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Foreword

Health care is evolving continually and it is big business. Nurses are required to be skilled and knowledgeable in their specific fields. The expectation from our governing and regulating bodies, as well as our customers, is to provide quality care that remains cost-effective while constantly delivering a positive experience.

Orthopaedic surgery is no longer just performed at hospitals or medical centers but is also performed in stand-alone outpatient facilities and in physician offices. No matter where the surgeries are performed, the standard of care, knowledge, and expertise are expected to be comparable and safe. Excellent care is expected by all consumers, including patients, surgeons, employers, and payers.

The mission statement of the National Association of Orthopaedic Nurses (NAON) is to advance the specialty of orthopaedic nursing through excellence in research, education, and nursing practice. To fulfill this mission, NAON has coordinated nursing experts in the field of musculoskeletal surgery to provide us with this third edition of the Orthopaedic Surgery Manual. NAON is the premier source of evidence-based practice for orthopaedic nursing care across the continuum. No one is better qualified to provide the operating room nurse with the information necessary to provide excellent musculoskeletal care. With this commitment, the Orthopaedic Surgery Manual provides nurses with up-to-date education and information specific to orthopaedic surgery.

This edition is in outline format to provide the nurse learner the ability to locate information quickly, providing value to the learner. This manual is valuable not only to the operating room nurse but also to the bedside nurse, providing insight into intraoperative care. The bedside nurse can use the information provided to better serve the consumer pre- and postoperatively. For example, knowledge of different surgical techniques allows the nurse to be an advocate for the consumer. Consumers can use the information shared by the nurse to make informed decisions regarding their care.

I would personally like to thank all contributors for the creation of this new edition and its ongoing success. Contributors such as the director of education, the senior coordinator of education, and every author, reviewer, editor, NAON staff member, and distributor serve as experts and are necessary for the success of this product. I would also like to thank you, the nurse, for pursuing the information in this Orthopaedic Surgery Manual. Doing so fulfills NAON’s mission of advancing the specialty of orthopaedic nursing.

It has been a privilege to serve as NAON’s 35th president. It is also an honor to contribute by providing the foreword for the Orthopaedic Surgery Manual, and I so appreciate being asked to do so. I am proud to be a nurse and especially proud to be an orthopaedic nurse. I have utilized NAON for knowledge and networking to enhance the workplace for the consumer’s benefit.

Please share this updated resource with your colleagues to motivate nurses to excel in the specialty of orthopaedic nursing.

Julie Twiss, RN, BSN, ONC
NAON President 2014-2015
Preface

Caring for patients in their most vulnerable moments is a sacred trust. Providing the highest-quality nursing care based on current evidence is a compelling responsibility. The surgical services suite is an environment where both of these principles are executed concurrently and continuously, beginning even before the patient arrives. Advances in technology have increased the sophistication and complexity of surgical interventions, calling the perioperative nurse to higher levels of competency. Orthopaedic surgical procedures require a specialized body of knowledge and expertise, which empowers the nurse to provide excellent care, intervene to prevent injuries and complications, and maintain safety for the staff and for the patient. It is with these thoughts in mind that we offer the third edition of the *Orthopaedic Surgery Manual*.

The target audience for the manual is the perioperative nurse. The manual also is an excellent resource for other members of the perioperative team, such as surgical technologists, surgeons, interns, and residents. It is a solid reference for others in the continuum of care—clinical nurse specialists, bedside care providers, nurse practitioners, educators, and students. Other stakeholders within the health care industry will also find helpful information regarding current and emerging trends, innovation, and controversy within the scope of perioperative nursing care.

Arranged in an outline format to afford quick referencing, this edition is hardbound to withstand extensive use. The manual begins with an overview of perioperative nursing, including detailed descriptions of the perioperative team members, roles, and scope of practice. Considerations for the specialty populations of pediatric and geriatric patients are discussed. Documentation essentials are described throughout the manual.

Perioperative nursing interventions correlate to optimal patient outcomes. This truth is detailed in concepts unique to orthopaedic perioperative care—specific procedures, equipment, implants, patient positioning, orthopaedic instruments, and management of soft tissue and bone graft products. The reviews of internal and external fixation reflect a comprehensive presentation of the many options for treatment of fractures.

