



*The Global Resource  
for Nutrition Practice*

**PEN: Practice-based Evidence in Nutrition®**

**PEN® Student Assignment Guide  
Assignment D**

**May 2015**

## Table of Contents

1.1	What is PEN®?	4
1.2	Purpose of this Guide and Overview of Assignment Process	4
1.3	What is a Knowledge Pathway? – Definition and Scope	5
<b>2.0</b>	<b>Assignments</b>	<b>7</b>
2.1	Assignment A – Evaluate Third Party Tools and Resources	<b>Error! Bookmark not defined.</b>
2.1.1	<i>Evaluating Third Party Tools and Resources</i>	<b>Error! Bookmark not defined.</b>
2.1.3	<i>Completing Assignment</i>	<b>Error! Bookmark not defined.</b>
2.2	Assignment B - Develop or Update a PEN® Client Handout	<b>Error! Bookmark not defined.</b>
2.2.1	<i>Health Literacy - what it is and why it is important</i>	<b>Error! Bookmark not defined.</b>
2.2.2	<i>Checks for Clear Writing</i>	<b>Error! Bookmark not defined.</b>
2.2.3	<i>Clear Writing Tips</i>	<b>Error! Bookmark not defined.</b>
2.2.4	<i>Process for Writing Client Handouts</i>	<b>Error! Bookmark not defined.</b>
2.3	Assignment C – Write up “News-making Evidence” for PEN® Home Page	<b>Error! Bookmark not defined.</b>
2.3.1	<i>Overview of the Issue (will more often be for Article Analysis)</i>	<b>Error! Bookmark not defined.</b>
2.3.3	<i>Conclusion - what should we be recommending to our clients?</i>	<b>Error! Bookmark not defined.</b>
2.3.4	<i>Link to any PEN® relevant PEN® Content</i>	<b>Error! Bookmark not defined.</b>
2.3.5	<i>Write content for Social Media</i>	<b>Error! Bookmark not defined.</b>
2.4	Assignment D – Synthesize the Evidence to Answer Practice Questions	7
2.4.1	<i>Criteria for Inclusion of Materials in a Knowledge Pathway</i>	8
2.4.2	<i>Searching the Literature</i>	8
2.4.3	<i>Practice Categories</i>	8
2.4.4	<i>Question Sub-Categories</i>	9
2.4.5	<i>Key Practice Points (KPPs)</i>	9
2.4.6	<i>Evidence</i>	11
2.4.7	<i>Grading the Evidence</i>	13
2.4.8	<i>Comments</i>	14
2.4.9	<i>Rationale</i>	14
2.4.10	<i>Writing a Background</i>	14
2.4.11	<i>Writing a Toolkit</i>	15
2.4.12	<i>Evidence Summary</i>	15
2.4.13	<i>Related Knowledge Pathways</i>	15
2.4.14	<i>Other links</i>	15
2.4.15	<i>Glossary</i>	15
2.4.16	<i>Social Media Posts</i>	15
2.4.17	<i>Review Process of PEN® Content</i>	16
2.4.18	<i>Editing</i>	16
2.4.19	<i>Specific to revising a practice question or Knowledge Pathways</i>	16
2.5	Assignment E – Applied Master’s Thesis / Project	<b>Error! Bookmark not defined.</b>
Appendices		18
Appendix 1	Intellectual Property (IP) & Declarations of Affiliation (DAI) and Interests Waivers	19
Appendix 2	Integrated Competencies According to Assignments	25
Appendix 3	PEN® Client Handout Template	<b>Error! Bookmark not defined.</b>
Appendix 4	Handout Feedback - Sample Form	<b>Error! Bookmark not defined.</b>
Appendix 5	News-making Evidence Templates	<b>Error! Bookmark not defined.</b>



## Forward

### 1.1 What is PEN®?

Practice-based Evidence in Nutrition® [PEN] is an evidence-based decision support service developed by Dietitians of Canada (DC) and launched in the fall of 2005. Thought leaders from the dietetic profession, knowledge translation and evidence-based decision-making and technology were consulted and engaged in the conceptualization, design and implementation of PEN. Review the impressive list of contributors at <http://www.pennutrition.com/contributors.aspx>.

Designed to support busy dietitians and other health professionals to keep pace with the vast amount of food and nutrition research available, PEN® enables them to be knowledge managers through ready online access to trusted and credible practice guidance based on questions arising in everyday nutrition practice.

Recognized authorities on each topic addressed in the PEN® system, identify the relevant literature from filtered and original sources and critically appraise, grade and synthesize that literature into key practice points which answer the practice questions. Additionally, client resources and other tools that are congruent with the evidence are included in PEN® to support practice, along with backgrounds, evidence summaries and toolkits.

The PEN® database is dynamic, constantly being updated in response to new practice questions submitted by users and new evidence that directs a change in current practice. The PEN® service is available as an individual or group license or through a site license for larger groups. A customized application has also been designed to support dial-a-dietitian contact centres (CC-PEN®). PEN® currently serves as the knowledge repository for three provincial dietitian contact centres (British Columbia, Manitoba and Ontario; each providing support to PEN® through contractual collaborative agreements). The PEN service is now governed by a collaborative partnership comprised of the British Dietetic Association, the Dietitians Association of Australia and Dietitians of Canada. Other national dietetic associations have joined as partners including Dietitians New Zealand, the Irish Nutrition and Dietetic Institute and The Association for Dietetics in South Africa.

### 1.2 Purpose of this Guide and Overview of Assignment Process

The PEN® team has worked with many students since its launch in 2005. Dietetic and nutrition undergraduate and graduate students, dietetic interns/stagiaires and practicum students have used various elements of the “PEN®- approach”. Our goal is to partner with dietetic educators to provide meaningful student learning experiences which build critical skills they will use in their future practice and which can enhance PEN® content. **It is helpful for students to have access to PEN® prior to working on an assignment.** They can sign up for a free two week trial if they don't have current access: [http://www.pennutrition.com/subscribe\\_dc.aspx?c=1](http://www.pennutrition.com/subscribe_dc.aspx?c=1) and we can arrange to extend that for a period of time while they are completing their assignment.

#### Expected outcomes:

- formative learning in the areas of health literacy, evidence-based practice cycle, nutrition care or health promotion topics and research concepts including critical appraisal and epidemiology relevant to dietetic practice
- skill development in the areas of project management, creating systematic literature searches using PICO question format, critical appraisal of research, synthesis of evidence, writing for consumers and social media
- achievement of enabling learning objectives and practice competencies
- contribution to practical guidance and tools for the international dietetics community.

