Title:

Blank and completed frameworks for the "PubMed Tutorial for Veterinarians"

"PubMed Tutorial for Veterinarians" URL:

http://cases.vetmoodle.org/CET_CoursePlayer/demo1/public/pubmed.html

Digital Collection of the documents for the "PubMed Tutorial for Veterinarians":

http://hdl.handle.net/1969.1/158203

Funding statement:

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PubMed: A Case Study Framework Worksheet

Learning Outcomes

Before designing a tutorial, you must identify the learning outcomes. Learning outcomes are the knowledge and skills you expect the participants to gain by the time they finish the tutorial.

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Introduce clinical need for a search (Storyline)

People learn best by immediately using new information to solve problems. Begin the tutorial with a problem to solve, or question to answer. For veterinarians, it is should be a clinical veterinary need. Include any relevant information such as patient history and diagnostic results.

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Video capture the initial search

Use the obvious search terms from your clinical need to illustrate the process of typing terms into PubMed and show how the results appear. There should be too many results at the end of this step, several hundred at least. This will work best with a screen capture of the action.

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Explain filter use

Point out that several hundred results is difficult to get through, and using filters can reduce these to a more manageable number. Keep the explanations brief and focused on location and activation of the default filters.

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Advanced user information on Boolean logic/ATM

It is important for users to understand principles of why searches succeed or fail. However, topics such as Boolean logic, and automatic term mapping will make more sense after a few searches have been conducted and the user becomes familiar with PubMed tools.

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Add to the storyline a new need or opportunity for more search terms

The new need in this clinical storyline should provide an opportunity to either refine or add another search term(s). This could be the need to add the specific drug name for a treatment, an additional symptom or a new diagnosis.

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Formulate an answerable question

Instruct the user on how to select terms that will provide the most accurate results. Help the user do this by explaining the benefits of using or modifying the PICO method to formulate a suitable question that will provide effective terms.

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Provide contrasting examples of answerable questions

Provide examples of suitable and unsuitable questions in any format you require. However, explanation should be provided for why each question is either suitable or not.

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Add new or refined search term from the answerable question

Explain how to select search terms for the answerable questions. Also illustrate the addition of a new or refined search term to the original two, and how it impacts the results. This should be done by either a series screen capture images, or video capture of the search.

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Illustrate investigation of retrieved results

Explain to the users how to read and interpret their search results. This could be done with a series of screen capture images or video capture of the process.

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Explain how to use of the Full record

Show the users how to read and use the full record from their search results. Use either a series of screen captures, or video capture to illustrate this.

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Discuss elements of successful search

Help users know when to stop refining the search, and use the results they have.

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Wrap up the clinical storyline

Provide a conclusion to what the veterinarian decided to do with the information they gleaned from the PubMed search. Include any relevant information such as diagnostic results or treatment outcomes to conclude the case in a satisfactory manner.

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PubMed: A Case Study Framework

Learning Outcomes

Before designing a tutorial, you must identify the learning outcomes. Learning outcomes are the knowledge and skills you expect the participants to gain by the time they finish the tutorial. Here is an example, the participant will be able to do the following:

1. Choose appropriate search terms from the following categories: species, disease, and/or diagnosis.
2. Recognize appropriate use of Boolean connectors AND and OR in creating a PubMed search.
3. Use PubMed filters, including the *Veterinary Science* filter, to limit search results.
4. Assess a search using the *Search details* tool to see how PubMed interpreted your search terms.
5. Recognize MeSH principles of how PubMed interprets search terms.

Introduce clinical need for a search (Storyline)

People learn best by immediately using new information to solve problems. Begin the tutorial with a problem to solve, or question to answer. For veterinarians, it is should be a clinical veterinary need. Include any relevant information such as patient history and diagnostic results.

Construct a clinical need the will provide obvious general search terms. These search terms should provide results that need refining. For example: Imagine you have a feline patient with hyperthyroidism. You would like to know the best way to treat the disease, and need the most current and accepted methods. Provide any clinical information that is relevant to supporting this need. This situation provides an opportunity to guide the participant through the search process using the treatment need to illustrate the process in a meaningful way to the learner. Additionally, the obvious search terms "cats" and "hyperthyroid" return results that are easily refined using filters and adding another search term.

