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Advanced Concept Map Formatting

Learning Objectives

- Identify the differences between basic and advanced concept map setup
- Discuss how knowledge application contributes to the advanced setup process
- Identify how concept mapping theory appears within a concept map
- Formulate questions that become part of the critical thinking process utilized in concept map formation
- Identify methods for evaluating concept map setup

Introduction

Advanced map setup provides more definition for concept maps. It is essential for differentiation of concepts in a complex, living map. This process is very similar to the approach an artist takes when creating a painting. First come the thoughts and ideas of the painting's subject. Whether in thought or on paper, the artist begins to sketch a basic idea, followed by a simple rendering. Once that is achieved, in-depth consideration is given to dimensions, colors, and placement. Artistic expression is used to refine and tease out the specifics needed to perfect the final finished product.

When you create a map, you are that artist. Basic map setup is the rendering you create to "sketch" the path you want your map to take. It is important to realize that

this complex process includes not only the practice maps you draw, but also the mental reasoning and thought processes that lead to the ideas transferred from your brain to the paper. The entire process is completed based on your core of nursing knowledge and how you evaluate and process it. You then give it meaning by applying it on paper. So, advanced setup is a progression of basic setup.

Because a more advanced approach is required for more complex concept maps, these maps are usually more expansive and complex. Your thought processes will need to be more advanced and refined as well. This chapter will lead you on a deeper path of questioning so that you can arrive at a destination of meaningful learning. This is critical thinking in action, and the results you see are what you put into expanding and honing it.

Key Terms and Definitions

- **Advanced concept map setup:** an extension of basic concept map setup where shape and color differentiation are utilized to refine the map for translation and readability
- **Concept map key:** a coded guide to color and shape included on the map to aid in interpretation
- **Uniformity** (as it applies to concept maps): selective use of shapes and colors with the advanced setup of a concept map
- **Concept map clarity:** the ability to interpret and follow the path of a concept map
- **Practice reflection:** the continuous and ongoing action of evaluating nursing knowledge and its application to refine and expand

Advanced Concept Map Setup

For use within nursing education, concept maps can become extremely detailed and large. If advanced formatting techniques are not employed, map information becomes crowded, difficult to interpret or read, and not very meaningful. Living concept maps focusing on nursing actions can become very expansive and contain a host of related concepts. A lack of utilized strategies to define, refine, and clarify all of them leads to a chaotic appearing map that is difficult to read, let alone learn from. Completing concept maps is not done to demonstrate solely what we know, but to help us to reflect on our knowledge base and the critical thinking abilities we are using to apply it. **Practice reflection** is the necessary act of evaluating and reevaluating what we know and how effectively we know it. **Advanced concept map setup** requires that reflective process for creating thorough and complete concept maps and allows us to assess and evaluate that knowledge simultaneously.

Because our goal for employing concept maps in nursing education is to promote and achieve strong critical thinking skills, we need to ensure that this is the purpose they serve. Creation, setup, and reflection of a completed concept map reinforce knowledge, critical thinking, and the analytical process of learning for application. The components of advanced setup are highlighted as follows.

Shapes

Using size and color with *shapes* will help to identify categories and relationships. This can be achieved in several ways:

- Shapes can be clear but outlined with different colors for emphasis and focus.
- Use separate colors to differentiate between main concepts and subconcepts.
- Use a larger size or different shapes for various categories.
- Shapes may be overlapped or touching to signify a codependent relationship.
- Cluster shapes to show multiple relationships or associations by using smaller shapes to surround a larger one.
- Alternate text colors or fonts within shapes to separate ideas and concepts or to link them.
- Shapes can be used as symbols to illustrate a point or to emphasize. For example, a small triangle could be used as a caution sign:
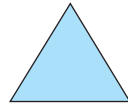
Shapes assist with information organization and can indicate differentiation while highlighting relationships at the same time.

Lines

Styles and colors of *lines* are just as important as shapes in creating and tailoring information within concept maps. Bold, dark lines might be used to demonstrate a primary relationship between concepts, while dashed lines could signify secondary relationships. The color choice for a line can indicate an emphasis or relationship. Curved lines and arrows can demonstrate a stronger link between concepts where a sequential or cause-and-effect relationship is shown. Many lines will appear in living maps demonstrating multiple connections all over the paper. It is of utmost importance to make clean lines with a clear path. Along with lines, *arrows* of various colors and degree curve help define sequencing and interconnected links. Arrows are sometimes underused as creative and meaningful ways of demonstrating this. A simple pattern of straight arrows can branch off of a main concept to indicate expanding effects of it. Double-ended arrows are great for demonstrating dependent relationships. Colored, curved arrows are a very effective way to show causal and sequencing relationships.
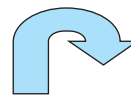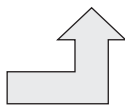
A crucial concept to remember when using lines, shapes, and color in larger maps is that **uniformity** is a priority. Using a wide variety of inconsistent styles can make for a very confusing map and detract from what you truly want to demonstrate.

