


TASKS FOR THE VETERINARY ASSISTANT

Third Edition

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CHAPTER

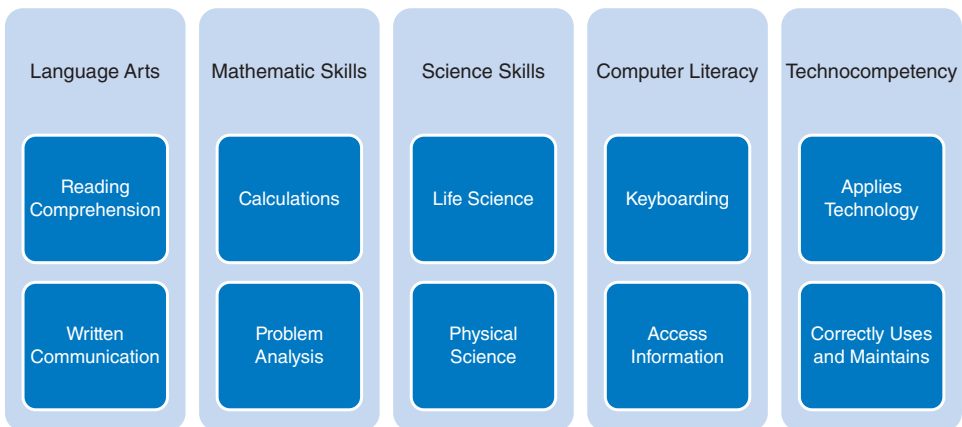
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FOUNDATION SKILLS

TREGEL COCKBURN

Foundation Skills

(Mastery: Minimum Eighth Grade Level)



CHAPTER OBJECTIVES

After completion of this chapter, the student will be able to:

1. Assess personal levels of language (written and spoken) arts and mathematical skills.
2. Strengthen foundation skills in language arts, math, and life science to the eighth-grade level.
3. Analyze basic medical terminology.
4. Approximate the literal meaning of veterinary medical terms based on the analysis of medical word parts.
5. Analyze medical math problems.
6. Solve medical math problems based on the analysis of the problem's components.
7. Assess the level of keyboarding and computer literacy skills.
8. Use veterinary software to correctly input and access information into a veterinary computer database.
9. Properly approach and use equipment found in the veterinary environment.
10. Follow equipment troubleshooting and maintenance procedures.

INTRODUCTION

Becoming a veterinary assistant can prove to be a very rewarding career choice with proper preparation to attain the prerequisite knowledge and skills. Today's veterinary employers hire for more than enthusiastic, personable, self-motivated employees with a positive "can-do" attitude. They also seek trained members of the veterinary health-care team who can masterfully apply their reasoning in various situations and competently adapt learned techniques. Both employers and clients value doers and thinkers. In this chapter, general skills such as reading, problem solving, and self-management will be presented as a starting point for what is hoped to be a desire for lifelong learning.

TASK 1.1

SELF-ASSESSMENT AND UNDERSTANDING OF FOUNDATION SKILLS

Concept: The learner needs appropriate foundation skills before learning task-specific skills.

Discussion: Learning or taking in new information is much like a sailing ship. A strong watertight keel and hull are necessary for a ship to remain buoyant and to float. If there are holes in the bottom or sides of the ship, it will take on excess water and perhaps sink. There is risk of the sailing occupants having to abandon the vessel as well as the loss of time, gear, and money.

Learning new skills is similar. There must be a solid watertight understanding before taking on new information and sailing your ship, which is equivalent to performing applied knowledge of tasks.

A firm foundation or base knowledge must exist prior to attempting to learn any job-specific tasks. The U.S. Department of Labor published a report, “Skills and Tasks for Jobs: A Secretary’s Commission on Achieving Necessary Skills (SCANS) Report for America 2000,” in which eight categories of Foundation Skills and SCANS Competencies are identified for the workforce to possess (Appendix A). In self-evaluation of the basic skills, anyone wishing to work within the veterinary environment must have skills at or above the eighth-grade level. These primary education skills include language arts such as grammar and reading, mathematical skills such as algebra and measurements, along with basic life and physical science knowledge. Important SCANS competencies include those listed under “Information” and “Technology.” Foundation skills are used in everyday life and in multiple areas of the veterinary environment.

