MEDICAL
SPEECH-LANGUAGE PATHOLOGY

A Desk Reference

FOURTH EDITION

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PREFACE

The practice of *medical* speech-language pathology includes the evaluation and treatment of communication, cognition, and swallowing within the context of medical conditions and, typically though not always, within a medical setting. In medical settings, the speech-language pathologist's (SLP's) treatment decisions may directly affect health and safety as well as communication; thus, clinicians who seek to work competently in medical settings should have a basic understanding of the conditions that bring patients to the hospital or clinic and what is being done to manage them. This fourth edition, as with the previous editions, is intended to provide that *basic* understanding with a handy reference for clinicians who are practicing or are in training to practice speech-language pathology in hospitals or other health care–related facilities, such as rehabilitation programs, private practice, outpatient clinics, nursing homes, and home health agencies. It is also intended as a desk reference for clinicians who work in school and preschool settings, where children with medically related communication and swallowing disorders are a part of the caseload.

Unlike the previous editions, authored solely by Lee Ann C. Golper, PhD, this edition represents the expertise, content contributions, and editing of additional collaborators, Bernice K. Klaben, PhD, and Claire Kane Miller, PhD. Each of these authors brings a master clinician–level of knowledge and experience as a medical speech-language pathologist. Their collective experience includes dysphagia in adults and children, neurogenic communication disorders, voice, head and neck surgery rehabilitation, geriatric practice, neonatal and early childhood development, feeding and swallowing disorders in infants and children, management of velopharyngeal dysfunction and craniofacial disorders, traumatic brain injury, and SLP practices within intensive care settings. The authors bring more than 100 years of combined expertise as clinicians, teachers, supervisors, and administrators in medically related settings. Like all other master clinicians in the profession, they know that learning is a lifelong experience. From the novice who is conducting his or her first solo bedside aphasia examination to the seasoned clinician who has treated thousands of patients, every day working in a medical setting provides an opportunity to learn something new.

To stay current with their medically oriented practice, the authors have acquired a substantial library of resource materials, textbooks, manuals, dictionaries, hospital memos, illustrations, tables, PowerPoint handouts, lecture and workshop notes, and so on. These published and

unpublished materials were consulted in the preparation of this text. The comments and observations of coworkers have also informed the content of each edition of this text. Those contributors who made particularly noteworthy contributions are cited in the Acknowledgments.

One of the nice features of technological advances is the ease of access to electronic libraries and reference articles. If we ran into an inconsistency, needed to check the spelling of a word, or wanted to find out about a new procedure, we could "Google it" and instantly find links and articles on the topic. We literally have the information we need at our fingertips, though some of that information is not necessarily authorative. With the movement toward the electronic health record, clinicians in hospitals are provided with links to medical terminology, approved abbreviations, the hospital's formulary, and so on, and, in some systems, they can be pointed to research or the most current recommended evidence-based management approaches for disorders and diseases.

Reflected in the third edition and expanded in this current fourth edition is the vastly changed role of the SLP in the neonatal intensive care unit and inpatient services in children's hospitals. Information related specifically to newborns and young children has been added to nearly every chapter. Additionally, tremendous medical advances have occurred throughout medical science over the past decade, particularly in two areas of medicine: genetics and oncology. Accordingly, material has been added related to "Medical Genetics" (Chapter 6), and the discussion of "Oncology" (Chapter 12) has been expanded to include the current tumor classifications and therapies. The SLP's role with geriatric medicine has also expanded in recent decades; thus, a chapter on "Rehabilitation Medicine and Geriatrics" (Chapter 14) highlights the specialties that share many principles and practices. That chapter includes a discussion of biomedical ethics and end-of-life issues across the lifespan. This area has been given greater attention as clinicians are increasingly participating in palliative care teams, particularly when dysphagic or communicatively impaired patients choose to have their end-of-life care take place in a hospital-based hospice or nursing home.

