

**The DEsign and conDUCt of dose Escalation trials (DEDUCE) platform - a unified resource for clinical investigators and statisticians to design and conduct more efficient and more accurate phase 1 trials.**

Overview

The DEDUCE platform is an interactive, web-based resource to design and conduct phase 1 dose escalation trials using rule-based and Bayesian adaptive designs. Our goal in developing this application is to raise awareness, educate, and provide open access to investigators for alternative, improved methods and tools to design and conduct phase 1 dose escalation trials.

DEDUCE Modules:

* **Trial Design**

Users can specify and compare the operating characteristics for hypothetical phase 1 designs through trial simulations, and select an optimal design for the needs of the trial.

* **Trial Conduct**

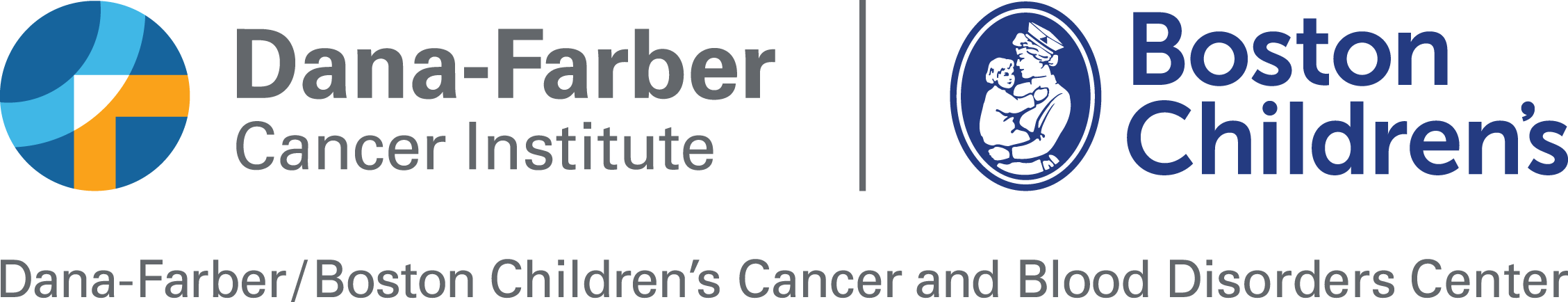
Users can implement the adaptive trial, and determine the recommended dose level each time a new patient enrolls.

Available Designs:

* Continual Reassessment Method (CRM) [O'Quigley et al. Biometrics, 1990]
* TARGETed-agent Continual Reassessment Method (TARGET-CRM)
* 3+3 [Storer. Biometrics, 1989]

Key Features of DEDUCE:

* Permits simultaneous comparison of multiple trial designs for the same set of simulation parameters
* Dynamically generates a written report summarizing simulation results

[[](https://www.danafarberbostonchildrens.org/)](https://www.danafarberbostonchildrens.org/" \t "_blank)￼[](https://hms.harvard.edu/)

|  |  |
| --- | --- |
|  | 1. For “Designs” parameter, please re-order options:   **3+3 CRM TARGET-CRM**   1. Replace text: “**Number of Dose Levels**” 2. In help text for dose level labels, there is a typo in “sep**a**rated” 3. For Target Toxicity Probability help text, revise to: “Please enter the true toxicity probabilities for each dose level **(separated by commas)**. Toxicity probabilities must increase with each subsequent dose level. 4. Start Dose Level: Can the drop-down menu reflect the dose level labels entered in the previous input? 5. Number of simulated trials -> please use increments of 100 for the slider. 6. Target toxicity probability -> please use increments of 0.01 rather than 0.1 for the slider. For example, I select use a toxicity probability of 0.25 currently. 7. Proportion of Patients from Cohort B -> please use increments of 0.01 rather than 0.1 for the slider. 8. Revise text for Prior Toxicity Probability Vector: “Please enter the true toxicity probabilities for each dose level **(separated by commas)**. Toxicity probabilities must increase with each subsequent dose level.” |
|  |  |

|  |  |
| --- | --- |
|  | 1. Replace text: Patient enrollment rate: “**Average Time (in Days) Between Patient Enrollments**” 2. Revise text: “Duration of DLT Observation Period **(in Days)**” 3. The “Proportion of Patients from Cohort B” parameter should only pop up when the TARGET-CRM design is selected. Use fixed Cohort B proportion = 0 when 3+3 or/and CRM are selected. 4. Revise help text for Proportion of Patients from Cohort B: “**Patients belong to either Cohort A (general enrollment) or Cohort B (enrichment cohort).** Please enter the proportion of enrolled patients belonging to Cohort B. **Enter a proportion of 0 if no enrichment cohort is needed.**” 5. Revise help text for Minimum enrollment of Cohort B patients (Optional): **“An optional feature is to require a trial to enroll a minimum number of Cohort B patients. Once the maximum N is attained, enrollment of Cohort A patients will be suspended and only Cohort B patients may enroll until the minimum number has been attained. Please enter the minimum number of Cohort B patients to be enrolled in a trial. Enter 0 if no minimum number is required.”** |

## Design tab: Input Parameters

The input parameters should be **reordered** and **grouped into three “tiers”**.

1. **Tier 1: Input parameters for all designs (3+3, TARGET-CRM, CRM)**
   1. Designs
   2. Number of Dose Levels
   3. Dose Level Labels
   4. Starting Dose Level
   5. Number of Simulated Trials
   6. Target Toxicity Probability
   7. True Toxicity Probability Vector
   8. Patient Enrollment Rate
   9. Duration of DLT Observation Period
2. **Tier 2: Input parameters for TARGET-CRM and CRM only**
   1. Prior Toxicity Probability Vector
   2. Maximum Sample Size
   3. Cohort Size
3. **Tier 3: Input parameters for TARGET-CRM ONLY**
   1. Proportion of Patients from Cohort B (TARGET-CRM only)
   2. Minimum Enrollment of Cohort B Patients (Optional)

### Functional requirements:

1. Tier 1 parameters should always be present, regardless of design selected.
2. Tier 2 parameters should be present ONLY IF CRM or TARGET-CRM is selected.
3. Tier 3 parameters should be present ONLY IF TARGET-CRM is selected.