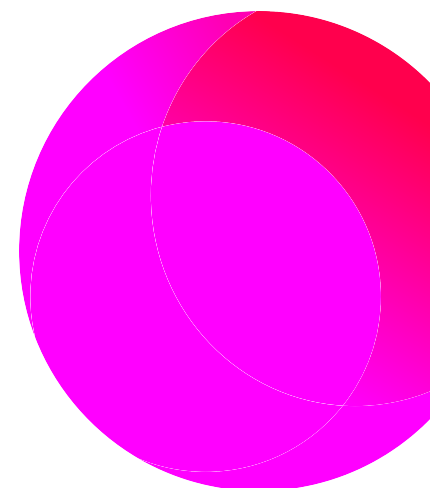# MEDICAL ASSISTING
REVIEW

Passing the CMA, RMA, CCMA, and NCMA Exams

Seventh Edition

Jahangir Moini, M.D., M.P.H.

Former Professor and Director of Allied Health Sciences including the Medical Assisting Program, Everest University, Melbourne, Florida; and Retired Professor of Science and Health, Eastern Florida State College, Palm Bay, Florida

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MEDICAL ASSISTING REVIEW: PASSING THE CMA, RMA, CCMA, and NCMA EXAMS, SEVENTH EDITION

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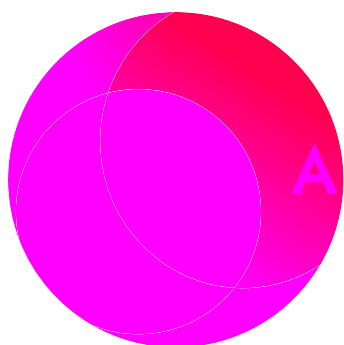
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Dedication
To the memory of my Mother,
and
To my wonderful wife,
Hengameh, my two daughters,
Mahkameh and Morvarid,
and also to my precious granddaughters,
Laila Jade and Anabelle Jasmine Mabry.

BRIEF TABLE OF CONTENTS

We have added as per the FM order.Please check and confirm.

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PREFACE

Catching your success has never been easier, with the sixth edition of *Medical Assisting Review: Passing the CMA, RMA, CCMA, and NCMA Exams.* Confidently master the competencies you need for certification with a user-friendly approach and various practice exams. *MA Review* is also now available with McGraw-Hill's revolutionary adaptive learning technology, LearnSmart! Study effectively, spending more time on topics you don't know and less time on the topics you do. Succeed with LearnSmart . . . Join the learning revolution and achieve certified success!

Organization

Medical Assisting Review is divided into three sections, similar to how the certification exams are divided: General Medical Assisting Knowledge (Chapters 1–8); Administrative Medical Assisting Knowledge (Chapters 9–15); and Clinical Medical Assisting Knowledge (Chapters 16–25). Each chapter opens with *Learning Outcomes* to set the stage for the content to come. That list is followed by a table listing the relevant CMA, RMA, CCMA, and NCMA *Medical Assisting Competencies* for that chapter. Throughout the chapters, you will find *At A Glance* tables that summarize key information for quick review. At the beginning and end of most chapters, there are also *Strategies for Success* boxes, which contain tips on study skills and test-taking skills. Each chapter then closes with the *Chapter Review*—10 multiple-choice questions written in the style of CMA, RMA, CCMA, and NCMA exam questions.

New to the Seventh Edition

OVERVIEW

A number of enhancements have been made with the sixth edition to enrich the user's experience with the product:

- The Chapter Reviews, at the end of each chapter, have additional questions so that they now have 25 questions each instead of 10.
- This edition has many new figures that did not appear previously.

- At the end of each section, there is a new Test Your Knowledge feature that contains 100 multiple choice questions. The Answer Key for each of these is at the end of the book.
- There are four exams included at the back of the book. The existing exams have all been updated to reflect new material in the chapters, and all of the exams have gone through an accuracy review.

CHAPTER HIGHLIGHTS

Definitions have been expanded and added in every chapter in direct response to market feedback:

- Chapter 4: Information has been added about Zika virus disease and Ebola virus disease.
- Chapter 11: The rules or guidelines that determine the daily working of an office have been removed from the section entitled "The Policy and Procedures Manual."
- Chapter 12: A new section has been added that is called "Cell Phones and the Internet."
- Chapter 13: A "W-9" form has been added.
- Chapter 15: A new introduction to medical coding has been added, and there has been a large amount of updating and revisions in this chapter.
- Chapter 19: Drug information has been completely updated.

- Chapter 20: Immunization schedules have been updated. Information on the Coronavirus (COVID-19) has been added.
- Chapter 23: This chapter has been retitled as "Promoting Healing After an Injury"; it was previously called "Physical Therapy."

For a detailed transition guide between the sixth and seventh editions for all chapters of *Medical Assisting Review,* visit the Instructor Resources in Connect.

Medical Assisting Review Preparation in the Digital World: Supplementary Materials for the Instructor and Student

Instructor Resources

You can rely on the following materials to help you and your students work through the material in this book. All of the resources in the following table are available through the Instructor Resources on the Library tab in Connect.

Supplement	Features
Instructor's Manual	Each chapter has: • Learning Outcomes and Lecture Outline • Overview of PowerPoint Presentations • Teaching Strategies • Answer Keys for End-of-Chapter Questions and two Practice Exams from the back of the book • List of Additional Resources
PowerPoint Presentations	• Key Concepts
Electronic Test Bank (Two Practice Exams)	• TestGen (computerized) • Word version • These two exams are also available in the Library tab of Connect. Both of them, along with 12 additional exams, are available within Connect. • Questions are tagged with learning outcomes, level of difficulty, level of Bloom's taxonomy, feedback, and ABHES and CAAHEP competencies.
Tools to Plan Course	• Transition Guide, by chapter, from Moini, 6e, to Moini, 7e • Correlations of the chapters to the major accrediting bodies (previously included in the book), as well as correlations by learning outcomes to ABHES and CAAHEP • Sample Syllabi • Asset Map—a recap of the key instructor resources, as well as information on the content available through Connect

A few things to note:

- All student content is now available to be assigned through Connect.
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office procedures, application of medical knowledge, and application of privacy and liability regulation. An ideal way to engage, excite, and prepare students to be successful on the job, Practice Medical Office is available for use on tablets and computers. It is perfect for the capstone Medical Assisting Examination Preparation course, and Externship course, or may be used throughout the Medical Assisting program. PMO is accessible through a widget in Connect. For a demo of Practice Medical Office, please go to **http://www.mhpractice.com/products/Practice_Medical_Office** and click on "Play the Demo."

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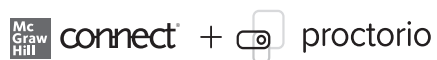
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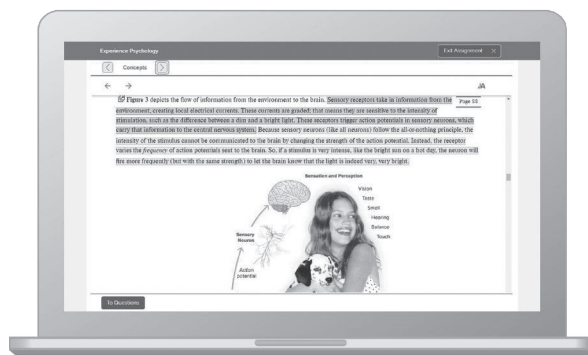
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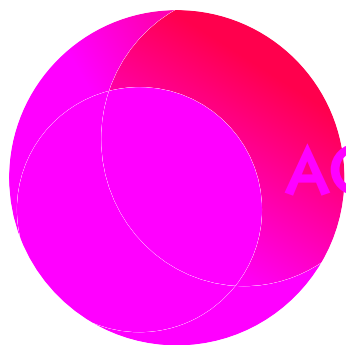
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GENERAL MEDICAL ASSISTING KNOWLEDGE

SECTION 1

SECTION OUTLINE

CHAPTER 1

THE PROFESSION OF MEDICAL ASSISTING

LEARNING OUTCOMES

1.1 Describe the administrative, clinical, and specialized duties of a medical assistant.

1.2 List the benefits of a medical assisting program.

1.3 Identify the different types of credentials available to medical assistants through examination.

1.4 List the three areas of knowledge included in the CMA and RMA exams.

1.5 Explain the requirements for obtaining and maintaining the CCMA credential.

1.6 Describe the subject areas covered by the NCMA exam.

1.7 Describe the purpose and benefits of the extern experience.

1.8 Describe the personal attributes of a professional medical assistant.

MEDICAL ASSISTING COMPETENCIES

COMPETENCY	CMA	RMA	CCMA	NCMA
General/Legal/Professional				
Respond to and initiate written communications by using correct grammar, spelling, and formatting techniques	X	X	X	X
Recognize and respond to verbal and nonverbal communications by being attentive and adapting communication to the recipient's level of understanding	X	X	X	X
Be aware of and perform within legal and ethical boundaries	X	X	X	X
Demonstrate knowledge of and monitor current federal and state health-care legislation and regulations; maintain licenses and accreditation	X	X	X	X
Exercise efficient time management	X	X	X	X
Project a positive attitude	X	X	X	

MEDICAL ASSISTING COMPETENCIES (cont.)

General/Legal/Professional

Be a "team player"	X	X	X	
Exhibit initiative	X	X	X	
Adapt to change	X	X	X	
Project a responsible attitude	X	X	X	
Be courteous and diplomatic	X	X	X	
Conduct work within scope of education, training, and ability	X	X	X	X
Be impartial and show empathy when dealing with patients	X	X	X	
Understand allied health professions and credentialing	X	X	X	

1.1 The Profession of Medical Assisting

Medical assisting is one of the most versatile health-care professions. Men and women can be equally successful as medical assistants. They are able to work in a variety of administrative and clinical positions within health care. According to the U.S. Department of Labor's *Occupational Outlook Handbook,* medical assisting is one of the 10 fastest growing occupations.

The Duties of a Medical Assistant

Medical assistants are skilled health-care professionals who work primarily in ambulatory settings such as medical offices and clinics. The duties a medical assistant may perform include administrative and clinical duties.

