Supplementary Table 1a. Prior distributions of the model parameters used in the (3-dose, 2-schedule) trial.

Parameter	Mean	Std. Dev.
ζ	0.0	0.5774
$log(\lambda_R)$	-6.970	10.0
$log(\alpha_{R,1})$	-15.31	10.0
$log(\beta_{R,1})$	-0.5317	10.0
$log(\alpha_{R,2})$	-13.06	10.0
$log(\beta_{R,2})$	0.6741	10.0
$\gamma_{R,1}$	1.0	0.1023
$log(\lambda_T)$	-6.758	10.0
$log(\alpha_{T,1})$	-18.85	10.0
$log(\beta_{T,1})$	-2.012	10.0
$log(\alpha_{T,2})$	-8.366	10.0
$log(\beta_{T,2})$	1.556	10.0
$\gamma_{T,1}$	1.0	0.1023

Supplementary Table 1b. Prior distribution of the model parameters used in the extended (4-dose, 3-schedule) trial.

Parameter	Mean	Std. Dev.
ζ	0.0	0.5774
$log(\lambda_R)$	-3.029	10.0
$log(\alpha_{R,1})$	-14.29	10.0
$log(\beta_{R,1})$	-0.5292	10.0
$log(\alpha_{R,2})$	-13.39	10.0
$log(\beta_{R,2})$	0.6794	10.0
$\gamma_{R,1}$	1.0	0.1023
$\gamma_{R,2}$	1.0	0.1023
$log(\lambda_T)$	-3.033	10.0
$log(\alpha_{T,1})$	-19.03	10.0
$log(\beta_{T,1})$	-2.000	10.0
$log(\alpha_{T,2})$	-7.770	10.0
$log(\beta_{T,2})$	1.565	10.0
$\gamma_{T,1}$	1.0	0.1023
$\gamma_{T,2}$	1.0	0.1023

Supplementary Table 2. True probabilities and expected true utilities of each simulation scenario, assuming lognormal event time distributions, in the (3-dose, 2-schedule) trial. Each toxicity time distribution is specified by $(F_{T,1}, F_{T,2})$, the cumulative probabilities of toxicity at the reference time and maximum follow-up time, respectively. Similarly, each response time distribution is specified by $(F_{R,1}, F_{R,2})$, the cumulative probabilities of response at the reference time and maximum follow-up time, respectively.

		1-Day Schedule			2-Day Schedule		
Scenario		Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3
1	$(F_{T,1}, F_{T,2})$	(.15, .17)	(.18, .20)	(.21, .23)	(.15, .17)	(.18, .20)	(.21, .23)
	$(F_{R,1}, F_{R,2})$	(.15, .25)	(.30, .40)	(.45, .55)	(.15, .25)	(.30, .40)	(.45, .55)
	$\bar{u}^{true}(s,d)$	52.2	57.5	62.9	52.2	57.5	62.9
2	$(F_{T,1}, F_{T,2})$	(.10, .13)	(.25, .28)	(.40, .43)	(.10, .13)	(.25, .28)	(.40, .43)
	$(F_{R,1}, F_{R,2})$	(.25, .35)	(.30, .40)	(.35, .45)	(.25, .35)	(.30, .40)	(.35, .45)
	$\bar{u}^{true}(s,d)$	59.0	53.7	48.1	59.0	53.7	48.1
3	$(F_{T,1}, F_{T,2})$	(.10, .13)	(.13, .16)	(.16, .19)	(.10, .13)	(.13, .16)	(.16, .19)
	$(F_{R,1}, F_{R,2})$	(.12, .22)	(.27, .37)	(.42, .52)	(.20, .30)	(.35, .45)	(.50, .60)
	$\bar{u}^{true}(s,d)$	53.1	58.4	63.8	56.8	62.1	67.6
4	$(F_{T,1}, F_{T,2})$	(.10, .13)	(.25, .28)	(.40, .43)	(.18, .21)	(.33, .36)	(.48, .51)
	$(F_{R,1}, F_{R,2})$	(.24, .34)	(.32, .42)	(.38, .48)	(.26, .36)	(.34, .44)	(.40, .50)
	$\bar{u}^{true}(s,d)$	58.6	54.6	49.7	55.4	51.4	46.5
5	$(F_{T,1}, F_{T,2})$	(.14, .16)	(.20, .22)	(.50, .52)	(.14, .16)	(.20, .22)	(.50, .52)
	$(F_{R,1}, F_{R,2})$	(.16, .24)	(.46, .52)	(.50, .56)	(.16, .24)	(.46, .52)	(.50, .56)
	$\bar{u}^{true}(s,d)$	52.9	63.6	50.2	52.9	63.6	50.2
6	$(F_{T,1}, F_{T,2})$	(.10, .14)	(.24, .28)	(.28, .32)	(.10, .14)	(.24, .28)	(.28, .32)
	$(F_{R,1}, F_{R,2})$	(.14, .22)	(.18, .26)	(.40, .50)	(.14, .22)	(.18, .26)	(.40, .50)
	$\bar{u}^{true}(s,d)$	53.5	48.1	56.5	53.5	48.1	56.5
7	$(F_{T,1}, F_{T,2})$	(.60, .64)	(.66, .70)	(.70, .74)	(.60, .64)	(.66, .70)	(.70, .74)
	$(F_{R,1}, F_{R,2})$	(.30, .40)	(.34, .44)	(.36, .46)	(.30, .40)	(.34, .44)	(.36, .46)
	$\bar{u}^{true}(s,d)$	35.3	34.2	33.0	35.3	34.2	33.0
8	$(F_{T,1}, F_{T,2})$	(.25, .30)	(.30, .35)	(.35, .40)	(.25, .30)	(.30, .35)	(.35, .40)
	$(F_{R,1}, F_{R,2})$	(.03, .06)	(.04, .07)	(.05, .08)	(.03, .06)	(.04, .07)	(.05, .08)
	$\bar{u}^{true}(s,d)$	39.9	37.8	35.6	39.9	37.8	35.6

