

Introduction

- Reducing amount of time spent driving from home to work can help maximize productivity in the work place.
- Compare designs to determine the optimal driving route from Dr. Gajewski's home to his work place at KUMC.
- Three route option: Plaza (control), Rainbow, Stateline.

Groups

- Fixed
 - RAR, lower interims
 - RAR, arm dropping
 - RAR, higher interims
 - RAR, no fixed allocation to Control
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- **All designs considered Independent dose model.*

Fixed Design

- Continuous recruiting.
- Dropout rate 0.1.
- 1:1:1 fixed allocation.
- No interims, final analysis at 33.
- Delta is about -1 minute.
- Zero type I error rate.
- Changed the continuous to deterministic.
- Use externally predefined accrual file from the 'DIAS' group.
- Changed dropout rate to 0.

Design: RAR, lower interims

- Deterministic accrual.
- Final endpoint = 0.01 weeks.
- No dropout rate.
- Externally predefined accrual file.
- Burn-in allocation ratio: 2:1:1 then RAR.
- 25% allocation to the control.
- Block size = 4
- Interims 3 at 8,16,24 and final analysis at 33.

Design: RAR, arm dropping

- Arm dropping.
- One interim at 15 and final analysis at 33.
- Only futility criteria.
- Optimistic prior.

Design: RAR, higher interims

- Continuous recruitment.
- Weeks means days.
- Dropout rate 0.05.
- Burn-in allocation ratio 2:2:2.
- Interims 2 at 12, 24 and final analysis at 33.
- Block size = 6
- Optimistic prior.

Design: RAR, no fixed allocation to Control

- Deterministic accrual.
- Final endpoint 0.01 weeks.
- No dropout rate.
- Burn-in allocation ratio 4:3:3 then RAR.
- 40% allocation to the control.
- Block size = *10*
- Interims *5* at *10,15,20,25,30* and final analysis at 33.

Initial Designs & Results

Design Type	Number of Interims (at N drives) ¹	Early Stopping Criteria	Final Criteria	Scenario (effect sizes)	Mean N Drives	Type 1 Error Rate/Power
Fixed	0	None	Success	Null	33.0	0.025
				Expected	33.0	0.978
				Best	33.0	0.934
RAR, lower interims	3 (8, 16, 24)	Futility and Success	Success	Null	23.6	0.024
				Expected	23.6	0.980
				Best	25.1	0.944
RAR, arm dropping	1 (15)	Futility	Futility and Success	Null	30.5	0.023
				Expected	32.9	0.987
				Best	32.9	0.932
RAR, higher interims	5 (10,15,20,25,30)	Futility and Success	Success	Null	25.6	0.020
				Expected	22.5	0.978
				Best	24.1	0.935
RAR, no fixed allocation to Control	5 (10,15,20,25,30)	Futility and Success	Success	Null	25.7	0.026
				Expected	24.3	0.902
				Best	25.4	0.886

¹All bolded N values represent when we start to evaluate the early stopping rules.

Final Design: RAR, lower interims

- Best operating statistics.
- Less interim analysis.
- The power of the one best scenario is 94.4%, which is superior to any other design's power.
- The expected number of drives under all scenarios are the smallest (23.546, 23.587, and 25.113), which reduces the trial duration.