

Supplementary Material

Varying Sample Size

Table 1: Total Sample Size n= 54

n = 54	Group 1				Group 2				Group 3			
$R(d_k)$	0.15	0.25	0.35	0.45	0.05	0.15	0.25	0.35	0.05	0.15	0.25	0.35
Prop. MTD Selection	0.251	0.467	0.257	0.025	0.020	0.300	0.524	0.156	0.000	0.182	0.505	0.313
$R(d_k)$	0.25	0.35	0.45	0.55	0.25	0.35	0.45	0.55	0.05	0.15	0.25	0.35
Prop. MTD Selection	0.756	0.223	0.020	0.001	0.563	0.342	0.087	0.008	0.033	0.375	0.478	0.114

Table 2: Total Sample Size n= 63

n = 63	Group 1				Group 2				Group 3			
$R(d_k)$	0.22	0.33	0.42	0.52	0.05	0.17	0.27	0.37	0.03	0.12	0.24	0.40
Prop. MTD Selection	0.490	0.404	0.097	0.009	0.035	0.360	0.517	0.088	0.000	0.190	0.634	0.176
$R(d_k)$	0.25	0.40	0.54	0.66	0.11	0.26	0.41	0.55	0.03	0.10	0.25	0.40
Prop. MTD Selection	0.699	0.293	0.008	0.000	0.226	0.561	0.205	0.008	0.006	0.305	0.566	0.123

Varying Patient Accrual Rate

Table 3: One patient is accrued every 0.4 months

Accrual Rate = 0.4	Group 1				Group 2				Group 3			
$R(d_k)$	0.25	0.35	0.45	0.55	0.25	0.35	0.45	0.55	0.05	0.15	0.25	0.35
Prop. MTD Selection	0.698	0.247	0.054	0.001	0.502	0.350	0.130	0.018	0.067	0.392	0.417	0.124

Table 4: One patient is accrued every 0.66 months

Accrual Rate = 0.66	Group 1				Group 2				Group 3			
$R(d_k)$	0.25	0.35	0.45	0.55	0.25	0.35	0.45	0.55	0.05	0.15	0.25	0.35
Prop. MTD Selection	0.706	0.250	0.043	0.001	0.508	0.353	0.130	0.009	0.057	0.410	0.390	0.143

Varying Target DLT Rate

Table 5: Target DLT Rate set at 0.30

$\Theta = 0.30$	Group 1				Group 2				Group 3			
$R(d_k)$	0.10	0.30	0.45	0.69	0.05	0.15	0.30	0.45	0.05	0.15	0.30	0.45
Prop. MTD Selection	0.208	0.528	0.253	0.011	0.014	0.272	0.553	0.161	0.000	0.134	0.555	0.311
$R(d_k)$	0.30	0.45	0.56	0.70	0.15	0.30	0.45	0.56	0.05	0.14	0.30	0.45
Prop. MTD Selection	0.660	0.297	0.042	0.001	0.255	0.461	0.264	0.020	0.014	0.263	0.572	0.151

Patient Allocation and Proportions of DLTs

Table 6: The average patient allocation and proportion of DLTs for each dose across the 7 scenarios used in the simulation study.

		Group 1				Group 2				Group 3			
Scenario		d_1	d_2	d_3	d_4	d_1	d_2	d_3	d_4	d_1	d_2	d_3	d_4
1	$R(d_k)$	0.05	0.15	0.25	0.35	0.05	0.15	0.25	0.35	0.05	0.15	0.25	0.35
	Avg. Patient Allocation	2.494	3.312	3.348	2.965	1.146	2.844	3.862	4.092	0.569	1.990	3.961	5.417
	Prop. of DLT	0.052	0.144	0.248	0.356	0.039	0.146	0.267	0.352	0.056	0.144	0.250	0.352
2	$R(d_k)$	0.15	0.25	0.35	0.45	0.05	0.15	0.25	0.35	0.05	0.15	0.25	0.35
	Avg. Patient Allocation	3.966	3.295	2.546	2.241	1.575	3.104	3.673	3.560	0.849	2.322	4.120	4.749
	Prop. of DLT	0.159	0.245	0.348	0.455	0.052	0.154	0.253	0.367	0.042	0.156	0.251	0.345
3	$R(d_k)$	0.22	0.33	0.42	0.52	0.05	0.17	0.27	0.37	0.03	0.12	0.24	0.40
	Avg. Patient Allocation	5.245	3.226	1.907	1.734	1.851	3.493	3.592	3.001	0.908	2.840	4.206	3.997
	Prop. of DLT	0.228	0.326	0.424	0.506	0.045	0.172	0.270	0.363	0.029	0.121	0.235	0.406
4	$R(d_k)$	0.13	0.27	0.45	0.55	0.16	0.26	0.36	0.46	0.05	0.15	0.25	0.35
	Avg. Patient Allocation	5.038	3.528	1.886	1.612	2.915	3.599	2.965	2.394	1.086	2.901	4.085	3.991
	Prop. of DLT	0.131	0.272	0.436	0.555	0.168	0.274	0.368	0.447	0.047	0.163	0.259	0.343
5	$R(d_k)$	0.22	0.32	0.40	0.52	0.15	0.24	0.33	0.43	0.05	0.15	0.25	0.40
	Avg. Patient Allocation	5.569	3.121	1.844	1.597	2.965	3.496	3.044	2.513	1.219	3.051	3.973	3.608
	Prop. of DLT	0.217	0.325	0.397	0.531	0.158	0.232	0.335	0.427	0.043	0.155	0.261	0.397
6	$R(d_k)$	0.25	0.35	0.45	0.55	0.25	0.35	0.45	0.55	0.05	0.15	0.25	0.35
	Avg. Patient Allocation	7.062	2.567	1.258	1.223	4.716	3.253	2.329	1.752	1.760	3.389	3.772	2.919
	Prop. of DLT	0.256	0.344	0.449	0.561	0.249	0.345	0.438	0.540	0.053	0.156	0.261	0.346
7	$R(d_k)$	0.24	0.40	0.54	0.66	0.11	0.26	0.41	0.55	0.03	0.10	0.25	0.40
	Avg. Patient Allocation	7.030	2.721	1.284	1.140	3.605	3.870	2.653	1.836	1.410	3.546	4.146	2.759
	Prop. of DLT	0.239	0.418	0.537	0.644	0.114	0.261	0.416	0.546	0.034	0.098	0.254	0.403