Supplementary Table 3a. Simulation results for the (3-dose, 2-schedule) trial using the greedy algorithm.

		1-Day Schedule			2-Day Schedule				R_{select}
Scenario		Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3	None	R_{treat}
1	$\bar{u}^{true}(s,d)$	52.2	57.5	62.9	52.2	57.5	62.9		
	% Sel	7	8	35	7	8	35	1	0.78
	# Pats	15.6	8.3	11.9	15.2	8.5	12.0		0.45
2	$\bar{u}^{true}(s,d)$	59.0	53.7	48.1	59.0	53.7	48.1		
	% Sel	38	5	5	41	6	5	1	0.85
	# Pats	27.0	5.4	3.1	27.5	5.4	3.3		0.84
3	$\bar{u}^{true}(s,d)$	53.1	58.4	63.8	56.8	62.1	67.6		
	% Sel	5	5	16	8	11	56	1	0.78
	# Pats	14.7	7.4	8.4	16.2	9.6	15.4		0.48
4	$\bar{u}^{true}(s,d)$	58.6	54.6	49.7	55.4	51.4	46.5		
	% Sel	59	9	7	16	4	6	0	0.80
	# Pats	33.4	6.3	3.3	20.3	5.1	3.3		0.77
5	$\bar{u}^{true}(s,d)$	52.9	63.6	50.2	52.9	63.6	50.2		
	% Sel	10	30	9	11	30	9	1	0.65
	# Pats	16.7	13.8	5.2	17.0	13.7	5.2		0.48
6	$\bar{u}^{true}(s,d)$	53.5	48.1	56.5	53.5	48.1	56.5		
	% Sel	23	4	23	22	4	21	3	0.75
	# Pats	20.7	6.2	8.7	20.6	6.3	8.6		0.62
7	$\bar{u}^{true}(s,d)$	35.3	34.2	33.0	35.3	34.2	33.0		
	% Sel	0	0	0	0	0	0	100	1.00
	# Pats	5.4	1.2	0.4	5.5	1.2	0.4		0.83
8	$\bar{u}^{true}(s,d)$	39.9	37.8	35.6	39.9	37.8	35.6		
	% Sel	1	1	1	1	0	1	96	0.54
	# Pats	7.2	4.1	4.5	7.2	4.0	4.5		0.59

Supplementary Table 3b. Simulation results for the (3-dose, 2-schedule) trial using the balanced, non-adaptive design. Each (s, d) pair is assigned 12 patients, and only one posterior computation is done, at the end of the trial.