Administrative duties: Administrative medical assisting duties include the following:

- Greeting patients
- Handling correspondence
- Scheduling appointments
- Answering telephones
- Communicating with patients, families, and coworkers
- Creating and maintaining patient medical records
- Handling billing, bookkeeping, and insurance claim form processing
- Performing medical transcription
- Arranging for hospital admissions and testing procedures
- Organizing and managing office supplies
- Explaining treatment procedures to patients
- Educating patients

- Coding for specific procedures and tests when filling out lab requests
- Collecting payments and speaking with patients about collection policies

Clinical duties: Medical assistants' clinical duties vary according to state law. They may include the following:

- Maintaining asepsis and controlling infection
- Preparing the examination and treatment areas
- Interviewing patients and documenting patients' vital signs and medical histories
- Preparing patients for examinations and explaining treatment procedures
- Assisting the physician during examinations
- Disposing of contaminated supplies
- Performing diagnostic tests, such as electrocardiograms (ECGs)
- Giving injections (where allowed by law)
- Performing first aid and cardiopulmonary resuscitation (CPR)
- Preparing and administering medications as directed by the physician, and following state laws for invasive procedures
- Removing sutures or changing wound dressings
- Sterilizing medical instruments
- Assisting patients from diverse cultural backgrounds, as well as patients with hearing or vision impairments or physical or mental disabilities
- Educating patients

Medical assistants' clinical duties may also include processing various laboratory tests. Medical assistants may prepare the

patient for the test, collect the sample, complete the test, report the results to the physician, and report information about the test from the physician to the patient. It must be noted that medical assistants are not qualified to make any diagnoses. Specific laboratory duties may include:

- Performing tests, such as a urine pregnancy test, in the physician's office laboratory (POL)
- Performing Clinical Laboratory Improvements Act (CLIA)-waived tests that have a low risk of an erroneous result, which include urinalysis and blood chemistry
- Collecting, preparing, and transmitting laboratory specimens, including blood, body fluids, cultures, tissue samples, and urine specimens
- Teaching specimen collection to patients
- Arranging laboratory services
- Meeting safety standards and fire protection mandates
- Performing as an Occupational Safety and Health Administration (OSHA) compliance officer

Specialization

Medical assistants may choose to specialize in a specific field of health care, in either an administrative or clinical area. For example, ophthalmic medical assistants help ophthalmologists (physicians who provide eye care) by administering diagnostic tests, measuring and recording vision, testing the functioning of a patient's eyes and eye muscles, and performing other duties. Additional training may be required for a medical assistant to specialize in certain areas.

Administrative specialty areas include the following:

- Multiskilled health-care professional
- Medical office administrator
- Dental office administrator
- Medical transcriptionist
- Medical record technologist
- Coding, billing, and insurance specialist

Clinical specialty areas include the following:

- Histologic technician
- Surgical technologist
- Physical therapy assistant
- CPR instructor
- Medical laboratory assistant
- Phlebotomist

1.2 Membership in a Medical Assisting Association

Certification and Registration

Certification or registration is not required to practice as a medical assistant in *most* states. However, for instance, as of July 2013, the state of Washington now requires certification. *Source: https://apps.leg.wa.gov/rcw/default.aspx?cite=18.360&full=true.* You may practice with a high school diploma or the equivalent. However, you will have more career options if you graduate from an accredited school and become certified or registered.

A solid medical assisting program provides the following:

- Facilities and equipment that are up to date
- Job placement services
- A cooperative education program and opportunities for continuing education

1.3 Medical Assisting Credentials

Professional associations set high standards for quality and performance in a profession. They define the tasks and functions of an occupation. They also provide members with the opportunity to communicate and network with one another.

State and Federal Regulations

Certain provisions of the Occupational Safety and Health Act (OSHA) and the Clinical Laboratory Improvements Act of 1988 (CLIA '88) are making mandatory credentialing for medical assistants a logical step in the hiring process. Currently, OSHA and CLIA '88 do not require that medical assistants be credentialed. However, various components of these statutes and their regulations can be met by demonstrating that medical assistants in a clinical setting are certified.

One of the CLIA regulatory categories based on their potential risk to public health is waived tests. Waived tests are "laboratory examination and procedures that have been approved by the Food and Drug Administration (FDA) for home use or that, as determined by the secretary, are simple laboratory examinations and procedures that have an insignificant risk of an erroneous result."

CMA Certification

The Certified Medical Assistant (CMA) credential is awarded by the Certifying Board of the American Association of Medical Assistants (AAMA). The AAMA works to raise the standards of medical assisting to a more professional level.

The AAMA's address is 20 N. Wacker Drive, Suite 1575, Chicago, IL 60606. Phone: 1-312-899-1500 or 1-800-228-2262. Fax: 1-312-899-1259. E-mail: certification@aama-ntl.org. Their website address is www.aama-ntl.org.

The AAMA Role Delineation Study: In 1996 the AAMA formed a committee. Its goal was to revise and update the standards used for accrediting medical assisting programs. Accreditation is defined as a process in which recognition is granted to an education program. The committee's findings were published in 1997 under the title of the "AAMA Role Delineation Study: Occupational Analysis of the Medical Assisting Profession." Included was a new Role Delineation Chart that outlined the areas of competence entry-level medical assistants must master. The Role Delineation Chart was further updated in 2003. The AAMA's certification examination evaluates the mastery of

medical assisting competencies on the basis of the 2003 Role Delineation Study. To take this exam, you must have graduated from a postsecondary accredited program. The National Board of Medical Examiners (NBME) also provides technical assistance in developing the tests. Its website address is www.nbme.org.

The areas of competence listed in the AAMA Role Delineation Study must be mastered by all students enrolled in accredited medical assisting programs. Each of the three areas of competence—administrative, clinical, and general (or trans-disciplinary)—contains a list of statements that describe the medical assistant's role.

According to the AAMA, the Role Delineation Chart may be used to:

- Describe the field of medical assisting to other health-care professionals
- Identify entry-level competency areas for medical assistants
- Help practitioners assess their own current competence in the field
- Aid in the development of continuing education programs
- Prepare appropriate materials for home study

Recertification for the CMA is required every five years. The medical assistant may choose to recertify by taking the examination again, or by obtaining 60 continuing education units (CEUs) over this five-year period.

RMA Certification

The Registered Medical Assistant (RMA) credential is awarded by the American Medical Technologists (AMT), an organization founded in 1939. AMT is accredited by the National Commission for Certifying Agencies (NCCA) and a member of the Institute for Credentialing Excellence.

The AMT's address is 10700 West Higgins Road, Suite 150, Rosemont, IL 60018. Phone: 1-847-823-5169. Fax: 1-847-823-0458. E-mail: mail@americanmedtech.org. The AMT's website address is www.americanmedtech.org.

Professional support for RMAs: The AMT offers many benefits for RMAs. These include:

- Insurance programs, including liability, health, and life
- Membership in the AMT Institute for Education
- State chapter activities
- Annual meeting and educational seminars

Recertification for the RMA is required every three years. Also, 30 hours of continuing education credits are required every year to maintain certification.

The American Registry of Medical Assistants (ARMA)

Medical assistants who become certified by passing a national certification examination (for example, the CMA or RMA) and medics in military service may apply for membership with the American Registry of Medical Assistants (ARMA).

ARMA is a national registry established in 1950 that certifies medical assistants who have provided the necessary documentation to be a qualified medical assistant.

ARMA grants qualified members the credential of RMA for clinical medical assistants and RMA-A for administrative medical assistants. The ARMA's website address is http://arma-cert.org.

1.4 CMA and RMA Exam Topics

The CMA and RMA qualifying examinations are rigorous. Participation in an accredited program, however, will help you learn what you need to know. The examinations cover several distinct areas of knowledge. These include:

- Administrative knowledge, including scheduling appointments, managing mail and office correspondence, medical records management, collections, insurance processing, and HIPAA (Health Insurance Portability and Accountability Act)
- Clinical knowledge, including examination room techniques; pharmacology—the preparation, calculation, and administration of medications; first aid and emergency care; performing ECGs; specimen collection and laboratory testing
- General medical knowledge, including terminology, anatomy and physiology, behavioral science, and medical law and ethics

The CMA exam is computer based and features 200 multiple-choice questions that have "one best answer" from five different answer choices. There are 180 questions that are scored, and 20 that are pretest questions that are not scored. They are formatted as incomplete statements or questions, and the answer choices either complete the statement or answer the question. After July 15, 2021, the AAMA will change the number and percent of questions by category as follows:

Clinical competency: 106 (59%), including Clinical Workflow: Patient Intake and Discharge, Safety and Infection Control, Procedures/Examinations, and Pharmacology

General: 9 (21%) including Legal and Ethical Issues, and Communication

Administrative: 6 (20%) including Billing, Coding, and Insurance; and Schedule Appoints and Health Information Management

For complete information, go to: CMA (AAMA) Certification Exam Content Outline located at: http://www .aama-ntl.org.

Each person taking the test must achieve a passing score on every section in order to become certified. An *unofficial* "pass" or "fail" is given immediately after the test, but final confirmation is mailed within 12 weeks.

The RMA exam is either computer based or can be taken using pencil and paper. It features 210 multiple-choice questions that have "one best answer" from four different answer choices. Candidates have 2.5 hours to complete the exam. It requires recall of facts, understanding of medical illustrations, solving of problems, and interpretation of information from case studies. The computerized version of the exam offers an immediate

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pass/fail score. If the pencil-and-paper version is taken, results will arrive by mail within eight weeks. A score of 70 or above is required to pass the exam. Candidates who fail the exam will be given detailed information about areas in which their knowledge was weakest. Anyone retaking the exam must complete the entire examination in full. Like the CMA exam, the RMA covers three areas: general, administrative, and clinical medical assisting knowledge.

1.5 Certified Clinical Medical Assistant (CCMA) Examination

This credential is awarded by the National Healthcareer Association (NHA). The CCMA exam is offered in a written form or by computer via its website. It consists of 150 questions plus 20 pretest questions covering several distinct areas of knowledge. These areas emphasize clinical knowledge, including general assisting, ECG, phlebotomy, and basic lab skills. Also included is preparation of patients, such as taking a medical history, vital signs, physical examination, and patient positioning; biological hazards; emergency first aid; infection control; understanding the structure of a prescription; anatomy and physiology; law and ethics; pharmacology; specimen handling; quality control; use of microscopes; and various laboratory procedures. CCMAs also need 10 hours of continuing education every two years in order to keep their certification. Recertification for the CCMA is required every two years.

The NHA's address is 1161 Overbrook Road, Leawood, KS 66211. Phone: 1-800-499-9092 or 1-913-661-5592. Fax: 1-913-661-6291. E-mail: info@nhanow.com. The website address is http://nhanow.com.