Individual chapters are provided for perioperative care of patients undergoing surgical procedures of the spine, shoulder, elbow, or forearm (Chapters 10–12). Chapter 13 addresses wrist and hand procedures and includes a special section on microvascular procedures. Chapter 14 features both elective and trauma repair approaches to the hip and pelvis. Nursing care related to knee surgical interventions is discussed in Chapter 15. Finally, Chapter 16 details common surgical interventions for foot and ankle procedures and discusses special considerations.

Great thought and research were put into the production of this manual. Because more than 12 years have passed since the previous edition, a full overhaul was needed. I commend the authors and reviewers, experts in their field, for their hard work and dedication to producing this excellent reference and resource. The perioperative nurse is required to be both caring and technically expert. The nurse must be armed with advanced critical thinking and make decisions that result in excellent patient outcomes. We pray this reference supports you in those endeavors.

Take care,

Tandy Gabbert, MSN, RN, ONC
Director of Education
National Association of Orthopaedic Nurses
Chapter 1

Overview of Perioperative Nursing

Elizabeth A. Schuring, MSHCA, BSPA, RN, RNFA, CNOR

Objectives

After reviewing this chapter, the learner will be able to

1. Identify the members of the perioperative patient care team and their roles.
2. Describe the process of preparation and care for perioperative patients.
3. Recognize special perioperative considerations for the geriatric and pediatric populations.

Outline

I. Perioperative Nursing
II. Perioperative Patient Care Team
III. Perioperative RN Circulator
IV. Scrub Person
V. First Assistant
VI. Preparation and Care of the Patient During Operative Procedures
VII. Perioperative Nursing Data Set
VIII. Clinical Aspects of Operative Pain
IX. Geriatric Nursing Considerations
X. Pediatric Nursing Considerations
XI. Perioperative Nursing: An Ever-Changing, Growing Specialty

References
I. Perioperative Nursing

A. Perioperative nursing is the comprehensive patient care provided within the framework of the nursing process before, during, and after surgical or invasive procedures.

B. Phases.
1. Preoperative period—from when a surgical intervention is planned to when the patient is taken to the operative suite.
2. Intraoperative period—from when the patient arrives in the operative suite to when the patient is ready to depart the operative suite.
3. Postoperative period—from the conclusion of the surgical intervention through the recovery phase.
   a. Perianesthesia Phase I—the patient emerges and recovers from a surgical intervention with general or regional anesthesia or moderate sedation in the postanesthesia care unit.
   b. Perianesthesia Phase II—the patient is prepared for discharge to home or another environment from a same-day surgery unit, a diagnostic imaging area, a free-standing surgical clinic, or any area where sedation or anesthesia is given to patients.
   c. Perianesthesia Phase III—extended observation in an inpatient unit, day surgery unit, or clinic prior to discharge.

C. Goals.
1. To manage patient care before, during, and after surgery.
2. To coordinate the needs of the surgical team.
3. To identify the risks and potential problems associated with a surgical procedure and to facilitate positive outcomes.
4. To actively engage patients in their own care whenever possible.

II. Perioperative Patient Care Team

A. Core team members have special roles and functions that through collaboration promote the best interests of the patient and achieve the expected outcomes. Team members apply basic knowledge of surgical procedures, anatomy, and physiology to each patient and seek opportunities to increase their knowledge base by learning about changes in health care and technology. The team may include some or all of the following individuals:
1. Surgeon or procedural physician.
2. Anesthesiologist.
3. Certified registered nurse anesthetist (CRNA) or anesthesia assistant (AA).
4. Perioperative RN circulator.
5. Scrub person (surgical technologist or other qualified person).
6. First assistant (FA) or registered nurse first assistant (RNFA).
7. Second assistant.

B. Allied health care providers have graduated from an accredited education program or have completed special training. Their roles and qualifications vary depending on state-specific health department regulatory requirements.
2. Biomedical technicians.
4. Radiology technicians.
5. Medical assistants.
6. Nursing assistive personnel.
7. Sterile processing technicians.
8. Endoscopy technicians.
9. Health care industry representatives.
11. Other specialty technicians who may need to set up and operate specialized equipment or monitoring devices during the surgical procedure.

