Bachelor of Science in Radiologic Sciences (B.S.R.S.) Core Curriculum

Introduction

The ASRT recognizes the baccalaureate degree as the professional level of radiologic science education. The ASRT, in concert with practitioners, educators, Joint Review Committee on Education in Radiologic Technology (JRCERT) and other interested parties, has created curriculum standards for several professional areas of medical imaging. An increasing range of knowledge and skills is required to efficiently and effectively operate within today's health care environment. The need for more sophisticated imaging management and leadership to respond to the clinical, organizational and fiscal demands facing the health care industry supports the creation of advanced educational and training opportunities for imaging and therapeutic practitioners.

As new roles evolve, combined with the desire of imaging and therapeutic practitioners to move up the economic ladder, the demand for primary and continuing education opportunities will continue to increase. With the increasing complexity of the health care setting, the emergence of new diseases combined with advances in imaging and therapeutic protocols, a strong emphasis on critical thinking and life long learning exists. This document is intended to establish curriculum elements for educational programs offering a bachelor of science degree in radiologic sciences, (B.S.R.S.). The goal is to outline a common body of knowledge and skills essential for radiologic science practitioners at the baccalaureate level.

Baccalaureate degree programs in radiography currently exist. This document has been developed with input from multiple parties of interest, including individuals from institutions with long-standing B.S. programs in radiography. The core curriculum content areas should be seen as the essential foundation of any B.S.R.S. program. Elements making up the core should be viewed as the minimum necessary, and expansion or addition of areas is encouraged in developing an overall curriculum plan. Items within the core may be modified for regional, state or institutional variations. Content areas are listed in syllabus format with learning objectives. The descriptions and objectives are general in nature and not all inclusive. Instructors may modify the descriptions and objectives to reflect personal knowledge and experience. Curriculum content in outline form is intended to provide the general aspects that should be covered in the curriculum, while allowing instructor latitude in choosing specific content to make up individual courses. Program faculty should decide whether to combine topics in a single course or divide the information in one content area into separate courses.

Existing standard curriculum documents developed by the ASRT have helped assist parties inside and outside the profession in recognizing elements considered core to the student training experience. This theme is carried over in the B.S.R.S. curriculum document. The layout of the document follows the structure of previously published ASRT curriculum guides. A reference resource list is included with the curriculum. It is not a comprehensive list of resources and is not an endorsement of publications other than those of the ASRT. A B.S.R.S. degree program includes:

- Entry-level training in radiography through primary training or transfer credit
- B.S.R.S. core curriculum
- Area of specialization
  - Imaging specialties
    - Computed tomography
    - Cardiovascular interventional technology
    - Magnetic resonance imaging
    - Mammography
    - Sonography
  - Education
  - Management
  - Radiologist assistant
- Institutional requirements for general education courses rounding out degree requirements

Sponsors of B.S.R.S. degrees are encouraged to create a favorable environment for the certificate-trained technologists who wish to transfer into the B.S.R.S. degree track.

The proposed B.S.R.S. core curriculum continues to emphasize areas found in the entry-level radiography curriculum, such as critical thinking, human diversity and written and oral communications. Students at the B.S.R.S. level will be reintroduced to these curriculum elements but will engage them at a higher level. Practitioners must operate increasingly within an environment where they must demonstrate leadership and competence in a collaborative and interdisciplinary mode. Research should be a priority. Through research, professionals in the imaging sciences can test, refine and advance the knowledge base on which improved education and practice rests.

Where applicable roles and responsibilities linked with curriculum content have been identified. This has been done to aid in formulating student academic and research experiences, as well as demonstrate to potential employers the range of competencies possessed by B.S.R.S. graduates.

Long-term career satisfaction must provide avenues for personal and professional growth and development to meet the demands of an ever increasingly complex health care environment. Individual progress toward the B.S.R.S. degree provides for such growth and development. At the same time individuals develop learning skills in preparation for graduate studies that will carry through their entire career.

Recommended General Education

General education is an integral part of the postsecondary learning experience.

General education provides an opportunity for personal enrichment and exploration outside the confines of the technical professional curriculum.

This portion of a student's academic experience helps shape an autonomous, self-determining individual and sets the stage for a life of civic engagement, personal growth and professional satisfaction resulting from the development of skills and attributes including:

- Preparing for lifelong social and professional learning.
- Defining problems and tasks.
- Preparing for advanced study in graduate or professional school
- Mastering information retrieval systems (libraries, books, periodicals, Internet, personal interviews).
- Planning and executing research.
- Organizing ideas and solutions.
- Writing and communicating.
- Learning what is needed in order to accomplish a task.
- Maintaining an open mind to new ideas and approaches.
- Forming disciplined work habits.
- Establishing an intellectually grounded foundation for ethical judgment and action.

Table of Contents

Patient Information Management

Description
Content is designed to provide the basic concepts of patient information management. Medical records management including privacy and regulatory issues will be examined. The role of the B.S.R.S. technologist will be identified and discussed.

Objectives:
1. Discuss the JCAHO standards regarding the accountability and protection of patient information.
2. List the requirements of a patient consent document.
3. Identify challenges to the protection of patient information.
4. Distinguish between various models to manage the patient records.
5. Explain the contents of the medical record.
6. Demonstrate proper charting.
7. Explain what types of procedures require charting.
8. Discuss privacy and regulatory issues related to patient information.
9. Apply the Health Insurance Portability and Accountability Act (HIPAA) to patient information systems.
10. Identify potential abuses of confidential patient information.
11. Define medical informatics and describe examples of informatics systems found in today's patient care setting.

Content
I. **JCAHO Standards**
   A. Accountability for protecting patient information
      1. Information collection
      2. Information maintenance
      3. Use of personally identifiable health information
      4. Contractual agreements
         a. Confidentiality clause
      5. Monitoring compliance
      6. Demonstrating compliance
         a. Audits
         b. External reviews

   B. Consents
      1. Informed
      2. Specific
      3. Voluntary
      4. Release of information
         a. Purposes
         b. Types of information released
         c. Recipients of information

   C. Education regarding policies, rights and responsibilities
      1. Patient education
      2. Provider education

II. **Challenges to the Protection of Patient Information**
   A. Patient issues
      1. Trust in the physician
      2. Who gets what information
      3. Rights in the case of an error or unauthorized disclosure of information

   B. Provider issues
      1. Implementation of confidentiality procedures
      2. Patient education on confidentiality rights

   C. Managed care organizations
      1. Information shared with external parties

   D. Research
      1. Access to information without breaching patient rights

III. **The Patient Record**
   A. Patient-centered medical record

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B. Problem-oriented medical record
    1. SOAP
        a. Subjective (patient's complaints)
        b. Objective (physician's findings)
        c. Assessment (interpretations and conclusions)
        d. Plan (medical policy)

C. Source-oriented medical record

D. Computer-based patient record
    1. Natural language processing
    2. Structured data entry

E. Coding and standardization

IV. **Medical Record Contents: Paper and Electronic**
    A. Patient identification

    B. History

    C. Physical exam

    D. Psychosocial needs

    E. Treatment plan

    F. Physician's orders

    G. Informed consent

    H. Clinical observations

    I. Progress notes

    J. Consultation requests and reports

    K. Surgical and invasive procedure reports

    L. Diagnostic procedure reports

    M. Transplant information

    N. Diagnosis

    O. Discharge summary and instructions

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P. Living will

Q. Patient education

R. Interventions

S. Outcomes

V. **Techniques and Procedures for Proper Documentation**
A. Location

B. Date

C. Time

D. Frequency

E. Route

F. Content

G. Signature

H. Corrections

I. Abbreviations

VI. **Procedures for Document Administration**
A. Consent forms

B. Preprocedure and postprocedure instructions

C. Interventions

D. Outcomes (evaluation)

E. Vital signs

F. Contrast administration

G. Patient baseline status

H. Changes in patient status

I. Contrast/medication reactions

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J.   Patient education

K.   Information exchange and lines of communications

VII.   **Patient Information Standards**
    A.   Privacy issues
        1.   Health Insurance Portability and Accountability Act (HIPAA)
            a.   Evolution of HIPAA
            b.   Impact on health care providers and personnel
            c.   Use of disclosure
                1)   Directory purposes
                2)   To family and close personal friends
                3)   For notification purposes
                4)   Other disclosures required by law
                5)   Public health authorities
                6)   Health oversight agencies
                7)   Individuals exposed to communicable disease
                8)   Employers responsible for workplace medical surveillance
                9)   Public health or government authorities
              10)   Coroners, medical examiners and funeral directors
            d.   State laws and regulation affecting the use and disclosure of health information

    B.   Medical informatics
        1.   Definition of informatics
        2.   Application in medicine
        3.   Telemedicine
        4.   Management
            a.   Data
            b.   Information
            c.   Knowledge
        5.   Information systems and standards
            a.   Hospital information system (HIS)
            b.   Radiology information system (RIS)
            c.   Picture archiving and communications system (PACS)
                1)   Computed radiography (CR)
                2)   Digital radiography (DR)
            d.   Digital imaging and communication in medicine (DICOM)
        6.   Information as a commodity
            a.   Potential abuses

Leadership Principles

Description

Content is designed to provide the skills and knowledge necessary for the radiologic professional to provide leadership in workplace performance and professional development, thus promoting efficient and effective patient care. It is based on the concept that leadership is exercised through personal example, initiating actions and communication that influences and encourages professional excellence. A clarification of mission, understanding of rules and an awareness of interdependencies within complex organizations evolves through team building.

