The Practice Standards for Medical Imaging and Radiation Therapy

Sonography Practice Standards

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Preface to Practice Standards

A profession’s practice standards serve as a guide for appropriate practice. The practice standards define the practice and establish general criteria to determine compliance. Practice standards are authoritative statements established by the profession for evaluating the quality of practice, service and education provided by individuals who practice in medical imaging and radiation therapy.

Practice Standards can be used by individual facilities to develop job descriptions and practice parameters. Those outside the imaging, therapeutic and radiation science community can use the standards as an overview of the role and responsibilities of the individual as defined by the profession.

The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

Format

The Practice Standards are divided into six sections: introduction, scope of practice, clinical performance, quality performance, professional performance and advisory opinion statements.

Introduction. The introduction provides definitions for the practice and the minimum qualifications for the education and certification of individuals in addition to an overview of the specific practice.

Scope of Practice. The scope of practice delineates the parameters of the specific practice.

Clinical Performance Standards. The clinical performance standards define the activities of the individual responsible for the care of patients and delivery of diagnostic or therapeutic procedures. The section incorporates patient assessment and management with procedural analysis, performance and evaluation.

Quality Performance Standards. The quality performance standards define the activities of the individual in the technical areas of performance, such as equipment and material assessment, safety standards and total quality management.

Professional Performance Standards. The professional performance standards define the activities of the individual in the areas of education, interpersonal relationships, self-assessment and ethical behavior.

Advisory Opinion Statements. The advisory opinions are interpretations of the standards intended for clarification and guidance of specific practice issues.
Each performance standards section is subdivided into individual standards. The standards are numbered and followed by a term or set of terms that identify the standards, such as “assessment” or “analysis/determination.” The next statement is the expected performance of the individual when performing the procedure or treatment. A rationale statement follows and explains why an individual should adhere to the particular standard of performance.

Criteria. Criteria are used to evaluate an individual’s performance. Each set is divided into two parts: the general criteria and the specific criteria. Both should be used when evaluating performance.

General Criteria. General criteria are written in a style that applies to imaging and radiation science individuals. These criteria are the same in all of the practice standards, with the exception of limited x-ray machine operators and medical dosimetry, and should be used for the appropriate area of practice.

Specific Criteria. Specific criteria meet the needs of the individuals in the various areas of professional performance. While many areas of performance within imaging and radiation sciences are similar, others are not. The specific criteria were drafted with these differences in mind.
Introduction to Sonography Practice Standards

Definition

The practice of sonography is performed by a segment of health care professionals responsible for the administration of high-frequency sound waves and other diagnostic techniques for diagnostic, therapeutic or research purposes. A sonographer performs sonographic procedures at the request of and for interpretation by a licensed practitioner.

The complex nature of disease processes involves multiple imaging modalities. Although an interdisciplinary team of clinicians, sonographers and support staff play a critical role in the delivery of health services, it is the sonographer who performs the ultrasound examination that creates the images needed for diagnosis.

Sonography integrates scientific knowledge, technical competence and patient interaction skills to provide safe and accurate procedures with compassion. A sonographer recognizes patient conditions essential for the successful completion of the procedure.

Sonographers must demonstrate an understanding of human anatomy, physiology, pathology and medical terminology.

Sonographers must maintain a high degree of accuracy in the production, use, recognition and analysis of ultrasound images and patterns used for patient diagnosis and treatment. They must possess, use and maintain knowledge about bioeffects of high-frequency sound waves. Sonographers independently perform or assist the licensed practitioner in the completion of sonographic procedures. Sonographers prepare, administer and document activities related to medications in accordance with state and federal regulations or lawful institutional policy.

Sonographers are the primary liaison between patients, licensed practitioners, and other members of the support team. Sonographers must remain sensitive to the needs of the patient through good communication, patient assessment, patient monitoring and patient care skills. As members of the health care team, sonographers participate in quality improvement processes and continually assess their professional performance.

Sonographers think critically and use independent, professional and ethical judgments in all aspects of their work. They engage in continuing education to include their area of practice to enhance patient care, public education, knowledge and technical competence.

