

CHAPTER 11

COMPUTERS IN THE AMBULATORY CARE SETTING

Overview

As the Information Age progresses and computers become an integral part of the workplace, the role of the medical assistant will continue to expand, reflecting the growing reliance of the ambulatory care setting on the capabilities of computers. Medical assisting students must learn what tasks computers can perform easily in the medical office. The basics of computer hardware and software configurations, computer operation, cloud computing, and maintenance are discussed. The study of ergonomics is explored, along with strategies for avoiding computer-related injuries such as back strain, eyestrain, and damage to the wrist. The need for medical assistants to follow guidelines preserving the confidentiality of electronic medical records (EMRs), including the release of computerized information, is stressed. Medical assisting students are encouraged to consider their role as information managers, demonstrating professionalism while using computers to perform tasks and access services, resources, and information that will assist themselves and their provider-employers as well as enhance patient care.

Lesson Plan

I. LEARNING OUTCOMES	ABHES	CAAHEP
A. Define, spell, and pronounce the key terms as presented in the glossary.		
B. Describe the four fundamental elements of a computer system.		
C. Identify the four main types of computers.		
D. List four input devices and describe the function of each.		
E. List three examples of data output devices.		
F. Explain how storage devices might be used in ambulatory care settings.		
G. Discuss the use of a flash drive and a tape drive and describe how each might be used in ambulatory care settings.		
H. Explain the difference between system and application software.		IV.C.9 V.P.6
I. Discuss the importance of computer system documentation and how it is upgraded.		
J. Describe networking of computers and its purpose.		
K. Differentiate the various network and connectivity technologies.		V.P.7
L. Understand the principles and techniques of promoting network and computer security.		
M. Discuss design considerations when computerizing a medical clinic.		IV.A.4, 9
N. Discuss applications of electronic technology in effective communication.	7.a, b.(2)	
O. Discuss principles of using electronic medical records (EMR).	4.a 8.hh, ll	I.C.12 V.C.11 V.P.5 IX.P.7
P. Discuss the importance of routine maintenance of clinic equipment.	8.y	V.C.14 V.P.9
Q. Explain why ergonomics is important and recall at least five guidelines for setting up a computer workstation.		XI.C.2, 8, 10 XI.P.2
R. Discuss patient confidentiality and guidelines for maintaining confidentiality while keeping in mind HIPAA requirements.		I.A.1 IX.C.2, 3 IX.P.1, 3
S. Analyze the professionalism questions and apply them to this chapter's content.	4.f 11.b.(2), (3), (5), (9)	I.A.2, 3 IX.C.1, 2 IX.P.2, 8 IX.A.3 X.A.1

II. PROFESSIONALISM QUESTIONS

- A. Competency
 - 1. Did you pay attention to detail?
 - 2. Did you ask questions if you were out of your comfort zone or did not have the experience to carry out tasks?
 - 3. Did you display sound judgment?
 - 4. Were you knowledgeable and accountable?
 - 5. Did you recognize the importance of local, state, and federal legislation and regulations in the practice setting?
- B. Initiative
 - 1. Did you develop a strategic plan to achieve your goals? Was your plan realistic?
 - 2. Did you seek out opportunities to expand your knowledge base?
 - 3. Did you implement time management principles to maintain effective office function?
 - 4. Did you assist coworkers when appropriate?
- C. Integrity
 - 1. Did you work within your scope of practice?
 - 2. Did you acknowledge the scope of practice of other health care professionals?
 - 3. Did you demonstrate sensitivity to patients' rights?
 - 4. Did you protect personal boundaries?
 - 5. Did you protect and maintain confidentiality?
 - 6. Did you immediately report any error you had made?
 - 7. Did you report situations that were harmful or illegal?

III. REFERENCES

- A. Lindh, Wilburta Q., Pooler, Marilyn S., Tamparo, Carol D., Dahl, Barbara M., & Morris, Julie A., *Delmar's Comprehensive Medical Assisting: Administrative and Clinical Competencies*, 5e
- B. See text Chapter 11, References/Bibliography
- C. Any other teacher-preferred reference material

IV. VISUAL AIDS

- A. Computer access to identified Internet resources
- B. Any other teacher-preferred visual aids (PowerPoint, etc.)

