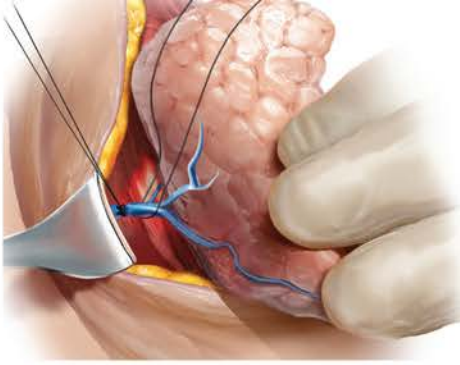
Fifth Edition

SURGICAL TECHNOLOGY

FOR THE SURGICAL TECHNOLOGIST

A Positive Care Approach



AST
Association of Surgical Technologists

SURGICAL TECHNOLOGY

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A Positive Care Approach

ASSOCIATION OF SURGICAL TECHNOLOGISTS, INC.

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Library of Congress Control Number: 2016952177

ISBN: 978-1-305-95641-4

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Printed in the United States of America
Print Number: 01 Print Year: 2017

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PREFACE

INTRODUCTION

Surgical Technology for the Surgical Technologist represents a significant change in the field of surgical technology education. Surgical technology faculty and students have long depended on textbooks prepared by and for the nursing student or nursing graduate to serve as the foundation text for surgical technology education. These textbooks, although excellent texts for their primary audience, contained a significant amount of information not related to the role of the surgical technologist. More significantly, these texts lacked the subtle observations and nuances that come from years of experience in the role of the surgical technologist. *Surgical Technology for the Surgical Technologist* is written by surgical technologists and surgical technology educators with many years of experience and commitment to the field of surgical technology.

Surgical Technology for the Surgical Technologist approaches the surgical technology student and instructor in an innovative manner. First and foremost, the textbook focuses on the knowledge, critical thinking, and cognitive skills required of the surgical technologist. Many specific practices and techniques are described, but all are placed in the context of the *A POSitive CARE Approach*. This approach provides a consistent and reliable way for students to learn and instructors to teach the knowledge and skills required of the surgical technologist.

The *A POSitive CARE Approach* focuses on the cognitive process used by the surgical technologist who is serving in the traditional role called "first scrub." The *A POSitive CARE Approach* for the surgical technologist finds its foundations in the following assumptions:

- The surgical technologist serves the patient's interest primarily by providing assistance to the surgeon.
- The surgical technologist's primary task during an operative procedure is to *anticipate* the intraoperative needs of the surgeon and surgical patient.
- To accomplish the primary task efficiently and effectively, the surgical technologist must learn to apply critical thinking skills and "think like the surgeon" intraoperatively.
- To accomplish the primary task efficiently and effectively, the surgical technologist must be well grounded in the basic sciences, especially anatomy, microbiology, and pathophysiology.
- The surgical technologist contributes to global patient care by serving as a team member who monitors the surgical environment along with the other team members.

The intraoperative team commonly makes these same assumptions and uses them to judge the competency of surgical technologists. Educators struggle to get students to anticipate the surgeon's next move or the effects of a given surgical action. Surgical technology graduates suddenly feel at home in the operating room when they begin to plan many steps ahead during an operative procedure. More important, the surgical technologist can be observed time and again to follow a specific sequence of cognitive steps. The cognitive steps require an adequate preparatory education. The surgical technologist must be well grounded in anatomy, pathophysiology, and microbiology. These studies are the foundation of all practices in the operating room. This information is the springboard to the cognitive activity of the surgical technologist.

The basic steps of the cognitive process are easy to define. The surgical technologist:

- has a mental image of normal anatomy;
- makes a mental comparison of the normal anatomy with the actual anatomy of a specific patient;

- knows the operative procedure used to correct the pathological condition;
- makes adjustments in instrumentation, supplies, and equipment according to variations in the pathology and the surgeon's needs;
- anticipates and prepares to meet the needs of the surgeon and surgical patient prior to the need being verbalized.

The cognitive sequence described is an anticipatory model. Its basis is the scientific method, and it differs only by type and depth of information from other models. The more information the surgical technologist has, the better she or he will be able to anticipate needs in the surgical setting and contribute to better patient care.

THE SURGICAL TECHNOLOGIST

Surgical Technology for the Surgical Technologist is written by surgical technologists and for surgical technologists. More specifically, it is written with the surgical technology student and instructor in mind, and it is focused on the surgical technologist in the first scrub role. Some of the underlying beliefs about the role of surgical technologists are:

- Surgical technologists are allied health professionals.
- Surgical technologists primarily render care to the patient by providing assistance to the surgeon.
- Surgical technologists primarily work in the role traditionally referred to as *first scrub.*
- Surgical technologists work within a synergistic team to provide care to the patient.
- Surgical technologists' knowledge, skills, and tasks sometimes overlap with the practice of other health care providers in the operating room.
- Surgical technologists best serve the patient when they have as much knowledge as possible to serve as an "extra pair of professional eyes and ears" in the operating room environment.

SURGICAL TECHNOLOGY EDUCATION

Surgical technology programs vary in format, length of time, and type of educational institution. Surgical technology programs are found in community colleges, vocational-technical schools, hospitals, universities, and the military. The programs vary in length from 12 to 24 months. The programs award certificates, diplomas, and associate-level degrees. In spite of the differences, there is a *Core Curriculum for Surgical Technology,* common accreditation standards, and considerable curriculum stabilization in terms of what topics are covered. Educationally, *Surgical Technology for the Surgical Technologist* is written with the following presumptions in mind:

- The necessary scope, sequence, and balance for surgical technology education are best delivered via an associate degree curriculum.
- Surgical technology students are best served when they have a solid background in the basic sciences.
- Students are best served when introductory anatomy and physiology with a focus on systemic anatomy and microbiology courses, with attendant lab sections, are taken as full-credit college-level courses, preferably as prerequisites.
  - Surgical anatomy should be taught within the context of surgical procedures without regard for the number of systemic anatomy courses that are taken.
  - Due to the variance in surgical technology programs, some basic microbiology should be included in the chapter on preventing disease transmission. (The authors do not suggest that it is inclusive.)
- A separate introductory pharmacology course is preferred. Due to the variance in surgical technology programs, some basic pharmacology should be included in the chapter on pharmacology and anesthesia. (The authors do not suggest that it is inclusive.)
- Surgical technology students (and their future patients) are worthy of the best educational program that can be provided.

Establishing a Cognitive Model

The question to ask is namely, what is the cognitive process used by the surgical technologist to perform the first scrub role during the surgical procedure? Physicians, for example, are educated according to what is commonly called the *medical model.* In other words, physicians are educated to think about health and health care in a certain way. Thinking this way does not guarantee a proper solution to a medical problem or exclude an error in judgment. Thinking this way does provide for a consistent method for approaching every medical question. This book establishes and uses a cognitive model for the surgical technologist performing the first scrub role to describe how a surgical technologist approaches the kinds of challenges faced daily in the operating room. The cognitive model is based on the fact that the primary task of the surgical technologist in the first scrub role is to anticipate a series of events and needs of the surgeon and surgical patient, given specific information. The cognitive educational model also prepares the surgical technologist to "think" like the surgeon in order to anticipate the surgeon's needs during

the procedure. Therefore, surgical technologists are considered to complete education and training under the medical model of education. The models serve the patient not by guaranteeing right solutions but by reducing errors in thought processes.

Surgical Procedures

Every textbook is limited in terms of space. However, a goal of the fifth edition is to present every procedure that is listed in the sixth edition *Core Curriculum for Surgical Technology*, and this edition achieves that goal. 191 procedures are offered in a comprehensive format utilizing the cognitive model for surgical technology.

THE *A POSITIVE CARE* APPROACH

This book will use a memory tool to reinforce the principles of the cognitive model. The memory tool is **"A POSitive CARE Approach."** The A POSitive CARE Approach is provided in two phases. The **A POS** phase comes directly from the cognitive model—Anatomy, Pathology, Operative procedure, and Specific variations. This phase directly relates to operative procedures. However, even technical information and skills serve a higher purpose. Logically, the psychological and philosophical desire to care for others precedes the development of knowledge and skills. The **CARE** phase is from the moral obligation to the surgical patient. This phase reinforces in the student's mind that caring attitudes and behaviors are a prerequisite to being a professional health care provider.

Using the *CARE* Acronym

The first 12 chapters are related to the CARE acronym. CARE is intended to remind the surgical technologist that all of his or her activities affect the care given to the patient. Caring behavior is primarily exhibited by consistent and professional concern for the technical tasks for which the surgical technologist is responsible. An improperly monitored surgical environment that leads to a contaminated surgical field resulting in a wound infection is inherently uncaring. The very nature of surgical intervention requires a heightened awareness of the effects of given behaviors:

C Care directed toward the patient and/or team
A Aseptic principles and technique
R Role of the surgical technologist
E Environmental awareness and concern

In the nonprocedural chapters, objectives will be oriented to the CARE acronym. For instance, the physical environment might have objectives such as these:

CARE

1. Discuss the relationship between the physical environment, safety procedures, and patient care outcomes.
2. Explain the relationship between asepsis and operating room design.
3. Discuss the relationship between proper operating room attire and asepsis.
4. Discuss the role of the surgical technologist in the maintenance of the operative environment.
5. Describe the physical layout of the operating room.
6. Describe the piped-in systems and the electrical outlets in an operating room.
7. State the proper ranges for temperature and humidity.
8. Explain the air ventilation system in the operating room, including laminar flow.
9. Discuss principles of environmental safety procedures.

Both the instructor and the student should be aware that the highly variable topics of these chapters do not allow for a simple one-to-one correlation of the CARE memory tool, but that it is a conceptual tool intended to help organize the information.

