

**KIN 412/512 BIOMECHANICS OF THE SKELETAL SYSTEM**  
Fall 2005

**GUIDELINES FOR THE REVIEW PAPER**

The purpose of the review paper is to have you conduct an in-depth review of the **biomechanics research literature** on a research question of interest to you. The question should be consistent with the content of this course, namely, related to the biomechanics of biological tissues (e.g., bones, ligaments, tendons, cartilage, muscle, etc.), joints, or injury mechanisms. The review primarily should summarize the literature or state of knowledge about a topic that will help you answer your research question. The emphasis of the paper should be on the **research/scientific** literature rather than the medical literature, but the latter can also be incorporated into the paper.

USEFUL SOURCES OF INFORMATION FOR IDENTIFYING A TOPIC  
AND SEARCHING THE LITERATURE

Bibliographies and Indexes (These are your most important resources. Look here first.)

Hay, J.G. *A Bibliography of Biomechanics Literature*. (Check both the fourth and fifth editions in the reference section of Noble Science Library.)

Vaughan, C.L. *Biomechanics of Human Gait, An Annotated Bibliography*. (Noble Library)

*Index Medicus/Med-line/PubMed* (<http://www.ncbi.nlm.nih.gov/PubMed/>)

*Physical Education Index* (Hayden Library). Also see the ASU Libraries "Biblio-File" handout for searching Physical Education and Sports literature. Ask reference librarian at either library for a copy.

*Physical Fitness/Sports Medicine* (reference section of the Noble Library). This provides recent references from research journals on a wide variety of subjects (e.g., athletic injuries, bicycling, biomechanics, electromyography, exercise therapy, exertion, jogging, muscles, physical education and training, sports medicine).

NOTE: Also check the "Uncover" option in the CARL computerized card catalog.

Data-based Refereed Journals (These are some examples, see attached list for additional journals.)

*Canadian Journal of Sports Sciences, Ergonomics, International Journal of Sport Biomechanics, Journal of Biomechanics, Journal of Bone and Joint Surgery, Journal of Sport Sciences, Medicine and Science in Sports and Exercise, Physical Therapy, Research Quarterly for Exercise and Sport* (Note: a "refereed" journal is one that has a system of "peer review" by other scientists before something gets published. Most coaching and/or popular journals such as *Track Technique, Swimming Technique, Golf Digest, International Gymnast, Scholastic Coach, and Runner's World* are not refereed and hence you need to be very cautious about the information published in them.)

Books

*Biomechanics I, II, III, . . . , IX-A, IX-B, X-A, X-B* (in Noble Library). These books are proceedings from International Congresses on Biomechanics and contain short articles on a wide variety of biomechanics topics.

*Exercise and Sports Sciences Reviews* (each volume contains several review articles)

Hay, James G. (1993). *The Biomechanics of Sports Techniques* (Noble Library)

Numerous other biomechanics books in the library may also be useful in identifying a topic or references for your topic. Use the computerized "card catalog" to review biomechanics titles. Note you are strongly encouraged *not* to rely on books as the predominant source of information for your paper. You are expected you to seek out original sources rather than summarize the contents of a book. This goes the same for review articles such as those in *Exercise and Sports Sciences Reviews*. Use these to find the original articles. Then go and read the original source of the research. If you cannot obtain the original source, it is OK to reference something through a secondary source (see below for the style of doing this). Also, be very cautious about the **medical literature** because it is full of opinions that are not documented with databased scientific information. **Do not base your paper on medical literature alone.**

### REVIEW PAPER PROPOSAL

(Deadline: Tuesday October 4)

You must submit a 1-2 page typewritten proposal for your topic that contains: a) a paragraph presenting a question which you will attempt to answer, and b) an **annotated** list of a minimum of five references related to your topic. The question should be something you are curious about, like “What causes tennis elbow?” or “Do knee braces really help prevent knee injuries in football?” The paragraph should describe why you are interested in this particular question. For the **annotated list of references**, include full bibliographic information for a given reference (i.e., author, title, journal (or book) title, year, page numbers, etc.) followed by a short statement describing how that particular reference will help you answer your question. At least three of the references must be from **refereed journal articles** (databased scientific articles published in research journals). You should also read the sample review papers placed on the class web page.

The proposal is worth 5 points and the paper itself is worth 40 points (60 points for 512 students) in the written assignments category. For each week following the above deadline that your proposal is judged to be unacceptable, you lose 1 point. Proposals that are unacceptable will be returned with suggestions the class period following the one in which they are due. You may then submit a revised proposal as necessary. **No review paper will be accepted without an approved proposal.** Note: Certain topics are off-limits because they have been written about many times in the past few semesters. Please discuss your potential review paper topic with the instructor **before** you spend a lot of time researching it in the library to make sure the topic is allowable this semester.