New terminology, abbreviations, and medical tests and procedures have been added to this new edition, and any errors that somehow escaped multiple sets of editing eyes in the earlier editions have been corrected. Our hope is that this version is flawless, but no textbook is perfect, and this type of text is particularly challenging to edit given all of the lists of terminology and abbreviations. Appreciating that English spelling varies between English-speaking countries (e.g., the United States and Canada), we have opted for the American version. Experts can disagree slightly as to how to define medical terms. In those cases, we have looked at multiple resources (listed at the end of each chapter) or "Googled it" to achieve a general consensus. Whenever the rare question about spelling, usage, pronunciation, or definition arose, we opted to let

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Taber's Cyclopedic Medical Dictionary, 23rd edition (2017), published by F. A. Davis Company and available at www.tabors.com, serve as the final arbiter. Although we did not cite Taber's at the end of each chapter, it should be viewed as an overarching reference for the entire text and a recommended resource for medical SLPs.

Due to the comprehensive and broad-brush scope of this text, the definitions and descriptions contained in it are, by necessity, terse and superficial. Be cautioned that this book was written by medical *speech-language pathologists*. Nearly every definition or brief description contained in this text should be read with the caveat: "Of course, it is a lot more complicated than that." When a complex medical condition, for example, *leukemia*, is reduced to a one-sentence definition, the result is a nugget of information that is sorely in need of further elaboration. As is the case with any quick reference text or online resource, even WebMD, what is provided is *information*. Information is not *knowledge*. In any area of professional work, it isn't enough to know *what* to do; you must also know *why* you are doing it. In medicine, knowledge implies an integrated understanding of how the body works, the essential causes of a medical condition, and the algorithms that go into selecting treatment options. Our hope is that the information we have provided will aid clinicians as they seek to become *knowledgeable* about certain conditions. In that effort, additional reference texts and medical authorities should be consulted, and explanations from medical colleagues should be sought. Ask questions. It is the authors' experience that physicians, dietitians, rehab therapists, and other colleagues love to teach.

We should remind readers that this text is a general desk reference *about medical practices*. It is *not about how to practice* medical SLP. Presumably, the knowledge, technical skills, core competencies, and principles and practices about how to practice medical SLP have been acquired in graduate classes and clinical practicum, and during Clinical Fellowships. Once we enter practice, skills with new technologies are usually acquired and maintained through continuing education, workshops, and certification courses. Comprehensive texts providing both broad and disorder-specific references about current medical SLP practices with children and adults are available from Plural Publishing, Inc. and other publishers. Some excellent references are cited at the end of each chapter. This book is intended to complement such texts on medically related clinical practices in SLP.

The information included here and the terminology reviewed cover topics and facts about medical conditions and medical care delivery and procedures that seemed to the authors to be important, or at least potentially useful, for clinicians to know about or have readily available. We are certain there will be gaps in the content, because health care generally, and our field specifically, continue to evolve with new advancements in research and technology. Those new developments will go into the next

edition. Several of the chapters include a review of related "fundamental principles" to add some background and context across the disorders or practices, and the terminology found in those chapters, or to help clinicians to understand that medical disorder or specialty better. Some of the information in this text is intended for reference only, and some could be viewed as rarely needed, but "nice to know." Most of the information contained in this text applies directly to the day-to-day work life of a medical SLP providing services to children and adults.

This fourth edition builds upon the material contained in the first, second, and third editions with new sections added where needed. Deletions, corrections, updates, expansions, and clarifications have been made with each revision of the original text. This text contains previously published and new material, data, and figures adapted from other sources or reproduced with permission. The attributions for these sources are cited and any pre-published material is used with the authors' gratitude. The array of reference texts that were consulted in preparing this and previous editions are listed following each chapter as "References and Resources Consulted."

This title of this text continues as revised in the third edition: *Medical Speech-Language Pathology: A Desk Reference*, but the overriding purpose with each edition has remained: to advance the practices of SLP clinicians and help them to become comfortable with the principles and practices found in hospitals and related settings so they can practice their profession and take their rightful place among other health care providers with confidence and competence.

ACKNOWLEDGMENTS

of this book. It was he who made the observation several years ago that, in his experience, most physicians know far less about the practices of speech-language pathology than speech-language pathologists know about medicine.