Based on these experiences and incorporating the new [Integrated Competencies for Dietetic Education and Practice](#) (ICDEP), PEN® has prepared this guide for educators and students called: **PEN® Student**

**Assignment Guide.** This guide contains details of the evidence-based approach, assignment guidelines and examples of the formative learnings, the enabling outcomes, performance indicators and the potential competencies to be achieved along with PEN<sup>®</sup> tools and resources (TRs) to use in developing various PEN<sup>®</sup> knowledge objects. **Purple text boxes** are action items for university instructors and internship coordinators and **yellow text boxes** are action items for students.

Depending on the quality of the completed assignments the content developed will either be added to the PEN<sup>®</sup> database or be used as a base for further development of PEN<sup>®</sup> content.

University instructors and internship coordinators are asked to contact the PEN<sup>®</sup> team as early as possible to indicate their interest in having students complete one of the PEN<sup>®</sup> assignments and to get guidance on assignment topics.

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**\*Contact us early.** PEN<sup>®</sup> projects will be confirmed on a first-come,

For purposes of this guide, unless specified, the term student will mean: dietetic/nutrition undergraduate and graduate students, dietetic interns/stagiaires, and practicum students

### 1.3 What is a Knowledge Pathway? - Definition and Scope

The PEN<sup>®</sup> service was designed using a knowledge pathway (KP) approach, each KP being related to a topic from the broad scope of the dietetics field (clinical, consulting, education, food service management, community nutrition, professional issues etc). Academics, practitioners and students develop content for KPs according to a prioritized list and time line.

A KP consists of succinct guidance statements and practice recommendations synthesized from the literature, supported by more detailed levels of carefully selected references, practice guidelines and position papers. It provides the flexibility to enable the busy practitioner to quickly find the short

answer to a specific question, as well as to “drill down” to review the evidence in more detail, when time permits.

A KP contains both professional and client appropriate Tools and Resources (TR) e.g. links to electronic publications, databases, tables, calculators, algorithms, as well as client education tools and PEN® client handouts when applicable. Each KP grows in breadth and depth over time as evidence that informs practice changes. In addition, new KPs can be easily added as the need and interest for those topics arises.

Students unfamiliar with PEN® should spend time browsing the site. Start from the [PEN® home page](http://www.pennutrition.com) at: [www.pennutrition.com](http://www.pennutrition.com). You can take a guided self-study tour (PEN® Orientation Tutorial) and view the PEN® webinar: Producing PEN® Pros: 10 Tips and tools to power your practice found at: <http://www.pennutrition.com/pencommunity>. Students might also find it helpful to watch a short PEN® Prezi: <http://www.pennutrition.com/pencommunity>

**Note:** For the Prezi - click on the “play” button (triangle) located on the black bar in the lower left-hand side of the Prezi. Select rectangle on the lower right-hand side of the Prezi for full screen view and select “play” button (triangle) so the slides will self-advance. [If you select play, and then full-screen mode, the slides will not self-advance].

All of the assignments in this guide are developing content within a KP, including revising or developing a PEN® client handout, or for the PEN® database. It is important for students to be familiar with the evidence-based practice cycle before beginning any of the assignments.

**Before starting their assignment students are asked to read from the PEN® Writers Guide:**  
<http://www.pennutrition.com/resources/PEN%20Writers%20Guide%20New%20March%2028%202015.pdf>

- Using the Evidence-based Practice Cycle Section 3
- Plagiarism Guidelines Appendix 10

There are other tools that are linked or can be found in the Appendices to assist the student in selecting and synthesizing the information for the KP and to help them make appropriate evidence-based decisions. These tools will be noted in the specific assignments.

University instructors and internship coordinators must have student's sign [both Intellectual Property \(IP\) & Declarations of Affiliation \(DAI\) and Interests Waivers \(Appendix 1\)](#) once the details of the assignment are finalized. Signed waivers are returned to the person identified in the Assignment Tables.

## 2.0 Assignments

### 2.4 Assignment D - Synthesize the Evidence to Answer Practice Questions.

Answering new individual questions or updating existing questions requires the students to use the evidence-based practice cycle in the [PEN<sup>®</sup> Writers Guide](#) Section 3 as a guide to answering the practice questions. The number of questions they will be able to answer and if they are new questions or updating existing ones will depend on the objectives for the assignment and the length of time they have to complete it.

This could be a university course assignment (one question), or an internship program assignment (several questions). See Appendix 2 for the practice competency areas where this assignment can contribute to the student’s formative learning and evaluation. In some areas, assignments provide opportunities for achievement of enabling learning outcomes contributing to the student’s summative assessment of the practice competence.

Before starting this assignment, students are reminded to read: [PEN<sup>®</sup> Writers Guide](#):

<http://www.pennutrition.com/resources/PEN%20Writers%20Guide%20New%20March%2028%202015.pdf>

- Using the Evidence-based Practice Cycle (Section 3)

Role of University/Internship	Role of PEN <sup>®</sup> Team	Role of Student/Intern
<ol style="list-style-type: none"> <li>1. Identify students to work on PEN<sup>®</sup> priority topics / questions, may be a course assignment.</li> <li>2. Assign students key practice question(s) to be revised or developed or Background topic to be developed. Revising an existing question, answering a new one or developing a Background document will depend on the time available for this activity.</li> <li>3. “Distribute” PEN<sup>®</sup> Student Assignment Guide D to students.</li> <li>4. Get students to sign the IP &amp; DAI Waivers and return them to: PEN-Content Manager.</li> <li>5. Review and assess the work and mentor content development.</li> </ol>	<ol style="list-style-type: none"> <li>1. Provide guidelines for revising or developing an answer to a practice question - see PEN<sup>®</sup> Student Assignment Guide D for guidelines and assignment details.</li> <li>2. Provide list of PEN<sup>®</sup> priority practice questions needing revision or developing.</li> <li>3. Act as a resource for the student / professor / internship director.</li> <li>4. Provide feedback on student’s work to university instructor / internship coordinator or directly to student.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use PEN<sup>®</sup> assignment guidelines, tools, templates in the PEN<sup>®</sup> Student Assignment Guide D to search for new literature and revise assigned practice question or develop answer to a new practice question in a timely manner.</li> <li>2. Commitment to revise based on feedback.</li> <li>3. Be respectful of commitment dates and communicate if changes are needed.</li> <li>4. Sign IP &amp; DAI Waivers and return to university course professor or internship coordinator.</li> </ol>