1.6 National Certified Medical Assistant (NCMA) Examination

The NCMA exam is offered by the National Center for Competency Testing (NCCT), a for-profit agency. To take the NCMA exam, candidates must have completed either an approved medical assistant training program or at least two years of on-the-job training that was supervised by a physician. Unlike the other medical assisting exams, the NCMA credential must be renewed every year, and 14 continuing education credits must be earned in order for renewal to be approved. The exam is offered in both computerized and paper forms. It consists of 165 questions, which includes 15 that are not graded. Three hours are allowed to take the exam. The NCMA exam covers a variety of subject areas, which include pharmacology, medical procedures, patient care, phlebotomy, diagnostic tests, electrocardiogram, general office procedures, medical office general management, financial management, and law and ethics.

The NCCT's address is 7007 College Blvd., Suite 385, Overland Park, KS 66211. Phone: 1-800-875-4404. Fax: 1-913-498-1243. The website address is http://www.ncctinc.com.

Table 1-1 summarizes the various certification examinations and their related information.

The National Association for Health Professionals (NAHP) (http://www.nahpusa.com) offers various credentials for health-care professionals. These include the Medical Assistant, Administrative Health Assistant, Coding Specialist, Dental Assistant, EKG Technician, Patient Care Technician, Pharmacy Technician, Phlebotomy Technician, and Surgical Technician credentials.

1.7 Externships

An externship offers work experience while you complete a medical assisting program. You will practice skills learned in the classroom in an actual medical office environment. A medical assisting extern must be able to accept constructive criticism, be flexible, and also be willing to learn. In an externship, you may be exposed to some procedures that are not performed exactly as you were taught in the classroom or clinical laboratory. Learn as much as possible while on an externship. It is unprofessional to argue with an externship preceptor. Ask your externship preceptor to explain any differences in techniques from what you learned while you were in the classroom.

AT A GLANCE	Medical Assistant Certification Exams		
Organization	**Credential**	**Fees**	**Notes**
American Association of Medical Assistants (AAMA)	CMA (5 years)	$125 for recent graduates and members, $250 for others	Not-for-profit. Annual fees $25–$40 for students, up to $107 for others, all based on state.
American Medical Technologists (AMT)	RMA (3 years)	$120	Not-for-profit. Annual fees $50.
National Healthcareer Association (NHA)	CCMA (2 years)	$149	For-profit.
National Center for Competency Testing (NCCT)	NCMA (1 year)	$90 for recent graduates; $135 for others	For-profit.

Table 1-1

1.8 Preparing for Employment

Career Services will assist you with your resume, interviewing skills, and learning about positions in your field. It is important to include certification awarded in relation to a position on your resume.

New employee: An initial performance evaluation should be given 90 days after employment.

Personal Attributes

Medical assistants can be more effective and productive if they have the personal qualifications of professionalism, empathy, flexibility, self-motivation, integrity and honesty, and accountability. A neat and professional appearance is also essential.

Professionalism: A medical assistant should demonstrate courtesy, conscientiousness, and a generally businesslike manner at all times. It is essential for medical assistants to act professionally with patients, doctors, and coworkers. Present a neat appearance and show courtesy and respect for peers and instructors.

Professionalism is also displayed in your attitude. The medical assistant is a skilled professional on whom many people, including coworkers and patients, depend. Your attitude can make or break your career. A professional always projects a positive, caring attitude. The medical assistant should avoid using terms of endearment with patients and remain strictly professional.

Empathy: Empathy is the ability to put yourself in someone else's situation—to identify with and understand another person's feelings. Patients who are sick, frustrated, or frightened appreciate empathetic medical personnel. It is always advisable for the medical assistant to ask patients if they need any assistance, including disabled patients.

Flexibility: An attitude of flexibility will allow you to adapt to and handle situations with professionalism. For example, when a physician's schedule changes to include evening and weekend hours, the staff also may be asked to change their schedules. Therefore, you must be flexible and meet the employer's needs.

Self-motivation: You must be self-motivated and offer assistance with work that needs to be done, even if it is not your assigned job. For example, if a coworker is on sick leave or vacation, offer to pitch in and work extra time to keep the office running smoothly.

Integrity and honesty: Medical assistants with integrity hold themselves to high standards. Integrity may be characterized by honesty, dependability, and reliability. The most important elements in providing superior customer service to patients are integrity and honesty. If you make an error, be honest about it. In order to have integrity, you must be dependable and reliable.

Accountability: Legal, mental, or moral responsibility. In medicine, it refers to the responsibility for moral and legal requirements of patient care.

Neat appearance: Medical facilities expect externs and their staff to appear as medical professionals. Most require a uniform that consists of a scrub top and bottom and a lab jacket. Your name tag or badge should always be worn and visible to patients. Visible tattoos must be covered. Your hair should be a natural color and pulled back from your face and off the collar. Perfumes and colognes should be avoided because patients with respiratory conditions or allergies may not be able to tolerate them.

Dependability: This is shown by arriving to work on time, reporting absences ahead of time, generally avoiding absenteeism, following orders, making notes of completed tasks, and preparing materials needed for work.

Initiative: Demonstrating the ability to initiate work, action, and decisions.

Credibility: The quality of being believable and worthy of trust.

Attitude: A positive, upbeat demeanor toward work and individuals.

Test-Taking Preparation

It is important to understand all of the content that the examination you choose to take will include. You must create a study schedule and follow it closely. Waiting until the last minute is never a good idea, and may even cause you to fail. Each of these exams is difficult and requires sufficient study in order to pass.

It is suggested that you take as many practice exams as possible prior to taking either the CMA, RMA, CCMA, or NCMA exam. When taking a practice exam, make sure to read all of the answer key content, including the rationales for each correct answer, and each incorrect answer. This will greatly help you to understand the material more deeply, and is a great way to study. The various organizations that offer these certification exams also provide guides and study materials to help you prepare. There are also exam study groups, handbooks, and other materials available via the Internet. Another important suggestion is to practice doing mathematic calculations without the use of a calculator or scratch paper, both of which are not allowed when you take an actual exam.

On the day of the exam, make sure you are well rested, wearing comfortable clothing, wearing a watch if you have one, and have eaten enough so that you do not get hungry during the exam. It is not suggested that you study right up until you leave to take the exam, since it is important to allow yourself a little "buffer time." Then, you will be more prepared to absorb the questions, and take in and process information. Arrive early, and make sure you bring whatever materials are required to enter the examination area. Do not bring anything else that will not be allowed into that area. Once inside, remember not to talk to anyone else taking the exam. Never leave the examination area without the permission of the test administrator. Be ready to get started, and remember that with all of your preparations, you should do very well.

The most important thing to remember when taking one of these exams is to read each question carefully, paying attention to detail. Questions that contain the words "except" or "not" can be tricky if you read them too quickly. Before you look at the answer choices, see if you have the answer already in mind. This way, the answer choices will not influence your selection, and you are less likely to choose incorrectly. Usually, one or more of the answer choices can be easily eliminated. Another tip is to cross off each of these in order to focus on the other remaining choices more effectively. Methods of "marking"

various questions vary between computerized versions of the exams, but paper exams are obviously easy to mark up.

Do not spend too much time on each question; instead, circle those that seem more difficult and come back to them. Pace yourself as you move through the various sections of the test. Do not simply go straight through the questions and attempt to answer each of them while not paying attention to the time that you are spending on each.

Make sure you respond to each question. No points will be subtracted for incorrect answers—you are only graded on the amount that you answer correctly. For the more difficult questions, eliminate as many answer choices as possible prior to making your selection. For paper exams, make sure you monitor your answer sheet carefully so that you are filling in the correct area for each question. If you must erase or change an answer, make sure you do it clearly so that your intended answer is obvious. At the end of an exam, or a section of an exam, if you still have extra time, go back over your answers to double check for any errors.

Give your eyes a break during your exam by looking away from the computer monitor or the test paper briefly, every 10–15 minutes. Excessive concentration while focusing on them can cause eye strain, resulting in a headache.

CHAPTER 1 REVIEW
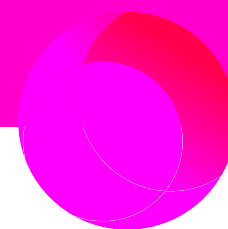
Instructions:

Answer the following questions.

1. Accreditation may be defined as
   A. a contract that specifies an agreement.
   B. permission to engage in a profession.
   C. permission to be licensed.
   D. an assessment of an individual's performance.
   E. a process in which recognition is granted to an education program.

2. Which of the following organizations offers the Registered Medical Assistant credential?
   A. AMA
   B. AAMA
   C. AMT
   D. CDC
   E. NBME

3. The CMA and RMA examinations cover all of the following distinct areas of knowledge *except*
   A. calculations for preparing medications.
   B. HIPAA.
   C. criminal justice.
   D. medical records.
   E. behavioral science.

4. Which of the following professional attributes indicates the ability to identify with someone else's situation?
   A. empathy
   B. professionalism
   C. self-motivation
   D. integrity
   E. flexibility

5. After you become a certified clinical medical assistant, how often is recertification required?
   A. every year
   B. every two years
   C. every three years
   D. every five years
   E. every seven years

6. Which of the following terms describes behaving courteously, conscientiously, and in a generally businesslike manner?
   A. self-motivation
   B. professionalism
   C. job description
   D. ethics
   E. morals

7. Which of the following constitutes unprofessional behavior when interacting with an externship preceptor?
   A. accepting criticism
   B. arguing
   C. being flexible
   D. listening to instructions
   E. having references

8. Which of the following is the correct website address for the National Board of Medical Examiners?
   A. www.nbme.org
   B. www.nbme.gov
   C. www.nbm.com
   D. www.meboard.com
   E. www.medexam.com

9. Which of the following is *not* an example of a medical assistant's clinical duties?
   A. preparing patients for examinations
   B. interviewing patients and documenting their vital signs
   C. performing diagnostic tests
   D. explaining treatment procedures to patients
   E. diagnosing communicable diseases

10. A patient with a physical disability comes to the office. The most appropriate response by the medical assistant is to
    A. express sympathy regarding the disability.
    B. tell your supervisor.
    C. ask the patient whether assistance is needed.
    D. ask the patient how the disability occurred.
    E. assume that the patient needs assistance and begin giving aid.

11 All of the following provide a certification examination for medical assistants, *except*

A. NHA.
B. NCCT.
C. AMT.
D. NAHP.
E. AAMA.

12. Which of the following terms refers to the responsibility for moral and legal requirements of patient care?

A. empathy
B. professionalism
C. accountability
D. flexibility
E. honesty

13. The CCMA exam consists of how many questions?

A. 90
B. 120
C. 150
D. 180
E. 210

14. For obtaining recertification for the CMA, how many continuing education units (CEUs) over a five-year period are required?

