

**DOCTOR OF PHYSICAL THERAPY PROGRAM  
School of Exercise and Rehabilitation Sciences  
COLLEGE OF HEALTH and HUMAN SERVICES  
THE UNIVERSITY OF TOLEDO**

## **SCHOLARLY PROJECT MANUAL**

**Fall 2017**

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## Purpose

Physical therapists use the principles of scientific inquiry to guide their treatment, and the ability to critically evaluate, interpret, synthesize, and apply the scholarly literature is a vital component of competent physical therapist practice. The purpose of the scholarly project is to allow the student to apply and further develop the skills necessary to become a scholarly clinician. To that end, all students are required to complete an in-depth investigation of a particular topic that will culminate in both a presentation in a public forum and a written manuscript. The project must:

- Include evidence of scholarship, such as the discovery of new knowledge, the critical analysis and synthesis of existing knowledge, or the application of existing knowledge to solve specific problems in the clinic or in the community
- be relevant to the field of physical therapy
- be within the scope of expertise of the faculty advisor

## Goals/Objectives

With the guidance of their faculty advisor, the student will:

- Complete an in-depth project over the course of several semesters that will apply and expand upon the theories, concepts, and techniques learned throughout the curriculum
- Formulate a focused research question, programmatic objective, or clinical question that is relevant to the field of physical therapy and is addressable within the confines of the proposed project
- Design and implement a project that addresses the question or objective
- Use databases and other resources to search the literature to find information relevant to the proposed question or objective
- Critically evaluate and synthesize the relevant literature
- Use their analysis of the literature to inform the project's approach and their interpretation of the results
- Produce a written manuscript that describes
  - why the question or objective is important and how it is relevant to the field of physical therapy
  - the approach taken to address the question or objective
  - the results of the project investigation and their interpretation in the context of the current literature
  - the potential impact of the results on the field of physical therapy
- Present the results of their project, in the form of a poster or a platform presentation, in a public forum of their peers, faculty, and clinicians

## Types of Projects

- **Systematic review** – Students will work in small groups with a faculty advisor to conduct a systematic review of the literature. The topic of the review will be directly related to the faculty advisor’s area of expertise. The process will include the development of a focused question that has meaning and significance to the field of physical therapy, comprehensive and systematic searching of peer-reviewed literature related to the question, the critical analysis and synthesis of the relevant literature, and specific recommendations for either clinical practice (i.e., using the format of a clinical practice guideline) and/or further study (if addressing a basic science question). If appropriate, the project may include a meta-analysis.
- **Faculty-directed project** – Students will work on a project that is directly related to a faculty member’s ongoing scholarly agenda. The format of the project is flexible, but must include evidence of scholarship. Depending on the scope of the project, students may work individually or in small groups. Types of acceptable projects include the following:
  - **Research project** – May include basic, clinical, survey, or qualitative research, but should be an extension of the faculty members established line of scholarship.
  - **Evidence-based community program** – Includes the implementation and assessment of a community program relevant to the field of physical therapy. Must include data collection, analysis, and interpretation in the context of the current literature.
  - **Proposal Development** – May take the form of a proposal for a research study or an evidence-based community program designed to address a specific problem related to Physical Therapy. The proposal must include a must include a focused statement of the problem and a critical appraisal of the evidence supporting the need for the study or program, the approach taken, the methods used. Expected results and their interpretation, as well as alternative approaches, should also be discussed.

## Processes for Completion of Scholarly Project

- **Choosing an advisor** – Students will be introduced to faculty research interests during PHYT 5180 (Applied Biostatistics) in the Summer of Year 2. They will meet with potential faculty advisors and discuss possible project ideas in the summer and early fall. Students will submit an “*Advisor Request Form*”, where they indicate their first and second choice of faculty advisor, by a designated deadline after the completion of summer semester of Year 2. Final assignments of faculty advisor will be made by the faculty within the first 2 weeks of August before the beginning of fall semester of Year 2. Once a student is assigned to an advisor, they will work with that advisor to develop the contours of the project.
  - The expectations of each student for the project will be defined in the “*Scholarly Project Contract*”, which will be completed by the student and their advisor in the **Fall Year 2**. A sample format for the contract is in Appendix H, although the exact form of the contract is left to the discretion of the faculty advisors. Whatever the format, the contract must specify the goals that the student is to achieve in each semester. Successful completion of these goals is required to earn a “satisfactory” grade for PHYT 6170-7200 (Scholarly Project I-IV).

