First accrual within 70 days of opening predicts overall trial accrual success

Kevin Hoy[1], PhD.; Lydia Masar, BA[1]; Aaron T. Gerds[2], MD, MS; Josephine Chan[3], PhD.; Kate McCaffrey[2], MBA; Emily Worthing[1], MBA; Fearon Arnold[1], BS; Megan Kilbane[2], MBA; H. John Poundardjian[1], MBA

Affiliations: 1) Case Comprehensive Cancer Center 2) Cleveland Clinic Foundation 3) University Hospitals Cleveland

Background

Low- and non-accruing trials consume limited resources while generating little meaningful output, resulting in increased costs and translational timeline for new biomedical discoveries. Comprehensive cancer centers normally use a reactive approach when addressing these studies. Trials that do not accrue at an acceptable rate are flagged for low accrual at six or twelve-month intervals. This process requires lengthy follow-up and is based on the goals that the study team self-reports during startup. This inefficient model of monitoring is time intensive and keeps low-accruing studies open for months before poor performance is discovered and mitigated.

In this project we looked to develop a straightforward early predictor of accrual success through the duration of a study. Previously, multifactorial methods to predict and characterize low-accruing protocols have been described (Bennette 2015; Tang 2017). We aimed to develop a simple, predictive metric that could identify unsuccessful clinical trials earlier in the study's life cycle. Here we examined all interventional trials from 2007-Q1 2023. Our hypothesis was that trials that accrued the first participant in 70 days or less would be significantly more likely to reach their accrual goals.

Conclusions

- Studies that accrue their first participant within 70 days of open to accrual had statistically higher overall accrual.

- This observation was also statistically different in : Early Phase I, Phase II, Phase III, and National Group protocols.

- This simple predictor could change the way accrual monitoring is performed.

	Within Seventy days (N=953)	Beyond Seventy days (N=1258)	Overall (N=2211)
Phase			
Pilot	20 (2.1%)	13 (1.0%)	33 (1.5%)
Early Phase I	7 (0.7%)	16 (1.3%)	23 (1.0%)
Phase I	169 (17.7%)	166 (13.2%)	335 (15.2%)
Phase I/II	107 (11.2%)	132 (10.5%)	239 (10.8%)
Phase I/III	0 (0%)	1 (0.1%)	1 (0.0%)
Phase II	330 (34.6%)	474 (37.7%)	804 (36.4%)
Phase II/III	27 (2.8%)	33 (2.6%)	60 (2.7%)
Phase III	217 (22.8%)	344 (27.3%)	561 (25.4%)
Phase IV	5 (0.5%)	5 (0.4%)	10 (0.5%)
N/A	71 (7.5%)	74 (5.9%)	145 (6.6%)
Protocol_Type			
Device Feasibility	1 (0.1%)	0 (0%)	1 (0.0%)
Diagnostic	25 (2.6%)	15 (1.2%)	40 (1.8%)
Prevention	7 (0.7%)	18 (1.4%)	25 (1.1%)
Screening	8 (0.8%)	6 (0.5%)	14 (0.6%)
Supportive Care	64 (6.7%)	91 (7.2%)	155 (7.0%)
Treatment	848 (89.0%)	1128 (89.7%)	1976 (89.4%)
Sponsor_Type			
Externally Peer-Reviewed	35 (3.7%)	31 (2.5%)	66 (3.0%)
Industry	498 (52.3%)	643 (51.1%)	1141 (51.6%)
Institutional	220 (23.1%)	197 (15.7%)	417 (18.9%)
National	200 (21.0%)	387 (30.8%)	587 (26.5%)
Total_Accrual			
Mean (SD)	15.7 (43.6)	5.20 (15.5)	9.73 (31.3)
Median [Min, Max]	6.00 [1.00, 840]	2.00 [0, 291]	3.00 [0, 840]

Characteristic	N	OR[†]	95% CI[†]	p-value
Protocol_Type	2,211			
Device Feasibility		—	—	
Diagnostic		0.00		>0.9
Prevention		0.00		>0.9
Screening		0.00		>0.9
Supportive Care		0.00		>0.9
Treatment		0.00		>0.9
Phase	2,211			
Pilot		—	—	
Early Phase I		0.28	0.09, 0.85	0.029
Phase I		0.66	0.31, 1.36	0.3
Phase I/II		0.53	0.25, 1.10	0.091
Phase I/III		0.00		>0.9
Phase II		0.45	0.22, 0.91	0.029
Phase II/III		0.53	0.22, 1.25	0.2
Phase III		0.41	0.20, 0.83	0.015
Phase IV		0.65	0.15, 2.76	0.6
N/A		0.62	0.28, 1.34	0.2
Sponsor_Type	2,211			
Externally Peer-Reviewed		—	—	
Industry		0.69	0.42, 1.13	0.14
Institutional		0.99	0.59, 1.66	>0.9
National		0.46	0.27, 0.76	0.003
Total_Accrual	2,211	1.04	1.03, 1.05	<0.001

† OR = Odds Ratio, CI = Confidence Interval

Simple Regression Comparing Total Accrual to Time between Opening to Enrollment and First Accrual (By Phase)
Transformation- Log₁₀

Simple Regression Comparing Total Accrual to Time between Opening to Enrollment and First Accrual (By Sponsor Type)
Transformation- log

Total Accrual of Studies Opened ≤ 70 Days vs. > 70 Days

Total Accrual of Phase III Studies (n=561), Opened ≤ 70 Days vs. > 70 Days

Total Accrual of National Group Studies (n=587), Opened ≤ 70 Days vs. > 70 Days

Total Accrual of Early Phase I Studies (n=23), Opened ≤ 70 Days vs. > 70 Days

Total Accrual of Phase II Studies (n=804), Opened ≤ 70 Days vs. > 70 Days