Tip Box 1.1: In striving to become a lifelong learner, develop the firm habit of checking your own base or foundation for knowledge gaps to avoid the risk of sinking in a sea of information like a leaky sailboat!

Procedure

Location used: Everywhere

PREPARATION

1. Obtain a notebook and tab a section for this chapter. Keep a pen or pencil ready for taking notes.
2. Using an Internet-connected computer or device, access the following websites:
Language Arts Skills: http://www.internet4classrooms.com/skills_8th_lang_new.htm
Mathematic Skills: http://www.internet4classrooms.com/skills_8th_math_new.htm
Science Skills: http://www.internet4classrooms.com/skills_8th_science_new.htm.

PROCEDURE

1. Scroll down and review several of the listed sites.
2. Access each and follow the directions.
3. Complete all activities.

FOLLOW-UP

1. Review any of the self-assessment activities you found difficult to understand or were unable to complete correctly. Access the following sites for strengthening knowledge:
Language Arts Skill Builders: <http://www.internet4classrooms.com/skills-8th-langbuilders.htm>
Mathematics Skill Builders: <http://www.internet4classrooms.com/skills-8th-mathbuilders.htm>
Grade-Level Science Resources: http://www.internet4classrooms.com/science_elem.htm.
2. Repeat this process for all three of the eight-grade levels.

TASK 1.2

ANALYSIS OF VETERINARY MEDICAL TERMINOLOGY

Veterinary communication is based on the use of medical and scientific terminology, which new learners may view as a foreign language. Proper use of medical terminology comes under the SCANS competency for “Information” and “Foundation Skills.”

Concept: The literal meaning of medical terms can be approximated by dissembling each word into its prefix (beginning), root (middle), and suffix (end).

Discussion: Approach word dissections like reading a personal greeting card with a bit of curiosity and a positive anticipation. There is the greeting card sender who is like the suffix of a medical term providing context to the body of the message. The card’s opening salutation qualifies its meaning similar to the prefix. Most medical word roots are derived from Greek and Latin with exceptions such as the country in which the word originated. Recognizing and memorizing definitions of frequently occurring word roots is essential to deciphering a word’s meaning.

Concept: The prefix and/or suffix are attached to the word root by a connecting vowel.

Discussion: Connecting vowels are customarily “o” or “i” and sometimes an “a.” The connecting vowel is not used and is thereby eliminated when the root begins or ends in a vowel. An example is the veterinary directional term *dors-al*, meaning relating to the animal’s back. The root word is “dorso” followed by the suffix *-al*; the “o” is dropped when the two parts are combined. Every year, new words appear in medical journals, textbooks, and manuals and are then updated in medical dictionaries. Be ever aware and seek out new terminology.

Concept: To begin, first analyze the suffix that occurs at the end of a root.

Discussion: This is denoted with a dash (–) preceding it, as in *–ology*, meaning “study of.” The suffix modifies the root or makes it a noun. For instance, *–itis* means “inflammation of,” as in *arthritis*, meaning “inflammation of the joint.”

Concept: Prefixes are small groups of letters that modify the meaning of the root, which in this example is *cardi* for “heart.”

Discussion: Many prefixes can be grouped into similar meanings or ideas such as numbers, colors, size, position, and time. Next, analyze the prefix indicated by the dash (–) that follows it, such as *endo–*, meaning “inside,” as in *endocarditis*, meaning “inflammation of the inside layer of the heart.”

Concept: Lastly, word roots are often related to body systems, but note that they are not designated with a dash neither in front nor behind.

Discussion: Two or more roots can be joined to form a word. For example, the root word *encephal* means “brain” or “inside the skull,” and *myel* means “spinal cord” or “marrow.” *Encephalomyelitis* literally means an inflammation of the brain and the spinal cord. The two root words are joined by the connecting vowel “o” for ease of pronunciation. The suffix *–itis* begins with a vowel, so there is no other vowel necessary to connect it to the root.

While memorizing word parts is daunting, once they are grouped with those having similar meanings, the task becomes more manageable. In Appendix B, there is a list of frequently occurring word parts with their meanings divided in categories; Appendix C contains the directional vocabulary. The appendices are not meant to be comprehensive but serve as an abbreviated starting point.