C. Support personnel have education and training in performing defined job duties and have an indirect role in patient care.
1. Surgery schedulers.
2. Administrative staff.
3. Clerical staff.
4. Patient transporters.
5. Environmental services personnel.
6. Facilities engineering personnel.
III. Perioperative RN Circulator

A. Definition. An RN who functions outside of the sterile field to
1. Plan, direct, and coordinate care for patients undergoing operative or other invasive procedures.
2. Provide nursing care to perioperative patients.
3. Coordinate the needs of the surgical team during the intraoperative period.

B. Scope of practice.
1. Uses the nursing process to assess patients, develop an individualized plan of care, and coordinate and deliver care to patients throughout the perioperative period.
2. Identifies patients’ needs, sets goals, and implements nursing interventions to achieve optimal patient outcomes.

C. Role.
1. Serves as a patient advocate and ensures patients’ safety during the intraoperative period when patients are vulnerable because their protective reflexes and self-care abilities are compromised.
2. Assists the team in creating and maintaining a safe, comfortable environment during the surgical or invasive procedure.
3. Addresses the physiological, psychological, sociocultural, and spiritual responses of patients.
4. Uses standards, knowledge, judgment, and skills based on scientific principles.
5. Provides quality patient care in an ethical, responsible, and accountable manner.
6. Uses evidence-based research as the foundation for practice.

D. Responsibilities.
1. Collects and analyzes patient health data relevant to the operative or invasive procedure to determine nursing diagnoses.
2. Identifies expected outcomes unique to the patient and develops an individualized plan of care to attain the outcomes.
3. Implements the plan of care through a coordinated team effort.
   a. Creates and maintains the sterile field.
   b. Provides equipment and supplies.
   c. Counts sponges, sharps, and instruments.
   d. Administers drugs and solutions as prescribed.
   e. Performs antimicrobial skin preparation.
   f. Manages safe patient positioning.
4. Performs tasks directly or delegates them to a qualified team member.
5. Evaluates patients’ progress toward attaining outcomes and revises the plan of care based on ongoing assessments and evaluations.
6. Educates patients and families to address knowledge deficits.
   a. Identifies the learning needs of patients and families.
   b. Assesses patients’ readiness to learn, taking into account their anxiety level and attention span.
   c. Provides instruction based on learning needs.
   d. Evaluates the effectiveness of the teaching.
7. Documents all nursing and other activities that take place throughout the perioperative period. Documentation formats and methods differ among surgical settings. Required common elements include
   a. Perioperative plan of care.
   b. Patient assessment data.
   c. The presence and disposition of prosthetic devices and/or sensory aids, implants, and piercings.
   d. Accurate times, including
      1) Entrance into the OR.
      2) Start of the anesthesia services.
      3) Start of the operative or invasive procedure.
      4) Wound closure.
      5) End of the procedure.
      6) Exit from the procedure room.
   e. Persons providing patient care and those present in the room during the intraoperative period, including name, title, and role.
   f. Patient skin condition upon arrival and discharge from the surgical suite.
   g. Patient positioning and devices used.
   h. Baseline and end-of-procedure sponge, sharps, and instrument counts (documented in conjunction with the scrub person).
i. Skin prep procedure, including the solutions used, the prep site, and the person performing the prep.

j. Preprocedure verification process (also known as a time-out or Universal Protocol), which includes verification of
   1) Correct procedure, correct patient, and correct site.
   2) Marking of correct surgical site.
   3) Any items that must be available for the procedure.

4) Required clinical documentation, including
   a) Completion of patient history and physical not more than 30 days before the date of the scheduled surgery.
   b) Admission and presurgical assessment with an updated medical record entry documenting an examination for any changes in the patient’s condition since completion of the most recent medical history and physical assessment.

5) Assessment of skin integrity after removal of the dispersive pad.

n. Pertinent details related to the use of other devices, including
   1) Temperature-regulating devices.
   2) Invasive and noninvasive monitoring devices.
   3) Tourniquets.
   4) Lasers.
   5) Ultrasonic energy devices.
   6) Argon-enhanced devices.
   7) Implantable cardioverter-defibrillators (ICDs), which may need to be deactivated prior to surgery and reactivated after surgery.

o. Administration of medications, irrigations, solutions, or blood products.

p. Specimens and cultures.

q. Communications with family and members of the surgical team and other significant communications.

r. Implants, including lot numbers and other information required for tracking.

t. Use of intraoperative imaging and X-rays.