Descriptive Phrases

Also, use of a coded **key** will be very helpful with larger maps containing multiple concepts and relationships. Actually, a key should be required for optimal interpretation.

No matter how large or small your map is or the purpose for it, *always use descriptive phrases*. Viewing a map is the launching point for examining relationships and their interactions, but the phrases make us take another look and begin the question-and-answer process that forms the basis of critical thinking. A map can never have too many descriptors. Repeated use of descriptors adds exposure to learning, leads to questioning that ensures comprehension, and aids in the ability to apply what is learned. See **Figure 3-1** (descriptive phrases are contained within the clear boxes).

Often, these larger, more complex living maps contain small groupings or clusters of information, which are then linked to other clusters and groupings. The flow of information then becomes extremely important so that the "trail" can be followed. Associations made may affect multiple clustered groups and related concepts. **Clarity** and organization are essential to creating a meaningful map. Descriptive phrases need to be well chosen to assist with defining actions and the links between and among concepts.

Figure 3-2 shows additional descriptive phrases from a standpoint of patient problem-based application. As stated earlier, descriptive phrases are all about action. Although some can almost strictly indicate a nursing or performance action and others a heavier thought-based emphasis, many times both actions can appear in one phrase because application is taking place. Application of knowledge links critical thinking to applied action.

Through this chart, a link appears between nursing diagnoses and the concept mapping process. Because the nursing process embodies critical thinking and application and nursing diagnosis determination is integral to this, it is important to demonstrate this. Follow through is an important part in completing the circle from assessment to evaluation. The purpose of descriptive phrases is to assist us with considering and addressing outcomes within our actions. I am always emphasizing to students the need to *follow*
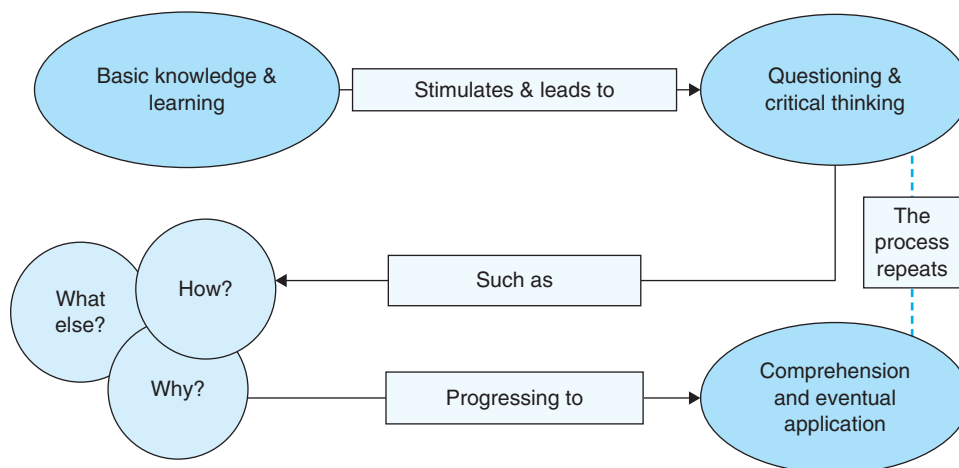
Figure 3-1 Descriptive phrases.

Figure 3-2 Additional descriptive phrases.

Phrase	Action Based	Thought Based	Concern/Problem	Possible Use
Educated patient about	✔		Knowledge deficit	New medication ordered on discharge
Documented	✔		Evaluation of planning	Follow up of treatment effectiveness
Redressed per protocol	✔	✔	Impaired skin integrity	Carries out orders related to wound care
				Shows an awareness of protocols and follow through
Notified	✔	✔	Need for collaboration	Recognizes the need for collaborators to complete care, whether as part of the care team or other departments (lab, x-ray)
Relates to		✔	Disease process	Recognition of an abnormal lab value stemming from the pathophysiology
Is caused by		✔	Symptomatology	Linking of abnormal assessment finding with a specific disease process

up and follow through. I have repeated this often because until students become more comfortable with in-depth critical thinking and gathering all the facts they need for effective application, they sometimes falter when completing the nursing process through to evaluation so that outcomes can be considered. Some of this faltering is no doubt a confidence issue as well as uncertainty in acting somewhat independently. Freshmen are used to very structured learning where they are guided in large part out of necessity. As students move toward the completion of their nursing education, they will be expected to act more independently. Critical thinking, clinical judgment, and clinical reasoning abilities must all expand and deepen to meet those requirements.