Education and Certification

Only medical imaging and radiation therapy professionals who have completed the appropriate education and obtained certification(s) as outlined in these standards should perform sonography procedures.
Sonographers prepare for their roles on the interdisciplinary team by successfully completing a program in sonography that is programmatically accredited or part of an institution that is regionally accredited, and by attaining appropriate primary certification from the American Registry of Radiologic Technologists, the American Registry of Diagnostic Medical Sonographers or Cardiovascular Credentialing International. Those passing the ARRT examination use the credential R.T.(S). Those passing the required ARDMS examinations use the credential RDMS, RDCS or RVT. Those passing the CCI examinations use the credential RCS or RVS.

Eligibility to take the postprimary examinations in sonography requires appropriate primary certification, documentation of structured education and clinical experience at the time of application. Those who successfully complete these examinations may use the credentials R.T.(S), R.T.(VS) and/or R.T.(BS).

Medical imaging and radiation therapy professionals performing multiple modality hybrid imaging should be registered by certification agencies recognized by the ASRT and be educationally prepared and clinically competent in the specific modality(ies) they are responsible to perform. Medical imaging and radiation therapy professionals performing diagnostic procedures in more than one imaging modality will adhere to the individual practice standard for each.

To maintain certification, sonographers must complete the appropriate continuing education and recertification as required to sustain a level of expertise and awareness of changes and advances in practice.

**Overview**

An interdisciplinary team of radiologists, sonographers, radiographers and other support staff plays a critical role in the delivery of health services as new modalities emerge and the need for imaging procedures increases. A comprehensive procedure list for the sonographer is impractical because clinical activities vary by practice needs and expertise of the sonographer. As sonographers gain more experience, knowledge and clinical competence, the clinical activities for the sonographer may evolve.

State statute, regulation or lawful community custom may dictate practice parameters. Wherever there is a conflict between these standards and state or local statutes or regulations, the state or local statutes or regulations supersede these standards. A sonographer should, within the boundaries of all applicable legal requirements and restrictions, exercise individual thought, judgment and discretion in the performance of the procedure.
Sonographer Scope of Practice

The scope of practice of the medical imaging and radiation therapy professional includes:

- Providing optimal patient care.

- Receiving, relaying and documenting verbal, written and electronic orders in the patient’s medical record.

- Corroborating a patient's clinical history with procedure and ensuring information is documented and available for use by a licensed practitioner.

- Verifying informed consent for applicable procedures.

- Assuming responsibility for patient needs during procedures.

- Preparing patients for procedures.

- Applying principles of ALARA to minimize exposure to patient, self and others.

- Performing venipuncture as prescribed by a licensed practitioner.

- Starting, maintaining and/or removing intravenous access as prescribed by a licensed practitioner.

- Identifying, preparing and/or administering medications as prescribed by a licensed practitioner.

- Evaluating images for technical quality and ensuring proper identification is recorded.

- Identifying and responding to emergency situations.

- Providing education.

- Educating and monitoring students and other health care providers.

- Performing ongoing quality assurance activities.

- Applying the principles of patient safety during all aspects of patient care.

The scope of practice of the sonographer also includes:

1. Performing diagnostic and therapeutic ultrasound procedures or examinations only as prescribed by a licensed practitioner or during appropriate educational activities.

2. Ensuring equipment parameters for diagnostic and therapeutic exams are of optimal technical and administrative quality as requested by a licensed practitioner.
Sonography Clinical Performance Standards

Standard One – Assessment

The sonographer collects pertinent data about the patient and the procedure.

Rationale
Information about the patient’s health status is essential in providing appropriate imaging and therapeutic services.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Obtains relevant information from all available resources and the release of information as needed.
2. Verifies patient identification and the procedure requested or prescribed.
3. Verifies that the patient has consented to the procedure.
4. Reviews all available patient medical record information to verify the appropriateness of the procedure requested or prescribed.
5. Verifies the patient’s pregnancy status.
6. Assesses factors that may negatively affect the procedure, such as medications, patient history, insufficient patient preparation or artifact producing-objects.
7. Recognizes signs and symptoms of an emergency.