A. 20
B. 30
C. 40
D. 50
E. 60

15. Which of the following is the correct website address for the AMT?

A. www.medboard.com
B. www.nbm.com
C. www.medexam.com
D. www.americanmedtech.org
E. www.americannatioanassoc.gov

16. Which of the following is the most important element in providing superior customer service to patients?

A. integrity and honesty
B. flexibility
C. empathy
D. accountability
E. attitude

17. How many multiple-choice questions are given to certify as an RMA?

A. 110
B. 150
C. 180
D. 210
E. 280

18. Which of the following is *not* a clinical specialty for medical assistants?

A. CPR instructor
B. phlebotomist
C. patient educator
D. histologic technician
E. surgical technologist

19. Which of the following organizations formed a committee to revise and update standards used for accrediting medical assistant programs?

A. HIPAA
B. AAMA
C. AMT
D. OSHA
E. NAHP

20. How many years are the CCMA credential good for?

A. one
B. two
C. three
D. four
E. five

21. Which of the following is the fee for membership in the AAMA?

A. $90
B. $110
C. $115
D. $120
E. $125

22. During an examination, excessive concentration on the computer monitor causes eye strain, resulting in which of the following?

A. headache
B. neck pain
C. strabismus
D. sleepiness
E. hunger

23. Which of the following organizations is for-profit?

    A. WHO
    B. NHA
    C. AAMA
    D. AMT
    E. CDC

24. Which of the following is the website address for the American Registry of Medical Assistants?

    A. www.nbme.org
    B. http://medscape.com
    C. http://medexam.com
    D. http://arma-cert.org
    E. http://www.ncctinc.com

25. What is the fee for CCMAs to take the medical assistant certification exam?

    A. $120
    B. $125
    C. $149
    D. $155
    E. $90

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MEDICAL TERMINOLOGY

LEARNING OUTCOMES

2.1 Identify and define common roots, suffixes, and prefixes.

2.2 Demonstrate proper spelling of common medical terms in singular, plural, and possessive forms.

2.3 Identify abbreviations commonly used in medical practice.

2.4 Define medical terms used in relation to diseases and body systems.

2.5 Describe unacceptable abbreviations as outlined by the Joint Commission.

MEDICAL ASSISTING COMPETENCIES

COMPETENCY	CMA	RMA	CCMA	NCMA
General/Legal/Professional				
Use appropriate medical terminology	X	X	X	X

2.1 Word Building

Root: The main part of a word that gives the word its central meaning. The root is the basic foundation of a word.
Prefix: A structure at the beginning of a word that modifies the meaning of the root. Not all medical words have a prefix. For a list of common prefixes, see Table 2-1.

Suffix: A word ending that modifies the meaning of the root. Not all words have a suffix. For a list of common suffixes, see Table 2-2.
Combining vowels: When a medical term is formed from many different word parts, these parts are often joined by a vowel. This vowel is usually an *o* and occasionally an *i*. The vowel *o* is the most common combining vowel. The combining vowel is used to ease pronunciation.

AT A GLANCE   Common General Prefixes

Prefix	Meaning	Example	Definition
a-	Without	Aphonia	Inability to produce sound
ab-	From, away from	Abduct	To move away from the midline of the body
ad-, ac-, af-, ag-, al-, ap-, ar-, as-, at-	Toward, increasing	Adduct	To move toward the midline of the body
alb-	White	Albinism	Whiteness of skin, hair, and eyes caused by the absence of pigment
ambi-	Both	Ambidextrous	Able to use both hands effectively
ana-	Up, upward	Anaphylactic	Characterized by an exaggerated reaction to an antigen or toxin
ante-	Before	Antepartum	Before childbirth
anti-	Against	Antibiotic	Acting against microorganisms
auto-	Self	Autodermic	Of the patient's own skin (said of skin grafts)
bi-	Two, both	Bilateral	Pertaining to both sides
bio-	Life	Biology	Study of life
broncho-	Bronchus, bronchi	Bronchorrhaphy	Suturing a wound of the bronchus
circum-	Around	Circumcision	Removal of the skin around the tip of the penis
con-, col-, com-, cor-	Together, with	Congenital	Accompanying birth, present at birth
contra-	Against	Contraceptive	Preventing conception
de-	Away from, down, not	Decalcify	To decrease or remove calcium
dia-	Through	Diagnosis	Knowledge through testing
dis-	Apart, separate	Dislocation	Removal of any part of the body from its normal position

Table 2-1, continued

AT A GLANCE	Common General Prefixes		
Prefix	**Meaning**	**Example**	**Definition**
dys-	Bad, difficult, painful, poor	Dysuria	Painful urination
ec-	Out, away	Ectopic	Pertaining to something outside its normal location
ecto-	Outside	Ectoplasm	Outermost layer of cell protoplasm
en-, em-	In	Endemic	Occurring continuously in a population
		Empyema	Pus in a body cavity
endo-	Within	Endoscope	Instrument to examine something from within
epi-	Upon, over	Epidermal	Upon the skin
eu-	Good	Eupnea	Normal, good breathing
ex-, e-	Out, away	Exhale	To breathe out
		Emanation	Something given off
hemi-	Half	Hemicardia	Half of the heart
hyper-	Excessive, beyond	Hyperlipemia	Condition of excessive fat in the blood
hypo-	Below, under	Hypoglycemia	Low blood sugar
in-, il-, im-, ir-	Not	Impotence	Inability to achieve erection
infra-	Below, under, beneath	Inframammary	Below the breast
inter-	Between	Intercellular	Between cells
intra-	Within	Intravenous	Within a vein
iso-	Equal	Isometric	Of equal dimension
juxta-	Near, beside	Juxtaarticular	Near a joint
mal-	Bad	Malaise	Discomfort
mega-, megal- / o	Large	Megacephaly	Abnormal enlargement of the head
mes- / o	Middle	Mesoderm	Middle layer of the skin
meta-	Beyond, after	Metastasis	Spread of disease from one part of the body to another
micro-	Small	Microscope	Instrument used to view small organisms
milli-	One-thousandth	Milliliter	One-thousandth of a liter
mono-	One, single	Mononuclear	Having only one nucleus
multi-	Many	Multidisciplinary	Pertaining to many areas of study
neo-	New, recent	Neonatal	Pertaining to the period after birth
non-	Not	Noninvasive	Not invading the body through any organ, cavity, or skin (said of a diagnostic or therapeutic technique)
para-	Near, beside, beyond, opposite, abnormal	Paramedic	Person who provides emergency medical care (alongside other medical personnel)
per-	Through	Percutaneous	Through the skin

Table 2-1, continued

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AT A GLANCE	Common General Prefixes		
Prefix	**Meaning**	**Example**	**Definition**
peri-	Around, surrounding	Perianal	Around the anus
poly-	Many	Polyarthritis	Inflammation of many joints
post-	After	Postmortem; Postprandial	After death; After taking medications
pre-	Before	Premature	Before maturation
primi-	First	Primiparous	Having given birth for the first time
re-	Again, back	Reactivate	To make active again
retro-	Back, backward, behind	Retrograde	Going backward
rube-	Red	Rubella	Viral disease characterized by red rashes, among other things
sacro-	Sacrum	Sacroiliac	Pertaining to the sacrum and iliac bones
sarco-	Flesh	Sarcoma	A malignant tumor arising from connective tissues
semi-	Half	Semiconscious	Half conscious
sub-	Under, below	Sublingual	Under the tongue
super-	Above, excessive	Superficial	Near or above the surface
supra-	Above, over	Suprapubic	Above the pubic area
syn-, sym-	Together	Symbiosis	Mutual interdependence
tri-	Three	Triceps	Muscle with three heads
ultra-	Beyond, excessive	Ultrasound	Sound with a very high frequency, used to obtain medical images
uni-	One	Unicellular	One-celled

Table 2-1, concluded

AT A GLANCE	Common General Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-ac	Pertaining to	Cardiac	Pertaining to the heart
-ad	Toward	Cephalad	Toward the head
-al	Pertaining to	Thermal	Pertaining to the production of heat
-ar	Pertaining to	Articular	Pertaining to a joint
-desis	Binding	Arthrodesis	Surgical binding or fusing of a joint
-e	Noun marker	Dermatome	Instrument used to cut the skin
-ectomy	Excision, removal	Hysterectomy	Removal of the entire uterus
-emesis	Vomit	Hyperemesis	Excessive vomiting

Table 2-2, continued

AT A GLANCE   Common General Suffixes

Suffix	Meaning	Example	Definition
-form	Resembling, like	Vermiform	Shaped like a worm
-genic	Beginning, originating, producing	Toxigenic	Producing toxins
-gram	Record	Electrocardiogram	Record of the variations in electrical potential caused by the heart muscle
-graph	Instrument for recording	Electrocardiograph	Instrument for making electrocardiograms
-graphy	Process of recording	Electrocystography	Process of recording the changes of electric potential in the urinary bladder
-iasis	Condition, formation	Lithiasis	Formation or presence of stones
-iatric	Pertaining to medical treatment	Pediatric	Pertaining to the treatment of children
-iatry	Study or field of medicine	Psychiatry	Study of the human psyche
-ic	Pertaining to	Thoracic	Pertaining to the thorax
-ical	Pertaining to	Neurological	Pertaining to nerves
-ism	Condition	Cryptorchidism	Condition of undescended testes
-ist	Specialist	Otorhinolaryngologist	Physician who specializes in the ear, nose, and larynx
-itis	Inflammation	Appendicitis	Inflammation of the appendix
-logist	Specialist in the study of	Microbiologist	Biologist who specializes in the study of microorganisms
-logy	Study of	Microbiology	Study of microorganisms
-lysis	Destruction, breaking down	Hemolysis	Breaking down of blood
-megaly	Enlargement	Cardiomegaly	Enlargement of the heart
-meter	Instrument used to measure	Scoliosometer	Instrument for measuring the curves of the spine
-oma	Tumor	Carcinoma	Cancerous, malignant tumor
-ory	Pertaining to	Auditory	Pertaining to hearing
-osis	Condition, disease	Leukocytosis	Condition of increased leukocytes in the blood
-pathy	Disease	Hemopathy	Disease of the blood
-penia	Deficiency	Leukocytopenia	Decrease in the number of white blood cells
-pexy	Surgical fixation	Orchiopexy	Surgical fixation of an undescended testicle within the scrotum
-phagia	Swallowing	Dysphagia	Difficulty swallowing
-philia	Attraction	Necrophilia	Attraction to dead bodies
-phobia	Abnormal fear	Photophobia	Fear of light
-plasia	Development	Dysplasia	Faulty formation
-plasty	Molding, surgical repair	Rhinoplasty	Surgical repair of the nose
-plegia	Paralysis	Paraplegia	Paralysis of the lower extremities
-pnea	Breathing	Hypopnea	Shallow breathing

Table 2-2, continued

AT A GLANCE	Common General Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-ptosis	Drooping, prolapse, falling	Mastoptosis	Drooping of the breast
-ptysis	Spitting	Hemoptysis	Spitting up blood
-rrhage, -rrhagia	Excessive flow, discharge	Hemorrhage	Bursting forth of blood
-rrhea	Discharge, flow	Amenorrhea	Absence of menstrual flow
-rrhexis	Rupture	Cardiorrhexis	Rupture of the heart
-scope	Instrument used to view	Oscilloscope	Instrument that displays visual representation of electrical variations
-scopy	Process of viewing with a scope	Opthalmoscopy	Process of examining the interior of the eye by using an opthalmoscope
-stasis	Stoppage, balance, control	Hemostasis	A stopping of the flow of blood
-stomy	Surgical creation of a new opening	Colostomy	Creation of an opening between the colon and the surface of the body
-tomy	Incision, cutting	Phlebotomy	Incision into a vein

Table 2-2, concluded

Guidelines for using combining vowels include the following:

- When a root and a suffix beginning with a vowel are connected, a combining vowel is usually not used.
- Connecting a word root and a suffix that starts with a consonant usually requires a connecting vowel.
- When two roots are connected, a combining vowel is most often used even if vowels are present at the junction.
- Most common prefixes can be connected to other word parts without a combining vowel.