Objectives

1. Indicate the elements of an effective team.
2. Illustrate ways to improve teamwork.
3. Appraise the purposes and uses of groups and teams.
4. Distinguish the roles of the team leader and other team members.
5. Discuss the terms vision, mission and goals as they relate to team effectiveness.
6. Express an understanding of the impact that styles have on team membership and working relationships.
7. Create a list of common skills found in productive teams.
8. Assess the relationship between job and work design and job satisfaction.
9. Describe connective process components.
10. Examine the procedures involved in performing a job analysis.
11. Plan training objectives to satisfy job requirements and expectations.
12. Describe the function of competency evaluations.
13. Prepare a list of essential elements making up a competency assessment program.
14. Compare select methods competency verification.
15. Describe avenues of professional advocacy.

Content
I. **Managing Groups and Teams**
   A. The nature of committees and teams
      1. Philosophy/definition of teamwork
      2. Elements of an effective team
      3. Team-building goals
      4. How teams can move
      5. Ways to improve teamwork

   B. The purposes and uses of groups and teams
      1. Limitations
      2. Disadvantages
      3. Enhancement of effectiveness

   C. The leader
      1. Coaching
      2. Empowering

   D. Team members
      1. Effective traits
      2. Role recognition

   E. The basics of the team
      1. Vision
      2. Mission
      3. Goals

   F. Understanding other team members
      1. Management style of the team leader
      2. Understand types of styles
      3. Influencing the style of others
      4. Working with different styles

   G. Key skills for productive teams
      1. Interdependence
      2. Trust
      3. Information flow
      4. Decision making
         a. Conflict management
         b. Conflict resolution

II. **Work Design and Evaluation**
   A. Approaches to job design and satisfaction

   B. Analysis of work

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C. Designing individual jobs

D. Coordinating interconnected work within the department

E. Problem solving and decision making

F. Connective process
   1. Interdependence
    2. Coordination
    3. Communication

III. **Professional Development**
    A. Departmental education activities
        1. Position analysis
            a. Job functions
            b. Required quality levels
            c. Job description
        2. Education plan
            a. Training objectives
            b. Training plan
            c. Format and content development
            d. Presentation and evaluation

    B. Competency evaluation
        1. Competency policy
            a. Definition of competency
            b. Goal of competency assessment
            c. Regulatory standards
                1) Orientation process and length
                2) Core competencies
                3) Age-specific competencies
        2. Essential elements of competency assessment
            a. Ongoing process
            b. Domains of skill
            c. Cost effectiveness
            d. Initial competencies vs. ongoing competencies
            e. Competency development
        3. Competency indicators
            a. Annual review
            b. High-risk, low-volume procedures
            c. JCAHO requirements
            d. New procedures
            e. New equipment
            f. New policies
        4. Methods of verification
            a. Return demonstration

        b. Education course/ post-test

        c. Self-learning packet

        d. Inservice

        e. Direct observation

        f. Peer review

        g. Discussion/reflection groups

        h. Quality improvement monitors

    5. Competency assessment process development

        a. Age-specific aspect

        b. Manager's response and follow-up

        c. Documenting and tracking

        d. Promoting accountability

C. Professional advocacy

    1. Power and politics in health care

    2. Developing alliances

    3. Types and forms of alliances

    4. Developing and using power

    5. The structure of political activity in organizations

    6. Power strategies and tactics

    7. Voluntarism

    8. Strategy making

    9. Creating and managing the future
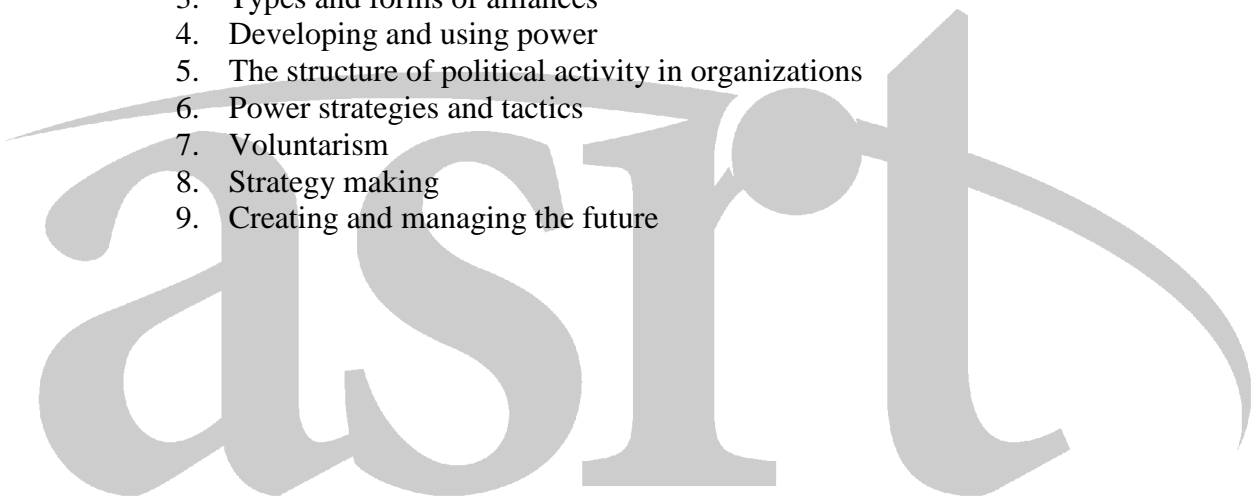
Health Care Systems

Description
Content is designed to impart an understanding of the forces shaping the present and future health care delivery system. The political context of health care organization and delivery in the United States will be discussed. Specific attention will focus on the concepts of health policy, as well as the mechanisms for policy formulation and implementation. Contemporary social and ethical issues and appropriate professional roles are examined using concepts and principles of ethical decision making, human diversity, global health care and epidemiology. The impact of information and health care technologies on patient care will be discussed.

Objectives
1. Identify the historical forces that shaped the current delivery system and their relevance for an emerging system.
2. Describe the mechanisms that affect the formulation and implementation of health policy.
3. Describe the relationship between national health policy and local health care delivery.
4. Determine the appropriate role of the radiographer when addressing contemporary social and ethical issues impacting patient care.
5. List epidemiological resources of information used to monitor the current health care delivery system.
6. Describe the impact of information and health care technologies on modern patient care.

Content

I. **Evolution of the American Health Care System**
   A. Historical perspective

   B. Evolution of national standards

   C. Evolution of state standards

   D. Landmark events

II. **Health Policy Formulation**
   A. National policy-making process

   B. State policy-making process

III. **National, State and Local Policy Influences on Direct Patient Care**
   A. National
      1. Veterans Health Administration
         a. Care for active and retired military personnel

   B. State
      1. County-sponsored hospitals
      2. Health care for incarcerated individuals
      3. Caring for the uninsured

   C. Local
      1. City-sponsored hospitals

   D. Health care delivery systems
      1. Philosophy/mission
      2. Organizational structure
      3. Recipients of care
      4. Health care providers
         a. Hospitals
         b. Outpatient clinics
         c. Public health centers
         d. Home health
         e. Nursing and extended-care facilities
         f. Emergency medical system
         g. Mobile clinics
         h. Collaborative agency relationships
         i. Occupational health

IV. **Radiographers' Role in Responding to Contemporary Social and Ethical Health Care Issues**
   A. Human Genome Project

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B. Organ donor programs

C. Euthanasia/assisted suicide

D. Inequities of health care access/delivery

V. **Sources of Research Information Designed to Measure or Monitor Health Care Delivery**
A. National agencies

B. International agencies

C. Professional organizations/societies

D. College research centers

VI. **Technology's Impact on Health Care Delivery**
A. Teleradiography
1. Access to experts in a particular field
2. Liability concerns
3. Confidentiality of patient information

B. Fusion technologies
1. PET/CT

C. Patient information/education resources

D. Pace of change in health care
1. Need for continuing education

Quality Management

Description

Content is designed to impart an understanding of the tasks and protocols making up the quality management activities of a typical radiology department. The roles and responsibilities of all parties contributing to the quality management effort will be presented. Tools, procedures and evaluation criteria used in the performance assessment of imaging modalities and image processing will be discussed. The role of the B.S.R.S. technologist will be identified and discussed. Special attention is given to American College of Radiology (ACR) and Mammography Quality Standards Act (MQSA) guidelines for mammography.