- **Planning the project** – Students will work closely with their faculty advisors and the instructors for PHYT 6170 (Drs. Lee and Encheff) to develop the research question and protocol. The majority of the planning should be completed during the fall of year 2 in PHYT 6170. The major phases of this process are described below. Each phase will culminate in a presentation, where students will present their work to student peers and faculty.
  - **Exploring the research topic**– Students will work with faculty advisors to identify a research topic and preliminary questions. Following this, students will conduct a preliminary literature search to become more familiar with the published literature on the topic and to begin to refine the research question.
    - Each student will present a summary and critique of a single article that is related to their topic. The presentation will follow the format described in Appendix B, and will be evaluated by peers and faculty members.
  - **Refining the research question**– In collaboration with the faculty advisor and the other members of the research group (if applicable), the student will refine the research question based on the results of their preliminary literature search.
    - The student (or group) will present an oral summary of the development of their research question. This must include a summary and synthesis of the key studies in their topic area, identification of the current gaps in our knowledge, and a statement of the research question to be addressed in the project. For those students completing a systematic review, this presentation must include evidence that the topic has not been addressed by a recent systematic review, and that sufficient published literature exists to support a systematic review on the topic. Guidelines for the presentation are described in Appendix C.
  - **Developing the research protocol** – Once the question has been established, the student will work with peers and faculty advisors to develop the study protocol that they will follow to address the research question. The components of the protocol are described in Appendix D.
    - The research protocol will be presented to peers and faculty during the proposal presentation. Guidelines for presenting the proposal are presented in Appendix E.
- **Obtaining Institutional Approval** – If the project involves human or animal subjects, ionizing radiation, biohazardous substances, or cadaveric tissues, approval of the protocol by the relevant boards is required prior to initiating the project. If data is to be collected at institutions other than UT, approval of local boards, in addition to those at UT, may be necessary. **The student should be aware that the approval process can take several months and should plan accordingly.**
  - Once the protocols are approved by the relevant boards, students must submit the “Graduate Research Advisory (GRAD) Committee Approval and Assurances Form” to Dr. Lee. See the GRAD form (Appendix H) for information regarding the necessary institutional approvals. The project cannot be initiated until all relevant approvals are obtained.
- **Conducting the Project** – Once all relevant approvals have been obtained, the project can be initiated. The student will continue to work on the project, with guidance from the faculty advisor, through the fall and Spring of Year 2 and the Summer of Year 3 (PHYT 6170-6190, Scholarly Project I-III).

- ***The Written Manuscript*** – To obtain a grade of “satisfactory” for PHYT 7200 (Scholarly Project IV), all students must submit their final written manuscript to their faculty advisor in the Fall of Year 3. **It is strongly suggested that the final manuscript be submitted early in the semester, before the oral presentation.** Sample manuscript formats are available in Appendix G.
  - The written manuscript must be accompanied by the “*Acceptance of Scholarly Project Form*” (Appendix H).
- ***The Oral Presentation*** – The scholarly project concludes with an oral presentation in a public forum during the fall of Year 3. The choice of poster or platform presentation is made jointly by the student and advisor. **The poster or platform presentation must be approved by the faculty advisor prior to presentation.**
  - After the presentation, the “*Final Approval of Scholarly Project*” will be signed by the faculty advisor and submitted to Dr. Lee.