2.2 Spelling

Spelling: Some commonly misspelled words are:

- Abscess
- Accessible
- Aerobic
- Agglutinate
- Analyses
- Analysis
- Aneurysm
- Asepsis
- Asthma
- Auxiliary
- Benign
- Capillary
- Chancre
- Changeable
- Clavicle
- Conscious
- Defibrillator
- Desiccation
- Dissect
- Epididymis
- Fissure
- Glaucoma
- Hemorrhoid
- Homeostasis
- Humerus
- Hyperglycemia
- Hypoglycemia
- Irrelevant
- Ischium
- Occlusion
- Osseous
- Pamphlet
- Pruritus
- Parenteral
- Parietal
- Perineum
- Perseverance
- Precede
- Predictable
- Principle
- Sizable
- Specimen
- Surgeon
- Tranquility
- Vaccine
- Vacuum

To correct a misspelled word in a patient's chart, you must draw a single line through the word.

Plural forms: Here are some general rules. Remember, there are almost always exceptions.

- Add an *s* or *es* to most singular nouns to make them plural.
- When a medical term in the singular form ends in *is*, drop the *is* and add *es* to make it plural (metastasis/metastases).
- When the term ends in *um* or *on*, drop the *um* or *on* and add *a* (atrium/atria, ganglion/ganglia).
- When the term ends in *us*, drop the *us* and add *i* (bronchus/bronchi). Exceptions to this rule mainly involve certain words of Latin origin (corpus/corpora, genus/genera, sinus/sinuses, virus/viruses).
- When the term ends in *ma*, add *ta* (stoma/stomata).
- When the term otherwise ends in *a*, drop the *a* and add *ae* (vertebra/vertebrae).

Possessive forms: For singular nouns and plural nouns that do not end in *s*, add an apostrophe and an *s*. For plural nouns that end in *s*, just add an apostrophe but no additional *s*.

2.3 Common Medical Abbreviations

Abbreviations: The most common abbreviations used in association with medical care facilities are presented in Table 2-3. The most common medical record abbreviations are listed in Table 2-4, abbreviations associated with the metric system are listed in Table 2-5, and common prescription abbreviations are listed in Table 2-6. Tables of relevant abbreviations are also included for each body system.

Pharmaceutical Abbreviations

Metric system: A system of measurement based on the decimal system. Its units include the meter, gram, and liter. It is the most commonly used system of measurement in health care. For a list of common abbreviations used in the metric system, see Table 2-5.

Conversion factors for the metric system: The meter (m), used for length, equals approximately 39.37 inches; the liter

AT A GLANCE	Medical Care Facility Abbreviations		
Abbreviation	**Meaning**	**Abbreviation**	**Meaning**
CCU	Coronary care unit	OR	Operating room
ED	Emergency department	PAR	Postanesthetic recovery
ER	Emergency room	postop	Postoperative
ICU	Intensive care unit	preop	Preoperative
IP	Inpatient	RTC	Return to clinic
OP	Outpatient	RTO	Return to office
OPD	Outpatient department		

Table 2-3

AT A GLANCE	Medical Record Abbreviations		
Abbreviation	**Meaning**	**Abbreviation**	**Meaning**
AIDS	Acquired immunodeficiency syndrome	GYN	Gynecology
a.m.a.	Against medical advice	H & P	History and physical
BP	Blood pressure	HEENT	Head, ears, eyes, nose, throat
bpm	Beats per minute	HIV	Human immunodeficiency virus
C	Celsius, centigrade	Ht	Height
CBC	Complete blood count	Hx	History
C.C.	Chief complaint	I & D	Incision and drainage
CNS	Central nervous system	inj	Injection
c/o	Complains of	IV	Intravenous
CP	Chest pain	L	Left
CPE	Complete physical examination	L & W	Living and well
CV	Cardiovascular	lab	Laboratory studies
D & C	Dilation and curettage	MM	Mucous membrane
Dx	Diagnosis	N & V	Nausea and vomiting
ECG/EKG	Electrocardiogram	NP	New patient, Nurse practitioner
ED, ER	Emergency room	P	Pulse

Table 2-4, continued

AT A GLANCE — Medical Record Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
F	Fahrenheit	Pap	Pap smear
FH	Family history	PE	Physical examination
Fl/fl	Fluid	pH	Hydrogen concentration (acidity/alkalinity)
GBS	Gallbladder series	PI	Present illness
GI	Gastrointestinal	PMH	Past medical history
GU	Genitourinary	PMS	Premenstrual syndrome
PNS	Peripheral nervous system	stat	Immediately
pt	Patient	STD	Sexually transmitted disease
PT	Physical therapy	surg	Surgery
Px	Physical examination	T	Temperature
R	Right	TPR	Temperature, pulse, respirations
re✔	Recheck	Tx	Treatment
ref	Referral	UCHD	Usual childhood diseases
R/O	Rule out	US	Ultrasound
ROS/SR	Review of systems/systems review	VS	Vital signs
Rx	Prescription	WDWN	Well-developed and well-nourished
subq.	Subcutaneously	WNL	Within normal limits
sig	Sigmoidoscopy	Wt	Weight
SOB	Shortness of breath	y.o.	Year old
S/R	Suture removal		

Table 2-4, concluded

AT A GLANCE — Common Abbreviations Used in the Metric System

Abbreviation	Meaning	Abbreviation	Meaning
cm	Centimeter (2.5 cm = 1 inch)	deca-	× 10
km	Kilometer	hect-	× 100
mL	Milliliter (1 mL = 1 cc)	kilo-	× 1000
mm	Millimeter	deci-	÷ 10
g, gm	Gram	centi-	÷ 100
kg	Kilogram (1 kg = 1000 gm = 2.2 pounds)	milli-	÷ 1000
L or l	Liter = 1000 mL (1 gallon = 4 quarts = 8 pints = 3.785 L; 1 pint = 473.16 mL)	micro-	÷ 1,000,000

Table 2-5

AT A GLANCE — Common Abbreviations Used in Prescriptions

Abbreviation	Meaning	Abbreviation	Meaning
a	Before	PR	Through the rectum
a.c.	Before meals	p.r.n., PRN	As needed
ad lib.	As desired	PV, vag.	Through the vagina
AM, a.m.	Morning	q	Every
amt	Amount	qh	Every hour
aq	Water	q2h	Every 2 hours
b.i.d., BID	Twice a day	q.i.d., QID	Four times a day
buc	Buccal	qm	Every month
$\bar{c}$	With	q.o.d., QOD	Every other day
cap	Capsule	®	Right, registered trademark
d	Day	Rx	Prescription, take
Fl.	Fluid	$\bar{s}$	Without
h, hr	Hour	sub-Q, subcu	Subcutaneous
h.s.*	At bedtime, at the hour of sleep	Sig:	Instruction to patient
ID	Intradermal	soln.	Solution
IM	Intramuscular	sp.	Spirits
IV	Intravenous	$\overline{ss}$	One half
noc., n.	Night	stat	Immediately
NPO	Nothing by mouth	supp., suppos	Suppository
oint., ung.	Ointment	syr.	Syrup
$\bar{p}$	After	T	Topical
p.c.	After meals	tab	Tablet
per	By, through	t.i.d., TID	Three times a day
PM, p.m.	After noon	x	Times, for
p.o., PO	By mouth		

Table 2-6

*Though this abbreviation is on the JCAHO's *Do Not Use List*, it is still in common usage.

(L or l), used for volume, equals approximately 1.056 U.S. quarts; and the gram (g or gm), used for weight, equals approximately 0.035 ounce.

Apothecaries' system: An old system of measurement in which the weight measure is based on one grain of wheat and the liquid measure is based on one drop of water. The apothecaries' system measures weight by grains (gr), scruples (scr), drams (dr), ounces (oz), and pounds (lb). It uses minims (min), fluidrams (fl dr), fluid ounces (fl oz), pints (pt), quarts (qt), and gallons (gal) to measure volume. In the apothecary system, dosage quantities are written in lowercase Roman numerals (i = 1, ii = 2, iv = 4, v = 5, vi = 6, ix = 9, x = 10, xi = 11, xx = 20, xl = 40, l = 50, lx = 60, xc = 90, c = 100, cx = 110, cc = 200, d = 500, m = 1000, mm = 2000, etc.). A bar written above a numeral multiplies its value by 1000:

$$(\bar{v} = 5000, \ \bar{c} = 100,000, \ \bar{m} = 1,000,000, \ \overline{ss} = \tfrac{1}{2}, \text{ etc.})$$

Conversion factors for the apothecaries' system: There are approximately 60 milligrams to a grain, and 15 grains to a gram.

grains × 60 = milligrams
grains ÷ 15 = grams

2.4 Medical Terminology in Practice

Common Terms Related to Disease

AT A GLANCE	Common Terms Related to Disease
Term	**Meaning**
Benign	Noncancerous
Convalescent	The period of recovery after an illness, injury, or surgery
Declining	Gradually deteriorating, weakening, or wasting
Degeneration	Change of tissue to a less functionally active form
Etiology	Cause of a disease
Incubation period	The time between exposure to an infectious organism and the onset of symptoms of illness
Malaise	Not feeling well (the first indication of illness)
Malignant	Cancerous
Prodromal	Pertaining to early symptoms that may mark the onset of a disease
Prognosis	Prediction about the outcome of a disease
Prophylaxis	Protection against disease
Remission	Cessation of signs and symptoms

