



# NUTRITIONAL SCIENCES PROGRAM

UNIVERSITY of WASHINGTON

School of Public Health

## The MS in Dietetics Practice Capstone Report Manual

### Introduction

The MS in Dietetics Practice Capstone Report is an opportunity to explore a specific nutrition issue and apply research findings to clinical practice. It is intended to showcase the student’s development of advanced skills in innovative nutrition practice and results-oriented leadership. It is aligned with the missions and strategic priorities of the Program, School and Institution. The content of the capstone should be relevant to practicing dietetic professionals. The final product will be a structured, rigorously and thoughtfully researched, well-written report.

### Timeline and Planning

For students interested in completing a capstone, the first step will be to identify their narrowed list of interest areas. After which, they should work with the MS Capstone Faculty Advisor to begin the process of finding a capstone project. During Spring Quarter of students’ first year, students will select a dietetic practitioner to partner with on their capstone project.

One Capstone credit will be taken in 1<sup>st</sup> Spring quarter. During this quarter, students should become familiar with the Capstone Report Manual and the kinds of information that will be needed for the final report. Students also need to formalize a relationship with the dietetic partners, and then learn as much as possible about the final deliverable the dietetic partner will be expecting. By the end of Spring quarter, begin to think about the approach needed to complete the Capstone. This process will be captured in the [MS capstone agreement form](#) that ideally is completed by the end of Spring quarter or before the NSP portfolio.

### Overall Timeline

Required courses for the thesis and capstone MS options are the same with the exception of the culminating project credits. Students completing the capstone option register for a total of nine capstone (NUTR 596) credits.

	Year 1		Year 2	
	Spr	Sum	Fall	Win
NUTR 596 (9 credits)	1 credit	Portfolio Capstone	Most Capstone credits taken during this quarter	Additional credits as needed to reach at least 9 total 596 credits and complete Capstone*

\*During fall and winter-summer quarters year 2, students may distribute the remaining NUTR 596 credits as best fits their schedule and anticipated quarter of completion. Note: students are strongly encouraged to complete Capstone during Fall quarter, year 2. **The capstone report is due in the quarter that students register for their final capstone credits (of the 9 required).**

## Human Subjects Review

If you will be collecting data for your research, you are *required* to get a formal determination from UW IRB about whether your activity is research. You may not begin data collection on your project until this determination has been received. This process can take 2-3 weeks. Once the determination has been received, forward notification to the MS Capstone Faculty Advisor. Acquisition of a formal determination is a three-step process. You will 1) complete circled questions on the standard IRB Protocol form or on the No Contact version of the form (this form is used if you have no contact with human subjects for your research) – forms can be downloaded using the link below; 2) In Zipline you will create a new application and attach your completed IRB Protocol form at the indicated place. The link to Zipline is: <https://www.washington.edu/research/hsd/zipline/>; 3) HSD will assess your application and issue a determination. Detailed instructions may be found by following this link: <https://www.washington.edu/research/hsd/do-i-need-irb-review/is-your-project-considered-research/>

## Proposed Report Chapters

*Note: It is likely that your project would be better represented by a different series of chapters. Chapter topics may be modified in conjunction with the MS Capstone Faculty Advisor and Dietetics Practice Capstone Mentor from your site.*

### Chapter I: Introduction

- Define the Capstone topic (What is the problem/Issue).
- Who is the population<sup>1</sup> addressed in the project.
- Define the specific nutrition issue(s) or questions and explain why this topic is important for clinical nutrition practice (briefly).
- Assess the potential implications of the project on the impacted population<sup>1</sup> (e.g., health, nutrition status, provide the big picture implications).

### Chapter II: Describe the organization and target population

- This section will be specific to each project, but in general could describe the organization that will be using the final deliverable and how they serve the intended population for your project<sup>2</sup>.
  - Consider partners and collaborators essential to the project.
  - Consider how the project aligns with the mission/vision/goals of the organization.
- Define the population<sup>1</sup> that the capstone project targets.
  - If you are targeting a disease state, then describe the general pathophysiology of the disease here.
  - Provide relevant demographics. As able, present data to support a connection between your nutrition topic of interest and health outcomes in this population

### Chapter III: Nutrition Issue of Focus

- Discuss the pathophysiology that links nutrition to the population/disease of interest<sup>3</sup>.
- Describe what has been done in the past around this issue and previous standards of care or protocols up to the present.

