	0.0	80.5	8.0/14.5	25.1
	# patients	6.12	9.87	13.23	3.90	2.44			

Table S 9: Simulation results of the LO-EffTox design using a piecewise exponential model and the Weibull model (for imputing missing outcomes) in Case 1. The true time to events is generated based on a 6-piecewise exponential distribution with hazard $(\lambda_1,\ \lambda_2,\ \lambda_3,\ \lambda_4,\ \lambda_5,\ \lambda_6) = (0.001, 0.001, 0.001, 0.001, 0.001, 4.0)$.

		Dose Level							Duration
Dist.		1	2	3	4	5	None	N_E/N_T	(Weeks)
	Scenario 1	(0.05, 0.03)	(0.10, 0.05)	(0.20, 0.07)	(0.25, 0.08)	(0.35, 0.10)			
	δ^{true}	0.52	0.53	0.58	0.61	0.67			
Piecewise	% selected	0.1	0.3	4.0	5.9	84.5	5.2	11.8/3.8	36.6
	# patients	5.64	6.42	6.62	5.39	23.11			
Weibull	% selected	0.0	0.5	3.1	4.9	77.7	13.8	12.1/3.9	34.3
	# patients	3.20	4.62	6.51	4.87	25.25			
	Scenario 2	(0.02, 0.10)	(0.10, 0.15)	(0.40, 0.20)	(0.45, 0.30)	(0.50, 0.60)			
	δ^{true}	0.43	0.43	0.59	0.52	0.32			
Piecewise	% selected	0.0	13.2	58.8	15.8	8.4	3.8	15.2/13.4	36.6
	# patients	6.10	9.35	13.35	7.87	10.44			
Weibull	% selected	0.1	19.3	57.2	12.3	4.2	6.9	15.7/13.5	35.2
	# patients	3.28	9.27	15.49	7.64	10.21			
	Scenario 3	(0.30, 0.10)	(0.35, 0.20)	(0.45, 0.40)	(0.50, 0.60)	(0.55, 0.65)			
	δ^{true}	0.63	0.55	0.43	0.32	0.31			
Piecewise	% selected	72.2	21.5	3.6	1.1	0.4	1.2	16.8/10.2	37.2
	# patients	24.36	12.86	6.24	2.97	1.31			
Weibull	% selected	68.1	23.3	5.2	0.6	0.2	2.6	17.3/11.4	36.6
	# patients	20.01	13.92	7.65	3.57	2.20			
	Scenario 4	(0.18, 0.20)	(0.28, 0.24)	(0.55, 0.28)	(0.74, 0.31)	(0.79, 0.33)			
	δ^{true}	0.44	0.46	0.62	0.76	0.78			
Piecewise	% selected	8.4	5.6	11.5	18.1	52.3	4.1	23.6/12.7	36.0
	# patients	11.40	8.11	7.56	8.02	11.60			
Weibull	% selected	6.2	4.9	8.7	20.3	55.9	4.0	26.7/13.3	36.1
	# patients	7.14	6.93	7.94	9.34	15.34			

Dist.		Dose Level 1	2	3	4	5	None	N_E/N_T	Duration (Weeks)
	Scenario 5	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.23)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.66	0.45	0.38			
Piecewise	% selected	22.0	42.2	26.1	6.8	2.6	0.3	21.2/11.0	37.3
	# patients	11.91	14.54	12.15	6.59	2.71			
Weibull	% selected	22.7	45.5	24.1	5.6	1.6	0.5	21.8/11.8	37.2
	# patients	9.43	15.55	12.04	6.53	4.27			
	Scenario 6	(0.20, 0.10)	(0.50, 0.19)	(0.52, 0.34)	(0.54, 0.44)	(0.56, 0.54)			
	δ^{true}	0.55	0.69	0.53	0.45	0.38			
Piecewise	% selected	29.7	45.7	16.8	5.3	1.9	0.6	20.2/11.4	37.3
	# patients	13.97	16.01	10.79	5.04	2.00			
Weibull	% selected	28.6	46.9	16.1	5.1	1.8	1.5	21.1/12.3	37.0
	# patients	11.04	16.39	10.94	5.74	3.35			
	Scenario 7	(0.02, 0.10)	(0.05, 0.25)	(0.30, 0.30)	(0.40, 0.55)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.42	0.31	0.27			
Piecewise	% selected	0.0	3.2	55.4	7.9	2.3	31.2	10.8/15.1	32.6
	# patients	5.94	8.81	15.59	6.09	6.54			
Weibull	% selected	0.0	5.6	53.3	4.9	0.8	35.4	11.2/15.0	30.6
	# patients	3.32	7.80	17.07	6.15	6.15			
	Scenario 8	(0.02, 0.10)	(0.05, 0.25)	(0.35, 0.55)	(0.40, 0.60)	(0.50, 0.70)			
	δ^{true}	0.43	0.34	0.29	0.28	0.27			
Piecewise	% selected	0.0	3.5	16.6	0.4	0.1	79.4	7.9/14.3	24.9
	# patients	5.98	9.32	12.93	3.96	2.74			
Weibull	% selected	0.0	4.7	15.4	0.2	0.1	79.6	8.4/14.2	23.0
	# patients	3.38	8.69	12.84	4.42	2.94			