Objectives

1. Differentiate between quality management (QM), quality assurance (QA) and quality control (QC).
2. Develop an understanding of the QM process.
3. State the purpose of a QM program.
4. Discuss the rationale for implementing a QM program.
5. Discuss the need for a radiographic QM program.
6. Describe the impact of QM on image quality.
7. Analyze the benefits of a QM program to the patient and to the department.
8. Describe how QM can reduce patient dose and save money.
9. Discuss how QM can improve consistency in image quality.
10. Analyze areas of patient care that can be improved through a QM program.
11. Identify tools that are used in QA.
12. Apply the QA tools to given situations.
13. Analyze QA data to determine system function.
14. Compare and contrast QA data with system standards.
15. Identify QC procedures associated with the radiographic suite, darkroom and accessory devices.
16. Discuss rationale for doing each QC test.
17. Identify the required equipment for each test.
18. Discuss the acceptance parameters for each test.
19. Explain the importance of record keeping.
20. Define trend, run and point out of control.
21. Explain the rationale behind testing frequency.
22. Discuss problems that might result in erroneous findings for each test.
23. Describe and discuss the procedure for doing each test.
24. Identify and discuss how often each test is performed.
25. Identify and discuss potential problems that might arise during or after each test.
26. Perform each test.
27. Analyze and interpret test results.
28. Discuss the role and responsibilities of each member of the QA team.
29. Discuss the importance of QA program evaluation.

30. Differentiate between mammography QM, QA and QC.
31. Discuss the importance of the medical outcomes audit.
32. Identify and discuss the QC procedures associated with mammography.
33. Perform each test procedure according to ACR and MQSA guidelines.
34. Perform sensitometric and densitometric measurements.
35. Evaluate sensitometric and densitometric data as related to darkroom environmental control.
36. Evaluate sensitometric film strips to determine and evaluate characteristic curves, speed, contrast (gamma and average gradient) and base-fog values.
37. Adjust for variations in film response to exposure as compared to other films or film-screen combinations using sensitometric measurements.
38. Evaluate processor, cine and cut-film for preventive maintenance.
39. Develop a procedure manual for equipment quality control.
40. Perform tests and collect data on radiographic equipment including mA, kVp, timer accuracy and screen response.
41. Perform tests to determine safety and operability of the pressure injector, serial film changer, defibrillator and monitoring equipment.
42. Clean and evaluate recording equipment including the videotape recorder, cine cameras, spot film cameras and projectors, physiological monitors and serial film changers.
43. Develop adequate warm-up procedures for radiographic tubes.
44. Collect data and check protocols for sterile technique, surgical procedures, universal precautions and Occupational Safety and Health Administration (OSHA) regulations.

Content
 I. **Definitions**
   A. Quality management

   B. Quality assurance

   C. Quality control

 II. **Concepts and Principles of Quality Management**
   A. Philosophical basis
       1. Departmental vision statement
       2. Mission
       3. Guiding principles

   B. QM problem-solving strategies
       1. Making the commitment to QM
       2. Identification of needed resources
           a. Personnel
           b. Tools
               1) Maintenance
           c. Training
       3. Scheduling
           a. Interruption of patient throughput
       4. Communication
           a. With management
           b. With staff

   C. Tools for problem identification and analysis
       1. Quantitative assessments
           a. Statistical models
       2. Qualitative assessment
           a. The "eyes of the observer"

 III. **Collection and Analysis of QA Data**
   A. Development of indicators
       1. Baselines
       2. Control limits
       3. Teamwork

   B. Data collection methods
       1. Protocols for data collection
           a. Film darkrooms
           b. Film processors
           c. Silver recovery
           d. Radiographic equipment

e. Ancillary equipment
            1) Automatic exposure control
            2) Tomographic systems
            3) Image receivers
            4) Grids
            5) Portable devices
        f. Fluoroscopic equipment
        g. Digital systems
        h. Mammographic equipment and processing
        i. Computed tomography
        j. Magnetic resonance
    2. Controlling for error
        a. Systematic error
        b. Process error

C. Data analysis
    1. Flowchart
    2. Cause-and-effect diagram
    3. Histogram
    4. Scatter plot
    5. Pareto chart
    6. Trend chart
    7. Control chart

D. Assessment of outcomes
    1. Determining appropriate next-step response
        a. Indicators of change
        b. Call for immediate action
        c. Baseline reassessment
    2. Identification of intervening variables
    3. Planning for reassessment

E. Standards for quality
    1. Internal standards for performance
    2. External guidelines and parameters for quality standards
    3. Continuous quality improvement

IV. **Benefits**
    A. Patient
        1. High-quality service to the patient
        2. Reduced wait times
        3. Efficient service
        4. Improved communications

    B. Dose reduction
        1. Information to implement new technology to reduce patient exposure

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C. Effective patient care
1. Improved customer satisfaction
2. Consistent image quality
3. Improved service to the referring physician

D. Department
1. Proactive vs. reactive management of service
2. Improved operator efficiency
3. Controlling expenses
4. Opportunity for career development
5. Impact of staff morale

E. Cost effectiveness
1. Time/patient throughput
2. Operator efficiency
3. Consumables
4. Repair and maintenance

F. Consistent diagnostic quality
1. Assure quality service to the radiologist
2. Ability to operate in a competitive environment of imaging service providers

V. **Radiography QM**
A. Physical principles
1. Radiation production
2. X-ray beam characteristics
3. Film-Screen characteristics
4. Film processing

B. Collection and analysis of QC data
1. Generator performance
2. Beam characteristics
3. Ancillary equipment evaluation
4. Processor performance
5. Imaging system performance

C. Personnel responsibilities
1. Administration
2. Technologist
3. Physicist
4. Service

D. Records
1. QM/QA/QC manuals

2. Record keeping techniques
3. Testing program review
4. Testing program evaluation

   E. Test instrumentation
1. kVp meter
2. Radiation detector
3. Exposure timer
4. Test objects (phantoms)
5. Sensitometer
6. Densitometer
7. Light meter
8. Wire mesh

VI. **Mammography QM**
   A. General information
1. Responsibilities
2. Reporting
3. Record keeping
4. Medical outcome audits
5. Consumer complaints
6. Infection control
7. Radiologist QA
8. Suboptimal image tracking

   B. Daily QA procedures
1. Darkroom
   a. Purpose of QA
   b. Regulations and recommendations
2. Processor
   a. Purpose of QA
   b. Control film
   c. Data plotted
     1) Film speed
     2) Film contrast
     3) Film fog
   d. Corrective measures
     1) Chemistry
       a) Developer
       b) Fixer
       c) Water (rinse)
     2) Temperature
       a) Developer
       b) Fixer
       c) Water (rinse)
       d) Dryer

        3) Time
        4) Film

C. Weekly QA procedures
  1. Screen cleanliness
    a. Purpose
    b. Procedure
    c. Documentation
  2. Viewbox maintenance
    a. Purpose
    b. Procedure
    c. Magnifying glasses
    d. Documentation
  3. Phantom images
    a. Purpose
    b. Congruity of image
      1) Cassette
      2) Phototimer
      3) Viewbox
    c. Documentation
      1) Exposure time
      2) Optical density
      3) Density difference
      4) Simulated fibers
      5) Speck groups
      6) Masses
    d. Problem-solving steps

D. Monthly QA procedures
  1. Visual checklist
    a. Purpose
    b. Documentation

E. Quarterly QA procedures
  1. Repeat analysis
    a. Purpose
    b. Analysis of data
    c. Documentation of data
  2. Fixer retention test
    a. Purpose
    b. Procedure
    c. Documentation

F. Semiannual QA procedures
  1. Darkroom fog test
    a. Purpose

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    b. Procedure

    c. Documentation

   2. Film-screen contact test

    a. Purpose

    b. Procedure

    c. Documentation

   3. Compression test

    a. Purpose

    b. Procedure

    c. Documentation

  G. Annual QA procedures

   1. Physicist's survey

   2. Inspection by federally certified or state-certified inspectors

   3. Qualification standards

    a. Physicians

    b. Mammographers

    c. Medical physicists

VII. Cardiovascular-Interventional Technology QM

  A. Quality control

   1. Processor control

    a. Darkroom environment

    b. Sensitometry

    c. Equipment

    d. Parameters

     1) Speed

     2) Contrast

     3) Gamma

     4) Average gradient

     5) Base fog

    e. Preventive maintenance

     1) Cine

     2) Cut-film

     3) Storage mediums (optical disc, CD-ROM, etc.)

    f. Daily log

    g. Darkroom disease

  B. Equipment control

   1. Radiographic unit

    a. kVp

    b. mA

    c. Timer accuracy

    d. Fluoroscopic resolution

    e. Fluoroscopic contrast

    f. Automatic brightness system

g. Collimator alignment
h. Screen response, condition and cleaning
2. Electromechanical (flow rate, pressure) injector
   a. Flow rate, consistency
   b. Electrical safety
   c. Mechanical lock
3. Serial film changer
4. Digital subtraction equipment
5. ECG equipment
6. Defibrillator
7. Pulse oximeter
8. Doppler
9. Video recorder
10. Warm-up procedures for tubes
11. Preventive maintenance on all equipment