University instructors and internship coordinators interested in having students complete this project should contact the PEN<sup>®</sup> Content Manager: [beth.armour@dietitians.ca](mailto:beth.armour@dietitians.ca)

Students should use the Knowledge Pathway (KP) template in the PEN<sup>®</sup> Writers Guide **Appendix 4a and 4b** and the PEN<sup>®</sup> Style Guide in the PEN<sup>®</sup> Writers Guide **Appendix 20** to help create their content in a standardized way. The PEN<sup>®</sup> Style Guide includes plain language tips, acceptable fonts, key grammar tips, spelling and the correct way to cite pathway references among many other important format issues. **As one reviews the following section having the template (Appendix 4a or 4b handy will be helpful.**

#### **2.4.1 Criteria for Inclusion of Materials in a Knowledge Pathway**

To be included in a knowledge path, materials must meet the following criteria:

- Accuracy - Information contained in the knowledge path selections must be accurate, verifiable, and peer reviewed.
- Authority - selections must be from an authoritative source. Where recommendations rely on expert opinion this too must be clearly stated so that practitioners understand the strength of the evidence supporting a particular guidance statement.
- Objectivity - selections must be science-based, evaluated and graded according to recognized standards of evidence. See Evidence Grading Checklist in the PEN<sup>®</sup> Writers Guide **Appendix 5**.
- Currency - the most recent evidence from peer reviewed articles or websites where content is reviewed at least annually should be used. An older item may be considered if no newer information or research exists or it sets the foundation for future research (e.g., a Surgeon General's report) or stands the test of time. Knowledge pathways will be reviewed and updated on a regular basis ensuring the PEN<sup>®</sup> service is dynamic and up-to-date.
- Scope - selections must specifically address the knowledge path topic and, where appropriate, should encompass the continuum of health promotion/protection; disease prevention; treatment/intervention; rehabilitation and support. Resources that describe and/or evaluate programs and/or discuss "lessons learned" are particularly helpful to the professional community of practice and should be included in each knowledge path. Succinct practice statements will have embedded links to more detailed information allowing users to dig into the information for more detail.
- Access - websites and other electronic resource selections must be easily accessible (i.e. no charge) and navigable. If not and the selection is essential to the path, we'll add navigational tips for the user. Any instance where a web site or reference requires a fee to access it, it must be discussed with the project coordinator and every effort will be made to identify an alternate resource.
- Language - while the content of PEN<sup>®</sup> is available only in English, if there are resources available in other languages that meet the above criteria and are in accordance with the evidence then they should also be included as a link or a PDF file.

#### **2.4.2 Searching the Literature**

Ensuring that all relevant literature has been found to answer the question is critical. See the PEN<sup>®</sup> Writers Guide **Appendix 8** for some guidelines on creating a search strategy. In **Appendix 9** you will find some suggested sources of evidence for both background and foreground questions.

#### **2.4.3 Practice Categories**

(Note: only applicable if you are creating a new KP; adding to or updating an existing KP will already have this determined)

There are 4 practice categories for KPs: Population Health / Lifecycle, Health condition / Disease, Food / Nutrients, Professional Practice

Some topics may fit into more than one practice category e.g., Healthy Weights / Obesity will likely fit into both the Population Health / Lifecycle (obesity prevention) and the Health Condition / Disease (treatment of obesity). Contrast this with Celiac Disease. Here, there is likely not a Population Health / Lifecycle component and screening, therapy and counseling etc. could all be addressed under the Health Condition / Disease practice category. To view the current PEN<sup>®</sup> KPs classified under the 4 practice categories, go to <http://www.pennutrition.com/TOC.aspx>. Select the practice category that most closely suits your KP and focus on the sub-categories to organize your questions.

#### 2.4.4 Question Sub-Categories

**Health Promotion / Prevention** - questions in this category relate to efficacy of health promotion or disease prevention activities or interventions; content may define or illustrate population health approaches including capacity building social marketing, etc.

**Assessment / Surveillance** - who should be assessed or screened, when, how, and why are the types of questions addressed here (they should be grounded in evidence and ideally tied to outcomes, not simply common or desirable practice)

**Intervention** - questions relating to effective program planning as well as nutrition interventions or therapy would be addressed in this sub-category

**Evaluation / Outcome Indicators** - questions in this section might relate to cost effectiveness, best practices, evaluation strategies, outcomes of interventions or validity of particular outcome measures

**Education** - questions addressing effectiveness of specific types of education/counselling or education programming would be addressed in this sub-category

#### 2.4.5 Key Practice Points (KPPs)

Authors should carefully develop KPPs. Generally there will be two parts to the KPP: Evidence Synthesis and Practice Guidance. Supporting research and/or evidence is provided in the Evidence Statements and additional details are provided in the Comments or Rationale sections. If the Evidence Synthesis is very practical, e.g. where there is a lack of scientific evidence and expert opinion is used, there may not be a need for the Practice Guidance section.

- Evidence Synthesis (ES) should consist of clear statements reflecting the evidence used to answer the question. Simple language should be used when possible. Supporting research and/or evidence is provided in the Evidence Statements. When crafting the ES, consider including the following information (as summarized from the evidence):
  - study design
  - population (if guidance targets a specific group, e.g. age, gender)
  - key conclusion/answer to the practice question - specify amounts if applicable e.g. x amount of a supplement daily
  - limitations of the evidence may be included if critical, in this case they would also be included in the evidence statements
  - future research needed/suggested if critical to clarify or enhance the understanding of the issue (either here or in the Comments section).

Evidence syntheses are given a Grade of Evidence using the PEN<sup>®</sup> Evidence Grading Checklist (Appendix 5). Note that if conclusions in the evidence synthesis have more than one grade of evidence, the grade should be indicated after each conclusion.

In some cases, rewording the question to include the population supported by the evidence may be warranted.

Information from the Evidence Synthesis section will be used in the Evidence Summary.

