Instructor's Manual to Accompany
An Illustrated Guide to
VETERINARY MEDICAL TERMINOLOGY

FOURTH EDITION

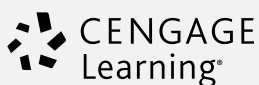**Janet Amundson Romich, DVM, MS**

**Instructor's Manual to Accompany
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PART I

Teaching Tips

Teaching veterinary medical terminology is no different from teaching other subjects: instructors need to consider the reality that students learn differently. Some students learn by doing (kinesthetic learners); others, by hearing (auditory learners); and still others, by seeing (visual learners). It is important to recognize that most students learn through a combination of these styles, so using varied teaching techniques that address the different learning styles will help your students learn and retain information better.

Your goal in lesson planning should be to have students actively participate in class and to fully involve as many senses as possible. This teaching format accommodates different learning styles, aids in holding students' attention, and makes the class more interesting for students and for you.

Generous use of a chalkboards, transparencies, or computer-based presentation programs help students see a medical term while it is being discussed. Pronouncing the term while presenting it visually helps students associate the two. As students progress in their understanding of medical terminology, it is helpful to pronounce the term and have students define it both in written and oral form. Remember that on the job, students will not always see the medical term written down so that they can analyze it. Learning medical terminology is similar to learning a foreign language. Seeing and analyzing foreign words is valuable in the learning stages, but using a foreign language in conversation and communication is the ultimate goal. One would not want a student who took French only to be able to conjugate verbs and not be able to order food at a French restaurant. Medical terminology works the same way. Having students listen to a description of a case history and then asking them what is happening is very valuable. Sometimes, you may need to go through the history very slowly and stop at key words; but this helps students retain medical terms and observe how those terms are used in context, and it improves students' listening skills.

Aids for developing good study skills and habits are also worthwhile to introduce in medical terminology courses. Using multiple colors of chalks or markers helps students group terms together and associate them with each other. For example, cardiovascular terms may be written in red, and urinary terms may be written in yellow. Then when you present the term *hematuria,*

you can write *hemat/o* in red and *-uria* in yellow. Because red is a darker color than yellow, *hematuria* will present itself as yellow urine that has become discolored with red blood. Not all samples of hematuria are red to the naked eye, but it does serve as a visual clue. When presenting the term *uremia*, *ur/o* may be written in yellow and *-emia* written in red. Since red is a darker color than yellow, the blood remains red but now has a yellow substance (urine or waste products) in it. Because students typically confuse the terms *hematuria* and *uremia*, it is important to give them as many memory tools as possible.

Word parts can also be written in different colors. Prefixes may be one color, root words another color, and suffixes still another color. If word parts are presented in three columns, students can mix and match them to make up their own terms. Even during the first few days of class, you will be amazed at how many accurate words students make.

For students who learn better by doing, it is helpful to work with instructors of other courses to have them use medical terms in their classes. To reinforce their learning of directional terms, students should be using those terms in animal handling classes. Live animals may be brought to the classroom for demonstrating directional terms. While holding an animal, students may be quizzed on directional terms and planes of the body. Videotapes of actual medical cases and reenactment of those cases also help reinforce words from a particular body system. Students usually can come up with other hands-on activities as well.

THE SUPPORTIVE CLASSROOM

Students who are comfortable in their environment do better in their studies, and an important factor in students' success is their knowing that the classroom provides a supportive environment. In this setting, students should feel free to learn without fear of ridicule or teasing. No question or comment is "stupid" during the learning process. The manner in which you structure class activities helps create such a setting.

The use of teams and team activities in class gives students a chance to work together to solve problems and does not make weaker students stand out from stronger students. Most veterinary clinics are based on the team approach, and this is a good skill for students to develop early in their career. Some instructors believe that the team approach divides the class and forms cliques, but when handled correctly, that problem can be avoided. It is helpful to rotate groups throughout the semester. Assigning partners or groups is another way to get students to work with different classmates during the course. The assigning of captains and team players often help the teams focus on the activity because everyone has his or her own responsibilities. The competition that arises between teams may motivate students to perform better.

Many class activities require students to work individually. Although some students are not comfortable working by themselves, a supportive atmosphere will help students become more confident in their abilities. Sometimes it takes a while for students to become comfortable in this setting, but when they do, they begin to ask questions and participate in discussions. This is a great feeling for you and the students.