C. Environmental control
   1. Sterile technique
   2. Surgical control
   3. Universal precautions
   4. OSHA regulations
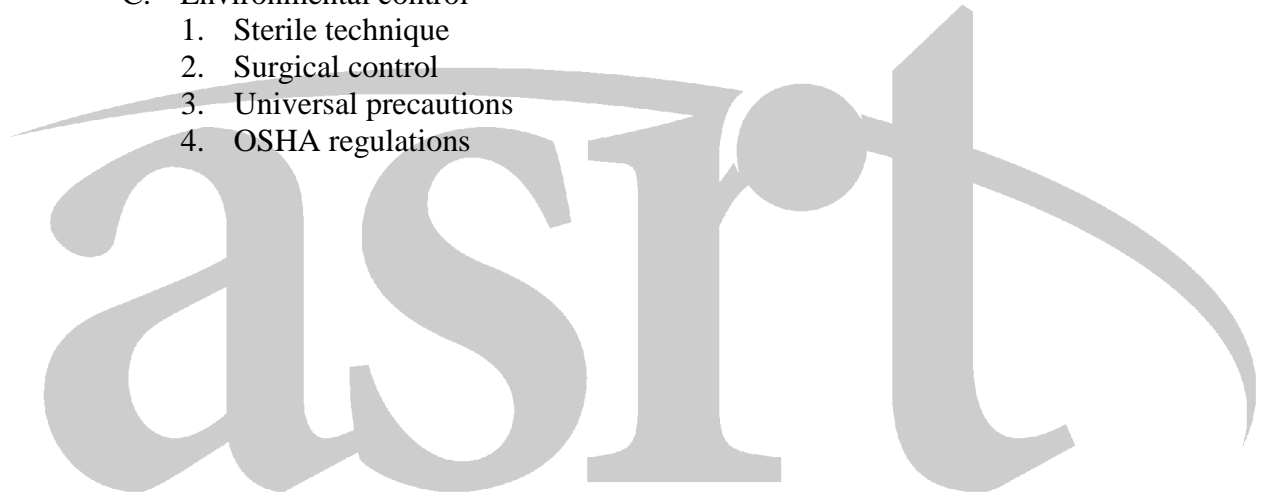
Risk Management

Description

Content is designed to establish a knowledge base in risk management. Sources of risk, target populations and incident reporting will be examined. Emphasis will be given to the systematic gathering and utilization of data as a strategy to reduce and minimize the possibility of a specific loss. Included is the formulation of a risk management action plan.

Objectives

1. Develop diagnostic skills to identify sources of risk in the patient care setting.
2. Articulate the importance of good medical records and patient communications.
3. Recognize the roles of federal, state, commercial and other agencies involved in risk management and other medical liability issues.
4. Assess the probability of adverse effects from a risk situation.
5. Formulate a risk management action plan to meet department needs.
6. Discuss the basic principles of risk management.
7. Properly complete and investigate an incident report.

Content
I. **Risk Applied to the Patient Care Setting**
  A. Possible populations at risk
    1. Patients
    2. Professional staff and students
    3. Medical staff and students
    4. Ancillary staff and volunteers
    5. Visitors

  B. Care provider-patient relationship
    1. Definition
    2. Managed care
      a. Obligations of contracts
      b. Patient advocacy role
      c. Financial agreements and disclosures
      d. Scope of training of team members

  C. Informed consent
    1. Components
      a. Diagnosis
      b. Nature and purpose of proposed treatment
      c. Possible complications
      d. Probability of success
      e. Alternatives
      f. Documenting conversations
      g. Written form completion
    2. Special patient situations
      a. Minors
      b. Mental incompetence
      c. Emergencies

  D. Communication
    1. Practitioner/patient
      a. Use of clear, understandable language
      b. Time spent with patients
      c. Importance of listening skills
      d. Receptivity to the needs of patients
      e. Responsiveness to culturally diverse patients
      f. Strategies for addressing patient complaints
    2. Practitioner/legal system
      a. Response to request for records
      b. Subpoenas
      c. Depositions
      d. Court appearances
    3. Staff issues
      a. Americans with Disabilities Act

b. Harassment
        c. Interview questions permitted and not permitted
        d. Occupational Safety and Health Administration issues
    4. Other providers
        a. Radiologist assistants
        b. Nurse practitioners
        c. Physician assistants
        d. Consultants
        e. Allied health providers

E. Legal definitions
    1. Sources of the law
        a. Supreme law
        b. Statutory law
        c. Decisional law
        d. Quasi-judicial law
    2. General legal liability
        a. Torts
        b. Intentional negligence
        c. Contract
    3. Duty to exercise care
    4. Applicable standard of care
    5. Breach of standard of care
    6. Causal relationship between breach of duty and injury
    7. Statute of limitations
    8. Statutory immunity

F. Documentation (paper or electronic)
    1. Patient record
        a. Accurate
        b. Complete
            1) Patient examination
                a) History and physical examination
                b) Lists of known conditions
                    (1) Allergies
                    (2) Previous illnesses
                    (3) Immunizations
                c) Specific notes
                    (1) Symptoms
                    (2) Patient noncompliance
                    (3) Patient responses
                d) Patient action plan
                    (1) Differential diagnosis, current diagnosis, therapy, plan of action
                    (2) Specific time of return visit
                    (3) Referral to other physicians

(4) Follow-up strategy
                    e) Telephone calls
                        (1) Reports of tests
                            (a) Acknowledgment of results
                            (b) Inclusion in chart
                            (c) Plan for abnormal results
                    f) Forms
                        (1) Preprinted forms
                        (2) Importance of signing and dating all entries
                        (3) Security of pages
                        (4) Notation of missed or cancelled appointments
            c. Legibility and readability
            d. Protocol for corrections and modifications to the patient's record
            e. Timely completion of medical records
            f. Confidentiality
                1) Legal breach of confidentiality
        2. Ancillary services charting of notes and comments

    G. Issues of practitioner competence
        1. Continuing medical education
        2. Practice standards

    H. Common allegations resulting in professional liability complaints

    I. Professional liability insurance
        1. Policy types
        2. Policy limits
            a. Minimum coverage
            b. Excess coverage
        3. Obligations
        4. Types of insurance providers

II. **Components of a Risk Management Program**
    A. Sources of risk in the radiology department
        1. Fixed equipment
        2. Mobile equipment
        3. Accidents (falls)
        4. Bloodbourne pathogens (needlesticks)
        5. Ergonomics
        6. Emergency situations
        7. Ancillary equipment
        8. Hazardous materials
        9. Radiation exposure
        10. Personalities and personnel
        11. Other

B.   Decision making as an outcome of risk analysis
1.   Impact evaluation
2.   Probability
3.   Time frame
4.   Risk classification
5.   Risk prioritization
6.   Determine responsibilities

C.   Planning to reduce risk
1.   Present and future actions

D.   Risk management team
1.   Involvement of other departments/agents
2.   Policy and procedures
a.   Claims prevention
b.   Incident reporting
1)   Components of the report
2)   Timeliness
3)   Documenting details of the occurrence
a)   Objectivity in reporting
4)   Witnesses
5)   Recording the report
6)   Record of inspection and care delivered
7)   Recording follow-up care and/or resolution of injury
3.   Assignment of tasks
4.   Monitor risk indicators and mitigating actions
5.   Frequency of plan assessment
6.   Indicators for education and training
7.   Communicating results

Health Care Law and Regulations

Description
Content is designed to provide a fundamental background in the law and regulatory issues of today's health care culture. Advanced legal terminology, concepts and principles will be presented, discussed and applied in relation to clinical practice. Radiologic technologist scope of practice issues and situations will be investigated.

Objectives
1. Explain how scope of practice affects the radiologic technologist.
2. Discuss the contents of the practice standards.
3. Compare civil and criminal law.
4. Explain civil procedures.
5. Describe the concept of standard of care.
6. Distinguish between the different types of consent.
7. Describe the client's/patient's legal responsibilities.
8. Describe the employer's legal responsibilities.
9. Describe the employee's legal responsibilities.
10. Discuss regulatory and accreditation issues related to health care.

Content
I. **Scope of Practice**

II. **Practice Standards**

III. **Legal Issues**
  A. Civil liability

  B. Intentional torts
    1. Elements
    2. Assault
    3. Battery
    4. False imprisonment
    5. Emotional distress
    6. Fraud
    7. Invasion of privacy
    8. Defamation
       a. Slander
       b. Libel
    9. Vicarious liability

  C. Unintentional torts/negligence
    1. Elements
    2. Contributory
    3. Comparative

  D. Criminal law
    1. Criminal negligence
    2. Falsification of records
    3. Drugs
    4. Fraud
    5. Patient abuse
    6. Theft

IV. **Civil Procedures**
  A. Pleadings

  B. Summons and complaint

  C. Discovery

  D. Motions

  E. Trial procedure

  F. Evidence

G. Verdict

H. Appeals

V. **Standard of Care**

VI. **Burden of Proof**

VII. *Res Ipsa Loquitur*

VIII. *Respondeat Superior*

IX. **Consent**
   A. Informed

   B. Uninformed

   C. Implied

X. **Patient Directives**
   A. Living wills

   B. Do-not-resuscitate orders (DNR)

   C. Power of attorney

XI. **Employer and Employee Responsibilities**
   A. Labor laws

   B. Unions

   C. Discrimination laws

   D. Harassment in the workplace
      1. Quid pro quo
      2. Hostile work environment
      3. Protected persons
      4. Unwelcome conduct
      5. Employer's liability
      6. Sexual harassment
      7. Harassment
      8. Assault and battery
      9. Infliction of emotional distress
      10. Invasion of privacy
      11. Wrongful discharge