5) Proper display of labeled diagnostic and radiological test results, including
   a) Radiology images and scans.
   b) Pathology reports.

6) Blood products, implants, special equipment, devices, or supplies specific to the procedure.

7) Drug and/or latex allergies.

8) Fire risk assessment

k. Completion of the surgical time-out (see Chapter 3, Section III.B)—any problems identified by the surgical team should be reconciled if responses differ or are incomplete.

l. The degree of contamination of the wound at the time of the surgical procedure according to the surgical wound classification based on the Centers for Disease Control and Prevention (CDC) classification system (see Chapter 6: Infection Prevention).

m. Use of electrosurgical unit, argon-enhanced coagulation, and bipolar sealers (e.g., Aquamantys).
   1) Preoperative assessment of skin.
   2) Specific unit used.
   3) Settings used during the procedure.
   4) Location of the dispersive pad.

8. Patient advocacy.
   a. Although patient advocacy is the responsibility of each member of the surgical team, it is central to the circulator’s role.
   b. The circulator has the overall responsibility for the patient, coordinates all nursing and staff activities pertaining to the patient, and gathers specific information regarding the patient’s needs and preferences.
   c. Advocacy in perioperative nursing involves acknowledging patients’ concerns and needs and ensuring the best interests of patients are achieved.
   d. The circulator speaks for patients when patients are unable to speak for themselves.
   e. Patient advocacy may include
      1) Protection of patients’ privacy by maintaining confidentiality and providing physical protection (e.g., limiting exposure during positioning, prepping, and draping).
References


Chapter 5

Use and Care of Orthopaedic Instruments

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Objectives

After reviewing this chapter, the learner will be able to

1. Describe the basic categories of surgical instruments and their function.
2. Identify basic orthopaedic instruments and their function.

Outline

I. Soft Tissue Instruments
II. Bone Instruments
III. Power Instruments
IV. Arthroscopic Instruments

References
I. Soft Tissue Instruments

A. Soft tissue instruments are used for draping the operative site, making the incision, clamping vessels, dissecting tissues, retracting wound edges, exposing the operative site, and closing the wound. The basic categories and functions of soft tissue instruments are cutting and dissecting tools; clamps; grasping and holding tools; retractors; suction tools; and probes, cannulas, and dilators.

1. Cutting and dissecting instruments are used to cut or separate tissue. They may be sharp or blunt (see Figures 5.1 and 5.2).

   a. Sharp dissectors are used to separate tissue planes and divide tissue attachments.
      1) Scalpels.
         a) Knife handle (#3, #4, #7).
         b) Blade (#10, #11, #15)—with a rounded, tapered, or hooked cutting edge.
         c) Beaver Mini-Blades—often used in pediatric procedures.
      2) Scissors.
         a) Mayo scissors.

   b. Metzenbaum scissors—curved or straight, with a rounded tip. More delicate than Mayo scissors. Used to cut or dissect delicate tissue.

   c. Tenotomy or small scissors—curved or straight, with a sharp tip. More delicate than Metzenbaum scissors. Often used in pediatric surgery.

   d. Bandage scissors—have right-angled jaws, a blunt upper blade, and a slightly longer lower blade with a wedge/probe tip. Used to cut thick tissue or dressing material.

   e. Utility scissors—have right-angled jaws, a blunt upper blade, and a slightly longer lower blade with a wedge/probe tip. Used to cut thick dressing materials but not used for patient tissue.

   f. Wire cutters—straight or angled, with two blunt tips and one serrated blade at a 45º angle. Used for cutting wire suture or intermediate pins.

   3) Ancillary dissectors—drills, osteotomes, peristeal elevators, chisels, and rongeurs.

   b. Blunt dissectors are used to separate tissue planes without creating an incision into tissue.
      1) Back end of knife handle.
      2) Dissector sponges.
         a) Peanut.
         b) Pusher.
         c) Kittner.
         d) Cherry.
         e) Rosebud.