Specific Criteria
The sonographer:
1. Locates and reviews previous examinations for comparison.
Sonography Clinical Performance Standards

Standard Two – Analysis/Determination

The sonographer analyzes the information obtained during the assessment phase and develops an action plan for completing the procedure.

Rationale
Determining the most appropriate action plan enhances patient safety and comfort, optimizes diagnostic and therapeutic quality and improves efficiency.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:

1. Selects the most appropriate and efficient action plan after reviewing all pertinent data and assessing the patient’s abilities and condition.

2. Employs professional judgment to adapt imaging and therapeutic procedures to improve diagnostic quality and therapeutic outcomes.

3. Consults appropriate medical personnel to determine a modified action plan.

4. Determines the need for and selects supplies, accessory equipment, shielding, and positioning and immobilization devices.

5. Determines the course of action for an emergent situation.

6. Determines that all procedural requirements are in place to achieve a quality diagnostic or therapeutic procedure.

Specific Criteria
The sonographer:

1. Selects appropriate equipment and scanning techniques to optimize the procedure.

2. Monitors the patient’s need for information and reassurance throughout the procedure.
Sonography Clinical Performance Standards

Standard Three – Education

The sonographer provides information about the procedure and related health issues according to protocol.

Rationale
Communication and education are necessary to establish a positive relationship.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Provides an accurate explanation and instructions at an appropriate time and at a level the patient and their care providers can understand. Addresses questions and concerns regarding the procedure.

2. Refers questions about diagnosis, treatment or prognosis to a licensed practitioner.

3. Provides patient education.

4. Explains effects and potential side effects of medications.

Specific Criteria
None added.
Sonography Clinical Performance Standards

Standard Four – Performance

The sonographer performs the action plan.

Rationale
Quality patient services are provided through the safe and accurate performance of a deliberate plan of action.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:

1. Performs procedural timeout.
2. Implements an action plan.
3. Explains to the patient each step of the action plan as it occurs and elicits the cooperation of the patient.
4. Uses an integrated team approach.
5. Modifies the action plan according to changes in the clinical situation.
6. Administers first aid or provides life support.
7. Uses accessory equipment.
8. Assesses and monitors the patient’s physical, emotional and mental status.
9. Applies principles of sterile technique.
10. Positions patient for anatomic area of interest, respecting patient ability and comfort.
11. Immobilizes patient for procedure.
12. Monitors the patient for reactions to medications.
Specific Criteria
The sonographer:
1. Recognizes sonographic appearance of normal and abnormal tissue structures and physiological data.
2. Coordinates and manages the collection and labeling of tissue and fluid specimens.
Sonography Clinical Performance Standards

Standard Five – Evaluation

The sonographer determines whether the goals of the action plan have been achieved.

Rationale
Careful examination of the procedure is important to determine that expected outcomes have been met.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Evaluates the patient and the procedure to identify variances that might affect the expected outcome.
2. Completes the evaluation process in a timely, accurate and comprehensive manner.
3. Measures the procedure against established policies, protocols and benchmarks.
4. Identifies exceptions to the expected outcome.
5. Develops a revised action plan to achieve the intended outcome.
6. Communicates the revised action plan to appropriate team members.

Specific Criteria
None added.
Sonography Clinical Performance Standards

Standard Six – Implementation

The sonographer implements the revised action plan.

Rationale
It may be necessary to make changes to the action plan to achieve the expected outcome.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Bases the revised plan on the patient’s condition and the most appropriate means of achieving the expected outcome.
2. Takes action based on patient and procedural variances.
3. Measures and evaluates the results of the revised action plan.
4. Notifies the appropriate health care provider when immediate clinical response is necessary, based on procedural findings and patient condition.

Specific Criteria
None added.
Sonography Clinical Performance Standards

Standard Seven – Outcomes Measurement

The sonographer reviews and evaluates the outcome of the procedure.

Rationale
To evaluate the quality of care, the sonographer compares the actual outcome with the expected outcome.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:

1. Reviews all diagnostic or therapeutic data for completeness and accuracy.

2. Uses evidence-based practice to determine whether the actual outcome is within established criteria.

3. Evaluates the process and recognizes opportunities for future changes.

4. Assesses the patient’s physical, emotional and mental status prior to discharge.

Specific Criteria
None added.
Sonography Clinical Performance Standards

Standard Eight – Documentation

The sonographer documents information about patient care, the procedure and the final outcome.

