

# A Bayesian Dose De-escalating Design With Stratified Minimax Regret

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**Abstract:** We propose a method to allocate patients in a Bayesian dose de-escalating design. The starting point is a positive POC study, which provided evidence of efficacy for the maximal tolerated dose (MTD). The objective of the dose-finding study is to identify a dose lower or equal to the MTD which is almost as effective as the MTD, with a small number of patients, in which we want to allocate as few patients as possible to ineffective doses.

A parametric class of models describes the time course of the drug effect; we determine two optimal threshold values  $(\delta_1^*, \delta_2^*) \in [0, 1]^2$  for the decision to allocate the next patient to either the current dose, a lower dose or to stop the de-escalation based on the comparison of the posterior probability  $q$  that the current dose is effective enough, with these threshold values. The optimal parameters  $(\delta_1^*, \delta_2^*)$  are derived by simulations over a set of scenario and designs, using a stratified minimax regret criterion.

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