		1-Day Schedule			2-Day Schedule				R_{select}
Scenario		Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3	None	R_{treat}
1	$\bar{u}^{true}(s,d)$	52.2	57.5	62.9	52.2	57.5	62.9		
	% Sel	4	7	38	4	6	40	0	0.85
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.50
2	$\bar{u}^{true}(s,d)$	59.0	53.7	48.1	59.0	53.7	48.1		
	% Sel	37	7	4	40	8	4	0	0.85
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.51
3	$\bar{u}^{true}(s,d)$	53.1	58.4	63.8	56.8	62.1	67.6		
	% Sel	3	4	17	5	9	62	0	0.83
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.50
4	$\bar{u}^{true}(s,d)$	58.6	54.6	49.7	55.4	51.4	46.5		
	% Sel	55	13	4	17	7	4	0	0.80
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.51
5	$\bar{u}^{true}(s,d)$	52.9	63.6	50.2	52.9	63.6	50.2		
	% Sel	9	37	5	9	37	5	0	0.77
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.40
6	$\bar{u}^{true}(s,d)$	53.5	48.1	56.5	53.5	48.1	56.5		
	% Sel	22	4	27	18	4	25	0	0.77
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.55
7	$\bar{u}^{true}(s,d)$	35.3	34.2	33.0	35.3	34.2	33.0		
	% Sel	1	0	0	1	0	0	98	0.94
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.50
8	$\bar{u}^{true}(s,d)$	39.9	37.8	35.6	39.9	37.8	35.6		
	% Sel	4	2	8	4	2	9	72	0.35
	# Pats	12.0	12.0	12.0	12.0	12.0	12.0		0.50

Supplementary Table 4. Summary statistics and stopping percentages for different true time-to-event distributions, in the (3-dose, 2-schedule) trial. All other simulation results for this trial used the Lognormal TTE distribution. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and thus have a gray background.

	Lognormal TTE		Gamma TTE		Weibull TTE		Uniform TTE	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.82 (1)	0.54	0.81 (1)	0.54	0.82 (1)	0.54	0.72 (2)	0.50
2	0.85 (1)	0.75	0.84 (1)	0.75	0.85 (1)	0.76	0.90 (2)	0.76
3	0.81 (1)	0.54	0.80 (1)	0.54	0.80 (1)	0.54	0.74 (1)	0.52
4	0.80 (1)	0.69	0.81 (1)	0.69	0.81 (1)	0.69	0.87 (1)	0.70
5	0.74 (1)	0.54	0.72 (1)	0.54	0.74 (0)	0.54	0.73 (1)	0.57
6	0.76 (2)	0.62	0.75 (2)	0.62	0.76 (3)	0.62	0.76 (4)	0.66
7	0.87 (100)	0.81	1.00 (100)	0.81	0.87 (100)	0.80	0.87 (96)	0.69
8	0.54 (96)	0.54	0.57 (95)	0.54	0.56 (96)	0.55	0.41 (98)	0.53

Supplementary Table 5a. Summary statistics and stopping percentages for different prior standard deviations $\tilde{\sigma}$, for the (3-dose, 2-schedule) trial. The actual trial design and other simulation results used $\tilde{\sigma} = 10$ as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	$\tilde{\sigma} = 8$		$\tilde{\sigma} = 10$		$\tilde{\sigma} = 12$		$\tilde{\sigma} = 14$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.84 (1)	0.53	0.82 (1)	0.54	0.80 (1)	0.54	0.79 (1)	0.54
2	0.86 (1)	0.76	0.85 (1)	0.75	0.85 (1)	0.76	0.86 (1)	0.76
3	0.81 (1)	0.54	0.81 (1)	0.54	0.79 (0)	0.54	0.78 (1)	0.54
4	0.82 (1)	0.69	0.80 (1)	0.69	0.82 (1)	0.69	0.81 (1)	0.69
5	0.71 (0)	0.51	0.74 (1)	0.54	0.73 (1)	0.55	0.75 (1)	0.56
6	0.75 (2)	0.62	0.76 (2)	0.62	0.76 (2)	0.62	0.76 (2)	0.62
7	1.00 (100)	0.81	0.87 (100)	0.81	0.99 (100)	0.80	0.83 (100)	0.80
8	0.57 (96)	0.56	0.54 (96)	0.54	0.51 (95)	0.53	0.52 (95)	0.53