Table 2-7

Integumentary System

AT A GLANCE	Integumentary System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
adip / o	Fat	Adipose tissue	Layer of fat beneath the skin
albin / o	White	Albinism	Condition caused by the lack of melanin pigment in the skin, hair, and eyes
cry / o	Cold	Cryosurgery	Surgery that uses liquid nitrogen to freeze tissue
cutane / o	Skin	Subcutaneous	Beneath the skin
dermat / o	Skin	Dermatitis	Inflammation of the skin
erythr / o	Red	Erythrodermatitis	Inflammation of the skin marked by redness and scaling
hidr / o	Sweat	Hidradenitis	Inflammation of a sweat gland
hist / o	Tissue	Histology	Study of tissues
kerat / o	Hard skin, horny tissue, keratin	Keratosis	Lesion formed from an overgrowth of the horny layer of skin
leuk / o	White	Leukoplakia	Raised, white patches on the mouth or vulva
lip / o	Fat	Lipoma	Common benign tumor of the fatty tissue
onych / o	Nail	Onycholysis	Separation of the nail from its bed

Table 2-8, continued

AT A GLANCE	Integumentary System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
pachy / o	Thick	Pachyonychia	Abnormal thickness of fingernails or toenails
seb / o	Sebum (oil)	Seborrhea	Excessive secretion of sebum
squam / o	Scale	Squamous	Scale-like
trich / o	Hair	Trichopathy	Any disease of the hair
xanth / o	Yellow	Xanthoma	Yellow deposit of fatty material in the skin
xer / o	Dry	Xerosis	Abnormal dryness of the eye, skin, and mouth

Table 2-8, concluded

AT A GLANCE	Integumentary System—Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-malacia	Softening	Onychomalacia	Softening of the nails
-phagia	Eating, swallowing	Dysphagia	Difficulty swallowing, painful swallowing

Table 2-9

AT A GLANCE	Integumentary System—Abbreviations
Abbreviation	**Meaning**
Bx	Biopsy
Derm	Dermatology
SC, sub-Q, SQ, subcu, subq	Subcutaneous

Table 2-10

Musculoskeletal System

AT A GLANCE	Musculoskeletal System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
ankyl / o	Stiff	Ankylosis	Complete loss of movement in a joint
arthr / o	Joint	Arthralgia	Pain in the joint
bucc / o	Cheek	Buccinator	Cheek muscle
burs / o	Bursa	Bursolith	Stone in a bursa
calc / o	Calcium	Hypercalcemia	Excessive amount of calcium in the blood
carp / o	Wrist	Carpal	Pertaining to the wrist
cervic / o	Neck	Cervical	Pertaining to the neck

Table 2-11, continued

AT A GLANCE — Musculoskeletal System—Common Combining Forms

Combining Form	Meaning	Example	Definition
chondr / o	Cartilage	Osteachondroma	Benign bone tumor
cost / o	Rib	Intercostal	Between the ribs
crani / o	Cranium (skull)	Cranial	Pertaining to the skull
dors / o	Back	Dorsal	Pertaining to the back
fasci / o	Band of fibrous tissue	Fasciotomy	Operation to relieve pressure on the muscles by making an incision into the fascia
fibr / o	Fiber	Fibroma	Benign tumor of the connective tissues
kyph / o	Hump	Kyphosis	Excessive curvature of the spine, "humpback"
lamin / o	Lamina	Laminectomy	Surgical removal of the lamina
lei / o	Smooth muscle	Leiomyoma	Benign tumor of smooth muscle
lord / o	Curve	Lordosis	Inward curvature of the spine, "swayback"
my / o	Muscle	Myalgia	Muscle pain
myos / o	Muscle	Myositis	Inflammation of muscle tissue
oste / o	Bone	Osteoporosis	Condition in which bones become porous and fragile
pector / o	Chest	Pectoral	Pertaining to the chest
rhabd / o	Striated, skeletal muscle	Rhabdomyolysis	Destruction of muscle tissue accompanied by the release of myoglobin
spondyl / o	Vertebra	Spondylitis	Inflammation of the joints between the vertebrae in the spine
synov / i	Synovia	Synovial membrane	Membrane lining the capsule of a joint
ten / o, tend / o, tendin / o	Tendon	Tendinitis	Inflammation of the tendons

Table 2-11, concluded

AT A GLANCE — Musculoskeletal System—Suffixes

Suffix	Meaning	Example	Definition
-asthenia	Weakness	Myasthenia gravis	Disorder of neuromuscular transmission marked by weakness
-clasia	Breaking	Arthroclasia	Artificial breaking of adhesions of an ankylosed joint
-desis	Binding	Arthrodesis	Surgical binding or fusing of a joint
-physis	Growth	Metaphysis	The growing portion of a long bone
-schisis	Splitting	Rachischisis	Failure of vertebral arches and neural tube to fuse
-trophy	Development	Hypertrophy	Excessive development

Table 2-12

AT A GLANCE | Musculoskeletal System—Abbreviations

Abbreviation	Meaning
C1, C2, . . . C7	Individual cervical vertebrae (first through seventh)
Ca	Calcium
CTS	Carpal tunnel syndrome
EMG	Electromyography
fx	Fracture
L1, L2, . . . L5	Individual lumbar vertebrae (first through fifth)
ortho	Orthopedics
ROM	Range of motion
SLE	Systemic lupus erythematosus
T1, T2, . . . T12	Individual thoracic vertebrae (first through twelfth)

Table 2-13

AT A GLANCE | Actions of Muscles

Motion	Meaning
Abduction	Movement away from the midline
Adduction	Movement toward the midline
Circumduction	Movement in a circular motion
Depression	Act of lowering a body part from a joint
Dorsiflexion	Act of pointing the foot upward
Elevation	Act of raising a body part from a joint
Eversion	Act of turning outward
Extension	Increase in the angle of a joint
Flexion	Decrease in the angle of a joint
Hyperextension	Increase in the angle of a joint beyond what is normal
Inversion	Act of turning inward
Plantar flexion	Act of pointing the foot downward
Pronation	Act of turning downward or inward
Protraction	Movement of a body part anteriorly
Retraction	Movement of a body part posteriorly
Rotation	Act or process of turning on an axis
Supination	Act of turning upward or outward

Table 2-14

Nervous System

AT A GLANCE	Nervous System—Common Combining Forms			
Combining Form	**Meaning**	**Example**	**Definition**	
cerebell / o	Cerebellum	Cerebellar	Pertaining to the cerebellum	
cerebr / o	Cerebrum	Cerebral cortex	Outer layer of the cerebrum	
dur / o	Dura mater	Subdural hematoma	Bleeding between the dural and arachnoidal membranes	
encephal / o	Brain	Encephalitis	Inflammation of the brain	
mening / o	Membrane	Meningomyelocele	Protrusion of the spinal cord through a defect in the vertebral column	
myel / o	Spinal cord, bone marrow	Myelogram	Radiographic study of the spinal subarachnoid space	
neur / o	Nerve	Neuralgia	Pain in a nerve	
poli / o	Gray matter	Poliodystrophy	Wasting of gray matter	
psych / o	Mind	Psychosomatic	Pertaining to the influence of the mind on the body	

Table 2-15

AT A GLANCE	Nervous System—Prefixes			
Prefix	**Meaning**	**Example**	**Definition**	
hemi-	Half	Hemihypesthesia	Diminished sensation in one side of the body	
tetra-	Four	Tetraparesis	Weakness of all four extremities	

Table 2-16

AT A GLANCE	Nervous System—Suffixes			
Suffix	**Meaning**	**Example**	**Definition**	
-algesia	Excessive sensitivity to pain	Analgesia	Without a sense of pain	
-algia	Pain	Neuralgia	Nerve pain	
-esthesia	Feeling sensation	Anesthesia	Loss of sensation	
-kinesia	Movement	Bradykinesia	Decrease in spontaneity and movement	
-kinesis	Movement	Hyperkinesis	Excessive muscular activity	
-lepsy	Seizure	Epilepsy	Chronic brain disorder, often characterized by seizures	
-paresis	Slight paralysis	Hemiparesis	Weakness on one side of the body	
-phasia	Speech	Aphasia	Impairment of language ability	
-plegia	Paralysis	Hemiplegia	Paralysis of one side of the body	
-praxia	Action	Apraxia	Impairment of purposeful movement	

Table 2-17

AT A GLANCE	Nervous System—Abbreviations
Abbreviation	**Meaning**
ALS	Amyotrophic lateral sclerosis
CAT	Computed axial tomography
CNS	Central nervous system
CP	Cerebral palsy
CSF	Cerebrospinal fluid
CT	Computed tomography
CVA	Cerebrovascular accident (stroke)
EEG	Electroencephalogram
LP	Lumbar puncture
MRI	Magnetic resonance imaging
MS	Multiple sclerosis
TIA	Transient ischemic attack

Table 2-18

Cardiovascular System

AT A GLANCE	Cardiovascular System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
angi / o	Vessel	Angiogram	X-ray image of a blood vessel
aort / o	Aorta	Aortic stenosis	Narrowing of the aorta
arter / i	Artery	Arteriectomy	Surgical removal of a portion of an artery
arter / o, arteri / o	Artery	Arteriosclerosis	Thickening of arterial walls
atri / o	Atrium	Atrial	Pertaining to an atrium
bas / o	Base	Basophil	Cell with granules that stain specifically with basic (alkaline) dyes
cardi / o	Heart	Cardiomegaly	Enlargement of the heart
coagul / o	Clotting	Anticoagulant	Drug that prevents clotting of the blood
coron / o	Crown, circle	Coronary arteries	Blood vessels encircling the heart
cyt / o	Cell	Cytology	Study of cells
hem / o, hem / a, hemat / o	Blood	Hemorrhage	Abnormal discharge of blood
		Hematology	Study of blood
is / o	Same, equal	Anisocytosis	Abnormality of red blood cells that are of unequal size
kary / o	Nucleus	Eukaryote	Cell that contains membrane-bound nucleus with chromosomes
lymph / o	Lymph	Lymphadenitis	Inflammation of the lymph nodes

Table 2-19, continued

AT A GLANCE	Cardiovascular System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
phleb / o	Vein	Phlebotomy	Incision in vein to draw blood
plasm / o	Plasma	Plasmapheresis	Removal of plasma from the body, separation and extraction of specific elements, and reinfusion
thromb / o	Clot	Thrombolysis	Dissolving of a clot
valv / o, valvul / o	Valve	Valvoplasty	Surgical reconstruction of a cardiac valve
vas / o	Vessel	Vasoconstriction	Narrowing of the blood vessels
ven / o	Vein	Venous	Pertaining to a vein