We will end our acknowledgments with a special thank you. Since the publication of the first edition of this book in 1988, continuing through the second and third editions, Dr. Robert T. (Terry) Wertz has provided advice, support, and expertise to these "sourcebook" and "desk reference" texts in his role as the Editor, and later Co-editor, of the Clinical Competency Series. That series was comprised of eight competency-related texts, authored by subject-matter experts, that were initially published through Singular Publishing Group, then Plural Publishing, Inc., and later transferred into the hands of Delmar Cengage Learning. The *Sourcebook for Medical Speech Pathology* was the first product released within the Clinical Competency Series.

In 1987, Dr. Wertz called Dr. Golper (on a landline telephone) to discuss his vision for a series of texts aimed at specific areas of clinical competency development in speech-language pathology. He asked, "Is there an area of need for clinical competency in the profession you'd like to write about?" Having worked in rehab settings and hospitals, both as a clinician and supervisor of graduate students and CFs, and based on her own experience having entered a position in a medical setting as a CF without much prior experience in hospitals, she immediately knew the answer to that question. She proposed a reference text aimed at familiarizing SLPs with the medically related conditions, practices, administrative operations, and the general vernacular (the common vocabulary and abbreviations) encountered in medical SLP. At that time, the term "medical" speech-language pathology was only beginning to be applied to certain practice settings. Dr. Golper's goal was to provide a text that would help clinicians working in hospitals to become competent and confident practitioners by enhancing their understanding of the world in which they worked. The proposed format of a desk reference type of book also lent itself well to the "outline and brief paragraph" style that Wertz had prescribed for all texts in the Clinical Competency Series. Now, 30 years later, the work continues.

ABOUT THE AUTHORS

Lee Ann C. Golper, PhD, is a Professor of Communication Sciences and Disorders with a 40-year career as a medical center–based clinician, supervisor, teacher, researcher, and author. She is the author of several textbooks in the profession, including the first three editions of this text. Before her retirement from the faculty at Vanderbilt University, she was the Director of the Masters of Science program in Speech-Language Pathology within the Graduate Studies Division, the Director of Quality for the Department of Hearing and Speech Sciences, and the Director of Clinical Speech-Language Pathology within Vanderbilt University Medical Center's hospitals and clinics. Dr. Golper was a Fellow of the Academy of Otolaryngology-Head and Neck Surgery and a Fellow of the American Heart Association–American Stroke Association. She holds Board Certification from the Academy of Neurologic Communication Disorders and Sciences (BC-ANCDS) and is a Fellow and Life Member of the American Speech-Language-Hearing Association (ASHA). She was awarded the Honors of ASHA in 2013.

Bernice K. Klaben, PhD, CCC-SLP, BCS-S, is an Associate Professor in the Department of Otolaryngology-Head and Neck Surgery at the University of Cincinnati Medical Center (UCMC). She is an Adjunct Instructor in the College of Allied Health Sciences in the Communication Science Department at UC. Her specialties are in the areas of voice, dysphagia, and head and neck cancer at the UC Voice and Swallowing Center, providing full assessments and rehabilitation. Dr. Klaben is a Board Certified Specialist in swallowing and swallowing disorders (BCS-S). She is

the coauthor of a text on voice disorders, published by Plural Publishing. Dr. Klaben was awarded a Senior Representative Fulbright Scholarship to Bulgaria, has given numerous presentations and seminars in the areas of voice and swallowing, and has served as mentor to many students in the field of medical speech-language pathology.

Claire Kane Miller, PhD, MHA, CCC-SLP, is the Program Director of the Aerodigestive and Esophageal Center's Interdisciplinary Feeding Team at Cincinnati Children's Hospital Medical Center, where she also assumes a clinical position in the Division of Speech-Language Pathology. She holds a faculty appointment as a field service Associate Professor in the Department of Otolaryngology-Head and Neck Surgery at the University of Cincinnati College of Medicine, where she is an adjunct Assistant Professor in the Department of Communication Sciences and Disorders. Her research and clinical interests are in the area of pediatric dysphagia, with a focus on instrumental swallowing assessment and the clinical management of medically fragile infants and children with congenital and acquired airway and digestive anomalies. She has authored publications and presented nationally and internationally on aspects of pediatric dysphagia. Dr. Miller is a coauthor of a textbook on pediatric dysphagia to be published by Plural Publishing.