There may be several word parts having the same or similar meanings. This requires careful reading and analysis by any person working in a medical environment as terminology skills are used throughout the workday. There are many subtleties in any language with medical terminology being no different. It is advised to master the basics for proper understanding and communication to members of veterinary medical health-care teams then to move on to the exceptions.

Procedure

Location used: Everywhere in a veterinary facility

PREPARATION

1. Have a medical dictionary at hand, preferably a veterinary comprehensive one or have ready access to a free medical dictionary on the Internet.
2. Have Appendix B, Appendix C, and the Glossary of this textbook marked and available.
3. Tab a section of your reference book as “Terminology.” Set up a table with the following headings: Word/Prefix/Root/Suffix – Approximate Meaning – Confirm Meaning.

PROCEDURE

1. Learn a new word part each day. Write a chosen medical term in the table in your reference book.
2. Place each word part in the appropriate order under prefix, each root, and suffix.
3. Identify the meaning of each part using appropriate textbook appendices or medical dictionary to assist.

Table 1.1
Exercise Example for Word Analyzing Medical Terminology

Medical Terms	Prefix	Root	Suffix	Literal or Approximate Meaning
Abdominal				
Antibiotic				
Antrum				
Cytology				
Dorsal				
Frontal				
Hemiparesis				
Nephrology				
Ventral				
Virucide				
Xanthoma				
Zygote				

Source: Modified from Pattengale, P. A. *Tasks for the Veterinary Assistant*, 2nd ed. Wiley-Blackwell Publishing.

4. Approximate the meaning of the whole word starting with the prefix, then root parts followed by the suffix in the order of their appearance, from left to right.
5. Combine the literal meaning of word parts together and record in a table.
6. Try the dozen terminology examples in Table 1.1. The answers are given at the end of Appendix B.

FOLLOW-UP

1. Locate the word in a medical dictionary (review pronunciation key) or in the Glossary of this book.
2. Compare the dictionary definition with the one approximated. Correct the meaning if your approximation is incorrect.
3. Analyze and reflect on any differences. Consider how you might modify your word dissections and literal meanings each day to improve language skills.
4. Repeat this process for any new and familiar medical terms to make this a learning habit.
5. Review terminology words for several minutes each day until firm in memory and understanding.

Tip Box 1.2: Some learners find it useful to add journal reflections to their daily notebook exercise entries such as what went well or did not go well with a plan for improvement, which includes active review.

TASK 1.3

REVIEW OF BASIC MATH SKILLS

Math and problem solving are essential foundation and thinking skills. An ability to apply various basic mathematical concepts such as addition, subtraction, multiplication, and division to both whole and negative numbers in real-world problems is assumed by veterinary employers. Additionally, the SCANS foundational skill in arithmetic includes mathematical computations without the use of a calculator; reasonable estimations; and conveyance of results in a table, graph, or diagram. This important skill would be periodically used throughout the day in the veterinary environment for such activities as product sales; inventory management; preparation of stock solutions for cleaning, disinfecting, or patient bathing; analyzing patient objective exam data; medical recordkeeping; and preparation of medications for dosing or medication dispensing.

Concept: Basic math knowledge continues with decimals and fractions.

Discussion: Both of these notations represent less than a whole number. For decimals, any number to the left of it is a whole number, while the first number to right is in the tenth position, the second number is the hundredth, and the third number is the thousandth. For fractions, the top number is called the numerator and the bottom the denominator. Seek to reduce fractions to the lowest common multiple or the lowest common denominator.

Concept: Converting fractions to decimals makes math processes simpler to perform.

Discussion: To covert fractions to decimals, divide the numerator by the denominator. Example: $2 \div 5 = 0.40$. Note the leading zero to the left of the answer, helping to justify the decimal point position so that it is not mistakenly overlooked or forgotten; multiply the numerator by the same factor; eliminate the denominator then move the decimal point two spaces to the right. Example: Convert the fraction $2/5$ (can be stated as 2 divided by 5) to a decimal (denominator: $5 \times 20 = 100$; numerator: $2 \times 20 = 40$). Eliminate the new denominator and the number is 0.40. Note the leading zero to the left of the answer, helping to justify the decimal point position so that it is not mistakenly overlooked or forgotten.

Concept: Percentages are used in many situations especially because they can be readily converted to a decimal answer when solving a math problem.