Using the *A POS* Acronym

The last 12 chapters relate to the A POS acronym and focus on operative procedures by surgical specialty. This systematic approach to intraoperative problem solving focuses on the ability of the surgical technologist to anticipate the surgeon's and patient's needs. **A POS** is defined as follows:

A Anatomy
P Pathology
O Operative procedure
S Specific variations

Each category has specific components. For instance, the surgical technologist is concerned with the following:

- Anatomy
  - Incision options
  - General systemic anatomy
  - Positioning
- Pathology
  - Diagnostic procedures
  - General pathology
  - Intended surgical outcomes
  - Potential morbidity
- Operative procedure
  - Patient safety
  - Procedural steps
  - Nonsterile equipment needed

- Sterile instrumentation, supplies, and equipment
- Suture and needles
- Dressings
- Immediate postoperative considerations
- Troubleshooting of equipment problems

- Specific variations
  - Common patient variations (such as age, size, gender, and other conditions)
  - Common equipment and instrumentation variations
  - Most common emergency conditions

Both the instructor and student will have the best results if they reinforce this format every time a procedure is addressed. The Study Guide and the Instructor's Manual will assist you in this effort.

GUIDELINES FOR THE STUDENT: LEARNING SURGICAL PROCEDURES

Surgical procedures are important to the surgical technologist for several reasons:

- Surgical procedures are the medical intervention taken to restore health to the surgical patient.
- Surgical procedures are the event around which most of the knowledge and skills of a surgical technologist are focused.
- Surgical procedures provide the best educational experience for learning "to think like a surgeon."
- Learning to think like a surgeon is the best way to organize the knowledge and skills required.

So how do you learn to think like a surgeon and apply it to the role of the surgical technologist? You learn it by repeated practice. As you will learn in this textbook, the process of becoming a health care professional, at every level, involves intellectual and physical development. The process includes developing specific knowledge, attitudes, perspectives, and physical skills. The following pattern is one that summarizes a specific approach to learning surgical procedures and serves as a mental checklist prior to each surgical procedure:

- Patient identification (name of patient, age, sex, allergies, prostheses)
- Surgeon and other team members
- Preoperative diagnosis
- Preoperative tests or diagnostic studies (results available in operating room, such as X-rays)
- Preoperative routines
- Anesthesia and anticipated challenges
- Surgical patient positioning and devices needed
- Surgical procedure to be performed, including anticipation of anatomical variations, incision, drains, closure, dressings
- Postoperative diagnosis
- Initial status of patient following completion of the surgical procedure

It is helpful for the surgical technology student to consistently follow this pattern of organization with variations that reflect the needs of the first scrub role until it becomes second nature. The student should notice that this process provides a consistent format for remembering information. It also allows the student to compare anesthesia, positioning, anatomy, procedure, and postoperative results learned in the classroom with what is seen in the operating room (OR). The student will discover that he or she remembers more information as experience is gained. As cases accumulate, the student will be able to identify variables such as different surgeons, anatomical situations, pathological conditions, and environmental conditions that resulted in variances. This helps the student to account for the variables and make better predictions about the patient's and surgeon's needs on the next similar case.

CORE CURRICULUM COMPLIANCE

The *Standards and Guidelines for an Accredited Educational Program in Surgical Technology* state that a program that is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) must demonstrate by comparison that the curriculum offered meets or exceeds the content demands of the latest edition of the *Core Curriculum for Surgical Technology,* published by the Association of Surgical Technologists (AST). This textbook offers the essential elements of the core curriculum (with the exception of the in-depth basic sciences that we believe require full-length courses for proper introduction to the core surgical technology courses, as described previously).

ORGANIZATION OF THE TEXTBOOK

This textbook comprises 24 chapters divided into three major content areas:

- Introduction to Surgical Technology
- Principles and Practice of Surgical Technology
- Surgical Procedures

Each chapter opens and closes with a case study to help apply material to real-life situations, and a key terms listing with online glossary is provided to help improve vocabulary.

- 191 surgical procedures detailed.
- The following format is applied for the surgical procedures: surgical anatomy, pathology, and preoperative diagnostic tests are presented at the beginning of each procedure in order to prevent the student from having to go back to the beginning of the chapter for information; equipment, instruments, and supplies unique to the procedure are listed to avoid repeating the information in each surgical procedure; preoperative preparation including positioning, anesthesia, skin prep, and draping are listed next; procedural considerations are listed directly under the steps of the surgical procedure; and lastly postoperative care, patient prognosis and wound classification information is provided.

NEW TO THE FIFTH EDITION

The changes to the fifth edition were based on extensive market feedback from surgical technology educators across the country. The publisher and authors have made every effort possible to consider and implement suggestions from current users of the textbook, and to improve the overall package.

In the fifth edition, new topics have been added, and others have been expanded and updated, including:

- Two new comprehensively illustrated procedures have been added: Open Nephrectomy and Lumbar Laminectomy.
- Surgical Team section in Chapter 1 has been rewritten and reorganized.
- Chapter 5 includes additional details about operating room furniture (including back table, mayo stands, ring stands, and anesthesia cart). Additional safety guidelines for ionizing radiation, electrical hazards, fire hazards, laser fire hazards, and sharps safety are included in the fifth edition.
- Chapter 6 has been renamed to reflect a focus on minimally invasive surgery.
- Chapter 11 has been renamed to highlight the topic of hemostasis.
- Chapter 12 updates include additional information on the admissions process, circulator roles/responsibilities, preop hygiene, patient transfer to OR, transfer and positioning of the OR table, thermoregulatory devices, vital signs, positioning the surgical patient, and urinary catheterization. Details about positioning, including reason for use, benefits, and potential hazards, have been added to all of the surgical position techniques.
- Chapter 13: Diagnostic Procedures—further details added for sources of patient data, history and physical examination, diagnostic imaging, plain radiography, mammography, MRI, echocardiography, plethysmography and phleborheography, electrocardiography (ECG, EKG), electroencephalography (EEG), electromyography (EMG), intraoperative neuromonitoring, intraoperative neuromonitoring, urinalysis, bacteriological tests, culture and sensitivity, gram stain, incisional and excisional biopsy, and care and handling of surgical specimens. Information has also been added for radiopaque contrast media imaging, CAT scan, fluoroscopy, urography, radioisotope imaging, positron emission topography, scintigraphy, pulmonary assessment, needle biopsy, washings and brush specimens, centesis and fluid analysis, and spinal tap.
- Ch. 14: General Surgery—bowel technique updated; expanded information on laparoscopic instrumentation; separate Part III with expanded information to address hernias.
- Ch 16: Ophthalmic Surgery—details have been added for several procedures, including Procedure 16-3 Iridectomy; Procedure 16-4 Strabismus Correction: Recession/Resection; Procedure 16-6 Dacryocystorhinostomy (DCR); Procedure 16-8 Keratoplasty (Corneal Transplant); and Procedure 16-9 Extracapsular Cataract Extraction.
- Ch 21: Orthopedic Surgery—additional details on bone tissue, Table 21-2 Orthopedic Pathologies has been significantly updated, and updates were added to Procedure 21-10 Total Hip Arthroplasty: Posterolateral Approach.
- Ch 23: Peripheral Vascular Surgery—surgical anatomy and pathology added to for Procedure 23-3 Angioplasty; Procedure 23-6 Abdominal Aortic Aneurysm with Graft; Procedure 23-7 Aortofemoral; Procedure 23-8 Femoropopliteal Bypass; and Procedure 23-11 Arteriovenuous Fistula and Shunt.

TEACHING AND LEARNING PACKAGE

The publisher has provided a complete learning package to accompany the fifth edition of *Surgical Technology for the Surgical Technologist: A Positive Care Approach*. Each supplement is authored by qualified educators currently teaching in surgical technology programs around the country.

Student Resources

The following resources were developed to aid students in the learning and practice of information essential to becoming a surgical technologist.

Study Guide to Accompany Surgical Technology for the Surgical Technologist ISBN: 978-1-305-95643-8

Revised to reflect the changes in the core text, the addition of numerous new questions, and new question types, the Study Guide is a robust resource for practicing surgical technology skills and concepts. Skill assessments track mastery of procedural skills, case studies develop critical thinking, and review questions build knowledge and confidence.

Student Companion Website

Students can find supplemental materials, including Appendix B—Common Measurements and Suffixes, Appendix C—Measurements, and Glossary, as well as additional learning materials on the Student Companion Website.

Go to www.cengagebrain.com and follow the onscreen instructions to access these resources.

MindTap

MindTap is a fully online, interactive learning experience built on authoritative content from the Association of Surgical Technologists in conjunction with Cengage Learning. By combining readings, multimedia, activities, and assessments into a singular learning path, MindTap elevates learning by providing real-world application to better engage students. Instructors customize the learning path by selecting Cengage Learning resources and adding their own content via apps that integrate into the MindTap framework seamlessly with many learning management systems. The guided learning path demonstrates the relevance of anatomy and physiology and surgical procedures to surgical technology professionals through engagement activities and interactive exercises. Learners apply an understanding of surgical instrumentation through games and simulation exercises. These simulations elevate the study of surgical technology by challenging students to apply concepts to practice.

To learn more, visit www.cengage.com/mindtap.

- IAC: 978-1-305-95646-9
- PAC: 978-1-305-95647-6

Instructor Resources

The following comprehensive tools are available to instructors to enhance the planning and implementation of their instructional program.

Instructor Companion Website to Accompany Surgical Technology for the Surgical Technologist ISBN: 978-1-305-95644-5

Spend less time planning and more time teaching with Cengage Learning's *Instructor Resources to Accompany Surgical Technology for the Surgical Technologist,* fifth edition. This online resource provides a number of tools to aid with course management, testing, and evaluation.