With appreciation and in honor of his vision for the Clinical Competency Series, and for shepherding this work through three decades of publication, the authors join in dedicating this text to a friend, colleague, and mentor, Robert T. (Terry) Wertz, PhD. Borrowing a line from his comments in the Foreword of the previous edition, we honor him for reminding us, *"Competent clinicians seek competence as much for what it demands as for what it promises."*

CHAPTER 2

Communicating Information and Record Keeping

Efficient and accurate communication in healthcare settings requires knowledge of the medical terminology routinely encountered in electronic and written documentation and in verbal reports. To be able to record and report findings and plans within the health care team, clinicians should have a basic knowledge of terminology, abbreviations, pronunciations, and usage. Presently, a patient's medical record is the primary vehicle for communication within and between medical facilities, accrediting bodies, and third-party payers. The medical record allows the organization and its providers to demonstrate to all reviewers they have met standards of care by verifying that appropriate care decisions, protocols, and sequences were followed by qualified and competent providers across the continuum of care from admission through discharge. There is a saying in health service delivery that goes, "If it wasn't documented, it wasn't done." That is, if a record of the billed service cannot be linked to the provider, time and date of a service there is no way to verify that it was performed and therefore reimbursement will be denied. Because documentation is crucial and time consuming, the use of approved **abbreviations**, **acronyms**, and **eponyms** is common both in handwritten and electronic medical records. The use of appropriate abbreviations also is encouraged when completing reimbursement forms and insurance claims. *Abbreviations* are shortened words or letters that stand for a word or phrase, such as "PT" for "physical therapy." *Acronyms* are words formed from the initial letters of a compound term; for example, the word *laser* is an acronym for *l*ight *a*mplification *s*timulated *e*mission of *r*adiation, and the word *rads* refers to *r*adiation *a*bsorbed *d*oses. *Eponyms* are words or phrases derived from or referencing the name of a person, as in *Apgar* score or the *Babinski* sign.

I. CHAPTER FOCUS

This chapter reviews medical communication and factors to consider when gathering and recording information in medical charts. All personnel should be comfortable with the conventional language and documentation formats, written and electronic, encountered in medical settings. This chapter introduces basic concepts in medical terminology and discusses the purposes and types of medical notations, including prescriptions and other notations. Abbreviations and symbols that are commonly found in progress notes, laboratory findings, and doctors' orders are included. Issues, such as confidentiality protections and informed consent, as well as guidelines for appropriate entries in medical records and other methods of communicating in medical settings are also discussed.

II. SOURCES FOR MEDICAL TERMINOLOGY

Speech-language pathology (SLP) clinicians who practice in medical settings should have at least one comprehensive textbook on medical terminology and a medical dictionary in their professional libraries. Even though the first place people look for answers these days is the Internet (just "Google" it on your smart phone), Internet resources do not typically tell us how medical terms are pronounced, or the context in which these terms are encountered or used. Medical terminology texts usually provide clinicians with the definition and etymology (explanations on the origin) of a term, its spelling (and variations) and pronunciation. Defining the suffixes and prefixes and the meanings of the root words is also helpful to understand the polysyllabic language of medicine. Most medical terms are derived from Greek or Latin; thus, knowing etymologic features of medical terms helps to determine both their pronunciation and meaning.

Throughout this book are lists of terminology and abbreviations likely to appear in medical records, reports, and progress notes. Some terms appear in more than one chapter, again, to help the clinician put terminology and abbreviations into the contexts in which they are likely to be encountered. In cases where a word is entirely unfamiliar to the clinician, a medical dictionary should be consulted to determine pronunciation and meaning. Medical terminology can be misused and is often mispronounced in the media, so the best source for the preferred pronunciation is experience—listening to how terms are pronounced and used in the context of descriptions and verbal reports made by physicians, nurses, and other providers. This text does not provide more than the occasional guidance on pronouncing medical terminology, but Latin and Greek derivatives and other non-English words are italicized throughout the text to highlight words that require attention in their pronunciation.