Rationale
Clear and precise documentation is essential for continuity of care, accuracy of care and quality assurance.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Documents diagnostic, treatment and patient data in the medical record in a timely, accurate and comprehensive manner.
2. Documents unintended outcomes or exceptions from the established criteria.
3. Provides pertinent information to authorized individual(s) involved in the patient’s care.
4. Records information used for billing and coding procedures.
5. Archives images or data.
6. Verifies patient consent is documented.
7. Documents procedural timeout.

Specific Criteria
The sonographer:
1. Documents initial impressions and technical data.
Sonography Quality Performance Standards

Standard One – Assessment

The sonographer collects pertinent information regarding equipment, procedures and the work environment.

Rationale
The planning and provision of safe and effective medical services relies on the collection of pertinent information about equipment, procedures and the work environment.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Determines that services are performed in a safe environment, minimizing potential hazards.
2. Confirms that equipment performance, maintenance and operation comply with the manufacturer’s specifications.
3. Verifies that protocol and procedure manuals include recommended criteria and are reviewed and revised.

Specific Criteria
The sonographer:
1. Participates in patient safety, risk management and quality management activities.
Sonography Quality Performance Standards

Standard Two – Analysis/Determination

The sonographer analyzes information collected during the assessment phase to determine the need for changes to equipment, procedures or the work environment.

Rationale
Determination of acceptable performance is necessary to provide safe and effective services.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Evaluates services, procedures and the environment to determine if they meet or exceed established guidelines, and revises the action plan.
2. Monitors equipment to meet or exceed established standards and revises the action plan.
3. Assesses and maintains the integrity of medical supplies.

Specific Criteria
None added.
Sonography Quality Performance Standards

Standard Three – Education

The sonographer informs the patient, public and other health care providers about procedures, equipment and facilities.

Rationale
Open communication promotes safe practices.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:

1. Elicits confidence and cooperation from the patient, the public and other health care providers by providing timely communication and effective instruction.

2. Presents explanations and instructions at the learner’s level of understanding.

3. Educates the patient, public and other health care providers about procedures and the associated biological effects.

4. Provides information to patients, health care providers, students and the public concerning the role and responsibilities of individuals in the profession.

Specific Criteria
None added.
Sonography Quality Performance Standards

Standard Four – Performance

The sonographer performs quality assurance activities.

Rationale
Quality assurance activities provide valid and reliable information regarding the performance of equipment, materials and processes.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Maintains current information on equipment, materials and processes.
2. Performs ongoing quality assurance activities.
3. Performs quality control testing of equipment.
4. Participates in safety and risk management activities.
5. When appropriate, wears one or more personal radiation monitoring devices at the location indicated on the personal radiation monitoring device or as indicated by the radiation safety officer or designee.

Specific Criteria
The sonographer:
1. Monitors image production to determine technical acceptability.
2. Performs routine archiving status checks.
Sonography Quality Performance Standards

Standard Five – Evaluation

The sonographer evaluates quality assurance results and establishes an appropriate action plan.

Rationale
Equipment, materials and processes depend on ongoing quality assurance activities that evaluate performance based on established guidelines.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
  1. Validates quality assurance testing conditions and results.
  2. Evaluates quality assurance results.
  3. Formulates an action plan.

Specific Criteria
None added.
Sonography Quality Performance Standards

Standard Six – Implementation

The sonographer implements the quality assurance action plan for equipment, materials and processes.

Rationale
Implementation of a quality assurance action plan promotes safe and effective services.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:

1. Obtains assistance to support the quality assurance action plan.

2. Implements the quality assurance action plan.

Specific Criteria
None added.
Sonography Quality Performance Standards

Standard Seven – Outcomes Measurement

The sonographer assesses the outcome of the quality management action plan for equipment, materials and processes.