Peer teaching is another way to help students learn and to build their self-confidence. Students may tutor each other in small groups or "team teach" with you on certain topics. If one student is having difficulty grasping the concept of medical word parts, another student can provide help and may provide a new suggestion for remembering the material. In some class periods, you can assign students a medical term from a specific unit and ask them to think of a way to remember it. Then go around the classroom asking students how they remember the term. By sharing information, a student does not have to provide all of the answers for every term, but rather an answer for just one or two terms. Students usually come up with creative ways to remember a term. Peer teaching also gets students comfortable with talking and studying outside of class.

Most instructors of medical terminology have developed mnemonics or other memory aids to help students remember difficult information. You can use your creativity and sense of humor when creating these learning aids. Flash cards get students to "play" with medical terms. Students also find rhyming phrases and letter association to be effective for remembering medical terms. For example, students tend to confuse the choana and the cloaca of birds. If you tell students that the term with the *h* is closer to the head (*h* and *h*), they usually can differentiate the two. The aorta is an artery: both begin with *a*. The list goes on and on.

GOALS OF TEACHING MEDICAL TERMINOLOGY

Students must understand what is expected of them in a medical terminology course. Without knowing the expected outcomes students become frustrated or overwhelmed with what is expected of them. They also need to know how they will be evaluated. When presented with all of the facts prior to starting the course, students can focus on learning the medical terms and not on trying to figure out the instructor's expectations.

In a medical terminology course, students must master the following foundational knowledge:

- Describe the types of medical word parts and state how each type is used.
- Spell and define commonly used medical word parts.
- State the rules for use of the combining vowel in medical terminology.

- Demonstrate the use of a medical dictionary in finding and defining medical terms.
- Describe the major body systems, their organs, and their functions.

In a medical terminology course, students are expected to master these competencies or end results:

- Recognize, pronounce, spell, and define commonly used medical terms relating to the diagnosis, pathology, and treatment of each body system.
- Given the definition of a medical term made up of medical word parts, find the term and spell and pronounce it correctly.
- Given an unfamiliar medical term that can be broken down into medical word parts, provide a reasonable definition.
- Use a medical dictionary and similar reference materials to find the meaning of medical terms and commonly used abbreviations.

EVALUATION CRITERIA

To evaluate competency in medical terminology, take into consideration the method of assessment, the decision as to whether the use of a medical dictionary is permitted, the time students have to complete the test, the passing score, and the number of attempts students are permitted.

Methods of Evaluation

A written test is the most efficient way to evaluate medical terminology competencies in a classroom setting. Almost any type of question can be used.

To test spelling, you can include a brief dictation section at the beginning of the test. Then students are allowed to proceed through the rest of the test at their own pace.

A written test does not assess the pronunciation of terms. If time permits, you can test students on this by listening to each student pronounce a list of, for example, 10 terms. Or, you can evaluate their pronunciation throughout the course in a less formal manner.

Use of a Medical Dictionary

Because the ability to use a medical dictionary is one of the competencies being tested, you should include questions to assess this skill.

Some instructors do not advocate the use of a dictionary because they fear students will not take time to study when they know they can look up answers. However, because students have a certain amount of time to complete the test, using a dictionary is a limited advantage. An alternative is to allow the use of a dictionary for only one section of the test that is

given on a separate piece of paper. After you provide students with a specific time frame, they can complete this part of the test first. Or, you can assess dictionary use through a quiz on a separate day.

If you still oppose the use of a dictionary on test day, include questions that test its use, such as: "Under what dictionary heading would you find *bovine viral diarrhea*?"

Time Limit

A time limit is particularly important if students are allowed to use a medical dictionary. The amount of time allocated for a test depends on the number of items on the test and their format. Students should be informed of the time limit before the test session.

Point Value

You should provide the point value of each test item so that students know which questions are more important and thus are weighted heavier. You also should give the total points for a section so that students are aware of how many points each section or question type is worth.

Passing Score

In an ideal world, only 100 percent performance by a medical health professional is acceptable. However, in an academic setting, the level of a passing score is usually determined by school policy.

Number of Attempts Permitted

Some instructors permit only one attempt to demonstrate a competency. This relates to the theory that in the workplace, there is only one opportunity to "get it right."

Other instructors allow more than one attempt for certain skills. These instructors believe that students should increase their skill with each attempt; therefore, if a student wants to improve a grade, he or she should be allowed to retest. However, there is usually some point penalty for each retest. This means that even if a student answers all of the questions correctly on a retest, the highest possible score is less than 100.