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<sup>1</sup> If you are developing education for providers, describe both the provider population and the population/community that will be impacted by educating the providers.

<sup>2</sup> This may not be needed if the “organization” is a single clinician.

<sup>3</sup> If you are doing an educational module – it may be appropriate to eliminate this section and have that be the primary focus of your evidence analysis summary.

- Identify which associations, societies, or professional organizations are related to the issue. Highlight guidelines that are related to this topic as relevant<sup>4</sup>.

#### **Chapter IV: Description of the Methods of Investigation**

- Literature review methods:
  - Describe search methods and process for article selection, including a list of search terms and the databases utilized.<sup>5</sup> Be very intentional in how you research your evidence, and describe that process here.
  - Describe how "level of evidence" was determined. It is recommended that students use the Academy of Nutrition and Dietetics' Evidence Analysis Library to classify studies. <http://www.andeal.org/> Students are encouraged to use the Academy of Nutrition and Dietetics Evidence analysis Library Worksheet Template and Quality Criteria Checklist form to assess each article. If another system analysis method was selected, provide a justification for this choice. For related resources, see: <http://libguides.hsl.washington.edu/ebpintro>, <http://www.cebm.net/oxford-centre-evidence-based-medicine-levels-evidence-march-2009/> and <http://guides.lib.uw.edu/friendly.php?action=82&s=hsl/ebptools><sup>6</sup>
- Describe other steps taken to collect information on this topic including communication and collaboration with RDNs and the development of related products: survey, interviews, and/or clinical observation.

#### **Chapter V: Evidence Analysis Summary**

- Drawing from the literature review, provide a detailed summary of the evidence<sup>7</sup>.
- Provide a discussion on the current state of the evidence related to your topic. Include an overall "level of evidence" statement, identifying how strong the evidence is to support your recommendations. Identify elements that both support and dispute your position.

#### **Chapter VI: Final Product, Executive Summary of the evidence 1-Pager**

- Include or attach the final product developed for providers (a paper, webinar, facility guidelines, etc.)
- 1-page Executive Summary of the Evidence for dietetic practitioners using the template provided unless another format makes more sense. (See Appendix B: Example Evidence Summary for Providers)

#### **Chapter VII: Dissemination Plan or Evaluation of product**

- Description of the dissemination plan for sharing the final product and findings with providers.
- Provide a presentation of the findings. The audience can either be UW nutritional sciences students and faculty or an audience chosen by the practitioner.  
OR
- Survey users to evaluate the final product. Then, compile the survey data along with any recommendations for future changes based on the feedback.

<sup>4</sup> If there are extensive guidelines, then please include those as an appendix.

<sup>5</sup> If a lit review is your primary product, then describe how you formulated your research questions and your search strategy (e.g PICO). If your main project is a literature review, then you also need a supporting questions table. **Appendix A: Example question & evidence table**

<sup>6</sup> If your scope is large, then select the most relevant/impactful primary research articles. Consider using articles published after development of clinical guidelines.

<sup>7</sup> If you are doing educational modules, use this section to provide a written description that accompanies the modules, describing the evidence in more detail. This section should be written so that if asked, it could accompany the final educational module acting as the reference text to what is presented in ppt (or similar format).

### Chapter VIII: Next Steps

- What are the next steps for informing clinicians about how to better care for this population? What research, if any, is needed? What are the specific questions that need to be answered?

Please see **format guidelines** in Appendix C.

### Project Check-Ins

At a minimum, check-ins are required twice per quarter with the Capstone Faculty Advisor. The purpose of these meetings is to assure that the project and timeline remain on-track, and that any issues or challenges are addressed promptly. It is up to the student to schedule these meetings and to complete the [Capstone Status Report form](#). This *ongoing* form is to be updated twice each quarter after a student declares they will be completing a capstone. It is due via email to your Capstone Faculty Advisor on the 5<sup>th</sup> Monday of the quarter and then again on the 10<sup>th</sup> Monday (9<sup>th</sup> Monday summer quarter). It will serve as the basis for in-person discussions with the MS Capstone Faculty Advisor, and for regular updates to the site preceptor.

