

DATA AND SAFETY MONITORING

1. Overview

For research involving human subjects federal regulations require that, when appropriate, research plans make adequate provisions for monitoring data to ensure the safety of research participants. This policy describes when such provisions are necessary and the range and types of monitoring to be considered.

2. Definitions

Data and Safety Monitoring: The process for reviewing data collected as research progresses to ensure the continued safety of current and future participants as well as the scientific validity and integrity of the research.

Data and Safety Monitoring Plan: The plan for reviewing research data to ensure the safety of participants and scientific validity of the research, including who will perform the monitoring, the type and frequency of review, and procedures for notifying appropriate entities (e.g., investigators, sponsor, etc.) of the results. *Note: Monitoring performed by a data and safety monitoring board is one type of data and safety monitoring plan.*

Data and Safety Monitoring Board (DSMB) or Committee (DSMC): A group comprised of expert(s) in the field of medicine and/or science applicable to the research, statistician(s), lay representative(s), and others as necessary to monitor study progress. A data and safety monitoring board reviews study-specific data periodically throughout the research to ensure continued participant safety and scientific validity and to make recommendations whether to continue, modify, or terminate the study. *Note: The following terms are interchangeable – data and safety monitoring board, data and safety monitoring committee, and data monitoring committee.*

3. General Information

- A. Federal regulations require as a criterion for IRB approval that, when appropriate, the research plan makes adequate provisions for monitoring collected data to ensure the safety of research participants. The regulations do not prescribe specifically when and how this monitoring should occur. Investigators and IRBs must determine what type of monitoring is needed in a proposed study to assure research participant safety and well-being.
- B. Data and safety monitoring plans can range from monitoring performed by the principal investigator or a group of investigators to the establishment of an independent data and safety monitoring board. The type of monitoring chosen should be based on the nature and complexity of the research, expected risks of participation, and population to be studied.

4. Types of Data and Safety Monitoring Plans

The type of monitoring required depends on the nature, size, and complexity of the research. Options include (but are not limited to) the following:

- **Monitoring by an individual investigator** – for studies that involve small numbers of research participants at a single site and interventions unlikely to lead to major changes in risks and benefits. Close, continuous monitoring by the investigator (often the principal investigator) and prompt reporting of unanticipated problems to the IRB and sponsor are generally considered to be adequate.
- **Monitoring by an individual or group other than the investigator** – for studies where assessments may require additional expertise or objectivity from individual(s) not directly involved with the design and/or conduct of the study. The individual(s) may be a safety officer or monitor associated with the sponsor in some situations, depending on potential conflict of interest considerations. Studies overseen by a monitor or monitoring group of this type are generally short-term in nature (e.g., a few days to a few months), study endpoints are not serious irreversible events, and risks to participants can be assessed through simple comparisons.
- **Data and Safety Monitoring Board or Committee** – for studies involving large numbers of research participants, particularly vulnerable populations, multiple performance sites, blinded study groups, particularly high-risk interventions where death or severe disability is a major risk of participation or a study endpoint, or when sophisticated data monitoring/statistical analysis is required. Studies in which suspension or early termination may be required because of *a priori* concerns about participant safety or possible observance of significant differences between study groups are usually overseen by a data and safety monitoring board. (See also “When Data and Safety Monitoring Boards are Required” below.)

5. Components of Data and Safety Monitoring Plans

Data and safety monitoring plans should generally describe the following:

- Who (individual or entity) will be conducting the monitoring and any relationship to the research (e.g., principal investigator, independent safety monitor, etc.)
- Specific data/events to be monitored
- Monitoring frequency (e.g., at specified intervals, after a specific number of participants has been enrolled, etc.)
- Reporting mechanisms and timeframe for reporting data/events to the monitoring entity
- Procedures for analysis and interpretation of the data
- Definitions of specific events or endpoints requiring that an action be taken (e.g., “stopping rules,” changes in drug dosage made in response to observed risks, etc.)

- Procedures for and frequency of communication to appropriate entities (e.g., investigators, sponsor, IRBs, etc.).

6. When Data and Safety Monitoring Plans are Required

- A. At OSU, all human subjects research that involves greater than minimal risk requires a data and safety monitoring plan. Sponsors, investigators, or IRBs may also recommend data and safety monitoring for any proposed research regardless of risk, as warranted. In all research, regardless of whether a formal data and safety monitoring plan is required, investigators are responsible for providing ongoing oversight to protect the safety and welfare of study participants.
- B. The type of monitoring plan required depends in part on the research being performed. All clinical trials and other biomedical or behavioral interventional studies involving greater than minimal risk require safety monitoring, but not all of these studies require monitoring by a data and safety monitoring board. For some research, federal regulations or federal policy specifically require establishment of a data and safety monitoring board. The circumstances in which data and safety monitoring boards are required are described below.