- The *Instructor's Manual to Accompany Surgical Technology for the Surgical Technologist,* fifth edition, contains a number of aids designed to simplify course management tasks and evaluation of learner progress. The downloadable manual includes a correlation chart that maps text content to the requirements of the *Core Curriculum for Surgical Technology,* sixth edition. Also provided is a list of Skill Assessments that appear in the Study Guide. Answer keys are given for the Case Studies and Questions for Further Study that appear in the textbook, and answer keys for all Study Guide exercises are also provided. Numerous new chapter pop quizzes have also been provided, along with answer keys, which can be printed and passed out to students for quick assessments. Additional new instructor support materials include sample syllabus and lesson plans, teaching notes for instructors' personal development, and handouts for students.
- PowerPoint® presentations for each chapter contain key concepts and images from the textbook.
- Cengage Learning Testing powered by Cognero is a flexible online system that allows you to author, edit, and manage test bank content with any operating system or browser. Create multiple test versions in an instant and deliver from your learning management system (LMS), your classroom, or wherever you want.

The Instructor Companion Website can be accessed by going to www.cengage.com/login to create a unique user login. Once your instructor account is activated, you'll have the Instructor's Manual, PowerPoints, Test Bank Questions, and more right at your fingertips.

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SECTION 1

INTRODUCTION TO SURGICAL TECHNOLOGY

CHAPTER 1

Orientation to Surgical Technology

Case Study A 42-year-old female patient has been scheduled for a diagnostic laparoscopy to search for any pathology causing her chronic pelvic pain. While in the preoperative holding area, a registered nurse (RN) performed the nursing evaluation: checked the patient's documentation, history and physical, allergies, and special needs, while providing emotional support. The anesthesia care provider reviewed the surgical steps and started an IV line. The RN and an OR nursing assistant bring the patient on the stretcher into the OR. The patient notices a person in the OR wearing a surgical gown, mask, gloves, hair cover, and protective eyewear; this person is setting up surgical instruments, equipment, and supplies on a large table draped in blue material. This strange-looking person steps back from the table, turns to the patient, and says, "Good morning, my name is Karen. I'm a Certified Surgical Technologist (CST), and I'll be assisting Dr. Lee today."

1. In what nursing role is the RN functioning?
2. In what surgical technologist role is Karen functioning?
3. What is the preferred educational background for Karen as established by the Association of Surgical Technologists?
4. What organization is responsible for accrediting the school Karen attended?
5. What organization offers the CST examination that Karen successfully passed?

Objectives

After studying this chapter, the reader should be able to:

C 1. Demonstrate the principles of communication in the surgical setting.
A 2. Trace the historical development of surgical technology.
3. Recognize members of the surgical team and their roles.
R 4. Describe the surgical technology professional organizations: AST, ARC/STSA, NBSTSA.

5. Compare and contrast the various roles of the surgical technologist.
6. Interpret the components of a job description for the surgical technologist.
7. Analyze the components of effective teamwork and communication.
8. Discuss the meaning of *surgical conscience* and its application to surgical technology.
9. Summarize the different types of health care facilities.
10. Analyze a typical hospital organizational structure.
11. Classify hospital departments and their relationship to surgical services.

E

Select Key Terms

Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC/STSA)
ambulatory surgery center (ASC)
American College of Surgeons (ACS)
Association of Surgical Technologists (AST)
circulator
competency
confidentiality
Core Curriculum for Surgical Technology
doctor of osteopathy (DO)
elective
emergency
health maintenance organization (HMO)
intraoperative
National Board of Surgical Technology and Surgical Assisting (NBSTSA)
optional
perioperative
postoperative
preceptor
preoperative
professional
proprietary
surgical conscience
surgical technologist
The Joint Commission
urgent

HISTORY OF SURGERY

The history of surgery involves insights into the nature of human anatomy and physiology based on the contemporary understanding of the world at the time. For example, in the Western World, the Classical period is recognized for its intellectual contributions to society. Theorists such as Hippocrates and Aristotle were insightful and influential, but the scientific method had yet to be established and natural phenomena were mainly explained by philosophical means.

The Middle Ages followed in Europe at the fall of the Roman Empire. Intellectual achievements were limited during this time and the few handwritten documents that were created were lost. The Renaissance period began and innovative thinking contributed to the development of modern theories, including those pertaining to the human body.

In his book *De humani corporis fabrica libri septem* (which is Latin for "On the Fabric of the Human Body in Seven Books"), Andreas Vesalius was able produce and distribute detailed illustrations due to the introduction of typography and moveable type printing. Almost single-handedly, Vesalius overthrew 1500 years of established anatomical teaching. His studies reached a larger audience and helped physicians gain insight into human anatomy; however, modern surgery as we know it was still not possible.

It wasn't until the relatively recent progress in pain management, infection control, and hemostasis that modern surgery became possible. We are now able to treat conditions that were previously untreatable. In the future, surgical intervention will be radically changed due to discoveries in areas such as targeted therapy drugs, bioengineered tissues, and gene therapy, just to name a few. A select review of the history of surgery is presented in Table 1-1.

HISTORY OF SURGICAL TECHNOLOGY

Surgical technology as we know it began in Britain and the United States following World War II. Surgeons have had nonphysician and non-nursing assistants since the beginning of surgical history. The military, in particular, used nonphysician and non-nursing assistants in various roles, partly because women were excluded from the battlefield. Key events in surgical technology are outlined in Table 1-2.

TABLE 1-1 Select History of Surgery Timeline (Dates Are Approximations)

4000 B.C.	Cuneiform script	First anatomical descriptions of human organs on tablets from Nineveh
2500 B.C.	Imhotep	Revered Egyptian physician (declared divine); wrote an early "book" on surgery
2000 B.C.	Code of Hammurabi	Medical practices of the day described; some reflect real insight into disease; most are religious in nature
1500 B.C.	Vedas (Hindu)	Correlates "sweet smell" of urine with a specific disease
1000 B.C.	Homer	Early Greek history/myth provides a view of military medicine of the day
500 B.C.	Aristotle	Established an early "scientific" mindset; founder of comparative anatomy
A.D. 47	Celsus	Described the signs of inflammation
A.D. 162	Galen	First great anatomist; controlled thought, unchallenged, for 1500 years; biology made to serve theology
1500	Pare	Greatest surgeon of the 16th century; began to ligate arteries after amputation; stopped cauterizing wounds with hot irons and oil
1500	Vesalius	Father of modern anatomy; challenged Galen openly and correctly; performed dissections on human cadavers himself; used illustrators to create permanent records; changed the whole approach to anatomical studies
1800	Jenner	Inventor of the vaccination for smallpox
1850	Pasteur	Father of microbiology, virology, and immunology
	Lister	Developed technique of antiseptic surgery
	Billroth	Responsible for advances in surgical procedures; best known for gastrectomy procedures
	Halsted	Developed meticulous closure of wounds
	Biejerinick	Developed the concept of a virus
	Roentgen	Developed the X-ray machine
1900	Cushing	Father of neurosurgery; reduced mortality rate for meningiomas from 96% to 5%
1950	Cooley	Perfected the heart-lung machine; performed first U.S. heart transplant and first total artificial heart implant
	DeBakey	Developed the first ventricular assist pump
1980s		Technological revolution begins; endoscopic surgery becomes routine
1990s		Computer age changes surgery; stereotactic approach to neurosurgery; virtual reality offers promise for education and clinical practice
2000s		Minimally invasive surgical (MIS) techniques, including lasers and robotic-assisted surgery, continue to evolve with the advances in biotechnology

THE SURGICAL TEAM

The surgical team is composed of four basic members: the surgeon, the first scrub, the anesthesia care provider, and the circulating nurse. All of these team members are responsible for the three phases of surgical case management: preoperative, intraoperative, postoperative. Each member functions in one of two capacities: nonsterile or sterile. All surgical team members must adhere to the principles of asepsis and the practice of sterile technique (refer to Chapter 7). While the surgical technologist (ST) in the first scrub role is the focus of this textbook, an overview of the roles and responsibilities of each surgical team member is provided.

Nonsterile Surgical Team Members

The nonsterile team members are the anesthesia care provider and the **circulator**. Additional personnel such as a radiology technologist, patient care technologist, or a pathologist may also be present in the operating room during a procedure.

TABLE 1-2 Select History of Surgical Technology Timeline

Date	Place or Actor	Event or Information
Late 19th century	London Hospital	Mr. Rampley employed in the operating room (OR) as "surgery beadle" (theater technician)
1948	Britain	Formation of the Operating Theater Technicians
Early 1950s	United States	Early development parallels Britain: • Many OR technicians educated in the military • Civilian education predominantly on the job and widely varying in expectations
1954	American Hospital Association	Publication of first book focused on OR technicians: *Surgical Technical Aide—Instructor's Manual* (Ginsberg)
1959	Association of Operating Room Nurses (AORN) Board of Directors	Forms survey group to study the needs of OR technicians
Dec. 1967	AORN Manual Committee	A new publication: *Teaching the Operating Room Technician*
Feb. 1969	AORN House of Delegates	A critical proposal: "The Association of Operating Room Nurses, Inc. (AORN) shall structure an associated organization for Operating Room Technicians, under the auspices of AORN. This organization will be known as the Association of Operating Room Technicians (AORT) and the two associations shall relate to each other through an Advisory Board at both the Local and National levels"
July 19–20, 1969	New York Conference	Formal Organization: Association of Operating Room Technicians (AORT)
Dec. 1970	AORT Board of Directors and Advisory Committee	• Certification selected over licensure • First examination given
1972	American Medical Association House of Delegates	Fundamentals of an education program for the OR technician adopted
1972	AORT	First edition of *O. R. Tech* magazine
1973	AORT and AORN	National Advisory Board dissolved "as AORT was able to assume the responsibilities of managing its own association."
1974	The Liaison Council on Certification for Surgical Technology (LCC-ST)	LCC becomes arm of AST responsible for certification
1974	Accreditation Review Committee on Education in Surgical Technology (ARC-ST)	ARC on Education for the ORT appointed (Commission on Accreditation of Allied Health Education Programs [CAAHEP] system)
1978	AORT National Conference	AORT changes name to **Association of Surgical Technologists (AST)**; OR Tech magazine changes to the journal *The Surgical Technologist*
1981	AST	***Core Curriculum for Surgical Technology*** (1st ed.) published
1985	AST	Code of Ethics published
Nov. 1986	*The Surgical Technologist*	Claire Olsen introduces associate degree discussion
May 1988	AST House of Delegates	First edition AST Standards of Practice adopted
Nov. 1990	ASA	Job description for Surgical First Assistant published; revised in 2008
Mar. 1992	ASA	Surgical assisting core curriculum published; revised in 2014
2006	LCC-ST	LCC-ST changes name to National Board of Surgical Technology and Surgical Assisting (NBSTSA)
2006– Present	AST	Comprehensive "Recommended Standards of Practice for Surgical Technology & Surgical Assisting" published
2009	ARC/STSA	ARC-ST changes name to Accreditation Review Council on Education in Surgical Technology and Surgical Assisting