Discussion: A percent is a certain fraction with the denominator always being 100. In the previous example, the fraction of $40/100$ can be stated as 40 per 100 or notated as 40% with the denominator eliminated and the percentage sign added.

Concept: An understanding of ratios is important for comparing portions between two quantities.

Discussion: Ratios are expressed as two numbers separated by a colon but can also be expressed as fractions, decimals, or percentages to make it easier to obtain their meaning. Concentrated solutions are often diluted with water based on certain portions to each. All of the following express the same ratio:

Ratio—2:5

Fractions— $2/5$, $20/50$, $40/100$

Percentage—40%

Decimal—0.40

Procedure

Location used: Everywhere in a veterinary facility

PREPARATION

1. Review the following website:
Mathematics Skill Builders: <http://www.internet4classrooms.com/skills-8th-mathbuilders.htm>

PROCEDURE

1. Create a reference book card entitled “Math Equations”: fractions/ratios/decimals/percentages, unfamiliar mathematical terms with definitions, conversion formulas with proper math notations (symbols), and any rules for order of mathematical operations.
2. Review the math cards for several minutes each day until firm in memory and understanding.

FOLLOW-UP

1. Add equations to your card(s) as you come across unfamiliar equations. Use the website to figure out how to solve the equations.
2. Confirm your work with your supervisor or coworker.

TASK 1.4

SOLVING COMMON VETERINARY MEDICAL MATH PROBLEMS

Basic math skills are used to convert between the various systems of measurement used in medicine. The metric system is the most frequently used of these systems. Conversions from the English and the older apothecary (chemists or pharmacist) systems are also used. You would anticipate the need to perform such mathematical conversions when recording patient objective exam for medical records and preparing medications for dosing or medication dispensing.

Concept: To convert between the metric and English systems, add these four formulas and symbols for their units to your math equations:

Weight conversion: $1 \text{ kg} = 2.2 \text{ lb}$

Length conversion: $1 \text{ in.} = 2.54 \text{ cm}$

Temperature conversion: Fahrenheit (F) to centigrade ($^{\circ}\text{C}$) or $^{\circ}\text{C}$ to F:

(a) $^{\circ}\text{C} = (5/9) \times (^{\circ}\text{F} - 32)$ and (b) $^{\circ}\text{F} = (9/5) \times (^{\circ}\text{C} + 32)$

Dose calculation formula: $\text{body weight (BW)} \times \text{dose} \div \text{concentration} = \underline{\hspace{1cm}}$ (mL or mg)

Table 1.2
Information Required to Fill a Prescription

What I Want To Know	Metric	English	Others (Such as Hands, Drops, Apothecary)	Possible Functions (Such as Addition, Subtraction, Multiplication, Division)
Answer in desired units. (Mark column of desired units.)				
What I Know				
About the patient				
About the dose				
About the drug				
Others as needed, such as time				
Add as many rows as needed				

Discussion: Review the terminology used in the metric, English, and apothecary systems for liquid, weight, and distance found in Appendix D. To convert from one system to the other requires multiplication and division. Weight is given in grams (g). Linear measurement is in meters (m). Volume is measured in centimeters cubed (cc) or milliliters (mL).

Concept: Medical problems often require several steps.

Discussion: Just as medical terms must be dissembled into their parts, so do medical math problems. Learn to analyze a problem by developing a simple chart or table with rows labeled “What I Want to Know” and “What I Know.” Label each column according to the various measures in the problem going from left to right. The last column is used for possible mathematical rules such as multiplication, division, and addition. See Table 1.2 for an example.

Using Table 1.2, fill in the table using this example of a word problem:

1. A hospitalized patient weighs 60lb; the medicine prescribed is marked in milligram per kilogram; the dose needed is 3 mg/kg; and the drug comes in a concentration of 10 mg/mL. What are you going to do to determine how much medicine in milliliters to give to the patient?

Set up a solution table in the following manner:

- a) First, convert the patient’s weight from the English system of pound to the metric system of kilogram, because the answer desired is in the metric system. Do this by using the 2.2 factor for converting pounds to kilograms. This is a division problem. $60\text{lb}/2.2\text{lb} = (X)\text{kg}$. The answer is 27.28 kg. Round off to the nearest tenths of a whole number to simply. The patient weighs 27.3 kg. Enter the weight into the table.
- b) Now determine the milligram per kilogram dose. This information is usually found in the prescription. This patient is supposed to receive 3 mg/kg of body weight (BW). This becomes a multiplication problem: $3\text{ mg} \times 27.3\text{ kg}$. The total dose is 81.9 mg. Enter the dose into the table.

