

**Boston University** School of Medicine

**Division of Graduate Medical Sciences**

**M.S. in Clinical Investigation Program**

**Thesis Mentor & Readers Responsibilities**

The purpose of the thesis in the MSCI program is for the student to demonstrate to faculty that they have attained the body of knowledge necessary to design, conduct, analyze, and communicate a clinical research study. The thesis readers assess whether or not the student has sufficiently demonstrated these skills. As such the readers are required to (1) read the first draft and the "near final" draft of the thesis, (2) participate in the thesis defense (***ask questions of the student presenter to make sure he/she understands what is presented***), and (3) sign off on the "final" version of the thesis.

In practice, we suggest to students that they send portions of the thesis to their readers for feedback as they are initially completed. Hence, a reader might see the background section, followed by the methods section with revisions to background, followed by the results/discussion section with revisions to prior portions, etc.

***Oral Presentation:***

The student will then present the ***near final*** thesis to their mentor and readers, MSCI faculty, students and guests.

The ***near final draf*t** of the thesis must be approved by the readers ***at least 2 weeks***prior to the student’s defense.

Once the *near final draft* is approved by the readers, the student, during their defense, will give a 20 – 30 minute oral presentation on the thesis research to the thesis readers, research mentor, MACI students and faculty members, and any other interested parties.

The purpose of the ***oral presentation*** is to demonstrate the student’s ability (1) to describe clearly the thesis research question, methods, and results; (2) to demonstrate an understanding of the study design, analytic principles, conclusions and limitations of his/her research; and (3) to place his/her research into a clinical context, while then proposing the next steps which should be taken with respect to future research. The presentation is followed by a question and answer period.

**Role of the Research Mentor in the clinical research thesis at BUSM** is to:

1. Provide guidance in the development of a hypothesis, timeline and outline for the project.
2. Provide supervision of the research including assistance in the experimental design as well as the interpretation and statistical analysis of collected data.
3. Provide critical review and guidance during the final writing stage, as needed, in order to assist the student in their completion of the thesis according to BUSM guidelines and deadlines with the submission of a thesis of the highest quality.
4. Ask questions of the student presenter during the oral presentation/defense to make sure he/she understands what is presented.

**Role of the Readers in the clinical research thesis at BUSM** is to:

1. Provide a critical eye as an additional evaluator of content and quality ***during the writing stage*** and submission of the thesis.
2. Grant the student permission to present/defend their thesis IF the thesis is in its **near final form** – students may not proceed with their defense without the permission of their readers.
3. Email the Assistant Director, Stacey Hess Pino ([sahess@bu.edu](mailto:sahess@bu.edu)) confirmation that the thesis is in its near final form and that the student has permission to move forward with the scheduled oral presentation/defense. *Each reader* must confirm via email that the written thesis is in its near final form before the student will be allowed to present/defend.
4. Ask questions of the student during the oral presentation/defense to make sure he/she understands what is presented.

**Content/Expectations of the Written Thesis for MSCI Students:**

**I. Abstract:** This should be a **succinct description** (< 350 words) of the project, and should include:

* Purpose: clear, brief statement of the thesis; the argument to be proven
* Methods/Procedures
* Results
* Conclusions

**II. Background:**

* This Section provides the ***theoretical and/or historical background information*** necessary for the reader to understand the project, to place it in its appropriate context, or to judge its contribution to the field, i.e**. it should** **include the previous literature to support WHY this study will be conducted/what is missing from the current literature that led to the study’s aims.**
* This Section is essentially the ***introduction,*** which explains in general terms what the thesis is about and provides a context for the thesis.
* This Section should include a description of what is the “***state of the art***” and an explanation of how this research contributes to the field:
  1. **Study Purpose**
  2. **Primary Study Question:** the Purpose paragraph should be followed by a statement/explanation of the ***Primary Study Question***,
  3. **Primary/Secondary Objectives:** the next paragraphs should describe the primary and secondary objectives of the research.
  4. **Study Rationale:** the final paragraph in this Section should include a description/statement of the study rationale, i.e. the reasoning or motivation for conducting/performing the proposed research/who has tried to address this issue in the past and why were their results inadequate.

**III. Materials and Methods:**

* This Section should provide the details of the materials and methods used to test the hypothesis, including the experimental design.
* This Section should provide the reader with the impression of ***HOW*** the study was conducted overall, and which techniques/procedures were used/executed. Student should also define/differentiate the standard of care from the research procedures [if a clinical research study was conducted].
  1. **Subject Population:** Student should provide a description of how the subjects were selected, including the details of the inclusion and exclusion criteria.
  2. **Study Design:** A statement/description of the study design should be included.
  3. **Statistical Analysis:**
* Student should provide a description of what type of statistical analyses were performed to assess the study’s outcome measures, i.e. primary outcome, secondary outcomes. **Student should clearly define all outcomes, endpoints and measures.**
  + - ***Sample size***: A description should be provided of how the sample size was calculated if applicable.
    - ***Confounders***: Student should describe those elements/factors that are potential confounders in their research and how they will address those confounders in their statistical analysis.

**IV. Results:**

* In this Section the student should report on what they found in their research, i.e. the data/findings that resulted from their research. ***Student should always provide data to support a claim or finding***.
* Student should describe the findings that resulted from the analyses of the data.
* Student should describe the differences that were found between the groups studied and any situations where differences were not found; any trends that became apparent; and any associations that were found.
* Student should also describe what is presented in their tables and figures – not simply repeat what is presented in the tables or figures, but note important or interesting features of the data.

**V. Discussion: - Critical Thinking Piece of the Paper!**

* This Section should present, interpret and discuss the adequacy of the results and of the research that was performed
* The Section summarizes the preceding ones, but it also should re-enforce the relationship, if any, of the results and its contribution to the field:
  + - Does the work support current theories and observations in the field?
    - Have the results advanced our understanding of the area?
    - How are the results relevant to what is understood today?
    - What are the implications of the results today?

1. **Limitations:**  Student should ***discuss*** the limitations of their research, i.e. discuss any constraints, failures, or weaknesses of their project. Student should NOT simply state the limitations of the research, rather they should EXPLAIN them and how they may have affected the findings of the study.
2. **Future Directions:** Student should discuss the future directions of their research, i.e. recommendations for future studies, i.e. student should stress the potential impact of their accomplishments if work on the project were to continue or discuss whether a new study could address some of the difficulties or challenges encountered in this study.

**VI. Conclusions:**

* This Section is a summary of intent of the research, the methods used to assess the study objectives, the results found and the conclusion drawn from the results, i.e. was the student able to answer their study question based on the results obtained in their research?