Anesthesia Care Provider

The anesthesia care provider may be a physician (MD), **doctor of osteopathy (DO)**, or a certified registered nurse anesthetist (CRNA). They may be assisted by an anesthesia technologist. Their duties include:

- Assess the patient preoperatively.
- Determine the type of anesthetic to be administered.
- Discuss the risks and benefits of the planned anesthetic with the patient and obtain the informed consent for anesthesia.
- Offer alternative anesthetic options to the patient, if necessary.
- Determine the patient position in consultation with the surgeon.
- Manage all phases of anesthesia (refer to Chapter 9).
- Monitor the patient's vital signs during the surgical procedure.
- Provide supportive measures such as fluid and airway management.

Circulator

The circulator is a registered nurse (RN). Duties of the circulator include:

- Assist the surgical technologist with preparation of the OR.
- Ensure documents and reports such as history and physical (H&P), surgical consent, diagnostic and laboratory results, and X-rays are available.
- Conduct the preoperative patient interview with the anesthesia care provider.
- Transport the patient from the pre-op holding area to the OR and assist transferring the patient from the stretcher to the OR table.
- Assist with positioning the patient.
- Perform the patient skin preparation (see Chapter 12).
- Connect various cords and tubes.
- Assist with initiating the surgical *time out*.
- Perform surgical counts with the first scrub ST.
- Provide additional items to the sterile field during the procedure as needed.
- Maintain the operative record (charting).
- Assist with the appropriate care of specimens.
- Secure dressings.
- Assist with transferring the patient from the OR table to the stretcher at the completion of the procedure.
- Assist with transporting the patient to the post anesthesia care unit (PACU).
- Assist with preparing the OR for the next patient (OR turnover).

Sterile Surgical Team Members

Sterile team members include the surgeon, first scrub surgical technologist, and surgical first assistant. The following provides a brief outline of the duties of each of these members.

Surgeon

The surgeon may be an MD, DO, doctor of podiatric medicine (DPM), or a doctor of dental science (DDS). Some of the duties of the surgeon include the following:

- Determine the necessity of surgical intervention and the type of procedure to be performed.
- Offer possible alternative treatment options, if necessary.
- Discuss the risks and benefits of the planned procedure with the patient and obtain the surgical consent.
- Identify the correct surgical site.
- Assist with the surgical time out.
- Perform the surgical procedure.
- Provide follow-up patient care.

Surgical First Assistant

The surgical first assistant (SFA) may be a physician (MD or DO) or a nonphysician Certified Surgical First Assistant (CSFA®). The SFA provides aid in exposure, hemostasis, closure and other intraoperative technical functions that help the surgeon carry out a safe operation. In addition to intraoperative duties, the SFA also performs preoperative and postoperative patient care duties. The SFA performs these duties under the direction and supervision of the surgeon that includes some of the following:

- Assist in positioning the patient.
- Assist with draping the patient (Figure 1-1).
- Participate in the surgical time out.

Figure 1-1 Surgical first assistant helping to drape the patient

- Provide exposure and visualization of the surgical site through retraction of tissue, suctioning, and sponging.
- Assist in identifying anatomical structures and landmarks.
- Assist with achieving temporary or permanent hemostasis.
- Closure of body planes.
- Apply dressings as directed by the surgeon.
- Assist in transferring the patient from the OR table to the stretcher.

First Scrub Surgical Technologist

The first scrub ST performs many nonsterile, pre- and postoperative case management duties along with sterile, intraoperative duties. Some of them include the following:

Preoperative Case Management

- Gather the necessary case cart, equipment, and supplies.
- Review the patient's information.
- Arrange the OR furniture.
- Perform the surgical scrub.
- Don the sterile gown and gloves.
- Create and maintain the sterile field.
- Organize the sterile field for use including labeling of medications (Figure 1-2).

Figure 1-2 Surgical technologist organizing the back table

Figure 1-3 Surgical technologist passing a scalpel to the surgeon

- Perform initial counts with the RN circulator.
- Gown and glove other sterile team members.
- Assist with draping the patient (Figure 1-1).

Intraoperative Case Management

- Maintain the sterile field, including establishing a neutral zone.
- Participate in the surgical time out.
- Anticipate the needs of the patient and surgeon to provide the necessary items in the order needed.
- Pass instruments and supplies to the surgeon (Figure 1-3).
- Prepare irrigation fluids and other medications.
- Perform additional surgical counts as needed.
- Maintain appropriate care of specimens.
- Clear residual blood and skin prep solution from the patient prior to the application of the sterile surgical dressings as directed by the surgeon.

Postoperative Case Management

- Maintain a sterile field until the patient has been transported from the OR suite.
- Separate instruments and disassemble the sterile field.
- Place sharps in a secured sharps container.
- Place contaminated items in biohazard bags.
- Transport instruments to the decontamination area.
- Coordinate and assist with room turnover.

TABLE 1-3 **Role Definitions of the CST**

Role	*Description*	*Examples of Duties*
Certified Surgical Technologist First Scrub	Sterile surgical team member who prepares the surgical environment, maintains and monitors the sterile field, and passes instrumentation, supplies, and equipment to the surgeon and other team members	• Anticipates needs of the surgeon and patient • Organizes the sterile field • Applies sterile surgical drapes • Passes sterile instruments, equipment, and supplies to surgeon and other sterile team members • Prepares, labels, and handles medications at the sterile field • Performs sponge, sharps, and instrument counts • Handles surgical specimens • Applies sterile dressings to surgical wounds
Certified Surgical Technologist Second Scrub	Sterile surgical team member who assists the surgeon by providing visualization of the surgical wound and assists with hemostasis and wound closure	• Provides visualization of the surgical site through retraction of tissue or manipulation of endoscope • Suctions blood and body fluids from wound • Sponges the surgical site • Assists with opening and closing the surgical incision
Certified Surgical Technologist Assistant Circulator	Nonsterile surgical team members who are responsible for providing an optimal surgical environment for the patient	• Prepares the OR • Transports the patient to the OR • Positions the patient • Performs the surgical skin prep • Dispenses additional items to the sterile field • Maintains the patient's operative record • Assists the anesthesia provider
Surgical First Assistant	Sterile surgical team member, CST, or CSFA who has obtained additional knowledge and experience and obtained an appropriate surgical assistant credential	• As defined by the American College of Surgeons (ACS), the surgical assistant provides aid in exposure, hemostasis, and other technical functions that will help the surgeon carry out a safe operation with optimal results for the patient. • Additional functions include, but are not limited to: ◦ Positioning the patient ◦ Suturing and closure of body planes and skin ◦ Application of dressings

Second Scrub Surgical Technologist

The second scrub surgical technologist assists the surgeon during the operative procedure by carrying out tasks that might, in some circumstances, be performed at the same time as the first scrub role. However, during large and/or complicated procedures a second surgical technologist often performs these duties. Duties include but are not exclusive to the following:

- Sponging.
- Suctioning.
- Cutting sutures.
- Apply electrocautery to clamps on bleeders.
- Hold retractors or instruments as directed by the surgeon.
- Maneuver the endoscopic camera as directed by the surgeon.

Table 1-3 provides additional information on the various roles the ST may fulfill in the OR.

AREAS OF SPECIALTY AND CLASSIFICATION OF PROCEDURES

Surgery is divided into several specialties and the surgeon chooses the specialty in which he will focus on providing to patients. Usually in larger hospitals, surgical technologists might also choose a specialty to focus on, such as being a member of the cardiovascular, ophthalmology, or orthopedic surgical team.

Specialties

The medical field is divided into categories known as specialties. The **American College of Surgeons (ACS)** and the American Board of Specialties (ABMS) recognizes 14 surgical specialties. Although medical licensure sets the minimum competency requirements to diagnose and treat patients, certification in a specialty declares a physician qualified to do so in that specialty. In order to receive board certification a candidate must complete four years of premedical education, four years of medical school that leads to a degree such as MD, DO, or DDS, completion of multiple years in an accredited residency training program gaining experience in the surgical specialty, and passing the board certification examination for the surgical specialty. The surgical specialties include:

- General
- Orthopedic
- Ophthalmic
- Genitourinary
- Neurosurgery
- Cardiothoracic
- Peripheral vascular
- Otorhinolaryngology
- Oral and maxillofacial
- Obstetric and gynecology
- Plastic and reconstructive

These specialties are further divided into subspecialties that focus on specific areas of surgical care. For example, while the focus of pediatric surgery is on providing care for all conditions affecting children, a surgeon may have particular expertise in neonatal, prenatal, trauma, or pediatric oncology. Surgeons may participate in fellowship programs to develop their expertise in these areas.