Table 1.3
Weight and Drug Conversion Formulas

What I Want To Know	Metric	English	Others	Possible Functions
Answer in desired units. (Mark column of desired units.)	$X = 8.19$ or 8.2 mL (rounded up to the nearest tenths)			
What I Know				
About the patient	27.28-kg BW (body weight) or 27.3 kg	Weight = 60 lb		(Step 1) Division: 2.2 lb = 1 kg $60 \text{ lb} \div 2.2 \text{ lb/kg} = 27.28 \text{ kg}$ round up to the nearest tenths = 27.3 kg
About the dose	3 mg/kg BW			(Step 2) Multiplication: $\text{BW} \times \text{dose} = \text{mg}$ $27.3 \text{ kg} \times 3 \text{ mg/kg} = 81.9 \text{ mg}$
About the drug	10 mg/mL			(Step 3) Division: $81.9 \text{ mg} \div 10 \text{ mg/mL}$ (concentration) = 8.19 mL

- c) The concentration of the medication in the vial is 10mg/mL. Determine how many centimeters cubed are needed for this dose for the patient. This is a division problem: $81.9 \text{ mg} / 10 \text{ mg/mL} = 8.19 \text{ mL}$. Enter the result into the table under "What I Want to Know." Again, round off the number to the nearest tenths of a whole number. This becomes your answer: 8.2mL of the prescribed medication. Place the answer after the $X =$ in the chart. Check your work by comparing it with Table 1.3.
2. A patient on a diet program comes in weekly for a weight check. Medical records are kept in the metric system. The scale records in both metric and English systems. The patient is first weighed by the metric scale and is recorded as 19kg. Now you press the English system button and the scale displays 41.8lb. The owner requests to know the original weight in pounds. According to the patient's record, the original weight was 20kg. What is the original weight in pounds? The owner also wants to know how much weight, in pounds, her pet has lost since starting the diet. Set up a new solution table.
- a) The formula is $20 \text{ kg} \times 2.2 \text{ lb}$ (the equivalent weight of 1 kg) = weight in pounds. The patient originally weighed 44lb. Enter the weight into the table.
- b) The patient's weight loss is a subtraction equation of previous weight minus current weight, so $20 \text{ kg} - 19 \text{ kg} = 1 \text{ kg}$. Convert the metric system to the English system of pounds: $(X) = 1 \times 2.2 \text{ lb}$. Enter the weight into the table. The patient has therefore lost 2.2lb. This is nothing more than using the conversion factor 2.2 from the known conversion formula.
- c) Compare your table with Table 1.4.

Table 1.4
Conversion from Pounds to Kilograms

What I Want To Know	Metric	English	Others	Possible Functions
Answer in desired units. (Mark column of desired units.)		$X = 2.2 \text{ lb}$		(Step 3) Subtraction: $44.0 \text{ lb} - 41.8 \text{ lb} = 2.2 \text{ lb}$ or combination of subtraction and multiplication: $20 \text{ kg} - 19 \text{ kg} \times 2.2 \text{ kg/lb}$ $= 2.2 \text{ lb}$
What I Know				
About the patient, originally	20 kg (BW)	44.00 lb rounded off to the nearest tenths = 44.0 lb		(Step 2) Multiplication: $20 \text{ kg} \times 2.2 \text{ lb/kg} = 44.00 \text{ lb}$
About the patient, currently	19 kg (BW)	41.80 lb rounded off to the nearest tenths = 41.8 lb		(Step 1) Multiplication: $19 \text{ kg} \times 2.2 \text{ lb/kg} = 41.80 \text{ lb}$