E. Conditions of employment
   1. Position descriptions
   2. Drug screening
   3. Background checks
   4. Misrepresentation

F. Liability coverage
   1. Employer
   2. Personal

G. Equipment safety regulations

H. Safety
   1. Hazard identification and control
   2. Policies and procedures
      a. Occupational Safety and Health Administration
      b. Centers for Disease Control and Prevention
      c. Facility
      d. State
   3. Employee training
   4. Fire, electrical and chemical safety
   5. Injury prevention
   6. Safety/quality improvement committees
   7. Risk management

I. Whistleblower protection

XII. **Accreditation and Regulatory Issues**
A. Purpose of accreditation

B. Education program accreditation
   1. Programmatic accreditation
   2. Regional accreditation
   3. National proprietary agencies
   4. State agencies and others

C. Health care facility accreditation
   1. Governmental
   2. National
   3. State

D. Health care professional credentialing
   1. Certification
   2. Licensure
   3. Registration

E. Credentialing agencies
    1. National organizations
    2. State agencies

F. Regulatory agencies
    1. Food and Drug Administration
    2. Nuclear Regulatory Commission
    3. Occupational Safety and Health Administration
    4. U.S. Department of Transportation
    5. State agencies

G. Advisory agencies
    1. International Commission on Radiation Units and Measurement
    2. National Council on Radiation Protection and Measurement
    3. National Academy of Sciences Advisory Committee on the Biologic Effects
        of Ionizing Radiation
    4. United Nations Scientific Committee on the Effects of Atomic Radiation

Directed Readings and Research

Description

Content is designed to aid in the development of inquiry and research skills. Learning research skills and conducting research projects benefits the individual and the profession. The individual benefits by learning new knowledge and skills; the profession benefits by adding to the professional body of knowledge.

Technological innovations result in new procedures, equipment and expanded or new modalities that require technologists to remain current in their knowledge and skills. One method of meeting this professional obligation is to read, study professional literature or conduct research.

Learning does not end when a student completes the formal educational process; therefore, as a professional, the technologist must develop inquiry skills, determine continuing education needs and pursue methods to meet those needs.

Objectives

1. Improve didactic and clinical performance through exposure to research.
2. Facilitate professional and personal growth through continued exposure to current trends in health care.
3. Enhance inquiry abilities through development of research skills.
4. Raise the level of professional competence through the continuing development of communication and writing skills.
5. Determine the ethical principles and legal constraints of research.
6. Identify the types of research.
7. Evaluate research topic for sufficient depth and breadth.
8. Conduct a comprehensive literature review.
9. Develop an appropriate outline for research study.
10. Develop a research paper for publication.
11. Evaluate the significance of research question.
12. Critique the research results for bias and study validity.
13. Analyze the appropriateness of references.

Content
I. **Intellectual Inquiry and Analysis of Research Articles.**
   A. Proper use of library, Internet and other research data services

   B. Selection of a topic of appropriate depth and breadth

   C. Analysis of journal articles and peer-reviewed sources
      1. Scholarly publications
      2. Information that should be documented
      3. New knowledge created
      4. Application of new knowledge
      5. Support of previous learning
      6. Research design
      7. Research bias
      8. Study validity
      9. Application for future research and recommendations
      10. Implications for professional practice

   D. Bibliography/reference documentation

II. **Preparing a Research Paper**
   A. Ethical principles and legal consideration

   B. Development of central topics

   C. Development of research plan

   D. Qualitative and quantitative research

   E. Types of research projects
      1. Literature review
      2. Experimental
      3. Descriptive/survey research
      4. Case study projects

   F. Selection of a research topic

   G. Purpose and scope of literature review

   H. Review of the literature

   I. Research design

   J. Preparation of the research topic outline

   K. Writing the first draft of a research paper

L. Preparation of the final draft of research paper

M. Submission for publication

III. **Evaluation of Research Projects**
  A. Research quality
      1. Technical accuracy
      2. Reader comprehension
      3. Scholarly
      4. Effectiveness of writing style
      5. Appropriate form and style

  B. Systematic literature analysis

  C. Research plan and paper organization
      1. Appropriate title
      2. Title page
      3. Abstract
      4. Introduction
      5. Definition of terms
      6. Literature review
      7. Research design or methodology
      8. Hypothesis or purpose of research
      9. Results or analysis
      10. Conclusions, discussions and recommendations

Communications

Description

Content is designed to expand the knowledge base and skills necessary for the practitioner to communicate effectively. Existing communication skills will be enhanced to include professional presentations, business communication, and research publication and evaluation. The practitioner's role and responsibility with regard to written and oral communication will also focus on patient education, advocacy and confidentiality. A heightened awareness of human diversity will be emphasized.

Objectives
1. Summarize the ways in which communication affects our daily lives.
2. Possess a general understanding of the communication principles and theories that are used to explain and analyze people's actions.
3. Apply principles of effective communication in a variety of contexts.
4. Critically interpret messages from a variety of sources.
5. Assess cultural, ethnic, linguistic and socioeconomic variables that impact client/health care provider communication.
6. Demonstrate technical writing ability in a variety of venues, including scholarly writing and business communications.

Content
  I. **General Communication**
     A. Verbal and nonverbal

     B. Formal and informal

     C. Intentional and unintentional

     D. Symbols

     E. Encoding

     F. Feedback

     G. Barriers to communication

 II. **Language and Intellectual Meaning**
     A. Language
        1. Nuances/meanings

     B. Words

     C. Labeling

     D. Style

     E. Empathy and sympathy

     F. Translation of medical terminology into lay terms
        1. Chronic vs. curable disease

III. **Listening and Feedback**
     A. Hearing vs. listening

     B. Active vs. inactive listening

     C. Reflecting

     D. Feedback

 IV. **Nonverbal Communication**
     A. Conversation regulating cues

     B. Types of nonverbal communication

C. Kinesics and body movement
1. Emblems
2. Illustrators
3. Regulators
4. Affect (internal emotion) displays
5. Body manipulators
6. Body movement and posture
7. Personal appearance and clothing
8. Touching

D. Spatial zones
1. Intimate
2. Personal
3. Social
4. Territoriality
5. Voice cues
6. Stereotypes

V. **Intrapersonal Communication**
A. Self-perception

B. Johari Window

C. Roles

D. Maslow's hierarchy of needs

E. Personal orientation

F. Personality traits

G. Defense mechanisms

H. Conditioning effects on awareness

I. Assumption that beliefs are upheld by others of same ethnicity

VI. **Interpersonal Communication**
A. Self-disclosure

B. Trust

C. Nonverbal

D. Types of health care relationships
    1. Professional – patient
        a. Developing trust
    2. Professional – professional
    3. Professional – family
    4. Patient – family

E. Factors affecting group performance
    1. Personality
    2. Cohesion
    3. Conflict
    4. Conformity
    5. Networks

F. Interviews in the care setting
    1. Information sharing
    2. Therapeutic
    3. Interview phases
    4. Question types

G. Phases of development/breakdown

H. Social interactions
    1. Cultural communication preferences

 I. Negotiation

VII. **Small Group Communication**
A. Group types

B. Responsibilities

C. Norms

D. Roles

E. Leadership
    1. Styles

F. Factors affecting group performance
    1. Personality
    2. Cohesion
    3. Conflict
    4. Conformity
    5. Networks

VIII. **Organizational Communication**
   A. Characteristics

   B. Message types

   C. Communication structure

   D. Channels

   E. Distortions

   F. Communication flow

   G. Professionalism

   H. Interviewing

   I. Negotiation

IX. **Public Communication**
   A. Speaker responsibility

   B. Speaker ethics and approaches

   C. Purposes

   D. Audience analysis

   E. Audience types

   F. Speaker environment

   G. Speaker-audience interactions

X. **Speech Creation and Delivery**
   A. Topic selection

   B. Narrowing a topic

   C. Source materials

   D. Parts of a speech

   E. Informative speech patterns

   F. Persuasive speech patterns

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G. Supporting materials for clarification

H. Speech delivery

XI. **Professional Presentation and Multimedia**
  A. Presentation tools
     1. Software
     2. Slides
     3. Overheads

  B. Multimedia
     1. CD-ROM
     2. Video
     3. Internet
     4. Text

XII. **Communication Through the Mass Media**
  A. Global village

  B. Delayed feedback

  C. Gate keeping – information selection

  D. Mass media

  E. Functions of mass communication

  F. Effects of mass media

XIII. **Written Communication**
  A. Types
     1. Evaluations
     2. Manuals
        a. Policy and procedure
        b. Protocols
        c. Scholarly research and publication
        d. Business communication

  B. Interpretation/synthesis

Human Diversity

Description

Content is designed to promote better understanding of patients, patients' families and professional peers by comparing characteristics of diverse populations, such as their value system, cultural and ethnic influences, communication styles, socioeconomic influences, health risks and life stages. Content will include the study of factors that influence the interrelationships with patients and professional peers. Understanding human diversity assists the student in providing better patient care.