Classification of Surgery

Surgical procedures for all specialties can be classified into broad categories based on the level of urgency for the surgery:

- **Emergency**: A medical emergency that requires immediate surgical intervention (e.g., craniotomy for a subdural hematoma or ruptured abdominal aortic aneurysm)
- **Urgent**: A medical condition that requires surgical intervention within a short period of time (e.g., unruptured ectopic pregnancy with stable vital signs)
- **Elective**: A planned, nonemergency, nonurgent procedure that may be either required for quality of life considerations (total joint arthroplasty) or **optional** (rhinoplasty)

Within each surgical classification there are three phases of surgical case management: **preoperative**, **intraoperative**, and **postoperative**; the term that refers to all three phases of surgery is **perioperative**.

SURGICAL TECHNOLOGY PROFESSION

Surgical technologists are allied health professionals who are an integral part of the team of medical practitioners providing surgical care to patients. Surgical technologists work under the supervision of a surgeon to facilitate the safe and effective conduct of invasive surgical procedures, ensuring that the operating room is safe, that equipment functions properly, and the operative procedure is conducted under the conditions that maximize patient safety. Surgical technologists possess expertise in the theory and application of sterile and aseptic technique and combine the knowledge of human anatomy, pathology, surgical procedures, and implementation of instruments and technologies to facilitate a surgeon's performance of invasive therapeutic and diagnostic procedures.

To be a **professional** means to maintain competence in a specialized body of knowledge and skills. It encompasses attitudes, values, and behaviors. Professionals must strive to learn, understand, and exhibit the characteristics that develop their vocation as a profession and not merely an occupation. In order to do so, one must continually seek opportunities for professional and personal growth.

Professionalism begins with **competency** in the workplace. Both employers and patients deserve to have a dependable health care provider. In order to achieve this one must commit to the following:

- Continuing education
- Being nonjudgmental of patients
- Surgical conscience and honesty
- Respect for the patient's decisions
- Ability to communicate effectively
- Willingness to serve on committees
- Consistent attendance and punctuality
- Maintaining the patient's confidentiality
- Willingness to learn and cope with change

Surgical Technology Education and Certification

Surgical technologists are graduates of accredited programs that are offered by community colleges, technical/vocational schools, universities/colleges, hospitals, and the military. Upon graduation from an accredited program, the individual is eligible to take the national certification examination.

Education

Surgical technology programs are accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). CAAHEP is a recognized accrediting organization by the Council for Higher Education Accreditation (CHEA). The **Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC/STSA)** is a

commission on accreditation under the umbrella of CAAHEP; ARC/STSA is responsible for ensuring that accredited programs continue to meet or exceed the standards for education as established by CAAHEP. Agencies related to surgical technology education are listed at the end of the chapter.

Surgical Technology Certification

National certification is offered by the **National Board of Surgical Technology and Surgical Assisting (NBSTSA)**. The Certified Surgical Technologist (CST) credential is earned when the individual successfully passes the national certification examination following completion of an accredited surgical technology program. Eligibility to take the certification examination is restricted to graduates of CAAHEP and Accrediting Bureau of Health Education Schools (ABHES) accredited programs. Certification requirement may be a condition of employment by an employer or required by state legislation; however, in some instances, it may be voluntary. CSTs maintain their certification by completing 60 continuing education credits during the four-year certification cycle or retaking the certifying examination at the conclusion of the four-year cycle.

AST: Professional Organization for Surgical Technology

The Association of Surgical Technologists (www.ast.org) is the national nonprofit organization for STs (Figure 1-4). It was established in 1969 and represents surgical technologists to ensure they have the knowledge and skills required to administer patient care of the highest quality. AST's mission statement "Enhancing the profession to ensure quality patient care" supported by the guiding principle of *Aeger Primo* (The Patient First) reflects the role of the professional organization. AST works with the ARC/STSA and NBSTSA to set standards for education and certification, and represents the profession at state and national levels to ensure graduation from an accredited program and that all surgical technologists attain the Certified Surgical Technologist (CST) credential as a condition of employment. AST provides continuing education opportunities to advance the knowledge and skills base of practicing surgical technologists. See Table 1-4 for further information.

Courtesy of the Association of Surgical Technologists

Figure 1-4 Association of Surgical Technologists logo

Table 1-4 Agencies Related to Surgical Technology Education

Association of Surgical Technologists (AST) (303-694-9130; www.ast.org): National nonprofit organization that represents STs through support of legislative activities, education standards, and continuing education.
Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC/STSA) (303-694-9262; www.arcstsa.org): Part of the CAAHEP system of program accreditation. Commission on Accreditation of Allied Health Education Programs (CAAHEP) (727-210-2350; www.caahep.org).
National Board of Surgical Technology and Surgical Assisting (NBSTSA) (800-707-0057; www.nbstsa.org): Responsible for the development and delivery of the national certification examinations as well as recertification.

Career Development and Opportunities

Most STs are employed in hospital surgery departments, labor and delivery departments, and ambulatory surgery centers to perform the first scrub role. To make the transition from student to employee, basic employability skills are needed to obtain and maintain a job:

- Dedication: empathy, devotion, and vocation
- Communication skills: verbal and nonverbal
- Work ethic: professional and personal honesty; moral integrity; strong desire to help others and make a valuable contribution to society
- Accountability: responsibility for your own actions
- Adaptability: ability to change to accept positive outcomes
- Conflict resolution: making a difference between positive and negative results
- Detail oriented: must be able to work quickly and accurately
- Responsibility: stable temperament and strong sense of responsibility
- Physical characteristics: excellent manual dexterity, good vision and hearing, physical stamina are vital
- Commitment to continuing education: enhancing your knowledge and personal growth
- Personal appearance and hygiene: important grooming habits for health care professionals

A key characteristic that the ST should exhibit is critical-thinking/problem-solving skills that are applied during all phases of surgical patient care. Good problem-solving skills include the following:

- Ability to prioritize and choose problems that can be solved within the time frame
- If time is short and the optimal solution cannot be implemented, exhibit the ability to consider alternative solutions that still solve the problem
- Ability to evaluate if problem can be solved on an individual basis or determine if others need to be involved
- Ability to work with others as a team to choose and implement best solution
- Ability to assess the results of the solution and identify with team members improved solutions in case the situation is reencountered in the future

Other characteristics important to performing in the OR are listed in Table 1-5.

TABLE 1-5 Surgical Technologist: Nature of the Position

The surgical technologist is expected to:

- Stand, bend, stoop, and/or sit for long periods of time in one location with minimal/no breaks.
- Refrain from nourishment or rest room breaks for long periods of time.
- Demonstrate sufficient visual and tactile ability to load fine suture onto needles and needle holders while wearing safety glasses.
- Hear and understand muffled communication without visualization of the communicator's mouth/lips.
- Hear activation/warning signals on equipment.
- Manipulate instruments, supplies, and equipment with speed, dexterity, and good eye–hand coordination.
- Assist with and/or lift, move, position, and manipulate patients.
- Perform tasks such as, but not limited to, mentally tracking surgical supplies and performing anticipation skills intraoperatively.
- Make appropriate judgments and decisions.
- Demonstrate the use of positive coping skills under stress.
- Demonstrate calm and effective responses, especially in emergency situations.
- Exhibit positive interpersonal skills in patient, staff, and faculty interactions.

Courtesy of the Association of Surgical Technologists

Job Descriptions

Health care workers must be aware of their job description at the facility of their employment. Regardless of the employment situation, the job description may establish the criteria by which the ST will be judged in a case concerning alleged negligence or malpractice. A copy of the job description should be kept in a professional file at home and updated as necessary. Should any of the components of a facility's standard job description be missing, it should be reported to a supervisor for inclusion in the description. The following items should be included in a job description:

- Job title (e.g., surgical technologist level 1)
- Requirements (e.g., graduation from an accredited program and national certification)
- Nature of the position (e.g., the surgical technologist is a member of the intraoperative surgical team)
- Duties (e.g., the surgical technologist, level 1, shall perform in the first scrub role and shall be responsible for . . .)
- Accountability (e.g., the ST shall be directly accountable to the director of surgical services)
- Immediate supervisor (e.g., the immediate supervisor for all surgical services personnel is the OR manager)
- Work hours (e.g., evening or night shift work; weekend; holidays; "emergency call")

With additional education, training, and experience, the ST can assume a challenging career by specializing, accepting management opportunities, or by advancement in other related fields of expertise. Traditionally, STs have been employed by hospitals or ambulatory surgery centers. With the advent of the private and traveling ST, the employer may be a physician, a physician's group, or an agency. In some locations, an ST who is employed outside the facility may be required to seek permission to work through a medical credentials committee. Employment options available to the experienced ST include:

- Office manager
- Surgery scheduler
- Veterinary assistant
- Anesthesia technician
- Organ and tissue procurement technician
- Private employment by a surgeon or group
- Research and product development assistant
- Medical services and equipment salesperson
- Surgical technology educator and/or program director (Figure 1-5)
- Employment in material management or sterile processing (Figure 1-6)
- Specialization in a surgical specialty such as orthopedics, cardiovascular surgery, or trauma

Figure 1-5 Surgical technology educator demonstrating the technique for placing a scalpel blade on a scalpel handle

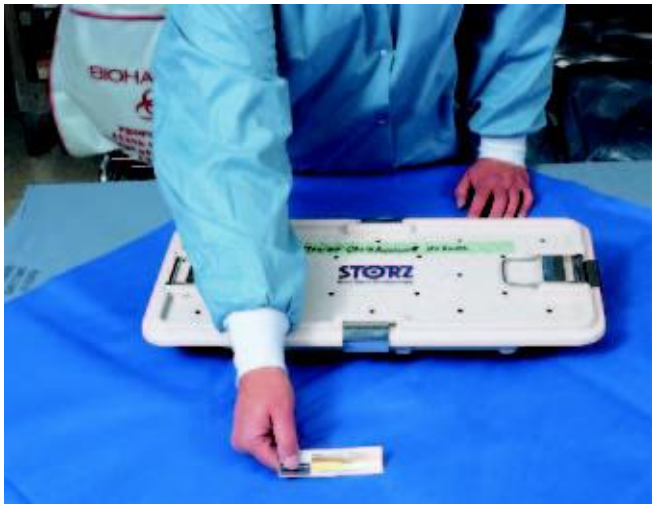

Figure 1-6 Surgical technologist preparing supplies for sterilization in the sterile processing department

Resume Preparation

A resume is an overview or a summary about your past experiences and indicates how you can meet the needs of the employer. A typical resume should include the following:

- Qualifications
- Work experience
- Education
- Skills and accomplishments

A high-quality resume and professional letters of communication with an employer should contain these components:

- Cover letter: introduces your resume and provides additional details of accomplishments, but should not repeat information provided in the resume
- Professional reference: letter of recommendation from someone of importance familiar with your skills, capabilities, and experience
- Thank-you letter: thanks the interviewer and expresses appreciation for the chance to meet and discuss the job opening
- Acceptance letter: thanks the interviewer for the opportunity to work with his or her business and accepts the position and terms offered
- Letter of refusal: thanks the interviewer for the opportunity to interview but indicates not accepting the position

An application must be prepared and completed prior to the interview. All application forms must be completed honestly and legibly. Any untruthful information may be terms for immediate dismissal.