Table 1.5
Conversion from Inches to Centimeters

What I Want To Know	Metric	English	Others—Hands (1 hand = 4 in.)	Possible Functions
Answer in desired units	$X = 152.4 \text{ cm}$ or 15.2 m (rounded off to the nearest tenths)			(Step 3) Conversion factor: $1 \text{ m} = 100 \text{ cm}$ Division: $152.4 \text{ cm} \div 100 \text{ cm} = 1.524 \text{ m}$
What I Know				
About the patient's total height		60 in.	15 hands	(Step 1) Multiplication: $15 \text{ hands} \times 4 \text{ in./hand} = 60 \text{ in.}$
Conversion formula: $1 \text{ in.} = 2.54 \text{ cm}$				(Step 2) Multiplication: $60 \text{ in.} \times 2.54 \text{ cm/in.} = 152.40 \text{ cm}$

3. A horse stands at a height of 15 hands. One hand equals 4 in. How tall is the horse in centimeters? (See Table 1.5.)

Fill in your solution table with the following examples:

- a) First, determine the height in inches: $(X) = 15 \times 4 \text{ in.}$, so height = 60 in.
- b) Then calculate the height in centimeters: $60 \text{ in.} \times 2.54 \text{ cm} = \text{height}$, which is 152.4 cm. Enter the result into the table and convert the final answer also to

meters to simplify. One hundred centimeters is equal to 1 m. This horse would be 1.52 m.

4. Practice this word problem on your own. The instruction label on a concentrated disinfectant says to dilute product 1:30 parts with tap water. You need to fill four spray bottles with 250 mL of the diluted disinfectant. How much concentrate and how much water do you need to mix the desired dilution in the desired total quantity? Create your solution table and calculate your answers stepwise. (If you need help, the answer is at the end of Appendix D.)

Procedure

Location used: Throughout the veterinary facility

PREPARATION

1. Have a pencil with an eraser and a calculator at hand.
2. Add the formulas in the preceding section to the math equation card in your reference book.
3. Select a math problem from your daily work.
4. Draw a solution table with rows that correspond to what you want to know and what you already know. Fill in cell labels.
5. Draw columns, one each for the systems represented in the problem and one for possible solutions with desired units. Fill in cell labels.

PROCEDURE

1. Fill in the rows with the values and the measures in the systems they represent.
2. Convert all measures into the system required by the answer. See “Answer” cell marked with an “ $X =$ ” representing the unknown final answer.
3. Solve the problem in a stepwise fashion.

FOLLOW-UP

1. Always check your work by repeating each calculation by hand.
2. Recheck your manual calculations with a calculator and compare.
3. Be aware of decimal point locations and units of measure. Does the answer make sense?
4. If the answer does not make sense, recheck the info placed in all rows and columns of the solution table for accuracy.
5. Show your work to your supervisor or coworker to check that you are doing the math calculations correctly.

TASK 1.5

COMPUTERS AND INFORMATION LITERACY

Concept: Expect to use computers for some tasks.

Discussion: Review the SCANS Competencies in Appendix A. Note under “Information” that an employer expects from every employee an ability to use “computers to process information.” The current assumption is that every employee has keyboarding skills and basic computer literacy. The necessary proficiency level varies from site to site and from task to task.

Some practices have achieved a nearly paperless status with most departments computerized and integrated into a single interactive database. These departments include the laboratory, radiology and patient imaging, medical records, prescriptions, client billing, and hospital management software. Some practices are partially computerized with only some functions automated such as vaccination certificates, invoicing, and client reminder labels. Computing and information retrieval skills occur throughout the day and usually most frequently when veterinary products and/or services are being recorded for medical, business, and legal purposes.

Concept: Software comes in individual modules that reflect the various hospital activities.

Discussion: A specific module can be found on a computer terminal in the area of the facility in which it is used. For example, the pharmacy module is accessed in the pharmacy, where prescriptions are filled. When filling the prescription, the assistant can enter data necessary to generate the prescription label, including date, drug, quantity, and patient name.

Concept: All modules are linked to each other as part of a primary interactive database providing information to other modules located throughout the hospital.

Discussion: Information about the prescription goes into a central database that can then generate information for the individual patient record, hospital inventory, client invoice, and so on.

Concept: The person entering any information is responsible for accurately adding the information to the database regardless of the module into which the information is first entered.

Discussion: The technician and veterinarian can see the date the prescription has been filled; the receptionist can determine how much to bill the client for the prescription; and the hospital manager can determine how much of a specific drug is still in inventory. However, the information they access is only as useful as the accuracy of the initial data typed into the computer terminal, computer station, or digital display panel present in the veterinary environment. Consider how a misspelled client’s name could lead to a lost computer billing record if the file cannot be retrieved. In this same example, poor client communications and marketing results will occur due to inaccurate mailing label for reminders and practice newsletters. The “GIGO effect” is an old computer science acronym meaning “garbage in, garbage out.” Strive not to contribute to the GIGO effect.