Table 7: Proportion of average patient allocation to doses below, at, and above the MTD for each group across the 7 scenarios.

Scenario	Group 1			Group 2			Group 3		
	Below MTD	At MTD	Above MTD	Below MTD	At MTD	Above MTD	Below MTD	At MTD	Above MTD
1	0.479	0.276	0.244	0.334	0.323	0.342	0.214	0.332	0.454
2	0.329	0.273	0.397	0.393	0.308	0.299	0.263	0.342	0.394
3	0.000	0.433	0.567	0.448	0.301	0.251	0.314	0.352	0.334
4	0.418	0.292	0.289	0.245	0.303	0.451	0.331	0.338	0.331
5	0.000	0.459	0.541	0.247	0.291	0.462	0.360	0.335	0.304
6	0.000	0.583	0.417	0.000	0.391	0.608	0.435	0.319	0.246
7	0.000	0.577	0.422	0.301	0.323	0.375	0.418	0.350	0.233

Additional Simulation Scenarios

Table 8: Distribution of MTD Selection across 4 randomly simulated dose-toxicity curves.

Scenario	Group 1					Group 2				Group 3			
		d_1	d_2	d_3	d_4	d_1	d_2	d_3	d_4	d_1	d_2	d_3	d_4
1	$R(d_k)$	0.222	0.377	0.422	0.559	0.027	0.266	0.344	0.479	0.129	0.157	0.263	0.322
	Prop. MTD Selection	0.580	0.324	0.089	0.007	0.160	0.483	0.313	0.044	0.055	0.371	0.395	0.179
2	$R(d_k)$	0.007	0.236	0.586	0.757	0.002	0.051	0.175	0.222	0.007	0.071	0.104	0.243
	Prop. MTD Selection	0.112	0.587	0.291	0.010	0.001	0.080	0.313	0.606	0.000	0.031	0.212	0.757
3	$R(d_k)$	0.254	0.288	0.378	0.456	0.044	0.124	0.254	0.530	0.042	0.085	0.125	0.252
	Prop. MTD Selection	0.360	0.372	0.231	0.037	0.051	0.334	0.469	0.146	0.005	0.123	0.379	0.493
4	$R(d_k)$	0.095	0.234	0.395	0.712	0.199	0.218	0.314	0.442	0.044	0.058	0.101	0.212
	Prop. MTD Selection	0.212	0.513	0.254	0.021	0.119	0.358	0.360	0.163	0.004	0.059	0.289	0.648

Table 9: Percentage of trials that stopped for safety and the average number of patients accrued across 1000 simulated trials (Yin, Guosheng. Clinical trial design: Bayesian and frequentist adaptive methods, p.93), using $\epsilon = 0.9$.

Group 1					Group 2				Group 3				% of stopped Trials (Avg. # pts accrued)	
Scenario	d_1	d_2	d_3	d_4	d_1	d_2	d_3	d_4	d_1	d_2	d_3	d_4	-	
1	$R(d_k)$	0.40	0.50	0.60	0.70	0.25	0.35	0.45	0.55	0.15	0.25	0.35	0.45	73.2% (21.347)
	Avg. Patient Allocation	4.078	1.355	0.723	0.810	2.374	1.991	1.549	1.252	1.072	1.935	2.558	1.650	-
	Prop. of DLT	0.402	0.494	0.600	0.690	0.254	0.342	0.462	0.551	0.171	0.268	0.346	0.443	-
2	$R(d_k)$	0.52	0.63	0.74	0.85	0.15	0.25	0.35	0.45	0.15	0.25	0.35	0.45	83.6% (19.48)
	Avg. Patient Allocation	3.826	1.155	0.644	0.780	1.662	1.966	1.596	1.284	0.864	1.747	2.432	1.524	-
	Prop. of DLT	0.531	0.652	0.745	0.857	0.144	0.242	0.361	0.454	0.156	0.259	0.354	0.441	-