Supplementary Table 5b. Summary statistics and stopping percentages for different priors of $\gamma_{m,j}$ in terms of the beta distribution parameters, or the equivalent 95% probability intervals within the $[0, 2]$ domain. The (3-dose, 2-schedule) trial design and main simulation results used beta parameters $(47.3, 47.3)$, which puts 95% prior mass on $(0.8, 1.2)$. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

Parameters	$(191, 191)$		$(47.3, 47.3)$		$(20.6, 20.6)$		$(11.3, 11.3)$	
95% interval	$(0.9, 1.1)$		$(0.8, 1.2)$		$(0.7, 1.3)$		$(0.6, 1.4)$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.81 (1)	0.53	0.82 (1)	0.54	0.81 (1)	0.54	0.83 (1)	0.54
2	0.86 (1)	0.76	0.85 (1)	0.75	0.85 (1)	0.75	0.84 (1)	0.75
3	0.81 (1)	0.54	0.81 (1)	0.54	0.80 (0)	0.54	0.81 (1)	0.54
4	0.79 (1)	0.69	0.80 (1)	0.69	0.80 (1)	0.69	0.81 (1)	0.69
5	0.76 (1)	0.55	0.74 (1)	0.54	0.72 (1)	0.53	0.69 (1)	0.53
6	0.76 (3)	0.62	0.76 (2)	0.62	0.76 (2)	0.62	0.76 (2)	0.63
7	0.99 (100)	0.80	0.87 (100)	0.81	0.99 (100)	0.81	0.91 (100)	0.81
8	0.55 (96)	0.54	0.54 (96)	0.54	0.50 (96)	0.54	0.53 (96)	0.55

Supplementary Table 6. Summary statistics and stopping percentages for varying cohort sizes with total sample size 72 in the original (3-dose, 2-schedule) trial. The actual trial design and other simulation results used cohort size 3 as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and thus have a gray background.

	cohort = 1		*cohort* = 2		*cohort* = 3	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.84 (14)	0.60	0.83 (4)	0.57	0.82 (1)	0.54
2	0.85 (16)	0.70	0.85 (5)	0.74	0.85 (1)	0.75
3	0.82 (12)	0.59	0.81 (3)	0.57	0.81 (1)	0.54
4	0.81 (13)	0.66	0.81 (3)	0.67	0.80 (1)	0.69
5	0.78 (10)	0.54	0.76 (2)	0.54	0.74 (1)	0.54
6	0.78 (21)	0.65	0.78 (8)	0.65	0.76 (2)	0.62
7	0.98 (100)	0.67	1.00 (100)	0.77	0.87 (100)	0.81
8	0.53 (98)	0.59	0.52 (97)	0.52	0.54 (96)	0.54

Supplementary Table 7. Comparison of the summary statistics and stopping percentages for varying sample sizes N with cohort 3 in the original (3-dose, 2-schedule) trial. The actual trial design and other simulation results used $N = 72$ as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	$N = 48$		$N = 60$		$N = 72$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.76 (1)	0.44	0.79 (1)	0.50	0.82 (1)	0.54
2	0.79 (1)	0.77	0.83 (1)	0.76	0.85 (1)	0.75
3	0.75 (1)	0.47	0.77 (1)	0.51	0.81 (1)	0.54
4	0.77 (1)	0.70	0.79 (1)	0.69	0.80 (1)	0.69
5	0.62 (1)	0.48	0.67 (1)	0.51	0.74 (1)	0.54
6	0.75 (2)	0.59	0.76 (2)	0.61	0.76 (2)	0.62
7	0.89 (99)	0.82	0.81 (100)	0.81	0.87 (100)	0.81
8	0.55 (88)	0.56	0.52 (93)	0.55	0.54 (96)	0.54