Tip Box 1.3: The GIGO effect can be viewed as universally self-evident not only in computing skills but also in the integrity of all personal work.

Procedure

Location used: Everywhere in a veterinary facility

PREPARATION

1. Prepare a task card entitled “Computer Literacy.”
2. Using an Internet-connected computer with a full keyboard, type “free online typing test” into the search engine box.
3. Select two to three websites from search results and follow the directions for the typing test.
4. Record the results for each test on your task card. Compare and average the results of self-assessments to determine a skill baseline.
5. Obtain and maintain basic keyboarding skills. A typing rate goal of 30–45 correctly typed words per minute is highly recommended.
6. Know basic computer terminology and correctly identify equipment. Use the Internet to locate an online computer dictionary such as <http://www.merriam-webster.com/>
7. Computer literacy skills include distinction between hardware and software. Use the Internet search box and locate “free online computer literacy test.”
8. Select one to two websites from search results and follow the directions for the test.
9. Record results in your task card as baseline self-assessment.
10. Know basic computer mechanics. Be able to connect a CPU to a monitor and change the ink or laser cartridge in a printer.
11. Know how to use a basic word processing program.

PROCEDURE

1. Create a task card entitled “Management Software—Checklist of Things to Learn”:
 - a) Which of your job responsibilities are computer based?
 - b) Which modules within the software program are you expected to use?
 - c) How to access these computer modules
 - d) How to use the printer and/or scanner
 - e) How computer training is provided in the facility
 - f) Pay close attention and record your own notes during training sessions.
 - g) Create a reference book card entitled “Computer Shortcuts to Help You Remember.”
2. Develop general computing speed and accuracy.
3. Practice computing and typing skills daily; track progress.
4. Utilize the Internet to research veterinary resource information and tutorials.

FOLLOW-UP

1. Always double-check data entry for accuracy including numbers, letters, capitalization, spelling, and spacing.
2. Utilize word processing grammar and spell-check programs, if available.
3. Develop mastery of the software to speed utilization.
4. Check the credibility of Internet sites—author, association, references, and if current (look for the date at the bottom of each webpage or website homepage to determine when it was last updated).

TASK 1.6

DEVELOPING TECHNOCOMPETENCY

Technocompetency or technology competency is no more than two root words combined that refer to a certain essential workforce skill. The veterinary employer expects an employee to select the correct equipment (technology) for a specific situation, to use (apply) the equipment correctly for the task at hand, and to properly maintain and troubleshoot the equipment used for each task (competency). The use of technology is one of the five SCANS competencies.

Concept: A range of equipment that is used in special circumstances is found throughout the veterinary facility.

Discussion: For example, a patient's vital signs are monitored throughout anesthesia using equipment that can graph or provide readings of basic vital signs such as heart rate (HR), respiratory rate (RR), electrical impulses within the heart (ECG or *electrocardiogram*), strength of blood flow through the blood vessels (BP or blood pressure), and readings of core body temperature (*T*, temp., or temperature). These functions can be measured by a single piece of equipment called a multiparameter patient monitoring unit or found in several separate units that only monitor one parameter each.

Concept: An ability to choose and locate the right equipment for the right circumstance is critical to patient health and even survival.

Discussion: Once the equipment is chosen, the equipment must be properly used. Using patient anesthesia as an example, the anesthetic machine must be correctly connected while the amount of gases delivered to the patient must be accurately calibrated. If the anesthetic machine is not working properly, the patient will not be anesthetized safely (correctly).

Concept: Equipment should be kept close where it is most frequently used for efficiency.

Discussion: Learn the correct name, location, and purpose for each piece of equipment in the facility including the office and kennel areas. Both medical and nonmedical equipment are routinely used throughout the day in the veterinary environment.

Concept: After locating each piece of equipment in the hospital, find its accompanying user's or operations manual.