TEST CONSTRUCTION

The first step in test construction is to review your course goals and determine the competency for which you are testing. Computerized test banks are useful, but unless you follow the textbook rigidly, some of the questions may not relate to the material you emphasized. Ask yourself what you want students to remember today, remember at the end of the course, remember on the job, and remember five years from now. A good balance of those types of questions will result in a good test.

The skills being tested in a medical terminology course are cognitive; most written question formats are acceptable for testing. The primary exception is the use of true/false or other questions that allow only two answer choices, automatically giving students a 50-50 chance of guessing correctly.

Make sure that any test you give is free from spelling and grammatical errors. When being tested for language skills, students are easily confused by spelling errors, often believing these are tricks to make sure they are reading for detail. Grammatical errors often produce questions in which students cannot determine what is being asked. Thus, they cannot demonstrate their knowledge.

Question Types

Fill in the Blank

These types of questions are effective for testing students' ability to read a definition and supply the term. Spelling can also be checked with this type of question. Make sure students know beforehand that they must spell the term correctly to receive full credit.

Multiple Choice

These types of questions can be adapted to most topics and testing situations. Remember that there are various levels of multiple choice questions, ranging from a basic level (testing memorization) to a more advanced level (testing logic and reasoning skills). Questions on a variety of levels should be included.

Tips for Writing Multiple Choice Questions

The Questions

- The question or stem is an introductory statement or question to which students must respond. The stem should be as short and simple as possible. You are testing students' comprehension, not their ability to decipher complex questions.
- The question may be in the form of a direct question; for example, "What is the medical term for increased urination?" This is an effective format.
- The question may be in the form of an incomplete sentence; for example, "Toward the head is called _____." This is also an effective format.
- The question may be in the form of a fill-in-the-blank question. This is an acceptable alternative to the direct question and incomplete sentence; for example, "Hematemesis means _____ blood."
- The question may be in the form of a negatively worded question. This type of question is more difficult because students must interpret the question and then find the answer; for example, "Which of the following is not a medical term for feces?"

The Answers

- The answers or choices are one correct answer and the distractors (incorrect answers). An effective multiple choice question has four possible answers. Fewer choices allow students to guess more easily. More choices increase the difficulty of the question.
- If the question or stem is written as an incomplete sentence, the answers must flow to complete the sentence.
- Verb tense in the answer should agree with that of the question. Any change in verb tense will give students a clue that a particular answer is made up.
- All distractors should be believable and fit with the question format.
- All answers should be of approximately equal length.
- The answers should be as short as possible.
- Any term or phrase that appears in all of the answers should be moved to the question.
- The answers should be arranged in alphabetical or logical order so that the answers proceed from shortest to longest.
- If one of the answers is "some of the above choices" (i.e., A and B are correct), it should be the last choice if another answer is "all of the above." That way students are not confused as to whether the choice indicating that A and B are correct is included in the choice indicating all of the above.

Matching

These types of questions have some items in one column and the answers for those items in another column. Students match the questions and answers from both columns. Matching questions are effective when a series of similar items are challenging to differentiate. For example, types of muscle movements or projections on bones are well suited for matching questions. If there are equal numbers of items in both columns, the questions are easier for students. If there are unequal numbers of items in both columns or if some of the choices can be used more than once, the questions are more difficult.

Labeling

These types of questions require students to identify items on a diagram and supply the answer. Labeling questions are frequently used for anatomy and physiology questions. Labeling of directional terms is also examined effectively with this technique. When using this type of question, make sure the illustration is free of distractions and the parts being questioned are clear.

COURSE PLANNING SUGGESTIONS

Developing a Syllabus

Preparation of the syllabus is the starting point of your planning process. The syllabus is a contract between you and your students and describes what is to be taught, when it will be taught, and what method of presentation will be used. It should also include the tentative dates of quizzes and examinations as well as assignment due dates. A syllabus should include the course name and number, course goal statement, your name and office (including room number, phone number, and e-mail address), time and days the course meets, and attendance policy (if you so choose). The body of the syllabus should include the following:

- Required and/or recommended texts
- Materials students need for class
- Teaching methods that will be used (required reading and exercises to be done before class, format of class time, etc.)
- Quizzes and examinations (and what each will cover)
- Assessment methods (including point assignment). A customizable syllabus is provided for you to work from.

Developing a Course Outline

The course outline details what is to be covered during each week of the course. It also states the assignments students are expected to complete in preparation for class, identifies when tests are scheduled, and helps ensure that all class sections cover the same information.