	$N = 120$		$N = 240$		$N = 360$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.87 (1)	0.64	0.94 (1)	0.73	0.95 (1)	0.75
2	0.91 (1)	0.75	0.96 (1)	0.77	0.97 (1)	0.77
3	0.86 (1)	0.62	0.93 (0)	0.68	0.94 (1)	0.69
4	0.87 (1)	0.69	0.92 (1)	0.70	0.95 (1)	0.71
5	0.88 (1)	0.62	0.97 (1)	0.72	0.99 (1)	0.75
6	0.79 (2)	0.65	0.82 (3)	0.69	0.84 (2)	0.71
7	– (100)	0.79	– (100)	0.80	– (100)	0.81
8	0.46 (99)	0.53	0.25 (100)	0.52	– (100)	0.53

Supplementary Table 8a. Hypothetical utilities with greater value for short response time for rectangles of Y_R = time to response and Y_T = time to toxicity. For each (Y_R, Y_T) rectangle, the two tabled values are $U^{(e)}$ = the hypothetical utility and $\hat{U}$ = the fitted parametric function evaluated at the rectangle's midpoint.

Y_T = Months	Y_R = Months to Response				
to Toxicity	[0, 1)	[1, 3)	[3, 6)	[6, 9)	[9, 12)
[9, 12)	95, 93.7	84, 82.3	66, 66.4	52, 51.2	40, 39.5
[6, 9)	88, 88.0	76, 76.6	62, 60.5	45, 45.3	32, 33.6
[3, 6)	80, 79.8	68, 68.3	52, 52.2	37, 36.9	24, 25.1
[1, 3)	72, 70.4	58, 58.9	42, 42.5	28, 27.1	16, 15.2
[0, 1)	64, 63.1	50, 51.5	34, 35.2	20, 19.7	8, 7.7

Supplementary Table 8b. Summary statistics and stopping percentages in the original (3-dose, 2-schedule) trial using hypothetical utilities with greater value for short response time. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and thus have a gray background.

	Actual Utility		*Hypothetical Utility*	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.82 (1)	0.54	0.93 (2)	0.67
2	0.85 (1)	0.75	0.72 (1)	0.67
3	0.81 (1)	0.54	0.88 (1)	0.63
4	0.80 (1)	0.69	0.71 (1)	0.63
5	0.74 (1)	0.54	0.84 (1)	0.62
6	0.76 (2)	0.62	0.74 (3)	0.51
7	0.87 (100)	0.81	0.16 (100)	0.33
8	0.54 (96)	0.54	0.34 (95)	0.53

Supplementary Table 9. Simulation results for the extended (4-dose, 3-schedule) trial. Under each scenario, $\bar{u}^{true}(s,d)$ denotes the expected utility of treating a patient with the combination (s,d).

			d				
Scenario	s		1	2	3	4	% none
1	1	$\bar{u}^{true}(s,d)$	52.2	54.8	57.5	62.9	1
$d=4$ *best*		% Sel (No. Pats.)	3% (7.3)	2% (4.8)	5% (4.5)	25% (7.5)	
	2	$\bar{u}^{true}(s,d)$	52.2	54.8	57.5	62.9	
		% Sel (No. Pats.)	3% (7.4)	2% (4.7)	4% (4.4)	23% (7.2)	
	3	$\bar{u}^{true}(s,d)$	52.2	54.8	57.5	62.9	
		% Sel (No. Pats.)	3% (7.3)	2% (4.7)	5% (4.5)	23% (7.3)	
2	1	$\bar{u}^{true}(s,d)$	59.0	56.3	53.7	48.1	0
$d=1$ *best*		% Sel (No. Pats.)	20% (12.7)	5% (5.6)	5% (3.4)	4% (2.3)	
	2	$\bar{u}^{true}(s,d)$	59.0	56.3	53.7	48.1	
		% Sel (No. Pats.)	19% (12.7)	5% (5.6)	5% (3.4)	4% (2.3)	
	3	$\bar{u}^{true}(s,d)$	59.0	56.3	53.7	48.1	
		% Sel (No. Pats.)	19% (12.7)	4% (5.5)	4% (3.4)	4% (2.3)	
3	1	$\bar{u}^{true}(s,d)$	53.1	55.8	58.4	63.9	1
$s=2$ *better*		% Sel (No. Pats.)	2% (7.2)	1% (4.6)	3% (4.4)	14% (6.8)	
high d better	2	$\bar{u}^{true}(s,d)$	56.8	59.4	62.1	67.6	
		% Sel (No. Pats.)	4% (7.4)	3% (4.8)	6% (4.7)	36% (8.1)	
	3	$\bar{u}^{true}(s,d)$	54.9	57.6	60.3	65.7	
		% Sel (No. Pats.)	3% (7.3)	2% (4.7)	4% (4.5)	22% (7.3)	
4	1	$\bar{u}^{true}(s,d)$	58.6	56.6	54.6	49.7	1
$s=1$ *better,*		% Sel (No. Pats.)	30% (12.8)	8% (5.7)	6% (3.5)	5% (2.3)	
low d better	2	$\bar{u}^{true}(s,d)$	55.4	53.4	51.4	46.5	
		% Sel (No. Pats.)	9% (12.5)	3% (5.5)	3% (3.4)	5% (2.2)	
	3	$\bar{u}^{true}(s,d)$	57.0	55.0	53.0	48.0	
		% Sel (No. Pats.)	17% (12.5)	5% (5.5)	4% (3.5)	4% (2.2)	