## Suggested Overview of Scholarly Project Timeline\*

Semester	Course	Goal/Activity	Documentation
Yr 2 Summer	PHYT 5180	<ul style="list-style-type: none"> <li>Meet with potential advisors to discuss research topics.</li> <li>Advisor assignment</li> </ul>	
Yr 2 Fall	PHYT 6170	<ul style="list-style-type: none"> <li>Meet with the faculty advisor to develop the design of the project</li> <li>Explore research topic</li> <li>Refine research question</li> <li>Develop research protocol</li> <li>Obtain institutional approval</li> <li>Implement project/complete all objectives included in the Scholarly Project Contract (if using)</li> </ul>	<ul style="list-style-type: none"> <li><i>Advisor Request</i></li> <li><i>Scholarly Project Contract</i> to advisor (if using)</li> <li>Article presentation</li> <li>Presentation of question</li> <li>Proposal presentation</li> <li>Appropriate review board documentation</li> <li><i>GRAD form</i></li> </ul>
Yr 2 Spring	PHYT 6180	<ul style="list-style-type: none"> <li>Implement project/complete all objectives included in the Scholarly Project Contract (if using)</li> </ul>	
Yr 3 Summer		<ul style="list-style-type: none"> <li>Work on scholarly objectives if not done.</li> <li>Prepare to meet expected scholarly objectives in Yr 3 fall.</li> </ul>	
Yr 3 Fall	PHYT 6190	<ul style="list-style-type: none"> <li>Continue to implement project/complete all objectives.</li> <li>Begin writing manuscript and preparing presentation</li> </ul>	
Y3 Spring	PHYT 7200	<ul style="list-style-type: none"> <li>Complete and submit written manuscript</li> <li>Oral presentation in public forum</li> </ul>	<ul style="list-style-type: none"> <li><i>Acceptance of Scholarly Project for Presentation</i></li> <li><i>Final Approval of Scholarly Project</i></li> </ul>

\*Note that the specific timeline for each project will be developed by the student and the faculty advisor and will be documented in the Scholarly Project Contract, which may include additional items or differ from the above suggested timeline.

## Responsibilities of the Student

*Timely completion of all components of the scholarly project is the student's responsibility.* The student is responsible for submitting the required documentation to the appropriate entities and meeting the goals described in the Scholarly Project Contract each semester. *Failure to do so will result in an "In progress" grade for the semester.* Conversion to a "satisfactory" grade can only occur once required work has been submitted and approved by the advisor. In addition, the student is expected to:

- take responsibility for their own learning, which may include asking questions of their advisor or other faculty members as well as independent research
- work with their advisor to set achievable objectives and timelines
- identify and communicate any problems in the advising relationship if and when they arise.

## **Responsibilities of the Faculty Advisor**

Advising styles vary considerably, and faculty advisors should clearly communicate their expectations to their students. Advisors are expected to work with the student to develop the Scholarly Project Contract, which will include milestones to be achieved each semester, and to guide the completion of all aspects of the project. In addition, faculty advisors are expected to guide the student's scholarly development through regular meetings, the frequency of which is left to the advisor's discretion, and timely feedback on written and other aspects of the project. The faculty advisor is also expected to identify and communicate any problems in the advising relationship if and when they develop.

## **Additional Resources**

The College of Graduate Studies holds professional development programs throughout the year that are open to all UT graduate students. Program topics include developing research questions, conducting literature reviews, scientific writing, and preparing posters and presentations. The programs are free, but do require prior registration. Students should check the College of Graduate Studies website (<http://www.utoledo.edu/graduate/currentstudents/additionalresources/upcomingprograms.html>) for updated information.

## **Financial Support of Student Research**

The College of Graduate studies offers a limited number of scholarships to support graduate student research. Interested students should peruse the College of Graduate Studies webpage (<http://www.utoledo.edu/graduate/currentstudents/opportunities.html>).

## **Publication and Authorship**

Although the primary purpose of the scholarly project is to further the student's scholarly development, students and faculty are encouraged to publish their projects when possible. Students and faculty are reminded that publishing important findings is an ethical responsibility.

Decisions about authorship should comply with the University of Toledo's "Responsible conduct of scholarship and research policy" (#3364-70-02), which states that "[a]uthorship should be granted to, and only to, those persons who have made appropriate contributions to the conceptualization, design, execution, or interpretation of the work reported. Individuals who have made lesser contributions such as providing

advice, analysis, subject material, or who may have supported the research in other ways, should be acknowledged”.

The student will be recognized as first author except under the following conditions:

- The student does not submit the manuscript for presentation and/or publication within 1 year of the final approval of the project. The faculty advisor has the prerogative to submit the manuscript as first author with the student recognized as second author.
- The student and faculty advisor agree that the advisor will serve as first author and the student will be recognized as second author to expedite submission for possible presentation and/or publication.
- Presentations and/or publications are prepared which involve student assistance in generating and/or analyzing data relative to a faculty research area, but the focus differs from the student’s research project OR the final presentation or publication represents the combination of the work of several student projects. The students whose work was included in the publication will be recognized as authors in the order commensurate with their contribution to the final publication.

