Figure 1. Dose response curves for three scenarios

Chart, line chart

Description automatically generated

Dose response curves for toxicity (blue), efficacy (purple), and utility (red). True MTD and MED are noted on two curves, respectively.

Table 1. DLT rates/Average NETS utility under each design for the 3 scenarios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | S1: Extremely Good | S2: Moderate | S3: Extremely Bad |
| DLT rates | EWOC | 0.17 | 0.16 | 0.21 |
| EWOUC-comp | 0.10 | 0.08 | 0.32 |
| EWOUC-NW | 0.15 | 0.15 | 0.32 |
| EWOUC-DA | 0.11 | 0.10 | 0.31 |
| Average NETS | EWOUC-NETS | 0.04 | 0.05 | 0.39 |

Table 2. Expected utility under each design for the 3 scenarios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | S1: Extremely Good | S2: Moderate | S3: Extremely Bad |
| Expected Utility | EWOC | 0.21 | -0.04 | -0.54 |
| EWOUC-comp | 0.28 | 0.10 | -0.85 |
| EWOUC-NW | 0.26 | 0.00 | -0.86 |
| EWOUC-DA | 0.28 | 0.08 | -0.82 |
| EWOUC-NETS | 0.63 | 0.21 | -0.36 |

Table 3. Dose recommendation percentage of each dose level for 4 designs under 3 scenarios.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S1: Extremely Good** | **Dose Level** | | | | | |
| **1** | **2** | **3** | **4** | **5** | None |
| Probability of DLT/NETS | 0.03 | 0.07 | 0.14 | 0.28 | 0.48 | NA |
| Probability of Efficacy | 0.08 | 0.3 | 0.68 | 0.91 | 0.98 | NA |
| Utility | 0.05 | 0.23 | 0.53 | 0.63 | 0.50 | NA |
| EWOC | 0.20 | 0.60 | 3.50 | 50.30 | 45.40 | 0.00 |
| EWOUC-NW | 0.00 | 0.90 | 49.60 | 47.30 | 0.80 | 1.40 |
| EWOUC-DA | 0.10 | 0.90 | 72.30 | 25.90 | 0.10 | 0.70 |
| EWOUC-Comp | 0.00 | 1.40 | 91.90 | 6.10 | 0.10 | 0.50 |
| EWOUC-NETS | 0.00 | 0.00 | 26.90 | 72.70 | 0.40 | 0.00 |
| **S2: Moderate** | **Dose Level** | | | | | |
| **1** | **2** | **3** | **4** | **5** | None |
| Probability of DLT/NETS | 0.03 | 0.06 | 0.11 | 0.2 | 0.33 | NA |
| Probability of Efficacy | 0.08 | 0.16 | 0.30 | 0.49 | 0.68 | NA |
| Utility | 0.05 | 0.09 | 0.16 | 0.21 | 0.20 | NA |
| EWOC | 0.10 | 0.20 | 0.10 | 26.00 | 73.60 | 0.00 |
| EWOUC-NW | 0.00 | 0.00 | 3.40 | 54.90 | 40.60 | 1.10 |
| EWOUC-DA | 0.00 | 0.00 | 9.90 | 67.00 | 22.70 | 0.40 |
| EWOUC-Comp | 0.00 | 0.10 | 28.50 | 67.90 | 2.60 | 0.90 |
| EWOUC-NETS | 0.00 | 0.00 | 11.70 | 83.00 | 5.30 | 0.00 |
| **S3: Extremely Bad** | **Dose Level** | | | | | |
| **1** | **2** | **3** | **4** | **5** | None |
| Probability of DLT/NETS | 0.03 | 0.48 | 0.96 | 0.99 | 1 | NA |
| Probability of Efficacy | 0.08 | 0.11 | 0.16 | 0.22 | 0.3 | NA |
| Utility | 0.05 | -0.36 | -0.80 | -0.77 | -0.7 | NA |
| EWOC | 53.40 | 42.70 | 3.90 | 0.00 | 0.00 | 0.00 |
| EWOUC-NW | 0.10 | 0.40 | 0.10 | 0.00 | 0.00 | 99.40 |
| EWOUC-DA | 0.10 | 3.00 | 0.50 | 0.00 | 0.00 | 96.40 |
| EWOUC-Comp | 0.10 | 1.60 | 0.20 | 0.00 | 0.00 | 98.10 |
| EWOUC-NETS | 1.30 | 6.30 | 0.10 | 0.00 | 0.00 | 92.40 |