Supplementary Table 9, continued

Scenario	s		d = 1	2	3	4	% none
5	1	$\bar{u}^{true}(s,d)$	52.9	58.2	63.6	50.2	0
Inverted		% Sel (No. Pats.)	4% (7.4)	7% (6.9)	17% (6.7)	6% (3.1)	
V-shaped	2	$\bar{u}^{true}(s,d)$	52.9	58.2	63.6	50.2	
utility		% Sel (No. Pats.)	4% (7.4)	6% (6.8)	15% (6.7)	6% (3.0)	
	3	$\bar{u}^{true}(s,d)$	52.9	58.2	63.6	50.2	
		% Sel (No. Pats.)	4% (7.5)	6% (6.7)	18% (6.7)	6% (2.9)	
6	1	$\bar{u}^{true}(s,d)$	53.5	50.8	48.1	56.5	1
V-shaped		% Sel (No. Pats.)	12% (10.3)	3% (4.5)	3% (3.5)	17% (5.7)	
utility	2	$\bar{u}^{true}(s,d)$	53.5	50.8	48.1	56.5	
		% Sel (No. Pats.)	12% (10.4)	3% (4.3)	3% (3.4)	15% (5.6)	
	3	$\bar{u}^{true}(s,d)$	53.5	50.8	48.1	56.5	
		% Sel (No. Pats.)	11% (10.3)	2% (4.4)	3% (3.4)	16% (5.6)	
7	1	$\bar{u}^{true}(s,d)$	35.3	34.8	34.2	33.0	100
All (s,d)		% Sel (No. Pats.)	0% (3.6)	0% (1.2)	0% (0.4)	0% (0.1)	
too toxic	2	$\bar{u}^{true}(s,d)$	35.3	34.8	34.2	33.0	
		% Sel (No. Pats.)	0% (3.6)	0% (1.2)	0% (0.4)	0% (0.1)	
	3	$\bar{u}^{true}(s,d)$	35.3	34.8	34.2	33.0	
		% Sel (No. Pats.)	0% (3.6)	0% (1.2)	0% (0.4)	0% (0.1)	
8	1	$\bar{u}^{true}(s,d)$	39.9	38.8	37.8	35.6	94
Safe, but		% Sel (No. Pats.)	1% (3.8)	0% (2.5)	0% (2.3)	1% (3.0)	
no (s,d)	2	$\bar{u}^{true}(s,d)$	39.9	38.8	37.8	35.6	
acceptable		% Sel (No. Pats.)	1% (3.7)	0% (2.5)	0% (2.3)	1% (3.1)	
	3	$\bar{u}^{true}(s,d)$	39.9	38.8	37.8	35.6	
		% Sel (No. Pats.)	1% (3.8)	0% (2.5)	0% (2.3)	1% (3.0)	