### Required Presentations

All Capstone students are required to present their project at the May Student Research and Practice Symposium and to one key stakeholder group of choice.

### Evaluation Matrix

The nine required credits of NUTR 596, Nutrition Practice Capstone are graded as Credit/No Credit. In conjunction with their advisor, students should outline their quarterly work plan. To receive 'Credit' for earlier quarters of NUTR 596, students must demonstrate progress on the capstone project as outlined. The capstone report is due in the quarter that students register for their final capstone credits (of the 9 required). The capstone report will be evaluated by the capstone instructor. Sections that do not meet (or exceed) expectations will be revised by the student until they are rated at the meets (or exceeds) level. To successfully complete the capstone and earn a grade of 'Credit' on the final capstone credits, a student must meet or exceed expectations on all sections of the report.

Criteria <sup>8</sup>	Exceeds Expectations	Meets Expectations	Needs Revision
Overall			
Clarity of organization of thoughts, paragraphs, and sentences.			
Attention to grammar, editing, syntax.			
Demonstrated thoughtfulness and thoroughness of ideas.			
Chapter I-VIII (each chapter will have its own row)			

Further guidance on areas needing revision:

<sup>8</sup> This table to be revised for each specific capstone.

## Appendix A: Example question & evidence table<sup>9</sup>

Evidence Analysis Library question	Conclusion and evidence grade
<b>Energy balance and body composition</b>	
#1: In adult athletes, what effect does negative energy balance have on exercise performance?	In three out of six studies of male and female athletes, negative energy balance (losses of 0.02% to 5.8% body mass; over five 30-day periods) was not associated with decreased performance. In the remaining three studies where decrements in both anaerobic and aerobic performance were observed, slow rates of weight loss (0.7% reduction body mass) were more beneficial to performance compared to fast (1.4% reduction body mass) and one study showed that self-selected energy restriction resulted in decreased hormone levels. <b>Grade II - Fair</b>
#2: In adult athletes, what is the time, energy, and macronutrient requirement to gain lean body mass?	Over periods of 4-12 weeks, increasing protein intake during hypocaloric conditions maintains lean body mass in male and female resistance-trained athletes. When adequate energy is provided or weight loss is gradual, an increase in lean body mass may be observed <b>Grade III - limited</b>
<b>Recovery</b>	
#3: In adult athletes, what is the effect of consuming carbohydrate on carbohydrate and protein-specific metabolic responses and/or exercise performance during recovery?	Based on the limited evidence available, there were no clear effects of carbohydrate supplementation during and after endurance exercise on carbohydrate and protein-specific metabolic responses during recovery. <b>Grade III - Limited</b>
#4: What is the effect of consuming carbohydrate on exercise performance during recovery?	Based on the limited evidence available, there were no clear effects of carbohydrate supplementation during and after endurance exercise on endurance performance in adult athletes during recovery. <b>Grade III - Limited</b>
#5: In adult athletes, what is the effect of consuming carbohydrate and protein together on carbohydrate- and protein-specific metabolic responses during recovery?	<ul style="list-style-type: none"> <li>Compared to ingestion of carbohydrate alone, coingestion of carbohydrate plus protein together during the recovery period resulted in no difference in the rate of muscle glycogen synthesis.</li> <li>Coingestion of protein with carbohydrate during the recovery period resulted in improved net protein balance postexercise.</li> <li>The effect of coingestion of protein with carbohydrate on creatine kinase levels is inconclusive and shows no impact on muscle soreness postexercise.</li> </ul> <b>Grade I - Good</b>
#6: In adult athletes, what is the effect of consuming carbohydrate and protein together on carbohydrate and protein-specific metabolic responses during recovery?	Coingestion of carbohydrate plus protein, together during the recovery period, resulted in no clear influence on subsequent strength or sprint power. <b>Grade II - Fair</b>
#7: In adult athletes, what is the effect of consuming carbohydrate and protein together on exercise performance during recovery?	Ingesting protein during the recovery period (postexercise) led to accelerated recovery of static force and dynamic power production during the delayed onset muscle soreness period and more repetitions performed subsequent to intense resistance training. <b>Grade II - Fair</b>
<i>(continued on next page)</i>	

**Figure 1.** Evidence analysis questions included in the position statement. Evidence grades: Grade I: Good, Grade II: Fair, Grade III: Limited, Grade IV: Expert opinion only; and Grade V: Not assignable. Refer to <http://www.andevidencelibrary.com/> for a complete list of evidence analysis citations.