## **Local, Regional, and National Presentation**

In addition to the student and faculty forum, students are encouraged to present their work at local, regional, and national professional conferences. The following conferences would be appropriate forums for student presentations.

### ***CHSHS Student Research Forum Award***

- *Conference date* - Spring
- *Submission deadline* - Spring
- *Contact information*

### ***The University of Toledo Midwest Graduate Research Symposium***

- *Conference date* – Mid March
- *Submission deadline* – Early March
- *Contact information* – UT Graduate Student Association  
([www.sites.google.com/site/graduatestudentassociation](http://www.sites.google.com/site/graduatestudentassociation))

### ***Ohio Physical Therapy Association Scientific Meeting***

- *Conference date*- October
- *Submission deadline*- August
- *Contact information* – ([http://associationdatabase.com/aws/OPTA/pt/sp/home\\_page](http://associationdatabase.com/aws/OPTA/pt/sp/home_page))

### ***American Physical Therapy Association Annual Conference***

- *Conference date*- June
- *Submission deadline*- September
- *Contact information*- (<http://www.apta.org//AM/Template.cfm?Section=Home>)

### ***American Physical Therapy Association Combined Sections Meeting***

- *Conference date*- February

- *Submission deadline*- June
- *Contact information*- (<http://www.apta.org//AM/Template.cfm?Section=Home>)

## Faculty Advisors and Scholarly Interests

Students will work with their assigned advisors to develop a project that is within the faculty advisor's scope of expertise. Typically, the project will be related to the faculty member's scholarly interests, although it may also be related to their area of teaching expertise.

### **Amy Both, MHS, PT**

- *Teaching Areas*
  - Clinical Practicum and Internship
  - Lifespan I
  - Professional Issues
  - Special Topics – Pediatric Rehabilitation
- *Scholarly Interests*
  - Select topics in clinical education
  - Physical activity and autism
  - Prone play recommendations in child care facilities

### **Lucinda Bouillon, PT, PhD**

- *Teaching Areas*
  - Anatomy
  - Analysis of Movement/Kinesiology
  - Musculoskeletal Rehabilitation
- *Scholarly Interests*
  - Balance performance in athletes and individuals with low back pain

### **David Kujawa, MBA, PT, OCS**

- *Teaching Areas*
  - Musculoskeletal Rehabilitation
  - Health Care Policy and Delivery
  - Practice Management
- *Scholarly Interests*
  - Physical therapy for headache and temporomandibular joint dysfunction
  - Alternative delivery models of physical therapy intervention

**Abraham D. Lee, PhD, PT**

- *Teaching Areas*
  - Clinical Pathophysiology
  - Applied Exercise Physiology
  - Cardiovascular Physical Therapy
  - Health Promotion
- *Scholarly Interests*
  - Metabolism during exercise
  - Prevention and treatment of obesity and diabetes mellitus
  - Muscle adaptations to exercise training

**Michelle Masterson, PhD, PT**

- *Teaching Areas*
  - Therapeutic Interventions I
  - Teaching and Learning
  - Lifespan II
- *Scholarly Interests*
  - Geriatrics, especially concepts related to health and wellness as individuals age
  - The evaluation and management of Parkinson's disease, especially as they relate to functional mobility and independence
  - Interprofessional Health Care delivery

**Tori Smith, PT, NCS**

- *Teaching Areas*
  - Neuroscience
  - Neuromuscular Rehabilitation
- *Scholarly Interests*
  - Defining community ambulation for older adults in urban, suburban, and rural areas
  - Wheelchair mobility requirements for students returning to college after spinal cord injury
  - Clinical practice recommendations for treatment of patients with neurological deficits, especially CVA, SCI, TBI, and MS

Under certain conditions and with faculty approval, students may work with a primary advisor outside of the Doctor of Physical Therapy Program. A secondary advisor within the program will be identified for that student and will be responsible for evaluating the student and maintaining the integrity of the educational experience.