Objectives
1. Explain the development of a personal value system.
2. Discuss the interrelationship between personal, community and societal values.
3. Explain the influence a person's value system has on his or her behavior.
4. Discuss the development of personal and professional values.
5. Describe how professional values influence patient care.
6. Examine Kohlberg's theory on how an individual's morality influences his or her behavior.
7. Differentiate between culture and ethnicity.
8. Explain how a person's cultural beliefs towards illness affect his or her recovery.
9. Explain the origins of medical ethnocentrism.
10. Discuss the societal factors that influence the quality of health care.
11. Compare alternative/complementary medicine to the traditional Western model.
12. Describe the culture of poverty and its effect on health care.
13. Discuss family dynamics in a cultural, social, ethnic and lifestyle context.

Content
I. **Values**
    A.   Personal
        1.   Values development
        2.   Effect on medical care
        3.   Impact on patient care
        4.   Values clarification

    B.   Societal
        1.   Rights and privileges
        2.   Community values
        3.   Impact on patient care

    C.   Professional
        1.   Values development
        2.   Values conflict
        3.   Impact on patient care

    D.   Moral development
        1.   Individual behavior
        2.   Kohlberg's theory
        3.   Impact on patient care

II. **Culture, Ethnicity and Diversity**
    A.   Medical ethnocentrism

    B.   Societal and individual factors
        1.   Socioeconomic
            a.   Effects on health care
            b.   Culture of poverty
            c.   Relationship to disease occurrence
        2.   Gender
            a.   Social bias
            b.   Medical treatment bias
            c.   Cultural differences
        3.   Age
            a.   Infancy
               1)   Needs
               2)   Psychosocial development
               3)   Family interactions
            b.   Childhood
               1)   Respect and authority
               2)   Family and peer interactions
            c.   Adolescence
               1)   Autonomy and authority
               2)   Family and peer interactions

      d. Adulthood
         1) Career
         2) Family
         3) Stress and responsibilities
      e. Middle age
         1) Social acceptance
         2) Success and responsibilities
         3) Boredom
         4) Family peer and social interactions
      f. Elderly
         1) Aging process
         2) Agism
         3) Challenges of aging
         4) Sensory deprivation
         5) Mental impairment
         6) Economic discrimination
         7) Friendship and family ties
         8) Death and dying
         9) Cultural bias toward aging
4. Family structure
      a. Two parent
      b. Single parent
      c. Nontraditional
      d. Extended
      e. Cultural differences
5. Urban vs. rural living environment
      a. Availability of health care services
      b. Social acceptance of diverse cultural differences
6. Religion
      a. Impact on health care choices
         1) Western medicine
         2) Alternative/complementary medicine
7. Lifestyle choices and behaviors
8. Family dynamics
9. Sexual orientation
10. Mentally and physically challenged

Pharmacology

Description

Content is designed to broaden the technologist's knowledge of pharmacology. Topics include consumer safety and drug regulation, sources and effects of drugs and safe dose preparation. Types of drug preparations, principles of responsible drug administration including routes and techniques are examined. An introduction to clinical drug trials and a classification of drugs related to body systems are included as topics for presentation.

Objectives

1. Identify key drug laws impacting consumer safety.
2. Identify the five schedules of controlled substances and cite a drug example of each.
3. Identify the role of the Food and Drug Administration (FDA) and Drug Enforcement Administration (DEA) in the regulation and control of consumer drugs.
4. Implement strategies for health care workers involved in dispensing medications to comply with drug law restrictions.
5. Interpret common abbreviations and symbols used for medication orders.
6. Translate drug measurements across measurement systems.
7. Differentiate among drug names (generic, chemical, trade, official).
8. Explain the restrictions of drug sales implied by these designations: over-the-counter, legend drug and controlled substance.
9. List common material sources from which drugs are developed.
10. Describe the biological processing of drugs in the body.
11. List common variables affecting drug action within the body.
12. Describe common unexpected responses to drugs.
13. Accurately perform calculations for drug dose delivery.
14. Describe dose modifiers for pediatric and geriatric patients.
15. Describe various forms of drug preparations and supplies.
16. Incorporate the principles of responsible drug administration in the patient care setting to prevent medication error.
17. Describe administration routes and techniques for select medications.
18. Describe the principles associated with a controlled clinical drug trial.
19. Distinguish between single-blind and double-blind drug trials.
20. Organize drugs according to body system.

Content
I. **Consumer Safety and Drug Regulations**
  A. Drug laws
      1. 1906 Pure Food and Drug Act
          a. Drug standards
      2. 1938 Federal Food, Drug, and Cosmetic Act

  B. 1970 Controlled Substances Act
      1. Five schedules of controlled substances

  C. Role of the Food and Drug Administration

  D. Role of the Drug Enforcement Administration

  E. Health care workers and the law

II. **Abbreviations and Systems of Measurement**
  A. Common abbreviations for medication orders

  B. Medication order components
      1. Date
      2. Patient's name
      3. Medication name
      4. Dosage or amount of medication
      5. Route/manner of delivery
      6. Time to be administered or frequency

  C. System of measurement
      1. Metric
      2. Apothecary
      3. Household

III. **Drug Names and References**
  A. Classifications

  B. Identifying names
      1. Generic name
      2. Chemical name
      3. Trade name
      4. Official name
      5. Patient education

  C. Legal terms referring to drugs
      1. Over the counter
      2. Legend drug
      3. Controlled substance

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D.   Terms indicating drug actions
  1.   Indications
  2.   Actions
  3.   Contraindications
  4.   Cautions
  5.   Side effects and adverse reactions
  6.   Interactions

E.   Drug references
  1.   *Physicians' Desk Reference*
  2.   *United States Pharmacopoeia dispensing information*
  3.   *American Hospital Formulary Service*
  4.   *Compendium of Drug Therapy*

IV.   **Sources and Bodily Effects of Drugs**
  A.   Sources of drugs
    1.   Plants
      a.   Example: Cinchona; trade name – Quinidine; classification – antiarrhythmic
    2.   Minerals
      a.   Example: Magnesium; trade name – milk of magnesia; classification – antacid
    3.   Animals
      a.   Example: Stomach of cow; trade name – pepsin; classification – digestive hormone
    4.   Synthetic
      a.   Example: Meperidine; trade name – Demerol; classification – analgesic

  B.   Effects of drugs
    1.   Systemic effects
    2.   Local effects

  C.   Pharmacokinetics
    1.   Absorption
    2.   Distribution
    3.   Metabolism
    4.   Excretion

  D.   Other variables
    1.   Age
    2.   Weight
    3.   Sex
    4.   Psychological state
    5.   Drug interactions

      6. Dosage
      7. Route

  E. Unexpected responses to drugs
    1. Teratogenic effect
    2. Tolerance
    3. Dependence
    4. Hypersensitivity
    5. Anaphylactic reaction

V. Safe Dosage Preparation
  A. Calculation guidelines

  B. Basic calculation

  C. Ratio and proportion

  D. Pediatric dosage

  E. Geriatric dosage

VI. Medication Preparations and Supplies
  A. Drug forms
    1. Transdermal patch
    2. Oral forms
      a. Tablet
      b. Enteric-coated tablet
      c. Capsule
      d. Sustained-release capsule
      e. Lozenge
      f. Suspension
      g. Emulsion
      h. Elixir, fluid extract
      i. Syrup
      j. Solution
    3. Rectal forms
      a. Suppository
      b. Enema solution
    4. Injectable forms
      a. Solution
      b. Powder
      c. Intravenous
      d. Intramuscular
      e. Subcutaneous
      f. Intradermal
      g. Epidural

        h.   Intracardiac
        i.   Intraspinal
        j.   Intracapsular
  5. Topical forms
        a.   Cream or ointment
        b.   Lotion
        c.   Liniment
        d.   Dermal patch
        e.   Eye, ear and nose drops
        f.   Eye ointment
        g.   Vaginal cream
        h.   Rectal or vaginal suppository
        i.   Douche solution
        j.   Buccal tablet
        k.   Sublingual tablet
  6. Inhalable forms
        a.   Spray or mist

VII. **Responsibilities and Principles of Drug Administration**
  A. Responsible drug administration

  B. Medication error avoidance

VIII. **Administration Routes and Techniques**
  A. Gastrointestinal
    1. Oral
    2. Nasogastric tube
    3. Gastric tube
    4. Rectal

  B. Parenteral
    1. Buccal
    2. Transcutaneous
    3. Inhalation therapy
    4. Injections
    5. Skin medications
    6. Mucous membrane application
    7. Eye medications

  C. Poison control
    1. Poisoning by ingestion
    2. Poisoning by inhalation
    3. External poisoning of skin or eyes
    4. Poisoning by sting and snakebite
    5. Patient education

IX. **Clinical Drug Trials**
   A. Principles of the controlled trial

   B. Pragmatic vs. exploratory trials

   C. Protection of subjects

   D. Efficacy assessment

   E. Randomization

   F. Single-blind and double-blind trials

   G. Sample size

   H. Choice of comparator

   I. Preparing a protocol

   J. Auditing the clinical trial

X. **Drug Classifications**
   A. Vitamins, minerals and herbs
      1. Fat-soluble vitamins
      2. Water-soluble vitamins
      3. Minerals
      4. Antioxidants
      5. Alternative medicines