3. Ancillary dissectors—drills, osteotomes, peristeal elevators, chisels, and rongeurs.

   b. Blunt dissectors are used to separate tissue planes without creating an incision into tissue.
      1) Back end of knife handle.
      2) Dissector sponges.
         a) Peanut.
         b) Pusher.
         c) Kittner.
         d) Cherry.
         e) Rosebud.
3) Sponge on a stick—folded 4”×4” gauze attached to Foerster or Kelly sponge forceps.

4) Surgeon’s finger or hand.

5) Curette.

6) Elevator.

2. Clamp instruments are used for closing circumferentially in a crushing or noncrushing manner for hemostasis or occlusion. They are designed to hold tissue or other materials and come in a variety of shapes and sizes. Their tips may be straight, curved, or angled. Some are fine and delicate while others are sturdy. The jaw design determines its use (see Figure 5.3).

a. Hemostatic clamps (straight or curved) are used to control the flow of blood. The clamping jaws are horizontally serrated.

1) Halsted mosquito forceps—straight, or curved, with a delicate, fine tip and a short jaw. Shaft length is 5”. Jaws have full-length horizontal serration. Used to clamp small bleeders in superficial layers of tissue. Often used in pediatric surgery.

2) Crile forceps—curved and slightly longer and heavier than mosquito forceps. Shaft length is 5 1/2” or 6 1/4”. Jaws have full-length horizontal serration.

3) Schnidt tonsil forceps, or burlishers—curved and longer than Crile forceps. Shaft length is 7 1/2”. Jaws have half-length horizontal serration. Used when additional length is needed.

4) Kelly forceps—straight or curved. Shaft length is 5 1/2”. Jaws have half-length horizontal serration. Heavier than Crile or Schnidt tonsil forceps.

5) Rochester-Pean forceps—straight or curved. Shaft length is 5 1/2”–12”. Jaws have full-length horizontal serration. Heavier than Crile or Schnidt tonsil forceps.

6) Mixter, or right-angled, forceps—with tips bent at a right angle. Shaft length is 6 1/4”, 7 1/4”, or 9”. Jaws have full-length or three-fourths horizontal serration. Used to separate tissue. Longer Mixter forceps are useful for clamping and separating tissues deep in the abdominal cavity. Smaller sizes are available for pediatric use.

b. Noncrushing vascular clamps have straight, curved, rounded, or angled jaws with opposing rows of fine serrations. They are used in vascular surgery to occlude a vessel without crushing it.

c. Occluding clamps have vertical jaw serrations that are close together and arranged in multiple rows. They are used to clamp tissue, such as bowel tissue or blood vessels, and are used to prevent leakage and when minimal tissue trauma is preferred.

d. Grasping/holding clamps are used for retraction; to secure tissue while controlling, repairing, or connecting; and to aid in dissection.

1) Allis forceps—have tips with multiple teeth that do not crush or damage tissue. Used on delicate tissue.

2) Lahey traction forceps—ring-handled, with three sharp teeth in each of the opposing jaws. Used to grasp fibrous tissue.

3) Babcock forceps—have curved and fenestrated tips without teeth. Used on delicate tissue.

4) Ochsner-Kocher forceps, also known as Rochester-Ochsner clamps or Kocher forceps—have transverse serrations and a single, heavy tooth at the tip. Used for grasping tough tissue and fascia. Smaller versions are available for pediatric use.

5) Allen clamps—have a straight jaw with longitudinal serrations. Resemble Ochsner-Kocher forceps but are lighter in weight.

6) Sponge forceps, or sponge stick or ring forceps—used to hold tissue, to hold folded 4”×4” gauze for blotting blood and fluid, and to dissect tissue.

7) Towel clamps (penetrating and nonperforating)—used to secure towels.
Key Terms
**Abduction**: movement away from the midline.

**Abrade**: to roughen or remove a surface by using friction.

**Adduction**: movement toward the midline.

**Adhesive capsulitis**: inflammation of the glenohumeral joint capsule in the shoulder resulting in thickening of the capsule and adhesions of the capsular structures.

**Alignment**: the state of being arranged in a straight line.

**Allograft**: a graft of tissue (including bone) that has been harvested from one individual (living or cadaveric) and is implanted into a different individual of the same species.