## Appendix A. Scholarly Project Checklist

<u>Target Date</u>	<u>Item</u>	<u>Date Complete</u>
Yr 2 Summer	Meet potential faculty advisors & Submit "Advisor Request Form" to Dr. Murray.	
Yr 2 Fall	Meet with advisor to formulate a research question or objective.	
	Complete "Scholarly Project Contract" with advisor (if using).	
	Present article summary and critique in PHYT 6170.	
	Present research question in PHYT 6170.	
	Present project proposal to faculty and peers.	
	Obtain institutional approval (as needed).	
	Submit "GRAD" form to Dr. Lee.	
	Meet objectives described in "Scholarly Project Contract" (if using).	
Yr 2 Spring	Meet objectives described in "Scholarly Project Contract" (if using).	
Yr 3 Summer	Work on scholarly objectives if not done. Prepare to meet expected scholarly objectives in Yr 3 fall.	
Yr 3 Fall	Continue to implement project/complete all objectives. Begin writing manuscript and preparing presentation.	
Yr 3 Spring	Submit poster/platform presentation to advisor for approval.	
	Submit "Acceptance of Scholarly Project for Presentation" form to Dr. Lee.	
	Make arrangements for poster printing with CHSHS IT (as needed; see appendix G).	
	Complete oral presentation.	
	Submit manuscript to advisor for final approval.	
	Submit final manuscript and "Final Approval of Scholarly Project" form to Dr. Lee.	

## Appendix B. Article Presentation Guidelines

You will present a brief summary and critique of an article that is directly related to your topic. Students completing a systematic review will present to the rest of your group. Your group and faculty will critique your presentation using the following evaluative criteria.

Score	Criteria
	<b>Background</b> <ul style="list-style-type: none"> <li>• A presenter introduced the research background of the article presented.</li> <li>• Sufficient background of the article is presented so that the listener could understand the overall context of the study</li> </ul>
	<b>Research Question</b> <ul style="list-style-type: none"> <li>• The presenter stated the research question being addressed by the study</li> <li>• The presenter provided the significance of the research question addressed in the study.</li> </ul>
	<b>Approach</b> <ul style="list-style-type: none"> <li>• The presenter summarized the approach used to address the question in key areas:               <ul style="list-style-type: none"> <li>○ Overall design</li> <li>○ Sampling and subjects</li> <li>○ Variables and how they were defined</li> <li>○ Measurement of dependent variables: reliability &amp; validity</li> <li>○ Statistical data analysis</li> </ul> </li> </ul>
	<b>Results</b> <ul style="list-style-type: none"> <li>• The student clearly summarized the key results of the study, considering both their statistical and clinical significance</li> </ul>
	<b>Appraisal</b> <ul style="list-style-type: none"> <li>• The student concisely appraised the quality of the study, using key quality indicators such as the study design, the number of subjects, measurement (reliability &amp; validity), statistical data analysis, the organizations of the article, the significance of the study, etc.</li> <li>• The strength of the study</li> <li>• The weakness of the study</li> </ul>
	<b>Relevance to Scholarly Project Topic</b> <ul style="list-style-type: none"> <li>• The student briefly summarized the relevance of the study to their scholarly project</li> </ul>
	<b>Style, clarity, and timelines, response to questions</b> <ul style="list-style-type: none"> <li>• The student spoke clearly.</li> <li>• The presentation was organized and focused.</li> <li>• The presentation lasted approximately 10-15 minutes.</li> <li>• The presenter answered questions clearly in an appropriate manner.</li> </ul>
Comments	

Each item will be scored on a 1-3 scale: 1. Poor-student did not meet the standard for this item; 2. Adequate-the student met the standard for this item; 3. Excellent-the student exceeded the standard for this item

## Appendix C. Research Question, Purpose, & Hypothesis Presentation Guidelines

Students (or groups) will present an oral presentation describing the development of their research question, purpose, and hypothesis of the study to student peers and faculty. The presentations will be approximately 15-20 minutes long, with a few minutes reserved for questions at the end. Students should use the evaluative criteria below to guide the format for their presentation.