Table 4. Percentage of patients treated at each dose level for the 4 designs under 5 scenarios

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S1: Extremely Good** | **Dose Level** | | | | |
| **1** | **2** | **3** | **4** | **5** |
| EWOC | 8.80 | 11.96 | 20.83 | 40.46 | 17.95 |
| EWOUC-NW | 8.59 | 10.86 | 28.94 | 46.36 | 5.26 |
| EWOUC-DA | 8.81 | 12.77 | 56.13 | 22.25 | 0.04 |
| EWOUC-Comp | 8.70 | 13.32 | 73.01 | 4.95 | 0.03 |
| EWOUC-NETS | 8.33 | 8.44 | 31.27 | 51.78 | 0.18 |
| **S2: Moderate** | **Dose Level** | | | | |
| **1** | **2** | **3** | **4** | **5** |
| EWOC | 8.62 | 10.00 | 11.37 | 33.51 | 36.51 |
| EWOUC-NW | 8.48 | 10.67 | 12.07 | 40.17 | 28.62 |
| EWOUC-DA | 8.56 | 10.24 | 25.11 | 47.37 | 8.72 |
| EWOUC-Comp | 8.53 | 10.52 | 29.43 | 47.73 | 3.78 |
| EWOUC-NETS | 8.33 | 8.47 | 24.63 | 57.36 | 1.22 |
| **S3: Extremely Bad** | **Dose Level** | | | | |
| **1** | **2** | **3** | **4** | **5** |
| EWOC | 48.18 | 47.02 | 4.80 | 0.00 | 0.00 |
| EWOUC-NW | 30.82 | 53.78 | 15.40 | 0.00 | 0.00 |
| EWOUC-DA | 28.59 | 59.74 | 11.67 | 0.00 | 0.00 |
| EWOUC-Comp | 30.30 | 55.61 | 14.09 | 0.00 | 0.00 |
| EWOUC-NETS | 26.28 | 68.66 | 5.06 | 0.00 | 0.00 |

Table 5. Simulation results (1000 replicates) of the trial designed with the EWOUC-NETS.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dose Level | 1 | 2 | 3 | 4\* | 5 |
| BKM120 (mg) | 20 | 40 | 60 | 80 | 100 |
| Everolimus (mg) | 10 | 10 | 10 | 10 | 10 |
| Expected NETS | 0.03 | 0.07 | 0.14 | 0.28 | 0.48 |
| Expected Efficacy | 0.08 | 0.3 | 0.68 | 0.91 | 0.98 |
| Utility | 0.05 | 0.23 | 0.54 | 0.63 | 0.50 |
| Patient distribution | 9.37 | 9.50 | 31.50 | 49.42 | 0.21 |
| Final dose recommendation | 0.00 | 0.00 | 16.90 | 82.50 | 0.60 |

\*: The true OUD is dose level 4.

Table 6. Expected time for a trial (months) under different assessment time periods and mean inter-cohort arrival times for 12 cohorts under scenario 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean Inter-arrival time (Month) | Assessment Period (Month) | EWOC-NETS-Comp (Month) | EWOUC-NETS-NW (Month) | Change |
| 0.25 | 3 | 28.05 | 5.99 | -78.65% |
| 0.5 | 3 | 28.27 | 8.98 | -68.23% |
| 1 | 3 | 28.36 | 14.96 | -47.25% |
| 2 | 3 | 34.65 | 26.92 | -22.31% |
| 3 | 3 | 42.37 | 38.88 | -8.24% |