**Anatomical reduction**: restoration of the exact prefracture shape of a bone.

**Anchor screw**: a screw that serves as a point of fixation for anchoring a wire loop, strong suture, or instrument.

**Ancillary personnel**: supplemental surgical personnel involved in such activities as instrument processing, case cart stocking, housekeeping, and patient transport.

**Anesthesia Assistant (AA)**: a nonphysician anesthesia provider who practices anesthesia under the medical direction of an anesthesiologist.

**Antegrade femoral nail (AFN)**: a double-curved intramedullary nail that follows the shape of the femur.

**Anterior**: toward the front of the body.

**Antiglide plate**: a surgical implant that prevents shear or overriding displacement of a fragment in an oblique fracture by functioning as a buttress.

**Antimicrobial prophylaxis**: a brief course of antimicrobial agent given intravenously before the surgical incision and inflation of the tourniquet.

**Arthralgia**: pain in one or more joints.

**Arthrodesis**: fusion of bone across a joint space that may occur spontaneously or may be surgically imposed.

**Arthropyathy**: also called arthrosis, a degenerative process affecting a joint.

**Arthroplasty**: surgical reconstruction of a joint.

**Arthroscopy**: visualization of the inside of a joint with an arthroscope. Also called endoscopic exploration.

**Articular**: pertaining to a joint.

**Articular fracture**: a fracture involving the surface of a joint.

**Aseptic technique**: the practice of asepsis to prevent microorganisms or infectious material from entering the surgical field.

**Autogenous bone**: a graft of bone tissue that contains osteogenic cells, osteoconductive scaffolding, and inductive bone matrix proteins to stimulate bone healing. Also called autologous bone graft or bone autograft.

**Autogenous graft**: a graft (including bone) taken from one site on a patient and grafted to a different site on the same patient. Also called autologous graft or autograft.

**Avascular necrosis (AVN)**: bone death without sepsis due to deprivation of the blood supply. Although the bone retains its normal strength, it is unable to heal, and bone collapse is possible with weight bearing.