Score	Criteria
	<p>Introduction</p> <ul style="list-style-type: none"> <li>• Brief description of the area of research</li> <li>• A clear statement of a focused issue or problem that needs to be resolved</li> <li>• The relevance of the problem to physical therapy</li> </ul>
	<p>Review of key studies</p> <ul style="list-style-type: none"> <li>• Key areas                             <ul style="list-style-type: none"> <li>○ Research questions, the purpose and hypothesis of the study</li> <li>○ Overall design</li> <li>○ Subjects studied</li> <li>○ Interventions (independent variable) and outcomes (dependent variable)</li> <li>○ Method of measurements</li> <li>○ Data analysis</li> <li>○ The results of a study (statistical &amp; clinical significance)</li> </ul> </li> </ul>
	<p>Summary and synthesis of key literature includes</p> <ul style="list-style-type: none"> <li>• The student concisely appraised the quality of the study using key quality indicators.</li> <li>• The student synthesized reviewed key articles.</li> <li>• A summary of key studies with sufficient depth and breadth to convey what is currently known about the problem.</li> </ul>
	<p>Identification of gaps</p> <ul style="list-style-type: none"> <li>• Clear description of what is NOT known, what gaps remain that may be addressed by the current project</li> </ul>
	<p>Statement of the research question</p> <ul style="list-style-type: none"> <li>• An explicit statement of the research question, using the PICOS format</li> <li>• A description of the relevance of the question to physical therapy</li> <li>• Evidence that the question has not been directly addressed in a recent original study or systematic review</li> </ul>
	<p>Purpose of the study</p> <ul style="list-style-type: none"> <li>• The student formulated the purpose of the study based on the research question.</li> <li>• The purpose is very significant in advancing knowledge in the area of research.</li> </ul>
	<p>Hypothesis of the study</p> <ul style="list-style-type: none"> <li>• The hypothesis is testable.</li> <li>• The hypothesis is stated with inclusion of independent and dependent variables.</li> </ul>
	<p>Overall presentation</p> <ul style="list-style-type: none"> <li>• The presentation was organized, focused, &amp; clear.</li> <li>• The presentation was done within expected time limit.</li> </ul>

Each item will be scored on a 1-3 scale: 1. Poor-student did not meet the standard for this item; 2. Adequate-the student met the standard for this item; 3. Excellent- the student exceeded the standard for this item

## Appendix D. The Research Protocol

**For students conducting faculty-directed research**, the protocol will vary depending on the nature of the project. Some general components that should be addressed are listed below.

1. Background
  - a. Briefly provide enough information for the listener to understand what the problem is and why the project is necessary
2. The purpose/research question
  - a. Be clear and specific.
  - b. For an experimental study, state the research question/objective and the specific hypotheses that you will test.
  - c. For a descriptive study or literature review, state the specific questions you will address with your project.
3. The Approach, including the basic design and major components of the project
  - a. For a research study, discuss the design, subjects, independent and dependent/outcome variables (how they will be measured, the reliability and validity of scales, if applicable), and analysis.
    - i. the evidence supporting the tests and interventions you will use
4. Timeline/milestones
  - a. Outline the major milestones and when they will be completed
5. Relevance to PT practice (1-2 slides)
6. For group projects, Roles and Responsibilities of each group member

**For students completing a systematic review**, the components of the protocol are listed below.

1. Rationale
  - a. Briefly explain why the review is necessary, based on what is known and what is not known. The rationale section should address the following points
    - i. Why is the review important?
      1. This may be due to the prevalence and/or severity of the clinical problem or other factors
    - ii. What is the current state of knowledge on this topic, and what gaps exist?
    - iii. What will this review add to our knowledge?
2. Objective
  - a. State the research question that will be addressed in the review, using the PICOS format:
    - i. **P**opulation: The population of interest
    - ii. **I**ntervention: The intervention being evaluated (or test, or prognostic factor, etc.)
    - iii. **C**omparison: The types of comparisons
      1. No treatment? Standard care? Another intervention?
    - iv. **O**utcome: The outcome of interest
    - v. **S**tudy design: The types of study designs to be included in the review
3. Eligibility Criteria