   B. Skin medications
      1. Antipruritics
      2. Corticosteroids
      3. Emollients and demulcents
      4. Keratolytics
      5. Scabicides and pediculicides
      6. Antifungals
      7. Antivirals
      8. Local anti-infectives
      9. Cautions for topical medications

   C. Autonomic nervous system drugs
      1. Andrenergics (sympathomimetics)
      2. Adrenergic blockers (alpha and beta blockers)
      3. Cholinergics (parasympathomimetics)
      4. Cholinergic blockers (anticholinergics)

D. Antineoplastic drugs
1. Antimetabolites
2. Alkylating agents
3. Plant alkaloids
4. Antitumor antibiotics
5. Hormone therapy
6. Biological response modifiers
7. Radioactive isotopes
8. Cautions and responsibilities for antineoplastic drugs

E. Urinary system drugs
1. Diuretics
2. Medications for gout
3. Antispasmodics
4. Cholinergics
5. Analgesics
6. Treatment of benign prostatic hypertrophy
7. Alpha blockers

F. Gastrointestinal drugs
1. Antacids
2. Agents for treatment of ulcers and gastroesophageal reflux disease
3. Antispasmodics/anticholinergics
4. Agents for treatment of inflammatory bowel disease
5. Antidiarrhea agents
6. Antiflatulents
7. Laxatives and cathartics
8. Antiemetics

G. Anti-infective drugs
1. Aminoglycosides
2. Cephalosporins
3. Macrolides
4. Penicillins
5. Quinolones
6. Tetracyclines
7. Antifungals
8. Antituberculosis agents
9. Miscellaneous anti-infectives
10. Antivirals
11. Treatment for human immunodeficiency virus
12. Infections
13. Sulfonamides
14. Urinary anti-infectives

H. Eye medications
1. Anti-infectives
2. Anti-inflammatory agents
3. Antiglaucoma agents
4. Mydriatics
5. Local anesthetics

I. Analgesics, sedatives and hypnotics
1. Analgesics
2. Sedatives and hypnotics

J. Psychotropic medications, alcohol and drug abuse
1. CNS stimulants
2. Antidepressants
3. Antimanic agents
4. Anxiolytics
5. Antipsychotic medications
6. Alcohol
7. Drug abuse

K. Musculoskeletal and anti-inflammatory drugs
1. Skeletal muscle relaxants
2. Anti-inflammatory drugs
3. Osteoporosis therapy

L. Anticonvulsants, antiparkinsonian drugs and agents for Alzheimer's disease
1. Anticonvulsants
2. Drugs for absence epilepsy
3. Drugs for grand mal and psychomotor epilepsy
4. Antiparkinsonian drugs
5. Agents for Alzheimer's disease

M. Endocrine system drugs
1. Pituitary hormones
2. Adrenal corticosteroids
3. Thyroid agents
4. Antithyroid agents
5. Antidiabetic agents

N. Reproductive system drugs
1. Androgens
2. Impotence agents
3. Estrogens
4. Progestins
5. Drugs for labor and delivery

      6. Gonadotropic drugs
      7. Infertility drugs

O. Cardiovascular drugs
      1. Cardiac glycosides
      2. Antiarrhythmic agents
      3. Antihypertensives
      4. Coronary vasodilators
      5. Antilipemic agents
      6. Vasoconstrictors
      7. Anticoagulants
      8. Platelet inhibitor therapy

P. Respiratory system drugs and antihistamines
      1. Oxygen
      2. Respiratory stimulants
      3. Bronchodilators
      4. Corticosteroids
      5. Asthma prophylaxis
      6. Mucolytics and expectorants
      7. Antihistamines
      8. Decongestants
      9. Smoking cessation aids

Q. Preoperative medications and local anesthetics
      1. Preoperative medications
      2. Anticholinergics
      3. Antiemetics
      4. Sedatives
      5. Opioids
      6. Local anesthetics
      7. Amide-type
      8. Aster-type
      9. Miscellaneous

R. Drugs and geriatrics
      1. Cumulative effect of drugs
      2. Gray-list drugs
      3. Drugs that may cause mental impairment
      4. Nonsteroidal anti-inflammatory drugs
      5. Polypharmacy
      6. Values development
      7. Effect on medical care
      8. Impact on patient care
      9. Values clarification

Patient Assessment, Management and Education

Description
Content introduces a model for clinical thinking to aid in patient assessment. Content includes the application of normal anatomy and physiological phenomena to ill and injured individuals. Interviewing skills and assessment techniques with clinical focus will be discussed. An emphasis on the analysis and interpretation of physiological data to assist in patient assessment and management will be introduced.

Objectives
1. Develop clinical-thinking skills applied to the patient care setting.
2. Develop skills in conducting patient interviews to document a patient's medical history.
3. Apply the techniques and procedures for conducting a patient physical assessment and procedures to document findings.
4. Obtain and critically analyze a patient's vital signs.
5. Compose a plan for managing the patient based upon patient needs.
6. Participate in patient education.
7. Foster relationship-centered patient care.
8. Adapt communications techniques to address patient needs.

Content
I. **The Process of Clinical Thinking**
  A. Identification of abnormal findings

  B. Anatomically localize findings

  C. Interpret findings in terms of probable causes

  D. Develop one or two hypotheses about the nature of the patient's problem
    1. Select the most specific and central finding
    2. Match findings against conditions
    3. Weigh competing possibilities
    4. Give attention to potentially life-threatening and treatable conditions

  E. Test the hypothesis

  F. Establish a working definition of the problem

II. **Interviewing and Patient History**
  A. The structure and purposes of the medical history

  B. Setting the stage for the interview

  C. Learning about the patient's illness
    1. Skills of good interviewing
       a. Nonverbal communication
       b. Facilitation
       c. Reflection
       d. Clarification
       e. Summarization
       f. Validation
       g. Empathic responses
       h. Transitions
    2. Interviewing challenges
       a. Patients at different ages
       b. Situations that call for specific responses
    3. Components of a comprehensive history
       a. Preliminary data
          1) Date and time of history
          2) Identifying data
          3) Reliability
       b. Chief complaint
       c. Present illness
       d. Past history
       e. Current health status

      f. Review of systems
        1) General
        2) Skin
        3) Head, eyes, ears, nose and throat
        4) Respiration
        5) Cardiac
        6) Gastrointestinal
        7) Urinary
        8) Male genital
        9) Female genital
        10) Peripheral vascular
        11) Musculoskeletal
        12) Neurologic
        13) Hematologic
        14) Endocrine
        15) Psychiatric

D. The physical assessment of the patient
   1. Level of consciousness
   2. Signs of distress
   3. Apparent state of health
   4. Vital statistics
   5. Sexual development
   6. Skin condition
   7. Posture, gait, motor activity
   8. Personal grooming
   9. Odors of breath and body
   10. Facial expression
   11. Vital signs
      a. Pulse
      b. Respiration
      c. Blood pressure
      d. Body temperature

E. Documentation of findings
   1. Characteristics required to describe a symptom
      a. Site
      b. Severity
      c. Quality
      d. Time course
      e. Setting
      f. Aggravating and relieving factors
      g. Associated features

III. **Performing the Patient Physical Exam**
   A. Patient preparation

B. Method and technique for obtaining a patient's vital signs
    1. Equipment needed
        a. Stethoscope
        b. Blood pressure cuff
        c. Watch displaying seconds
        d. Thermometer
    2. General considerations
    3. Temperature
        a. Oral
        b. Axillary
        c. Rectal
        d. Aural
    4. Respiration
    5. Pulse
        a. Regular
        b. Regularly irregular
        c. Irregularly irregular
    6. Blood pressure
        a. Keys for distinguishing blood pressure levels
            1) Normal
            2) Isolated systolic hypertension
            3) Mild hypertension
            4) Moderate hypertension
            5) Severe hypertension
            6) Crisis hypertension

IV. **Method and Technique for Performing an Examination of the Skin**
    A. Changes with age

    B. Assessment
        1. Skin
        2. Color
            a. Moisture
            b. Temperature
            c. Texture
            d. Mobility and turgor
            e. Lesions
        3. Nails
        4. Hair

    C. Patient education
        1. Sun exposure
        2. Skin inspection

V. **Method and Technique for Performing an Examination of the Head and Neck**
   A. Head
      1. Hair
      2. Scalp
      3. Skull
      4. Face
      5. Skin

   B. Eyes
      1. Visual acuity
      2. Fields of confrontation
      3. Position and alignment
      4. Eyebrows
      5. Eyelids
      6. Lacrimal apparatus
      7. Conjunctiva and sclera
      8. Cornea and lens
      9. Iris
      10. Extraocular muscles
      11. Ophthalmoscopic inspection

   C. Ears
      1. Auricle
      2. Ear canal and drum
      3. Auditory acuity
      4. Air and bone conduction

   D. Nose and paranasal sinuses

   E. Mouth and pharynx
      1. Lips
      2. Oral mucosa
      3. Gums and teeth
      4. Roof of the mouth
      5. Tongue and floor of the mouth