- Practice Guidance (PG) includes the more practical information needed to answer the practice question and guide practitioners. Its content can be derived from the Evidence Synthesis, Evidence Statements, Comments and Rationale sections but every effort should be made to use clear and simple language. It will usually indicate what to consider in discussion with clients. A grade of evidence is not applied to this section. The PG can include:
  - context for the topic / issue (can include brief rationale or reasoning)
  - recommendation/conclusion
    - Some information from the Evidence Synthesis may be repeated here.
    - A few words to reflect the quality of the evidence informing practice guidance (e.g. “limited evidence suggests...”). Use wording consistent with PEN’s Evidence Grading Checklist (Appendix 5)
  - additional practical information such as risk/benefit ratio, convenience and burden, costs, nutrient information, patients’ value and preferences, health status, comorbidities, lifestyle, culture etc.
  - links to standard international collections ([http://www.pennutrition.com/international\\_guidelines\\_collection.aspx](http://www.pennutrition.com/international_guidelines_collection.aspx)) that help guide practice, as appropriate to the topic, such as Healthy Eating Guidelines and Dietary Reference Values.

Information from the Practice Guidance section will be used in the Toolkit.

When discussing specific nutrient requirements or healthy eating guidelines in a KPP and there are known partner country differences, link PEN® users to the appropriate collection in the International Guideline Collections:

[http://www.pennutrition.com/international\\_guidelines\\_collection.aspx](http://www.pennutrition.com/international_guidelines_collection.aspx)

Examples of clear, succinct KPP’s incorporating one of the International Guideline Collections:

Observational studies have evaluated a number of foods, nutrients or dietary factors and risk of developing rheumatoid arthritis (RA); however most results have been inconclusive. At the present time, no specific food, nutrient or dietary factor is recommended to consume or avoid to decrease the risk for developing RA. It is recommended that all individuals should strive to meet their nutritional needs by following [Healthy Eating Guidelines](#).

Students must keep in mind that PEN® is an international tool and when referring to dietary guidelines, food guides, labeling issues, etc., to include those from the UK, Australia, New Zealand and South Africa. [See International Guideline Collections](#)  
[http://www.pennutrition.com/international\\_guidelines\\_collection.aspx](http://www.pennutrition.com/international_guidelines_collection.aspx) on the PEN® home page.

## 2.4.6 Evidence

Be as succinct as possible when summarizing and critically appraising the evidence (systematic reviews, primary research, position papers, guidelines etc.) into evidence statements. Include the following information:

- type of publication e.g. review, study, practice guideline
- year - not required but if the evidence is a systematic review include the dates of the literature reviewed; better to use the actual year than an adjective such as “recent”; if the evidence is from several Clinical Practice Guidelines (CPG) from different countries and different years then indicate the year of publication of the CPG.
- population studied - including key inclusion/exclusion criteria relevant to the question
- number of subjects - refer to them as subjects, clients, individuals, **not** patients
- methods and interventions
- main findings - include odds ratio (OR), relative risk (RR), hazard ratio (HR) etc and Confidence Intervals (CI) when appropriate e.g. when the question relates to risk. Only need to report on those that are relevant / primary outcomes relating to the practice question.
- author's main conclusions
- limitations noted in the cited article - should be distinguished from those identified by the PEN<sup>®</sup> author. Ensure the reference number is at the end of the sentence where the article author's limitations are discussed. A transitional statement or phrase can help, e.g. The following limitations have been identified by the author of the study.... and additional limitations to note are.....
- conflict of interest - comment if obvious e.g. identified by the author of a systematic review. Since it is not mandatory for authors to report conflict of interest in all publications, it is not always possible to establish whether or not conflict of interest is present).
- source of bias - e.g. if there is only one research group who has published all of the evidence
- the number of the reference in brackets is to be used, not the author's name and publication year

Evidence statements are not just a summary or a paraphrase of the article abstract. Students should summarize, in their own words, the study and results and put them into context for the reader using their critical appraisal skills. This contextualization can occur through the evidence statement, the comments section, and rationale.

Students are reminded to read: Plagiarism Guidelines Appendix 10 in the [PEN<sup>®</sup> Writers Guide](http://www.pennutrition.com/resources/PEN%20Writers%20Guide%20New%20March%2028%202015.pdf)  
<http://www.pennutrition.com/resources/PEN%20Writers%20Guide%20New%20March%2028%202015.pdf>

Occasionally, an evidence summary table can be attached to the knowledge pathway as a tool if the data and topic area necessitate it (e.g. large body of controversial evidence, with some similarities in study design). A standard table with basic headings should be used. Columns/headings can be added as needed. The decision to use an evidence summary table should be discussed with your PEN<sup>®</sup> team mentor.

### Example:

Ref #	Study design	Population	Baseline measures	Interventions/ Treatment/ exposure	Comparisons/ control	Outcomes	Comments / Limitations
1	Multi-center, randomized, controlled, open trial.	129 F, 98 M, BMI= $\sim$ 26 kg/m <sup>2</sup> , $\sim$ 65 years, generally healthy	$\leq$ 1.5 servings/day dairy products, 690 $\pm$ 234 mg/day	Regular diet plus 3 8-oz servings low fat milk daily = -1404 $\pm$ 296 mg/day Ca <sup>2+</sup> 12 wks	. Regular diet (control) = -690 $\pm$ 234 mg/day Ca <sup>2+</sup>	Wt $\uparrow$ over time both groups, but significantly more weight gain with extra milk (-0.6 kg).	Intake was $\sim$ 100 kcal/day more with extra milk ingestion as per 3-day food diaries at BL, weeks 8 & 12. Good compliance as per daily milk intake logs. No intention to treat analysis reported.