**Avulsion fracture**: separation of a small fragment of bone at the site of attachment of a ligament or tendon.

**Axillary roll**: a soft, cushioned pad that is placed in the axilla for patients in lateral decubitus position.

**Bankart lesion**: a tear of the anterior glenoid capsule from its bony attachment.

**Bier block**: a form of intravenous regional anesthesia that is accomplished when limb circulation is occluded with a tourniquet and a local anesthetic is injected into a vein distal to the occlusion.
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<td>AA</td>
<td>anesthesia assistant</td>
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<tr>
<td>AAOS</td>
<td>American Academy of Orthopaedic Surgeons</td>
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<td>AATB</td>
<td>American Association of Tissue Banks</td>
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<tr>
<td>AC</td>
<td>acromioclavicular</td>
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<td>ACDF</td>
<td>anterior cervical disectomy and fusion</td>
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<tr>
<td>ACF</td>
<td>anterior cervical fusion</td>
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<td>ACI</td>
<td>autologous chondrocyte implantation</td>
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<td>ACL</td>
<td>anterior cruciate ligament</td>
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<td>ACS</td>
<td>American College of Surgeons</td>
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<tr>
<td>ADL</td>
<td>activities of daily living</td>
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<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality</td>
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<tr>
<td>ALARA</td>
<td>as low as reasonably achievable</td>
</tr>
<tr>
<td>ALL</td>
<td>anterior longitudinal ligament (also used for acute lymphocytic anemia)</td>
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<tr>
<td>AORN</td>
<td>Association of periOperative Registered Nurses</td>
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<tr>
<td>AP</td>
<td>anteroposterior</td>
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<td>ASA</td>
<td>American Society of Anesthesiologists</td>
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<td>ASC</td>
<td>ambulatory surgical center (also used for atypical squamous cells)</td>
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<td>ATLS</td>
<td>advanced trauma life support</td>
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<td>BI</td>
<td>biological indicator</td>
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<td>BMI</td>
<td>body mass index</td>
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<td>BMP</td>
<td>bone morphogenetic proteins</td>
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<td>CAL</td>
<td>coracoclavicular</td>
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<td>CAM</td>
<td>controlled ankle motion</td>
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<td>CAP</td>
<td>College of American Pathologists</td>
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<td>CBC</td>
<td>complete blood count</td>
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<td>CC</td>
<td>coracoclavicular</td>
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<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
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<td>CFN</td>
<td>cannulated femoral nail</td>
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<td>CFU</td>
<td>colony forming unit</td>
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<tr>
<td>CMC</td>
<td>carpometacarpal</td>
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<td>CMF</td>
<td>combined magnetic field</td>
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<td>CMS</td>
<td>Centers for Medicare and Medicaid Services</td>
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<td>CoNS</td>
<td>coagulase-negative staphylococci</td>
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<tr>
<td>CRNA</td>
<td>certified registered nurse anesthetist</td>
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<td>DBM</td>
<td>demineralized bone matrix</td>
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<td>DCP</td>
<td>dynamic compression plate</td>
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<tr>
<td>DDH</td>
<td>developmental dysplasia of the hip</td>
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<tr>
<td>DHS</td>
<td>dynamic hip screw</td>
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<td>DIP</td>
<td>distal interphalangeal</td>
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<td>DVT</td>
<td>deep vein thrombosis</td>
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<td>EMG</td>
<td>electromyography</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<td>ETO</td>
<td>ethylene oxide</td>
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<td>FDA</td>
<td>Food and Drug Administration</td>
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<tr>
<td>GGTP</td>
<td>gamma-glutamyl transpeptidase</td>
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<tr>
<td>GLAD</td>
<td>glenolabral articular disruption</td>
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<tr>
<td>HAI</td>
<td>health care-associated infections</td>
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<tr>
<td>HBV</td>
<td>Hepatitis B virus</td>
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<td>HCV</td>
<td>Hepatitis C virus</td>
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<td>HEPA</td>
<td>high-efficiency particulate air</td>
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<td>HIV</td>
<td>human immunodeficiency virus</td>
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<tr>
<td>ICD</td>
<td>implantable cardioverter-defibrillator</td>
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<tr>
<td>IGHL</td>
<td>inferior glenohumeral ligament</td>
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<tr>
<td>IM</td>
<td>intramedullary</td>
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<tr>
<td>IP</td>
<td>interphalangeal</td>
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<tr>
<td>LAT</td>
<td>lateral (designated with &quot;lat&quot; in small letters)</td>
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<tr>
<td>LC-DCP</td>
<td>limited contact dynamic compression plate</td>
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<tr>
<td>LCL</td>
<td>lateral collateral ligament</td>
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<tr>
<td>LCP</td>
<td>locking compression plate</td>