- a. Inclusion and exclusion criteria, with justification. Criteria may be related to
  - i. The STUDY, including those related to the PICOS question
  - ii. The REPORT, including language and year of publication, published vs. non-published (i.e., dissertations, conference proceedings)
- 4. Search Strategy
  - a. Describe the strategies that will be used to identify evidence for the review, including
    - i. Electronic databases
      - 1. Describe the databases that will be included, key search terms, limits, etc.
    - ii. Searching bibliographies of identified articles
    - iii. Registry websites
- 5. Screening Procedures
  - a. Describe the screening procedures, how many people will screen, how conflicts will be resolved, and how information will be managed
    - i. Screening is typically done in 2 phases: a preliminary title/abstract screen, then a full text screen
    - ii. Each article should be screened independently by at least 2 screeners. Conflicts may be resolved through consensus or a tie-breaker vote
    - iii. Students must keep track of their screening decisions, and will be expected to produce a flow diagram as stated in the PRISMA statement.
- 6. Appraisal Procedures
  - a. Describe how the risk of bias will be evaluated in each included study will you evaluate the risk of bias in each included study?
    - i. Each study should be reviewed by at least 2 reviewers
- 7. Extraction Procedures
  - a. Indicate the data will be extracted from the individual studies. Include a standardized list of items that will be used for each article.
- 8. Means of Analyzing Results
  - a. Describe how the results will be analyzed and synthesized?
- 9. Milestones and Timeline
  - a. Describe the key milestones in the project and a timeline for achieving them
- 10. Roles and Responsibilities
  - a. Describe the roles and responsibilities for each student in the group. While all students will contribute to each phase, describe who will be responsible for what
    - i. Should be equitable
    - ii. Remember that several steps must be done independently by 2 people

## Appendix E. Proposal Presentation Guidelines

Proposals will be presented during PHYT 6170 in the fall of year 2. Specific dates and times will be determined by the faculty. For students working individually or in groups, presentations should last approximately 20 minutes each (15 minutes for presentation, 5 minutes for questions). Visual aids (i.e., PowerPoint slides) should be employed during the presentation. The proposal should follow the format of the proposal (i.e., with each numbered item above being a section of the presentation). In preparing the presentation, students should keep the following in mind:

1. Be judicious about what you discuss. You can't include every part of your study. Focus on the key aspects and explain them clearly.
2. Don't cram too much on 1 slide. In general,
  - a. Pictures/figures are better than words
  - b. Bullet-points are better than sentences
3. Plan on at least 1 minute per slide.
4. Conclude the presentation with a statement about the relevance of the project to the field of Physical Therapy.

**Students are strongly encouraged to practice their proposal with their advisor prior to their proposal date.**

## Appendix F. Citation Guidelines

Before writing, students should ensure that they have a clear understanding of how to cite their sources. Failing to do so can lead to improper citation, which may leave one vulnerable to charges of plagiarism. An excellent overview of plagiarism is available here (<https://www.indiana.edu/~istd/definition.html>).

The first principle of to follow is to always give credit to the original source of any content that is included in your project. In scholarly work, this means citing sources, both in the body of the text (i.e., with attribution in the text itself and superscripts indicating the reference number) and in the reference list. Additionally, students should primarily rely on primary resources (i.e., original articles), rather than secondary sources (e.g., textbooks).

Students should follow the citation guidelines outlined in the AMA Manual of Style, 10<sup>th</sup> edition (Oxford University Press). The manual is available at the UT library, and online guides are available on the library's website (<http://libguides.utoledo.edu/content.php?pid=68219&sid=575762>). Constructing a reference list is much easier using reference software such as Endnote, which is freely available to all UT students here (<https://myutaccount.utoledo.edu/?>). Students are encouraged to become familiar with Endnote early and to keep their electronic libraries up to date. Extensive instructions for the use of Endnote are available on the library's website (<http://libguides.utoledo.edu/content.php?pid=221467&sid=1875158>).

## Appendix G. Sample Manuscript Formats

Students should consult the AMA Manual of Style, 10<sup>th</sup> edition, for guidance on the formatting of manuscripts. Additionally, students should consult published guidelines for reporting the results of research studies.

- Students who conduct clinical trials should consult the CONSORT statement (<http://www.consort-statement.org/>)
- Students who conduct observational studies should consult the STROBE statement (<http://www.strobe-statement.org/>)
- Students who conduct studies about tests and measures should consult the STARD statement (<http://www.stard-statement.org/>)
- Students who conduct systematic reviews should consult the PRISMA statement (attached).