Rationale
Outcomes assessment is an integral part of the ongoing quality management action plan to enhance diagnostic and therapeutic services.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:

1. Reviews the implementation process for accuracy and validity.

2. Determines that actual outcomes are within established criteria.

3. Develops and implements a revised action plan.

Specific Criteria
None added.
Sonography Quality Performance Standards

Standard Eight – Documentation

The sonographer documents quality assurance activities and results.

Rationale
Documentation provides evidence of quality assurance activities designed to enhance safety.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Maintains documentation of quality assurance activities, procedures and results.
2. Documents in a timely, accurate and comprehensive manner.

Specific Criteria
None added.
Sonography Professional Performance Standards

Standard One – Quality

The sonographer strives to provide optimal patient care.

Rationale
Patients expect and deserve optimal care during diagnosis and treatment.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Collaborates with others to elevate the quality of care.
2. Participates in ongoing quality assurance programs.
3. Adheres to standards, policies and established guidelines.
4. Applies professional judgment and discretion while performing the diagnostic study or treatment.
5. Anticipates, considers and responds to the needs of a diverse patient population.

Specific Criteria
The sonographer:
1. Strives to minimize patient exposure to acoustic energy.
Sonography Professional Performance Standards

Standard Two – Self-Assessment

The sonographer evaluates personal performance.

Rationale
Self-assessment is necessary for personal growth and professional development.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Assesses personal work ethics, behaviors and attitudes.
2. Evaluates performance and recognizes opportunities for educational growth and improvement.
3. Recognizes and applies personal and professional strengths.
4. Participates in professional societies and organizations.

Specific Criteria
None added.
Sonography Professional Performance Standards

Standard Three – Education

The sonographer acquires and maintains current knowledge in practice.

Rationale
Advancements in the profession and optimal patient care require additional knowledge and skills through education.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Maintains credentials and certification related to practice.

2. Advocates for and participates in continuing education related to area of practice, to maintain and enhance clinical competency.

3. Advocates for and participates in vendor specific applications training to maintain clinical competency.

Specific Criteria
None added.
Sonography Professional Performance Standards

Standard Four – Collaboration and Collegiality

The sonographer promotes a positive and collaborative practice atmosphere with other members of the health care team.

*Rationale*
To provide quality patient care, all members of the health care team must communicate effectively and work together efficiently.

*General Stipulation*
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

*General Criteria*
The sonographer:
1. Shares knowledge and expertise with others.
2. Develops and maintains collaborative partnerships to enhance quality and efficiency.
3. Promotes understanding of the profession.

*Specific Criteria*
None added.
Sonography Professional Performance Standards

Standard Five – Ethics

The sonographer adheres to the profession’s accepted ethical standards.

Rationale
Decisions made and actions taken on behalf of the patient are based on a sound ethical foundation.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Provides health care services with consideration for a diverse patient population.
3. Accepts accountability for decisions made and actions taken.
4. Delivers patient care and service free from bias or discrimination.
5. Respects the patient’s right to privacy and confidentiality.
6. Adheres to the established practice standards of the profession.
7. Adheres to the established ethical standards of recognized certifying agencies.

Specific Criteria
The sonographer:
1. Opposes participation in sonography procedures for the purpose of nonmedical entrepreneurial application or entertainment contrary to the tenets of ethical medical practice.
Sonography Professional Performance Standards

Standard Six – Research and Innovation

The sonographer participates in the acquisition and dissemination of knowledge and the advancement of the profession.

Rationale
Scholarly activities such as research, scientific investigation, presentation and publication advance the profession.

General Stipulation
The individual must be educationally prepared and clinically competent as a prerequisite to professional practice. Federal and state laws, accreditation standards necessary to participate in government programs, and lawful institutional policies and procedures supersede these standards.

General Criteria
The sonographer:
1. Reads and evaluates research relevant to the profession.
2. Participates in data collection.
3. Investigates innovative methods for application in practice.
4. Shares information through publication, presentation and collaboration.
5. Adopts new best practices.

Specific Criteria
None added.
Sonography Advisory Opinion Statements

Administering Medication in Peripherally Inserted Central Catheter Lines or Ports with a Power Injector.

Medication Administration by Medical Imaging and Radiation Therapy Professionals.

Medication Administration Through Existing Vascular Access.