The preparation of the original and subsequent editions of this text has required consulting and comparing several references on medical terminology as well as medical dictionaries, textbooks in pediatric and adult critical care, medical manuals, physicians' pocket guides, nursing care handbooks, and the like. The sources consulted in preparation of this edition and previous editions are listed along with more current or cited references at the end of each chapter. These references or similar texts would be useful additions to the SLP's departmental or personal library. Most facilities have a physical or an electronic medical library with comparable terminology resource texts. In addition to published texts on medical terminology, medical centers are required to provide staff with a list of "acceptable abbreviations" and legends for their facility. That list is periodically updated and can usually be obtained from the Compliance Office, Medical Records Department, Medical Administration Office, Hospital Administration Office, or the facility library. In large health care facilities, the **Compliance Office** is charged with overseeing staff adherence with various federal and state mandates and statutes as well as the facility's accreditation standards; consequently, the Compliance Office requires staff to use only the facility's **approved abbreviations**.

Many abbreviations are easily confused, and can be the source of medical errors and putting the patient and the organization at risk. The advent of the electronic health record (EHR) has largely eliminated these confusions. Nonetheless, it is mandatory that SLPs and other service providers use only the accepted and appropriate terminology and abbreviations for their facility. For example, the abbreviation "DC" might refer to "discharge," "discontinue," "diagnostic code," "dilation and curettage," "death certificate," "day care," "decrease," "distal colon," and so forth. As a part of the **Risk Management** program, the Compliance Office publishes and enforces the use of approved abbreviations. Steps to ensure consistently accurate communication and create a "safety culture" in hospitals are key to the **prevention of medical errors**. Medical errors include actions, or neglected performance of actions, that may have caused no notable consequence or may have caused some amount of unintended harm to the patient. These errors include, for example, administering the wrong medications or the wrong dosages, treating the wrong patient or the wrong body part, or failing to take actions to prevent the development of problems, such as decubitus ulcers (bed sores) or pneumonia.

III. COMMON MEDICAL TERMINOLOGY

A. Terms for Direction

Afferent. Going toward a body or center.
Anterior. Toward the front or before.

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Brachial. Toward the upper arms.

Cephalad. Toward the head.

Cervical. Toward the neck.

Deep. Away from the surface.

Distal. Away from the body or point of attachment.

Dorsal. In back of or posterior.

Dorsal cavities. Cranial cavity and spinal cavity.

Efferent. Going away from a body or center.

Gluteal. Buttocks.

Inferior. Below or in a downward direction.

Intermediate. Between the medial and lateral parts.

Lateral. Toward the side.

Medial. Toward the midline.

Posterior. Toward the back or behind.

Proximal. Toward the body or nearest point of attachment.

Thoracic. Toward the chest.

Superficial. Near the surface.

Superior. Above or in an upward direction.

Ventral. In front or anterior.

Ventral cavities. Thoracic cavity; pleural cavity, pericardial cavity, mediastinum.

B. Terms for Spatial Orientation or Planes

Apex, apical. Referring to the top or tip of a body organ or part.

Base, basal. Referring to the foundation or lowest part.

Frontal, or coronal. Vertical plane parallel to the coronal suture of the cranium, dividing the body's front from the back at right angles to the midsagittal plane.

Longitudinal. Any plane parallel to the long axis of a structure.

Midsagittal. Vertical division of the body through the midline to make a left and a right half.

Parasagittal. Planes parallel and lateral to the midsagittal plane.

Sagittal. Parallel to midline.

Transverse, or horizontal. Dividing superior (upper) from inferior (lower) portions of the body.

C. Terms Used to Indicate Regions of the Body

Figure 3–1 illustrates some of these regions.

Abdominopelvic cavity. Abdominal cavity, pelvic cavity.

Axillary. In the armpit.

Cervical. Area involving the neck.

Clavicular. Near the clavicle.

Crural. Toward the shin and calf region of the leg.

Epigastric. Lower midchest; above the stomach.

Flank. Part of the body extending below the ribs to the ileum, the distal portion of the small intestine.

Hypochrondriac. Lateral, on either side of the epigastric region.

Hypogastric. Abdominal; below the stomach.

Inguinal. Lower pelvic regions; groin area.

Lumbar. Midlateral regions of the back.

Perianal. Around the anus.