Supplementary Table 10. Comparison of the summary statistics and stopping percentages for the hybrid selection method versus the greedy selection method in the extended (4-dose, 3-schedule) trial. The "balanced" method assigns the same number of patients (6) to each (schedule, dose) pair and has only one posterior computation at the end of the trial. Other simulation results for this extended trial used the hybrid method as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	Hybrid		Greedy		Balanced	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.79 (1)	0.45	0.78 (1)	0.37	0.84 (0)	0.43
2	0.77 (0)	0.78	0.78 (0)	0.85	0.76 (0)	0.57
3	0.76 (1)	0.47	0.74 (0)	0.41	0.80 (0)	0.45
4	0.73 (1)	0.71	0.74 (0)	0.77	0.72 (0)	0.56
5	0.64 (0)	0.51	0.55 (0)	0.44	0.70 (0)	0.45
6	0.73 (1)	0.58	0.72 (1)	0.59	0.80 (0)	0.49
7	0.99 (100)	0.86	0.98 (100)	0.90	0.98 (87)	0.56
8	0.52 (94)	0.58	0.51 (95)	0.62	0.18 (38)	0.56

Supplementary Table 11. Comparison of the summary statistics and stopping percentages for varying true time-to-event distributions of the extended (4-dose, 3-schedule) trial. Other simulation results for this extended trial used the Lognormal TTE distribution as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	Lognormal TTE		Gamma TTE		Weibull TTE		Uniform TTE	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.79 (1)	0.45	0.79 (1)	0.44	0.78 (1)	0.44	0.69 (1)	0.42
2	0.77 (0)	0.78	0.79 (0)	0.79	0.79 (0)	0.79	0.85 (1)	0.79
3	0.76 (1)	0.47	0.75 (0)	0.46	0.75 (0)	0.46	0.71 (1)	0.46
4	0.73 (1)	0.71	0.74 (0)	0.71	0.74 (0)	0.72	0.80 (1)	0.72
5	0.64 (0)	0.51	0.64 (0)	0.51	0.64 (0)	0.51	0.68 (0)	0.56
6	0.73 (1)	0.58	0.74 (1)	0.57	0.75 (1)	0.57	0.74 (3)	0.62
7	0.99 (100)	0.86	0.89 (100)	0.87	0.73 (100)	0.86	0.84 (96)	0.77
8	0.52 (94)	0.58	0.47 (94)	0.58	0.55 (95)	0.58	0.50 (97)	0.57

Supplementary Table 12a. Comparison of the summary statistics and stopping percentages for varying prior standard deviations $\tilde{\sigma}$ of the extended (4-dose, 3-schedule) trial. Other simulation results for this extended trial used $\tilde{\sigma} = 10$ as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	$\tilde{\sigma} = 8$		$\tilde{\sigma} = 10$		$\tilde{\sigma} = 12$		$\tilde{\sigma} = 14$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.79 (1)	0.44	0.79 (1)	0.45	0.77 (1)	0.44	0.74 (1)	0.43
2	0.76 (1)	0.77	0.77 (0)	0.78	0.80 (1)	0.79	0.81 (0)	0.80
3	0.77 (0)	0.47	0.76 (1)	0.47	0.72 (0)	0.45	0.72 (0)	0.46
4	0.73 (1)	0.72	0.73 (1)	0.71	0.76 (0)	0.72	0.77 (0)	0.72
5	0.65 (0)	0.50	0.64 (0)	0.51	0.63 (0)	0.51	0.62 (0)	0.52
6	0.72 (2)	0.57	0.73 (1)	0.58	0.74 (2)	0.57	0.74 (1)	0.57
7	0.89 (100)	0.88	0.99 (100)	0.86	0.80 (100)	0.86	0.93 (100)	0.86
8	0.48 (95)	0.58	0.52 (94)	0.58	0.52 (94)	0.58	0.47 (94)	0.58

Supplementary Table 12b. Summary statistics and stopping percentages for varying priors of $\gamma_{m,j}$ in terms of the beta distribution parameters, or the equivalent 95% probability intervals within the $[0, 2]$ domain. Other simulation results for the extended (4-dose, 3-schedule) trial used beta parameters $(47.3, 47.3)$ as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

