# CROSSOVER EXPERIMENTS PROTECTED AGAINST SUBJECT DROPOUT

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We consider balanced crossover designs with at least three periods, and assume the standard additive model with first-order carryover effects. The objective is to estimate contrasts between the direct treatment effects and to estimate contrasts between the carryover treatment effects. When the experiment is executed there is a risk that, for reasons unrelated to the treatments received, some subjects may fail to complete their treatment sequences. This can result in a disconnected design: there are some contrasts which cannot be estimated. We show that initial designs satisfying a simple condition are protected against becoming disconnected under certain reasonable assumptions about subject dropout. We demonstrate the construction of balanced designs satisfying this simple condition, and suggest how current common practice can be altered in a straightforward way to incorporate this condition.