Perineal. Between the anus and the genitalia.

Peritoneal. Pertaining to the membranous sac lining the abdominopelvic cavity containing the viscera (internal organs).

Sternal. Near the sternum.

Umbilical. Near the navel.

IV. ROOTS, PREFIXES, SUFFIXES, PLURALS, AND PRONUNCIATION

A. Roots

Aden– Gland, lymphatic, lymph nodal

Adip– Fat

Aer– Pertaining to air

Angio– Vessel

Arterio– Artery

Arth– Joint

Athero– Fatty substance

Blephar– Eyelid

Brachi– Arm

Carcin– Cancer

Cardi– Heart

Cerebro– Brain

Cephal– Head

Cerv– Neck

Cheil–, chil– Lip

Chem– Chemical

Chol– Bile

Chondr– Cartilage

Cost– Rib

Cis– To cut

Crani– Skull

Cysto– Bladder, biliary, urinary

Cyt– Cell

Dactyl– Finger, toe

Dermat– Skin

Dors– Back

Enter– Intestine

Gastr– Stomach

Gloss– Tongue

Glyco– Sweet

Gynec– Female

Hem– Blood

Hepa– Liver

Histo– Pertaining to tissue

Hydr– Water

Hyster– Uterus

Ile–, elie– Ileum (distal part of the small intestine)

Ili– Ilium (pelvis, hip bone)