Each student should receive a copy of the syllabus and the course outline at the beginning of the course. Based on this information, students know what is expected of them and when it is expected; this leaves no room for surprises or excuses.

Developing an effective syllabus and course outline allows you to see how much material can be covered. For example, *An Illustrated Guide to Veterinary Medical Terminology*, 4E, has 23 chapters. Most schools do not have 23-week courses, so you must decide how and when to present the material. For most instructors, chapters 18 through 23 will be supplements to other chapters. Some body system chapters are longer than others, and you need to decide whether any chapters can be combined and covered in one week. An example syllabus is as follows:

Week 1: Chapter 1 and begin Chapter 2
Week 2: Finish Chapter 2
Week 3: Chapter 3
Week 4: Chapters 4 and 5
Examination

Week 5: Chapter 6
Week 6: Chapter 7
Week 7: Chapter 8
Week 8: Chapter 9
Examination

Week 9: Chapters 10 and 11
Week 10: Chapter 12
Week 11: Chapter 13
Week 12: Chapters 14 and 15
Examination

Week 13: Chapter 16
Week 14: Chapter 17
Week 15: Review material (using Chapters 18–23 as a guide)
Week 16: Review material (using Chapters 18–23 as a guide)
Final Examination

In the course outline, reading assignments, optional assignments, and student practice exercises can be assigned. This further clarifies the expectations that students must meet to complete the course successfully.

PART II

Teaching Aids

This section includes support materials that students may find helpful in learning veterinary medical terminology.

STUDENT STUDY SUGGESTIONS

1. Study the text and complete the review exercises at the end of each chapter.
2. Do not try to learn all of the words in one night (especially before a test).
3. Study regularly—20 to 30 minutes each day in *review* is helpful.
4. Do not be overwhelmed by the amount of material. At some point, it will seem as though the word parts are reshuffled parts that you already know.
5. Use activity cards. Carry them with you and use them when you have a few free minutes.
6. Listen to audio recordings.
7. Say the words and definitions aloud.
8. Write the words and their definitions.
9. Form a study group or pair to quiz each other.
10. Work medical terminology puzzles or do fun activities to keep the information at your fingertips.

FLASH CARDS

Flash cards have always served as an effective study tool for learning medical terms. Having students make the cards themselves helped them learn the words as they prepared the cards, but it was a time-consuming project that sometimes hindered the time students spent studying. Making grid sheets for students to photocopy is one way instructors can help students spend less time making the cards and more time studying them.

The CourseMate that accompanies the text contains electronic flash cards and audio pronunciations. Students can quiz themselves on medical terms

or medical definitions. The program supplements the text by quizzing students on the most commonly used terms from *An Illustrated Guide to Veterinary Medical Terminology*, 4E. The program is organized to correlate to the chapters in the text. The program includes approximately 5,000 words, so it serves as a good resource for students.

Auditory Learning

The audio library on the CourseMate is a versatile teaching aid for use in the classroom, independent study, or distance education programs. Suggestions for using the audio include the following:

- Have students listen to the term in the audio library as they work through the chapters in the text. Students often get frustrated when they cannot pronounce a term and when they have difficulty with pronunciation keys or need positive reinforcement of the term's pronunciation.
- Instructors may want to use the audio library at the beginning of the class period to prepare students for the lecture or to review previously covered material. Other instructors like to use the audio library at the end of the class period to reinforce the material presented in class.
- Students can review terms at their own pace. This allows students to hear the terms whenever and how often they choose.
- Some instructors like to use the audio library for transcription exercises or spelling tests.
- As students become more familiar with the material, they can listen to the audio library and come to understand the medical terms as they are spoken. Sometimes students become very good at dividing medical terms into parts and defining them when they see the terms, but in the real world, they often need to follow verbal directions and give verbal instructions. Being able to hear, understand, and use terms in everyday language is one of the goals of a veterinary medical terminology course.

Multimedia

A variety of multimedia resources (DVDs, videostreaming, computer-based presentations, etc.) help students visualize the topic of discussion and allow students to hear medical terms being used in context. Multimedia sources include pet food companies, veterinary clinics, state veterinary medical associations, the U.S. Department of Agriculture (USDA), veterinary schools, veterinary distributors, the Internet, and private vendors who produce client and educational style videos.

Case Studies

Case studies are a valuable resource because they clearly demonstrate the use of medical terms in a real setting. Additional case studies, for use in the classroom or as homework activities, are available in this Instructor's Manual.