### GUIDELINES AND FORMAT FOR THE REVIEW PAPER

(Deadline: Tuesday November 8)

You are required to turn in **two** copies of your paper (an electronic copy via email for the instructor to keep and a paper copy to be returned to you). Staple the pages of the paper copy in the upper left hand corner. **No binders please.** For students in KIN 412, your paper should be 5-10 double-spaced typed pages that include the body of the paper, figures, tables, and references. For graduate students enrolled in KIN 512, the paper should be 15-20 double-spaced pages. Place the title of your paper and your name at the top of the first page and immediately follow that with a one or two paragraph introduction to the topic you have chosen. At the end of this short introduction, **be sure to include a thesis statement or statement of the problem.** This is the most commonly omitted part of the review paper. This statement may take one of several forms. You may choose to state something like this: “The purpose of this paper is...” or “This paper deals with...” It should be clear to the reader exactly what question are you attempting to answer.

You should then provide a review of all relevant literature in an attempt to find an answer to your question. **Be sure to reference all statements that are not your own opinions** (see examples of citing references on the following page). The reader should be able to trace all information to its source.

Conclude the body of the paper with a short summary and conclusions paragraph. Here you should state the answer to your question if you found one. You may have uncovered more questions than answers. If so, you should note them here and provide recommendations for future studies.

A list of all references cited in your review should be included at the end of the paper. Please use the style of the American Psychological Association (APA) as the format for citing and listing references. You should check in the library for the APA style guide to writing papers. Examining the style of articles in *Research Quarterly for Exercise and Sport* and *International Journal of Sport Biomechanics* may also be helpful since both use APA format (or close to it) as their styles. Examples are shown below.

#### Six examples of citing references in the text:

The research literature contains numerous examples of feedback devices that allow a cyclist to improve pedaling effectiveness (Bergmaier, Hediger, & Marki, 1989; Briggs, Fedel, Wooley, & Foulke, 1989; McLean

& LaFortune, 1988).

LaFortune, Cavanagh, Valiant, and Burke (1983) and Cavanagh and Sanderson (cited in Gregor, 1991) have examined the pedaling technique of elite sprint cyclists. [Note: The Gregor reference is an example of a citing a secondary source when the primary source is not available. In this case, the Gregor article should appear in your reference list, but the primary source should not. This method of citing articles is discouraged but sometimes unavoidable.]

The most popular approach used to estimate segment inertial properties has been based on data from elderly male cadavers (e.g., Dempster, 1955; Drillis & Contini, 1966; Clauser et al., 1969; Chandler et al., 1975).

Research approaches investigated to date have included mathematical modeling (Whitsett, 1963; Hanavan, 1964), photogrammetry (Herron et al., 1976; Jensen, 1978), gamma mass scanning (Brooks & Jacobs, 1975; Zatsiorsky & Seluyanov, 1983, 1985), and computerized axial tomography (Huang & Wu, 1976; Huang & Suarez, 1983).

Chandler et al. (1975) developed regression equations for moment of inertia estimates in which body mass served as the sole predictor.

[Note: The first time you cite a reference in the text, you should include all the authors' names followed by the date, e.g. "The results of a study conducted by Hinrichs, Cavanagh, and Williams (1983) indicate that...". Subsequent citations of this reference should be shown as Hinrichs et al. (1983). The "et al." should be used only when there are **three or more authors**. When there are two authors, you should list both authors in all citations.]

Example (a very short one) of a reference list at the end of a paper:

- Biewener, A.A. & Taylor, C.R. (1986). Bone strain: a determinant of gait and speed? *Journal of Experimental Biology*, 123, 383-400.
- Cavanagh, P.R. & Kram, R. (1985). Mechanical and muscular factors affecting the efficiency of human movement. *Medicine and Science in Sports and Exercise*, 17, 326-331.
- Hay, J.G. (1985). *The Biomechanics of Sports Techniques*, Englewood Cliffs, NJ: Prentice Hall, pp. 395-402.
- Hinrichs, R.N., Cavanagh, P.R., & Williams, K.R. (1983). Upper extremity contributions to angular momentum in running. In H. Matsui and K. Kobayashi (Eds.), *Biomechanics VIII-B* (pp. 641-647), Champaign, IL: Human Kinetics.
- Lephart, A.S. (1984). Measuring the inertial properties of cadaver segments. *Journal of Biomechanics*, 17, 537-543.

[Note: Do not include any articles in your reference list that you do not actually cite in your text. This should not be a **bibliography** (where you list everything you read), but rather a **list of references** (articles you specifically refer to in the text).]