<sup>9</sup> From J Acad Nutr Diet. 2016;116:501-528.



# Position of the Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and Athletic Performance



## ABSTRACT

It is the position of the Academy of Nutrition and Dietetics (Academy), Dietitians of Canada (DC), and the American College of Sports Medicine (ACSM) that the performance of, and recovery from, sporting activities are enhanced by well-chosen nutrition strategies. These organizations provide guidelines for the appropriate type, amount, and timing of intake of food, fluids, and supplements to promote optimal health and performance across different scenarios of training and competitive sport. This position paper was prepared for members of the Academy, DC, and ACSM, other professional associations, government agencies, industry, and the public. It outlines the Academy's, DC's, and ACSM's stance on nutrition factors that have been determined to influence athletic performance and emerging trends in the field of sports nutrition. Athletes should be referred to a registered dietitian nutritionist for a personalized nutrition plan. In the United States and in Canada, the Certified Specialist in Sports Dietetics is a registered dietitian nutritionist and a credentialed sports nutrition expert.

J Acad Nutr Diet. 2016;116:501-528.

## POSITION STATEMENT

It is the position of the Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sports Medicine that the performance of, and recovery from, sporting activities are enhanced by well-chosen nutrition strategies. These organizations provide guidelines for the appropriate type, amount, and timing of intake of food, fluids, and dietary supplements to promote optimal health and sport performance across different scenarios of training and competitive sport.

**T**HIS ARTICLE OUTLINES THE current energy, nutrient, and fluid recommendations for active adults and competitive athletes. These general recommendations can be adjusted by sports dietitians\*

\*Because credentialing practices vary internationally, the term "sports dietitian" will be used throughout this article to encompass all terms of accreditation, including registered dietitian nutritionist (RDN), registered dietitian (RD), professional dietitian (PDT), or Board Certified Specialist in Sports Dietetics (CSSD).

This article is being published concurrently on the Dietitians of Canada website ([www.dietitians.ca/sports](http://www.dietitians.ca/sports)) and in *Medicine & Science in Sports and Exercise*. The articles are identical except for minor stylistic and spelling differences in keeping with each journal's style. Either citation can be used when citing this article.

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<http://dx.doi.org/10.1016/j.jand.2015.12.006>

to accommodate the unique issues of individual athletes regarding health, nutrient needs, performance goals, physique characteristics (ie, body size, shape, growth, and composition), practical challenges, and food preferences.

## EVIDENCE-BASED ANALYSIS

This article was developed using the Academy of Nutrition and Dietetics (Academy) Evidence Analysis Library (EAL) and will outline some key themes related to nutrition and athletic performance. The EAL is a synthesis of relevant nutrition research on important dietetics-related practice questions. The publication range for the evidence-based analysis spanned March 2006 to November 2014. For the details on the systematic review and methodology go to [www.evidenceanalysislibrary.com](http://www.evidenceanalysislibrary.com). Figure 1 presents the evidence analysis questions used in this position paper.

## NEW PERSPECTIVES IN SPORTS NUTRITION

The past decade has seen an increase in the number and topics of publications

This Academy position paper includes the authors' independent review of the literature in addition to systematic review conducted using the Academy's Evidence Analysis Process and information from the Academy Evidence Analysis Library (EAL). Topics from the EAL are clearly delineated. The use of an evidence-based approach provides important added benefits to earlier review methods. The major advantage of the approach is the more rigorous standardization of review criteria, which minimizes the likelihood of reviewer bias and increases the ease with which disparate articles may be compared. For a detailed description of the methods used in the evidence analysis process, access the Academy's Evidence Analysis Process (<http://www.evidenceanalysislibrary.com/eaprocess>).