Another form of the case study is to provide students with a list of 10 terms (which you choose so that the terms correlate). Students are then asked to make up their own case studies. At first, students often say that they do not have enough medical knowledge to complete this activity. However, most students come up with fairly accurate cases. If they do make up a case study that is inaccurate, it serves as a good topic for classroom discussion. As time progresses, students become very skilled at preparing case histories, know what information is helpful in taking case histories, and integrate information learned in other courses to make up more accurate case studies. Students seem to enjoy this activity as well.

Case study organization, for you and for students, should be based on the following:

- Signalment
- History and physical examination
- Laboratory reports
- Case summaries
- Consultation reports
- Surgical reports
- Discharge summaries

Suggestions for using case studies include:

- Holding stimulating class discussion.
- Providing spelling practice.
- Teaching different history-taking or reporting styles.
- Translating medical terminology into lay terms for clients (client education sheets).
- Encouraging students to research veterinary medical topics about diseases, conditions, or techniques.
- Learning abbreviations. (Instead of memorizing long lists of abbreviations, students learn them in context and by body system.)
- Expanding students' awareness of complex medical terms or medical terms that may not have been covered in class. (Providing pathology reports is an excellent way of demonstrating to students that they may not know all of the medical terms, but they can make sense of most of them.)
- Learning laboratory tests.
- Learning about medications and medication forms.

Crossword Puzzles

Medical terminology crossword puzzles and similar word searches are excellent ways to get students to interact with the material they are learning.

Crossword puzzles can be duplicated and provided to students to solve individually, or transparencies of the puzzles can be used as classroom activities. Crossword puzzle software can be purchased at many computer stores. Answer keys to the puzzles can be provided on the reverse side of the sheets given to students or duplicated and given to students after they work the puzzles.

Current Veterinary Medical Information Portfolio

A portfolio containing current veterinary medical articles is a useful resource. Articles from veterinary technician journals, breeder newsletters, and the Internet, or client education sheets can be laminated or stored in protective sheets in a three-ring binder. Students may choose articles from the portfolio to test their knowledge of medical terminology, to use in preparing reports, or to use when preparing class presentations. Students also may collect articles to add to the portfolio.

Suggestions for maintaining the portfolio include the following:

- Encourage students to make copies of the articles they deem important so that they can add them to their notes.
- Make sure the articles show the source and date of publication.
- Retire older articles and replace them with newer articles or compare the information in older articles with more current information.
- Make the portfolio available to all students.
- Allow students to use the articles to prepare reports. Also use the articles to spike interest about a topic in which many different medical terms are used and to stimulate classroom discussion to evaluate the accuracy of the information.

Reading Veterinary-Related Books to Arouse Student Interest

Assigning a veterinary-related book for students to read is one way to stimulate their interest in learning veterinary medical terminology. One suggestion is to have students read *Every Living Thing* by James Herriot and complete medical terminology worksheets based on terms presented in the book.

Visual Aids

Overhead transparencies or computer-based presentations (such as PowerPoint) are visual teaching aids used to complement written material. When creating your own presentations, use the following guidelines:

- Make sure the type is large enough to be read at a distance (at least 12-point type).
- Use colored pens, colored highlighters, or colored duplications for clarification during class.

- Duplicate case studies to be used for classroom discussion.
- Complete word division exercises for classroom demonstration.
- Use presentations for testing.
- Include example test questions to show students the exam format or to review material.
- Include discussion questions to direct student studying.
- Give students a printed copy for notetaking. Some of the printed copies can be left incomplete for students to fill in during lecture. For example, you can use a diagram to demonstrate blood flow through the heart.

Wall Charts and Posters

Wall charts and posters are effective learning tools if the print and pictures are large enough. These aids can be obtained from veterinary clinics or veterinary distributors or purchased through various catalogs.

Bulletin Board

A bulletin board (whether it is wall-mounted or electronic) is an effective way to communicate with students and to remind them of what they have learned and what they will learn. Review questions, pictures, and outlines can be displayed on a bulletin board for students to check. This will help students think about a class after a lecture and remind them about the key concepts of a section.

Models

Anatomic models are effective tools to demonstrate what body parts look like and how processes occur in the body. Live models help in correlating a body part from a photo to a live animal. Sometimes it is helpful to see where the elbow is on a live animal versus a skeleton. Photocopies of these models or body systems should be provided to students as well so that they can take accurate notes at the same time.

Personal Experiences

Providing students with personal experiences that relate to the material being covered helps them relate the material they are learning to what they will need in the real world. It is also an effective way to integrate the material covered in other courses.