### Sample Format for Research Study

- Title page
  - Project title – brief and descriptive (150 characters)
  - Date
  - Name of student and faculty advisor
- Abstract - A brief (250 word) summary of the purpose, hypotheses, methods, results, and conclusions of the study
- Introduction
  - Should provide context for the article, including a review and synthesis of key literature, the objectives, and the hypotheses or research question.
- Methods
  - A detailed description of the methods used in the study. May include the following
    - Participants – selection criteria
    - Study design and protocol
    - Variables and how they were measured/implemented
    - Analysis procedures
      - Define independent and dependent variables
      - Describe statistical procedures used to test each hypothesis
- Results
  - Start with a description of the subject characteristics, followed results of the study, with specific reference to the research question and/or hypotheses. Use tables and figures to summarize findings (at end of document). Data in tables and figures should not be duplicated in the text.
- Discussion
  - Brief synopsis and interpretation of key findings
  - Consider mechanisms and explanations
  - Place in context of previously published studies

- Limitations
- Clinical and research implications
- References
  - Cite primary studies or systematic reviews
  - Avoid textbooks or lay web sites
  - Use American Medical Association referencing style
- Tables - Each table on a new page
- Figure Legends - A brief, descriptive title for each figure, with an explanatory legend as needed.
- Figures -Each figure on a new page
- Appendices
  - Data collection tools
  - Informed Consent documentation

## Sample Format for Proposal

- Title page
  - Project title – brief and descriptive (150 characters)
  - Date
  - Name of student and faculty advisor
- Abstract - A brief (250 word) summary of the purpose, hypotheses, methods, results, and conclusions of the study
- Statement of the Problem
  - Rationale and justification for the study or program
  - Significance of the study or program and relevance to Physical Therapy
- Background/Literature Review
  - Evidence supporting the
    - Need for the study or program
    - Approach to the problem
    - Methods used (validity, reliability, etc.)
- Methods
  - Subjects – Characteristics, sampling methods, plans for recruitment
  - Materials and instrumentation
  - Procedures
    - Study design
    - Details of test and administration
    - Data collection methods
    - Timetable
    - Organizational chart
  - Data management and analysis
- Expected Results and Interpretation
- References
  - Cite primary studies or systematic reviews
  - Avoid textbooks or lay web sites

- Use American Medical Association referencing style
- Appendices
  - Data collection tools
  - Budget
  - Resources and Environment
  - Personnel

## Sample Format for Systematic Review

- Title page
  - Project title – brief and descriptive, it should identify the report as a systematic review, meta-analysis, or both (150 characters)
  - Date
  - Name of student and faculty advisor
- Abstract - A brief (250 word) structured summary including: background, objectives, study eligibility criteria, participants and interventions, appraisal and synthesis methods, results, limitations, conclusions and implications of key findings
- Introduction
  - Rationale
  - The research question, using PICOS format
- Methods
  - Eligibility criteria
  - Information sources and search strategies used (databases, keywords, etc.)
  - Study selection
  - Data collection process and data items
  - Means of evaluating risk of bias in individual studies
- Results
  - Study selection
  - Study characteristics
  - Risk of bias within studies
  - Synthesis of results
  - Risk of bias across studies
- Discussion
  - Summary of evidence
  - Limitations
  - Conclusions and clinical and research implications
- References
  - Cite primary studies or systematic reviews
  - Avoid textbooks or lay web sites
  - Use American Medical Association referencing style
- Tables - Each table on a new page
- Figure Legends - A brief, descriptive title for each figure
- Figures -Each figure on a new page

- A flow diagram describing the number of studies at each phase of the review should be included (see PRISMA statement)

## Appendix H. Forms and Additional Resources

- Advisor Request form
- Suggested format for Scholarly Project Contract
- Graduate Research Advisory (GRAD) Committee Approval and Assurances Form
  - Available at  
<http://www.utoledo.edu/graduate/currentstudents/academicprogramforms/index.html>
- Acceptance of Scholarly Project for Presentation
  - Available at  
<http://www.utoledo.edu/graduate/currentstudents/academicprogramforms/index.html>
    - On the bottom banner, click “Health Science Campus Forms”
    - Select “Acceptance of Thesis/Dissertation/Scholarly Project Form”
- CHS Student Poster Printing Procedure and Agreement
  - Available in the College Computing Office (HHS Room 2400)
- Final Approval of Scholarly Project
  - Available at  
<http://www.utoledo.edu/graduate/currentstudents/academicprogramforms/index.html>
  - On the “Academic Forms” page, select “Approval of Project”
- Resources for students completing a systematic review
  - PRISMA statement (Moher et al., (2009) PLoS Med 6(7); e1000097)
  - PRISMA Explanations (Liberati et al., (2009) Ann Intern Med 151:W-65-W-95)