V. EQUIPMENT AND MATERIALS

- A. Computer, TV monitor, and Internet access
- B. Computer hardware (microcomputer)
- C. Computer software, especially those relating to the medical clinic
- D. Variety of computer-generated forms, reports, envelopes
- E. See IV: Visual Aids

VI. SAFETY

- A. Basic classroom procedures
- B. Check all electrical cords and plugs
- C. Use good posture when working on the computer and appropriate computer equipment to avoid injury

VII. PREPARATION

- A. Arrange for visual aids equipment.
- B. Collect materials.
- C. Review Chapter 11 in the text, the Study Guide, the Competency Manual, and the Instructor's Manual.

VIII. INTRODUCTORY REMARKS/ACTIONS

- A. Read Learning Outcomes in the text with students to introduce the chapter.
- B. Share with students how you use the computer in your job. Invite students to share how they use computers.

IX. PRESENTATION

- A. The Computer System
 1. Basic System (Figure 11-1)
 - a. Central processing unit (CPU)
 - b. Input devices
 - c. Output devices
 - d. Software
 2. Types of Computers (Figure 11-2A and Figure 11-2B)
 - a. Personal computers (PCs)
 - b. Supercomputers
 - c. Mainframe computers
 - d. Minicomputers
 - e. Microcomputers
 - f. Personal digital assistants (PDAs)
 - g. Smartphones
 - h. Typical capabilities of microcomputers (Table 11-1)
 3. Components of a Computer System
 - a. Hardware, components that can be seen, touched, or heard
 - (1) Data input devices
 - (2) Central processing unit
 - (3) Data output devices
 - (4) Data storage devices
 - b. Software, frequently referred to as a computer program
 - (1) System software
 - (2) Application software
 - (3) Drivers
 4. Documentation
 - a. Patches
 - b. Licenses
 5. Assignment/discussions of the Critical Thinking box
 6. Hardware and Software Compatibility
- B. Computer Networks
 1. Networking—the electronic or optical connection of computers and peripheral equipment for the purpose of sharing information and resources
 2. Types of networks
 - a. Local area network (LAN)
 - b. Wide area network (WAN)
 - c. Internet
 3. Connecting networks
 - a. Hard-wired connection
 - b. WiFi connection
 - c. Bluetooth® connection
 - d. WiMAX connection
 4. Systems security
 - a. Operating system
 - b. Firewall
 - c. Antivirus software
 - d. Password
 - e. Training
 - f. Inventory control
 - g. Data management
 - h. Data backup
 - i. Manual selection of WiFi access points
 - j. Personal access points
 - k. Deactivate file sharing by your computer

5. Virus protection programs
 6. Recognizing secured sites (Figure 11-3)
 7. Firewalls
 8. System backup
 9. Power outage, electrical surge, and static discharge protection devices
 10. Cloud computing
 - C. Computer Maintenance by Clinic Personnel
 1. Replacement of printer ink and toner cartridges and refilling of paper trays
 2. Defragmentation
 3. Installation of security patches
 4. Service agreement management
 - D. Use of Computers in the Medical Clinic
 1. General clinic procedures
 2. Maintaining EMRs and EHRs (Figure 11-4 and Figure 11-5)
 3. Procedure 11-1: Perform Routine Maintenance of Clinic Computers and Ancillary Equipment with Documentation
 4. Clinical and laboratory applications
 5. Portable computers in the medical clinic
 - a. Personal digital assistants (PDAs)
 - b. Smartphones (Figure 11-6)
 - c. Tablet PCs (Figure 11-2B)
 - E. Design Considerations for a Computerized Medical Clinic
 1. Software Installation (Procedure 11-2)
 2. Hardware Installation (Procedure 11-3)
 - F. Scheduling the Changeover
 1. Assign or discuss the Critical Thinking activity
 - G. Ergonomics
 1. Eye strain (Figure 11-7)
 2. Cumulative trauma disorder (Figure 11-8A and Figure 11-8B)
 3. Posture (Figure 11-9 through Figure 11-11)
 - H. Patient Confidentiality in a Computerized Medical Clinic
 1. Adhere to HIPAA regulations
 2. Ensure that computer-literate personnel are employed to set up the system
 3. Establish protocols defining who can access and modify data and provide identification, dating, and authenticating mechanisms for those changes and additions
 4. Persons other than authorized personnel should not be able to view monitors
 5. Passwords or PINs should not be shared
 6. Printers and fax machines should be located where unauthorized personnel cannot view them
 7. Adhere to AMA computer confidentiality (Figure 11-12)
 - I. HIPAA Standards for Safeguarding Protected Health Information (PHI)
 - J. Professionalism in the Computerized Medical Clinic
 1. Work as a member of the health care team
 2. Adapt to change
 3. Maintain a work ethic
 4. Enhance skills through continuing education
 5. Assign or discuss the Critical Thinking activity
- X. APPLICATION
- A. Use the Learning Outcomes at the beginning of Chapter 11 in the text as the basis for questions to assess comprehension.
 - B. See the Classroom Activities section below for numerous application activities.
 - C. Assign students to complete Chapter 11 in the Study Guide.
 - D. Complete the Procedures in Chapter 11, using the Competency Manual to evaluate.
- XI. EVALUATION
- A. Evaluate any assigned application activities.
 - B. Evaluate student participation during presentation.
 - C. Grade responses to Chapter 11 in the Study Guide.
 - D. Evaluate student performance on Chapter 11 Procedures.