Video capture the initial search

Use the obvious search terms from your clinical need to illustrate the process of typing terms into PubMed and show how the results appear. There should be too many results at the end of this step, several hundred at least. This will work best with a screen capture of the action.

For our example, the terms "cats" and "hyperthyroid" were used in the search bar. This returned over 400 results that are easily reduced through filter use.

Explain filter use

Point out that several hundred results is difficult to get through, and using filters can reduce these to a more manageable number. Keep the explanations brief and focused on location and activation of the default filters.

Show the location of filters that can be turned on by one click, and keep explanation of these filters very brief. (Article types, Text availability, Publication dates, and Species) You will need to provide more detailed instruction for locating and using the Veterinary science subset within the Subjects filter. Either a series of screenshots or a video capture would be most useful here.

Advanced user information on Boolean logic/ATM

It is important for users to understand principles of why searches succeed or fail. However, topics such as Boolean logic, and automatic term mapping will make more sense after a few searches have been conducted and the user becomes familiar with PubMed tools.

Provide in-depth explanations for how Boolean logic and automatic term mapping influences PubMed searches. However, do not make the explanation required at this point in the tutorial. No matter the media used to provide this instruction, make the instruction on these topics optional so the user can either learn more right now, or look at it later when they are more comfortable with the searching process.

Add to the storyline a new need or opportunity for more search terms

The new need in this clinical storyline should provide an opportunity to either refine or add another search term(s). This could be the need to add the specific drug name for a treatment, an additional symptom or a new diagnosis.

For the feline hyperthyroid example, we presented the users with a few different common treatments for hyperthyroidism. One treatment was chosen based on the circumstances we outlined where the cat could not be treated with oral medication. Therefore, we were able to add "transdermal methimazole" to the original search terms: "cats" and "hyperthyroid". This illustrated how refining the search terms can provide more targeted results.

Formulate an answerable question

Instruct the user on how to select terms that will provide the most accurate results. Help the user do this by explaining the benefits of using or modifying the PICO method to formulate a suitable question that will provide effective terms.

We used the PICO method to assist users with formulating effective questions. However, you can use any method that has been successful for your learners. Just be sure that your process is easy for others to replicate.

Provide contrasting examples of answerable questions

Provide examples of suitable and unsuitable questions in any format you require. However, explanation should be provided for why each question is either suitable or not.

For our tutorial, we did this in a quiz format. We provided the user with three examples of questions that illustrated different levels of suitability: incorrect, correct but incomplete, and correct. They were asked to select the most appropriate question.

Add new or refined search term from the answerable question

Explain how to select search terms for the answerable questions. Also illustrate the addition of a new or refined search term to the original two, and how it impacts the results. This should be done by either a series screen capture images, or video capture of the search.

We provided a video capture clip of adding "transdermal methimazol" to the already existing "cats" and "hyperthyroid". This allowed users to see how the results are narrowed and improved.

Illustrate investigation of retrieved results

Explain to the users how to read and interpret their search results. This could be done with a series of screen capture images or video capture of the process.

Here we showed the users how to interpret the Search details box.

Explain how to use of the Full record	Show the users how to read and use the full record from their search results. Use either a series of screen captures, or video capture to illustrate this.

Discuss elements of successful search	Help users know when to stop refining the search, and use the results they have.

There are many factors that determine whether or not someone should keep trying to refine their search. All of these are contextually based on individual situations and needs. However, it is worthwhile to give users of a few of these factors to consider. We used three factors:

- Results have a reasonable number of articles.
- Results are within an acceptable date of publication ranges.
- Results are reasonably focused and are on topic.

Wrap up the clinical storyline	Provide a conclusion to what the veterinarian decided to do with the information they gleaned from the PubMed search. Include any relevant information such as diagnostic results or treatment outcomes to conclude the case in a satisfactory manner.