#### Table abbreviations

$\sim$  = approximately, **BL**= baseline, **BMI**= body mass index, **Ca<sup>2+</sup>** = calcium, **F**= female, **g**= gram, **kcal**= calorie(s), **kg**= kilogram, **M**= male, **m**= meter, **mg**= milligram, **oz**= ounce, **PA**= physical activity, **RCT**= randomized controlled trial, **wks**= weeks, **wt**= weight

#### References

1. Barr SI, McCarron DA, Heaney RP, Dawson-Hughes B, Berga SL, Stern JS, et al. Effects of increased consumption of fluid milk on energy and nutrient intake, body weight, and cardiovascular risk factors in healthy older adults. *J Am Diet Assoc.* 2000;100(7):810-7. Abstract available from: <http://www.ncbi.nlm.nih.gov/pubmed/10916520>

#### Examples of clear succinct evidence statements:

##### Systematic Review (example)

- a. A systematic review (including studies published up to 2003) examining the role of diet or biological markers in the development of rheumatoid arthritis (RA) identified 11 studies (14 articles): five case-control and three cohort studies of diet, and three case-control studies of serum biomarkers (1). The authors summarize results of specific foods or nutrients and their association with RA as follows:
  - a. Oils and fish: Three case control studies were identified. Two studies found that higher consumption of fish was associated with decreased RA risk; however in one study of U.S. women this was found for broiled or baked fish only and the association was stronger in cases who tested positive for rheumatoid factor (seropositive RA) compared to negative cases (2). Two studies from Greece reported that higher olive oil consumption was associated with reduced risk of RA.
  - b. Fruits, vegetables and antioxidant vitamins: Two case-control and one cohort study were identified, which showed that higher intakes of fruit, cooked vegetables and cruciferous vegetables were associated with reduced RA risk. In two of these studies, beta-cryptoxanthin and vitamin C were also found to be protective.
  - c. Coffee, tea and caffeine: Three cohort studies found mixed results, with one study from Finland showing coffee consumption was associated with an increased RA risk in individuals with seropositive RA; however the Iowa Women's Health Study of 55-69 year-old women showed an increased RA risk with decaffeinated coffee, but not caffeinated coffee and decreased RA risk associated with high tea consumption (3). The Nurses' Health Study, found no association between coffee, decaffeinated coffee, tea or caffeine and RA risk (4).
  - d. Alcohol: Two case-control and one cohort study were identified all conducted in women. Results from, one case-control in the Netherlands showed a protective effect of alcohol on RA (highest intake compared to no alcohol); however the other two studies, both from the U.S. showed no significant association between alcohol intake and risk of developing RA.
  - e. Other food groups / nutrients: One cohort study found no association between calcium intake and RA; however a case-control study showed an inverse association between calcium and phosphorus intake as well as energy intake and RA risk (2). This latter study

also reported a negative association between protein and meat intake and RA risk, but no association with other macronutrients or dairy foods (2).

- f. Biomarker studies: Three studies found lower levels of antioxidant nutrients (beta-carotene, retinol, alpha-tocopherol, and selenium) in individuals with RA compared to controls. Two studies from Finland report lower serum levels of alpha-tocopherol, beta-carotene and selenium in new cases of RA collected prior to symptom onset.

The authors of the review conclude that evidence for an effect of diet in the etiology of RA is limited, acknowledging weaknesses in the identified studies (1).

#### Individual Study (example)

- a. The Nurses' Health Study included 82,063 women and identified 546 cases of RA during follow-up (1980-2002) (7). Evaluation of diet (in particular, sources of protein and iron) found no association between RA and any measure of protein or iron intake, or of red meat, poultry and fish intake and RA risk. Similarly evaluation of data from the Nurses' Health Study and Nurses' Health Study II cohorts (over 180,000 women followed from 1980-2002) showed no association with vitamin D intake (8) or antioxidant intake (vitamins A, C, and E and alpha-carotene, beta-carotene, beta-cryptoxanthin, lycopene, lutein, and zeaxanthin from foods and supplements) (9) and risk of RA. The Women's Health Study of 39,144 health professionals followed from 1992-2004, randomized women to receive low-dose aspirin and vitamin E (600 IU/day) or placebo for primary prevention of cardiovascular disease and showed no difference between vitamin E or placebo group in risk of developing RA (10). There were also no significant risk reductions in either seropositive or seronegative RA cases (10).

Students can find research-related glossary items in the Research Terms resource in the Research Methods KP at:  
<http://www.pennutrition.com/KnowledgePathway.aspx?kpid=14732&trcatid=ALL&trid=18322>

#### 2.4.7 Grading the Evidence

Using the Evidence Checklist in the [PEN<sup>®</sup> Writers Guide Appendix 5](#) and the Center for Health Evidence worksheets: Users Guides to the Medical Literature in [Appendix 9](#) appraise your materials to establish the quality of the evidence related to your questions.

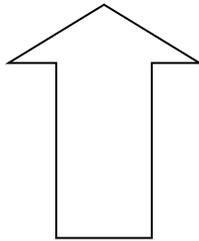
From time-to-time there may be a situation where there is no evidence to support a known fact. In this case we refer to the fact as a truism which is defined as “an un-doubted or self-evident truth” (Source: <http://www.merriam-webster.com/dictionary/truism>). An example may be “Boiling water coming into direct contact with human skin will burn the skin.” Even though, the only evidence available for this may be case reports and anecdotes, the physiological rationale and basic science would support this as a truism and warrant a higher evidence grade.

Take the following scale into consideration when doing your appraisal:

## Research Ratings Scale

*Hierarchy of Study Designs (CHE - Evidence-Based Decision Making Tutorial 2009)*

Results may be more valid or believable



- N of 1 randomized controlled trials
- Randomized control trials
- Cohort studies
- Case-Control studies
- Cross-sectional analytic studies
- Ecological studies
- Case series
- Case reports

Results may be less valid or believable

### 2.4.8 Comments

Include relevant information to support the KPP that does not belong in the evidence statements, Statements should be referenced and these references become part of the main reference list for the question. Example - if the question is about chromium the comment might include sources of chromium in foods, different valances of chromium - food versus chemical and industrial; length of trials and lack of clarity on safety.

### 2.4.9 Rationale

This section allows explanation of the proposed or known mechanisms of action, reasoning behind research hypotheses and explanations for theories. It should be referenced and these references become part of the main reference list for the question.

Example:

#### KPP

In adults, data from observational studies suggest that low vitamin D status is associated with a greater risk of CVD; however clinical trials have not demonstrated a beneficial effect of vitamin D supplementation on clinical CVD outcomes. Additional research is required to examine whether a protective effect on CVD exists for vitamin D with consideration given to the dosage of vitamin D supplement used and the population studied (e.g. individuals with vitamin D insufficiency or individuals at increased risk of CVD).

#### Rationale

Several mechanisms have been suggested whereby vitamin D may affect risk for cardiovascular outcomes: vitamin D "regulates the renin-angiotensin system, suppresses proliferation of vascular cell smooth muscle, improves insulin resistance and endothelial cell-dependent vasodilation, inhibits anticoagulant activity and myocardial cell hypertrophy, and may modulate macrophage activity and cytokine generation" (2).