Classroom Activities

1. Assign computer lessons for students to complete after demonstration of the equipment. Check to be sure students operate the equipment properly and that their work is 100 percent accurate.
2. Have students “work” one hour per week in one of your institution’s offices to get familiar with office equipment.
3. Have students key lecture notes on a computer for a week.
4. Assign students to go window shopping in a computer software store and explore the variety of available programs. Students should come to class with a list of software they think might be helpful to have in a medical clinic.
5. Invite a working medical assistant in to speak to the class about the uses of the computer in the medical clinic in which he or she works. The speaker should describe any custom software the clinic uses.
6. Invite a computer expert in to demonstrate various computer uses and software. Include a brief introduction to word processing, graphics, spreadsheets, and databases.
7. Invite an EHR vendor to your class to describe/demonstrate the software they have to offer in this area.
8. Have teams of students design an ergonomic workstation for a clinic reception area. Students may sketch the drawing on paper or create a cardboard model. The students can share their project with the class, explaining the ergonomic features and the importance of each.
9. Using Figure 11-1 in the textbook, ask students to develop questions related to the function of each component. Use the questions in discussion by the entire class or as groups/teams.
10. Ask students how they may be using cloud computing and how they see its usefulness in a medical clinic.
11. Critical Thinking exercises are provided within the chapter content to stimulate critical thinking discussion and skills necessary for using computers in a clinic environment.
12. Explore the Case Studies provided in the Study Guide for an additional discussion and enhancement of principles pertinent to chapter content.

Answers to Critical Thinking Boxes

Your clinic has received legal notification requiring a list of all the software used in the practice and to show proof that all necessary licenses are current. You are successful in showing compliance, but the clinic procedures were disrupted for days in meeting this court mandate. Prepare a clinic protocol designed to ensure that all software is legal and that unauthorized persons have not installed illegal software on any clinic computers.

The protocol should include the following:

- Identify a person responsible for authorizing all software purchases.
- A statement that prohibits installation of any personal software.
- Establish a database identifying all copyright software, product IDs, and the computer IDs on which it is installed.
- Establish a file system to store documentation and licenses for all copyright software.
- Develop a schedule for checking the installed software on each clinic computer against the previously noted database, deleting any personal copyright software not on the list. Verify that the licenses are in the documentation file and properly cover the number of computers on which each item is installed.

Your clinic has obtained new medical management software. List as many options as you can think of for training clinic personnel to use the management software effectively. Identify the pros and cons for each option.

- Arrange for a trainer from the software supplier to provide training sessions using a computer classroom. PRO: The trainer is knowledgeable of the program and can answer questions specific to the varied functions performed by each staff member. The staff would be able to learn by listening to the instructor lecture and by actually operating the computer program. The staff would get a better understanding of how the entire system works, not simply how they would utilize it for their specific area. CON: This approach would require training to be after the clinic closes or on weekends. Some staff members might be inconvenienced, and overtime pay could be a consideration. Meals and travel expenses may also be involved.
- Arrange for a computer-literate staff member to be trained by the supplier of the software and then have that person train individual staff members on the job. PRO: The trainee would have one-on-one training and would learn by doing. Training would not require special time away from work. CON: The trainer would not be extremely knowledgeable of the program. The trainee would learn only how the software worked for their function.

The provider–employer has informed the clinic manager that he or she has observed employees visiting Web sites not connected with clinic requirements and is concerned about the practice becoming widespread. You have been

asked to prepare a draft guideline for a policy on business and personal Internet use on clinic equipment during business hours. You have been further told that the policy should not be totally prohibitive, but it does need to address performing personal tasks during business hours and exercising propriety in the sites visited.