Guest speakers from the veterinary field and laboratory setting also help students recognize the importance of understanding and using veterinary medical terminology. Videotaping guest speakers results in a library of useful teaching tools and serves as a substitute in case guest speakers cancel at the last minute. Field trips help students observe medical terminology being used in a work setting. A field trip may serve as a reward at the end of the course.

Pairing of Information

Many medical terms sound alike or can be related to another term. Pairs help students distinguish the difference between terms and the importance of recognizing this difference.

Suggestions for pairing of terms include the following:

- Post word pairs or duplicate a sheet of word pairs at the beginning of the course. This helps students get in the habit of studying terms in this fashion.
- Add to the list as the course progresses. If students want to add a pair that does not seem to fit the pattern, take time to explain why the terms do not fit.
- Use the list for drills and classroom activities.
- Test from the list.

Resource Files

Having your own set of resource files allows you to organize your ideas and enrich the material that worked well, as well as cull the material that did not work so well. Ways to get started include the following:

- Create a file folder for each major topic or textbook chapter.
- Arrange files in alphabetical order and allow space for expansion.
- As you come across information on a topic, add it to the file.
- Encourage students to add relevant material to the file. Students have a fresh outlook on what does and does not work, so use them as a resource.
- Include client education sheets and area newsletters, as they are useful sources of information. Class discussions can center around both correct and incorrect material.
- Add Internet information, both correct and incorrect, to your file. Remember that websites that end in .net are from major Internet providers, .com sites are businesses and can be added by anyone, .org sites are organizations (both nonprofit and service groups) and are considered more accurate than .com sources, .edu sites are from educational institutions, .gov sites are from government agencies, and .mil sites are from military facilities.
- Include veterinary medical newsletters published by area referral clinics or veterinary medical teaching hospitals. These newsletters serve as excellent sources of information. Consult area veterinarians for information about various schools.

Researching Topics

Having students prepare reports is a valuable teaching tool because it gives them experience seeking out and analyzing information. Reports can help students understand a topic, as well as the medical terminology used in the report.

Suggestions for the use of reports include the following:

- Assign students a medical topic that interests them.
- Have students make a copy of the article and submit it with their report.
- Have students study the article and be prepared to present it to the class.
- Assign the report well in advance so that students have enough time to find an article that interests them. You may find it necessary to provide students with various "stepping stones" for completing the final project; that is, this week they turn in their topics, next week they turn in their searches, the following week they provide an abstract, etc. This may help eliminate duplication of topics.
- Make sure each student uses a different article.
- Consider assigning specific articles from your resource file.
- If the article is written in lay terms, have students circle those terms and substitute the appropriate medical terms.
- If the article is written in medical terms, have students circle those terms and substitute lay terms or definitions.
- Have students present their reports in oral or written form (may vary throughout the course).

Reading

Reading books on animal-related subjects is a good way for students to understand the importance of learning medical terminology. Students will have many opportunities to read textbooks and content-laden books on academic material throughout their courses. Another way to introduce them to medical terminology in everyday use is to have them read popular press books related to veterinary medicine. For example, you may assign weekly chapters for students to read and have them turn in three sets of answers to instructor-generated questions at three specified times during the course. This way students see how terms they are learning are used in a less structured way. It also teaches them concepts about veterinary medicine that would not get covered in a typical terminology course. Students should answer the questions in a general sense, using a dictionary if needed. The way the term is presented in the chapters is helpful in seeing how it is used, but should not replace dividing the word and defining each word part or using a dictionary. Sometimes students relate the term only to the chapter and answer the question only for the species involved in the chapter. Warn students of this.

PART III

Answers to Text Review Exercises

Answers are shown in **boldface** type.

Chapter 1

Multiple Choice

1. **b**		14. **c**	
2. **b**		15. **b**	
3. **c**		16. **d**	
4. **d**		17. **d**	
5. **b**		18. **d**	
6. **a**		19. **c**	
7. **d**		20. **c**	
8. **d**		21. **c**	
9. **c**		22. **d**	
10. **a**		23. **d**	
11. **a**		24. **c**	
12. **c**		25. **b**	
13. **b**			

Matching

1. **i**		9. **m**	
2. **j**		10. **h**	
3. **k**		11. **g**	
4. **a**		12. **e**	
5. **b**		13. **f**	
6. **c**		14. **o**	
7. **l**		15. **n**	
8. **d**			