Concept Map Key

Use of a coded **concept map key** will be very helpful with larger maps containing multiple concepts and relationships. A key is a requirement for optimal interpretation. This might be the last thing you add to your completed concept map. This will be extremely important for interpretation from several perspectives:

1. Your map will be easier to follow and interpret. A complex, living map is much easier to follow when the reader is guided by a coded key. Main concepts are easily identified, and it is much easier to clarify related concepts as well. Each

component, whether a line or shape, will have an assigned color, similar to a map legend, which definitively demonstrates how it is used.
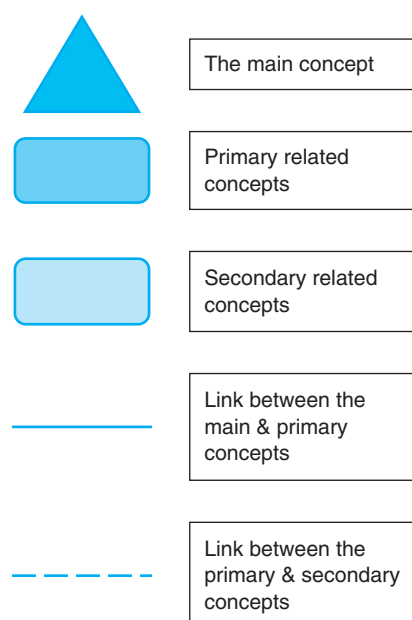
2. Advanced setup techniques allow key features to pop off the paper and stand out. The key then helps to define their places in the critical thinking and association-forming processes.

3. This allows the instructor to assess your critical thinking abilities in terms of the nursing process and outcome achievement.

4. Reviewing your concept map using the key offers you an additional opportunity to reflect on your own thinking processes and assess your own competency. **Figure 3-3** is an example of a coded key.

The key you use can be expanded to include how clusters of information relate to each other and to some other important component. In the case of a nursing-based concept map, for example, one cluster may relate to an item in the patient's past medical history, as well as to the main problem. You will see other examples of this throughout the text. The main thing is to expand the key as needed to show each and every link you have provided.

Summary

We have now journeyed from basic concept mapping theory to basic and advanced setup components of a concept map. Setting up any concept map stems from your understanding of concept mapping theory. Integral to that process is your knowledge base. When you take those first tentative steps in nursing education, your knowledge base

Figure 3-3   Example of coded key.

- The main concept
- Primary related concepts
- Secondary related concepts
- Link between the main & primary concepts
- Link between the primary & secondary concepts

is small. Critical thinking is still in its formative stages as you move from basic under-standing to comprehension. The concept maps you create during this time will and should be basic static concept maps. Make it part of your class preparation to create these simple maps to reinforce current theory. This process becomes the building block from which you will expand into more complex knowledge necessitating deeper critical thinking. This accompanies the more complex skills you will learn as well. Using con-cept maps allows you to pull everything together that you need to know, whether for theory or skills. Then, moving one step further, it sends you on the path to application of knowledge based on critical thinking and the ability to analyze and associate pieces of knowledge.

Key to this entire continuum is your responsibility to evaluate your knowledge base by reflecting on your learning and thinking abilities. The part you play in your own educational growth is a major one. As a simple example, suppose you were learning to change a dressing but instead of performing it, you could only watch while the instructor completed the task. How meaningful do you think that would be? Com-pleting the task yourself would force you to think about the theory behind the task and all nursing implications involved. It would demand that you ask questions and analyze to achieve objectives related to the task. This is active learning and what concept maps directly address.

Critical Thinking Questions and Activities

1. Make a disease-related concept map on hypertension using advanced setup tech-niques and then answer the following:
   a. Is my map in a uniform style?
   b. Is my critical thinking thought process evident?
   c. Is it easy to differentiate between the main and related concepts?
2. Write a short summary of how the nursing process is reflected in your map.
3. Discuss the descriptive phrases you chose to use and your rationale for using them.
4. Discuss how you would use nursing actions to follow up on outcomes related to hypertension.

Case Studies

Directions: Read through each case study and answer the questions using the chapter material provided.

1. Stan is thinking about a concept map he has been assigned to complete on his patient's main diagnosis. The assignment objective is to show critical thinking.
   a. How do concept maps indicate that critical thinking has taken place?
   b. How can the use of advanced concept map setup be used to show thought pathways?
   c. In what ways do descriptive phrases play a role in indicating critical thinking abilities?

2. Andrea wants to construct a concept map for her clinical experience so that she can remember the four assessment methods.

   a. What type of concept map would this be?

   b. What is the difference between static and complex concept maps?

   c. How are nursing actions and outcomes determined using concept mapping theory?

3. Andy and Melissa are discussing and reviewing the nursing process. They want to better understand how to demonstrate its use within a concept map.

   a. Identify the steps of the nursing process.

   b. What types of patient information would fall into each step of the nursing process?

   c. What nursing actions come from each step?

   d. How does each action demonstrate application of nursing knowledge?

   e. How can a concept map be used to reinforce following up and following through on patient problems?

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References

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