Immun– Immunity

Inguino– Groin

Laryng– Larynx

Leuk– White

Lipo– Fat

Lith– Stone

Mening– Membrane

Metr– Uterus

Morph– Form, shape

Musculo– Muscle

Myel– Marrow

Myo– Muscle

Nephr– Kidney

Neuro– Nerve

Ophthalm– Eye

Oro– Mouth

Ortho– Straight

Osteo– Bone

Ot– Ear

Path– Disease

Pleur– Ribs

Pneum– Lung

Proct– Rectum

Psych– Mind

Pulmon– Lung

Pyel– Pelvis

Pyo– Pus

Radi– Ray, radiation

Rhino– Nose

Spondyl– Vertebral

Thorac– Chest

Trache– Neck

Ventr– Belly

Viscer– Organ

B. Prefixes

a–, an– without

ab– from, away from

acro– top

ad– increase, near, toward

ambi– found on both sides

ana– up, increase

ante– before

anti– against

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auto– self

bi– two, both

brady– slow

cata– down, decrease

circum– around

con– together

contra– opposite, against

cost– rib

cysto– sac, bladder

de– without

dia– through, between

dys– bad, poor, painful, difficult, abnormal

ecto– outside

ed– out of or from

em–, en– in

endo– within, inner

epi– upon, in addition, over

eso– inward

eu– normal, good

ex– external, outward

exo– outward

extra– outside of

fossa– hollow or depressed area

hetero– different

hemi– half

homo– same

hydro– water

hyper– above, excessive

hypo– beneath, deficient

iatro– related to medicine or a physician

in– not; inward

infra– below, beneath

inter– among, between

intra– within

isch– restriction

iso– equal

leuko– white

macro– large

medi– middle

mega– large

meso– middle

meta– beyond, change

micro– small size

my– to shut

neo– new

neutr– neutral

pan– all, total, wide

para– beside, near, abnormal

parentr– not directly into the intestine

per– through, by

peri– around, surrounding

post– after

poly– much, excessive

pre– before

pro– in front of, forward

pseudo– false

re– back

retro– backward, behind

semi– half

sub– below, under

super–, supra– above, beyond, superior

sym–, syn– with, together, beside

tachy– rapid, fast

trans– across, through

ultra– beyond, excess

un– not

C. Value Prefixes

bi– two

hemi– half

mono– one

multi– many

nulli– none

poly– many

pluri– many

primi– first

quadri– four

semi– partial, half

tetra– four

tri– three

uni– one

D. Suffixes

–algia. Pain

–ar, –ary. Pertaining to

–cele. Herniation, tumor, protrusion

–centesis. Puncture

–cyte. Cell

–dynia. Pain

–ectasis. Dilation

–ectomy. Excision, removal

–edasis. Expansion, dilatation

–emesis. Vomiting

–emia. Blood

–gen. That which produces

–genesis. Produces, generates

–genic. Origin, caused by or resulting from

–ia, –ic. State, condition

–iasis. Abnormal condition, formation of

–ism. State of

–itis. Inflammation

–logist. One who studies

–logy. Study of

–lysis. Breaking down, destruction

–lytic. Destruction

–malacia. Abnormal softening

–megaly. Enlargement, large

–oid. Resembling

–oma. Tumor, mass, swelling

–osis. Abnormal condition, disease

–pathy. Disease

–penia. Deficiency

–phobia. Fear

–plasia. Development, growth

–plasm. Formation, development

–plasty. Reconstruction

–ptosis. Falling, drooping

–ptysis. Spitting, coughing

–rrhage. Excessive, abnormal flow

–rrhagia. Abnormal flow condition

–rrhea. Discharge, flow

–rrhexis. Rupture

–sclerosis. Hardening

–stalsis. Contraction

–stasis. Stopped

–staxia. Dripping

–stenosis. Narrowing

–therapy. Treatment

–trophy. Nourishment, excessive development

–ule. Small

E. Procedure Suffixes

–centesis. Puncture to withdraw fluid

–ectomy. Removal

–gram, –graph. Record or image

–graphy. Process of recording

–meter. Measurement, measuring instrument

–metry. Process of measuring

–ostomy. Surgically create an opening

–otomy. Cutting into

–pexy, –pexis. Suspension, fixation

–plasty. Surgical repair

–plexy. Surgical fixation

–rrhaphy. Suture

–scope. Instrument for viewing

–scopy. Visually inspecting

–stomy. Creation of a new opening

–tomy. Incision into

–tripsy. Crushing

–trophy, –trophic. Relating to development, nourishment

F. Singular and Plural Forms

Singular		Plural
a as in bursa	to	**ae** as in bursae
us as in incus	to	**udes** as in incudes
us as in alveolus	to	**i** as in alveoli
um as in datum, or ovum	to	**a** as in data, or ova
ex as in apex	to	**ices** as in apices
ix as in appendix	to	**ices** as in appendices[1]
ax as in thorax	to	**axes** as in thoraxes
nx as in larynx, or phlanx	to	**nges** as in larynges[1] or phlanges
oma as in adenoma, or stoma	to	**omata** as in adenomata or stomata[1]
u as in cornu	to	**ua** as in cornua
ur as in femur	to	**ura** as in femura
us as in nucleus	to	**i** as in nuclei
is as in crisis	to	**es** as in crises

Singular		Plural
is as in iris	to	**ides** as in irides
er as in tuber	to	**era** as in tubera
en as in foramen	to	**ina** as in foramina
on as in criterion	to	**a** as in criteria

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[1]"Larynxes" and "stomas" are also conventional and "appendixes" is acceptable.

G. Latin Abbreviations

See Table 2–1, Abbreviations Used in Prescriptions.

a.m., p.m. *ante meridiem*, *post meridiem* (before midday, after midday)

c. *circa* (around)

C.V. *curriculum vitae* (course of life)

etc. *et cetera* (and other things)

i.e. *id est* (that is)

MD. *Medicinae Doctor* (teacher or scholar of medicine)

PhD. *Philosophiae Doctor* (teacher or scholar of philosophy)

vs or v. *versus* (against)

H. Pronunciation

–ae. When the *ae* ending is a plural of a Latin word, it is pronounced like the diphthong "i" as in the English word *tie*. For example, the plural word "petechiae," referring to small hemorrhages, is pronounced as /pe–**ti**-ki-a•I/. Words beginning with the letters ***aer*** are derivatives from Greek or combined forms using Greek and Latin. These letters are pronounced as "air" (e.g., "aerosol").

cn–, gn–, kn–, mn–, pn– Words beginning with *cn*, *gn*, *kn*, *mn*, and *pn*, as in cnemical, gnathic, knot, mnemic, and pneumonia, are pronounced as though they begin with "n" and the first letters are silent.

ps– Words beginning with *ps*, as in psychology, are pronounced as though they begin with "s."

pt– Words beginning with *pt*, as in ptosis, are pronounced as though they begin with "t."