Interview Preparation

The more prepared you are for the interview, the easier it is to communicate effectively with the interviewer and present your message in a clear and concise manner. The following summarizes the "to-do" list before an interview:

- Dress for success.
- Practice mock interviews.
- Review and know your resume.
- Review qualifications for the specific job.
- Be positive when referencing past experiences.
- Arrive before the scheduled time of the interview.
- Prepare answers about yourself (education, experience, availability).
- Learn about the organization and develop ideas about how you can contribute.

Resignation

Just as you take time to prepare for an interview, careful consideration must be given when resigning from a job. Resignation notice may be written or verbal. Even though most employments are "at will," two weeks' notice is desirable. The most important job-search rule to remember when resigning from any job is not to leave on bad terms with the employer. Some companies may require an exit interview with a representative of the company's human resources (HR) department and the departing employee. The HR representative might ask the employee questions, complete a questionnaire, or both.

Clinical Ladder Programs

Clinical ladder programs (Table 1-6) allow an ST to move upward to positions of increased responsibility within an organization. They offer employers a long-term strategy for employee

TABLE 1-6 AST Recommended Clinical Ladder for the Surgical Technologist

Level I: Entry-Level Practitioner

The Level I practitioner is a recent graduate of an accredited surgical technology program who has been employed as a surgical technologist for 1 year or less.

1. Has graduated from an accredited surgical technology program
2. Independently scrubs basic surgical procedures
3. Demonstrates ability to problem solve in relation to the procedure being performed
4. Applies base knowledge of anatomy and physiology, medical terminology, microbiology, and pharmacology for optimal surgical patient care
5. Applies basic knowledge of computers, robotics, and lasers
6. Demonstrates knowledge and practice of patient care concepts
7. Applies the principles of asepsis during surgical procedures
8. Participates in orientation program to attain competency in complex cases and achieve Level II: Proficient Practitioner
9. Becomes certified within 1 year of graduation
10. Maintains certification by participating in continuing education activities

Level II: Proficient Practitioner

The Level II practitioner is a Certified Surgical Technologist who has been employed as a surgical technologist for 1 year or more and who takes on greater responsibility in providing patient care than a Level I practitioner. Level II practitioners demonstrate higher-level critical thinking and problem-solving skills than do Level I practitioners.

1. Meets the criteria stated in Level I
2. Demonstrates advanced knowledge and proficient practice in the first scrub role in a majority of surgical procedures
3. Applies knowledge of advanced surgical techniques
4. Applies knowledge related to emergency situations and surgical procedures
5. Demonstrates critical thinking skills in relation to anticipating the perioperative needs of the patient and surgeon
6. Exhibits a higher level of collaboration with peers in making decisions related to surgical patient care
7. Assists in performing circulating skills and tasks
8. Participates in program to achieve Level III: Expert Practitioner

Level III: Expert Practitioner

The Level III practitioner is an advanced practitioner who thinks on a more global level and is more involved in endeavours related to, but outside of, the surgery department.

1. Meets the criteria stated in Level II
2. Demonstrates superior knowledge of the various surgical equipment and advanced surgical instrumentation
3. Demonstrates superior knowledge and expert practice in the first scrub role in advanced surgical procedures
4. Performs the **preceptor** role for surgical technology students
5. Demonstrates leadership abilities
6. Serves as a mentor and role model
7. Member of at least one department or hospital committee
8. Involved with community health promotional efforts and other related community services
9. Demonstrates knowledge of department fiscal requirements
10. Participates in decision-making activities related to evaluating and acquiring surgical equipment, instruments, and supplies
11. Collaborates with other health care professionals in the development of surgical budgetary requirements
12. Demonstrates skills in organizing and coordinating the effective use of personnel and materials
13. Develops, organizes, and delivers continuing education topics and/or courses

Courtesy of the Association of Surgical Technologists

retention and maintaining good department morale. They also serve as motivation for STs to continually improve their knowledge, skills and competencies. The goals of the clinical ladder program are to:

- Enhance quality surgical patient care.
- Encourage employer recognition and reward advanced competency.
- Increase the visibility of the role of the ST in the hospital and other facilities.
- Provide new staff the means for advancement to encourage the professional growth of the ST.
- Promote accountability and responsibility of the ST toward the patient as well as broaden the role.

THE SURGICAL TECHNOLOGIST'S LIFESTYLE

Many of the duties of the ST require standing for extended periods of time, and the ability to lift and move heavy objects. OR staff are exposed to communicable diseases, unpleasant sights, odors, and hazardous materials. Most procedures are completed during the day and a 40-hour workweek is common. At large health care facilities, hours outside of this should be expected as those facilities often have evening and night shifts. Additionally, the ST might have to work weekends and holidays, as well as "emergency call" hours.

A surgical technologist must adhere to the following principles of **surgical conscience**:

- An ST must maintain the principles of asepsis and commit to the practice of sterile technique. They must insist that all team members are accountable, alert teammates when there is a break, and take appropriate actions. Of all the tasks and roles that an ST fulfills, the most important is that of strictly practicing sterile technique in the OR. An ST must be willing to accept responsibility for his or her own actions and be willing to be held liable for his or her actions and to provide the information needed for an accurate evaluation of those actions.
- An ST must be committed to maintaining the **confidentiality** of patient information. Patients should never have to question that their personal information will be handled properly.
- An ST must demonstrate nondiscriminatory treatment of all patients. Personal values, feelings, and principles take a secondary position to the patient's need for the highest-quality treatment.
- An ST must be cost conscience as medical treatment is very expensive and unnecessary waste must be avoided. Cost containment is the responsibility of everyone involved: health care facility and health care providers.

TEAMWORK AND COMMUNICATION

Technical skills are only part of the skills required of an ST. The ST must have excellent teamwork skills in order to contribute to the efficient care of the patient, and effective use of communication skills are essential to teamwork.

A useful theory of team dynamics was developed by Bruce Tuckman in his 1965 publication *Tuckman's Stages of Group Development*. According to his model, teams progress through the following five stages:

1. *Forming:* The formation of the group occurs and individuals are driven by the desire to be accepted by others while avoiding conflicts.
2. *Storming:* Initial trust is developed and the members feel comfortable discussing discontent and challenging others opinions. This stage is necessary for team growth and development of tolerance for differences.
3. *Norming:* Team members develop a mutual plan and work toward the success of the project goal.
4. *Performing:* Highly functioning teams operate at this stage. The group functions as a unit to accomplish its tasks. Members are competent and able to perform their assigned tasks without supervision.
5. *Adjourning:* The task is completed and the team is dissolved.

Teams often repeatedly cycle through these stages or repeat specific stages. Although disagreement is healthy for the team, it is important to recognize problematic behavior and engage in conflict management. Problematic behaviors include controlling behaviors, verbal abuse, constant complaining, negative criticism, and sexual harassment.

The Thomas-Kilmann *Conflict Mode Instrument* (2002) is a model for measuring conflict. Since individuals do not have the same expectations and desires, conflict is a natural consequence of our interactions with others. The Thomas-Kilmann conflict mode instrument (TKI) divides an individual's behavior between two factors: (1) assertiveness—the extent to which the person will attempt to satisfy his/her own concerns; (2) cooperativeness—the extent to which the person attempts to satisfy the other person's concerns. These two modes of behavior are then used to define five response modes to conflict:

1. *Competing:* Individual is selfish in pursuing his/her own concerns at the expense of others; the person wants to win.
2. *Accommodating:* Opposite of competing; individual completely ignores his/her own concern to satisfy the concerns of the other individuals.
3. *Avoiding:* Person is neutral; neither pursues his/her own concerns or those of the other individuals in order to avoid conflict.

4. *Collaborating:* Person attempts to work and cooperate with others to reach a solution that everyone agrees upon.
5. *Compromising:* Individual's goal is to reach a solution as quickly as possible that may be accepted by others, but only partially fulfills the concerns of the group.

Everyone is capable of using these five modes; however, the individual might have strengths in being able to use one or two modes better than the others and therefore, rely on the use of those modes.

Teamwork in Surgery

Teamwork is a fundamental aspect of surgery as the environment is clinically and technologically complicated and inherently dangerous. All team members must not only know their individual roles but also those of others. Everyone must be observant of the events occurring around them, use effective verbal and nonverbal communication skills with one another, and follow these principles:

- Politeness and respect
- Promote positive team interactions
- Willingness to reach a compromise
- Collaboration toward a common goal
- Encourage discussion of processes and potential conflicts
- Acknowledging acceptance of alternative solutions and change

AST Position Statement on Teamwork

Teamwork is an essential part of the surgical environment. The Association of Surgical Technologist recognizes the importance of collaborative teamwork. The primary focus of all surgical team members is to provide a seamless, safe, and efficient surgical experience with a positive patient outcome.