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<tr>
<td>LHS</td>
<td>locking head screw</td>
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<td>LLIF</td>
<td>lateral lumbar interbody fusion</td>
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<td>LMA</td>
<td>laryngeal mask airway</td>
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<tr>
<td>LPN</td>
<td>licensed practical nurse</td>
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<td>LSO</td>
<td>lumbosacral orthosis</td>
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<tr>
<td>LVN</td>
<td>licensed vocational nurse</td>
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<tr>
<td>MCP</td>
<td>medial collateral ligament</td>
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<tr>
<td>MGHL</td>
<td>middle glenohumeral ligament</td>
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<td>MMA</td>
<td>methyl methacrylate</td>
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<tr>
<td>MRSA</td>
<td>methicillin-resistant <em>Staphylococcus aureus</em></td>
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<tr>
<td>MSI</td>
<td>microbiological safety index</td>
</tr>
<tr>
<td>MTF</td>
<td>Musculoskeletal Transplant Foundation</td>
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<tr>
<td>MTP</td>
<td>metatarsophalangeal</td>
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<td>NC</td>
<td>naviculocuneiform</td>
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<td>NIC</td>
<td>Nursing Interventions Classification</td>
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<tr>
<td>NPO</td>
<td>nothing-by-mouth</td>
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<tr>
<td>OA</td>
<td>osteoarthritic arthritis</td>
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<tr>
<td>OATS</td>
<td>osteochondral autograft transplantation</td>
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<tr>
<td>ORIF</td>
<td>open reduction with internal fixation</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>PA</td>
<td>Orthopaedic Trauma Association</td>
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<tr>
<td>PACS</td>
<td>picture archiving and communicating system</td>
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<tr>
<td>PACU</td>
<td>postanesthesia care unit</td>
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<tr>
<td>PASS</td>
<td>pull, aim, squeeze, sweep</td>
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<tr>
<td>PCA</td>
<td>patient-controlled analgesia</td>
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<tr>
<td>PCL</td>
<td>posterior cruciate ligament</td>
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<tr>
<td>PEMF</td>
<td>pulsed electromagnetic field</td>
</tr>
<tr>
<td>PIP</td>
<td>proximal interphalangeal</td>
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<tr>
<td>PLIF</td>
<td>posterior lumbar interbody fusion</td>
</tr>
<tr>
<td>PLL</td>
<td>posterior longitudinal ligament</td>
</tr>
<tr>
<td>PMMA</td>
<td>polymethyl methacrylate</td>
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<tr>
<td>PNDS</td>
<td>Perioperative Nursing Data Set</td>
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<tr>
<td>PPE</td>
<td>personal protective equipment</td>
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<tr>
<td>PT</td>
<td>prothrombin time</td>
</tr>
<tr>
<td>PTT</td>
<td>partial thromboplastin time</td>
</tr>
<tr>
<td>RA</td>
<td>rheumatoid arthritis</td>
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<tr>
<td>RACE</td>
<td>rescue, alarm/alert, confine/close, extinguish/evacuate</td>
</tr>
<tr>
<td>RNFA</td>
<td>registered nurse first assistant</td>
</tr>
<tr>
<td>ROM</td>
<td>range of motion</td>
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<tr>
<td>SCD</td>
<td>sequential compression device</td>
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<tr>
<td>SCFE</td>
<td>slipped capital femoral epiphysis</td>
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<tr>
<td>SCPD</td>
<td>sterilization process monitoring device</td>
</tr>
<tr>
<td>SSI</td>
<td>surgical site infection</td>
</tr>
<tr>
<td>ST</td>
<td>surgical technologist</td>
</tr>
<tr>
<td>TEN</td>
<td>titanium elastic nail</td>
</tr>
<tr>
<td>TENS</td>
<td>transcutaneous electrical nerve stimulation</td>
</tr>
<tr>
<td>TFCC</td>
<td>triangular fibrocartilage complex</td>
</tr>
<tr>
<td>THR</td>
<td>total hip replacement</td>
</tr>
<tr>
<td>TKA</td>
<td>total knee arthroplasty</td>
</tr>
<tr>
<td>TLF</td>
<td>transforminal lumbar interbody fusion</td>
</tr>
<tr>
<td>TLO</td>
<td>thoracolumbosacral orthosis</td>
</tr>
<tr>
<td>TN</td>
<td>talonavicular (also used for trigeminal nerve)</td>
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<tr>
<td>TPS</td>
<td>Total Performance System</td>
</tr>
<tr>
<td>UKA</td>
<td>unicompartmental knee arthroplasty</td>
</tr>
<tr>
<td>VAC</td>
<td>vacuum-assisted closure</td>
</tr>
<tr>
<td>VRE</td>
<td>vancomycin-resistant enterococci</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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**Note:** This is a listing of abbreviations that appear in this manual. Always follow your organization’s approved listing, if available.
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This comprehensive new edition of the NAON Orthopaedic Surgery Manual is a resource for members of the healthcare team along the entire treatment continuum. The new edition utilizes an outline format for quick, easy referencing.

Additional tables, figures, photographs, and radiographs have been added to enhance the text descriptions. Current approaches and techniques are detailed with a full reference list at the end of each chapter. A section of Key Terms defines and clarifies hundreds of words and phrases inherent to the care of the orthopaedic patient in the perioperative environment. A listing of abbreviations and a comprehensive index provide additional resources.

The current state of orthopaedic nursing care in the perioperative arena is evident in each chapter, as each contributor demonstrates proficiency in the content and application of current principles and practices. The NAON Orthopaedic Surgery Manual is a wealth of knowledge and information for practitioners new to the orthopaedic operating room environment. It is also a working reference for nurses who want to know more about surgical interventions for preoperative and postoperative care considerations and patient/family education. This book is a must for Perioperative Services Departments, Orthopaedic Inpatient Units, and Ambulatory Care Settings.