   F. Neck
      1. Lymph nodes
      2. Trachea and thyroid gland
      3. Carotid artery and jugular veins

   G. Patient education
      1. Vision and hearing changes associated with age
      2. Glaucoma
      3. Cataracts
      4. Oral health promotion

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VI. **Method and Technique for Performing an Examination of the Thorax and Lungs**
   A. Equipment needed

   B. General considerations
      1. Patient preparation
      2. Finger clubbing, cyanosis, air hunger

   C. Inspection
      1. Respiratory rate, rhythm, depth and breathing effort
      2. Wheezes or unusual sounds
      3. Chest symmetry
      4. Palpation
      5. Auscultation

   D. Percussion
      1. Technique
         a. Posterior chest
            1) Diaphragmatic excursion
         b. Anterior chest
            1) Interpretation
            2) Flat or dull
            3) Normal
            4) Hyperresonant

   E. Auscultation
      1. Posterior chest
      2. Anterior chest
      3. Interpretation
         a. Crackles
         b. Wheezes
         c. Rhonchi

   F. Special tests
      1. Peak flow monitoring

   G. Characteristics of common symptoms associated with types of chest pain
      1. Angina pectoris
      2. Myocardial infarction
      3. Acute pericarditis
      4. Pleurisy
      5. Esophageal pain

   H. Characteristics of common symptoms associated with shortness of breath
      1. Left ventricular failure and acute pulmonary edema

2. Bronchial asthma
3. Chronic obstructive airway disease
4. Spontaneous pneumothorax
5. Metabolic acidosis
6. Anxiety

I. Patient education
   1. Smoking risks and cessation
   2. Risks to nonsmokers

VII. **Method and Technique for Performing an Examination of the Abdomen**
   A. Equipment needed

   B. General considerations

   C. Patient preparation

   D. Appropriate terminology to locate findings
      1. Right upper quadrant (RUQ)
      2. Right lower quadrant (RLQ)
      3. Left upper quadrant (LUQ)
      4. Left lower quadrant (LLQ)
      5. Midline
         a. Epigastric
         b. Periumbilical
         c. Suprapubic

   E. Inspection
      1. Auscultation
         a. Bowel sounds, bruits
      2. Percussion
         a. Liver span
         b. Splenic dullness
      3. Palpation
         a. General palpation
         b. Palpation of the liver
            1) Standard method
            2) Alternate method
         c. Palpation of the spleen
         d. Palpation of the aorta

   F. Special tests
      1. Rebound tenderness

   G. Characteristics of common symptoms associated with types of abdominal pain
      1. Peptic ulcer

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2. Biliary colic and acute cholecystitis
3. Renal colic
4. Acute pancreatitis

H. Patient education
1. Screening for alcoholism
2. Infectious hepatitis
3. Colon cancer risks

VIII. **Method and Technique for Performing an Examination of the Breasts and Axillae**
A. Breast inspection
1. Appearance of the skin
2. Size and symmetry
3. Contour
4. Nipple characteristics

B. Breast palpation
1. Consistency of tissues
2. Tenderness
3. Nodules
4. Nipple

C. Axillae
1. Inspection
2. Palpation

D. General considerations
1. Aging effects on breast characteristics

E. Patient education
1. Breast self-examination
2. Breast cancer risk factors
3. Breast cancer screening

IX. **Method and Technique for Performing an Examination of the Musculoskeletal System**
A. Inspection and palpation

B. Range of motion and maneuvers
1. Temporomandibular joint
2. Shoulder
3. Elbow
4. Wrist and hand
5. Spine
6. Hip

7. Knee
8. Ankle and foot

C. Evaluation for carpal tunnel syndrome

D. Characteristics of common symptoms associated with types of joint pain
1. Rheumatoid arthritis
2. Osteoarthritis
3. Gout

E. Patient education
1. Balanced nutrition
2. Regular exercise
3. Weight control
4. Postmenopausal hormone replacement therapy and osteoporosis

X. **Method and Technique for Performing an Evaluation of the Cardiovascular System**
A. Equipment needed

B. General considerations

C. Arterial pulses
1. Rate and rhythm
2. Amplitude and contour
3. Auscultation for bruits and thrills
4. Blood pressure
a. Interpretation
b. Special problems
1) Apprehensive patient
2) Obese arm
3) Leg pulse and pressures
4) Weak or inaudible Korotkoff sounds
5) Arrhythmias

D. Jugular venous pressure (JVP)
1. Pulsations

E. Precordial movement

F. Auscultation
1. Interpretation
2. Murmurs
a. Timing
b. Shape
c. Intensity

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        d.   Pitch
        e.   Quality

    G. Patient education
       1. Cholesterol counseling
       2. Weight counseling
       3. Exercise counseling

XI. **Method and Technique for Performing an Examination of the Peripheral Vascular System**
    A. Inspection and palpation
       1. Arms
       2. Legs
       3. Pulses

    B. Search for edema

    C. Patient education
       1. Reducing the risks of peripheral vascular disease
       2. Smoking cessation
       3. Blood pressure control
       4. Diet and exercise
       5. Promoting good foot care in patients with diabetes

XII. **Method and Technique for Performing an Examination of the Nervous System**
    A. Mental status and speech

    B. Cranial nerves

    C. Motor system
       1. Body position
       2. Involuntary movements
       3. Muscle tone
       4. Muscle strength
       5. Coordination

    D. Sensory system
       1. Pain and temperature
       2. Position and vibration
       3. Light touch
       4. Discriminative sensations

    E. Reflexes
       1. Biceps reflex
       2. Triceps reflex
       3. Supinator or brachioradialis reflex

    4. Abdominal reflexes
    5. Knee reflex
    6. Ankle reflex
    7. Plantar response

F. Characteristics of common symptoms associated with sudden loss of consciousness
    1. Vasovagal syncope
    2. Epilepsy
    3. Syncope due to cardiac causes
    4. Syncope due to postural hypotension
    5. Loss of consciousness due to hypoglycemia

G. Patient education
    1. Changes of mental capacity with age
    2. Depression
    3. Alcohol and drug abuse
    4. Suicide

XIII. **The Foundation of Patient Care Delivery**
A. Relationships formed in the delivery of care

B. Relationships-centered care
    1. Dimensions of relations-centered health care
    2. Patient-practitioner relationship
    3. Community-practitioner relationship
    4. Practitioner-practitioner relationship

C. Knowledge, skills and values of relationship-centered care
    1. Self-awareness
    2. Patient experience of health and illness
    3. Developing and maintaining caring relationships
    4. Effective communication

D. Expectations and the key role of medicine
    1. Matching resources to reality

E. Radiologist assistant-patient interaction

F. Problems of the patient
    1. Loss of formed self-image
    2. Losses associated with hospitalization
       a. Home
       b. Privacy
    3. Loss of independence
    4. Uncertainty of the future

G. Privileges of the patient
1. Advantages of staying sick
2. Escape and financial gain

H. Incentives for getting well
1. Societal values
2. Personal values
3. Discovering a meaningful value system
4. Values clarification
5. Discovering and reclaiming values

I. Patient Interactions
1. Interaction within a dependence relationship
a. Type of dependence
2. Interaction with the health professional
3. Interaction with technology
a. The computer in health care
4. Other forms of technology
5. Interaction with society

J. Determinants of effective interaction between the health professional and the patient
1. Verbal communications
2. Talking together – a bridge to relationship

K. Determinants of successful verbal communication
1. Presentation of material
2. Attitudes
3. Voice tone and volume
4. Effective listening

L. Nonverbal communication
1. Metacommunication
2. Facial expression
3. Positions, postures and gestures
4. Physical appearance
5. Touch

M. Cultural and personal biases as determinants of effectiveness
1. Cultural bias
2. Differing concepts of distance awareness
3. Differing concepts of time awareness
4. Personal biases

N. Working with patients in the middle and later years of life
   1. Middle years
      a. Responsibility and stress
      b. Boredom
      c. Doubt at the crossroads
   2. Later years
      a. Biological processes of aging
      b. Intellectual processes of aging
         1) Learning ability
         2) Acquisition of skills
      c. Psychological processes of aging
         1) Friendship and family ties
         2) Losses
      d. Old age and ageism
         1) Economic discrimination
         2) Belittling stereotypes
      e. Depression and reminiscence

O. Working with older patients
   1. Assessing the patient's value system

P. Working with patients in life-and-death situations
   1. Terminal illness and the process of dying
   2. The process of dying and the death event
   3. Fears associated with dying and death
   4. Patient's response to knowing

Q. Working with the patient who has a terminal illness
   1. Telling the bad news
      a. Information sharing: duties and rights
      b. The what and how of telling
      c. Conflicts among health professionals
   2. The family during terminal illness
   3. Interaction with patients and their families
      a. Treating the losses and fears
      b. Maintaining hope
   4. Supportive interaction between health professionals

R. Life-and-death decisions in the health professions
   1. When death is imminent
      a. Maximizing comfort
      b. Saying good bye
      c. Accepting rejection
   2. When imminent death is not inevitable
   3. Technology: blessing or behemoth?
   4. Prolongation of life

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