### 2.4.10 Writing a Background

PEN<sup>®</sup> subscribers have indicated they find background materials very valuable especially if they are new to the topic area. Templates have been developed to guide the development of backgrounders depending on whether the topic is clinical, lifecycle or other. See Appendix 15 and 16 in the [PEN<sup>®</sup> Writers Guide](#).

There is a section in the Background for definitions. These should be definitions that we don't want in the glossary e.g. if there is one definition in one disease and a slightly different one in another or if the term is commonly used in another topic we don't want a multitude of

underlining in a KP. Please check the glossary before adding words to the Background as we don't want to duplicate definitions. Even if a term is in the Glossary you may have a better or different reference for the term which could be useful to add to the Glossary. Make certain to include the complete reference for the definition.

#### **2.4.11 Writing a Toolkit**

For each KP there will be a brief summary / overview / roll-up of the key practice points and relevant background material, written as educational guidelines for the practitioner to use with clients / consumers. If writing a Toolkit is part of your assignment you are encouraged to spend a little time viewing a variety of [Toolkits](http://www.pennutrition.com/Toolkits.aspx) <http://www.pennutrition.com/Toolkits.aspx> so that you can familiarize yourself with the style required. A template has been created to assist you in developing your Toolkit. See Appendix 17 in the [PEN- Writers Guide - Toolkit Template](#).

To save time, you may want to write this tool after you receive feedback from the reviewers to ensure you are working with final approved content.

#### **2.4.12 Evidence Summary**

For each KP there will be, when applicable, a brief summary / overview / roll-up of the key practice points in each of the four levels of evidence. This is written by a member of the PEN<sup>®</sup> team once all of the content is finalized and ready for posting in PEN<sup>®</sup>.

#### **2.4.13 Related Knowledge Pathways**

Provide a list of PEN<sup>®</sup> topics or KPs that may contain additional information that is related to this issue/topic.

#### **2.4.14 Other links**

This could be websites, Partner Networks/Interest Groups, Communities of Practice, on-line courses. Recommended websites should be credible, preferably national in scope, be directly related to the knowledge pathway and free of advertising. If there is more than one general website recommended, then a separate Related Tools & Resources called Web Links should be developed. See Appendix 15 and Appendix 16 - Background templates for details on creating this Tool & Resources in the [PEN<sup>®</sup> Writers Guide](#).

#### **2.4.15 Glossary**

Provide definitions of key terminology used in the pathway that a dietitian may be unfamiliar with. Include the reference used for the definition.

#### **2.4.16 Social Media Posts**

Students are asked to provide a short, succinct teaser about the PEN<sup>®</sup> content you have written that can be used for a tweet (Twitter) and a post on the PEN<sup>®</sup> Facebook wall. Here are examples:

##### **Twitter tweet (maximum 140 characters):**

Chitosan has questionable significance in weight loss among overweight or obese adults. For more info, see:

<http://www.pennutrition.com/index.aspx?ReturnURL=%2fKnowledgePathway.aspx%3fkpid%3d15325%26pqcatid%3d146%26pqid%3d18733>

**Facebook post (no maximum length but want something informative but short and easy to read):**

Are chitosan supplements effective for weight loss among overweight or obese adults?  
Any effect of chitosan on weight loss is of questionable clinical significance. For more information,

see: <http://www.pennutrition.com/KnowledgePathway.aspx?kpid=15325&pqcatid=146&pqid=18733>

Or

Are chitosan supplements safe for weight loss among overweight or obese adults?

While chitosan supplements appear to be well tolerated in most people, the potential does exist for interference with warfarin, for shellfish allergy and, as with most ocean-derived products, for heavy metal contamination. Chitosan is often derived from shrimp, lobster and crab exoskeleton.

For more information, see:

<http://www.pennutrition.com/KnowledgePathway.aspx?kpid=15325&pqcatid=146&pqid=18733>

#### **2.4.17 Review Process of PEN<sup>®</sup> Content**

##### **External Review**

Once the PEN<sup>®</sup> content has been drafted, the student should review the PEN<sup>®</sup> Writer's Checklist Appendix 2 in the [PEN<sup>®</sup> Writers Guide](#) to make certain the content is ready for review. A PEN<sup>®</sup> team member will be assigned as a contact for your assignment and will provide preliminary feedback.

When it is determined that the content is ready for external review, the PEN<sup>®</sup> team member will send out the content in a WORD document to identified external reviewers. Reviewers, with expertise in the topic area, both from academia and practice are identified by the PEN<sup>®</sup> team. This is a critical stage in the KP development and answering practice questions as it adds credibility to what is written in PEN<sup>®</sup>. The PEN<sup>®</sup> team member will ensure that the WORD document contains information on the reviewers, including email address and country of origin. To see what reviewers are looking for, see Guidelines for KP Reviewers in the [PEN<sup>®</sup> Writers Guide Appendix 3](#).

#### **2.4.18 Editing**

Once the reviewers' feedback has been incorporated, the MS WORD document is ready for the PEN<sup>®</sup> Editor who ensures that the content is consistent, grammatically correct and that it reads well. From the [PEN<sup>®</sup> Writers Guide](#), the PEN<sup>®</sup> Editor also checks for plagiarism (see **Appendix 10** -Plagiarism Guidelines), the use of abbreviations (e.g. see **Appendix 12** for Metric System Equivalentents for Units of Measure) and formatting and style (see **Appendix 20** - PEN<sup>®</sup> Style Guide). The PEN<sup>®</sup> team member who is mentoring the writing of the content will discuss any issues or clarifications needed with you.

#### **2.4.19 Specific to revising a practice question or Knowledge Pathways**

On a regular basis, frequency depends on volume of new research on the topic, or at least every two to three years each KP is revised. Your assignment may involve revising an entire existing KP or several questions in an existing KP. Revision involves:

- obtaining an MS WORD document of the content to be revised, this will be created by a member of the PEN<sup>®</sup> team. The document includes the KP content and any related questions or just the questions to be revised. The PEN<sup>®</sup> Editor will add comments to the related questions section indicating which questions will need to be reviewed for consistency with your updated content. The student is to flag any inconsistencies of the related questions with the PEN<sup>®</sup> team mentor.