The surgical arena is a highly technical and fast-paced environment. In many cases, this technological environment has decreased the amount of time that the patient spends within the OR. This time reduction has resulted in the need for increased proficiency, team collaboration, and the use of interpersonal skills to provide safe, quality outcomes for the surgical patient.

Team-building skills aid in the ability of a group to work together effectively. Team players need to learn and refine their skills in communication, conflict negotiation and resolution, and consensual decision making. The AST promotes the development of these skills within the surgical environment as this is imperative to achieving exceptional team and patient outcomes.

Communication

There are three basic relationships an ST should distinguish: social relationships that include peers and friends; professional relationships that include co-workers, doctors, and other health care providers; and therapeutic relationships that involve interactions with the patient and the patient's family. As an ST, you might only have brief communication with patients and families. One must quickly establish a professional relationship with them and develop a high level of trust. This is accomplished by maintaining professional teamwork among staff members and creating an environment that is comfortable and positive. Patients must feel they are able to express their physical needs and emotions, as they are likely to be very anxious.

There are five broad goals of communication:

1. Solve problems.
2. Express personal feelings.
3. Provide information to an individual or group.
4. Obtain information from an individual or group.
5. Persuade an individual or group to change a behavior or opinion about a specific subject.

There are four components of communication. The following provides a brief outline of each of the components (Figure 1-7):

1. *Sender:* The sender shares a message with an individual or group. Senders deliver or "encode" this message through verbal and nonverbal means.
2. *Message:* The message is the information. It might be distorted by outside influences such as noise.
3. *Receiver:* The receiver gets the message and "decodes" it with respect to the receiver's knowledge, background, and environment. The receiver can employ active listening skills to increase the effectiveness of communication.
4. *Feedback:* Information is sent from the receiver to the sender regarding the message. It is a very important confirmation that the proper message was received. It might be necessary for the sender to request feedback by asking if the receiver understands what was conveyed.

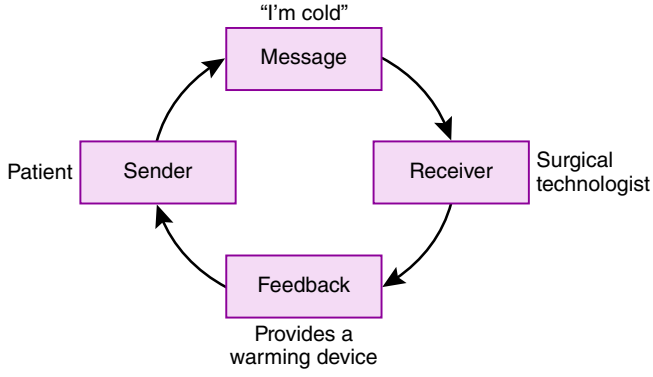

Figure 1-7 Components of communication

TABLE 1-7 Examples of Communication of Important Information

Information Needed by	*Information Needed from First Scrub Surgical Technologist*
Anesthesia provider: checking blood loss	"500 mL of irrigation has been used."
Anesthesia provider: beginning of craniotomy	"We have 25 mL of 1% lidocaine with epinephrine in the scalp."
Surgeon: as cholangiocath is passed	"Cholangiocath has been irrigated with normal saline. Syringe contains normal saline."
Surgeon: as peritoneum is being closed	"First closing count is correct."
Circulator: change in expected procedure	"We are going to need the GI suture after all. 3–0 chromic and 3–0 silk please."

An effective communication style employs the following techniques (Table 1-7):

- Always speak respectfully and professionally.
- Keep communication focused on the procedure and the patient.
- Express needs clearly and directly: "David, may I have another package of lap sponges, please?"
- Always repeat orders, names of medications, solutions, and count information and respond with a confirmation: "David, you're giving me 1% lidocaine with epinephrine. Is that correct?"
- If unsure, then ask questions: "Doctor, are you ready to switch from saline irrigation solution to contrast medium?"
- If you're concerned about an action that another teammate is about to take, state the concern in the form of a question: "Doctor, should we switch from monopolar to bipolar ESU at this point?" Remember, you're not questioning their judgment, you're simply asking them to help you understand what they are about to do.
- Always tell the truth. The patient's well-being depends on it: "David, unfortunately, this medication is not labeled and it was not verified during the relief report. I have to dispose of it."

Effective verbal communication must be combined with effective listening skills. Often, surgical patients need someone who will listen to them to help alleviate their anxiety. Effective listening skills include the following:

- *Make eye contact:* Focus on what the speaker is saying. Eye contact cannot always be maintained, for example, when transporting the patient on the stretcher down the hall, but when possible it lets the patient know you are attentive.
- *Be receptive:* Be open-minded and objective about what the patient is saying; he or she may be providing important information related to his or her medical condition, status, ethical beliefs, and level of anxiety.
- *Show sensitivity:* Think about your response; respond in a positive, sincere manner that does not belittle the patient's feelings and anxiety.

With this in mind, it is important to understand body language. This is a type of nonverbal communication and can provide clues as to a patient's condition as well as reinforce what they are saying. Additionally, one's own body language can be recognized by the patient and interpreted as either positive or negative. Positive body language includes the following:

- Smiling
- Eye contact
- Arms unfolded
- Therapeutic touching
- Leaning slightly toward the patient

Negative body language can include:

- Tightly folded arms
- Frowning and eye rolling
- Distancing oneself from the patient
- Indicating impatience by tapping one's foot or finger

Interdepartmental Communication

On a larger scale the surgery department is responsible for coordinating the care of the patient along with multiple departments and therefore, has daily contact with those departments.

Patient safety and hospital efficiency and effectiveness are related to how well departments communicate with each other. Health care facility departments communicate through several means: medical records; requisitions for service; electronic means (email, online live chat, electronic medical/health record); telephone; verbally (individually or interdepartmental meetings).

HOSPITAL ORGANIZATION

Traditionally, surgical care was provided in a hospital. However, health care has dramatically changed and surgical services are now provided in many different settings, including traditional, hospital-based ORs; **ambulatory surgery centers (ASC)** that provide surgical services to patients who do not require hospitalization; surgeons' offices/clinics; and labor and delivery units (L&D) where separate ORs are available to perform cesarean sections, dilation and curettage, and tubal ligations.

A hospital is an organization with an in-patient facility, a governing body, medical staff, and professional staff. Hospitals provide medical and related services twenty-four hours a day. There are three general types of hospitals: proprietary, nonprofit or not-for-profit, and government supported. States have varying legal definitions of a hospital to distinguish them from other health care organizations.

Proprietary hospitals are investor owned by an individual or corporation. In comparison with all other types of hospitals, proprietary hospitals focus on providing quality patient care, but an objective of this type of facility is to create a profit that is returned to the investors. Nonprofit or not-for-profit hospitals differ from proprietary hospitals in that profits are reinvested back into the facility such as to purchase state-of-the-art equipment, support research, or expansion/construction efforts. Government supported or government-owned public hospitals receive the majority of their operating revenue from government funding (tax supported facility). In countries with public health care, services are provided free of charge as the hospital receives its funding from the government.

Hospital philosophy and policies are typically established by a board of directors or board of trustees. Given the type of hospital, boards are either elected or appointed. The board will hire a chief executive officer (CEO) whose job it is to enact the philosophy and policies. Under the CEO, there are typically several layers of administration. At the top administrative level, several vice presidents oversee broad areas of responsibility. For example, administration, medical affairs, patient services, legal services, finances, and environmental departments each might have a vice president assigned to it (Figure 1-8).