Table 2-19, concluded

AT A GLANCE	Cardiovascular System—Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-apharesis	Removal	Plasmapheresis	Removal of plasma from the blood with a centrifuge
-blast	Immature stage, germ, bud	Myoblast	Immature muscle cell
-clast	Breakdown	Osteoclast	Bone breakdown
-crit	Separation	Hematocrit	Percentage of volume of a blood sample that is composed of cells
-cytosis	Abnormal condition of cells	Poikilocytosis	Presence of large, irregularly shaped blood cells
-globin	Protein	Hemoglobin	Protein of red blood cells

Table 2-20

AT A GLANCE	Cardiovascular System—Abbreviations
Abbreviation	**Meaning**
AED	Automatic external defibrillator
AF	Atrial fibrillation
AS	Aortic stenosis
ASD	Atrial septal defect
BP	Blood pressure
CAD	Coronary artery disease
CHD	Coronary heart disease
CHF	Congestive heart failure
ECG, EKG	Electrocardiogram
ECHO	Echocardiography

Table 2-21, continued

AT A GLANCE — Cardiovascular System—Abbreviations

Abbreviation	Meaning
HTN	Hypertension
MI	Myocardial infarction (heart attack)
MVP	Mitral valve prolapse
PDA	Patent ductus arteriosus
PVC	Premature ventricular contraction
VT	Ventricular tachycardia

Table 2-21, concluded

Respiratory System

AT A GLANCE — Respiratory System—Common Combining Forms

Combining Form	Meaning	Example	Definition
adenoid / o	Adenoid	Adenoidectomy	Operation to remove adenoid growths
alveol / o	Air sac	Alveolar	Pertaining to a small cell or cavity
bronch / i, bronch / o	Bronchus	Bronchitis	Inflammation of the mucous membrane of the bronchial tubes
capn / o	Carbon dioxide	Hypercapnia	Excessive carbon dioxide in the blood
coni / o	Dust	Pneumoconiosis	Pulmonary disease caused by prolonged inhalation of fine dust
cyan / o	Blue	Cyanosis	Bluish discoloration of the skin caused by a deficiency of oxygen in the blood
laryng / o	Larynx	Laryngitis	Inflammation of the mucous membrane in the larynx
lob / o	Lobe of the lung	Lobectomy	Excision of a lobe
nas / o	Nose	Paranasal sinuses	Accessory sinuses in the bones of the face that open into the nasal cavities
ox / o, ox / i	Oxygen	Hypoxia	Deficiency of oxygen in tissue cells
phon / o	Voice, Sound	Dysphonia	Hoarseness, difficulty speaking
phren / o	Diaphragm	Phrenohepatic	Pertaining to the diaphragm and liver
pneum / o, pneum / a, pneumat / o	Lung, air	Pneumatosis	Abnormal presence of air or other gas
pneum / o, pneumon / o	Lung	Pneumonia	Inflammation of the lung parenchyma
pulmon / o	Lung	Pulmonary	Pertaining to the lungs
rhin / o	Nose	Rhinorrhea	A watery discharge from the nose
spir / o	Breathing	Spirometer	Gasometer used to measure respiration
tonsill / o	Tonsil	Tonsillectomy	Removal of the tonsil

Table 2-22

AT A GLANCE — Respiratory System—Suffixes

Suffix	Meaning	Example	Definition
-ema	Condition	Empyema	Condition of having pus in a body cavity as a result of a lung infection
-oxia	Oxygen	Anoxia	Absence of oxygen from blood or tissues
-pnea	Breathing	Apnea	Inability to breathe
-ptysis	Spitting	Hemoptysis	Coughing up and spitting out blood
-sphyxia	Pulse	Asphyxia	Impairment of oxygen intake
-thorax	Chest	Hemothorax	Blood in the pleural cavity

Table 2-23

AT A GLANCE — Respiratory System—Abbreviations

Abbreviation	Meaning
ARDS	Acute respiratory distress syndrome
COPD	Chronic obstructive pulmonary disease
CPR	Cardiopulmonary resuscitation
CXR	Chest X-ray
pCO2	Partial pressure of carbon dioxide
PFT	Pulmonary function test
TB	Tuberculosis
URI	Upper respiratory infection

Table 2-24

AT A GLANCE — Digestive System—Common Combining Forms

Combining Form	Meaning	Example	Definition
an / o	Anus	Perianal	Located around the anus
append / o	Appendix	Appendectomy	Surgical removal of the appendix
bucc / o	Cheek	Buccalabial	Pertaining to the cheek and lip
cec / o	Cecum	Cecal	Pertaining to the cecum
cheil / o	Lip	Cheilosis	Dry scaling and fissuring of lips
chol / o, chol / e	Bile	Choledochus	Bile duct
cholecyst / o	Gallbladder	Cholecystectomy	Surgical removal of the gallbladder
col / o	Colon	Colostomy	Creation of an artificial opening into the colon
colon / o	Colon	Colonic	Pertaining to the colon

Table 2-25, continued

AT A GLANCE	Digestive System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
enter / o	Intestine	Enteropathy	Intestinal disease
epigastr / o	Above the stomach	Epigastrorrhaphy	Suturing the region above the stomach
gastr / o	Stomach	Gastritis	Inflammation of the stomach
gingiv / o	Gum	Gingivitis	Inflammation of the gums
gloss / o	Tongue	Hypoglossal	Below the tongue
hepat / o	Liver	Hepatitis	Inflammation of the liver
lapar / o	Abdomen	Laparoscopy	Examination and often surgery of the abdominal cavity with a laparoscope
or / o	Mouth	Oral	Pertaining to the mouth
peritone / o	Peritoneum	Peritonitis	Inflammation of the peritoneum
rect / o	Rectum	Rectocele	Prolapse of the rectum
stomat / o	Mouth	Stomatitis	Inflammation of the mouth

Table 2-25, concluded

Digestive System

AT A GLANCE	Digestive System—Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-ase	Enzyme	Amylase	Class of digestive enzymes that act on starch
-chezia	Defecation	Hematochezia	Passage of bloody stools
-iasis	Abnormal condition	Choledocholithiasis	Stones in the common bile duct
-pepsia	Digestion	Dyspepsia	Upset stomach
-prandial	Meal	Postprandial	Following a meal
-rrhaphy	Repair or suture	Hepatorrhaphy	Repair of a wound or rupture in the liver.

Table 2-26

AT A GLANCE	Digestive System—Abbreviations	
Abbreviation		**Meaning**
BE		Barium enema
EGD		Esophagogastroduodenoscopy
EUS		Endoscopic ultrasound
GERD		Gastroesophageal reflux disease
GI		Gastrointestinal
IBS		Irritable bowel syndrome

Table 2-27

Endocrine System

AT A GLANCE	Endocrine System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
aden / o	Gland	Adenectomy	Excision of a gland
adrenal / o, adren / o	Adrenal gland	Adrenalectomy	Removal of one or both adrenal glands
andr / o	Male	Androgen	Hormone produced by the testes in males and by the adrenal cortex in males and females
calc / i	Calcium	Hypercalcemia	Elevated concentration of calcium in the blood
cortic / o	Cortex, outer region	Corticosteroid	Steroid produced by the adrenal cortex
crin / o	Secretion	Endocrinologist	Physician who specializes in endocrinology
dips / o	Thirst	Polydipsia	Prolonged excessive thirst
epinephr / o	Adrenal gland	Epinephritis	Inflammation of an adrenal gland
glyc / o	Sugar	Hyperglycemia	High blood sugar
gonad / o	Sex gland	Gonadotropin	Hormone that promotes gonadal growth
home / o	Like, similar	Homeostasis	State of bodily equilibrium
hormon / o	Hormone	Hormonal	Pertaining to hormones
kal / i	Potassium	Hypokalemia	Lack of potassium in the blood as a result of dehydration, excessive vomiting, and diarrhea
lact / o	Milk	Prolactin	Hormone that stimulates milk production during pregnancy
natr / i	Sodium	Hyponatremia	Low concentration of sodium in the blood
parathyroid / o	Parathyroid gland	Parathyroidectomy	Excision of the parathyroid gland
somat / o	Body	Somatotropic	Having a stimulating effect on body growth
ster / o	Solid structure	Steroid	Pertaining to the steroids, some of which increase muscle mass
thyr / o	Thyroid gland	Thyrotropin hormone	Hormone that stimulates growth of the thyroid gland
thyroid / o	Thyroid gland	Thyroiditis	Inflammation of the thyroid gland

Table 2-28

AT A GLANCE	Endocrine System—Prefixes		
Prefix	**Meaning**	**Example**	**Definition**
oxy-	Rapid, sharp	Oxytocin	Hormone that influences contractions of the uterus
pan-	All	Panhypopituitarism	State of inadequate or absent secretion of pituitary hormones
tri-	Three	Triiodothyronine	Hormone secreted by the thyroid gland that regulates metabolism

Table 2-29

AT A GLANCE — Endocrine System—Suffixes

Suffix	Meaning	Example	Definition
-agon	Assemblage, a gathering together	Glucagon	Hormone produced by the pancreas that causes an increase in blood sugar
-in, -ine	A substance	Epinephrine	Stress hormone secreted by the adrenal gland
-uria	Urine condition	Glycosuria	Urinary excretion of sugar

Table 2-30

AT A GLANCE — Endocrine System—Abbreviations

Abbreviation	Meaning
ACTH	Adrenocorticotropic hormone
BMR	Basal metabolic rate
Ca	Calcium
DI	Diabetes insipidus
DM	Diabetes mellitus
FBS	Fasting blood sugar
FSH	Follicle-stimulating hormone
GH	Growth hormone
GTT	Glucose tolerance test
IDDM	Insulin-dependent diabetes mellitus
K	Potassium
Na	Sodium
NIDDM	Non-insulin-dependent diabetes mellitus
PRL	Prolactin
TFT	Thyroid function test

Table 2-31

Sensory System
The Eye

AT A GLANCE — The Eye—Common Combining Forms

Combining Form	Meaning	Example	Definition
aque / o	Water	Aqueous	Containing, or like water
blephar / o	Eyelid	Blepharitis	Inflammation of the eyelids
conjunctiv / o	Conjunctiva	Conjunctivitis	Inflammation of the conjunctiva, pinkeye
cor / o, core / o	Pupil	Corepraxy	Procedure to centralize a pupil that is abnormally situated
dacry / o	Tear, tear duct	Dacryoadenitis	Inflammation of the lacrimal gland