- reviewing existing questions, **Note:** if the student would like to eliminate a PQ or change the wording of the PQ (the question itself, not the content), there needs to be dialogue and approval from the PEN<sup>®</sup> team member who is mentoring them in revising the KP since some questions are linked to more than one KP.
- searching for and incorporating new literature on the topic into the KPPs and Evidence Statements
- if reviewing a KP, there may be new questions on the topic to answer
- if reviewing a KP, reviewing tools and resources, recommending removal of those that no longer match the evidence and recommending new ones
- updating the Background document and Toolkit

## Appendices

## Appendix 1 Intellectual Property (IP) & Declarations of Affiliation (DAI) and Interests Waivers

### ASSIGNMENT OF INTELLECTUAL PROPERTY AND INTELLECTUAL PROPERTY RIGHTS AND WAIVER OF MORAL RIGHTS PEN® Student Version

TO: DIETITIANS OF CANADA

WHEREAS Dietitians of Canada ("DC") has provided a type of experience for length and dates for name of student/intern, name and location of university / internship to what the assignment will achieve or contribute to e.g. research component, meeting certain practice competencies.

WHEREAS name of student, has contributed to the Works outlined in Schedule A;  
AND WHEREAS the Assignor intends that this assignment supersede any other assignment as between the Assignor and DC in respect of the subject matter of this assignment of intellectual property and intellectual property rights and waiver of moral rights ("Assignment and Waiver");

NOW THEREFORE, for the payment of \$1.00 and other good and valuable consideration, the receipt and adequacy of which is acknowledged, the Assignor agrees as follows:

1. The Assignor represents and warrants that, in respect of the Works, the Assignor has not infringed, violated or misappropriated the rights of any other person.
2. The Assignor hereby:
  - a. irrevocably sells, assigns, transfers, sets over and conveys to and in favour of DC all of the Assignor's worldwide right, title and interest in and to the Works and Intellectual Property Rights therein; and
  - b. irrevocably and unconditionally waives in favour of DC any author, moral or similar rights that the Assignor has or holds in the Works or in any part thereof.
3. This assignment and transfer shall be an irrevocable and absolute assignment to and for the sole and exclusive benefit of DC. This Assignment and Waiver is in addition to any other assignment, or similar instrument entered into, by the Assignor to and in favour of DC. If there is a conflict between this Assignment and Waiver and any other assignment or instrument between the Assignor and DC, this Assignment and Waiver shall rank in priority to any such other assignment or instrument.
4. This Assignment and Waiver shall enure to the benefit of DC and its successors and assigns and be binding upon DC and the Assignor and the Assignor's heirs, assigns, successors in interest, administrators and legal representatives, as applicable.
5. The Assignor shall execute all such further assignments and other documents, and shall do all such further acts and things as may be necessary or desirable in the opinion of DC from time to time in order to more effectively complete the assignment and transfer to DC contemplated hereunder.
6. This Assignment and Waiver shall be governed by and construed and enforced in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein, without regard to any principles of conflicts of law. In the event of any litigation to enforce the terms of this Assignment and Waiver, the parties hereto irrevocably consent to the exclusive jurisdiction of the Courts of Ontario with the venue being the Courts of Ontario in the City of Toronto, Ontario, Canada.
7. This Assignment and Waiver may be executed either by original signature, or by facsimile signature, or by PDF signature attached to an email.

8. **IN WITNESS WHEREOF** the Assignor has executed this Assignment and Waiver as of the **day of**  
**the month of the year.**

\_\_\_\_\_  
Assignor Signature (i.e. student):

\_\_\_\_\_  
Assignor Name(print):

\_\_\_\_\_  
Witness Signature:

\_\_\_\_\_  
Witness Name (print):

Schedule "A"  
Definitions

1 "Intellectual Property Rights" means any:

- a) intellectual property rights provided in Canada under copyright law (including moral rights), trade-mark law, patent law, industrial design law or any other Law applicable to the Agreement, which may provide rights in:
  - i. any software and works (including, without limitation, any literary works) and compilations of works of any kind, word and design marks and other distinguishing features associated with wares and services, inventions, business methods, developments and industrial designs, as applicable, whether registered or unregistered, and any confidential information and trade secrets, or
  - ii. the expression or use of any of the foregoing;
- b) rights in and to any application, registration, licence, sub-licence, assignment, waiver, agreement or any other instrument or document that evidences any rights set out in subsection 1(a) above; and
- c) rights to enforce the rights and obtain remedies for any violation of any of the rights set out in subsections 1(a) and (b) above.

2. "Law" means any law, statute, code, ordinance, decree, rule, regulation, bylaw, statutory rule, principle of law, published policy and guideline, judicial or arbitral or administrative or ministerial or departmental or regulatory judgment, order, decision, ruling or award, including general principle of common and civil law, and terms and conditions of any grant of approval, permission, authority or licence of and any agreement with any governmental authority.

3. "person" means any individual, corporation, partnership, limited liability company, proprietorship, association, trust or other legal entity other than the Assignor.

"Works" means any and all materials, content and work products that have been conceived, created, written, made, produced, reduced to practice or developed by the Assignor pursuant to or in connection with the provision of the Services, including all information, software, specifications, flow charts, plans, drawings, designs, records, manuals, procedures, data and databases, reports and other documentation in all formats, whether complete or not, all of which are described below:

Description of the PEN<sup>®</sup> assignment / project including the topic and the knowledge objects involved.

Timeline - with specific dates

Work is to be completed following the PEN<sup>®</sup> student assignment guidelines and processes outlined in the PEN<sup>®</sup> Student Assignment Guide, and using the recommended format in the PEN<sup>®</sup> Style Guide. Completed checklists associated with the various assignments are to be submitted as well.

**Reminders:**

- The PEN<sup>®</sup> content being developed, including Key Practice Points (KPPs) and evidence statements that answer defined practice questions must be in one's own words. Plagiarism is not acceptable and we ask that you review the Plagiarism section in the PEN<sup>®</sup> Guidelines for Developing a Knowledge Pathway.
- Assurance is needed that content of the Knowledge Pathway, including evidence-based answers to practice questions submitted to PEN<sup>®</sup> have not have been published, submitted or accepted for publication elsewhere. Evidence-based answers must be based on a synthesis of the most recent scientific literature. However, answers adapted from work published elsewhere, (e.g., systematic reviews, technical reviews etc.) may be considered with proper referencing of the document of origin. When submitting a Knowledge Pathway or an evidence-based answer to a

practice question, the author should always make a full statement to the PEN Director about all submissions and prior reports that might be regarded as prior or duplicate publication of the same or very similar work. Copies of such material should be included with the submitted PEN documents.