Conclusion Statements are assigned a grade by an expert work group based on the systematic analysis and evaluation of the supporting research evidence. Grade I—Good; Grade II—Fair; Grade III—Limited; Grade IV—Expert Opinion Only; and Grade V—Not Assignable (because there is no evidence to support or refute the conclusion). See grade definitions at [www.evidenceanalysislibrary.com/](http://www.evidenceanalysislibrary.com/).

Evidence-based information for this and other topics can be found at <https://www.evidenceanalysislibrary.com> and subscriptions for nonmembers are purchasable at <https://www.evidenceanalysislibrary.com/store.cfm>.

# High-Protein Hypocaloric Feeding in ICU Patients

Recommendations from the 2016 International Protein Summit

Protein catabolism and loss of muscle mass is present in critically ill patients. Protein loss is associated with increased morbidity and mortality, making adequate protein provision essential. Despite recommendations being high enough, many critically ill patients still do not meet their protein needs. This can result in protein energy malnutrition, leading to loss of lean body mass, respiratory failure, poor wound healing, and immune dysfunction.

Current research indicates benefits of potential for prioritizing protein needs over energy needs and protein initiation independent of energy and other nutrients for **critically ill patients** in the ICU.<sup>1</sup>

## Why prioritize protein over energy?

- Energy sufficiency without protein sufficiency does not preserve lean body mass.<sup>1</sup>
- Dietary protein obtained by oral consumption or delivered through nutrition support therapy is a fundamental prerequisite for muscle protein synthesis and maintenance of function.<sup>2</sup>
- Focusing on protein rather than energy can help prevent overfeeding and need for insulin.<sup>1</sup>

## What are the current recommendations?

SCCM / ASPEN <sup>3</sup>	ESPEN <sup>4</sup>	2016 Summit <sup>1</sup>
(for critically ill patients) <ul style="list-style-type: none"> <li>• Normal weight: 1.2-2 g/kg</li> <li>• BMI 30-40: &gt;2 g/kg of IBW</li> <li>• BMI &gt;40: &gt;2.5 g/kg of IBW</li> <li>• Hypocaloric feeding on PN (≤20 kcal/ kg/d or 80% energy needs)</li> </ul>	(for critically ill patients on PN) <ul style="list-style-type: none"> <li>• 1.3-1.5 g/kg/d of IBW</li> <li>• Maintain an "adequate energy supply"</li> </ul>	(for critically ill patients) <ul style="list-style-type: none"> <li>• 1.2-2.5 g/kg/day</li> <li>• Hypocaloric feeding (80-90% energy needs)</li> </ul>

## What is the evidence?

- Physiologic and observational studies suggest that providing protein >1.2 g/kg/d may improve mortality in critical illness.<sup>3,5,6</sup>
- Observational ICU data show a reduction in mortality when > 80% of protein needs are delivered, regardless of energy intake.<sup>7</sup>
- Worldwide, ICU patients fail to receive protein in the recommended range of 1.2-2.0 g/kg/d.<sup>8</sup>
- A recent RCT showed that high-protein (1.7 g/kg/d) hypocaloric (15 kcal/kg/d) may reduce insulin requirements during hospital stays and improve nitrogen balance in ICU patients.<sup>9,10</sup>
- There is a lack of RCT's studying protein requirements, although research is ongoing.

### *How can we increase protein delivery to critically ill patients?*

- Delivery of enteral or parenteral nutrition to ensure adequate protein intake should be started as early as possible in the ICU. Delays in initiating EN or PN result not only in caloric deficit but also inadequate protein administration.<sup>1</sup>
- Strategies:
  - Use high-protein EN formulas
  - Add protein supplements to EN formulas
  - Supplement EN patients with PN amino acids
  - Implement EN feeding protocols that enhance protein delivery
- Increase EN protein to >1.2 g/kg/day by the 4<sup>th</sup> day following admission to the ICU<sup>1</sup>
- Monitoring – determine whether sufficient protein has been delivered<sup>1</sup>

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*Keep in Mind:* Less amino acids reach circulation when administered via EN versus PN due to first-pass elimination.<sup>1</sup> This should be taken into consideration when trying to administer sufficient protein.