Discussion: This manual may come in the form of a booklet, spiral-bound manual or a three-ring binder found near or with the equipment. It contains instruction for use, maintenance, troubleshooting, and contact procedures for repairs. If there is no manual near the equipment, it might be found in a centrally located file cabinet or bookshelf that contains the operation's manuals for all the equipment in the facility. If the manual is away from the instrument, prepare task cards for each piece of equipment containing essential user and maintenance information. Always refer to the full manual for additional details.

Know what is contained within any user's or operations manual and how it is organized. Start off with the "Table of Contents" at the front of the manual followed by the alphabetical "Index" located at the back. These aids will tell you where to locate information more quickly. Next, study the diagram of the equipment to name and locate its parts. Read the "How to Use" section to learn when and how to correctly use the equipment.

Concept: Follow maintenance procedures along with any suggested time schedule for performing them.

Discussion: Depending on the device, a piece of equipment might need cleaning after each use, calibration and/or warm-up cycle, and periodic factory service.

Concept: Always make certain every piece of equipment is working correctly before using it.

Discussion: The equipment may have visual indicators such as small control panel lights that change colors to alert the user of the equipment's status. Such indicator lights inform the user that the equipment is turned on (amber or flashing green light), ready for use (steady green light), or if any error or problem has occurred (red light). Equipment with digital control panels may inform the user with error codes or symbols. Use the troubleshooting section of the manual to determine what the lights, codes, or symbols mean.

Tip Box 1.4: Incorrect use or any improperly working equipment part may put a patient's life in jeopardy.

Every piece of veterinary medical equipment must be maintained, at a minimum, according to the manufacturer's recommendations. Improperly working medical equipment must be recognized and immediately corrected or a patient's well-being may be jeopardized. Something as simple as calibrating a *refractometer* to scale zero before determining a patient's urine specific gravity is essential. If this quality control step is not done, the measurement will be read inaccurately. This seemingly small error leads to a larger incorrect conclusion. This, in turn, leads to a much bigger problem with an inappropriate diagnosis, treatment plan, and prognosis. Veterinary medicine is not an "Oops!" profession where you can change errors easily. Inaccuracies and incorrect actions have a domino effect that can lead to serious patient harm including death.

Procedure

Location used: Throughout the veterinary facility

PREPARATION

1. Prepare a reference book care entitled "Equipment" and, as already mentioned, task cards for each piece of equipment you are responsible to maintain.
2. Determine what tasks need to be accomplished.
3. Determine which piece of equipment is used in the clinic.
4. Confirm with your supervisor the equipment chosen for each task.
5. Locate the appropriate equipment for task; mark the storage location.
6. Locate the current user's or operations manual for equipment.

PROCEDURE

1. Mark procedure for which each piece of equipment is required.
2. Ensure the chosen equipment is working properly.
3. With the aid of the operations manual, follow the directions for use.

FOLLOW-UP

1. Clean the equipment per manufacturer's directions and the surrounding area if dirty.
2. Properly power-down the piece of equipment or be sure it is placed on standby.
3. Return the equipment to the designated location and apply dustcovers when applicable.
4. If chemicals, test reagents, or other consumables are used with the equipment, check use-by or outdate to determine if the product is still safe to use; make certain to refill and check the inventory supply for future use. If supplies are low, promptly inform the facility inventory manager.
5. Are there maintenance procedures? Make a task card for each if there are. Include the frequency and summary of procedure and place these in the "Daily/Weekly/Monthly/Yearly" section of your task box.

RESOURCES

The Free Dictionary by Farlex. Retrieved from: <http://medical-dictionary.thefreedictionary.com/>.

Lake, T., & Green, N. (2009). *Essential Calculations for Veterinary Nurses and Technicians*, 2nd ed. New York: Elsevier.

Online Dictionary for Computer and Internet Terminology. Retrieved from: <http://www.webopedia.com/>

Romich, J. A. (2009). *An Illustrated Guide to Veterinary Medical Terminology*, 3rd ed. Clifton Park, NY: Delmar Cengage Learning.

Stumpf, E., Fritz, F., & Bradford, W. (2009). *Mathematics for Veterinary Medical Technicians*, 3rd ed. Durham, NC: Carolina Academic Press.



Go to www.wiley.com/go/pattengale/tasks to find additional learning materials for this chapter:

- Competency checklist
- Downloadable flash cards
- Review questions
- Concept maps
- The figures from the chapter in PowerPoint
- Instructor lesson plans