- PEN Authors and reviewers are asked to declare any potential conflicts of interest. “A conflict of interest occurs where, in the mind of a reasonable person, a dietitian has a personal interest that could improperly influence their professional judgment” (from: *The Jurisprudence Handbook for Dietitians in Ontario p 100*)

**Please complete PEN® Declaration of Affiliations and Interests form.**

Student Initials (indicates the specifics of the Works section have been read) \_\_\_\_\_

**Declaration of Affiliations (DAI) and Interests Form  
Practice-based Evidence in Nutrition**

Name: \_\_\_\_\_

I have reviewed my current activities and those of recent years, particularly as they relate to the ***Affiliations and Interests Checklist*** - next page. I have also considered the activities of my spouse and immediate family members in so far as they could be viewed to affect my impartiality.

I would like to bring the following to the attention of PEN: Practice-based evidence in Nutrition:

Enter text here

I hereby certify that I am not in a position of real, potential or apparent conflict of interest except as disclosed above.

If before the PEN<sup>®</sup> content I am developing or reviewing has been completed there are any changes in circumstances that may place me in a position of real, potential or apparent conflict of interest I will inform the Director.

**Declaration of DC's Right to Provide Personal Contact Information in PEN<sup>®</sup> System**

I agree to have my email address indicated in the Pathway contributors section of PEN<sup>®</sup> so that subscribers may contact me if they have specific questions related to the questions I have answered.

Signature \_\_\_\_\_

Date \_\_\_\_\_

Once signed please return it to: \_\_\_\_\_

- adapted from the Office of the Canadian Task Force on Preventative Health Care

### Affiliations and Interests Checklist

In reviewing your activities (and those of your spouse and immediate family members) to determine whether they affect your impartiality or create a real, potential or apparent conflict of interest, among other things, consider the following:

- Investments in a business enterprise (Other than mutual funds or Registered Savings Plans)
- Retirement Savings Plans that are not self-directed);
- Participation as investigator in clinical trials of relevance to the knowledge pathway;
- Previous, present and potential Contracts, Grants and/or Contributions;
- Pending negotiations regarding potential contracts;
- Honoraria and other sources of personal income;
- Gifts and hospitality of significant value;
- Travel sponsorship;
- Promotion of a product(s) of relevance to the knowledge pathway;
- Publications;
- Public statements;
- Lobbying activities;
- Membership in special interest groups;
- Expert testimonies in court;
- Any interest or activity, which may create a reasonable apprehension of bias.



Professional Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
1.06 Use a systematic approach to decision making a. Apply ethical principles to decision making e.g. no plagiarism b. Assess relevant evidence and best practice information e. Make and justify decisions f. Take responsibility for decisions and actions	✓	✓	✓	✓	✓	✓
1.07 Maintain a client-centered focus b. Consider clients abilities and resources c. Integrate client perspectives into practice activities (focus testing) d. Identify services and resources relevant to client demographics and needs	✓	✓	✓			
1.08 Manage time and workload effectively a. Prioritize professional activities b. Meet deadlines	✓	✓	✓	✓	✓	✓
1.09 Use technologies to support practice. a. Use technology to communicate b. Use technology to seek and manage information c. Use applications related to dietetics	✓	✓	✓	✓	✓	✓
1.11 Assess and enhance approaches to dietetic practice (from the literature) a. Assess effectiveness of approaches to practice b. Reflect on effectiveness of practice c. Seek new knowledge that may enhance or support practice d. Identify ways to enhance practice	✓	✓	✓	✓	✓	✓

Communication and Collaboration Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
2.01 Select appropriate communication approaches a. Identify opportunities and barrier affecting communication b. Select appropriate communications technique c. Select appropriate terminology	✓	✓	✓	✓	✓	✓
2.02 Use effective written communication skills a. Ensure that written material facilitates communication b. Write clearly and concisely, in a manner responsive to the needs of the reader(s) c. Write in an organized and logical fashion	✓	✓	✓	✓	✓	✓

Communication and Collaboration Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
d. Provide accurate and relevant information						
2.03 Use effective oral communication skills	✓	✓	✓	✓	✓	✓
a. Speak clearly and concisely, in a manner responsive to the needs of the listener(s)						
b. Use appropriate tone of voice and body language						
c. Recognize and respond appropriately to non verbal communication						
2.04 Use effective interpersonal skills						
b. Communicate in a respectful manner	✓	✓	✓	✓	✓	✓
d. Establish a rapport	✓	✓	✓	✓	✓	✓
e. Apply counselling principles - Client handout development	✓		✓			
f. Apply principles of negotiation and conflict management	✓	✓	✓	✓	✓	✓
g. Seek, respond to and provide feedback	✓	✓	✓	✓	✓	✓
2.05 Contribute to the learning of others	✓	✓	✓	✓	✓	✓
a. Recognize opportunities to contribute to the learning of others						
c. Select and implement appropriate educational strategies						
d. Select learning resources						
e. Develop learning resources						
2.06 Contribute productively to teamwork and collaborative processes - only if a group project	✓	✓	✓	✓	✓	✓
a. Contribute dietetics knowledge in collaborative practice						
b. Draw upon the expertise of others						
c. Contribute to shared decision making						
d. Facilitate interactions and discussions among team members						

Nutrition Care Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
3.02 Develop nutrition care plans				✓	✓	✓
b. Identify appropriate nutrition interventions - Toolkit/PGS						
i. Develop client education plans - Toolkit/PGS						

Health Promotion Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
4.01 Assess food and nutrition related issues of groups, communities and	✓	✓	✓	✓	✓	✓

Health Promotion Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
populations c. Obtain and interpret food and nutrition surveillance, monitoring and intake data e. Obtain and interpret information relating to determinants of health f. Obtain and interpret information related to food systems and food practices g. Identify relevant group, community or population assets and resources						

Management Practice Competencies	PEN Assignments					
Performance Indicators	A	B	C	D	E	F
5.02 Assess strengths and needs of programs and services related to dietetics a. Analyze goals, objectives and activities with reference to strategic planning principles b. Identify relevant assessment information	✓	✓	✓	✓	✓	✓
5.02 Manage programs and projects a. Identify appropriate goals and objectives for programs and projects b. Identify strategies to meet goals and objectives for programs or projects c. Develop activity plan for programs or projects	✓	✓	✓	✓	✓	✓