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### *Recommendations / Application to Practice:*

- Consider prioritizing protein over energy in patients who are critically ill.
- While research is ongoing, stay aware of new results. Use your clinical judgement in practice.

### *References*

1. Hurt RT, McClave SA, Martindale RG, et al. Summary Points and Consensus Recommendations From the International Protein Summit. *Nutr Clin Pract.* 2017;32(1\_suppl):142s-151s.
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6. Alberda C, Gramlich L, Jones N, et al. The relationship between nutritional intake and clinical outcomes in critically ill patients: results of an international multicenter observational study. *Intensive Care Med.* 2009;35(10):1728-1737.
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## MS Capstone Report Format Guidelines

### A. Required Sections - There are five required report sections:

#### 1. *Title Page*

Title page template:

Your Name as it appears in your UW Student Record

A Capstone Report

Submitted in partial fulfillment of the requirements for the degree of

Master of Science in Dietetics Practice

University of Washington

(Graduation Year, e.g. 2018)

(Capstone Faculty Advisor)

Program Authorized to Offer Degree:

Nutritional Sciences Program

School of Public Health

2. ***Acknowledgments*** - acknowledge clinical partners and/or others you would like to recognize as contributors to your successful capstone project.
3. ***Table of Contents***

4. **Report Chapters** - The report contains chapters as described below. You should customize the chapter titles as appropriate to your topic. Example:

Chapter Content	Example of Capstone Chapter Title
Chapter I: Introduction	Introduction to use of blenderized tube feeding in an inpatient setting
Chapter II: Organization and target population	Define the organization (mission, service) and population (illness and/or circumstance)
Chapter III: Nutrition issue of focus	History of current care; guidelines; importance of nutrition in population
Chapter IV: Description of the methods of investigation	Interviews/ needs assessments of families currently using blenderized tube feeds
Chapter V: Evidence analysis summary	Recipe Development Recipe goals, creations, viscosity testing procedure, gravity bag testing
Chapter VI: Final product	Final Product/ Executive Summary
Chapter VII: Dissemination plan	Project Summary and Roll out
Chapter VIII: Next steps	Next steps and future recommendations

## 5. References

References: Students should use AMA Style unless another reference format can be justified as being more appropriate. (see: <http://guides.lib.uw.edu/c.php?g=99161&p=642357>)

## B. Formatting and File Format for the Report

- Font: Any legible font except script, italic, or ornamental fonts equivalent in scale to 10 pt Arial or 12 pt Times New Roman.
- Margins: Use 1" margins right, left, top and bottom. Page numbers should be at least 3/4" from the edge of the page.
- Line Spacing: 1.5 space all sections except for footnotes/endnotes, bibliographic entries and lists in appendices. These should be single-spaced.
- Color: Digital manuscripts will appear in color when viewed electronically, but reproductions will not preserve color. Colors will appear in shades of gray and may compromise legibility of figures, headings, illustrations, photography and graphics. Data and information that is color-coded or based on color shading may not be interpretable. For best results, prepare report in black and white. Color may be used for attachments, appendices, or other materials associated with the project.
- File format: Submit final report in Adobe PDF with no compression, password protection or digital signature. Be sure the final PDF version follows formatting guidelines.
- Tables and Figures: The caption for a figure appears *below* the graphic; for a table, *above*.
  - Typically, boldface or underscore the word "Figure" or "Table" and the associated number in the caption, then present the caption in plain text with only the initial letter of the caption and any proper names in the caption capitalized.
  - Focus on completeness and concreteness as you caption figures and tables. Do not be afraid to use lengthy figure and table captions—better than confusing or incomplete ones.

- If your figure or table is essentially the same as or based on another author's, but you recreated or adapted it, it is standard to include the words "Adapted from" followed by the author's name and a citation at the end of the caption.
- Always cite the figure or table if it—or its data—came from a source, using the same citation style that you have used throughout the paper. The most logical place for the citation to appear is at the end of the caption.
- Always refer to your tables and figures in the main body of the text. There should be no figures/tables without a clear reference in the main text.