Matching

1. **m**
2. **l**
3. **k**
4. **d**
5. **n**
6. **c**
7. **o**
8. **j**
9. **i**
10. **e**
11. **g**
12. **b**
13. **a**
14. **f**
15. **h**

Fill in the Blanks

1. **gastric**
2. **hepatitis**
3. **osteomalacia**
4. **arthrodynia or arthralgia**
5. **endoscopy**
6. **cardiomegaly**
7. **renal**
8. **hemorrhage**
9. **gastropexy**
10. **chemotherapy**

True or False

1. **F**
2. **F**
3. **T**
4. **T**
5. **T**

Spelling

1. **mucus**
2. **cystocentesis; urinalysis**
3. **diarrhea**
4. **cutaneous**
5. **anesthetic**
6. **enteropathy**
7. **hepatitis**
8. **eponym**
9. **hematoma**
10. **ilium**

Word Part Identification

word root(s)

1. **hepat**/itis
2. **gastr**/o/**intestin**/al
3. **cardi**/o/logy
4. intra/**ven**/ous
5. **nephr**/osis

suffix

6. hepat/**itis**
7. gastr/o/intestin/**al**
8. cardi/o/**logy**
9. intra/ven/**ous**
10. nephr/**osis**
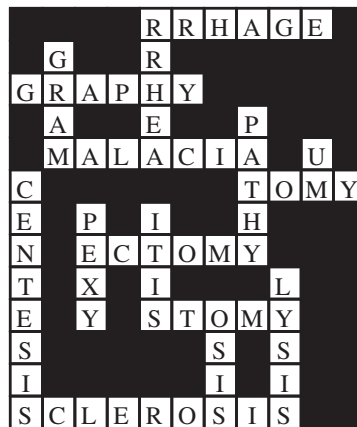
prefix

11. **hyper**/secretion
12. **peri**/card/itis
13. **endo**/cardi/um
14. **poly**/uria
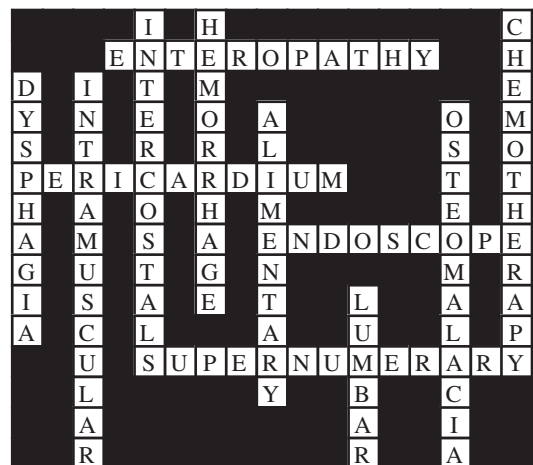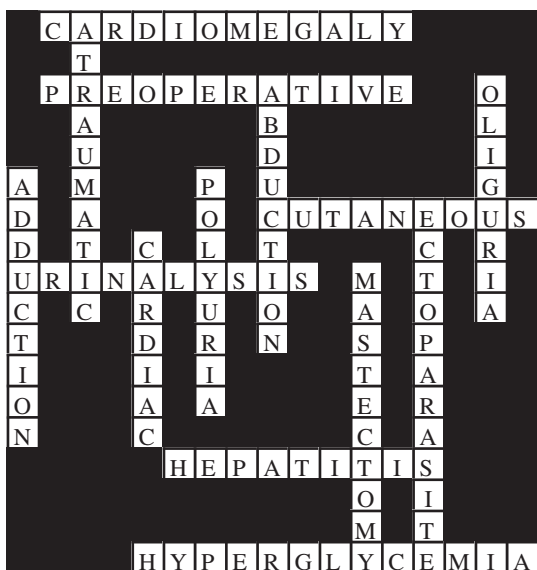15. ur/o/lith (*Urolith* does not contain a prefix.)