7. When Data and Safety Monitoring Boards are Required

- A. Data and safety monitoring boards are generally established for large, randomized multi-site studies that evaluate interventions intended to prolong life, delay progression of a serious disease or medical condition, or reduce the risk of a major adverse health outcome (e.g., a cardiovascular event), or for clinical trials of any size that compare rates of mortality or major morbidity. By contrast, data and safety monitoring boards are not generally involved in reviewing data from studies intended to evaluate interventions to relieve less serious symptoms or conditions (e.g., nausea and vomiting), unless additional expertise, objectivity, or oversight is needed.
- B. Data and safety monitoring boards are generally required in studies with one or more of the following characteristics:
 - A study endpoint involves a highly favorable or unfavorable result that might ethically require termination of the study before its planned completion
 - There are *a priori* reasons for specific safety concerns (e.g., when study procedures are particularly invasive)
 - Existing information suggests the possibility of serious toxicity resulting from the study procedures
 - The study is being performed in a potentially vulnerable population, such as children, pregnant women, adults with diminished decision-making capacity, the very elderly, terminally ill, or other vulnerable population requiring additional protections

- The study is being performed in a population at increased risk of death or other serious outcome (i.e., even when the study objective is not to intended to evaluate this outcome)
 - The study is large, of long duration, and involves multiple performance sites.
- C. The National Institutes of Health (NIH) requires oversight and monitoring of all NIH-supported or NIH-conducted clinical intervention studies to ensure the safety of participants and the validity and integrity of the data. Data and safety monitoring boards are generally required by NIH for phase III clinical trials (except for low-risk behavioral and nutritional trials) and are recommended for certain other studies (phase I and II) if the research involves multiple clinical sites, is blinded, or includes particularly high-risk interventions or vulnerable populations. (See also “Additional Information on Data and Safety Monitoring” below.)
- D. Federal regulations require establishment of an independent data monitoring committee to oversee planned emergency research in life-threatening situations where a waiver of informed consent has been approved by the IRB. For additional information on the requirements for planned emergency research, see OSU HRPP policy [[Planned Emergency Research](#)].

8. Monitoring Information Provided to and Reviewed by the IRB

- A. When appropriate, at the time of the **initial** review investigators are responsible for providing detailed information (as described in “Components of Data and Safety Monitoring Plans” above) to the IRB regarding their plans to oversee the research, monitor data collected to ensure participant safety and data integrity, and communicate findings from monitoring to the IRB.
- B. For research with a data and safety monitoring plan, at **continuing review** the IRB is responsible for confirming that the plan that was approved for monitoring data was implemented and continues to be appropriate for the research. Investigators are responsible for providing the following information to the IRB regarding the findings from monitoring, depending on the type of monitoring plan in place:
- If a data and safety monitoring board is in place, the most current report from the DSMB is to be provided, including the information reviewed (e.g., study-wide adverse events, interim findings, and any literature or other information that may be relevant to the research), date of review, and assessment of the information.
 - If the plan for data and safety monitoring does not include a DSMB, a summary of any unanticipated problems and/or adverse events (e.g., whether adverse events have occurred at the expected frequency and level of severity) is to be provided along with any literature or other information that may be relevant to the research.

9. Additional Information on Data and Safety Monitoring

- A. For more information on NIH requirements for data and safety monitoring, see [NIH Policy for Data and Safety Monitoring](#) and [Further Guidance on a Data and Safety Monitoring for Phase I and Phase II Trials](#).
- B. For information on requirements for cancer clinical trials funded by the National Cancer Institute (NCI) see NCI guidance, [Data and Safety Monitoring Guidelines](#).
- C. For more information on the roles, responsibilities, and operating procedures of data and safety monitoring boards/committees see FDA guidance, [Establishment and Operation of Clinical Trial Data Monitoring Committees](#).

10. Applicable Regulations/Guidance

21 CFR 50.24, 21 CFR 56.111, 45 CFR 46.111, Federal Register, Vol. 61, No. 192, p. 51531-51533 (10/02/96), FDA “Guidance for Clinical Trial Sponsors: Establishment and Operation of Clinical Trial Data Monitoring Committees” (03/27/06), “NIH Policy for Data Safety Monitoring” (06/10/98), NIH “Further Guidance On a Data and Safety Monitoring For Phase I and Phase II Trials” (06/05/00), OHRP Guidance “Guidance on Reviewing and Reporting Unanticipated Problems Involving Risks to Subjects or Others and Adverse Events” (01/15/07)