Parameters	$(191, 191)$		$(47.3, 47.3)$		$(20.6, 20.6)$		$(11.3, 11.3)$	
95% interval	$(0.9, 1.1)$		$(0.8, 1.2)$		$(0.7, 1.3)$		$(0.6, 1.4)$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.79 (3)	0.44	0.79 (1)	0.45	0.80 (1)	0.45	0.80 (1)	0.45
2	0.79 (0)	0.79	0.77 (0)	0.78	0.78 (0)	0.78	0.77 (0)	0.78
3	0.74 (0)	0.46	0.76 (1)	0.47	0.76 (0)	0.47	0.77 (1)	0.47
4	0.74 (1)	0.72	0.73 (1)	0.71	0.73 (0)	0.71	0.74 (1)	0.71
5	0.65 (0)	0.52	0.64 (0)	0.51	0.62 (0)	0.50	0.60 (0)	0.50
6	0.74 (2)	0.57	0.73 (1)	0.58	0.74 (1)	0.57	0.75 (2)	0.58
7	0.83 (100)	0.87	0.99 (100)	0.86	0.99 (100)	0.87	0.98 (100)	0.86
8	0.49 (95)	0.58	0.52 (94)	0.58	0.53 (94)	0.58	0.52 (95)	0.59

Supplementary Table 13. Comparison of the summary statistics and stopping percentages for varying cohort sizes in the extended (4-dose, 3-schedule) trial. Other simulation results for this extended trial used cohort size 2 as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	cohort = 1		*cohort* = 2		*cohort* = 3	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.82 (6)	0.54	0.79 (1)	0.45	0.76 (0)	0.36
2	0.80 (5)	0.74	0.77 (0)	0.78	0.76 (0)	0.82
3	0.78 (5)	0.53	0.76 (1)	0.47	0.73 (0)	0.40
4	0.75 (4)	0.68	0.73 (1)	0.71	0.72 (0)	0.74
5	0.67 (3)	0.53	0.64 (0)	0.51	0.59 (0)	0.49
6	0.77 (12)	0.62	0.73 (1)	0.58	0.73 (0)	0.54
7	0.99 (100)	0.79	0.99 (100)	0.86	0.94 (100)	0.89
8	0.50 (97)	0.62	0.52 (94)	0.58	0.46 (90)	0.57

Supplementary Table 14. Comparison of the summary statistics and stopping percentages for varying sample sizes N with cohort 2 in the extended (4-dose, 3-schedule) trial. Other simulation results for this extended trial used $N = 72$ as default. Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and have a gray background.

	$N = 72$		$N = 120$		$N = 240$		$N = 360$	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.79 (1)	0.45	0.86 (1)	0.58	0.92 (1)	0.68	0.95 (1)	0.71
2	0.77 (0)	0.78	0.84 (0)	0.77	0.89 (0)	0.76	0.92 (0)	0.78
3	0.76 (1)	0.47	0.83 (1)	0.57	0.89 (1)	0.64	0.91 (0)	0.66
4	0.73 (1)	0.71	0.79 (0)	0.70	0.86 (0)	0.71	0.88 (1)	0.71
5	0.64 (0)	0.51	0.77 (0)	0.58	0.89 (0)	0.68	0.92 (1)	0.72
6	0.73 (1)	0.58	0.77 (1)	0.62	0.81 (2)	0.66	0.83 (2)	0.68
7	0.99 (100)	0.86	– (100)	0.87	– (100)	0.87	– (100)	0.85
8	0.52 (94)	0.58	0.59 (99)	0.57	0.00 (100)	0.56	– (100)	0.57

Supplementary Table 15. Summary statistics and stopping percentages in the extended (4-dose, 3-schedule) trial using hypothetical utilities with greater value for short response time (Supplementary Table 8a). Each number in parentheses after R_{select} is the percentage of times the trial was stopped with no (schedule, dose) selected. The R_{select} values for scenarios 7 and 8 with no acceptable treatment are less relevant and thus have a gray background.

	Actual Utility		*Hypothetical Utility*	
Scenario	R_{select}	R_{treat}	R_{select}	R_{treat}
1	0.79 (1)	0.45	0.91 (1)	0.58
2	0.77 (0)	0.78	0.62 (0)	0.69
3	0.76 (1)	0.47	0.85 (0)	0.67
4	0.73 (1)	0.71	0.66 (1)	0.65
5	0.64 (0)	0.51	0.75 (0)	0.56
6	0.73 (1)	0.58	0.74 (2)	0.44
7	0.99 (100)	0.86	0.11 (100)	0.27
8	0.52 (94)	0.58	0.35 (95)	0.55