Crossword Puzzles

Prefix Puzzle

```
1M  E  T  2A
          N
      3T  R  4A  N  5S
      I       N      U
      P              E      6I  N  T  7E  R
      E              N              X
      8P  E  R       T
      O              R
      9S  U  10P  R  A
      T       R          11P      12E
      13E  N  D  O       O       C
              L       T
              14H  Y  P  O
```

Suffixes

```
            R  R  H  A  G  E
      G     R
G  R  A  P  H  Y
      A        E        P
      M  A  L  A  C  I  A     U
C                    T  O  M  Y
E        P     I        H
N        E  C  T  O  M  Y
T        X     I           L
E        Y     S  T  O  M  Y
S              S           S
I              I           I
S  C  L  E  R  O  S  I  S
```

Medical Terms

```
   C  A  R  D  I  O  M  E  G  A  L  Y
   T
P  R  E  O  P  E  R  A  T  I  V  E        O
   A              B                       L
   U              D                       I
A  M        P     U                       G
D  A        O  C  U  T  A  N  E  O  U  S
D  T     C  L     T           C           R
U  R  I  N  A  L  Y  S  I  S  M           I
C     C  R  U     I     O  N  A           A
T        D  R              M
I        I  I              A  S
O        A  A              T  E
N        C                 E  C
         H  E  P  A  T  I  T  I  S
                           O  I
                           M  T
      H  Y  P  E  R  G  L  Y  C  E  M  I  A
```

```
                  I     H                        C
            E  N  T  E  R  O  P  A  T  H  Y       H
D        I     T     M                       O   E
Y        N     E     O     A                 S   M
S        T     R     R     L                 T   O
P  E  R  I  C  A  R  D  I  U  M              E   T
H        A     O     H     M                     H
A        M     S     A  E  N  D  O  S  C  O  P  E
G        U     T     G     T           M         R
I        S     A     E           L     A         A
A        C     L     A           U     L         P
         U     S  U  P  E  R  N  U  M  E  R  A  R  Y
         L           Y           B     C
         A                       A     I
         R                       R     A
```
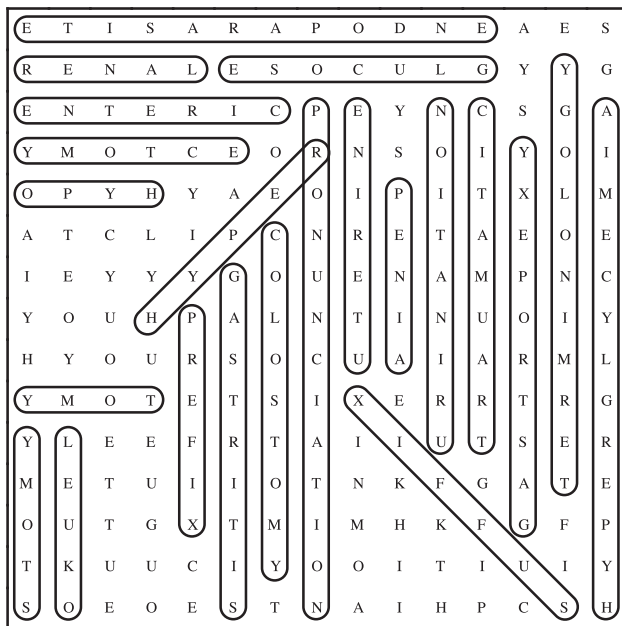
Word Search

Case Studies

A 5-year-old male neutered cat is presented to a veterinary clinic with **dysuria** (painful urination) and **oliguria** (scant urine production). Upon examination, the abdomen is <u>palpated</u> and **cystomegaly** (enlarged urinary bladder) is noted. After completing the examination, the veterinarian suspects an <u>obstruction</u> of the **urethra** (tube that carries urine from the urinary bladder to outside the body). Blood is taken for analysis, and the cat is admitted to the clinic. The cat is anesthetized and a urinary <u>catheter</u> is passed. Urine is collected for **urinalysis** (breakdown of urine into its components). In addition to the obstruction, the cat is treated for **cystitis** (inflammation of the urinary bladder).

1. palpated **examined by feeling**
2. obstruction **complete stoppage or impairment to passage**
3. catheter **tube that is inserted into a body cavity to inject or remove fluid**

Case Studies

1. examination **the act of studying a body using inspection, palpation (feeling with hands), percussion (tapping with the fingers), and auscultation (listening).**
2. vital **pertaining to life**
3. metabolic **pertaining to the biochemical processes of living organisms**

Critical Thinking Exercise

1. Stephanie needs to learn veterinary medical terminology to become a veterinary technician. What study habits would help her achieve her goal?
   There are a variety of ways that Stephanie can learn medical terminology including:
   - **reviewing the word parts daily**
   - **studying with other students**
   - **making study tools that work for her such as writing practice exams, flashcards, or sentences using medical term**
   - **completing the review activities at the end of each section**
   - **studying in an environment that is quiet and free of stress**
   - **listening to the terms using the online pronunciations**