Prepare a draft policy proposal for computer use, and obtain written comments from several students regarding the policy guidelines. Prepare a final draft incorporating changes made to obtain consensus by the persons making comments and submit the original draft, the comments, and final draft to the instructor, together with your observations on the difficulty in achieving consensus on the policy.

- Proposed Protocols for Medical Practice Computer Usage Suggestions
 - a. Usage of clinic computers is limited to medical practice purposes during regular working hours.
 - b. Checking for and sending personal email and conducting personal business such as banking, paying bills, etc., may be done using clinic computers while on breaks, during lunch period, and after business hours, provided the equipment is not required for practice business.
 - c. Use of clinic computers to “surf the Web,” access pornographic Web sites, or conduct any form of illegal activities online is strictly prohibited and will result in disciplinary action.

Answers to Case Studies

Case Study 11-1

Refer to the scenario at the beginning of the chapter.

1. How will Walter establish benchmarks or comparisons for computer needs?

To establish benchmarks or comparisons for computer needs, Walter should telephone other clinics in the area to discuss their systems and performance satisfaction. He may also want to schedule a visit to these clinics to discuss and view their setups. Most vendors will say their system is the best and will offer demonstrations that can help in the assessment of meeting the needs of your particular clinic.

2. List important considerations when selecting a computer vendor.

Choose a knowledgeable and trustworthy vendor. The vendor should understand computers and software as well as the needs of the clinic. A reliable vendor should be able to assist in anticipating and allowing for a minimum of two years' future needs. Select software appropriate for the clinic needs and hardware and define the hardware needs for each program. Programs must be compatible with the computer's operating system and all other software selections. Training should be considered.

3. What steps might Walter implement to ensure a smooth transition from a manual to a computerized system?

Provide extensive training for all involved in the use of the computer system. Installation should take place during a down period such as a long holiday weekend or vacations when the clinic is closed. It is best to have both the old and the new system operating at the same time until all of the glitches are worked out of the new system. Assign staff members to transfer files and data. As they do this, they become familiar with the new programs and enhance their computer skills. Walter should encourage and praise staff for what they are doing well and the progress they are making. Remember that there will be some disruption during the transition. Providing a way for staff to “vent” their frustration may be helpful. This may consist of simply writing out the problem and discussing it during a staff meeting or break time.

Case Study 11-2

Walter Seals, CMA (AAMA), who is employed by Inner City Health Care, has been given approval to computerize the clinic. Walter is also concerned about confidentiality issues involved with a computerized clinic.

1. Identify the areas where confidentiality is most likely to be jeopardized.

Confidentiality is most likely to be jeopardized with the use of computer-based medical records, electronic transfer of medical records, invasion by hackers, and inappropriate discussion of patient records.

2. Suggest possible solutions to protect confidentiality in each of these areas. Write a one-page summary and submit it to your instructor.

- a. Computer-based medical records—The use of passwords is successful in controlling access to computer files and in providing an authentication mechanism. Development of a firewall to allow outside computers to access your computer while restricting access to your databases is essentially impossible. The clinic should not allow outside computers access to database computers and not allow communication with an outside network or the Internet while using a dedicated computer. Computer security protocols should be written, training

should be provided to employees, and confidentiality statements should be signed by all personnel having exposure to computer-based medical records before access is granted.

- b. Electronic transfer of medical records—Follow the same procedures as computer-based medical records.
- c. Hackers—Medical records sent over the Internet to an external location could be intercepted by hackers and posted on the Web for all to read. Encryption programs may be employed when sensitive medical records must be transmitted via electronic means.
- d. Inappropriate discussions—All medical clinic employees should sign a confidentiality statement. During staff meetings, discuss the importance and ramifications of discussing confidential medical records via electronic methods. Answers will vary but should address most of the answers given in question 2 above.

Answers to Certification Review

1. c. are widely used in today's health care facility
2. b. is the brain of the computer system
3. c. keystrokes, motion, and temperature
4. b. ROM, RAM, hard drives, and flash drives
5. d. consists of the manuals and documents that define how programs or hardware operate
6. c. LANs, WANs, and Internet
7. a. WiMAX
8. d. a and c only
9. d. all of the above
10. d. none of the above
11. a. complete all insurance forms
12. d. expect the computer system to be 100% operational immediately
13. b. adheres to HIPAA policies and procedures
14. c. used mainly by governmental provider services
15. a. cloud computing is made possible by WiMAX connections

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