Time from protocol release to ethics and/or regulatory submission and approval

Metrics in Clinical Trials: A literature review

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BACKGROUND

Clinical trials play an integral role in the advancement of medical treatment. As stated by the Australian Commission on Safety and Quality in Health Care (ACSQHC, 2019), clinical trials provide evidence to indicate the adoption or continuation of effective treatment and care or the abandonment of ineffective treatments. This allows for Australians to have access to the best possible care, including new and innovative treatments, best evidence based practice and cost effective treatments (Australian Clinical Trials Alliance (ACTA), 2017).

Not only are clinical trials beneficial for guiding such clinical practice they can also generation income for health services. It is estimated that approximately $1.1 billion is invested in clinical trials in Australia each year by government and industry (Askie et al, 2017). Majority of this investment comes from Industry-funded trials ($930 million).

Australia is known to conduct high quality clinical trials, but the clinical research sector continues to decline due to the high costs associated with conducting clinical trials. In an attempt to boost the clinical trials sector in Australia, ASQHC is currently developing a National Clinical Trials Framework (NCTF, 2019) to allow for a national approach to effective and efficient trials practice ASQHC (2019).

The ability to evaluate a clinical trial site's performance remains difficult. One area recommended in the NCTF includes the development and use of clinical trial metrics. The framework describes how metrics can be used to not only monitor the research site but also be used to promote the sites ability to remain competitive in the clinical trial environment (ASQHC, 2019). Measuring metrics or KPI's is not systematically practiced within local research units, however, the new NCTF indicates new governance procedures which will include metrics monitoring.

Although the NCTF has described the need to collect metrics in clinical trials there has been no indication of what would be the most useful metrics to measure at site level or what items will be selected during national accreditation evaluations (ASQHC, 2019). It is also unknown if other local sites internationally and/or nationally are currently monitoring metrics and how this may benefit their business models.

METHODOLOGY

A search of Medline and PubMed were used to identify publications for this literature review, using search terms such as "site performance" "clinical trials" "metrics". Articles selected included papers published between 2010-2019, Full text and Written in English

FINDINGS

Four articles were selected, 2 papers describe the development of clinical trial metrics, 1 paper reported on the implementation of these metrics and 1 paper was a systematic review of performance metrics. All four articles were published in the UK and USA, there were no current papers found to be published within Australia.

Table1: Papers Identified in literature review

Metrics Categories	# of Identified Metrics	Author
Project implementation, Project completion, General Conrtibutions, Intellectual development	8	Stanley, R. et al. (2010).
Recruitment and retention, Data Quality, Protocol compliance	8	Whitham, D. et al. (2018).
Site potential, Recruitment, Retention, Data collection, Trial conduct, Trial safety	5	Walker, K. et al. Trials (2018).
Start up, Recruitment, Quality of data and Laboratory samples.	18	Berthon-Jones, N., Courtney-Vega, K,. Donaldson, A., Haskelberg, H., Emery, S., & Berthon-Jones, R.P., et al. (2015).

METRICS

There were five broad categories of metrics identified from the literature. Within each of these categories several individual metrics were described as shown in Figure 1. A total of 11 metrics were identified. There were similarities within the 4 papers when describing metrics categories which included "recruitment", "retention" and "data quality". The only metrics that were consistent among all papers included "actual vs target participant recruitment" and "number/percentage of data queries per participant".

Figure 1: Clinical Trial Metrics

Study Start - Up	Recruitment and Retention	Data Collection and data quality	Study Conduct	Study Safety
Time from protocol release to ethics and/or regulatory submission and approval	Current actual recruitment versus target recruitment (%)	The percentage of randomised participants for whom the central trial team has sent one or more queries relating to the primary outcome	Percentage of randomised participants who started allocated intervention	Percentage of randomised participants with at least one adverse event reported
Time from protocol release to First Participant Randomisation (FPR) and Last Participant Randomisation (LPR)	Percentage of eligible individuals who have consented	Percentage of expected participants with complete data for primary and important secondary outcomes	IRB proposals, renewals & amendments submitted/approved	Percentage of randomised participants at the site with any protocol violation/s
	The percentage of randomised participants who have withdrawn			

Although there were a number of similarities found, there was no evidence throughout the literature of a key set of metrics being used or validated across local sites, nationally or internationally.

Further research in this area would benefit clinical trial sites to understand inefficiencies and ineffective processes as well as to remain competitive in the current market. By remaining current and competitive in industry driven trials will allow Australian patients to gain access to treatments and medications that they otherwise would not be able to obtain until they reach the pharmaceutical market. Furthermore, the evaluation of clinical trial performance could aid in the delivery of consistent and safe clinical care for patients choosing to participate in clinical trials.

FUTURE RESEARCH

- Which metrics could be implemented and validated at a local level?
- How can these metrics improve local business processes?
- Are there other means of measuring site performance such as patient satisfaction or patient outcomes and how will it be measured?

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