Category: Clinical Trial Operations (Trial Start-up, Regulatory, Data Management, IITs) – Work in Progress

How Can We Improve Data Integrity in Risk-Based Monitoring? A Structured TSDV Strategy

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1. Background

Targeted source data verification (TSDV) involves selectively reviewing Critical Datapoints (CDPs) within the electronic data capture (EDC) system. As a key component of risk-based monitoring (RBM), TSDV enhances monitoring efficiency while maintaining data integrity and patient safety. However, the absence of standardized methodology for selecting CDPs leads to variability in oversight.

Two common approaches to TSDV include:

1. Study Participant-Based Selection – A subset of participants undergo full monitoring for all CDPs. However, this approach may create oversight gaps if deficiencies are not present in the selected participants.
2. Critical Data Point-Based Selection – CDPs are categorized into tiers based on a risk assessment. Higher-risk CDPs are reviewed in a greater number of participants.

At Memorial Sloan Kettering Cancer Center (MSK), we have implemented a funnel approach to CDP-based selection, prioritizing the monitoring of informed consent and eligibility. In studies with numerous CDPs, those with similar risk levels are grouped into predefined tiers, ensuring a balanced and systematic review throughout the trial.

2. Goals

To present preliminary data on the implementation of a structured tiered TSDV system within a RBM framework, evaluating its feasibility and effectiveness in optimizing resources, focusing on CDPs, and maintaining patient safety and data integrity.

3. Solutions and Methods

At MSK, a funnel approach is applied in investigator-initiated trials (IIT). prioritizing informed consent and eligibility verification for the largest number of participants. For additional participant data review two different approaches are used depending on the overall number of CDPs:

1. Level One (Fewer CDPs): A randomly selected subset of participants undergoes 100 percent CDP review.
2. Level Two (More CDPs): A tiered TSDV system is implemented using a structured TSDV calendar, following these steps:
    - Tier Definition & CDP assignment: Tiers are organized based on CDP risk levels. High-risk CDPs (e.g., SAEs, screening assessments), are reviewed across all tiers, while lower-risk CDPs are proportionally distributed to balance monitoring activities.
    - Random Participant Assignment: Participants are randomly assigned to tiers based on predefined percentages, ensuring proportional distribution while maintaining CDP coverage.

4. Outcomes

Between January 1, 2023, and December 31, 2024, the two-level tiered TSDV system was implemented. The table below summarizes trials with monitored participant data during this period, including both closed trials and ongoing trials recently opened for monitoring.

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5. Lessons Learned and Future Directions

The funnel strategy, paired with a tiered TSDV calendar, ensured broad CDP coverage while maintaining targeted verification. Level Two provided an effective solution for maintaining oversight across a higher percentage of participants, proving especially valuable in studies with a large number of CDPs. This highlights the benefits of structured TSDV in optimizing monitoring efforts.

Key Takeaways:

- Structured TSDV streamlined monitoring, reduced workload, and improved accuracy.
- Tiered review improved early detection of data trends and deficiencies, allowing proactive corrective actions.

Future Enhancements:

- Expanding automation for CDP selection and monitoring workflows
- Refining risk-based tier assignments with real-time analytics for adaptative monitoring
- Exploring machine-learning for automated tiered TSDV calendar creation

By continuously refining this approach, we aim to further improve efficiency, accuracy and oversight in clinical trial monitoring, ensuring high-quality data collection while optimizing resources.

Figure

Review summary	Level One	Level Two	Variance*
Number of trials	19	16	-3
Number of monitoring visits including participant review	81	66	-15
Total of participants reviewed	407	224	-183
Total of monitoring days	336	254	-82
Average participant reviewed per day	1.2	0.9	-0.3
Total lesser deficiencies	643	411	-232
Total major deficiencies	636	298	-338
Total deficiencies	1279	709	-570
Average deficiencies per visit	16	11	-5
Average deficiencies per participant	3.1	3.2	0.1
Average CDP per participant	103	174	71
Average visit duration (days)	4.1	3.8	-0.3
% of participants monitored	83.3%	83.1%	-0.20%
% of informed consents reviewed	83.3%	82.0%	-1.30%
% of eligibility verification	72.6%	78.7%	6.10%
% participant data reviewed	43.5%	50.9%	7.40%
% of study treatment reviewed	39.6%	43.5%	3.90%
% of toxicity reviewed	41.9%	50.9%	9.00%
*Green-shadowed cells indicated a benefit that supports a level two review			