3+3 Design

The 3+3 design implemented here aims to find the MTD at which no more than 1/6 patients has DLT, based on the following dose escalation/de-escalation rule:

- If 0/3 patient has DLT, escalate the dose;
- if 1/3 patient has DLT, treat 3 more patients at the same dose;
- if 2/3 patients have DLT, deescalate the dose, or select the next lower dose as the MTD if 6 patients have been treated at that dose.
- If 0/6 or 1/6 patients has DLT, escalate the dose;
- if 2/6 patients have DLT, deescalate the dose, or select the next lower dose as the MTD if 6 patients have been treated at that dose.

The sample size of the 3+3 design is random, while the sample size of BOIN design is prespecified. Checking the box "Match maximum sample size between BOIN and 3+3" will give two options to match the sample size between the two designs.

- Perform cohort expansion on 3+3 to match BOIN: perform cohort expansion (i.e., treat additional patients) at the MTD selected by the 3+3 design such that the total sample size of the 3+3 design (plus cohort expansion) matches that of the BOIN. This sample size matching is applicable only when both designs complete the trial and select the MTD.

- Match the maximum sample size of BOIN to 3+3: match the maximum sample size of BOIN to that of 3+3. For example, if the number of patients using 3+3 is n_{33}, then the number of cohort used for BOIN design will be determined as $\lceil n_{33}/cohortsize \rceil$.

Because the 3+3 and iBOIN often have different percentages of simulated trials stopped due to the use of different stopping rules, the average total sample size in simulation results may be slightly different between two designs even after the sample size matching.