Table 2-32, continued

AT A GLANCE	The Eye—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
dipl / o	Double	Diplopia	Condition in which one object is perceived as two objects (double vision)
glauc / o	Gray	Glaucoma	Eye disease that may result in blindness
ir / o	Iris	Iritis	Inflammation of the iris
lacrim / o	Tear	Lacrimal	Pertaining to tears
mi / o	Smaller, less	Miosis	Contraction of the pupil
nyct / o, noct / o	Night	Nyctalopia	Poor night vision
ocul / o	Eye	Intraocular	Inside the eye
ophthalm / o	Eye	Ophthalmologist	Physician who specializes in treating eyes
opt / o	Vision	Optometer	Instrument for determining refraction of the eye
palpebr / o	Eyelid	Palpebral	Pertaining to the eyelid
phot / o	Light	Photophobia	Fear and avoidance of light
presby / o	Old age	Presbyopia	Loss of accommodation in the eye resulting from aging
pupill / o	Pupil	Pupillary	Pertaining to the pupil
retin / o	Retina	Retinitis	Inflammation of the retina
scot / o	Darkness	Scotoma	Blind spot in which vision is absent or depressed
uve / o	Vascular layer of the eye	Uveitis	Inflammation of the uveal tract
vitre / o	Glassy	Vitreous humor	Fluid component of the transparent vitreous body

Table 2-32, concluded

AT A GLANCE	The Eye—Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-opia	Vision	Hyperopia	Farsightedness
-tropia	A turning	Estropia	Inward turning of the eye, toward the nose

Table 2-33

AT A GLANCE	The Eye—Abbreviations
Abbreviation	**Meaning**
ast	Astigmatism
IOP	Intraocular pressure
OD*	Right eye
OS*	Left eye

Table 2-34, continued

AT A GLANCE	The Eye—Abbreviations

Abbreviation	Meaning
OU*	Each eye, both eyes
PERRLA	Pupils equal, round, reactive to light and accommodation
REM	Rapid eye movement
VA	Visual acuity
VF	Visual field

Table 2-34, concluded

The Ear

AT A GLANCE	The Ear—Common Combining Forms

Combining Form	Meaning	Example	Definition
acou, acous / o	Hearing	Acoustic	Pertaining to hearing
audi / o	Hearing	Audiometer	Instrument for measuring hearing
audit / o	Hearing	Auditory	Pertaining to the sense or organs of hearing
aur / i	Ear	Aural	Pertaining to the ear
cochle / o	Cochlea	Cochlear	Pertaining to the cochlea
mastoid / o	Mastoid process	Mastoiditis	Inflammation of the mastoid process
myring / o	Tympanic membrane	Myringoplasty	Surgical repair of damaged tympanic membrane
ot / o	Ear	Otic	Pertaining to the ear
tympan / o	Eardrum	Tympanoplasty	Operation on a damaged middle ear

Table 2-35

AT A GLANCE	The Ear—Suffixes

Suffix	Meaning	Example	Definition
-cusis, -acousia	Hearing	Presbycusis, presbyacousia	Nerve deafness caused by aging
-otia	Ear condition	Macrotia	Enlarged ears

Table 2-36

AT A GLANCE	The Ear—Abbreviations

Abbreviation	Meaning
AD*	Right ear
AS*	Left ear
AU*	Both ears
EENT	Eyes, ears, nose, and throat
oto	Otology

Table 2-37

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Urinary System

AT A GLANCE	Urinary System—Common Combining Forms		
Combining Form	**Meaning**	**Example**	**Definition**
albumin / o	Protein	Albuminuria	Protein in the urine
bacteri / o	Bacterium, bacteria	Bacteriuria	Bacteria in the urine
cali / o	Calix (calyx)	Caliectasis	Dilation of the calices
cyst / o	Urinary bladder	Cystitis	Inflammation of the urinary bladder
ket / o	Ketone bodies	Ketosis	Enhanced production of ketone bodies
lith / o	Stone	Nephrolithiasis	Presence of a renal stone or stones
meat / o	Opening, passageway	Meatoscope	Speculum for examining the urinary meatus
nephr / o	Kidney	Nephromegaly	Enlargement of the kidney
olig / o	Scanty, few	Oliguria	Scanty urine production
pyel / o	Renal pelvis	Pyelolithotomy	Operation to remove a stone from the kidney
ren / i, ren / o	Kidney	Renography	Radiography of the kidney
ur / o, urin / o	Urine, urinary tract	Urodynia	Pain on urination
vesic / o	Urinary bladder	Perivesical	Surrounding the urinary bladder

Table 2-38

AT A GLANCE	Urinary System—Suffixes		
Suffix	**Meaning**	**Example**	**Definition**
-tripsy	Crushing	Lithotripsy	Crushing of a stone in the renal pelvis, ureter, or bladder
-uria	Urination	Dysuria	Difficulty or pain in urinating

Table 2-39

AT A GLANCE	Urinary System—Abbreviations
Abbreviation	**Meaning**
ADH	Antidiuretic hormone; vasopressin
ARF	Acute renal failure
BUN	Blood urea nitrogen
Cath	Catheter
CRF	Chronic renal failure

Table 2-40, continued

AT A GLANCE — Urinary System—Abbreviations

Abbreviation	Meaning
ESRD	End-stage renal disease
HD	Hemodialysis
IVP	Intravenous pyelogram
KUB	Kidney, ureter, and bladder
PKU	Phenylketonuria
UA	Urinalysis
UTI	Urinary tract infection

Table 2-40, concluded

Reproductive System

AT A GLANCE — Reproductive System—Common Combining Forms

Combining Form	Meaning	Example	Definition
amni / o	Amnion	Amniocentesis	Aspiration of amniotic fluid for diagnosis
balan / o	Glans penis	Balanitis	Inflammation of the glans penis
cervic / o	Cervix, neck	Endocervicitis	Inflammation of the mucous membrane of the cervix
colp / o	Vagina	Colposcopy	Examination of the cervix using a colposcope
crypt / o	Hidden	Cryptorchism	Failure of one or both testes to descend
culd / o	Cul-de-sac	Culdocentesis	Aspiration of fluid from the cul-de-sac
epididym / o	Epididymis	Epididymitis	Inflammation of the epididymis
galact / o	Milk	Galactorrhea	Abnormal, persistent discharge of milk
gon / o	Generation, genitals	Gonorrhea	Contagious inflammation of the genital mucous membrane
gynec / o	Female	Gynecology	The study of the female reproductive system
hyster / o	Uterus	Hysterectomy	Removal of the uterus
lact / i, lact / o	Milk	Lactation	Production of milk
mamm / o	Breast	Mammogram	Breast X-ray
mast / o	Breast	Mastectomy	Excision of the breast
men / o	Menses	Amenorrhea	Absence or abnormal cessation of menses
metr / o	Uterus	Metrorrhagia	Irregular bleeding from the uterus between periods
nat / i	Birth	Neonatal	Pertaining to the first month of life
orchi / o, orchid / o	Testis, testicle	Orchiectomy	Removal of one or both testes

Table 2-41, continued

AT A GLANCE | **Reproductive System—Common Combining Forms**

Combining Form	Meaning	Example	Definition
ov / o	Egg	Ovum	Female sex cell, or egg
prostat / o	Prostate gland	Prostatitis	Inflammation of the prostate gland
terat / o	Monster	Teratoma	Neoplasm composed of tissues not normally found in the organ
test / o	Testis, testicle	Testicular	Pertaining to the testes
vagin / o	Vagina	Vaginitis	Inflammation of the vagina
vas / o	Vessel, duct	Vasectomy	Removal of a section of the vas deferens
vert / i, vers / i	A turning	Cephalic version	Turning of the fetus so that the head is correctly positioned for delivery

Table 2-41, concluded

AT A GLANCE | **Reproductive System—Suffixes**

Suffix	Meaning	Example	Definition
-arche	Beginning	Menarche	Time of the first menstrual period
-gravida	Pregnant	Primigravida	Woman in her first pregnancy
-one	Hormone	Testosterone	Hormone related to masculinization and reproduction
-pause	Cessation	Menopause	The cessation of menses
-pexy	Fixation, fastening	Orchiopexy	Surgical treatment of an undescended testicle
-stomy	(New) opening	Vasostomy	Surgical procedure of making a new opening into the vas deferens
-tocia	Labor, birth	Dystocia	Difficult childbirth

Table 2-42

AT A GLANCE | **Reproductive System—Abbreviations**

Abbreviation	Meaning
AB	Abortion
AIDS	Acquired immunodeficiency syndrome
BPH	Benign prostatic hyperplasia/benign prostatic hypertrophy
CS, C-section	Cesarean section
CX	Cervix
D & C	Dilation and curettage
ECC	Endocervical curettage

Table 2-43, continued

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AT A GLANCE	Reproductive System—Abbreviations
Abbreviation	**Meaning**
EMB	Endometrial biopsy
FHT	Fetal heart tones
FSH	Follicle-stimulating hormone
GYN	Gynecology
HCG	Human chorionic gonadotropin
HIV	Human immunodeficiency virus
HSV	Herpes simplex virus
LH	Luteinizing hormone
Multip	Multipara
Pap smear	Papanicolaou smear (test for cervical or vaginal cancer)
PMS	Premenstrual syndrome
PSA	Prostate-specific antigen
STI	Sexually transmitted infection

Table 2-43, concluded

STRATEGIES TO SUCCESS

▶ *Test-Taking Skills*

Think success!
Approach the exam with confidence. It's unlikely that you will get all the questions right. Don't panic or become stressed when you can't answer a question. Relax, and imagine yourself doing wonderfully. A positive attitude will help you stay in control and allow you to focus on all the questions that you do know.

2.5 Unacceptable Abbreviations

Today, there are certain abbreviations that the Joint Commission recommends medical professionals to avoid. Table 2-44 includes examples of unacceptable abbreviations. The Joint Commission's complete list of these abbreviations can be found at http://www .jointcommission.org/topics/patient_safety.aspx.

AT A GLANCE   EXAMPLES OF UNACCEPTABLE ABBREVIATIONS

Terms	Do Not Use	What You Should Do
Daily	qd	Write out
Discontinue and discharge	D/C, dc, DC	Write out
Every other day	qod	Write out
International units	IU	Write out
Magnesium sulfate	MgSO4	Write out
Microgram	μg	Use mcg or write out
Morphine sulfate	MS, MSO4	Write out
Related to the ears	AD, AS, AU	Write out
Related to the eyes	OD, OS, OU	Write out
Subcutaneous	SC, SQ	Use subQ or subC
Units	U or u	Write out

Table 2-44