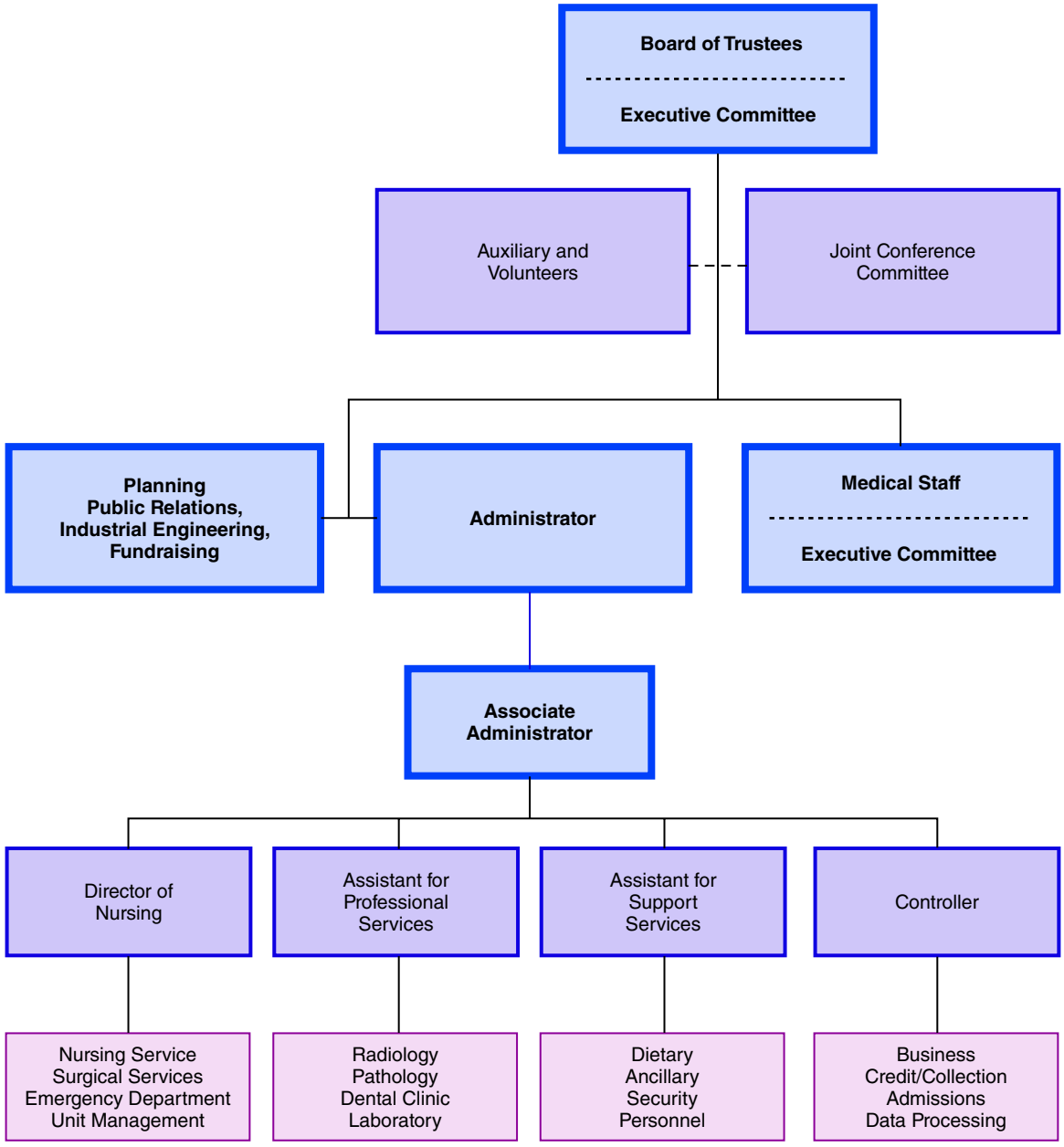

Figure 1-8 Sample hospital organization chart

TABLE 1-8 Direct Patient Care Departments

Department	*Hospital Administrator*	*Direct Oversight*	*Contribution*
Patient care units/intensive and critical care units	Director of nursing	Charge nurse	Direct nursing care
Diagnostic imaging	Contracted physician, contracted company	Radiologist	Diagnostic support for all departments
Medical laboratory, blood bank, and pathology	Contracted physician, contracted company	Pathologist	Diagnostic support for all departments
Pharmacy	Hospital administrator	Pharmacist	Drug intervention advice and control for all departments
Physical/occupational therapy	Varies	Therapist	Rehabilitation services

Depending on the size of the hospital, these areas may be further subdivided. Typically, under medical affairs there will be a second division for medical services and nursing/ staffing services. The physicians are classified under medical services that are supervised by a physician known as the chief of staff. There could be multiple chiefs of staff, each with a divided area of responsibility. For example, there could be a chief of medicine and a chief of surgery. The surgical division is often subdivided according to specialty; for example, the chief of orthopedics.

Most hospitals classify STs under nursing or staffing services, and the director of nursing (DON) oversees the nursing services. As with medical services, this department is typically divided into subunits. Surgical or perioperative services may be one of those subunits and is headed by a director of surgical services. Surgical services can be further divided into areas of responsibility and each one assigned a manager. Separate coordinators can also be assigned to surgical specialties.

Hospital Departments and Interdepartmental Communication

Many related departments and personnel are involved in patient care and safety in a hospital. Departments can be categorized as having either direct or indirect patient care responsibilities. The following departments have direct patient care responsibilities (Table 1-8):

- Pharmacy
- Physical and occupational therapy
- Patient care units such as medical, surgical, and critical care
- Diagnostic imaging department, which includes radiography, magnetic resonance imaging (MRI), nuclear medicine, ultrasound, echocardiography, computed tomography (CT), etc.
- Medical or laboratory department, which includes clinical (chemistry, hematology, genetics, reproductive, etc.), pathology (microbiology, virology, toxicology, immunology, etc.), and the blood bank

Departments that contribute to indirect patient care include (Table 1-9):

- Hospital administration.
- Hospital maintenance and security services.
- Housekeeping and environmental services.
- Dietetics and food services.
- Purchasing, central supply, materials management.
- Medical records and admissions.

The department of surgical or perioperative services has regular contact with most departments of the hospital. Some interactions may exist based on the type of service supplied by the department or its relationship to the patients in surgery. Typical interactions are described in Table 1-10.

Patient safety, hospital efficiency, and service effectiveness are related to the consistency and clarity with which these communications are carried out. Hospital departments can communicate with each other through several means: direct communication, requisitions for services, and medical records to name a few. Staff must know the forms of communication that are used in their department and their responsibility in relation to each.

Financial Considerations and Reimbursement

Surgical intervention can be very costly. However, in some special instances surgical intervention is provided free of charge or as a charitable mission. For instance, some surgeons may donate a portion of their time to treating children whose families lack the financial resources to gain treatment. Additionally, as a part of maintaining proprietary status, organizations may waive some portion of costs as charitable donations, including the cost of surgical care. In general, surgical care is based on a fee-for-service system. However, based on the passage of The Patient Protection and Affordable Care Act (2010), the delivery of health care is undergoing major changes to attempt to ensure health care coverage and access for all individuals.

TABLE 1-9 Indirect Patient Care Departments

Department	*Hospital Administrator*	*Direct Oversight*	*Contribution*
Administration	Chief executive officer	Vice president of area	Fiscal and policy oversight
Maintenance and security	Vice president of physical environment	Shift supervisor	Care and maintenance of the building and grounds
Environmental services	Vice president of physical environment	Shift supervisor	Daily upkeep of rooms and furniture, including patient rooms
Dietitian and food services	Vice president of food services	Chef/dietitian/ supervisor	Food preparation for patients, family, and staff
Purchasing/central services and materials management	Vice president of finances	Purchasing agent	Control, purchase, storage, and dispersal of equipment and supplies
Medical records and admissions	Varies	Supervisor	Maintenance of all legal records of patient care

TABLE 1-10 Special Relationships

Department	*Surgical Services Interactions or Relationship*
Patient care units	Patient preparation Informed consent Transportation of patient to and from unit to OR Coordination of information for family Postoperative recovery and care (Several units may be specialty units, such as orthopedics)
Diagnostic imaging	Preoperative diagnostic studies Communication of studies and diagnostic findings to OR Intraoperative studies Stereotactic assistance Postoperative studies
Medical/clinical laboratory Blood bank Pathology department	Preoperative diagnostic studies Communication of studies and diagnostic findings to OR Intraoperative studies (e.g., blood gases, electrolytes) Blood replacement Pathological studies (e.g., frozen section) Postoperative studies
Pharmacy	Control and dispensing of medications Response to special needs Response to emergency needs
Physical/occupational therapy/home health and hospice services	Rehabilitation (may begin in the postanesthesia care unit)
Maintenance and biomed	Control of physical environment Repair of broken equipment Safety checks

(*continues*)

TABLE 1-10 (*continued*)

Department	*Surgical Services Interactions or Relationship*
Environmental services	General housekeeping tasks
Purchasing/central services	Purchasing and dispensing of surgical services equipment and supply needs
	Typically has a central sterile supply unit
	Oversees sterilization needs
	May perform basic case cart preparation
	Restocking of basic supplies for OR
Medical records	Transcription of history and physical
	Maintains and verifies all patient records
	Requires proper signatures
	May provide past medical information when needed
Risk management	Establishment of policies for patient and employee safety
	Identification of patient hazards and developing solutions
Infection control	Tracking postoperative infection rates
	Identifying causes of postoperative infections
	Instituting preventive measures
Administration	Budget
	Human resources
	Policies and procedures

Insurance designates a contractual relationship that exists when one party or entity agrees to pay another for a specified loss or condition. Typically, with health insurance, the individual and the insurance provider enter into a contract, where the individual pays a fee to the insurer on an ongoing basis and the insurer agrees to cover health care expenses, which are outlined in the insurance policy or contract. Historically, the most common type of health insurance is private insurance, where a private citizen and private insurance agency enter into a contractual agreement for health care coverage. This type of insurance may also evolve from a contractual agreement between a business and an insurer for the benefit of the employee, where the employer pays for all or a portion of the insurance premium.

Private insurance is still used today as a means for reimbursing hospitals, physicians, and other health care professionals for their services. However, most health care coverage today is provided through **health maintenance organizations (HMOs)** and preferred provider organizations (PPOs). Although many types of these programs exist, their primary purpose is to control costs through contractual agreements with health care providers (hospitals and physicians), limiting the payment to an agreed amount or capitated payment. Additional health care coverage may be provided in the form of government-sponsored programs such as Medicare and Medicaid. Table 1-11 describes various types of health care reimbursement programs.

Health care reimbursement has been influenced by the implementation of Medicare diagnosis-related groups (DRGs), which were implemented in 1983. Within this system, providers are reimbursed through a prospective payment system. Providers are reimbursed based on the average charges for treatment upon hospital discharge. For instance, if the average cost for treating a patient with acute cholelithiasis (gallbladder stones) is $5,000, then the hospital is reimbursed at that rate no matter how long the patient is admitted. With this in mind, every member of the surgical team must develop both cost awareness and quality conscience in order to ensure cost-effective care with the best possible surgical outcomes for the patient.

PROFESSIONAL ORGANIZATIONS

To understand health care in the United States and to effectively develop as a professional, one must have an awareness of the various national organizations related to health care. The following is a list of professional health care organizations:

- The American College of Surgeons (ACS): professional organization dedicated to improving the quality of care for the surgical patient by setting standards for surgical education and practice.
- The American Medical Association (AMA): professional organization dedicated to ensuring sustainable physician practices that result in better health outcomes for patients.
- The American National Standards Institute (ANSI): national organization that oversees the development and use of recognized standards that directly impact businesses in nearly every sector, including health care.